FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	STP 2023(866)HES		RISINGER RD
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	1
CONTROL	SECTION	JOB	
0902	90	208	

K-3107

CITY PROJEC NO. 103636

FINAL PLANS

NAME OF CONTRACTOR: _____

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK COMPLETED: _____

DATE WORK ACCEPTED: _____

SUMMARY OF CHANGE ORDERS:

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED INTERSECTION IMPROVEMENTS

FEDERAL AID PROJECT

RISINGER RD
AT GARDEN SPRINGS DR

TARRANT COUNTY

CSJ: 0902-90-208

PROJECT LENGTH = 0.150 MILES

LIMITS: FROM 0.1E TO 0.1 W OF GARDEN SPRINGS DRIVE

FOR THE CONSTRUCTION OF INTERSECTION & OPERATIONAL IMPROVEMENTS

CONSISTING OF INSTALLING TRAFFIC SIGNAL AND ADDING TURN LANES, CURB RAMPS, SIGNING & PAVEMENT MARKINGS

SEE SHEET 2 FOR INDEX OF SHEETS

ROADWAY	CLASSIFICATION	DESIGN SPEED (MPH)
RISINGER RD	COMMERCIAL CONNECTOR	40
GARDEN SPRINGS DR	NEIGHBORHOOD CONNECTOR	30

RISINGER ROAD

2017 AADT: 9,491
2037 AADT: 13,290
DESIGN SPEED: 40 MPH

GARDEN SPRINGS DRIVE

2015 AADT: 1,155
2037 AADT: 1,617
DESIGN SPEED: 30 MPH

NOTE:

1. *TRAFFIC COUNTS TAKEN FROM TXDOT STATE WIDE PLANNING GIS MAP.*
2. *STREET DATA SHOWN ARE IN REGIONS WHERE PEDESTRIAN TRAFFIC SIGNALS ARE PROPOSED.*

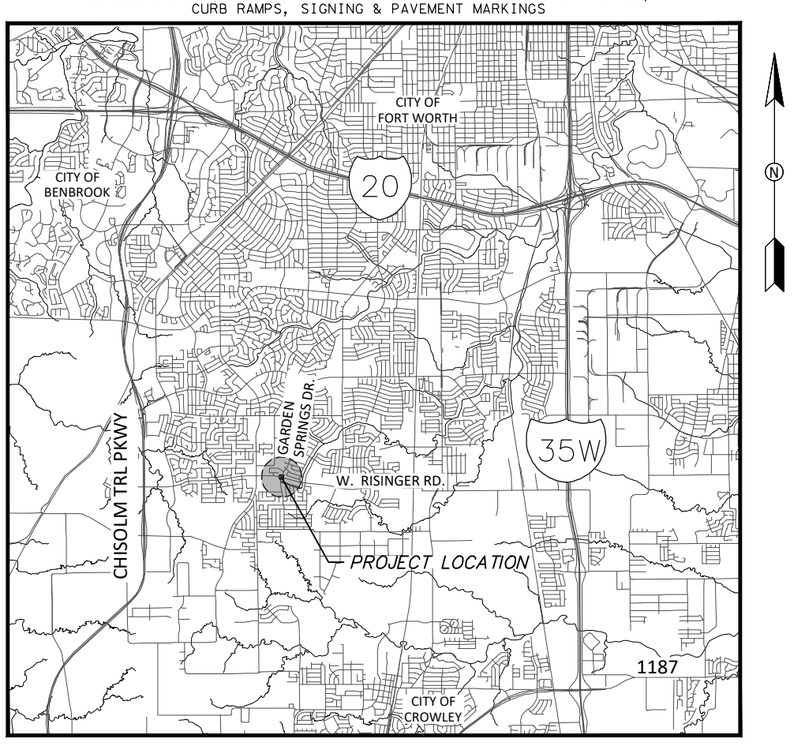
MAY 2023

FORT WORTH

CITY OF FORT WORTH
PROJ NO: 103636

CITY OF FORT WORTH
PROJ. MANAGER: FANTA KABA

CITY OF FORT WORTH
FILE NO.(S) ASSIGNED: ***K-3107***



LOCATION MAP

N.T.S.

NO EQUATIONS, NO EXCEPTIONS, NO RAILROAD CROSSINGS

TDLR INSPECTION REQUIRED
TDLR NO. TABS2023010448

ALL CONSTRUCTION SHOWN IN THESE PLANS WILL REQUIRE COMPLIANCE TO TxDOT STANDARD SPECIFICATIONS, STANDARD PLANS, AND TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, UNLESS OTHERWISE SHOWN.

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

DUNAWAY

550 Bailey Avenue • Suite 400 • Fort Worth, Texas 76107
Tel: 817.335.1121
(TX REG. F-1174)

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED PROFESSIONAL ENGINEER

SUBMITTED FOR LETTING 05/04/2023

PROJECT MANAGER
DUNAWAY ASSOCIATES

CONCURRENCE: May 5, 2023

TRANSPORTATION AND PUBLIC WORKS CITY ENGINEER, CITY OF FORT WORTH

CONCURRENCE: May 4, 2023

TRANSPORTATION AND PUBLIC WORKS INTERIM PROGRAM MANAGER, CITY OF FORT WORTH

Texas Department of Transportation

SUBMITTED FOR LETTING DocuSigned by: 3/7/2023
2F552E37025E4A8...
AREA ENGINEER

RECOMMENDED FOR LETTING 3/22/2023
DocuSigned by:
7879B0B92E5D403...
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

APPROVED FOR LETTING 3/24/2023
DocuSigned by:
David M Salazar, P.E.
B741E64FAD82411...
DISTRICT ENGINEER

RISINGER RD AT GARDEN SPRINGS DR INTERSECTION IMPROVEMENTS

EXISTING LEGEND

	PROPERTY LINE AND RIGHT-OF-WAY
	EASEMENT LINE
IRF	IRON ROD FOUND
	BENCH MARK OR CONTROL POINT
	UTILITY POLE
	LIGHT POLE
	GUY WIRE
	STEEL POLE & MAST ARM
	PEDESTAL POLE
	EXISTING SIGN
	FLAG POLE
	MAIL BOX
	BOLLARD, GATE POST
	TELEPHONE RISER
WM	WATER METER
	WATER VALVE
	IRRIGATION VALVE
	SPRINKLER VALVE
SH	SPRINKLER HEAD
	FIRE HYDRANT
GM	GAS METER
SD	STORM DRAIN MANHOLE
30" RCP	STORM DRAIN PIPE
SS	SANITARY SEWER MANHOLE
	SANITARY SEWER CLEANOUT
SB	SIGNAL BOX
CVT	CABLE BOX
	WOOD FENCE
	IRON FENCE
	CHAIN LINK FENCE
	WIRE FENCE
	SHRUB
	TREE
	BUILDING
	CONC CURB & GUTTER
	EDGE OF ASPHALT
	EDGE OF GRAVEL
EX-OHE	OVERHEAD ELECTRIC
EX-UE	UNDERGROUND ELECTRIC
EX-T	UNDERGROUND TELEPHONE
EX-SS	SANITARY SEWER
EX-W	WATER LINE
EX-GAS	GAS LINE
EX-FO	UNDERGROUND FIBER OPTIC CABLE
EX-UGC	UNDERGROUND CABLE

PAVING LEGEND

	PROPOSED 7" CONCRETE PAVEMENT w/ 8" FLEX BASE
	PROPOSED 4" SIDEWALK/RAMP (5' WIDE)
	PROPOSED 5" REINFORCED CONCRETE RIPRAP
	PROPOSED 6" INTEGRAL CURB
	PROPOSED BLOCK SOD

ABBREVIATIONS

BC	BACK OF CURB
BM	BENCH MARK
BW	BOTTOM OF WALL
CI	CURB INLET
C.O.F.W.	CITY OF FORT WORTH
CP	CONTROL POINT
D.R.T.C.T.	DEED RECORDS TARRANT COUNTY TEXAS
ELEV	ELEVATION
EG	EXISTING GRADE ELEVATION
EXIST.	EXISTING
FC	FACE OF CURB
FG	FINISHED GRADE ELEVATION
FL	FLOW LINE
GT	GUTTER
HGL	HYDRAULIC GRADE LINE
LAT	LATERAL
LF	LINEAR FEET
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PGL	PROPOSED GRADE LINE
PI	POINT OF INTERSECTION
PRC	POINT OF REVERSE CURVATURE
PROP	PROPOSED
PT	POINT OF TANGENCY
PVI	POINT OF VERTICAL INTERSECTION
PVC	POINT OF VERTICAL CURVATURE
PVT	POINT OF VERTICAL TANGENCY
RP	RADIUS POINT
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
SD	STORM DRAIN
SDWK	SIDEWALK
STD	STANDARD
STA	STATION
SS	SANITARY SEWER
TC	TOP OF CURB
TG	TOP OF GRATE
TOF	TOP OF FOUNDATION
TOP	TOP OF PIPE
TOW	TOP OF WALL
YR	YEAR

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

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

PROJECT ENGINEER

2/24/2023
DATE

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

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

PROJECT ENGINEER

2/24/2023
DATE

INDEX OF SHEETS

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1117
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

RISINGER & GARDEN SPRINGS IMPROVEMENTS

INDEX OF SHEETS & LEGENDS

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	2

Specification Data

Basis of Estimate

Item	Description	Rate	Unit
168	Vegetative Watering	169.400 gal./acre	1.000 gal.

Compaction Requirements for Base Courses

Item	Material	Course	Min. Density
247	Flex Base	All	100 %

(Minimum Density is the percentage of density required based on results of Tex-113-E, Tex-114-E, Tex-120-E, and/or Tex-121-E)

Special Notes

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

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

The data located in these files is for non-construction purposes only and can be found at

TxDOT's public FTP site at https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/.

Access is read-only.

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

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

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

Area Engineer's Email: David.Neeley@TxDOT.gov
Assistant Area Engineer's Email: N/A
Design Manager's Email: N/A

County: Tarrant **Control:** 0902-90-208

Highway: Risinger Rd

Contractor questions will be accepted through email, phone, and in person by the above individuals. Questions may also be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

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

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

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

Single lane closures, except as otherwise shown in the plans, will be restricted to off-peak hours as defined in the following table:

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

Existing storm sewers and utilities are shown from the best available information. Verify the location of all underground facilities prior to starting work.

Modifications to Lane Closure / Work Restrictions:

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

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

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

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

Complete all work in these easement areas prior to the expiration dates shown. In the event that work is done after these expiration dates, all costs for extending these dates will be paid by the Contractor.

Mail box manipulation made necessary because of construction will be in accordance with Item 560 "Mailbox Assemblies," except that this work will not be paid for directly but will subsidiary to the pertinent bid items.

Provide all-weather surface for temporary ingress and egress to adjacent property, as directed. Materials, labor, equipment and incidentals necessary to provide temporary ingress and egress will not be paid for directly, but will be subsidiary to the various bid items.

Where necessary, the governing slopes indicated herein may be varied from the limits shown, to the extent approved.

Locations and lengths of all private entrances are approximate only. The actual locations, lengths, lines and grades are to be determined by the Engineer and shall conform to the regulations of The City of Fort Worth.

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

Remove the grass from the crown of shoulders or pavement edges by blading or other approved methods. Payment for this work will not be made directly, but will be subsidiary to the various items of the contract.

Provide temporary drain openings at all low points or other drainage structures, as required, at the Contractor's expense.

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

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

Item 2. Instructions to Bidders

Proposals with a bid of more than 107 working days for the substantial completion of the project will be considered non-responsive.

Item 4 – Scope of Work

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

Item 5. Control of the Work

When supplementary bridge plans, shop drawings, shop details, erection drawings, working drawings, forming plans, or other drawings are required, prepare and submit drawings on sheets 8-1/2 by 11 inches, 17 by 22 inches, or full size drawings reduced to half scale if completely legible. If, in the opinion of the Engineer, the drawings are not completely legible, prepare and submit on sheets 22 by 34 inches, with a 1-1/2 inch left margin, and 1/2 inch top, right, and bottom margins.

Submit all sheets with a title in the lower right hand corner. The title must include the sheet index data shown on the lower right corner of the project plans, name of the structure or element or stream, sheet numbering for the shop drawings, name of the fabricator and the name of the Contractor.

Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Item 6.

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

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

The Buy America Material Classification Sheet is located at the below link.
https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

Item 7. Legal Relations and Responsibilities

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

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

Holiday Lane Closure Restrictions	
New Year's Eve and New Year's Day (December 31 through January 1)	3 PM December 30 through 9 AM January 2
Easter Holiday Weekend (Friday through Sunday)	3PM Thursday through 9 AM Monday
Memorial Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Independence Day (July 3 through July 5)	3 PM July 2 through 9 AM July 6
Labor Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Thanksgiving Holiday (Wednesday through Sunday)	3 PM Tuesday through 9 AM Monday
Christmas Holiday (December 23 through December 26)	3 PM December 22 through 9 AM December 27

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

Item 8. Prosecution and Progress

Working days will be computed and charged in accordance with Section 8.3.1.1. 'Five-Day Workweek.'

Substantially complete the project in 107 working days.

Item 110. Excavation

Review proposed waste sites to determine if any site is located in a "Base Floodplain" or "Floodway" as defined by the Federal Emergency Management Agency (FEMA).

If waste material from this project is placed in a base floodplain as defined by FEMA, obtain a permit from the local community responsible for enforcing National Flood Insurance Program (NFIP) regulations. Ensure that the owner of the property receiving the waste has obtained the necessary permit.

County: Tarrant **Control:** 0902-90-208

Highway: Risinger Rd

Item 160. Topsoil

Salvage approximately 1000 cubic yards of topsoil from areas shown on plans. Maximum salvage depth is 6-in. Place 4-in. layer of Topsoil to designated areas.

Place approximately 4 inches of topsoil on areas shown or directed.

Excavation for topsoil should not exceed 3 feet in depth unless otherwise directed.

Item 162. Sodding for Erosion Control

Furnish and place Bermudagrass sod.

Item 166. Fertilizer

Fertilize all areas of project to be seeded or sodded.

Item 168. Vegetative Watering

Furnish and install an approved rain gauge at the project site, as directed. Furnishing and installation of the rain gauge will not be paid for directly, but will be subsidiary to Item 168.

Apply vegetative watering for an establishment period of thirteen weeks following application of seed or installation of sod, at a rate of 1/2 inch of water depth per week (approximately 13,030 gallons per acre). During the first four weeks after seeding, apply water twice per week, on non-consecutive days, each at half the weekly application rate. For the remainder of the establishment period, apply vegetative watering once per week during the months of January through June or September through December, at the weekly application rate; apply watering twice per week, on non-consecutive days during the months of July and August, each at one-half the weekly application rate.

Average weekly rainfall rates for the District are:

January—0.39" April—0.86" July—0.48" October—0.68"
February—0.46" May—1.00" August—0.47" November—0.46"
March—0.48" June—0.63" September—0.74" December—0.37"

Item 247. Flexible Base

Place material in two or more equal lifts unless otherwise directed.

Do not add field sand to modify the final material to meet the requirements.

Item 360. Concrete Pavement

When using the Hardy Chair-Lok to support reinforcing steel, chair spacing may be increased to 1.67 sq. yd. per chair, placed in a diamond or square pattern. Do not exceed 60" longitudinal spacing.

The provisions of Article 360.6.2, "Deficient Thickness Adjustment," will not be a requirement and the pavement will not be cored.

Include the approved mix design number on each delivery ticket.

Item 432. Riprap

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

Welded Wire Reinforcement (WWR) may be used for construction joint and toe wall reinforcing with the approval of the Engineer.

Item 502. Barricades, Signs, and Traffic Handling

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

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

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

County: Tarrant **Control:** 0902-90-208

Highway: Risinger Rd

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

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

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

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

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

The SW3P for this project will consist of using the following items as directed:

- Temporary curb inlet sediment protection

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

Items 530 And 531. Intersections, Driveways and Turnouts, and Sidewalks

The furnishing and installation of the sand cushion in proposed sidewalks, sidewalk ramps, and driveways will not be paid for directly but will be subsidiary to this bid item.

Item 666. Reflectorized Pavement Markings with Retroreflective Requirements

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

Traffic Signal General Notes

Special Notes:

The TxDOT Signal Shop can be reached at 817-370-3661. Contact the Signal Shop in advance for notification of pre-construction meetings, delivery of equipment, request for electrical inspection, placing signals into flash or turn on, or set up of signal detection.

Provide a qualified technician, approved by the Engineer, on the project site to place the traffic signals in flash or in full operation. A qualified TxDOT signal technician must also be present.

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

The contractor is responsible for notifying TxDOT project manager for picking up and dropping off materials furnished by the State. Contact the TxDOT Signal Shop 48 hours in advance of picking up to make arrangements.

Item 400. Excavation and Backfill for Structures

Drilling, boring, and trenching through rock is subsidiary to the various bid items. No additional compensation will be paid to the contractor for the removal of rock or any other obstruction during excavation, trenching, jacking, boring, or drilling and for any additional equipment, materials, labor, tools, or incidentals required to complete the work.

Item 416. Drilled Shaft Foundations

Contractor shall stake foundation as shown on plans. Engineer or Engineers designee will verify and approve staked locations before installing foundations. Calculate signal head clearance and report to the Engineer or Engineers designee.

Obtain Engineer's approval of location before installing foundation.

Item 421. Hydraulic Cement Concrete

Notify the TxDOT Signal Shop 48 hours in advance of placing concrete. Do not place concrete without an inspector present unless approved.
Contractor personnel performing job-control (QC) testing on concrete must be ACI certified and maintain certification. Provide a copy of all personnel certification papers to the Engineer at the preconstruction meeting. The Engineer may require the Contractor's testers to provide the certification papers upon arrival and before testing at the job site. Certified testers will be required to participate with certified TxDOT personnel annually for slump (Tex-415-A), air

County: Tarrant **Control:** 0902-90-208

Highway: Risinger Rd

content (Tex-416-A), compression testing (Tex-418-A), and capping cylinders (Tex-450-A) to retain their certification on TxDOT projects.

Contractor shall furnish a hard copy of all testing equipment calibration reports at the preconstruction meeting when non-TxDOT equipment is used to test concrete. Furnish updated reports as equipment is calibrated through the project contract. The calibration frequency will match TxDOT's and will apply for each piece of equipment as follows:

Slump Cone - Annual
Air Meter - Every 3 months
Compression Tester - Annual
Beam breaker - Annual

The Engineer may allow the use of local commercial laboratories under contract to provide these services. The Commercial Laboratory must fulfill requirements listed above prior to performing any work.

Item 618. Conduit

After installing conduit and pulling conductor, leave a high tensile strength polyester fiber pull tape in the conduit for future use.

Item 620. Electrical Conductors

Clearly and permanently mark each conductor installed in a signal pole where it can be clearly seen from the hand hole. Use plastic zip ties with labeling plate to mark conductor with appropriate designation.

Item 624. Ground Boxes

Slack conductors required by Standard Sheet ED(3)-14 will be subsidiary to Item 624.

Concrete removal required for installation of ground boxes will be subsidiary to Item 624.

Ground all junction boxes mounted on bridges and underpasses with a ground rod in the nearest ground box.

Item 628. Electrical Services

Before installing any electrical service, consult with the appropriate utility company before beginning work and verify all metering equipment requirements with the provider have been met. Provide a commercial grade, meter base with by-pass switch if required by the utility company.

Contractor shall obtain 911 address and EISD from electric utility company then contact the TXDOT Signal Shop to receive the Contract Request for Electrical Service Meter form to complete and return. TXDOT will make application to the Electric Utility Company for service, unless otherwise maintained by the following Cities: Arlington, Bedford, Colleyville, Euless, Fort Worth, Grand Prairie, Grapevine, Hurst, Mansfield, North Richland Hills, and Weatherford.

Item 656. Foundations for Traffic Control Devices

Contractor shall stake foundation as shown on plans. Engineer or Engineers designee will verify and approve staked locations before installing foundations.

For traffic signal controller foundation, use reinforcing bars or deformed Welded Wire Reinforcing (WWR). Provide #3 reinforcing bars spaced at 16" Spaced Center-Center. Provide deformed Welded Wire Reinforcing (WWR) as 6x6-D3xD3. Use lap splices of a minimum 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars.

Item 666. Reflectorized Pavement Markings with Retroreflective Requirements

Notify Engineer 48 hours prior to installation of pavement markings.

All testing is waived from Type I Pavement Markings for locations with less than 1000 LF per bid item.

Item 6365. Highway Traffic Signals (City of Fort Worth)

Contractor shall contact Fort Worth District TMC 817-370-3661 and City of Fort Worth Signal Shop prior to starting any signal modifications. Provide qualified personnel reachable by telephone and available to receive calls on a 24-hour basis. Respond to reported calls and make field assessment within 2 hours and make appropriate repairs within 24 hours.

Furnish and install all required materials, incidentals and equipment necessary for a fully operational traffic signal. The proposed equipment shall be compatible with the existing systems in the area.

Provide all illumination fixtures to be installed in this contract. Use 250W equivalent LED luminaires.

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

Deliver the cabinet, controller, accessories, and three complete sets of signal construction plans to the operating agency Signal Shop for testing. Notify the Signal Shop two working days prior to delivery of the cabinet.

County: Tarrant **Control:** 0902-90-208

Highway: Risinger Rd

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

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

Signal Flash. Upon the satisfactory completion of repairs or corrections, contact the TxDOT and City of Fort Worth Signal Shop at least one week prior to placing in flash. Schedule signal flash for Monday thru Thursday between 9:00 AM – 12:00 PM. Operate the signal in flash mode for 2-3 days prior to turning on to full actuation. The TxDOT signal inspector and technician must be present when the signals are placed in flash.

Signal Turn-On. Upon completion of the signal flash, schedule the date and time for the turn on of the traffic signal on Monday thru Thursday between 9:00 AM – 12:00 PM. Place the traffic signal into full operation only after all required striping is complete and all conflicting signing is removed. The TxDOT and City of Fort Worth signal inspectors and technicians must be present when the signals are placed in full color operation.

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

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

Item 682. Vehicle and Pedestrian Signal Heads

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

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

Item 684. Traffic Signal Cables

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

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

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

Item 686. Traffic Signal Pole Assemblies (Steel)

Provide all signal poles for a project from the same manufacturer.

Install mast arm damping plates at the end of SMA and DMA standard poles in accordance with the details shown in the MA-DPD standard sheet. Dampers are not recommended for LMA poles.

Plug any unused openings in the mast arms or poles with an approved material.

Provide a 3-piece bracket assembly on strain poles or drill the pole and use thimble eyebolts to attach the strand vise for the span wire.

Item 688. Pedestrian Detectors and Vehicle Loop Detectors

For Accessible Pedestrian Signals, Provide a completed final system operational check list, completed schematic diagram for pushbutton station locations, and a completed default and field settings sheet as provided in the APS manufacturer's manual. Provide a qualified personnel for testing and set up of the equipment at the time of signal flash and turn on.

Item 6001. Portable Changeable Message Signs

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

Four (4) electronic portable changeable message sign unit(s) will be required. Individual or collective use of signs will be required by the Engineer when deemed necessary to supplement the traffic control plan.

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

County: Tarrant **Control:** 0902-90-208

Highway: Risinger Rd

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

CITY OF FORT WORTH
STANDARD CONSTRUCTION GENERAL NOTES
REVISED MARCH 11, 2022

GENERAL NOTES

DIVISION 34 – TRANSPORTATION

TRAFFIC SIGNALS:

1. PRIOR TO ACTIVATING TRAFFIC SIGNALS WITH NEW OR REVISED SIGNAL TIMING, THE CONTRACTOR SHALL E-MAIL AZIZ RAHMAN, ENGINEERING MANAGER, AT AZIZ.RAHMAN@FORTWORTHTEXAS.GOV AT LEAST THREE (3) WEEKS IN ADVANCE TO SCHEDULE THAT.
2. IF NEW CABINETS AND CONTROLLERS ARE BEING INSTALLED AND THE CONTROLLERS NEED TO BE PROGRAMMED AND TESTED BY CITY FORCES; THE CONTRACTOR SHALL DELIVER THEM TO THE CITY OF FORT WORTH, SIGNAL SHOP AT 5001 JAMES AVE., AT LEAST THREE (3) WEEKS IN ADVANCE TO SCHEDULE THAT. IF A CELLULAR MODEM IS BEING INSTALLED, THE CONTRACTOR SHALL ALSO DELIVER THE MODEM WITH THE CABINET TO THE CITY OF FORT WORTH SIGNAL SHOP SO THE MODEM CAN BE ACTIVATED PRIOR TO INSTALLATION.
3. IF APPLICABLE, EQUIPMENT SUPPLIED BY THE CITY WILL BE AVAILABLE FOR PICK UP FROM THE TRANSPORTATION/PUBLIC WORKS (T/PW) WAREHOUSE AT 5001 JAMES AVENUE. THE PROJECT REPRESENTATIVE MUST AUTHORIZE ALL EQUIPMENT PICKUPS.
4. CONTRACTOR SHALL PROVIDE A 5-YEAR MANUFACTURER WARRANTY ON APS SYSTEMS. THE WARRANTY DOCUMENTATION SHALL INCLUDE THE START DATE (WHEN MATERIAL IS DELIVERED TO JOB SITE) AND THE END DATE OF THE WARRANTY AND THE SERIAL NUMBER OF THE EQUIPMENT.
5. THE CITY WILL NOT PROVIDE TRAFFIC SIGNAL CABINET OR TRAFFIC SIGNAL CONTROLLER TO THE CONTRACTOR. THE COST FOR THESE ITEMS MUST BE INCLUDED IN THE CITY PROJECT BUDGET, OR FOR ALL PRIVATELY FUNDED PROJECTS, THE COST MUST BE INCLUDED IN THE BID PACKAGE FOR PURCHASE FROM THE VENDOR.
6. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS NEEDED TO CONSTRUCT A FULLY OPERATIONAL TRAFFIC SIGNAL AS CALLED OUT FOR IN THE PLANS AND SPECIFICATIONS.
7. THE CONTRACTOR SHALL CONTACT ADRIAN OLGUIN, TPW SUPERINTENDENT, AT 817-392-7239 OR ADRIAN.OLGUIN@FORTWORTHTEXAS.GOV AT LEAST ONE (1) WEEK IN ADVANCE OF ANY DISPOSAL OF MATERIAL TO COORDINATE ANY MATERIAL THAT THE CITY MAY NEED SALVAGED. THE CONTRACTOR IS RESPONSIBLE FOR HAULING AND PROPERLY DISPOSING OF SALVAGED MATERIAL FROM THE JOB SITE TO A DISPOSAL SITE OF THEIR CHOOSING. THE CONTRACTOR WILL NOT BE ALLOWED TO DROP OFF SALVAGED MATERIALS AT THE CITY YARDS UNLESS OTHERWISE DIRECTED BY TPW SUPERINTENDENT FOR THE SPECIFIED MATERIAL ONLY.

FOUNDATIONS:

1. DIMENSIONS SHOWN ON PLANS FOR LOCATIONS OF SIGNAL FOUNDATIONS, CONDUIT, AND OTHER ITEMS MAY VARY IN ORDER TO MEET LOCAL CONDITIONS. ALL LOCATIONS OF FOUNDATIONS, CONDUIT, AND GROUND BOXES SHALL BE APPROVED BY CITY TRAFFIC SIGNAL ENGINEER.
2. CONTRACTOR SHALL CONTACT THE CITY TRAFFIC SIGNAL INSPECTOR PRIOR TO POURING CABINET FOUNDATION TO BE SURE THAT TEMPLATE AND BOLT PATTERNS ARE CORRECT FOR TYPE OF CABINET BEING SUPPLIED. FOUNDATION SHALL BE INSTALLED PER CITY SPECIFICATION AND CITY DETAIL.
3. PIER FOUNDATIONS SHALL BE POURED TOGETHER IN ONE PIECE.
4. NO SIGNAL POLES SHALL BE PLACED ON FOUNDATIONS PRIOR TO FIVE (5) CALENDAR DAYS FOLLOWING POURING OF CONCRETE.
5. CONTRACTOR SHALL CLEAN UP AND REMOVE ALL LOOSE MATERIAL RESULTING FROM CONSTRUCTION OPERATIONS EACH DAY PRIOR TO THE WORK IS BEING SUSPENDED.
6. CONTROLLER CABINET CONCRETE APRON SHALL BE SUBSIDIARY TO THE BID ITEM FOR THE CONTROLLER CABINET FOUNDATION. CABINET FOUNDATION AND APRON SHALL BE POURED TOGETHER IN ONE PIECE.

CONTROLLER AND CABINET:

1. CONTRACTOR SHALL INSTALL CONTROLLER CABINET AND CONNECT ALL ASSOCIATED FIELD WIRING.
2. ETHERNET CABLE SHALL BE PROVIDED TO CONNECT CONTROLLER TO COMMUNICATION DEVICE. MATERIAL AND INSTALLATION SHALL BE SUBSIDIARY TO INSTALL OF CONTROLLER OR CONTROLLER CABINET BID ITEM.
3. CITY WILL INSTALL SIGNAL TIMING AND PROGRAM CONTROLLER.

CONDUIT:

1. A CONTINUOUS GROUNDED SYSTEM SHALL BE PROVIDED IN PVC CONDUIT BY RUNNING 1 NO. 8 BARE COPPER STRANDED GROUND WIRE IN CONDUIT BETWEEN FOUNDATIONS AND GROUNDING AT EACH FOUNDATION GROUND ROD.
2. GROUNDING SHALL NOT EXCEED 25 OHMS AT EACH GROUND ROD.
3. ALL CONDUITS SHALL BE SCHEDULE 80 PVC.

SIGNAL HEADS:

1. ALL SIGNAL HEADS SHALL BE EITHER MCCAIN™, ECONOLITE™, OR APPROVED EQUIVALENT STYLE AND DIMENSIONS.
2. ALL SIGNAL HEAD ATTACHMENTS SHALL BE DESIGNED SUCH THAT THE WIRING TO EACH SIGNAL HEAD SHALL PASS FROM THE MAST ARM THROUGH A RAIN TIGHT CONNECTOR TO THE SIGNAL HEAD BRACING OR ATTACHMENT HARDWARE TO THE SIGNAL HEAD. A SMALL AMOUNT OF EXPOSED SIGNAL CABLE SHALL FORM A DRIP LOOP.
3. ALL LED SIGNAL INDICATIONS SHALL BE GENERAL ELECTRIC (GE) GELCORE™ OR EQUIVALENT AND SHALL MEET THE LATEST ITE STANDARDS.
4. SIGNAL HEADS (ALL DISPLAYS) AND PEDESTRIAN WALK AND DON'T WALK HEADS WITH COUNTDOWN DISPLAYS SHALL HAVE LED INSERTS.
5. CLAM-SHELL MOUNTING ASSEMBLIES SHALL BE USED FOR PEDESTRIAN INDICATIONS.
6. ALL LED SIGNALS SHALL BE OF THE INCANDESCENT APPEARANCE.
7. ALL SIGNAL HEADS SHALL HAVE BLACK ALUMINUM, LOUVERED, SINGLE PIECE BACK PLATES COMPATIBLE WITH MCCAIN™, ECONOLITE™, OR APPROVED EQUIVALENT SIGNAL HEAD HOUSINGS.

TRAFFIC SIGNS AND PAVEMENT MARKINGS:

1. ALL TRAFFIC SIGNS AND MOUNTING HARDWARE SHOWN ON THE PLANS WILL BE FURNISHED AND INSTALLED BY THE CONTRACTOR INCLUDING THE METRO STREET NAME SIGNS. THE CONTRACTOR SHALL PROVIDE A DETAIL SHEET FOR THE METRO STREET NAME SIGNS WITH BLOCK NUMBERS TO THE CITY FOR APPROVAL PRIOR TO FABRICATION AND INSTALLATION.
2. EXISTING STOP SIGNS AND POSTS WILL BE REMOVED BY THE CONTRACTOR UPON, OR BEFORE, THE SIGNAL TURN-ON.

DETECTION SYSTEM:

1. THE CONTRACTOR SHALL FURNISH AND INSTALL THE DETECTION SYSTEM AND CABLE UNLESS OTHERWISE CALLED OUT IN THE PLANS.
2. ETHERNET CABLE SHALL BE PROVIDED CONNECTING THE DETECTION CENTRAL CONTROL UNIT TO THE COMMUNICATION DEVICE. MATERIAL AND INSTALLATION SHALL BE SUBSIDIARY TO THE INSTALLATION DETECTION SYSTEM BID ITEM.
3. THE CONTRACTOR SHALL INSTALL, AIM AND PROGRAM ALL DETECTORS AS PER CITY STANDARD SPECIFICATIONS AND CITY DETAILS.
4. THE CONTRACTOR SHALL REFER TO CITY STANDARD DETAILS AND PROJECT PLANS FOR DETECTION ZONES PLACEMENT.

EMERGENCY VEHICLE PREEMPTION EQUIPMENT (EVP):

1. THE CONTRACTOR SHALL FURNISH AND INSTALL THE OPTICOM™ EVP (DETECTORS, CABLE, AND DISCRIMINATOR UNITS) UNLESS OTHERWISE CALLED OUT IN THE PLANS.
2. THE CONTRACTOR SHALL INSTALL THE EVP DETECTORS ON THE MAST ARM AS SHOWN ON THE PLANS AND APPROPRIATE CITY DETAIL, AND RUN ONE CONTINUOUS EVP CABLE FROM THE DETECTOR TO THE CABINET. INSTALLATION OF THE EVP SYSTEM WILL BE PAID FOR PER BID ITEM.
3. COST FOR INSTALLATION OF CITY PROVIDED ITEMS TO BE INCLUDED IN PRICE BID FOR ITEM 680 6002 INSTALL HWY TRF SIG (ISOLATED)

ACCESSIBLE PEDESTRIAN SIGNAL (APS):

1. APS UNITS WITH AUDIBLE MESSAGE SHALL BE INSTALLED ON ALL TXDOT LOCATIONS OR AS CALLED OUT IN THE PLANS.
2. ETHERNET CABLE SHALL BE CONNECTED FROM APS CENTRAL CONTROL UNIT TO COMMUNICATION DEVICE. MATERIAL AND INSTALLATION SHALL BE SUBSIDIARY TO INSTALLATION OF APS BID ITEM.
3. APS UNITS SHALL COMPLY WITH THE LATEST VERSION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
4. APS UNITS SHALL BE INSTALLED PER CITY STANDARD SPECIFICATION AND CITY DETAIL.
5. APS UNITS SHALL BE PROGRAMMED BY THE CONTRACTOR.

POWDER COATING AND PAINT:

1. ALL NEW SIGNAL POLES, PEDESTRIAN POLES, AND MAST ARMS SHALL BE POWDER COATED BLACK (RAL 9017). IF CALLED OUTS IN THE PLANS, ALL EXISTING SIGNAL POLES, PEDESTRIAN POLES, AND MAST ARMS SHALL BE PAINTED BLACK (RAL 9017).

BATTERY BACKUP:

1. IF CALLED OUT FOR IN THE PLANS, BATTERY BACKUP UNITS SUPPLIED SHALL BE ALPHA OR APPROVED EQUIVALENT. INSTALLATION SHALL BE COMPLETED PER CITY STANDARD SPECIFICATIONS AND CITY DETAIL.
2. ETHERNET CABLE SHALL BE PROVIDED FOR BBUS CONNECTING BBU TO THE COMMUNICATION DEVICE. WHEN MOUNTING AN EXTERNAL BBU, ENSURE CABLE IS ROUTED INTO THE CABINET. ETHERNET CABLE SHALL BE SUBSIDIARY TO THE INSTALLATION OF BBU BID ITEM.

PTZ CAMERA:

1. IF CALLED OUT FOR IN THE PLANS, PTZ CAMERA UNITS SHALL COMPLY WITH THE CITY STANDARD SPECIFICATIONS.
2. POWER SUPPLY AND ETHERNET CABLE MATERIAL AND INSTALLATION SHALL BE SUBSIDIARY TO INSTALLATION OF PTZ CAMERA BID ITEM.
3. COST FOR INSTALLATION OF CITY PROVIDED ITEMS TO BE INCLUDED IN PRICE BID FOR ITEM 680 6002 INSTALL HWY TRF SIG (ISOLATED)

CELLULAR MODEM:

1. ANTENNA, ETHERNET CABLE, POWER SUPPLY, AND UNMANAGED NETWORK SWITCH MATERIAL AND INSTALLATION SHALL BE SUBSIDIARY TO INSTALLATION OF CELLULAR MODEM BID ITEM.

FRANCHISE UTILITY COORDINATION:

CONTRACTOR SHALL COORDINATE WITH EXISTING UTILITY COMPANIES BEFORE AND DURING CONSTRUCTION.

ATMOS – JAMES LARUE – CONTACT NO. 682-359-3289

ONCOR – SUZANNE NASSAR – CONTACT NO. 682-239-1000

ATT – JASON ROGERS – CONTACT NO. 817 688-2383

SPECTRUM – BRENT BASCOM – CONTACT NO. 817-822-9377

ATMOS AND ONCOR LINES SHOWN IN CONFLICT HAVE BEEN RELOCATED BY RESPECTIVE OWNERS. CONTRACTOR SHALL VERIFY.

ATT AND SPECTRUM LINES SHALL BE ADJUSTED IN THE FIELD DURING CONSTRUCTION. CONTRACTOR TO COORDINATE.

2/23/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1114
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

CITY OF FORT WORTH TRANSPORTATION GENERAL NOTES

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	4

SUMMARY OF QUANTITIES RISINGER & GARDEN SPRINGS (CSJ 0902-90-208)

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY
104 6001	REMOVING CONC (PAV)	SY	67
104 6021	REMOVING CONC (CURB)	LF	485
104 6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	68
110 6001	EXCAVATION (ROADWAY)	CY	522
160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	1250
162 6002	BLOCK SODDING	SY	1250
166 6001	FERTILIZER	AC	0.25
168 6001	VEGETATIVE WATERING	MG	44
247 6230	FL BS (CMP IN PLACE)(TY A GR 1-2)(8")	SY	1253
360 6001	CONC PVMT (CONT REINF - CRCP) (7")	SY	1120
360 6027	CURB (TYPE II)	LF	1199
416 6030	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	12
416 6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	11
416 6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	39
432 6002	RIPRAP (CONC)(5 IN)	CY	5
479 6004	ADJUSTING MANHOLES (SANITARY)	EA	1
500 6001	MOBILIZATION	LS	1
502 6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	5
506 6047	TEMP SDMT CONT FENCE (INLET PROTECTION)	LF	270
531 6001	CONC SIDEWALKS (4")	SY	7
531 6010	CURB RAMPS (TY 7)	EA	8
618 6046	CONDT (PVC) (SCH 80) (2")	LF	90
618 6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	245
618 6058	CONDT (PVC) (SCH 80) (4")	LF	100
618 6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	390
620 6006	ELEC CONDR (NO.10) INSULATED	LF	780
620 6007	ELEC CONDR (NO.8) BARE	LF	765
620 6009	ELEC CONDR (NO.6) BARE	LF	10
620 6010	ELEC CONDR (NO.6) INSULATED	LF	20
624 6009	GROUND BOX TY D (162922)	EA	3
624 6010	GROUND BOX TY D (162922)W/APRON	EA	5
628 6144	ELC SRV TY D 120/240 060(NS)SS(E)PS(U)	EA	1
644 6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	7
644 6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA	1
644 6076	REMOVE SM RD SN SUP&AM	EA	9
666 6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	216
666 6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	575
666 6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	6
666 6057	REFL PAV MRK TY I(W)(DBL ARROW)(100MIL)	EA	2
666 6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	6
666 6162	RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL)	LF	447

SUMMARY OF QUANTITIES RISINGER & GARDEN SPRINGS (CSJ 0902-90-208)

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY
666 6321	RE PM W/RET REQ TY I (Y) 6"(SLD)(100MIL)	LF	299
672 6007	REFL PAV MRKR TY I-C	EA	28
672 6009	REFL PAV MRKR TY II-A-A	EA	10
677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	286
677 6007	ELIM EXT PAV MRK & MRKS (24")	LF	87
678 6002	PAV SURF PREP FOR MRK (6")	LF	746
678 6004	PAV SURF PREP FOR MRK (8")	LF	216
678 6008	PAV SURF PREP FOR MRK (24")	LF	575
678 6009	PAV SURF PREP FOR MRK (ARROW)	EA	6
678 6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	2
678 6016	PAV SURF PREP FOR MRK (WORD)	EA	6
678 6033	PAV SURF PREP FOR MRK (RPM)	EA	38
682 6001	VEH SIG SEC (12")LED(GRN)	EA	6
682 6002	VEH SIG SEC (12")LED(GRN ARW)	EA	6
682 6003	VEH SIG SEC (12")LED(YEL)	EA	8
682 6004	VEH SIG SEC (12")LED(YEL ARW)	EA	8
682 6005	VEH SIG SEC (12")LED(RED)	EA	8
682 6006	VEH SIG SEC (12")LED(RED ARW)	EA	4
682 6018	PED SIG SEC (LED)(COUNTDOWN)	EA	8
682 6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	8
682 6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	4
684 6029	TRF SIG CBL (TY A)(14 AWG)(3 CONDR)	LF	1220
684 6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	370
684 6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	595
684 6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	635
686 6035	INS TRF SIG PL AM(S)1 ARM(32')LUM	EA	1
686 6041	INS TRF SIG PL AM(S)1 ARM(40')	EA	1
686 6049	INS TRF SIG PL AM(S)1 ARM(48')	EA	1
686 6051	INS TRF SIG PL AM(S)1 ARM(48')LUM	EA	1
687 6001	PED POLE ASSEMBLY	EA	2
688 6001	PED DETECT PUSH BUTTON (APS)	EA	8
688 6003	PED DETECTOR CONTROLLER UNIT	EA	1
690 6127	REMOVE LUMINARE POLE	EA	1
6001 6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	428
6010 6002	CCTV FIELD EQUIPMENT (DIGITAL)	EA	1
6058 6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1
6083 6001	VIDEO IMAGING AND RAD VEH DETECTION SYS	EA	5
6089 6002	CAT 5 ETHERNET CABLE	LF	800
6365 6001	HIGHWAY TRAFFIC SIGNALS (CITY OF FORT WORTH)	EA	1
6396 6001	COFW EMR VEH (EV) PREEMPT (INST ONLY)	EA	4
6421 6001	COFW CELLULAR ROUTER (INSTALL ONLY)	EA	1

NOTE:

CITY TO FURNISH MATERIAL FOR PREEMPTION DETECTORS, PREEMPTION CABLE, AND PTZ CAMERA. CONTRACTOR SHALL INSTALL.

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11149
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

SUMMARY OF QUANTITES

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	5

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0902-90-208 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY RISINGER RD

				CONTROL SECTION JOB	0902-90-208		TOTAL EST.	TOTAL FINAL
				PROJECT ID	A00178788			
				COUNTY	Tarrant			
				HIGHWAY	RISINGER RD			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL			
	104-6001	REMOVING CONC (PAV)	SY	67.000		67.000		
	104-6021	REMOVING CONC (CURB)	LF	485.000		485.000		
	104-6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	68.000		68.000		
	110-6001	EXCAVATION (ROADWAY)	CY	522.000		522.000		
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	1,250.000		1,250.000		
	162-6002	BLOCK SODDING	SY	1,250.000		1,250.000		
	166-6001	FERTILIZER	AC	0.250		0.250		
	168-6001	VEGETATIVE WATERING	MG	44.000		44.000		
	247-6230	FL BS (CMP IN PLACE)(TY A GR 1-2)(8")	SY	1,253.000		1,253.000		
	360-6001	CONC PVMT (CONT REINF - CRCP) (7")	SY	1,120.000		1,120.000		
	360-6027	CURB (TYPE II)	LF	1,199.000		1,199.000		
	416-6030	DRILL SHAFT (TRF SIG POLE) (24 IN)	LF	12.000		12.000		
	416-6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	11.000		11.000		
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	39.000		39.000		
	432-6002	RIPRAP (CONC)(5 IN)	CY	5.000		5.000		
	479-6004	ADJUSTING MANHOLES (SANITARY)	EA	1.000		1.000		
	500-6001	MOBILIZATION	LS	1.000		1.000		
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	5.000		5.000		
	506-6047	TEMP SDMT CONT FENCE (INLET PROTECTION)	LF	270.000		270.000		
	531-6001	CONC SIDEWALKS (4")	SY	7.000		7.000		
	531-6010	CURB RAMPS (TY 7)	EA	8.000		8.000		
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	90.000		90.000		
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	245.000		245.000		
	618-6058	CONDT (PVC) (SCH 80) (4")	LF	100.000		100.000		
	618-6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	390.000		390.000		
	620-6006	ELEC CONDR (NO.10) INSULATED	LF	780.000		780.000		
	620-6007	ELEC CONDR (NO.8) BARE	LF	765.000		765.000		
	620-6009	ELEC CONDR (NO.6) BARE	LF	10.000		10.000		
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	20.000		20.000		
	624-6009	GROUND BOX TY D (162922)	EA	3.000		3.000		
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	5.000		5.000		
	628-6144	ELC SRV TY D 120/240 060(NS)SS(E)PS(U)	EA	1.000		1.000		
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	7.000		7.000		
	644-6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA	1.000		1.000		
	644-6076	REMOVE SM RD SN SUP&AM	EA	9.000		9.000		
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	216.000		216.000		
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	575.000		575.000		

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0902-90-208 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY RISINGER RD

		CONTROL SECTION JOB	0902-90-208		TOTAL EST.	TOTAL FINAL
		PROJECT ID	A00178788			
		COUNTY	Tarrant			
		HIGHWAY	RISINGER RD			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	6.000		6.000	
	666-6057	REFL PAV MRK TY I(W)(DBL ARROW)(100MIL)	EA	2.000		2.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	6.000		6.000	
	666-6162	RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL)	LF	447.000		447.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	299.000		299.000	
	672-6007	REFL PAV MRKR TY I-C	EA	28.000		28.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	10.000		10.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	286.000		286.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	87.000		87.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF	746.000		746.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	216.000		216.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	575.000		575.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	6.000		6.000	
	678-6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	2.000		2.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA	6.000		6.000	
	678-6033	PAV SURF PREP FOR MRK (RPM)	EA	38.000		38.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	6.000		6.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	6.000		6.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	8.000		8.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	8.000		8.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	8.000		8.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	4.000		4.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	8.000		8.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	8.000		8.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	4.000		4.000	
	684-6029	TRF SIG CBL (TY A)(14 AWG)(3 CONDR)	LF	1,220.000		1,220.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	370.000		370.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	595.000		595.000	
	684-6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	635.000		635.000	
	686-6035	INS TRF SIG PL AM(S)1 ARM(32')LUM	EA	1.000		1.000	
	686-6041	INS TRF SIG PL AM(S)1 ARM(40')	EA	1.000		1.000	
	686-6049	INS TRF SIG PL AM(S)1 ARM(48')	EA	1.000		1.000	
	686-6051	INS TRF SIG PL AM(S)1 ARM(48')LUM	EA	1.000		1.000	
	687-6001	PED POLE ASSEMBLY	EA	2.000		2.000	
	688-6001	PED DETECT PUSH BUTTON (APS)	EA	8.000		8.000	
	688-6003	PED DETECTOR CONTROLLER UNIT	EA	1.000		1.000	
	690-6127	REMOVE LUMINAIRE POLE	EA	1.000		1.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0902-90-208 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY RISINGER RD

				CONTROL SECTION JOB	0902-90-208		TOTAL EST.	TOTAL FINAL
				PROJECT ID	A00178788			
				COUNTY	Tarrant			
				HIGHWAY	RISINGER RD			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL			
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	428.000		428.000		
	6010-6002	CCTV FIELD EQUIPMENT (DIGITAL)	EA	1.000		1.000		
	6058-6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1.000		1.000		
	6083-6001	VIDEO IMAGING AND RAD VEH DETECTION SYS	EA	5.000		5.000		
	6089-6002	CAT 5 ETHERNET CABLE	LF	800.000		800.000		
	6365-6001	HIGHWAY TRAFFIC SIGNALS	EA	1.000		1.000		
	6396-6001	COFW EMR VEH (EV) PREEMPT (INST ONLY)	EA	4.000		4.000		
	6421-6001	COFW CELLULAR ROUTER (INSTALL ONLY)	EA	1.000		1.000		
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000		
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000		

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

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

GENERAL

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

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

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

4. ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES.

5. TEMPORARY DRAINAGE IS THE RESPONSIBILITY OF THE CONTRACTOR.

6. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EXISTING DRAINAGE PATTERNS DURING CONSTRUCTION.

7. LANE CLOSURES SHALL BE BETWEEN THE HOURS OF 9:00AM TO 3:00PM.

SAFETY

1. THE CONTRACTOR WILL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH STATE STANDARDS BC (1-12)-21. ANY SIGNS REQUIRED THAT ARE NOT DETAILED IN THE STANDARD SHEETS SHALL BE IN CONFORMANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND "THE STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS".

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

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

HAULING EQUIPMENT

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

FINAL CLEAN UP

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

PAYMENT

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

SEQUENCE OF WORK

CSJ 0902-90-208

1. INSTALL TRAFFIC CONTROL DEVICES, INCLUDING PROJECT LIMIT AND WORKZONE SIGNAGE AS SHOWN ON STANDARD DETAILS IN PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. ADJUST TRAFFIC CONTROL AS NECESSARY AS PROJECT PROGRESSES.
2. INSTALL EROSION CONTROL DEVICES AS SHOWN IN STANDARD DETAILS IN PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER.
3. REMOVE PAVEMENT MARKINGS.
4. REMOVE/COVER CONFLICTING ROADWAY SIGNAGE.
5. PREPARE RIGHT OF WAY, AS NECESSARY.
6. INSTALL SIGNALS AND RELATED APPURTENANCES PER PLANS AND STANDARD DETAILS.
7. ADJUST SANITARY SEWER MANHOLE TO GRADE.
8. CONSTRUCT PAVING, SIDEWALKS, RAMPS AND RELATED APPURTENANCES PER PLANS.
9. PLACE TOPSOIL, SOD, AND WATER TO ESTABLISHMENT.
10. INSTALL PAVEMENT MARKINGS.
11. ACTIVATE NEW SIGNAL AS DIRECTED BY ENGINEER AND CITY OF FORT WORTH PERSONNEL.
12. PERFORM CLEAN UP OF CONSTRUCTION AREA. COMPLETE PUNCHLIST.
13. REMOVE EROSION CONTROL DEVICES.
14. REMOVE TRAFFIC CONTROL DEVICES.

2/23/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1114
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

TRAFFIC CONTROL NARRATIVE

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	7

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

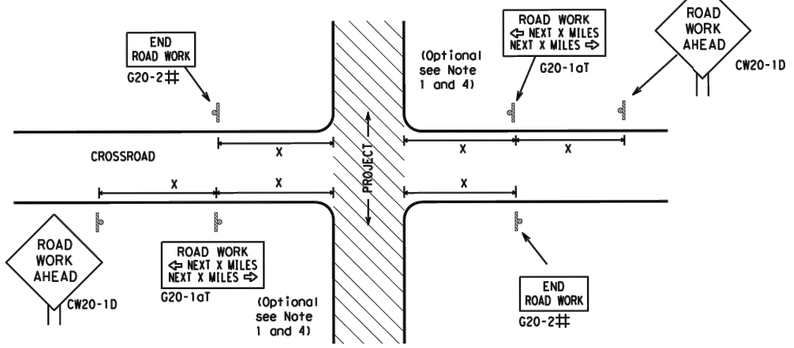
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0902	90	208	RISINGER RD
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		8

DATE:
FILE:

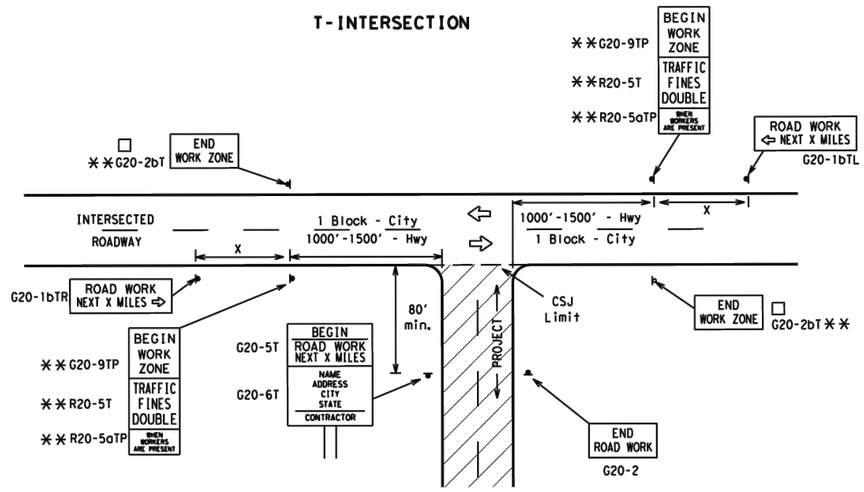
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

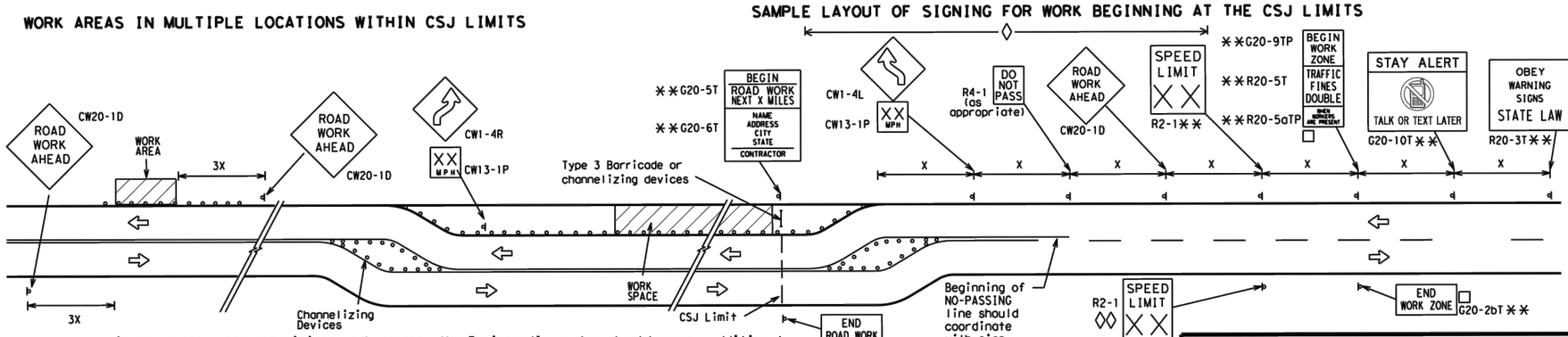
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

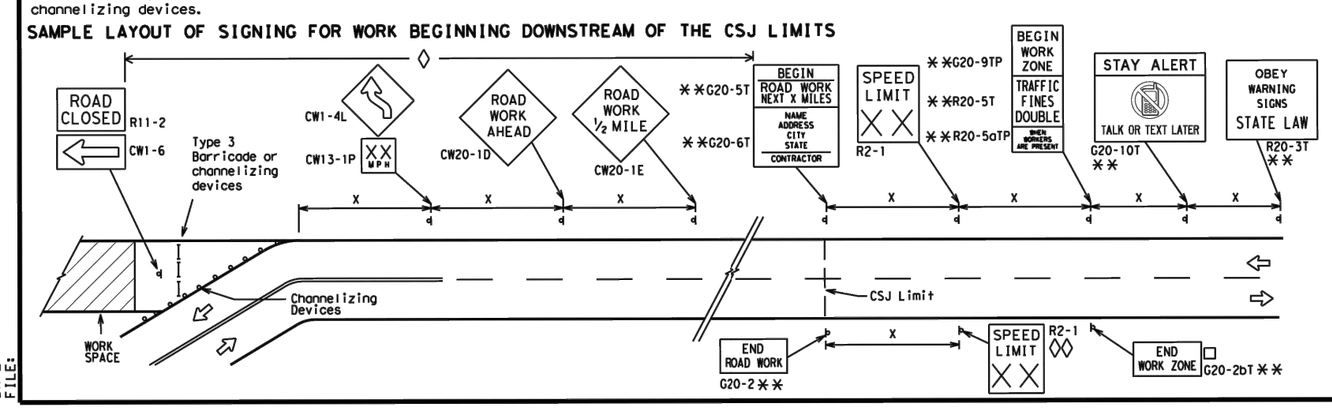
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES"(G20-5T)sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

□ The "BEGIN WORK ZONE"(G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

** CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.

◊ Area for placement of "ROAD WORK AHEAD" (CW20-1D)sign and other signs or devices as called for on the Traffic Control Plan.

◊◊ Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

⊢	Type 3 Barricade
○ ○ ○	Channelizing Devices
▬	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0902	90	208	RISINGER RD
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		9

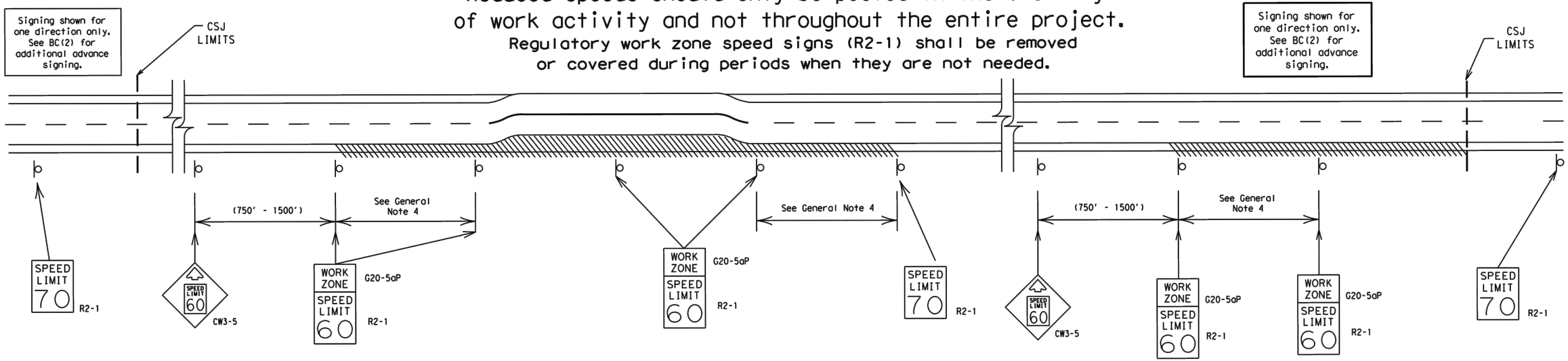
DATE:
FILE:

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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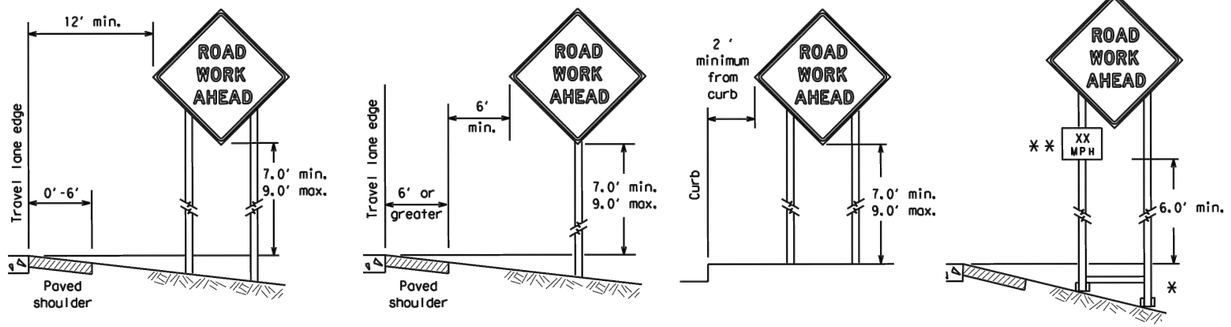
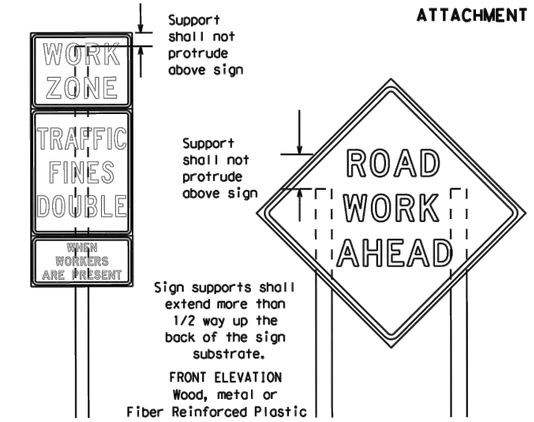
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



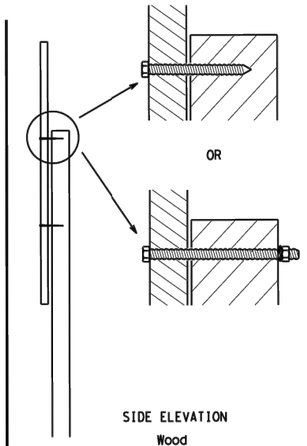
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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



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

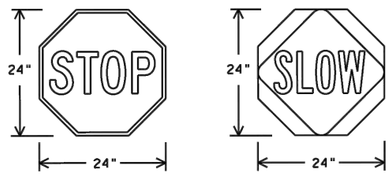


Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

STOP/SLOW PADDLES

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



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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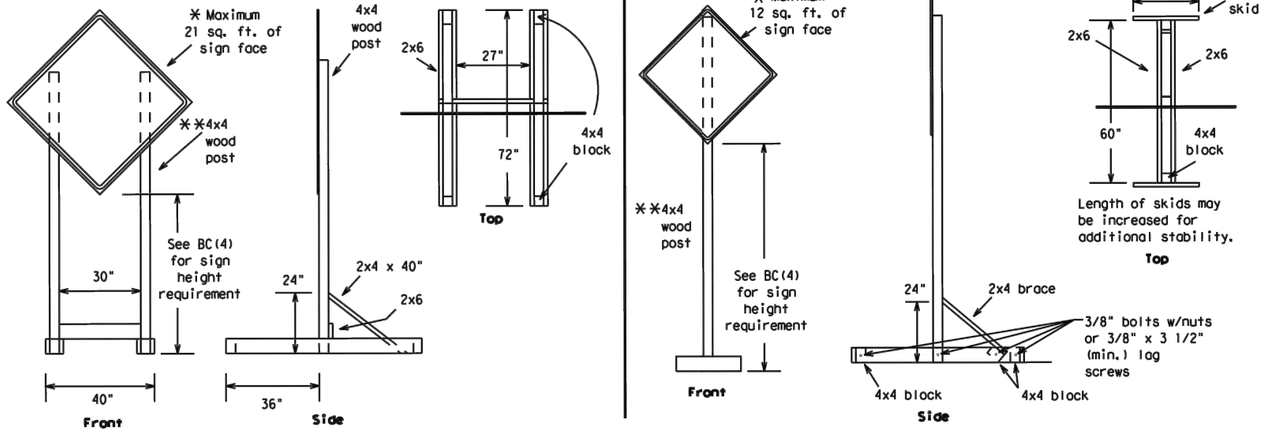
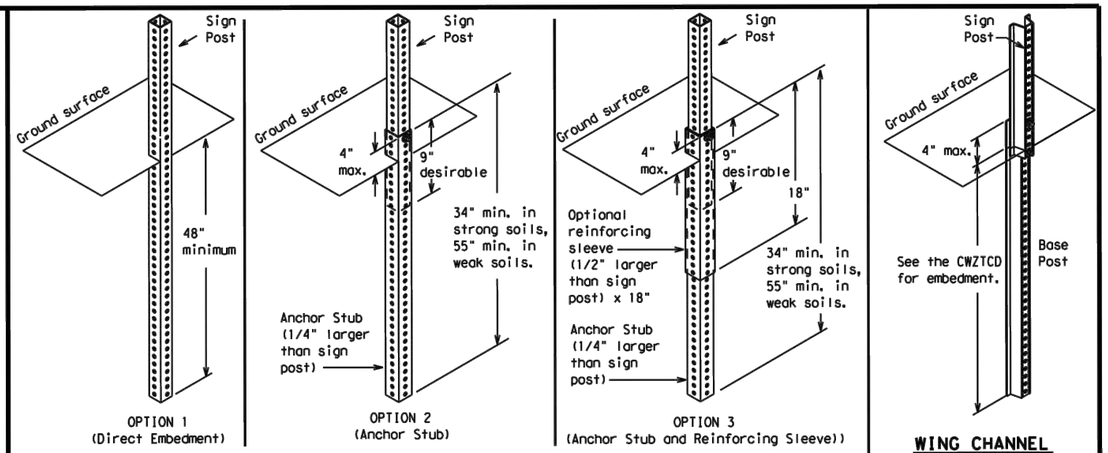


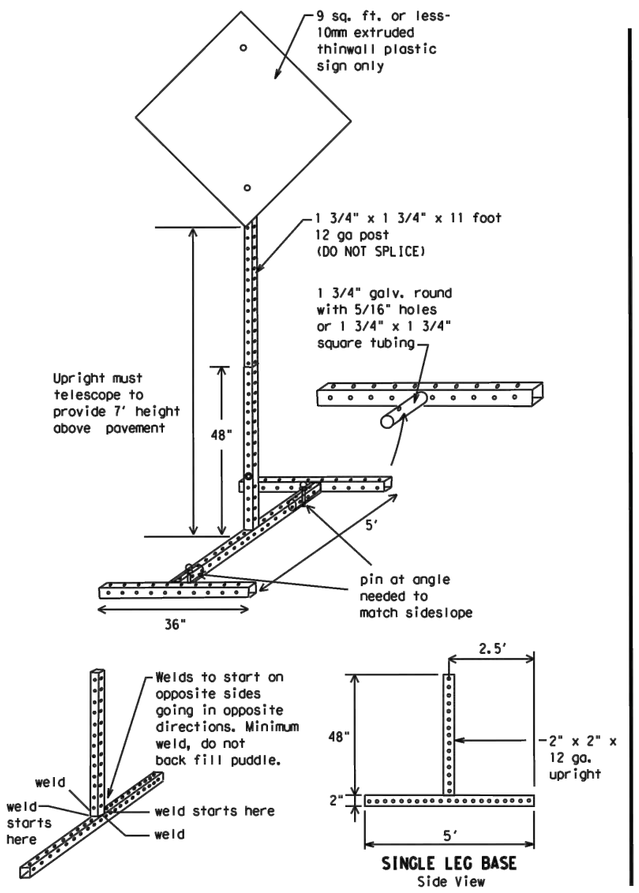
SKID MOUNTED WOOD SIGN SUPPORTS

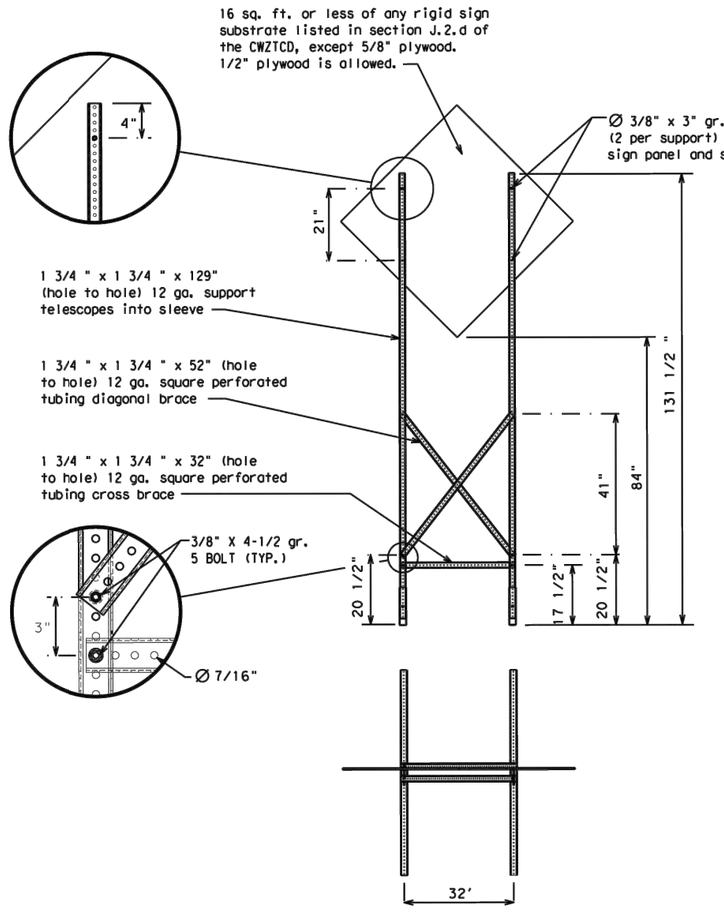
*** LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS**

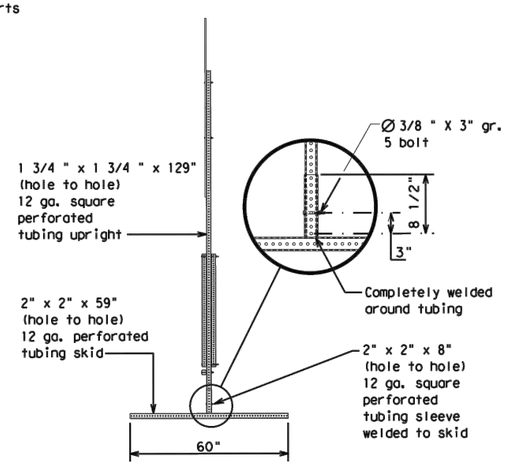


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

SHEET 6 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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7-13 5-21	FTW	TARRANT		13

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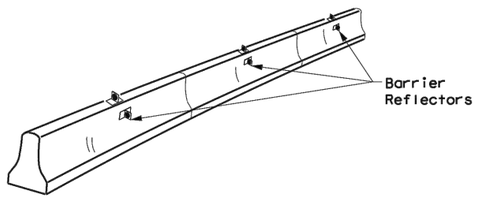
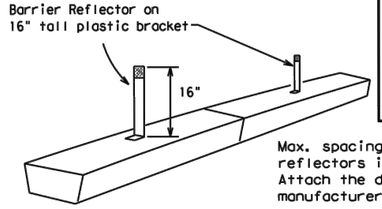
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



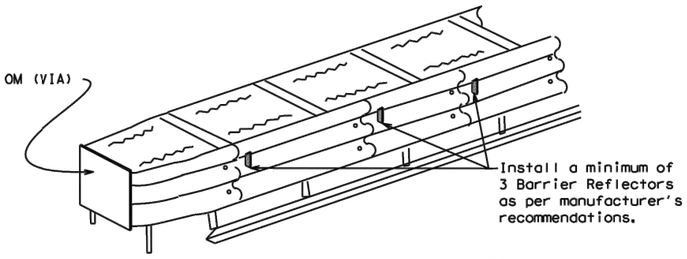
CONCRETE TRAFFIC BARRIER (CTB)

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



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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

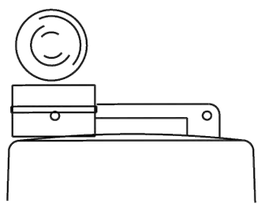
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

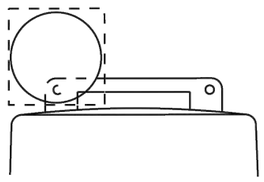
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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

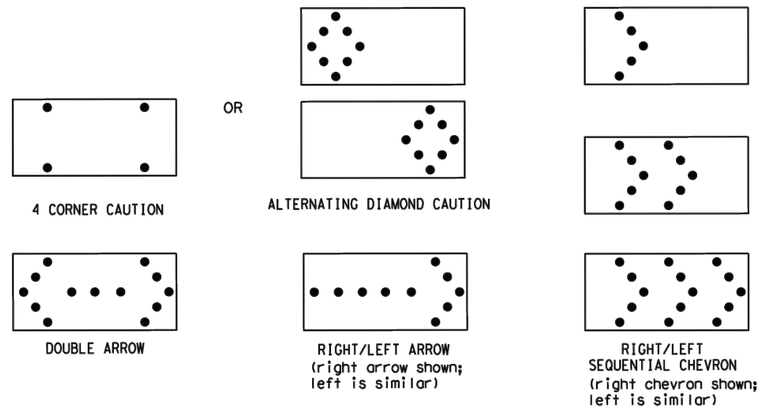
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

SHEET 7 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		14

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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections, one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

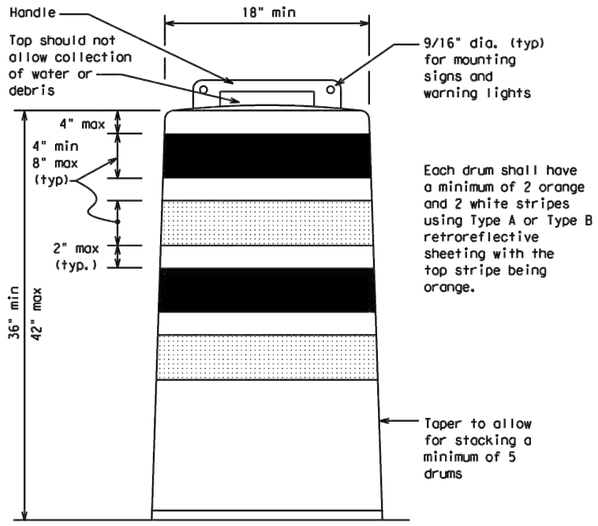
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

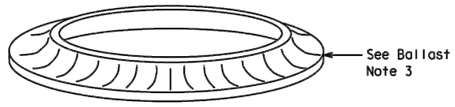
RETROREFLECTIVE SHEETING

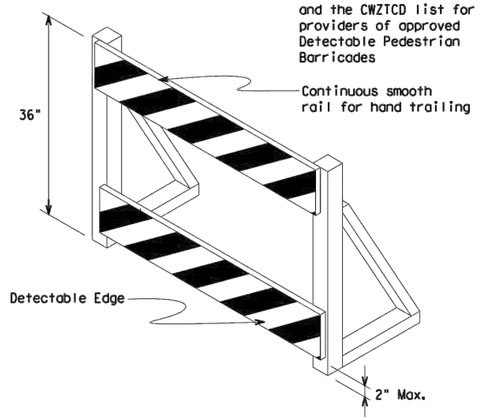
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

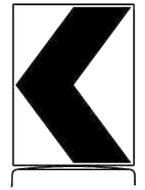




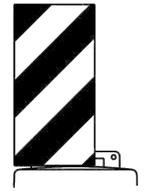


DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

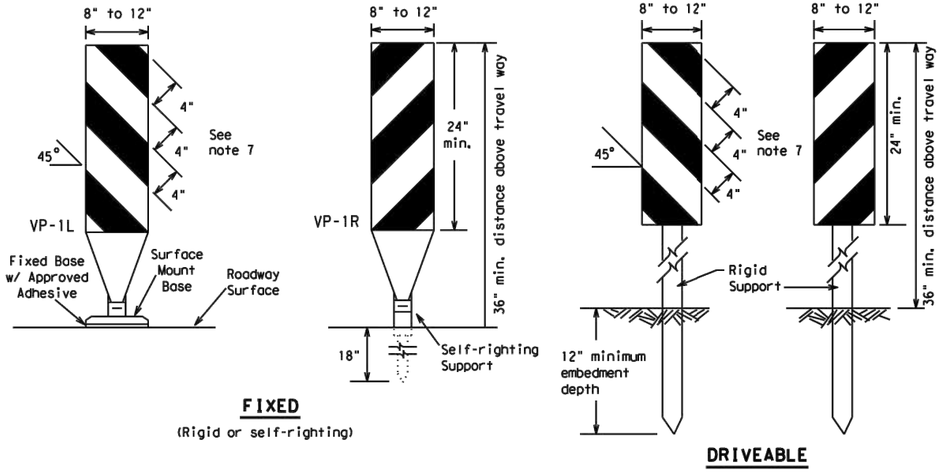
Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

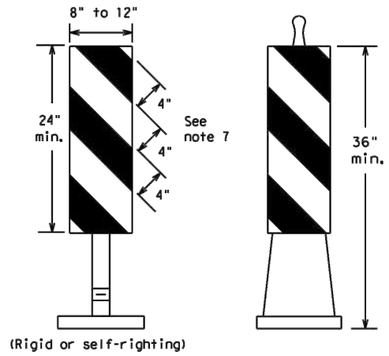
BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	FTW	TARRANT		15
7-13				



FIXED
(Rigid or self-righting)

DRIVEABLE

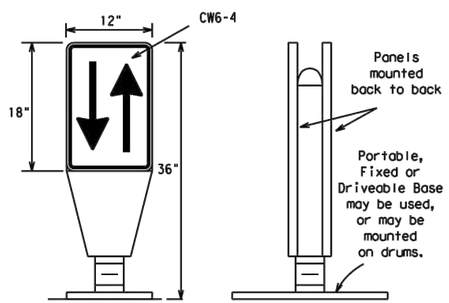


(Rigid or self-righting)

PORTABLE

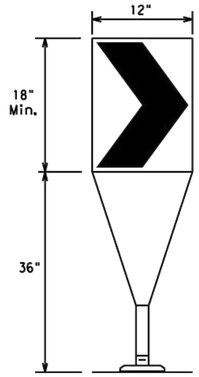
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



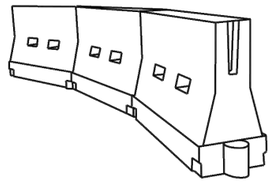
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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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7-13 5-21	FTW	TARRANT		16

DATE:
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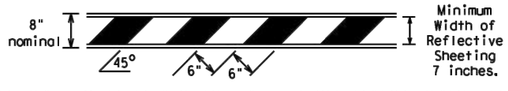
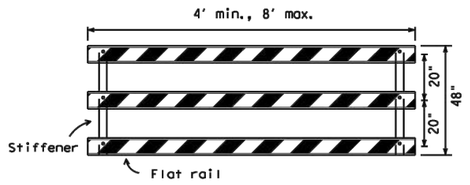
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



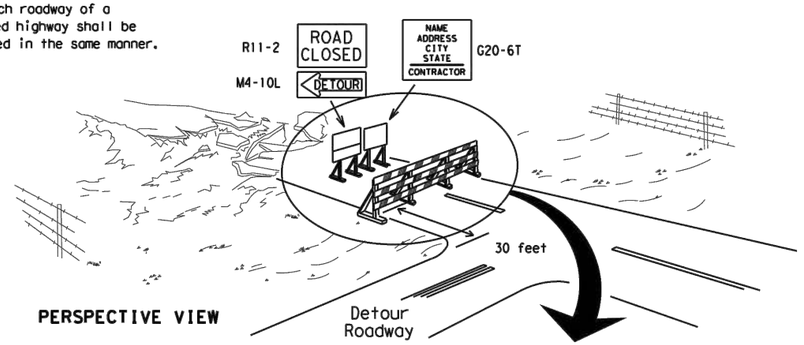
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

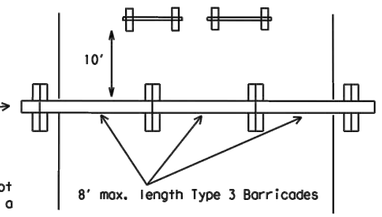
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

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

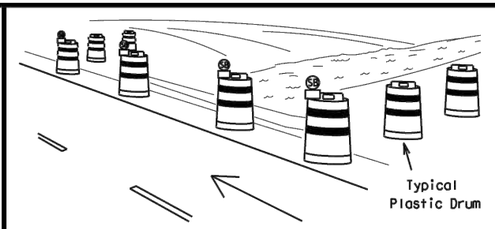
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

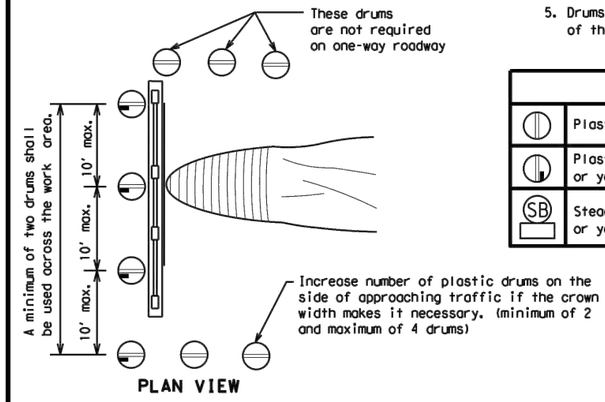
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

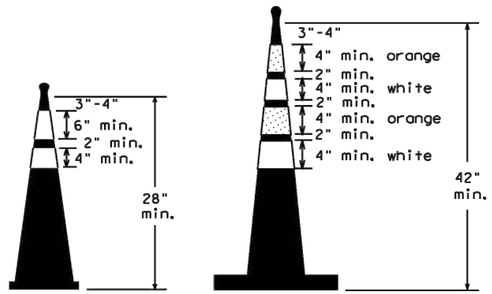
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



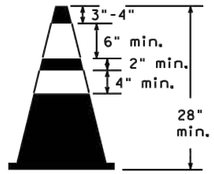
PLAN VIEW

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

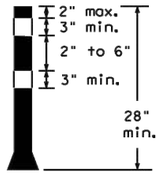
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

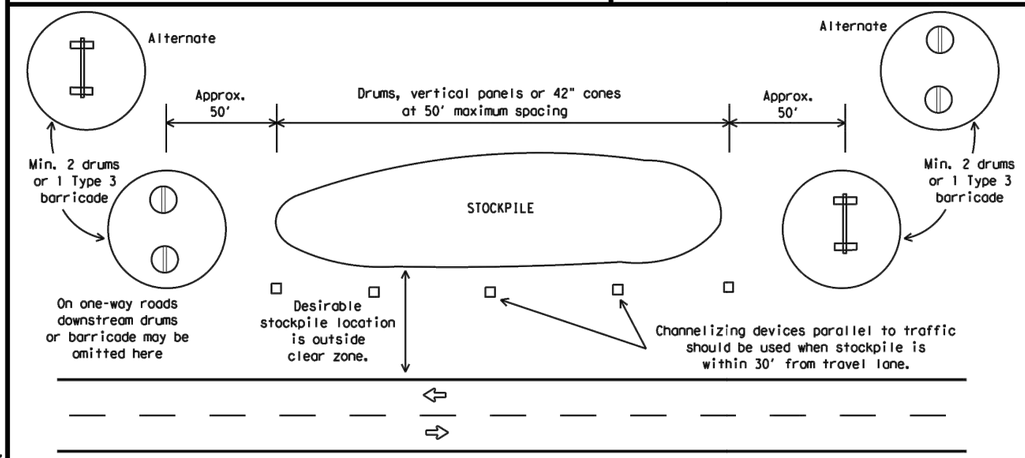


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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7-13 5-21	FTW	TARRANT		17

DATE:
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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.

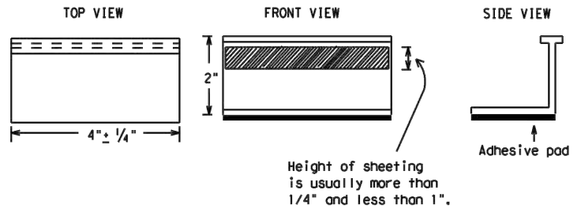
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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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1-02 7-13	FTW	TARRANT		18
11-02 8-14				

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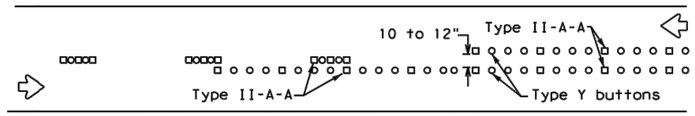
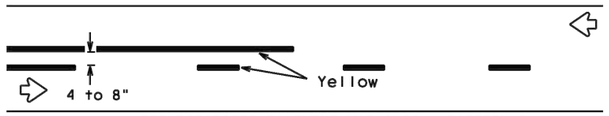
PAVEMENT MARKING PATTERNS

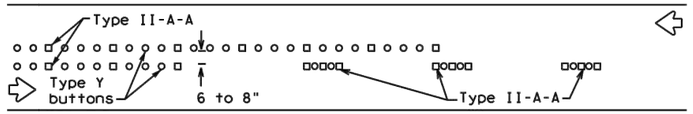
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



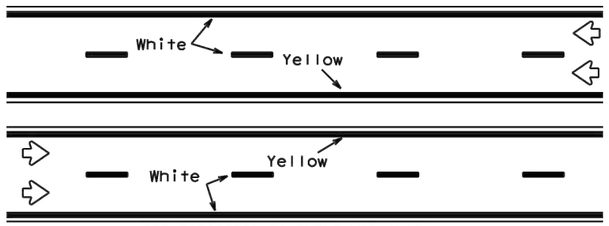
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



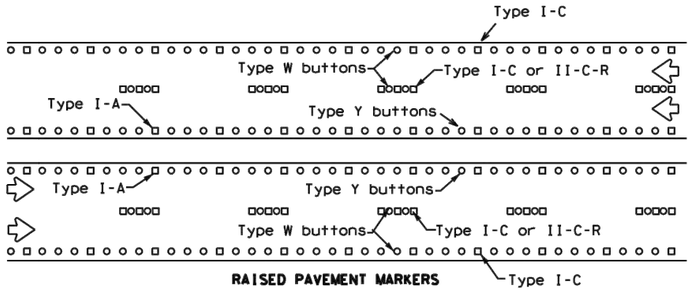
RAISED PAVEMENT MARKERS - PATTERN B

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

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



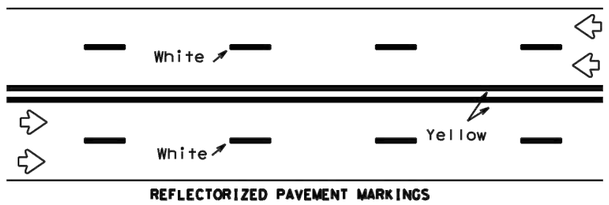
REFLECTORIZED PAVEMENT MARKINGS



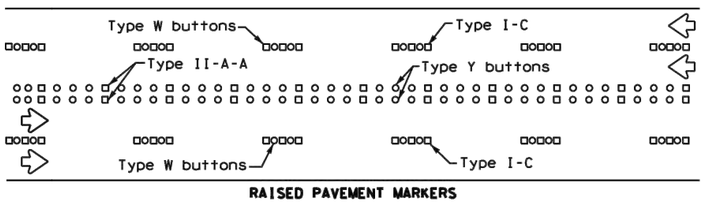
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



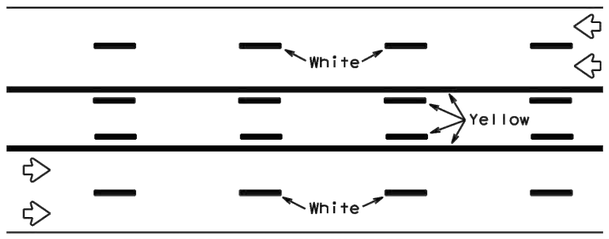
REFLECTORIZED PAVEMENT MARKINGS



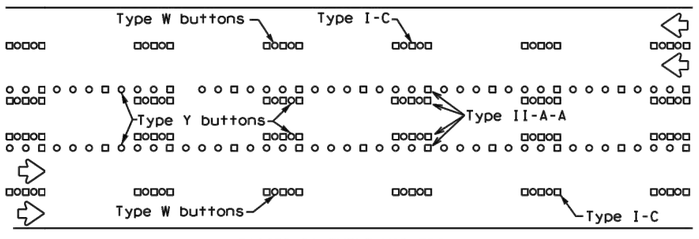
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



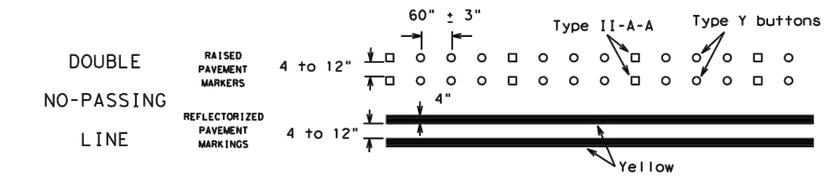
RAISED PAVEMENT MARKERS

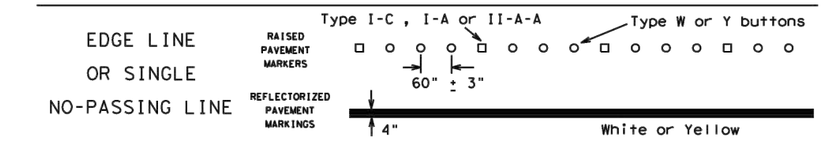
Prefabricated markings may be substituted for reflectorized pavement markings.

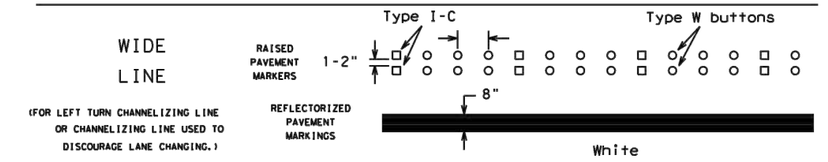
TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

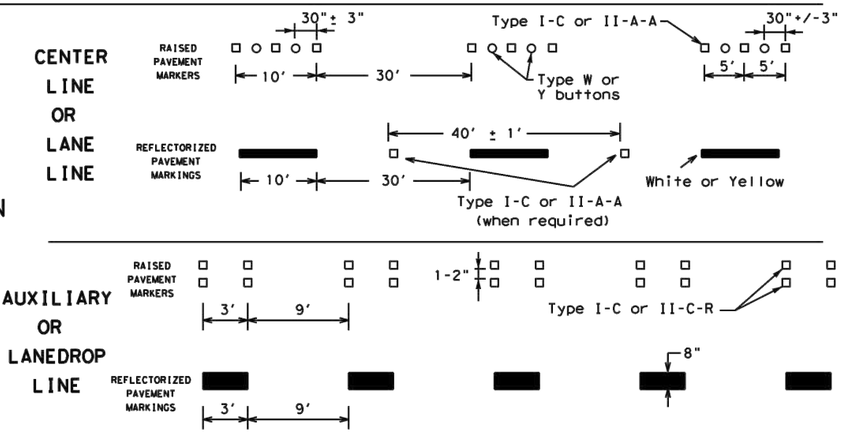
SOLID LINES





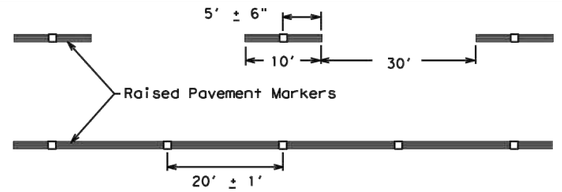


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

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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106

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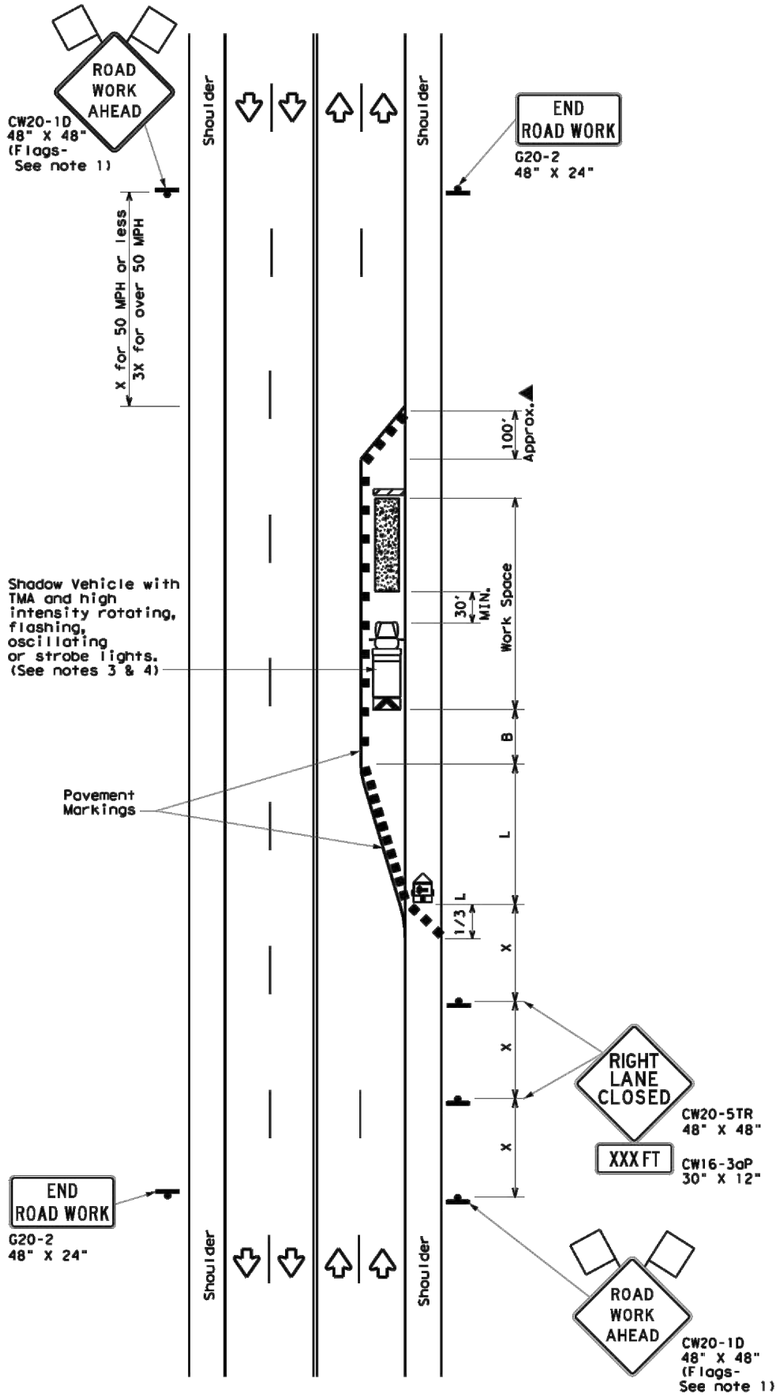
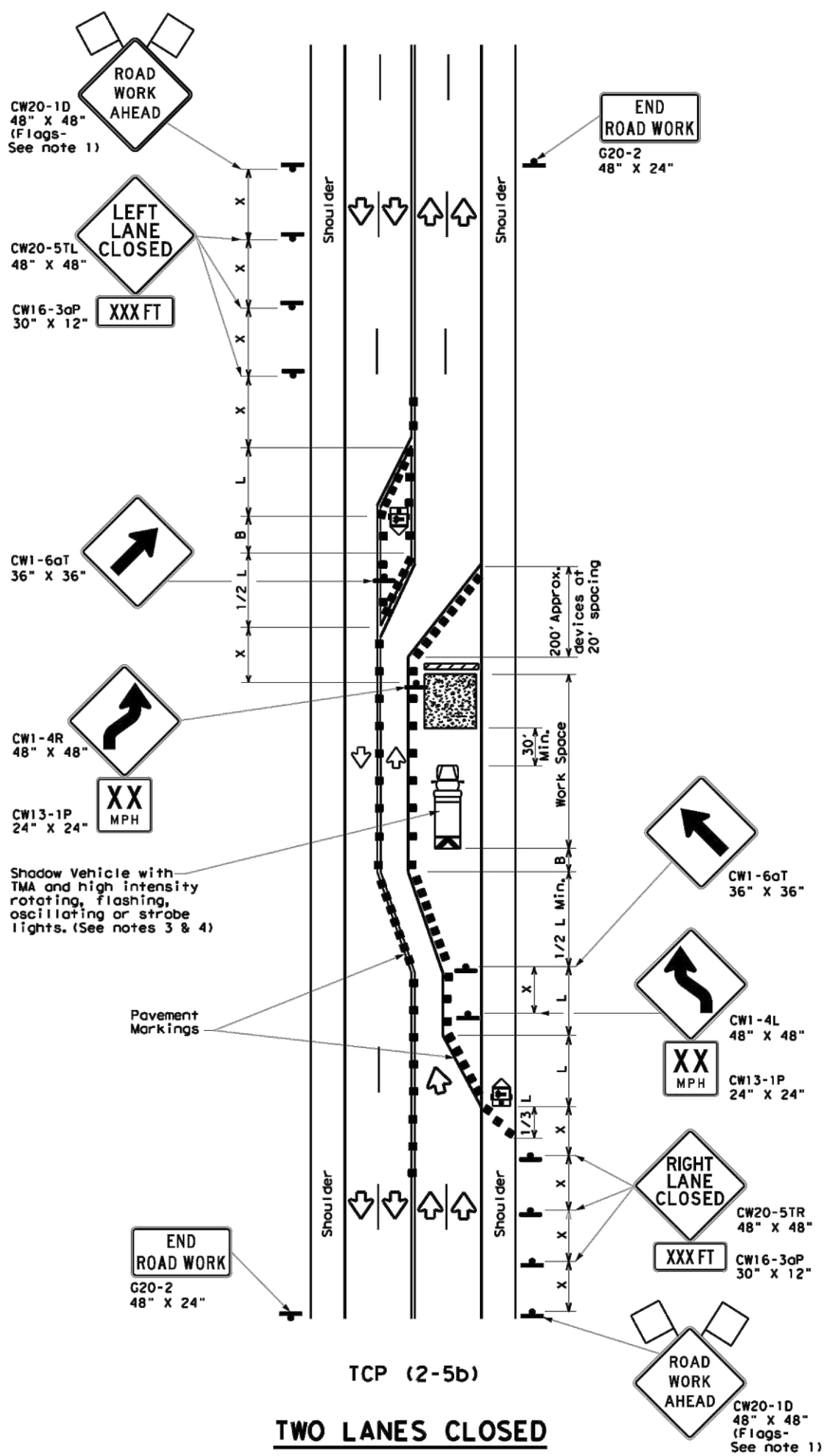


TCP (2-5a)

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

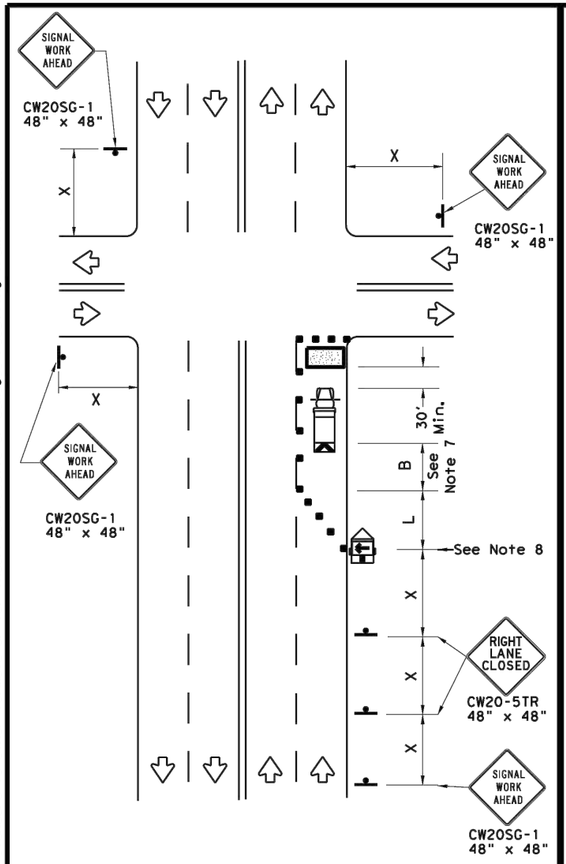
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

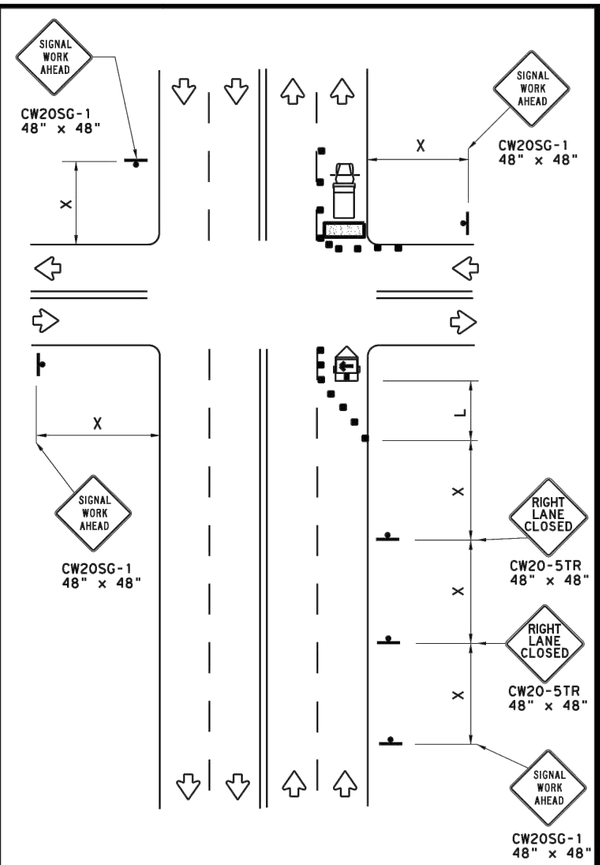
FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
8-95 2-12	DIST	COUNTY		SHEET NO.
1-97 3-03	FTW	TARRANT		20
4-98 2-18				

DATE:
FILE:



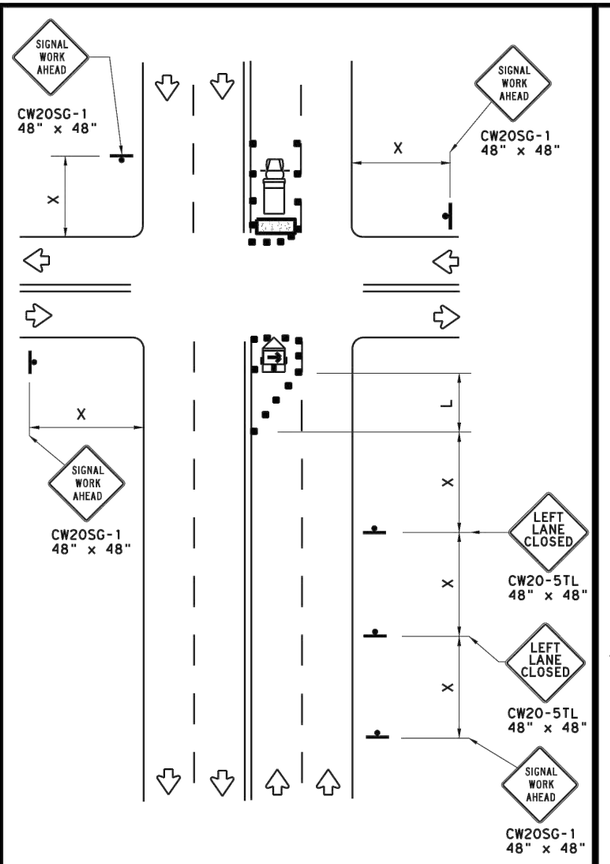
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



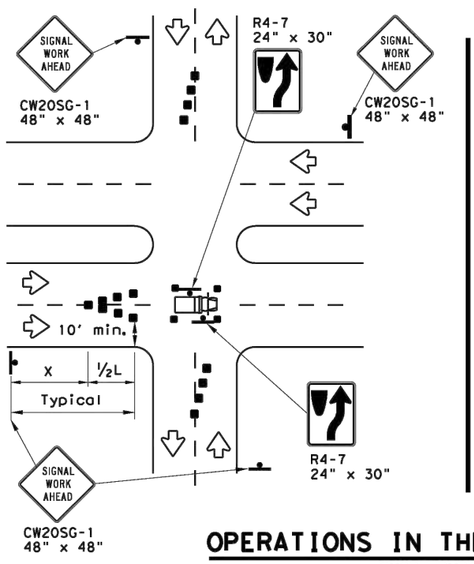
FAR SIDE RIGHT LANE CLOSURE

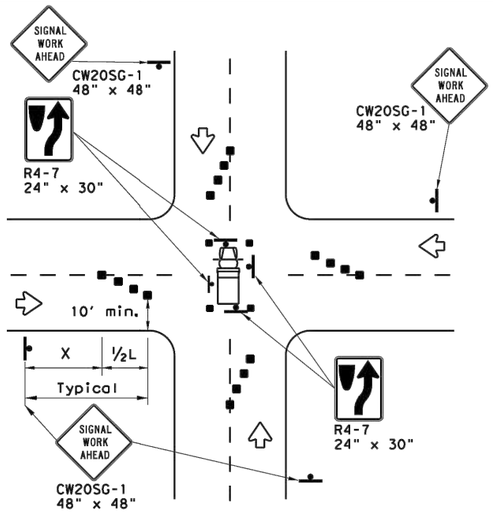
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

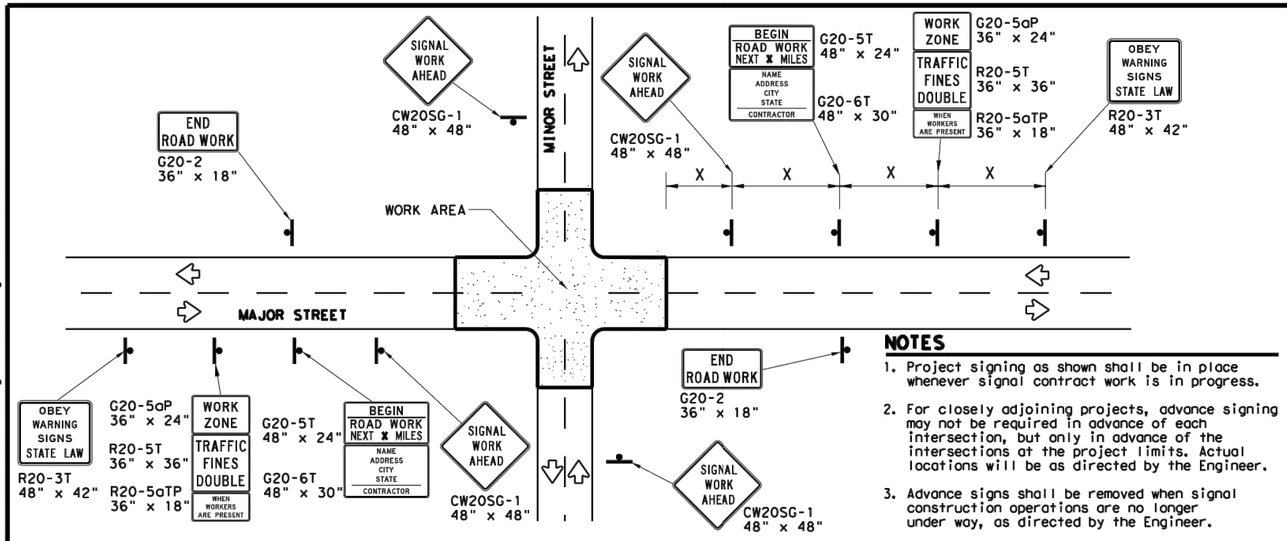
Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	FTW	TARRANT		21

DATE:
FILE:



TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

DURATION OF WORK

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

SIGN MOUNTING HEIGHT

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

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night without damaging the sign sheeting. Burlap, or heavy materials such as plywood or 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

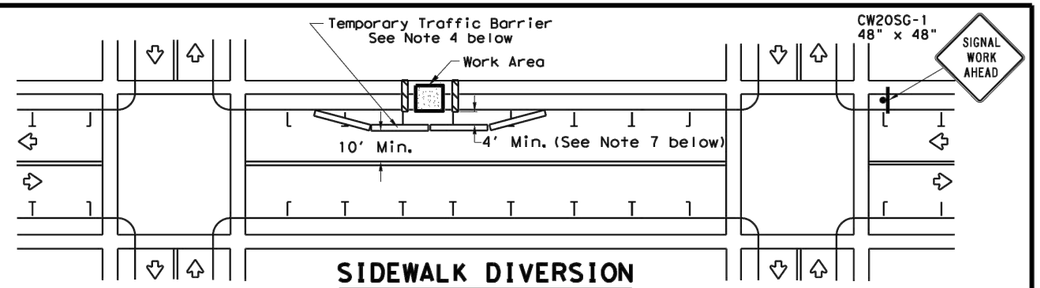
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

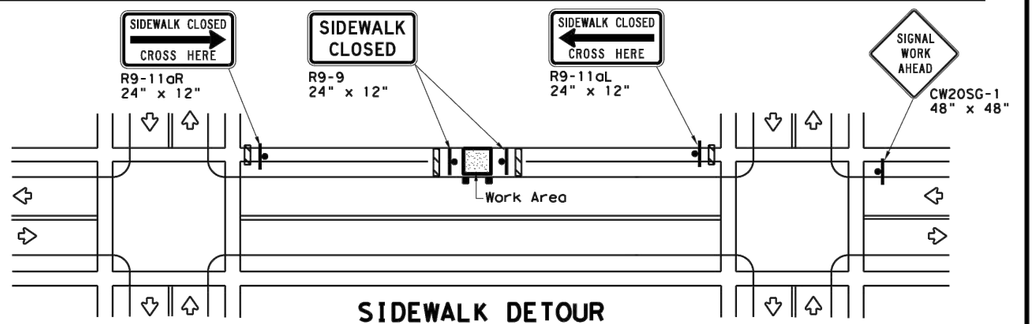
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

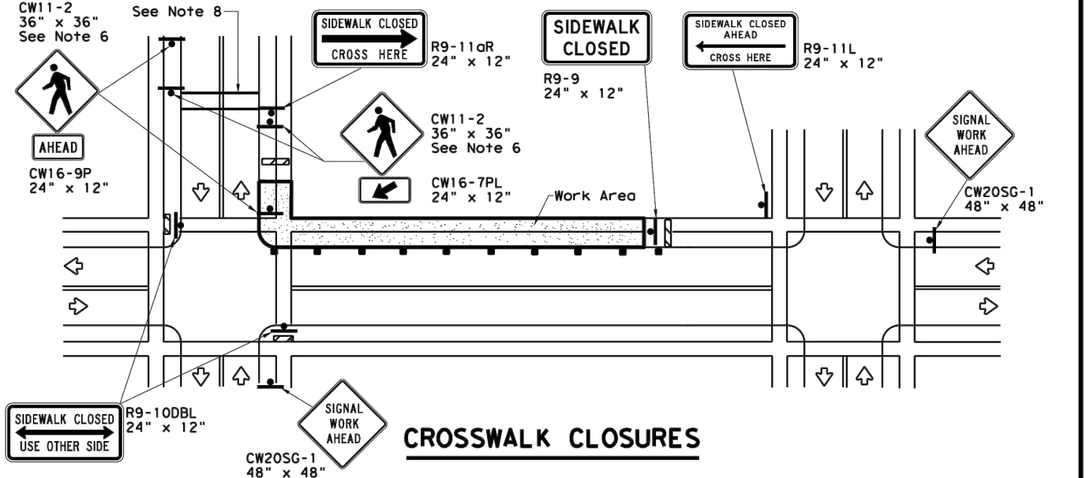
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



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.

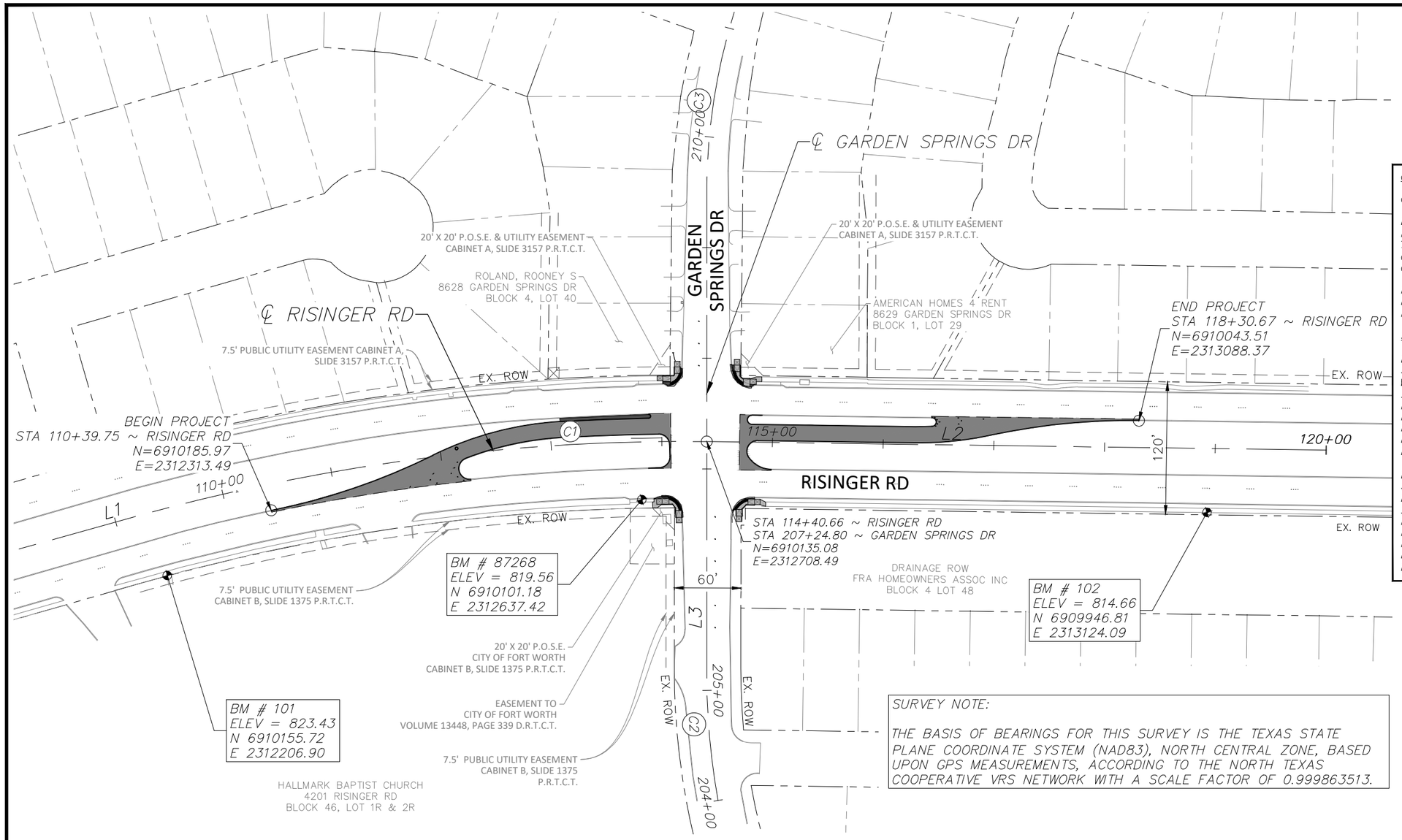
Texas Department of Transportation

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
REVISIONS		0902	90	208	RISINGER RD
2-98 10-99 7-13		DIST	COUNTY		SHEET NO.
4-98 3-03		FTW	TARRANT		22



CITY BENCHMARK:

CITY OF FORT WORTH: MONUMENT 87268

DESCRIPTION: ON THE SOUTHWEST CORNER OF RISINGER ROAD AND GARDEN SPRINGS DRIVE , WEST +/– 36.3' OF THE WEST CURB LINE OF GARDEN SPRINGS DRIVE IN THE CENTER OF A DOUBLE 10' INLET 1' OFF THE FACE OF CURB. SHOWN HEREON

N: 6,909,176.27
E: 2,312,327.87
PUBLISHED ELEVATION: 519.56'

SITE BENCHMARKS:

BM 101 (CP–101)
SQUARE CUT WITH "X" ON TOP OF CONCRETE WALKWAY , WEST +/– 467.3' THE WEST CURB LINE OF GARDEN SPRINGS ROAD AND +/– 9.9' SOUTH OF CURB LINE OF RISINGER ROAD , SHOWN HEREON
NAD83 TXNC GRID COORDINATE:
N: 6,909,230.80
E: 2,311,897.41
ELEV. = 823.43'

BM 102 (CP–102)
SQUARE CUT WITH "X" ON TOP OF CONCRETE WALKWAY , EAST +/– 430' FROM THE EAST CURB LINE OF GARDEN SPRINGS ROAD AND +/– 7.5' SOUTH OF CURB LINE OF RISINGER ROAD , SHOWN HEREON
NAD83 TXNC GRID COORDINATE:
N: 6,909,021.92
E: 2,312,814.48
ELEV. = 814.66'

SURVEY NOTE:

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE TEXAS STATE PLANE COORDINATE SYSTEM (NAD83), NORTH CENTRAL ZONE, BASED UPON GPS MEASUREMENTS, ACCORDING TO THE NORTH TEXAS COOPERATIVE VRS NETWORK WITH A SCALE FACTOR OF 0.999863513.

RISINGER RD ALIGNMENT DATA

TAG NUMBER	LENGTH	RADIUS	BEARING	START STATION	END STATION	DELTA	CHORD BEARING	CHORD LENGTH	START BEARING	END BEARING	PI STATION	START NORTHING, EASTING	END NORTHING, EASTING	PI POINT NORTHING, EASTING
L1	*166.61'*		*S89°18'31.32"E*	*107+50.00*	*109+16.61*							*6910217.05, 2312025.75*	*6910215.04, 2312192.35*	
C1	*530.07'*	*1850.00*		*109+16.61*	*114+46.69*	*16.42*	*S81°06'01.24"E*	*528.26'*	*S89°18'31.32"E*	*S72°53'31.16"E*	*111+83.48*	*6910215.04, 2312192.35*	*6910133.32, 2312714.26*	*6910211.82, 2312459.20*
L2	*553.69'*		*S72°53'31.16"E*	*114+46.69*	*120+00.38*							*6910133.32, 2312714.26*	*6909970.44, 2313243.45*	

GARDEN SPRINGS DR ALIGNMENT DATA

TAG NUMBER	LENGTH	RADIUS	BEARING	START STATION	END STATION	DELTA	CHORD BEARING	CHORD LENGTH	START BEARING	END BEARING	PI STATION	START NORTHING, EASTING	END NORTHING, EASTING	PI POINT NORTHING, EASTING
C2	*115.02'*	*630.00*		*204+00.00*	*205+15.02*	*10.46*	*N11°11'20.71"E*	*114.86'*	*N5°57'32.45"E*	*N16°25'08.96"E*	*204+57.67*	*6909821.07, 2312627.28*	*6909933.75, 2312649.57*	*6909878.43, 2312633.27*
L3	*442.22'*		*N16°18'39.81"E*	*205+15.02*	*209+57.24*							*6909933.75, 2312649.57*	*6910358.17, 2312773.77*	
C3	*210.25'*	*550.00*		*209+57.24*	*211+67.49*	*21.90*	*N28°05'14.37"E*	*208.97'*	*N17°08'10.08"E*	*N39°02'18.67"E*	*210+63.66*	*6910358.17, 2312773.77*	*6910542.53, 2312872.16*	*6910459.87, 2312805.13*

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1116
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

RISINGER & GARDEN SPRINGS IMPROVEMENTS

PROJECT LAYOUT & CONTROL

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	23

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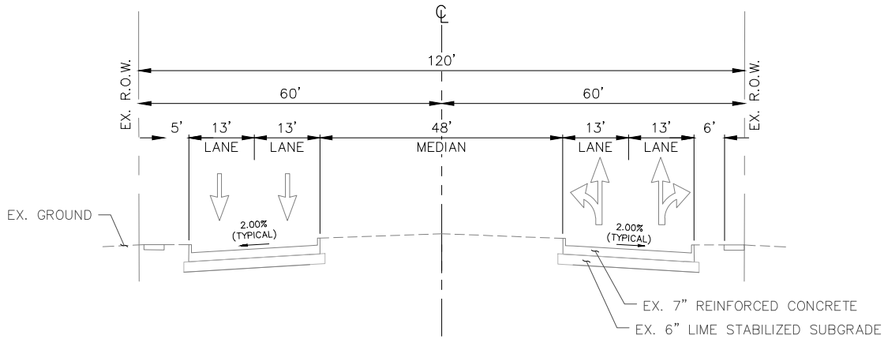
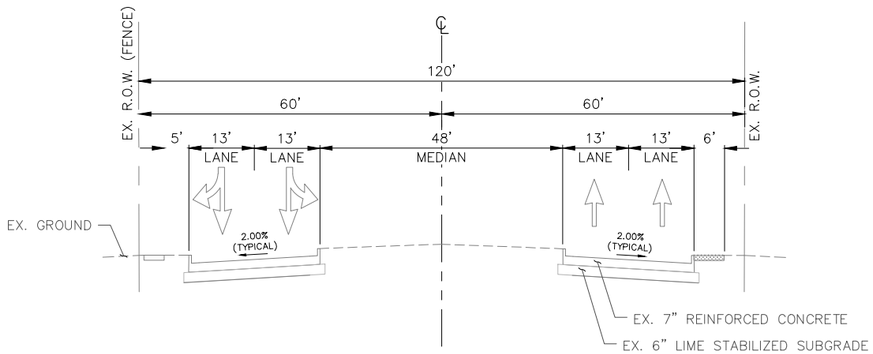
PLOTTED WITH: _Adobe PDF.pc3



RISINGER RD - WEST OF INTERSECTION
STA. 113+09.23 TO STA. 113+88.58
EXISTING TYPICAL SECTION - NO. 1

NOT TO SCALE



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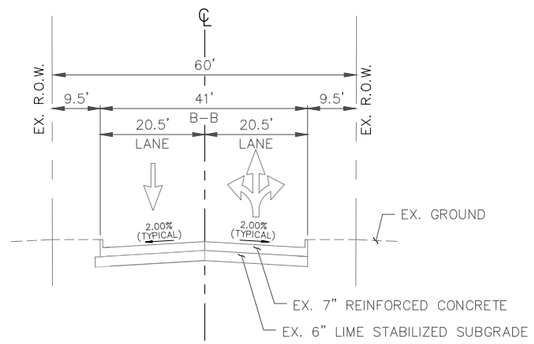
STA. 114+86.87 TO STA. 116+28.87
EXISTING TYPICAL SECTION - NO. 2

NOT TO SCALE



GARDEN SPRINGS DR. - SOUTH OF INTERSECTION
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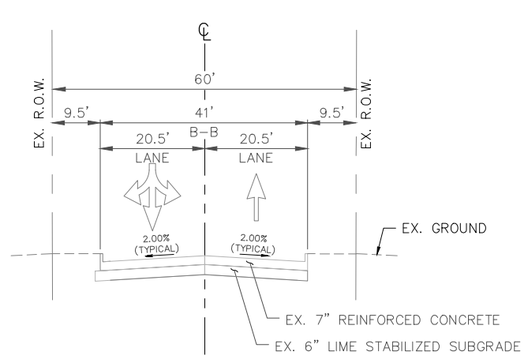
EXISTING TYPICAL SECTION - NO. 1

NOT TO SCALE



GARDEN SPRINGS DR. - NORTH OF INTERSECTION
STA. 207+94.40 TO STA. 208+42.21
EXISTING TYPICAL SECTION - NO. 2

NOT TO SCALE

NOTES:

1. *ALL EXISTING MEDIANS/ROWs DISTURBED DURING CONSTRUCTION SHALL BE RETURNED TO THEIR ORIGINAL STATE OR BETTER UPON COMPLETION OF THE PROJECT. IN THE EVENT THAT GRASS HAS BEEN DISTURBED, GRASS SHALL BE ESTABLISHED AT 100% BY CONTRACTOR.*
2. *PRIOR TO SOD OR SEEDING, REMOVE ALL ROCKS GREATER THAN 1" (32 92 13–SODDING–REVISED MAY 13, 2021 OR 32 92 14–NON NATIVE SEEDING–REVISED MAY 13, 2021).*
3. *ALL DIRT MOUNDS SHALL BE REMOVED FROM MEDIAN/ROWs PRIOR TO SEEDING AFTER CONSTRUCTION IS COMPLETED.*

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1114
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

TYPICAL SECTIONS
EXISTING

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	24

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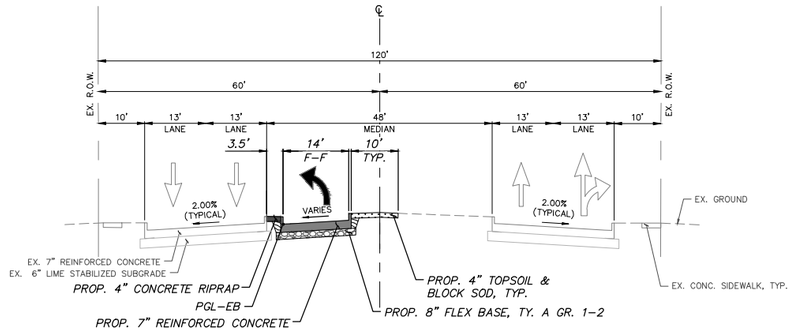
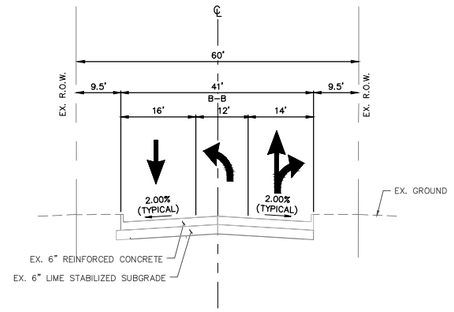


RISINGER RD - WEST OF INTERSECTION
STA. 113+09.26 TO STA. 113+88.58
EXISTING TYPICAL SECTION - NO. 1

NOT TO SCALE

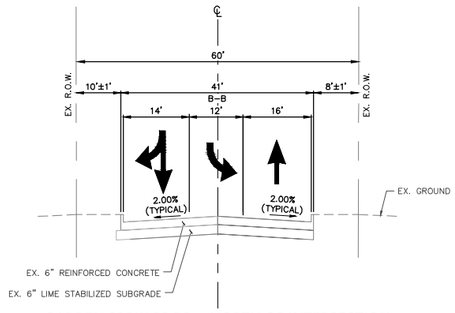
RISINGER RD - EAST OF INTERSECTION
STA. 114+86.87 TO STA. 116+28.87
EXISTING TYPICAL SECTION - NO. 2

NOT TO SCALE



GARDEN SPRINGS DR. - SOUTH OF INTERSECTION
STA. 205+57.97 TO STA. 206+57.97
PROPOSED TYPICAL SECTION - NO. 1

NOT TO SCALE



GARDEN SPRINGS DR. - NORTH OF INTERSECTION
STA. 207+94.40 TO STA. 208+42.21
PROPOSED TYPICAL SECTION - NO. 2

NOT TO SCALE

NOTES:

1. *ALL EXISTING MEDIANS/ROWs DISTURBED DURING CONSTRUCTION SHALL BE RETURNED TO THEIR ORIGINAL STATE OR BETTER UPON COMPLETION OF THE PROJECT. IN THE EVENT THAT GRASS HAS BEEN DISTURBED, GRASS SHALL BE ESTABLISHED AT 100% BY CONTRACTOR.*
2. *PRIOR TO SOD OR SEEDING, REMOVE ALL ROCKS GREATER THAN 1" (32 92 13-SODDING-REVISED MAY 13, 2021 OR 32 92 14-NON NATIVE SEEDING-REVISED MAY 13, 2021).*
3. *ALL DIRT MOUNDS SHALL BE REMOVED FROM MEDIAN/ROWs PRIOR TO SEEDING AFTER CONSTRUCTION IS COMPLETED.*

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1114
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

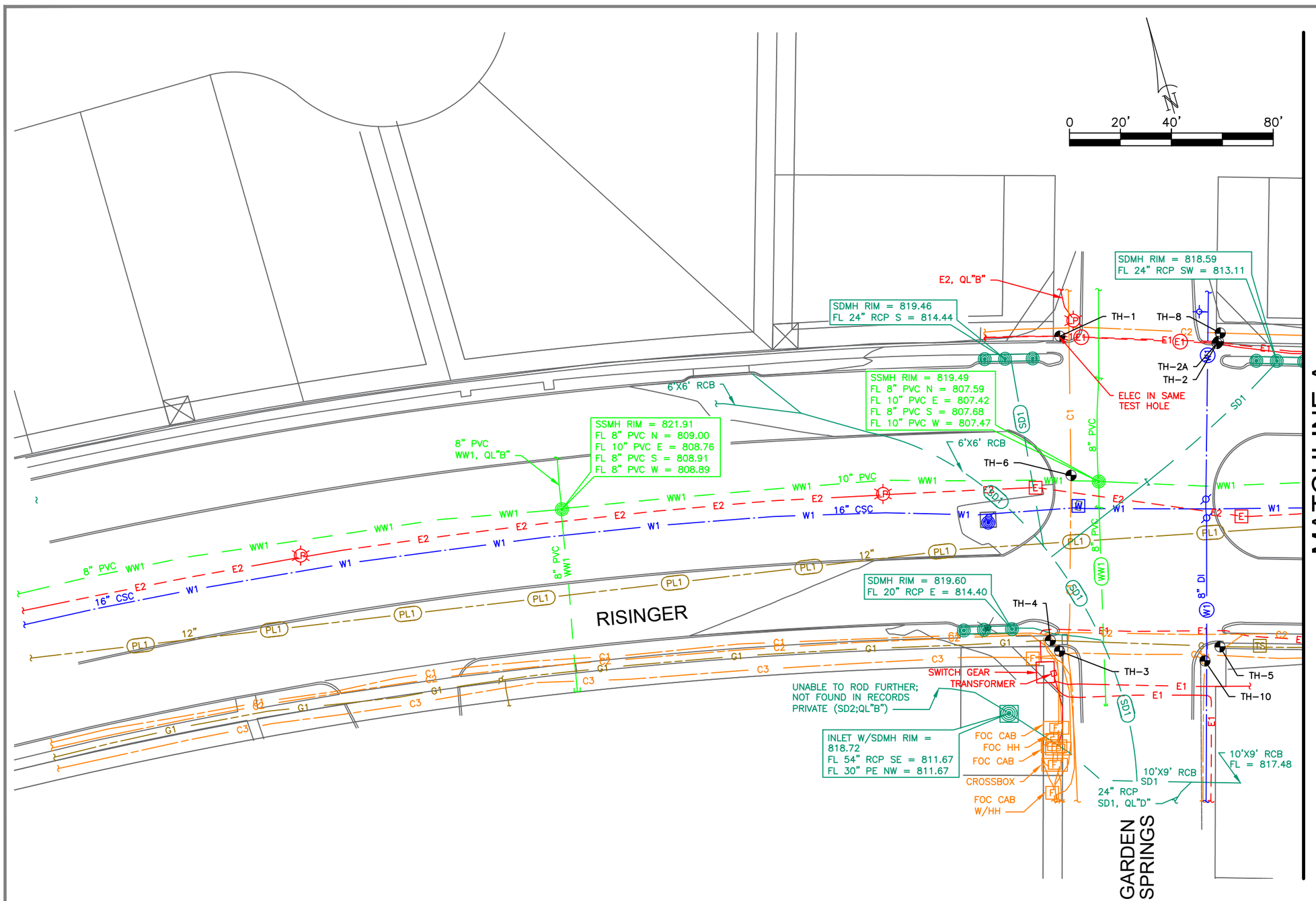
Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

TYPICAL SECTIONS
PROPOSED

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	25

FULL PATH: G:\Production4000\095000\5081\017 - Risinger Rd & Garden Springs Dr Signal\Civil\Drawings\Plot Sheets
FILENAME: ROAD-TS.dwg
PLOTTED BY: Lee Monastesse
PLOTTED WITH: _Adobe PDF.pc3



LEGEND OF U.G. UTILITY TYPES

COMMUNICATIONS — QL"B"
- AT&T (FO/DUCT) — C1
- AT&T (TELE) — C2
- SPECTRUM(FO/DUCT) — C3
- SPECTRUM (CTV) — C4

QL"C"/"D"
- AT&T (FO/DUCT) — C1
- AT&T (TELE) — C2
- SPECTRUM(FO/DUCT) — C3
- SPECTRUM (CTV) — C4

GAS / PETROLEUM — QL"B"
- ATMOS — G1
- WILLIAMS — PL1

QL"C"/"D"
- ATMOS — G1
- WILLIAMS — PL1

ELECTRIC / POWER — QL"B"
- ONCOR — E1
- CITY OF FORT WORTH — E2

QL"C"/"D"
- ONCOR — E1
- CITY OF FORT WORTH — E2

POTABLE WATER — QL"B"
- CITY OF FORT WORTH — W1

QL"C"/"D"
- CITY OF FORT WORTH — W1

SANITARY SEWER — QL"B"
- CITY OF FORT WORTH — WW1

QL"C"/"D"
- CITY OF FORT WORTH — WW1

STORM DRAIN — QL"B"
- CITY OF FORT WORTH — SD1
- PRIVATE — SD2

QL"C"/"D"
- CITY OF FORT WORTH — SD1
- PRIVATE — SD2

- ABANDONED UTILITY
- UNKNOWN UTILITY

LEGEND OF UTILITY SYMBOLS

END CAP
QUALITY LEVEL CHANGE
TEST HOLE
UTILITY CONTINUATION

FIBER CABINET
FIBER HANDHOLE

ELECTRIC HANDHOLE
LIGHT POLE

GAS MANHOLE
GAS METER
GAS TEST STATION
GAS VALVE
GAS VENT PIPE (GAS RISER)

STORM SEWER MANHOLE

WASTE WATER CLEANOUT
WASTE WATER MANHOLE

FIRE HYDRANT
WATER MANHOLE
WATER METER
WATER VALVE
WATER VAULT

The Rios Group, Inc.
TBPE Firm #F-14595

STATE OF TEXAS
J. S. ANDERSON
69493
LICENSED
PROFESSIONAL ENGINEER
01-17-2023

DATE	BY	REV	REVISION

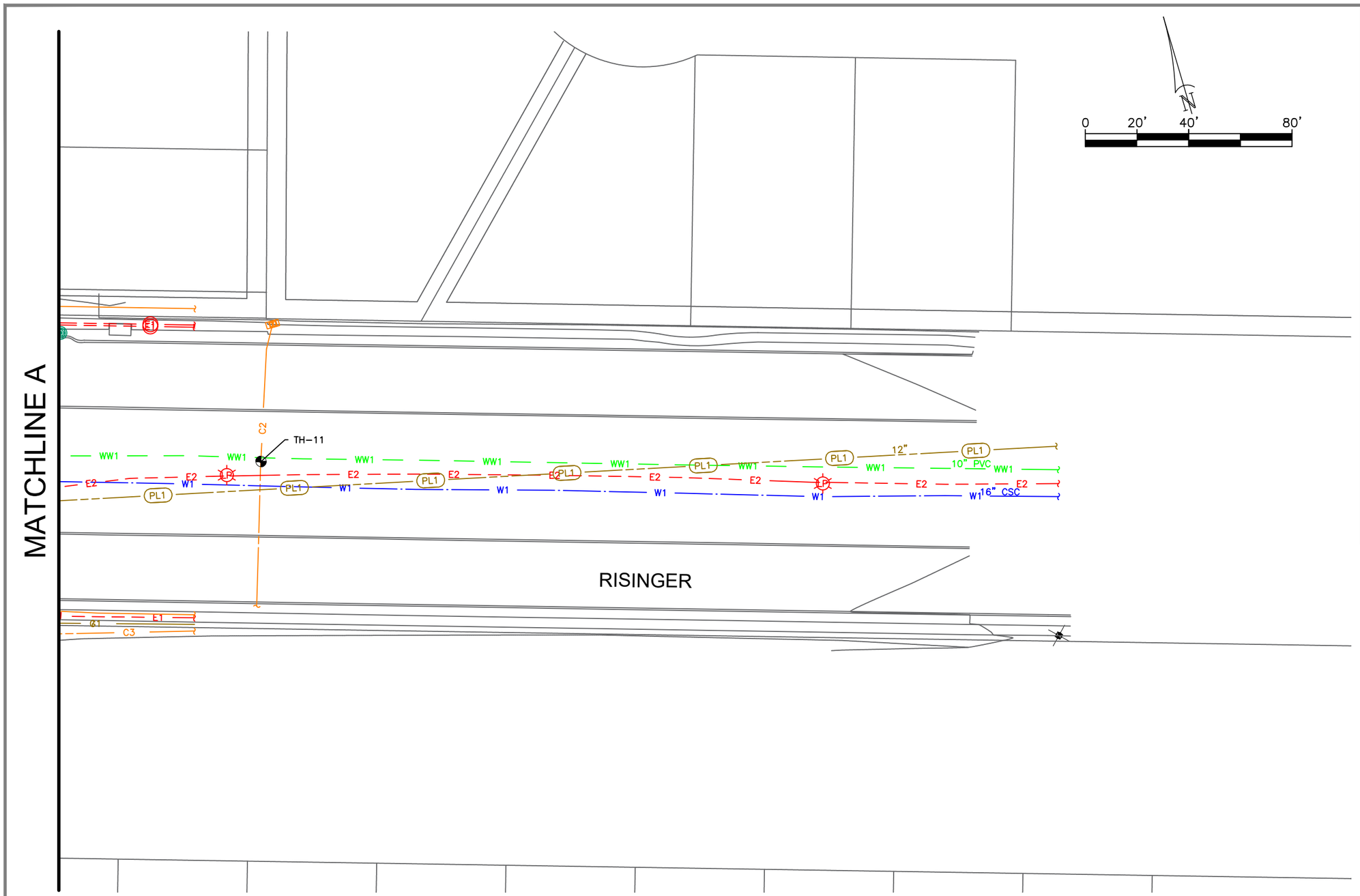
THE RIOS GROUP
SUBSURFACE UTILITY ENGINEERING
UTILITY COORDINATION
7400 Sand Street
Fort Worth, TX. 76118
817.345.7500

RISINGER & GARDEN SPRINGS IMPROVEMENTS

SUE PLAN SHEET

SHEET 1 OF 2

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			CS
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	26



LEGEND OF U.G. UTILITY TYPES

COMMUNICATIONS
- AT&T (FO/DUCT) — QL"B" — C1
- AT&T (TELE) — C2
- SPECTRUM(FO/DUCT) — C3
- SPECTRUM (CTV) — C4
- AT&T (FO/DUCT) — QL"C"/"D" — C1
- AT&T (TELE) — C2
- SPECTRUM(FO/DUCT) — C3
- SPECTRUM (CTV) — C4

GAS / PETROLEUM
- ATMOS — QL"B" — G1
- WILLIAMS — PL1
- ATMOS — QL"C"/"D" — G1
- WILLIAMS — PL1

ELECTRIC / POWER
- ONCOR — QL"B" — E1
- CITY OF FORT WORTH — E2
- ONCOR — QL"C"/"D" — E1
- CITY OF FORT WORTH — E2

POTABLE WATER
- CITY OF FORT WORTH — QL"B" — W1
- CITY OF FORT WORTH — QL"C"/"D" — W1

SANITARY SEWER
- CITY OF FORT WORTH — QL"B" — WW1
- CITY OF FORT WORTH — QL"C"/"D" — WW1

STORM DRAIN
- CITY OF FORT WORTH — QL"B" — SD1
- PRIVATE — SD2
- CITY OF FORT WORTH — QL"C"/"D" — SD1
- PRIVATE — SD2

ABANDONED UTILITY
UNKNOWN UTILITY

LEGEND OF UTILITY SYMBOLS

END CAP
QUALITY LEVEL CHANGE
TEST HOLE
UTILITY CONTINUATION

FIBER CABINET
FIBER HANDHOLE — F

ELECTRIC HANDHOLE
LIGHT POLE — E

GAS MANHOLE
GAS METER
GAS TEST STATION — TS
GAS VALVE — GM
GAS VENT PIPE (GAS RISER)

STORM SEWER MANHOLE

WASTE WATER CLEANOUT
WASTE WATER MANHOLE

FIRE HYDRANT
WATER MANHOLE — WM
WATER METER
WATER VALVE — W
WATER VAULT

The Rios Group, Inc.
TBPE Firm #F-14595

STATE OF TEXAS
J. S. ANDERSON
69493
LICENSED
PROFESSIONAL ENGINEER
01–17–2023

DATE	BY	REV	REVISION

THE RIOS GROUP
SUBSURFACE UTILITY ENGINEERING
UTILITY COORDINATION
7400 Sand Street
Fort Worth TX. 76118
817.345.7500

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

SUE PLAN SHEET

SHEET 2 OF 2

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			CS
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	27

The Rios Group
7400 Sand St.
Fort Worth, TX 76118
(817)345-7500

Summary of Test Hole Information and Coordinates

Project Name: Risinger and Garden Springs
General Location: W Risinger Rd and Garden Springs Dr
Client Name: Dunaway
TRG Proj. Number: DUNA2202.00
City/Town: Fort Worth **County:** Tarrant **State:** TX

Field Manager: C.M.
Technicians: G.A., M.B.
Vacuum Excavation Truck/Trailer: VT-7
Designating Truck: T-15

Test Hole #	Utility Size, O.D. (Inches)	Utility Material (Refer to Legend)	Utility Type (Refer to Legend)	Depth to Top of Utility (Feet)	Cross Sectional View	General Utility Direction	Surface Type and Thickness (Inches) (Refer to Legend)	ID'd By: 1:5/8"Iron Rod/Cap 2: Nail/Disk 3: 'X'in Conc.	Date Test Hole Excavated	Utility Observed (Yes or No)	Survey Point #	Northing (Y)	Easting (X)	Ground Elevation (Z)	Top of Utility Elevation	Test Hole Specific Notes/Locations/Etc
1	6" ; 2"	PVC	E	3.28			NG	Rod/Cap	8/24/2022	Yes	10005	6910203.12	2312696.48	819.56	816.28	Oncor
2	2	PVC	E	4.68			NG	Rod/Cap	8/23/2022	Yes	10003	6910183.24	2312754.99	818.83	814.15	Oncor
2A	6	PVC	E	4.24			NG	Rod/Cap	8/24/2022	Yes	10004	6910183.74	2312755.67	818.87	814.63	Oncor
3	2	PE	FOC	1.04			NG	Rod/Cap	8/23/2022	Yes	10000	6910084.46	2312661.93	819.27	818.23	AT&T
4	8	PE	G	2.86			C - 6	X in Conc	8/24/2022	Yes	10001	6910089.51	2312659.61	819.40	816.54	Atmos
5	8	PE	G	2.48			NG	Rod/Cap	8/23/2022	Yes	10002	6910068.54	2312722.86	818.96	816.48	Atmos
6	2"; 2"	PE	FOC	2.56			C - 8	X in Conc	9/29/2022	Yes	10012	6910149.45	2312685.48	819.54	816.98	AT&T
7																No utility found at this location
8	1	DBC	T	2.68			NG	Rod/Cap	9/28/2022	Yes	10003	6910186.8	2312757.3	819.327	816.65	AT&T
9																No utility found at this location
10	2" ; 1"	DBC	T	1.80			NG	Rod/Cap	9/28/2022	Yes	10000	6910064.86	2312715.67	818.912	817.11	AT&T
11	2	DBC	T	2.16			NG	Rod/Cap	9/28/2022	Yes	10001	6910097.52	2312846.43	818.431	816.27	AT&T

Notes:

Utility Materials:		
STL - Steel	**PVC** - Polyvinyl Chloride	**CSC** - Concrete/Steel Cylinder
PE - Polyethylene	**DBC** - Direct Buried Cable	**CMP** - Corrugated Metal Pipe
AC - Transite	**RCP** - Reinforced Concrete Pipe	**RCCP** - Reinforced Concrete Cylinder Pipe
CI - Cast Iron	**VC** - Vitrified Clay	-
DI - Ductile Iron	**FG** - Fiberglass	-

Utility Types:		
E - Electric	**T** - Telephone	**TS** - Traffic Signal
G - Gas	**FOC** - Fiber Optic Cable	**FM** - Force Main
W - Water	**SAN** - Sanitary Sewer	-
PL - Product Line	**STM** - Storm Sewer	-
FL - Fuel Line	**CTV** - Cable Television	-

Surface Types:
A - Asphalt
B - Brick
C - Concrete
NG - Natural Ground
-

Prepared By: L. Petty Date: 10/8/2022
Checked by: R. Chapin Date: 10/13/2022
Sheet: 28

The Rios Group, Inc.
TBPE Firm #F-14595

STATE OF TEXAS
J. S. ANDERSON
69493
LICENSED
PROFESSIONAL ENGINEER
01-17-2023

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11144
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

SUE DATA

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	28

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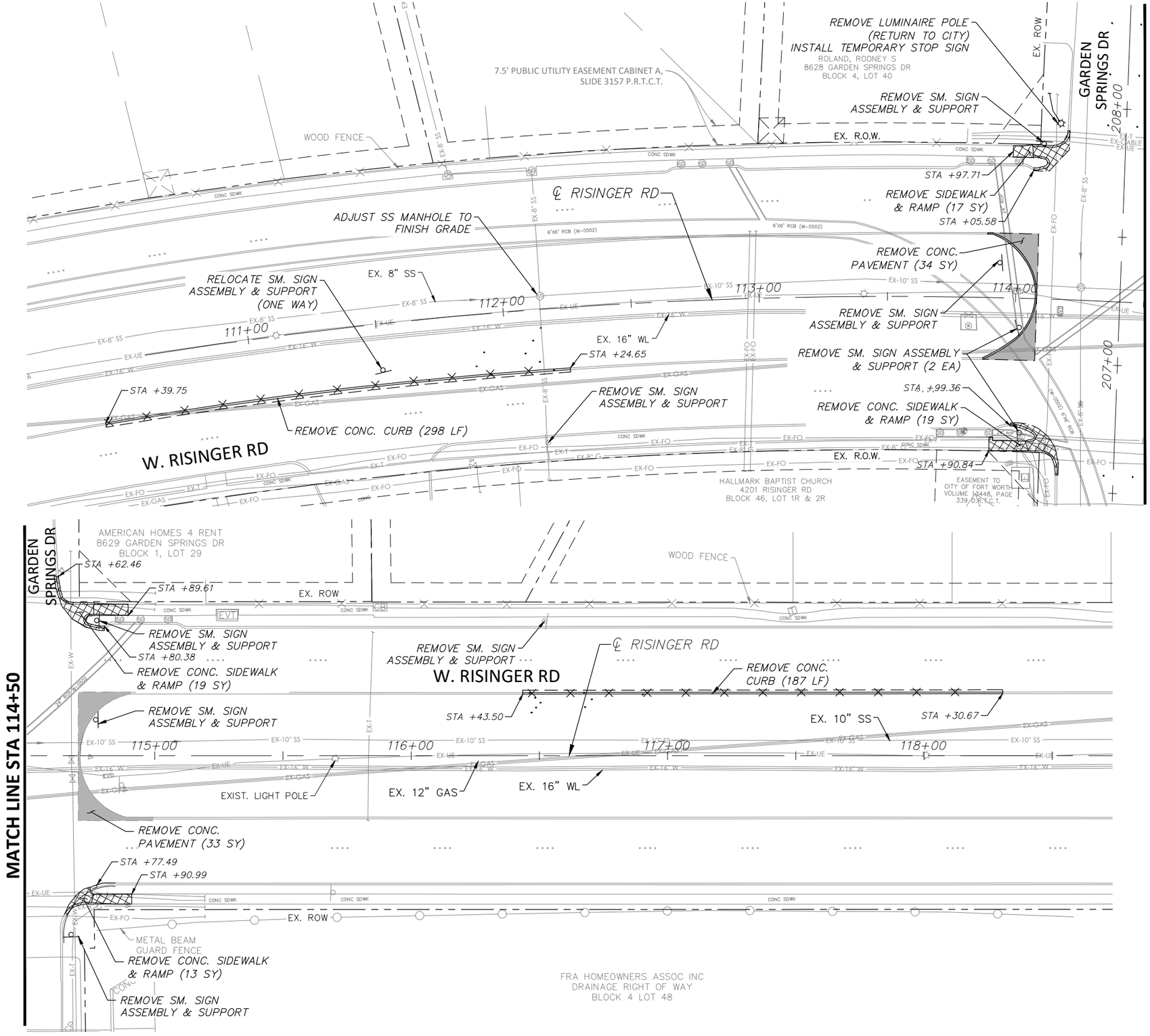
PLOTTED WITH: _Adobe PDF.pc3



20 0 20 40

GRAPHIC SCALE IN FEET
HORIZONTAL
1" = 40'

DEMOLITION LEGEND

- CONC. CURB REMOVAL
- CONC. PAVEMENT REMOVAL
- CONC. SIDEWALK AND RAMP REMOVAL

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11141
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

DEMOLITION PLAN - RISINGER RD

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	29

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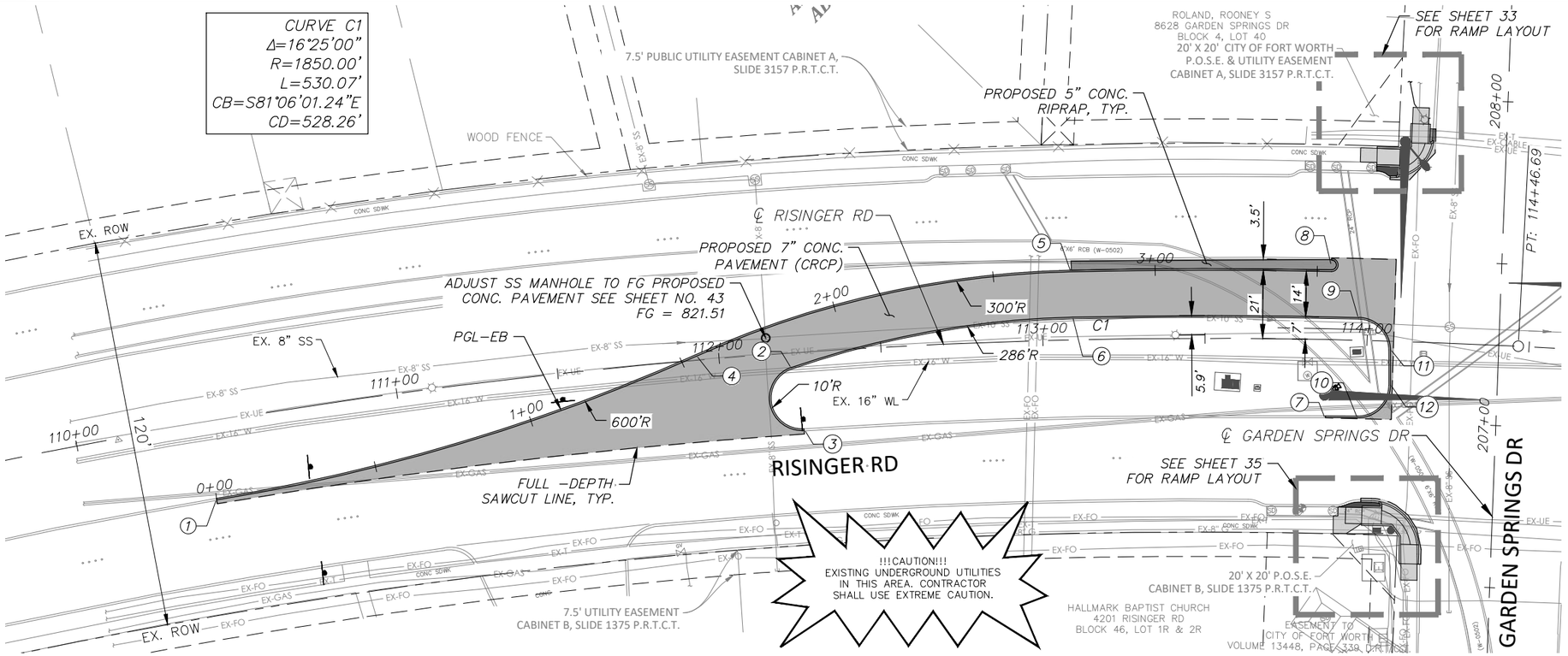
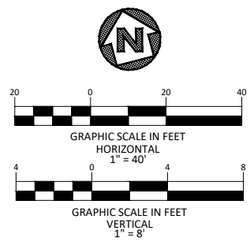
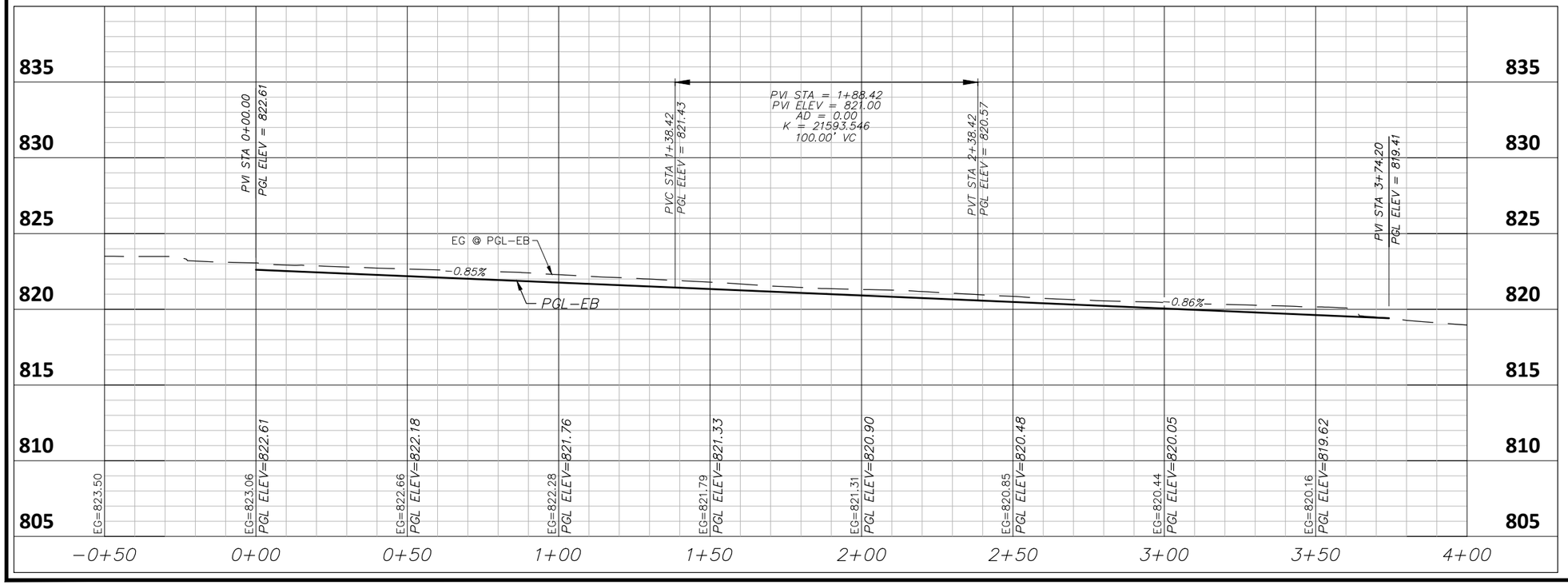




GEOMETRY POINTS			
NO.	TYPE	STA	OFFSET
1	PC	110+39.75	24.07 RT
2	PC	112+22.07	4.49 RT
3	EP	112+24.65	24.14 RT
4	PRC	111+93.06	1.23 LT
5	PT	113+09.26	21.00 LT
6	PT	113+09.26	7.00 LT
7	EP	113+87.62	24.07 RT
8	RP	113+88.58	23.00 LT
9	PC	113+97.28	7.00 LT
10	PT	113+97.73	23.92 RT
11	PT	114+07.29	2.72 RT
12	PC	114+07.62	13.64 RT

GEOMETRY POINTS REFERENCE RISINGER RD ℄ MEASURED FROM FACE OF CURB.

RISINGER RD EB PGL



2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11144
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

RISINGER & GARDEN SPRINGS IMPROVEMENTS

PAVING PLAN & PROFILE EB TURN LANE

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	30

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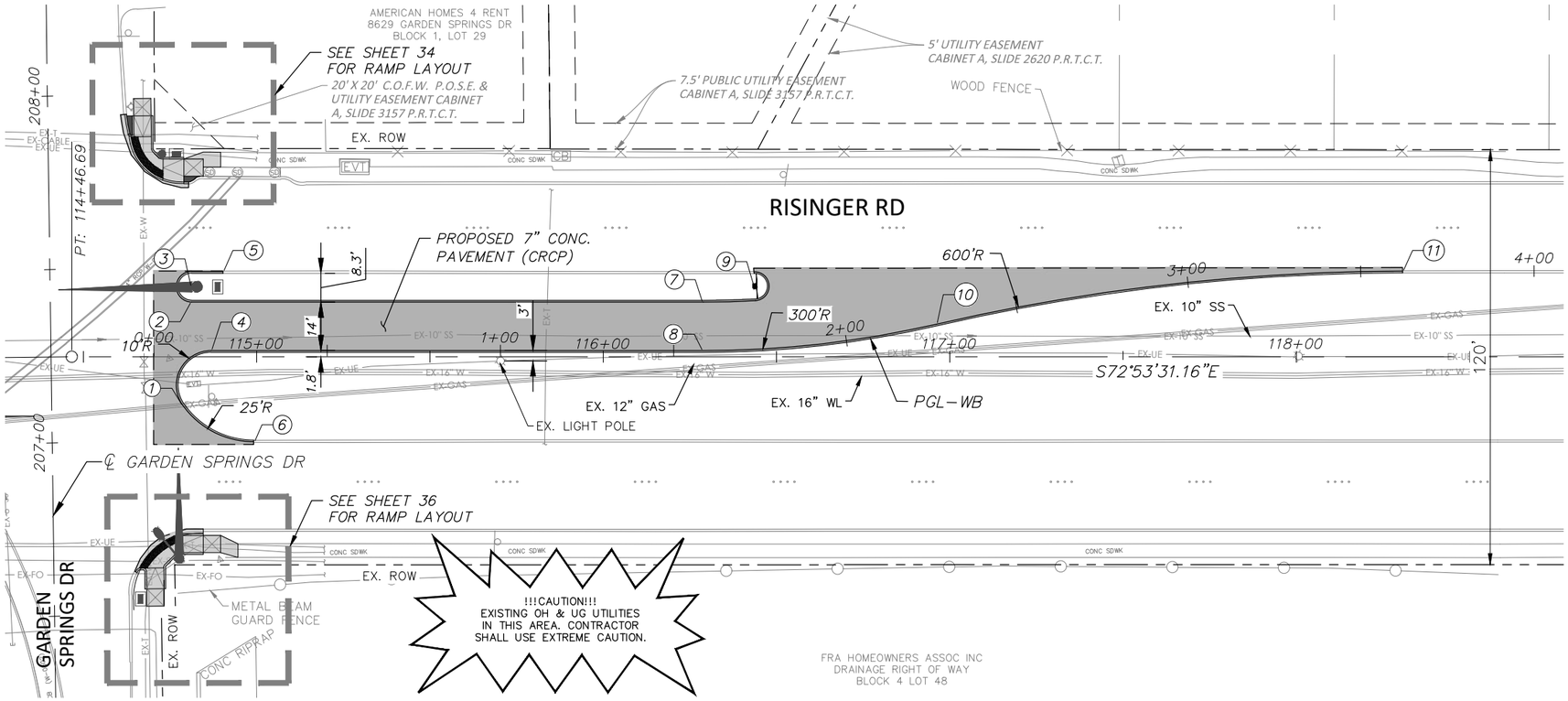
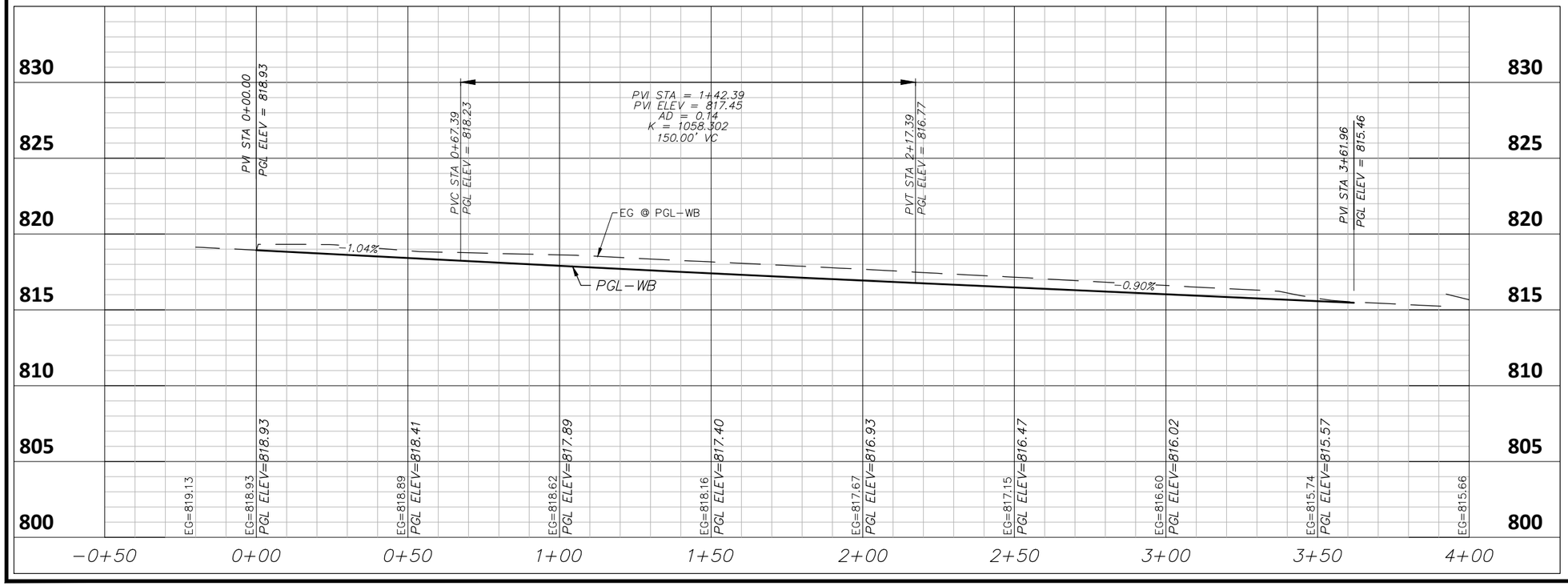
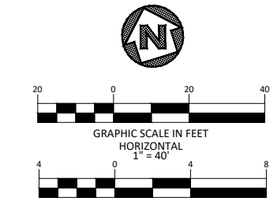
PLOTTED WITH: _Adobe PDF.pc3



RISINGER RD WB TURN LANE

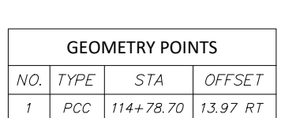




GEOMETRY POINTS			
NO.	TYPE	STA	OFFSET
1	PCC	114+78.70	13.97 RT
2	PC	114+81.28	15.80 LT
3	RP	114+81.28	20.21 LT
4	PT	114+86.87	1.80 LT
5	EP	114+90.28	24.60 LT
6	EP	114+99.15	24.54 RT
7	PC	116+28.87	15.80 LT
8	PC	116+28.87	1.80 LT
9	RP	116+43.69	20.36 LT
10	PRC	116+96.15	9.44 LT
11	EP	118+30.67	24.72 LT

GEOMETRY POINTS REFERENCE RISINGER RD ℄ MEASURED FROM FACE OF CURB.

2/23/23



DATE	BY	REV	REVISION

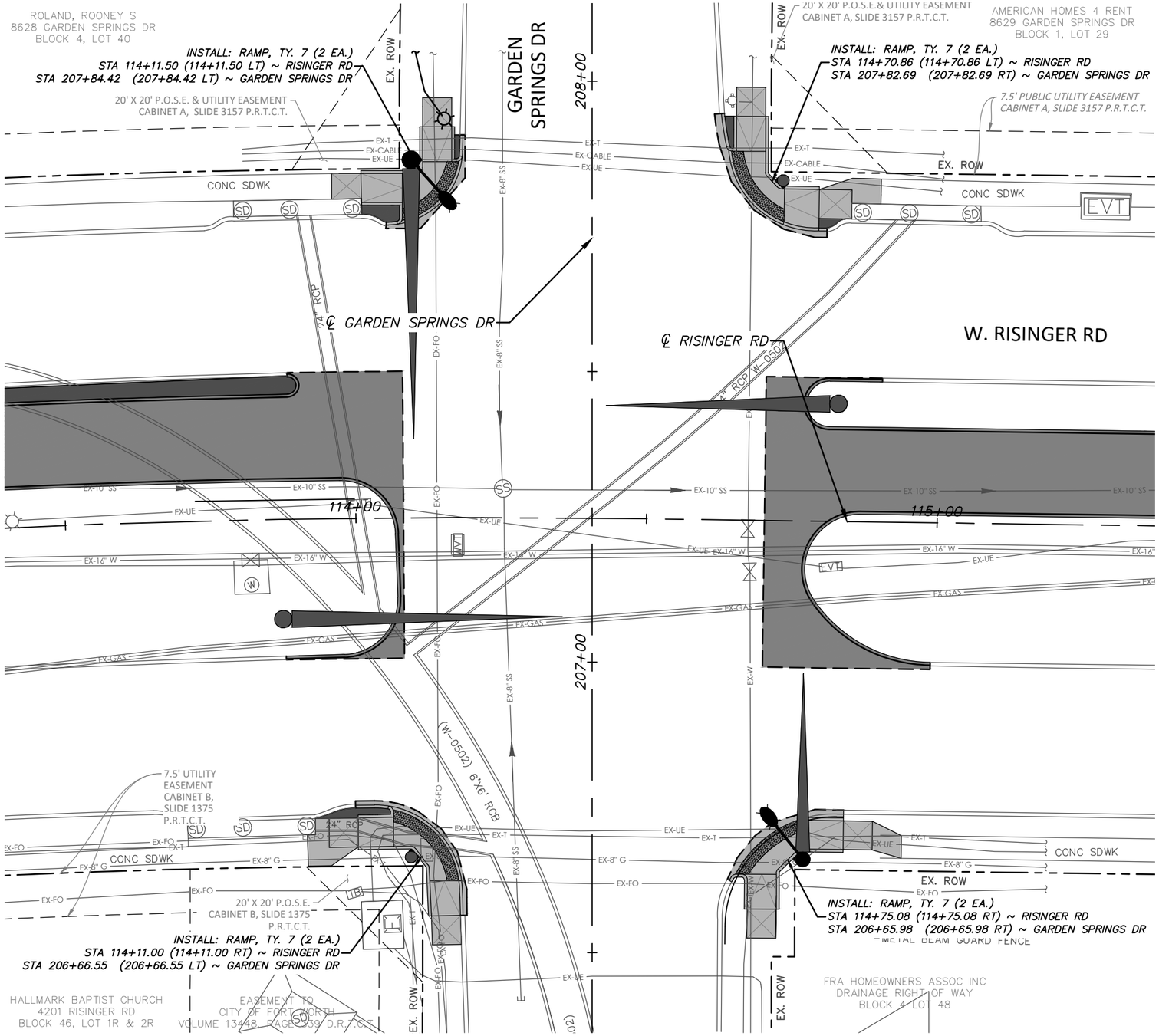
DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1114
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

PAVING PLAN & PROFILE WB TURN LANE

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	31



10 0 10 20
GRAPHIC SCALE IN FEET
1" = 20'

FRANCHISE UTILITY COORDINATION:

CONTRACTOR SHALL COORDINATE WITH EXISTING UTILITY COMPANIES BEFORE AND DURING CONSTRUCTION.

ATMOS – JAMES LARUE – CONTACT NO. 682–359–3289

ONCOR – SUZANNE NASSAR – CONTACT NO. 682–239–1000

ATT – JASON ROGERS – CONTACT NO. 817 688–2383

SPECTRUM – BRENT BASCOM – CONTACT NO. 817–822–9377

ATMOS AND ONCOR LINES SHOWN IN CONFLICT HAVE BEEN RELOCATED BY RESPECTIVE OWNERS. CONTRACTOR SHALL VERIFY.

ATT AND SPECTRUM LINES SHALL BE ADJUSTED IN THE FIELD DURING CONSTRUCTION. CONTRACTOR TO COORDINATE.

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1144
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

PAVING PLAN
RAMP LAYOUT

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	32

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PLOTTED WITH: _Adobe PDF.pc3

FRANCHISE UTILITY COORDINATION:

CONTRACTOR SHALL COORDINATE WITH EXISTING UTILITY COMPANIES BEFORE AND DURING CONSTRUCTION.

ATMOS – JAMES LARUE – CONTACT NO. 682–359–3289

ONCOR – SUZANNE NASSAR – CONTACT NO. 682–239–1000

ATT – JASON ROGERS – CONTACT NO. 817 688–2383

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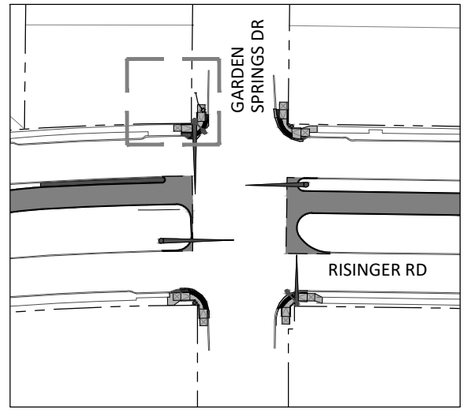
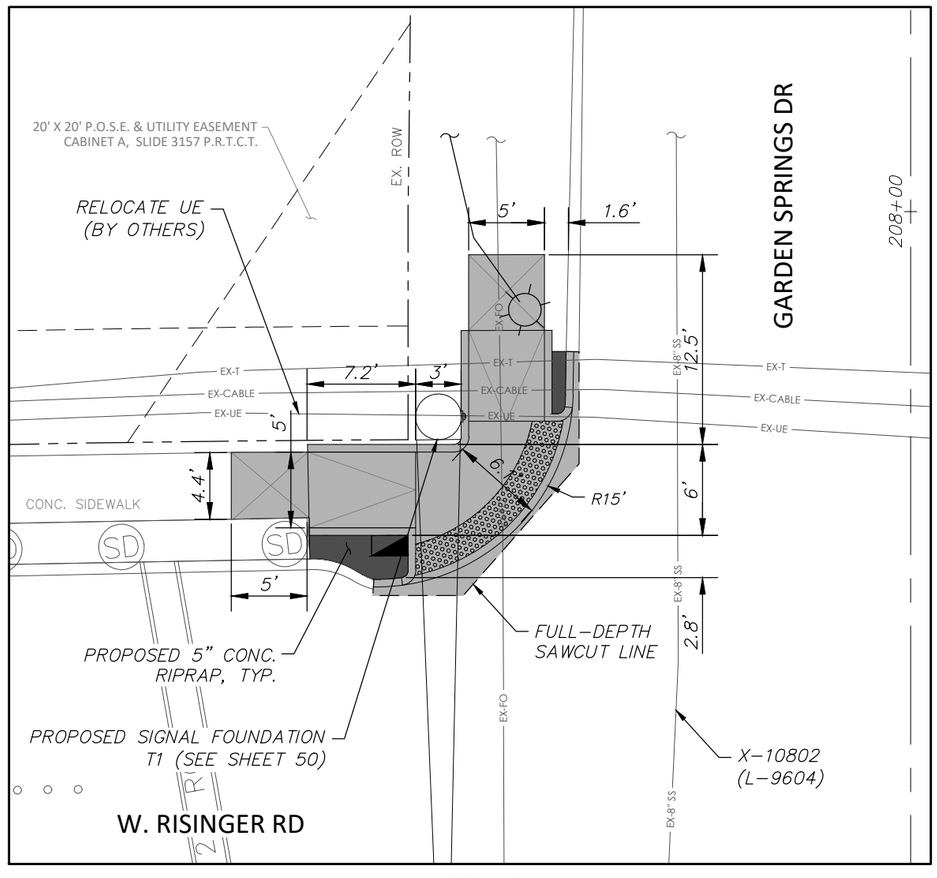
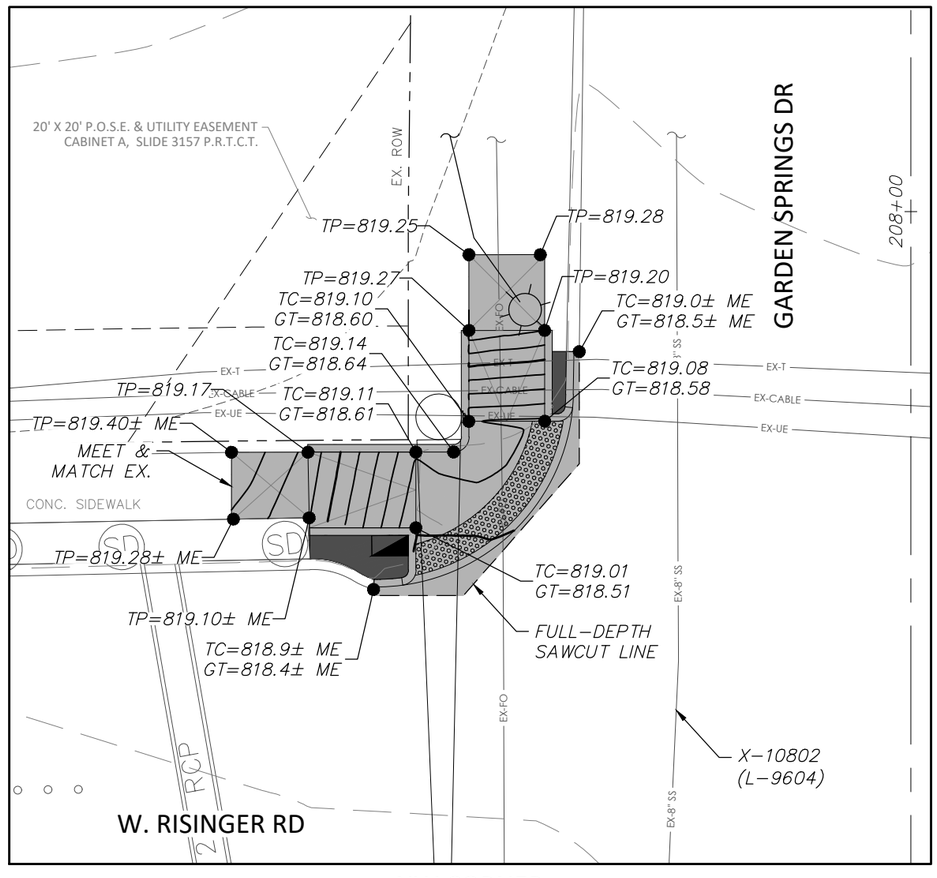
ATT AND SPECTRUM LINES SHALL BE ADJUSTED IN THE FIELD DURING CONSTRUCTION. CONTRACTOR TO COORDINATE.



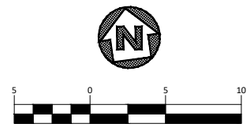
INSET A
N.T.S.



NW CORNER
PLAN



NW CORNER
GRADING



NOTES:

1. CONTRACTOR SHALL INSTALL PRE–MANUFACTURED RADIUS CURB TILES. RECTANGULAR TILES NOT PERMITTED.
2. ALL DIMENSIONS ARE FROM EITHER BACK OF CURB OR EDGE OF PAVEMENT.
3. FG CONTOUR INTERVALS SHOWN ARE 0.1'. CURB CONTOUR LINES NOT SHOWN.

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11144
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

NORTHWEST RAMP DETAIL

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	33

FULL PATH: G:\Production4000\0050000\50081\017 - Risinger Rd & Garden Springs Dr Signal\Civil\Drawings\Plot Sheets
FILENAME: ROAD-RAMP-LAYT.dwg
PLOTTED BY: Lee Monastesse
PLOTTED WITH: _Adobe PDF.pc3

FRANCHISE UTILITY COORDINATION:

CONTRACTOR SHALL COORDINATE WITH EXISTING UTILITY COMPANIES BEFORE AND DURING CONSTRUCTION.

ATMOS – JAMES LARUE – CONTACT NO. 682–359–3289

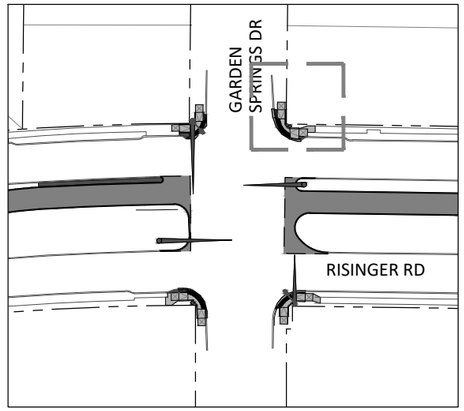
ONCOR – SUZANNE NASSAR – CONTACT NO. 682–239–1000

ATT – JASON ROGERS – CONTACT NO. 817 688–2383

SPECTRUM – BRENT BASCOM – CONTACT NO. 817–822–9377

ATMOS AND ONCOR LINES SHOWN IN CONFLICT HAVE BEEN RELOCATED BY RESPECTIVE OWNERS. CONTRACTOR SHALL VERIFY.

ATT AND SPECTRUM LINES SHALL BE ADJUSTED IN THE FIELD DURING CONSTRUCTION. CONTRACTOR TO COORDINATE.



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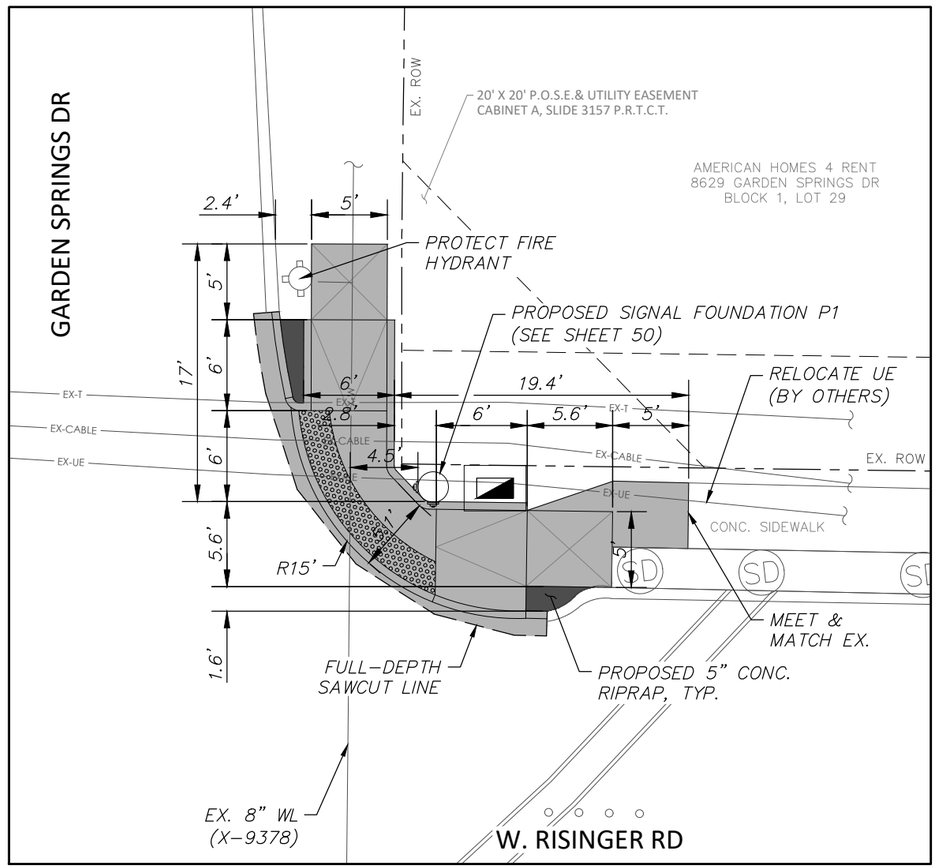
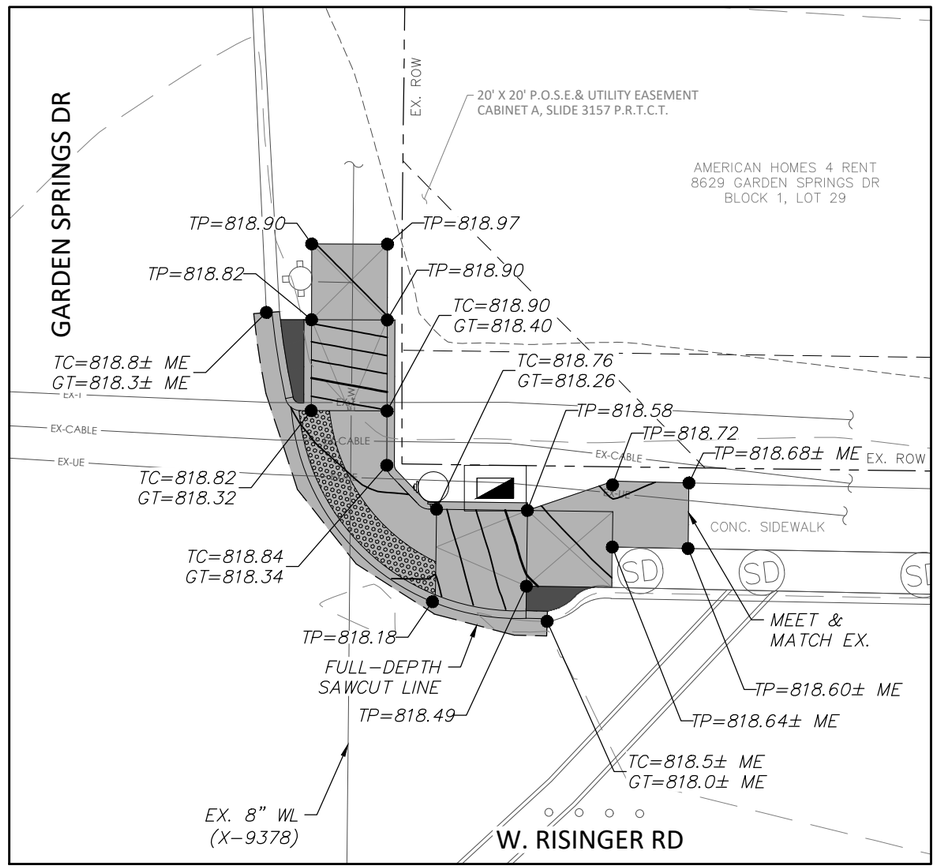
N.T.S.



NE CORNER
PLAN



NE CORNER
GRADING

NOTES:

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2. ALL DIMENSIONS ARE FROM EITHER BACK OF CURB OR EDGE OF PAVEMENT.
3. FG CONTOUR INTERVALS SHOWN ARE 0.1'. CURB CONTOUR LINES NOT SHOWN.

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11171
550 Bailey Avenue
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Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

NORTHEAST
RAMP DETAIL

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	34

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FRANCHISE UTILITY COORDINATION:

CONTRACTOR SHALL COORDINATE WITH EXISTING UTILITY COMPANIES BEFORE AND DURING CONSTRUCTION.

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SPECTRUM – BRENT BASCOM – CONTACT NO. 817–822–9377

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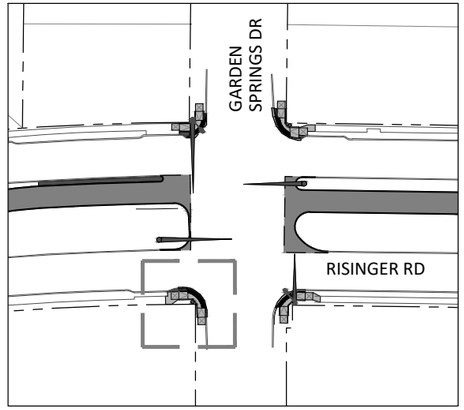

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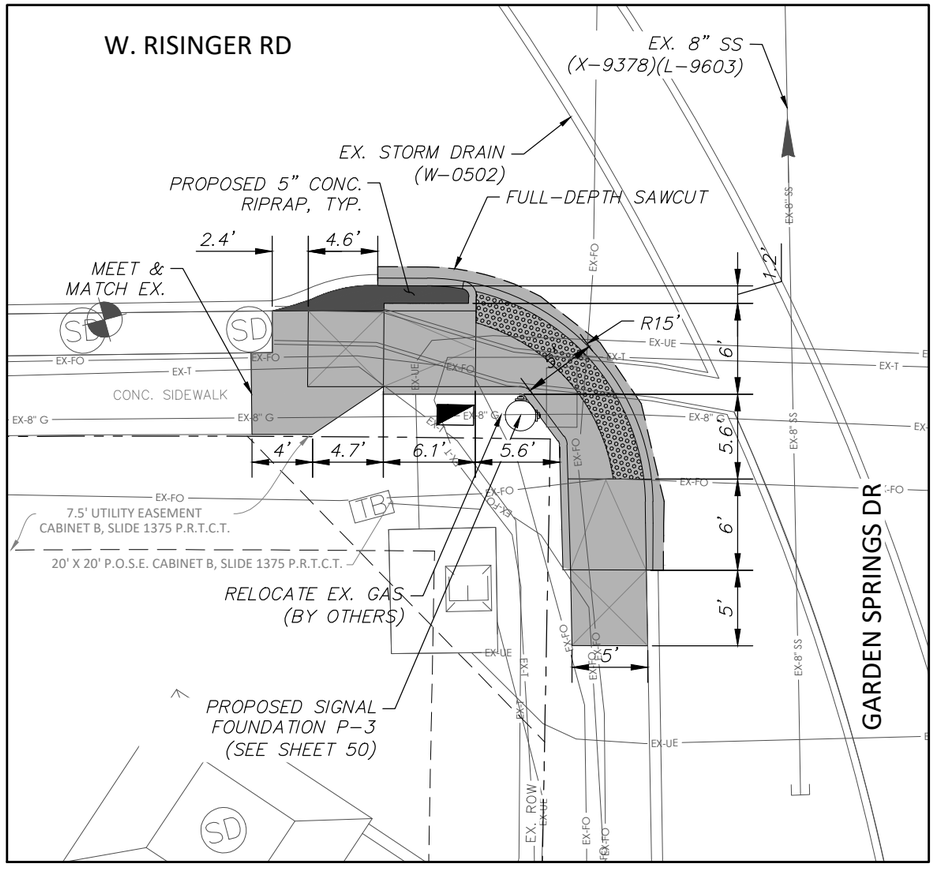
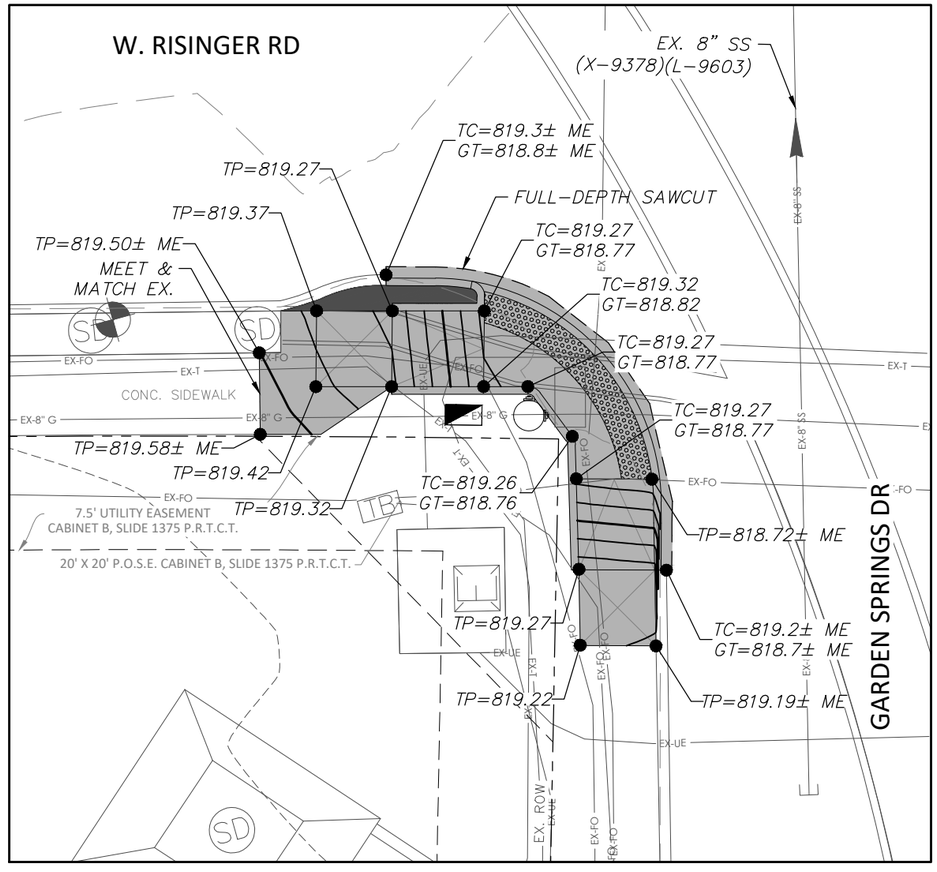


SW CORNER
PLAN



SW CORNER
GRADING

NOTES:

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2. ALL DIMENSIONS ARE FROM EITHER BACK OF CURB OR EDGE OF PAVEMENT.
3. FG CONTOUR INTERVALS SHOWN ARE 0.1'. CURB CONTOUR LINES NOT SHOWN.

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

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Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

SOUTHWEST
RAMP DETAIL

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	35

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FRANCHISE UTILITY COORDINATION:

CONTRACTOR SHALL COORDINATE WITH EXISTING UTILITY COMPANIES BEFORE AND DURING CONSTRUCTION.

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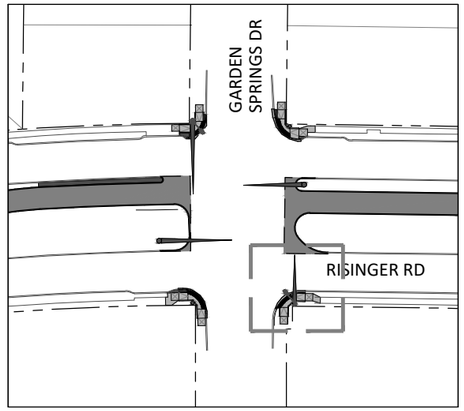

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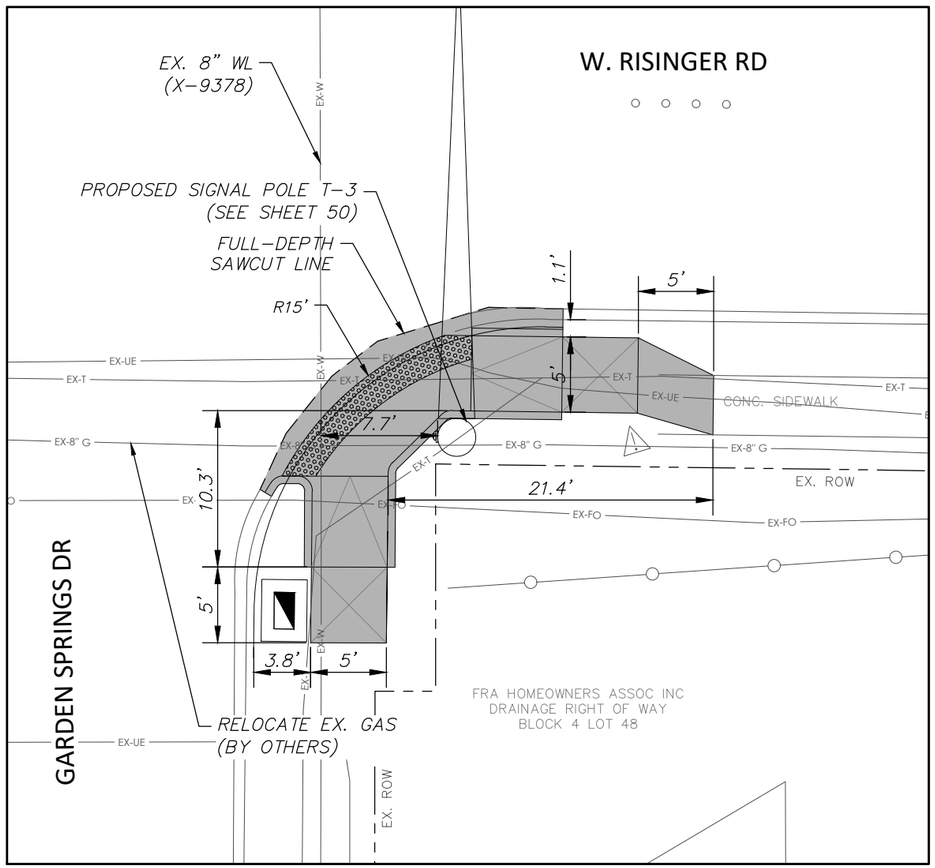
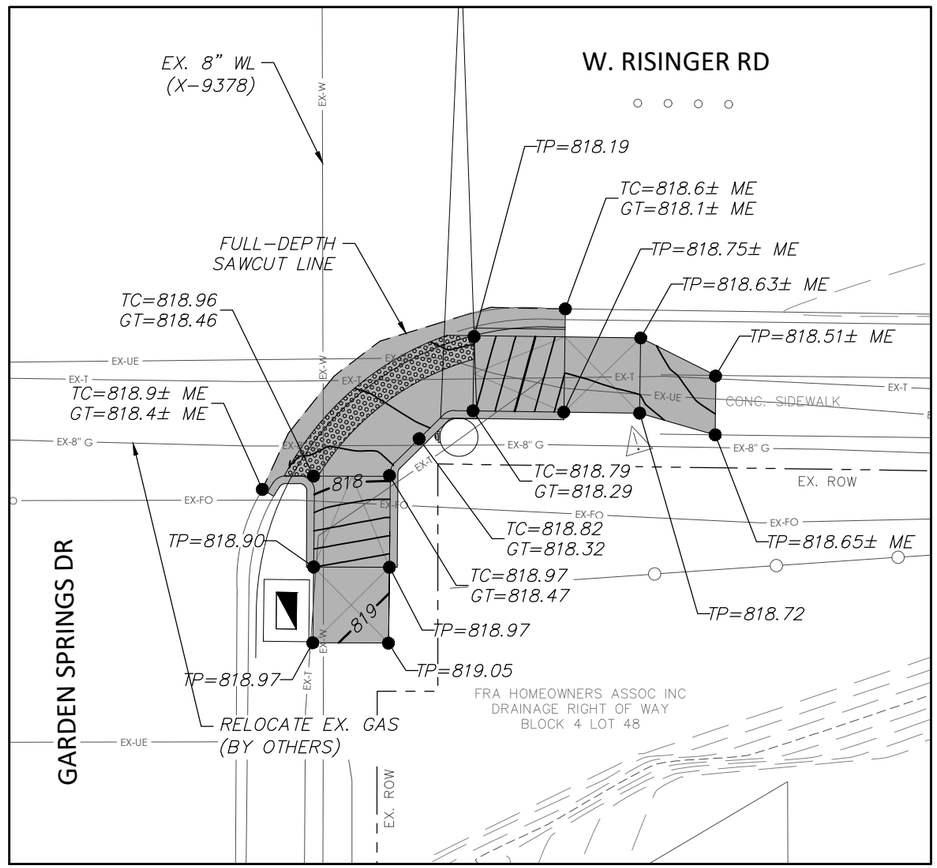


SE CORNER
PLAN



SE CORNER
GRADING

NOTES:

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2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
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Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

SOUTHEAST RAMP DETAIL

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	36

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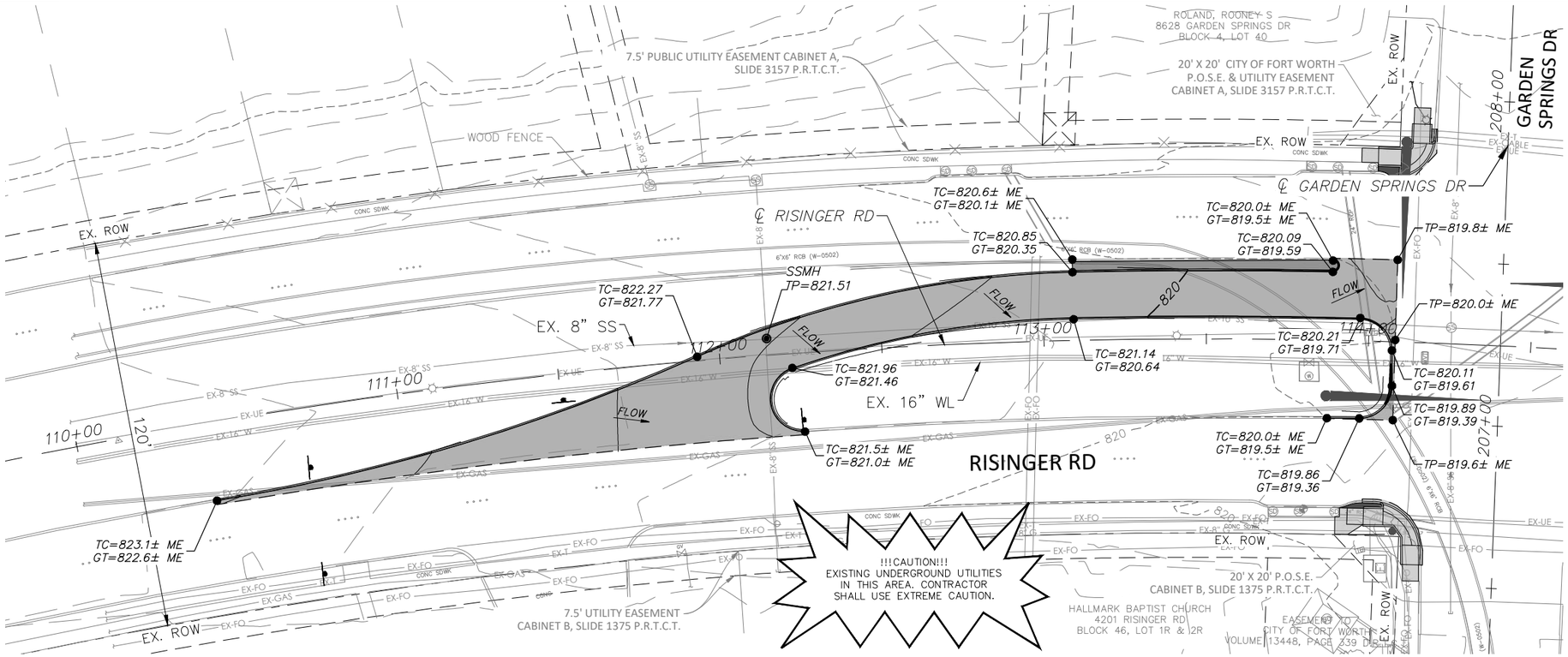

20 0 20 40

GRAPHIC SCALE IN FEET
HORIZONTAL
1" = 40'

GRADING LEGEND

815	MAJOR CONTOUR (5 FT)
	MINOR CONTOUR (0.5FT)
←	STORMWATER FLOW
GT	GUTTER
ME	MATCH EXISTING
TC	TOP OF CURB
TP	TOP OF PAVEMENT

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11144
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817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

GRADING PLAN

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	37

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PLOTTED BY: Lee Monastesse
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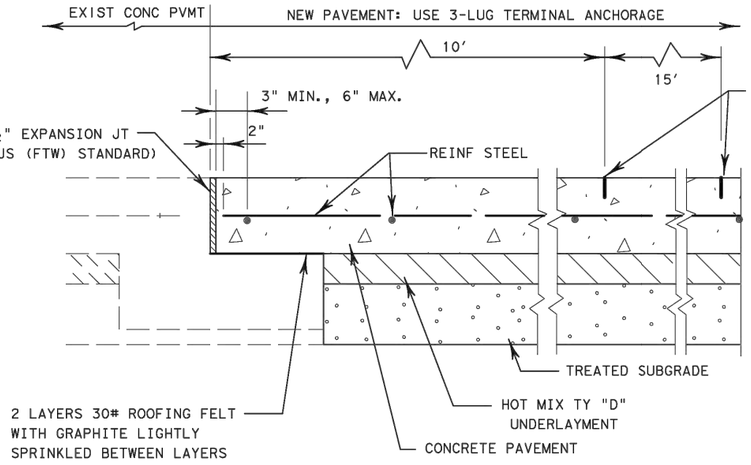
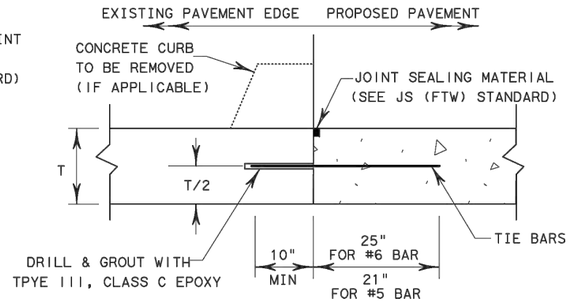
http://www.dot.state.tx.us/ftw/specinfo/standard.htm
11/10/2020 10:13:34 AM
P:\PROJECTS\TXDT\16121\5 FTW Standards Revision\CADD\Modifications in Progress\
cptep-ftw.dgn



TIE TO EXIST. CONCRETE PAVEMENT

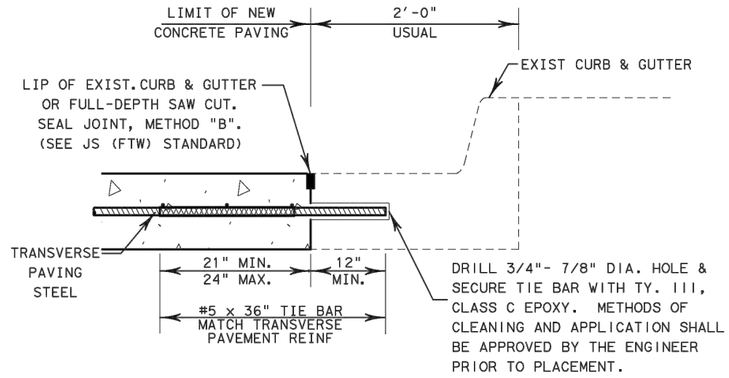
(TRANSVERSE JOINTS W/EXISTING "SLEEPER" SLAB)
N.T.S.



1. BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQUIRMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER SLABS, USE #5 TIE BARS FOR LESS THAN 8" THICK SLABS.

LONGITUDINAL WIDENING JOINT DETAIL

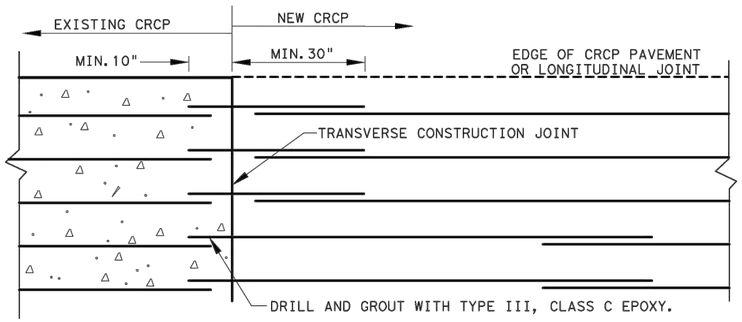
N.T.S.



TIE TO EXIST. CONC. CURB & GUTTER

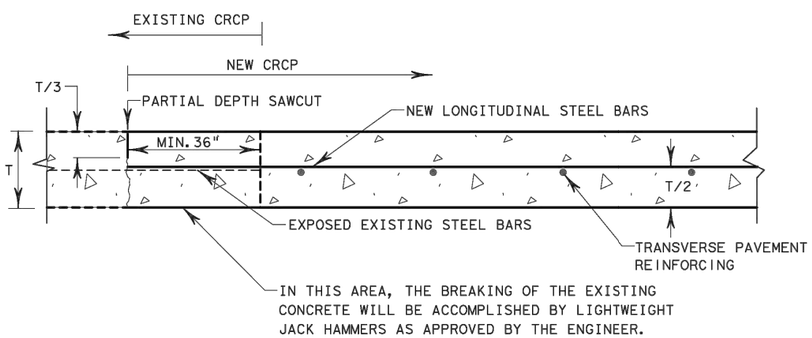
N.T.S.

NOTE:
SAWING OF PAVEMENT AND REMOVAL OF EXISTING CONC. WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE SUBSIDIARY TO THE VARIOUS BID ITEMS.



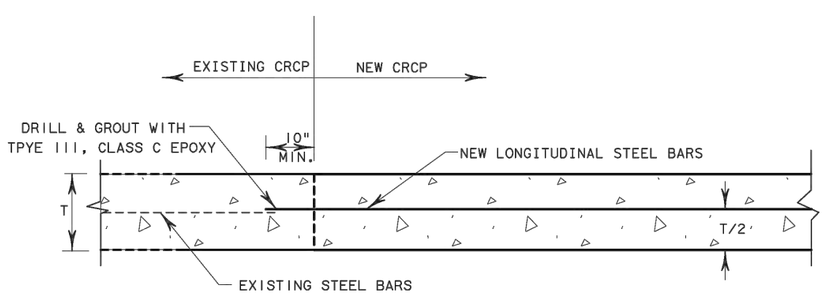
NOTE:
TIE BAR SIZE AND SPACING TO MATCH LONGITUDINAL REINFORCING. FOR LONGITUDINAL BAR SIZE AND SPACING, REFER TO CONCRETE PAVEMENT STANDARDS.

IF, IN THE OPINION OF THE ENGINEER, THE LENGTH OF AREA OF NEW PAVEMENT DOES NOT WARRANT STAGGERED LAPPING AS SHOWN, THIS REQUIREMENT MAY BE WAIVED.



TIED TRANSVERSE CONSTRUCTION JOINT DETAIL

EXISTING CRCP TO NEW CRCP
BREAKBACK AND LAP
N.T.S.



TIED TRANSVERSE CONSTRUCTION JOINT DETAIL

EXISTING CRCP TO NEW CRCP
DRILL AND EPOXY
N.T.S.

GENERAL NOTES

TIE BARS SHALL BE SECURED INTO THE EXISTING CONCRETE THE MINIMUM LENGTHS SHOWN, USING TY III EPOXY, CLASS "C" AND MUST MEET THE REQUIREMENTS OF THE PULL-OUT TEST SPECIFIED IN ITEM 361.

ALL HOLES FOR TIE BARS OR CONCRETE ANCHORS SHALL BE DRILLED WITH A CORE OR ROTARY DRILL. THE USE OF HAMMER DRILLS WILL NOT BE PERMITTED.

SEE JS (FTW) STANDARD FOR JOINT DETAILS.

SEE CONCRETE PAVEMENT STANDARD FOR ADDITIONAL INFORMATION

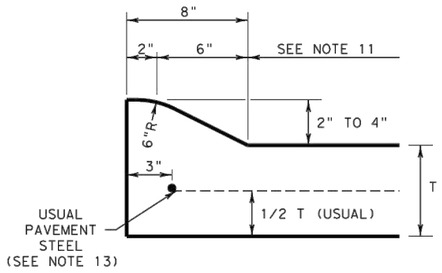
Texas Department of Transportation

Fort Worth District Standard

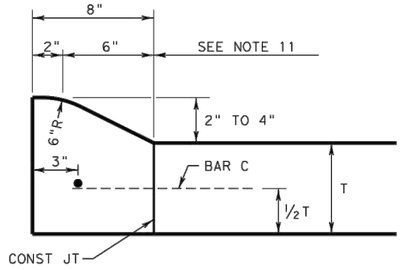
CONCRETE PAVEMENT TIES TO EXISTING PAVEMENT

CP-TEP (FTW)

ORIGINAL DRAWING: 05/2019	cptep-ftw.dgn	FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
DATE	REVISIONS	6	STP 2023(866)HES	38
05/2019	NEW STANDARD	STATE	STATE DIST.NO.	COUNTY
06/2020	ADD LONGITUDINAL AND TRAVERSE JOINTS	TEXAS	FTW	TARRANT
11/2020	ADD DRILL AND EPOXY TRANSVERSE JOINT DETAIL, REVISED JOINT NOMENCLATURE; ADD REFERENCE TO CONC PAVING STANDARDS	CONT.	SECT.	JOB / HIGHWAY NO.
		0902	90	208 / RISINGER RD



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



TYPE I CURB
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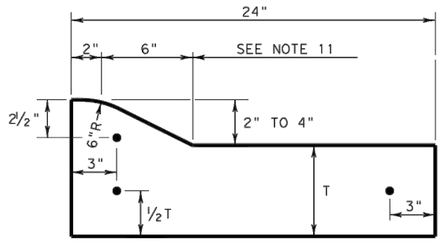
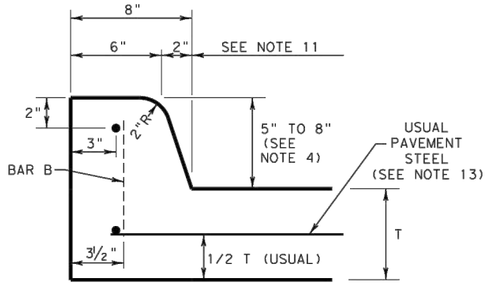
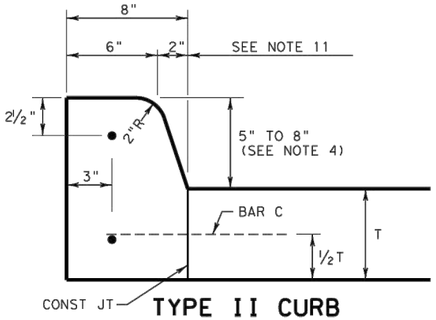


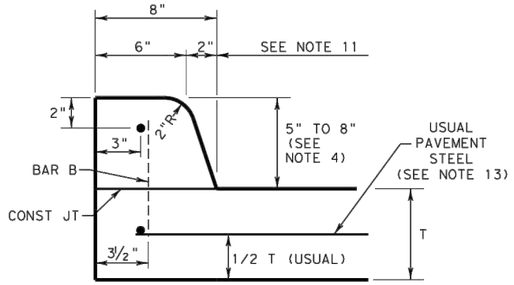
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



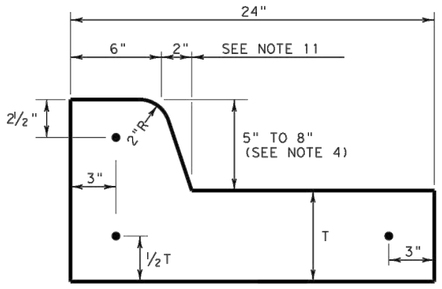
TYPE II CURB (MONOLITHIC)
5" - 8" HEIGHT



TYPE II CURB
5" - 8" HEIGHT
DOWELED VERTICAL JOINT

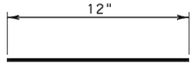


TYPE II CURB
5" - 8" HEIGHT
DOWELED HORIZONTAL JOINT

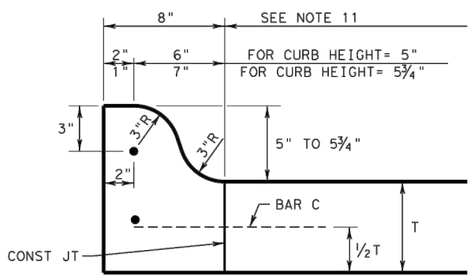


TYPE II CURB AND GUTTER
5" - 8" HEIGHT

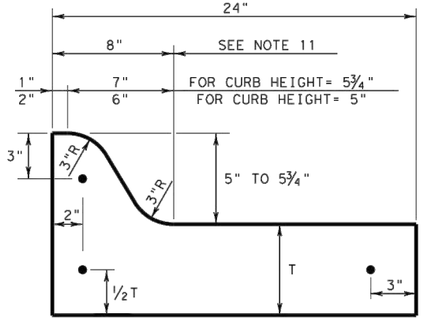
BAR B
L = (T/2) + (H- 1½")
WHERE "H" = CURB HEIGHT
FOR NEW PAVEMENT, EMBED T/2 INTO FRESH CONCRETE.
FOR EXISTING PAVEMENT, DRILL 3/8" DIAM HOLE T/2 + 1/4" INTO PAVEMENT. SECURE WITH TY III EPOXY, CLASS "E" OR "F".



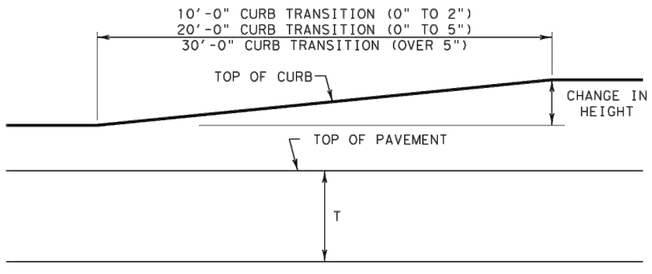
BAR C
EMBED 6" INTO EXISTING CONCRETE PAVEMENT.
DRILL 3/8" X 6 1/4" HOLE SECURE WITH TY III EPOXY, CLASS "E" OR "F".



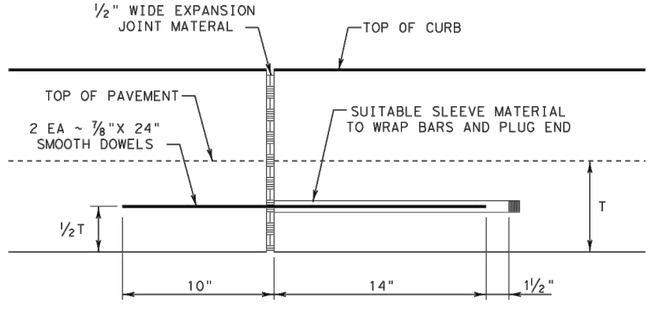
TYPE IIA CURB
5" - 5 3/4" HEIGHT



TYPE IIA CURB AND GUTTER
5" - 5 3/4" HEIGHT



CURB TRANSITION
NOTE: TO BE PAID FOR AS HIGHEST CURB



EXPANSION JOINT DETAIL

GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH ITEM 529, "CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER".
2. ALL CONCRETE SHALL BE CLASS "A".
3. ALL REINFORCING BARS SHALL BE #4, UNLESS OTHERWISE SHOWN.
4. UNLESS OTHERWISE SHOWN, ALL TYPE II CURB SHALL BE 6" HEIGHT .
5. ROUND EXPOSED SHARP EDGES WITH A ROUNDING TOOL, TO A MINIMUM RADIUS OF ¼".
6. ALL EXISTING CURBS AND DRIVEWAYS TO BE REMOVED SHALL BE SAW CUT FULL DEPTH OR REMOVED AT EXISTING JOINTS.
7. WHERE CONCRETE CURB IS PLACED ON EXISTING CONCRETE PAVEMENT, THE PAVEMENT SHALL BE DRILLED AND THE REINFORCING BARS GROUTED OR EPOXIED IN PLACE.
8. EXPANSION AND CONTRACTION JOINTS SHALL BE CONSTRUCTED TO MATCH PAVEMENT JOINTS IN ALL CURBS OR CURB AND GUTTER ADJACENT TO JOINTED CONCRETE PAVEMENT. WHERE PLACEMENT OF CURB OR CURB AND GUTTER IS NOT ADJACENT TO CONCRETE PAVEMENT, EXPANSION JOINTS SHALL BE PROVIDED AT STRUCTURES, CURB RETURNS AT STREETS OR DRIVEWAYS, AND AT LOCATIONS DIRECTED BY THE ENGINEER.
9. VERTICAL AND HORIZONTAL DOWELS BARS AND TRANSVERSE REINFORCING BARS SHALL BE PLACED AT 4' C-C.
10. DIMENSION "T" SHOWN IS THE THICKNESS OF ADJACENT CONCRETE PAVEMENT, OR, WHEN CURB IS INSTALLED ADJACENT TO FLEXIBLE PAVEMENT, "T" IS 6" MINIMUM, 8" MAXIMUM.
11. USUAL PROFILE GRADE LINE. REFER TO TYPICAL SECTIONS AND PLAN-PROFILE SHEETS FOR EXACT LOCATIONS.
12. A SEALED, ½" EXPANSION JOINT SHALL BE PROVIDED WHERE CURB AND GUTTER IS ADJACENT TO SIDEWALK OR RIPRAP.
13. LONGITUDINAL AND TRANSVERSE PAVEMENT STEEL SHALL BE PLACED IN ACCORDANCE WITH PAVEMENT DETAILS SHOWN ELSEWHERE IN THE PLANS.

Texas Department of Transportation

Fort Worth District Standard

CONCRETE CURB AND CURB AND GUTTER DETAILS

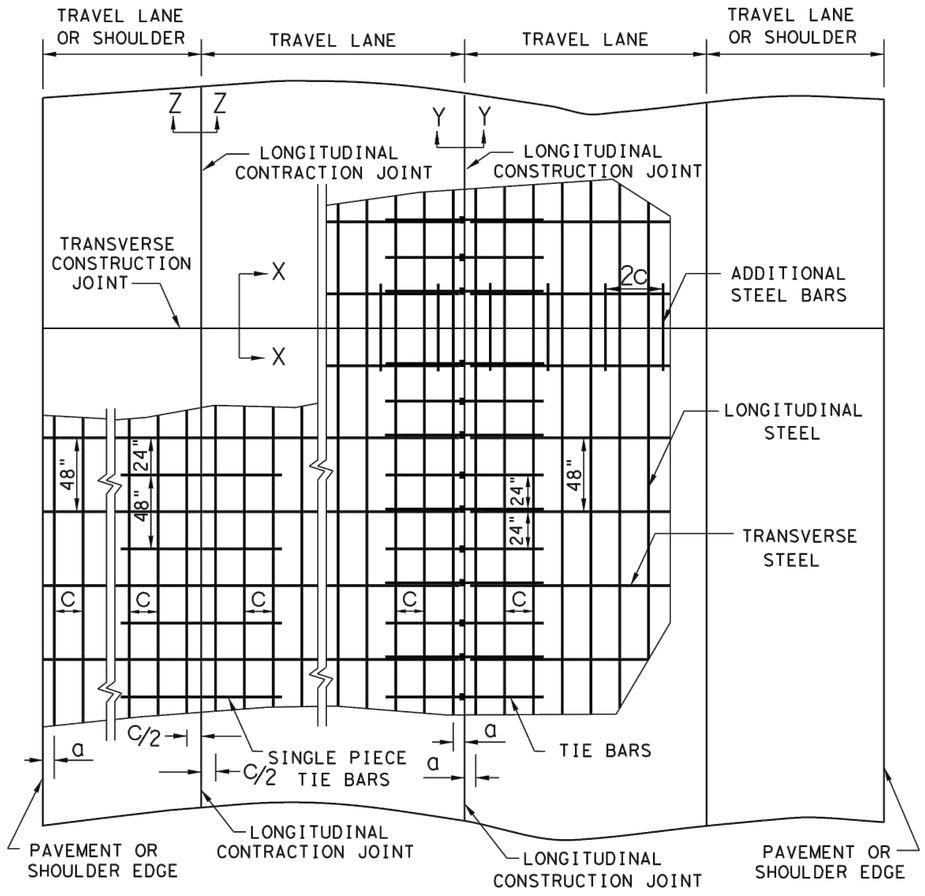
CCCG (FTW)

ORIGINAL DRAWING: 05/2019	cccg-ftw.dgn	FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
DATE	REVISIONS	6	STP 2023(866)HES	39
05/2019	NEW STANDARD	STATE	STATE DIST.NO.	COUNTY
07/2022	DESIGNATE USUAL 6" HEIGHT	TEXAS	FTW	TARRANT
		CONT.	SECT.	JOB / HIGHWAY NO.
		0902	90	208 / RISNGER RD

DATE:
FILE:

TABLE NO. 1 LONGITUDINAL STEEL					
SLAB THICKNESS AND BAR SIZE		REGULAR STEEL BARS	FIRST SPACING AT EDGE OR JOINT	ADDITIONAL STEEL BARS AT TRANSVERSE CONSTRUCTION JOINT (SECTION X-X)	
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING a (IN.)	SPACING 2 X C (IN.)	LENGTH L (IN.)
7.0	#5	6.5	3 TO 4	13	50
7.5	#5	6.0	3 TO 4	12	50
8.0	#6	9.0	3 TO 4	18	50
8.5	#6	8.5	3 TO 4	17	50
9.0	#6	8.0	3 TO 4	16	50
9.5	#6	7.5	3 TO 4	15	50
10.0	#6	7.0	3 TO 4	14	50
10.5	#6	6.75	3 TO 4	13.5	50
11.0	#6	6.5	3 TO 4	13	50
11.5	#6	6.25	3 TO 4	12.5	50
12.0	#6	6.0	3 TO 4	12	50
12.5	#6	5.75	3 TO 4	11.5	50
13.0	#6	5.5	3 TO 4	11	50

TABLE NO. 2 TRANSVERSE STEEL AND TIE BARS						
SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONSTRUCTION JOINT (SECTION Y-Y)	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
7.0 - 7.5	#5	48	#5	48	#5	24
8.0 - 13.0	#5	48	#6	48	#6	24

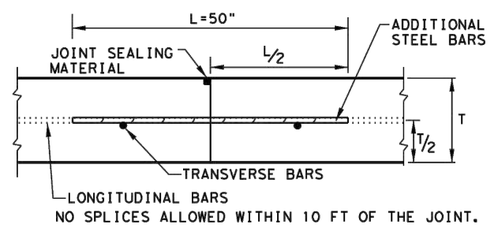


TYPICAL PAVEMENT LAYOUT

PLAN VIEW (NOT TO SCALE)

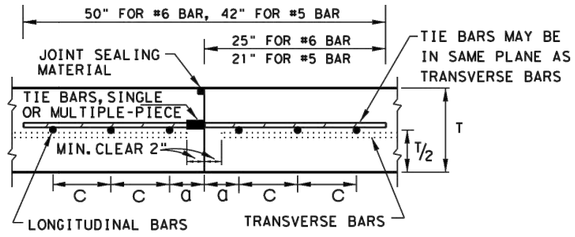
GENERAL NOTES

1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT ARE NOT COVERED BY THIS STANDARD.
2. USE COARSE AGGREGATES WITH A RATED COEFFICIENT OF THERMAL EXPANSION (CoTE) OF NOT MORE THAN 5.5 X 10^{-6} IN/IN/ °F AS LISTED IN THE CONCRETE RATED SOURCE QUALITY CATALOG (CRSQC).
3. ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60) OR ABOVE. STEEL BAR SIZES AND SPACINGS SHALL CONFORM TO TABLE NO. 1 AND TABLE NO. 2.
4. STEEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1 IN. HORIZONTALLY AND +/- 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS) SHALL CONFORM TO TABLE NO. 1
5. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
6. THE SAW CUT DEPTH FOR THE LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z) SHALL BE ONE THIRD OF THE SLAB THICKNESS (T/3).
7. WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 IN. OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF TIE BAR.
8. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN. 10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
9. OMIT TIE BARS LOCATED WITHIN 18-IN. OF THE TRANSVERSE CONSTRUCTION JOINTS (SECTION X-X). USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
10. LONGITUDINAL REINFORCING STEEL SPLICES SHALL BE A MINIMUM OF 25 IN. STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT.
11. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



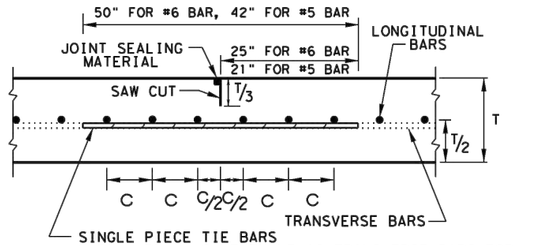
TRANSVERSE CONSTRUCTION JOINT

SECTION X - X



LONGITUDINAL CONSTRUCTION JOINT

SECTION Y - Y



LONGITUDINAL CONTRACTION JOINT

SECTION Z - Z

Texas Department of Transportation

Design Division Standard

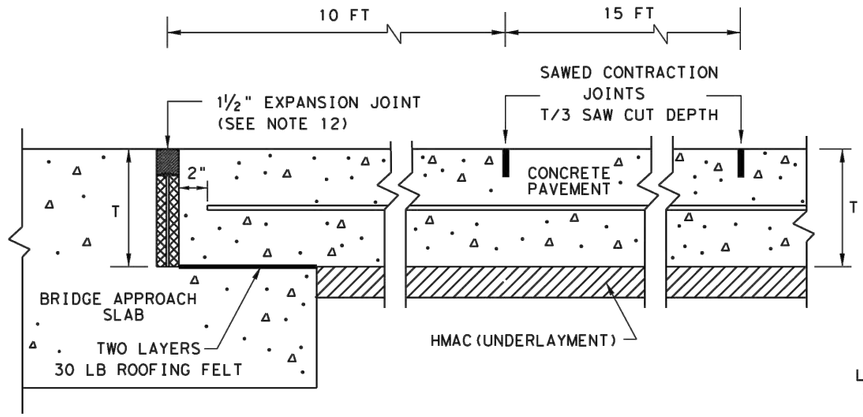
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT T - 7 to 13 INCHES

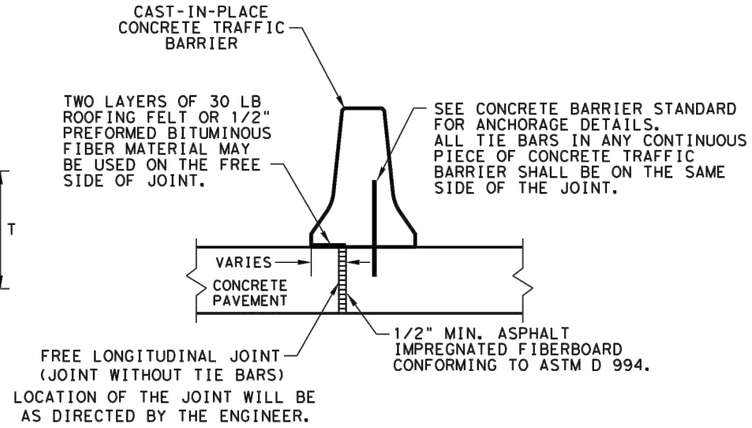
CRCP(1)-20

FILE: crcp120.dgn	DN: TxDOT	CK: KM	DW: AN	CK: VP
© TxDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
10/10/2011 ADD GN #12	DIST	COUNTY		SHEET NO.
04/09/2013 REMOVE 6" AND 6.5" ADD CTE REQUIREMENTS	FTW	TARRANT		40
05/05/2017 CoTE AS RATED 4.3				

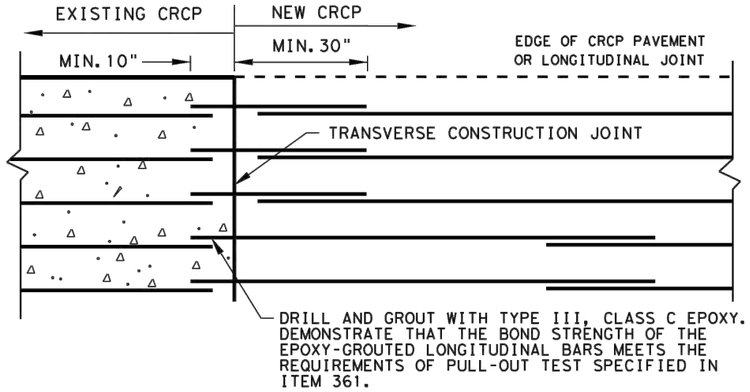
DATE:
FILE:



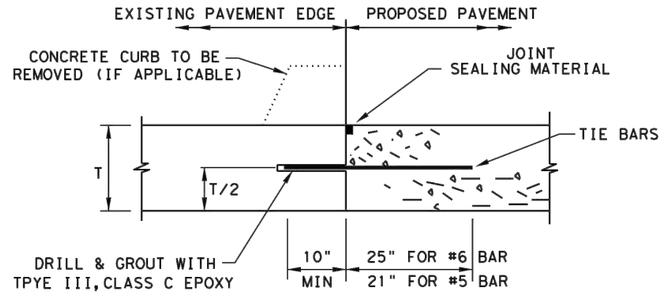
TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH



FREE LONGITUDINAL JOINT DETAIL

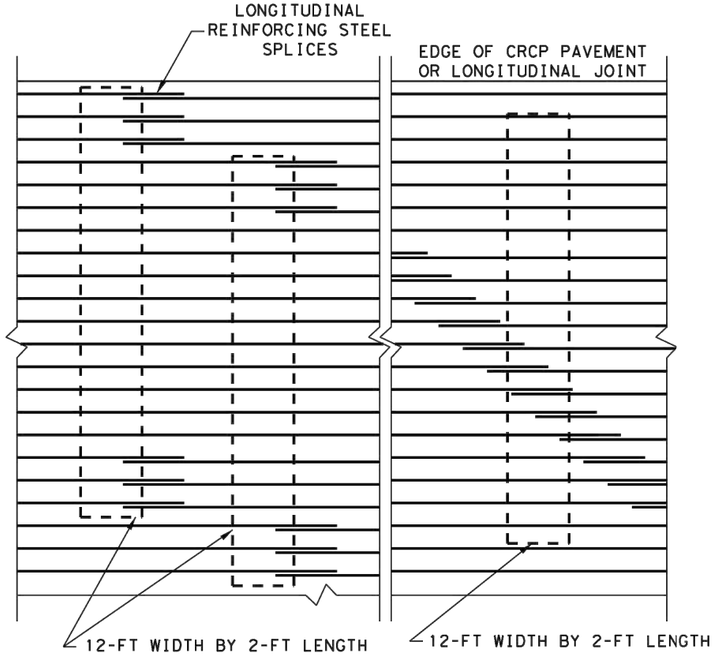


OPTION A: DRILL AND EPOXY
PLAN VIEW (NOT TO SCALE)



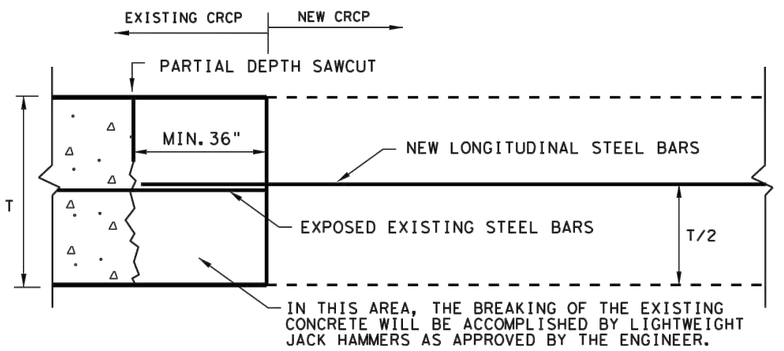
1. BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQUIRMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER SLABS, USE #5 TIE BARS FOR LESS THAN 8" THICK SLABS.

LONGITUDINAL WIDENING JOINT DETAIL



STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT. ANY OTHER LAP CONFIGURATION MEETING THIS REQUIREMENT WILL BE ALLOWED.

EXAMPLES OF LAP CONFIGURATION
PLAN VIEW (NOT TO SCALE)



OPTION B: BREAKBACK AND LAP

TRANSVERSE TIE JOINT DETAIL
EXISTING CRCP TO NEW CRCP

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

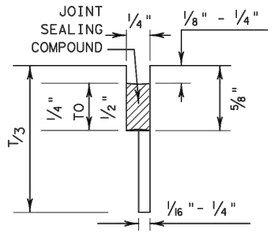
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

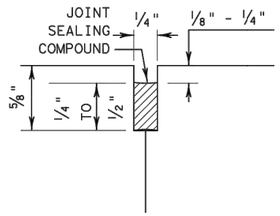
CRCP(1)-20

FILE: crcp120.dgn	DN: TxDOT	CK: KM	DW: AN	CK: VP
© TxDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 03/16/2020 REMOVED TABLE 1A	0902	90	208	RISINGER RD
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		41

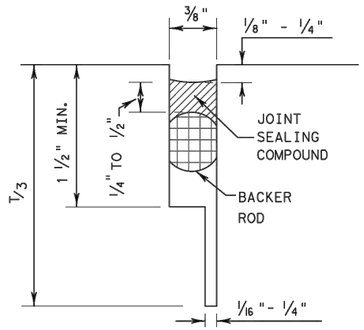
METHOD B: JOINT SEALING COMPOUND



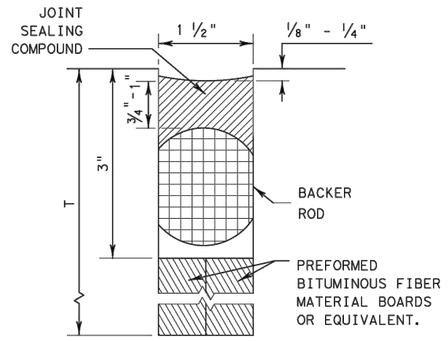
LONGITUDINAL SAWED
CONTRACTION JOINT



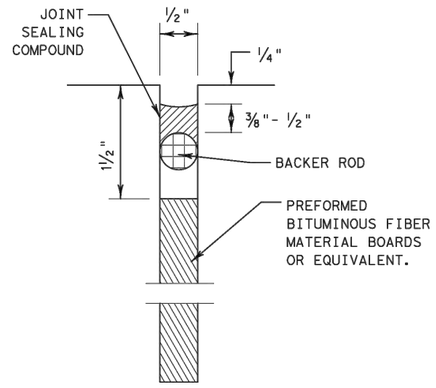
LONGITUDINAL OR TRANSVERSE
CONSTRUCTION JOINT



TRANSVERSE SAWED
CONTRACTION JOINT



TRANSVERSE FORMED
EXPANSION JOINT



FORMED
ISOLATION JOINT

GENERAL NOTES

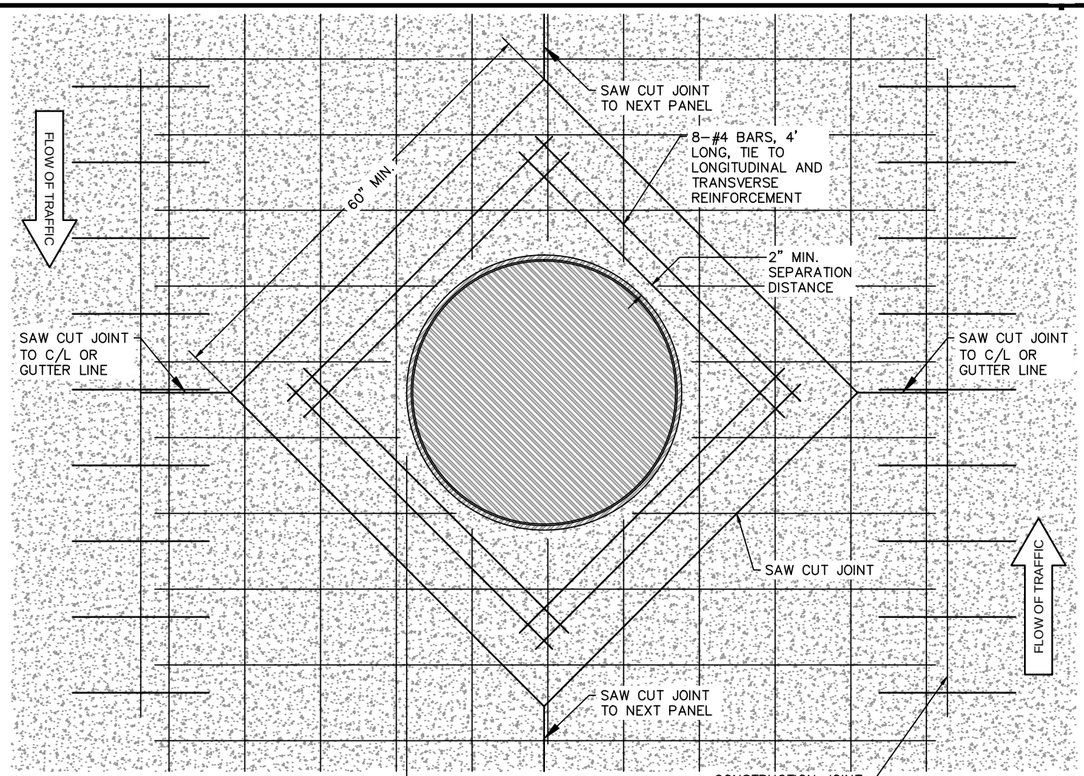
1. PREFORMED COMPRESSION SEALS (METHOD A) WILL NOT BE PERMITTED.
2. DIMENSION "T" IS THICKNESS OF CONCRETE PAVEMENT.
3. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
4. THE JOINT RESERVOIR FOR SEALANT FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION JOINTS AND SAWED JOINTS SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS.
5. REFER TO DMS-6310 "JOINT SEALANTS AND FILLERS" FOR SEALANT CLASSIFICATIONS.
6. FOR SAWED LONGITUDINAL JOINTS, LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINTS, USE JOINT SEALANT CLASS 5 OR 8 UNLESS OTHERWISE SHOWN ON THE PLANS OR APPROVED.
7. FOR TRANSVERSE SAWED CONTRACTION JOINTS, TRANSVERSE FORMED EXPANSION JOINTS, AND ISOLATION/EXPANSION JOINTS, USE JOINT SEALANT CLASS 5 OR 8 AT NEW JOINTS. USE JOINT SEALANT CLASS 4, 5, 7, OR 8 FOR MAINTAINING EXISTING JOINTS.
8. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 "CLEANING AND SEALING JOINTS" OR ITEM 713 "CLEANING AND SEALING JOINTS AND CRACKS (CONCRETE PAVEMENT)".
9. ISOLATION JOINTS ACCOMMODATE HORIZONTAL AND VERTICAL MOVEMENTS THAT OCCUR BETWEEN A PAVEMENT AND A STRUCTURE. ISOLATION JOINTS MAY BE USED FOR BRIDGE ABUTMENTS, INTERSECTIONS, CURB AND GUTTER, OLD AND NEW PAVEMENTS, OR AROUND DRAINAGE INLETS, MANHOLES, FOOTINGS AND LIGHTING STRUCTURES.

Texas Department of Transportation

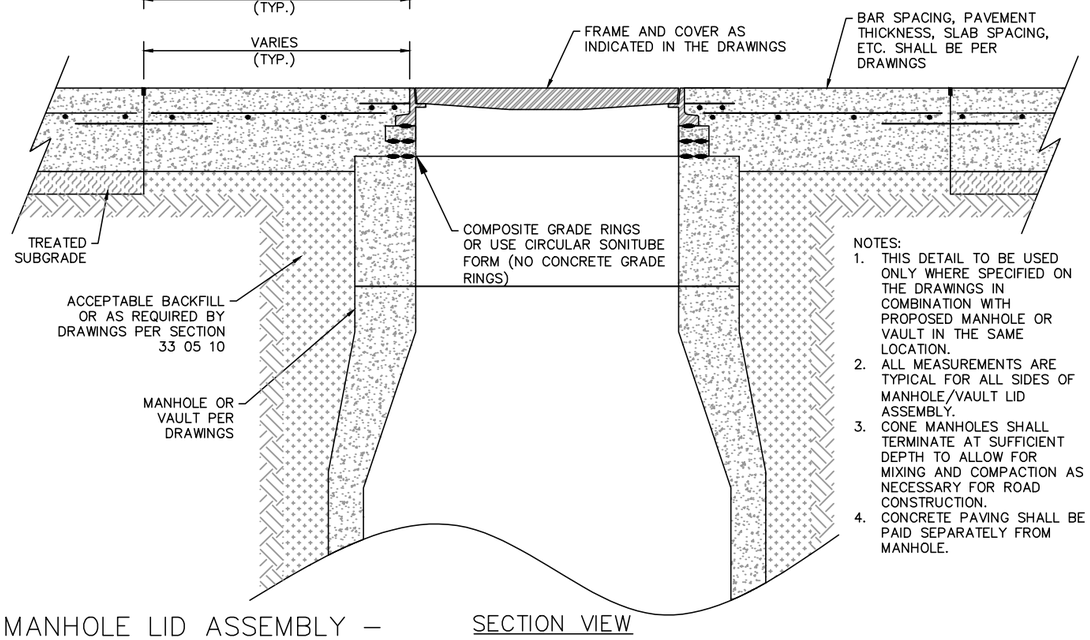
Fort Worth District Standard

CONCRETE PAVING DETAILS
JOINT SEALS
JS (FTW)

ORIGINAL DRAWING: 05/2019	js-ftw.dgn	FED.RD. DIV.NO.	PROJECT NO.			SHEET NO.
DATE	REVISIONS	6	STP 2023(866)HES			42
05/2019	REPLACES JS-03(FW)	STATE	STATE DIST.NO.	COUNTY		
11/2020	REVISE NOMENCLATURE FOR ISOLATION JOINTS (OMIT "EXPANSION")	TEXAS	FTW	TARRANT		
		CONT.	SECT.	JOB	HIGHWAY NO.	
		0902	90	208	RISINGER RD	



PLAN VIEW



SECTION VIEW

NOTES:
1. THIS DETAIL TO BE USED ONLY WHERE SPECIFIED ON THE DRAWINGS IN COMBINATION WITH PROPOSED MANHOLE OR VAULT IN THE SAME LOCATION.
2. ALL MEASUREMENTS ARE TYPICAL FOR ALL SIDES OF MANHOLE/VAULT LID ASSEMBLY.
3. CONE MANHOLES SHALL TERMINATE AT SUFFICIENT DEPTH TO ALLOW FOR MIXING AND COMPACTION AS NECESSARY FOR ROAD CONSTRUCTION.
4. CONCRETE PAVING SHALL BE PAID SEPARATELY FROM MANHOLE.

MANHOLE LID ASSEMBLY – PROPOSED CONCRETE PAVEMENT (CONE) D014

SCALE: N.T.S.

REVISED: 09-09-2022

05/05/2023

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

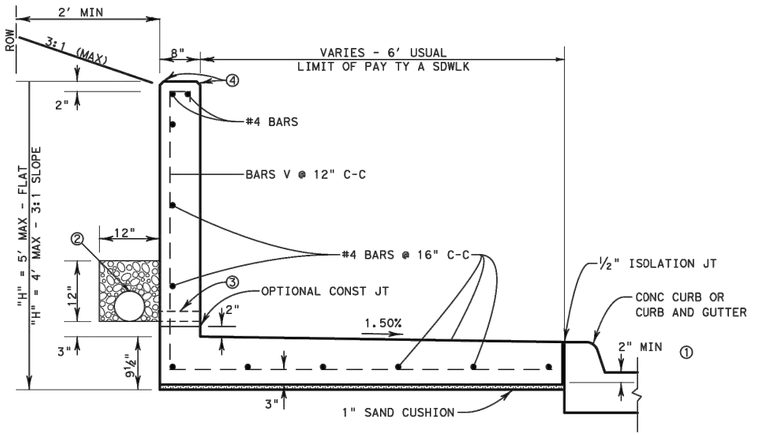
DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1174
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

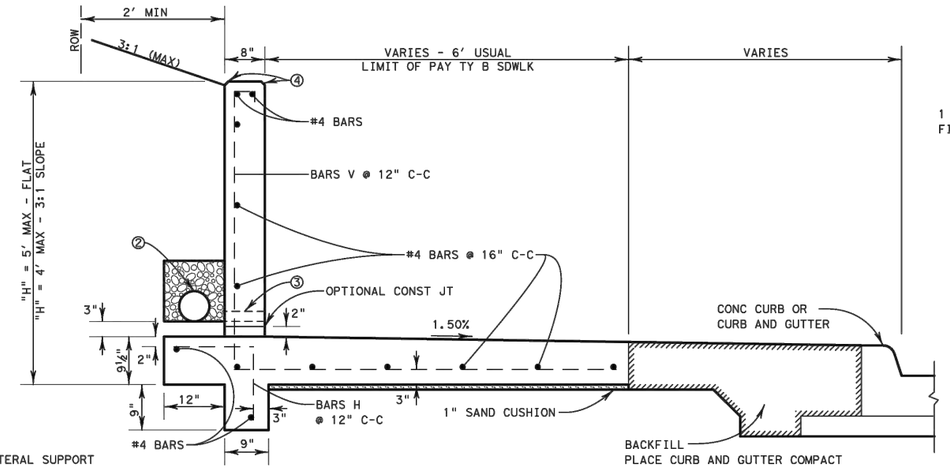
MANHOLE LID ASSEMBLY - D014
(CITY OF FORT WORTH)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	43



① 2" MINIMUM REQUIRED FOR LATERAL SUPPORT
② INSTALL 6" PIPE UNDERDRAIN (TY. 5, 6, 7, OR 8) ENTIRE LENGTH OF WALL. USE TY. "E" FILTER MATERIAL. SLOPE TO DRAIN AND CONNECT TO STORM DRAIN.
⑤ IF, IN THE OPINION OF THE ENGINEER, USE OF UNDERDRAIN IS IMPRACTICAL, INSTALL WEEP HOLES AS SHOWN.
④ ¾" CHAMFER

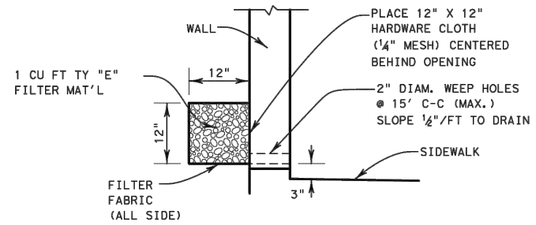
TYPE A SIDEWALK-ADJACENT TO CURB



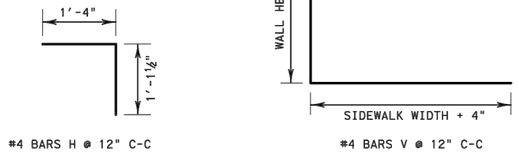
TYPE B SIDEWALK-REMOTE FROM CURB

SPECIAL CONCRETE SIDEWALK w/ INTEGRATED RETAINING WALL

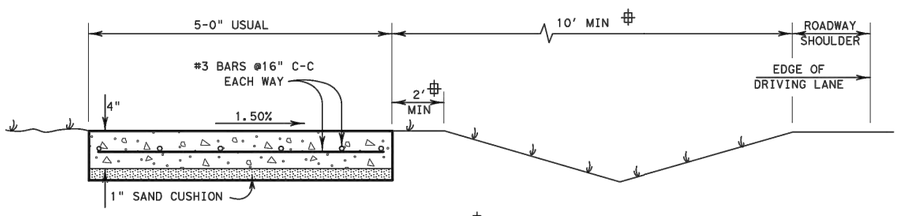
N. T. S.



WEEP HOLE DETAIL

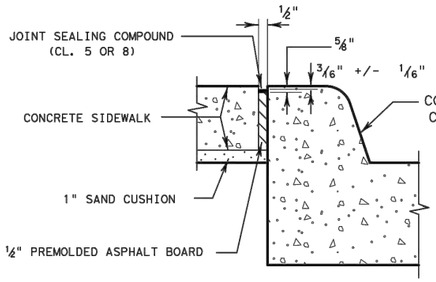


REINFORCING STEEL DETAILS



⌗ SIDEWALK TO BE 10' MIN. FROM EDGE OF SHOULDER OR 2' MIN. FROM TOP OF DITCH BACK SLOPE, WHICHEVER IS GREATER (10' MIN. FROM EDGE OF SHOULDER IF NO DITCH.)

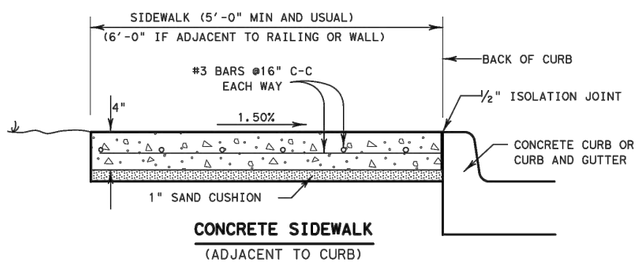
CONCRETE SIDEWALK
(ROADWAY W/O CURB)



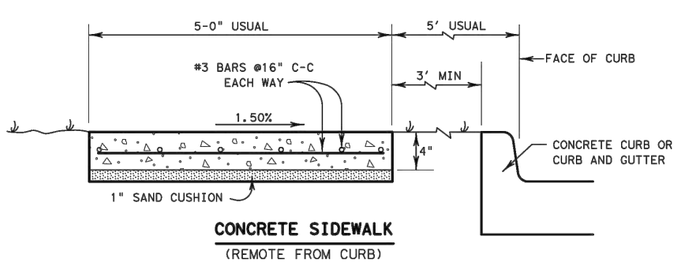
1/2" ISOLATION JOINT
(SIDEWALK ADJACENT TO CURB)

GENERAL NOTES:

1. ALL CONCRETE SHALL BE CLASS "C".
2. ALL REINFORCING STEEL SHALL BE GRADE 60, # 4 BARS UNLESS OTHERWISE INDICATED.
3. SEE PLAN SHEETS FOR LOCATIONS OF SIDEWALKS AND RETAINING WALLS.
4. LONGITUDINAL SLOPE OF SIDEWALKS SHALL NOT EXCEED 5% EXCEPT IN CASES WHERE THE ADJACENT ROADWAY SLOPE EXCEEDS 5%. IF ROADWAY SLOPE EXCEEDS 5%, LONGITUDINAL SLOPE OF SIDEWALK MAY MATCH THAT OF ROADWAY.
5. IF SIDEWALK WIDTH IS LESS THAN 5', PROVIDE 5' X 5' PASSING AREAS AT INTERVALS NOT TO EXCEED 200' SPACING.
6. RETAINING WALL WILL BE SUBSIDIARY TO THE ITEM, "CONC SIDEWALKS (SPECIAL) (TYPE A)" OR "CONC SIDEWALKS (SPECIAL)(TYPE B)", WITH LIMITS OF PAY AS SHOWN.
7. SURFACE TREATMENT OF RETAINING WALL FACE DETAILED ELSEWHERE IN THE PLANS.
8. SEE PED STANDARDS FOR TREATMENT AT INTERSECTIONS AND CROSSWALKS.



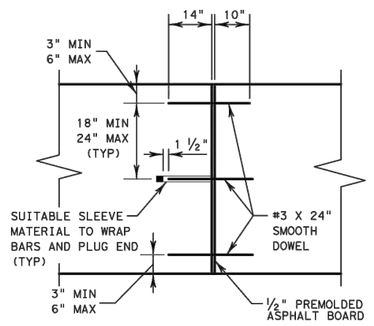
CONCRETE SIDEWALK
(ADJACENT TO CURB)



CONCRETE SIDEWALK
(REMOTE FROM CURB)

CONCRETE SIDEWALK DETAILS

N. T. S.



TRANSVERSE EXPANSION JOINT

Texas Department of Transportation

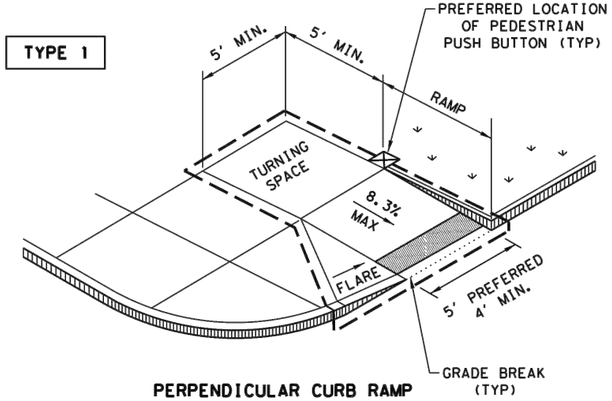
Fort Worth District Standard

CONCRETE SIDEWALK DETAILS
CSWD (FTW)

ORIGINAL DRAWING: 05/2019	cswd-ftw.dgn	PROJECT NO.			SHEET NO.
DATE	REVISIONS	STP 2023(866)HES			44
05/2019	NEW STANDARD	STATE	STATE DIST. NO.	COUNTY	
11/2020	REVISE JOINT NOMENCLATURE, REVISE ALLOWABLE SEALANT TYPES	TEXAS	FTW	TARRANT	
		CONT.	SECT.	JOB	HIGHWAY NO.
		0902	90	208	RISINGER RD

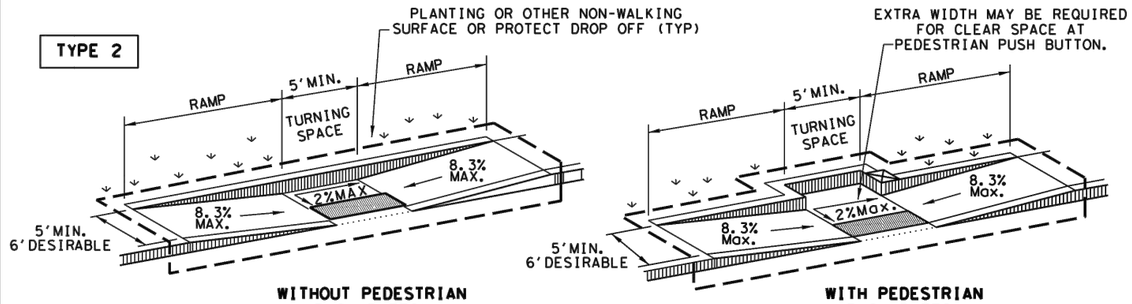
DATE:
FILE:

TYPE 1



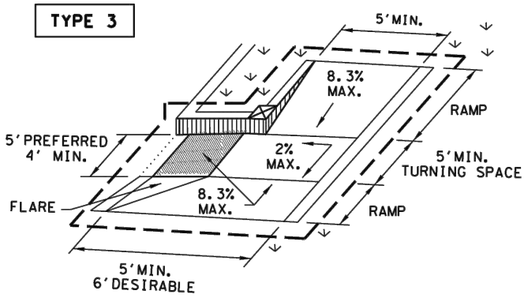
PERPENDICULAR CURB RAMP

TYPE 2

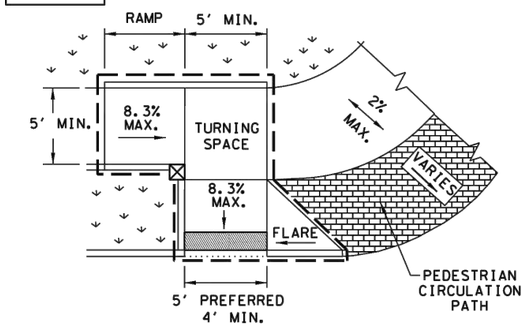


PARALLEL CURB RAMP

TYPE 3

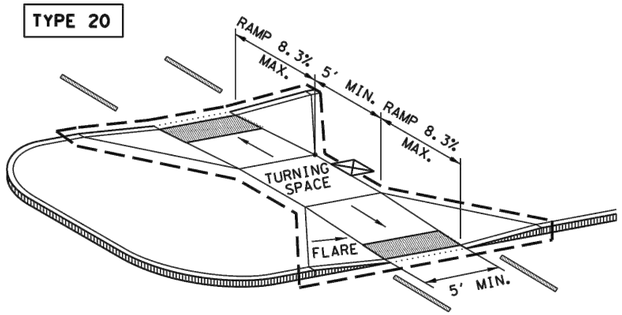


TYPE 6



COMBINATION CURB RAMPS

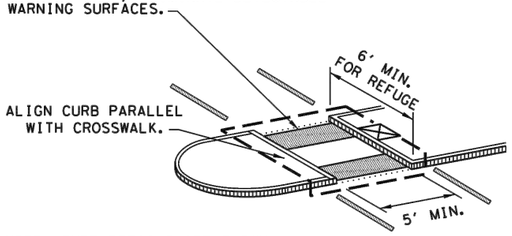
TYPE 20



CURB RAMPS AT MEDIAN ISLANDS

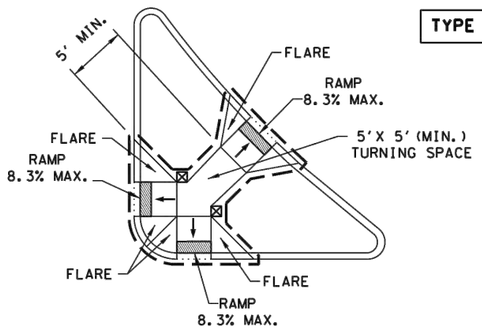
TYPE 21

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



NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

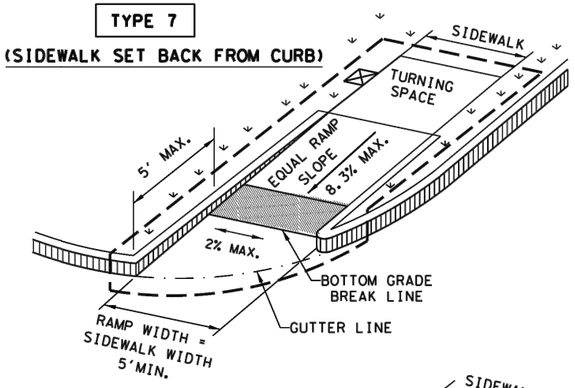
TYPE 22



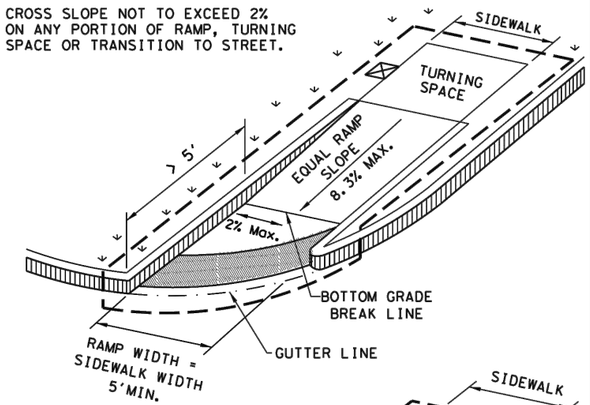
COMBINATION ISLAND RAMPS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

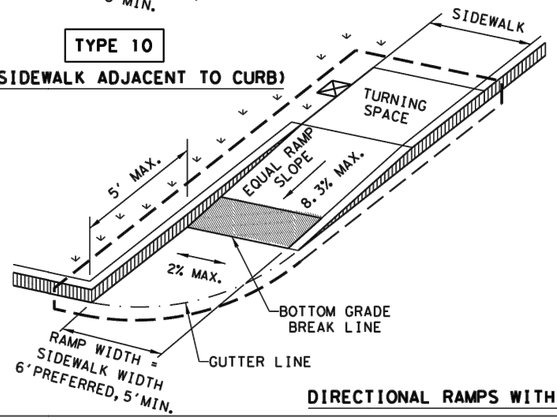


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

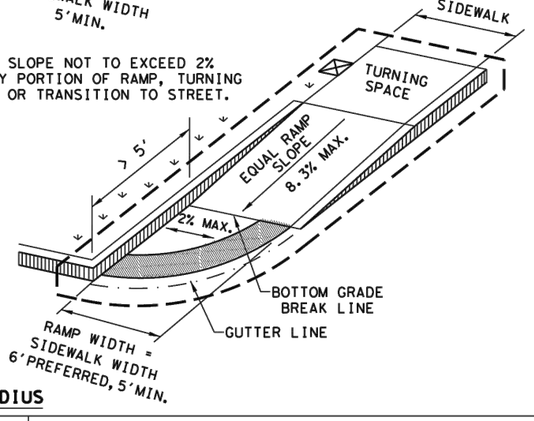


TYPE 10

(SIDEWALK ADJACENT TO CURB)

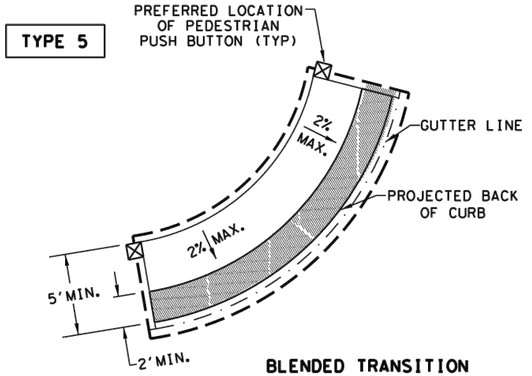


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



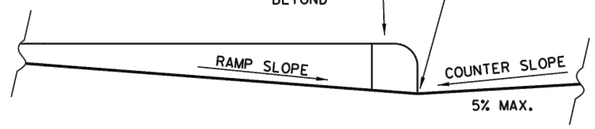
DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

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



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

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

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

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE. ☒

GUTTER LINE — · —

GRADE BREAK .....

RAMP LIMITS OF PAYMENT — —

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0902	90	208		RISINGER RD
REVISED 08, 2009 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY			SHEET NO.
	FTW	TARRANT			45

DATE:
FILE:

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

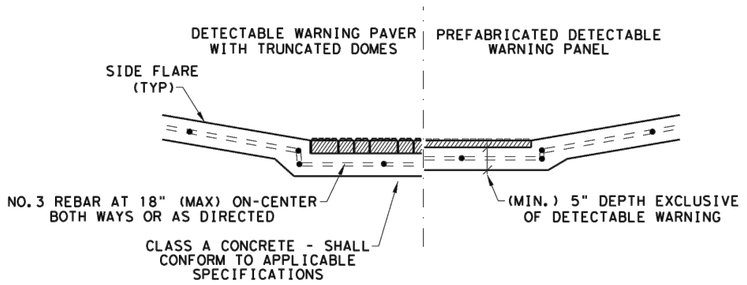
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

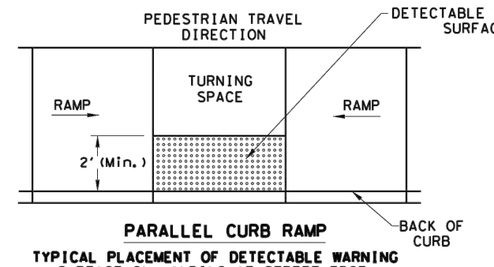
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

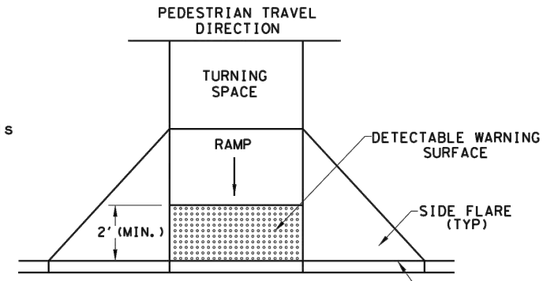


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

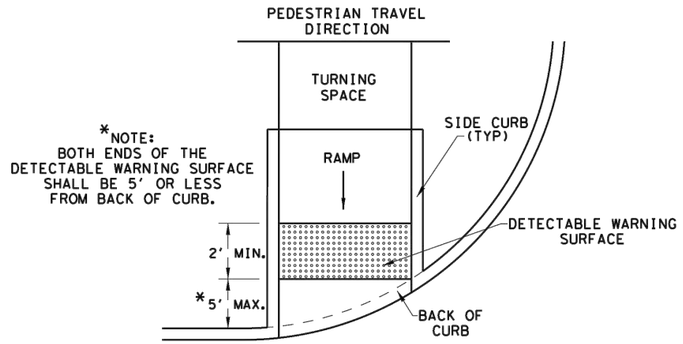
DETECTABLE WARNING SURFACE DETAILS



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



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

Texas Department of Transportation | Design Division Standard

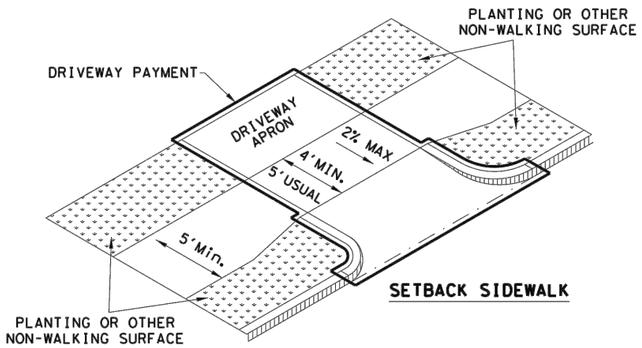
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

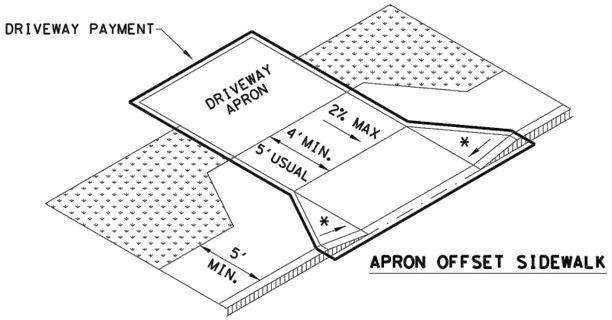
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0902	90	208		RISINGER RD
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	FTW	TARRANT			46

DATE:
FILE:

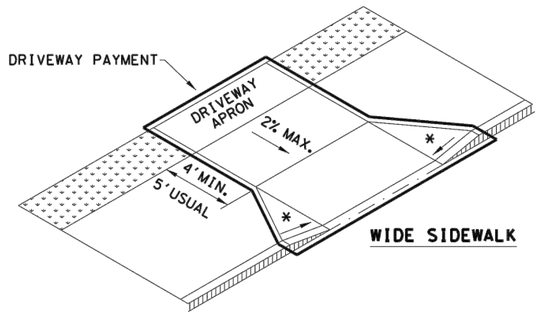
SIDEWALK TREATMENT AT DRIVEWAYS



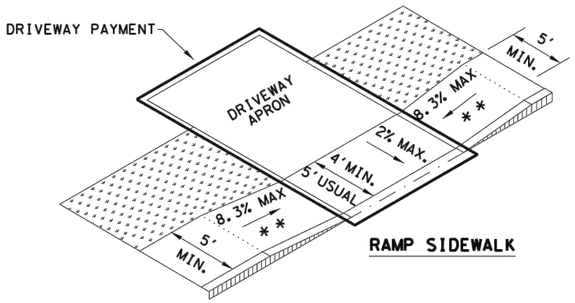
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

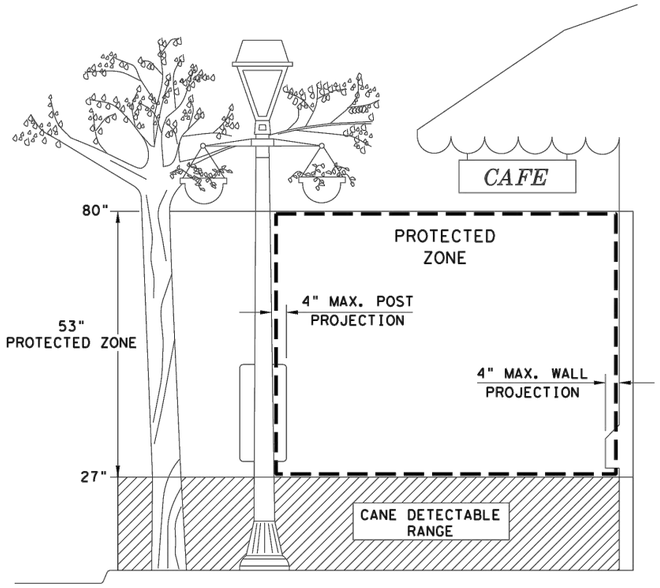


RAMP SIDEWALK

NOTES:

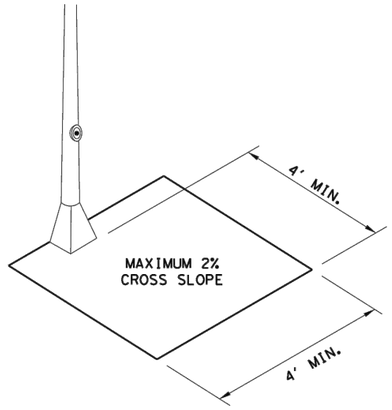
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

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

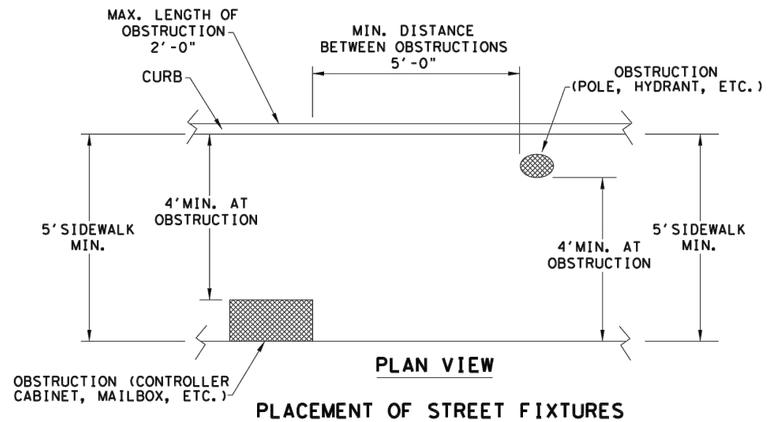


PROTECTED ZONE

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



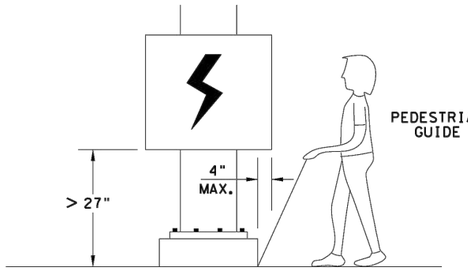
CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



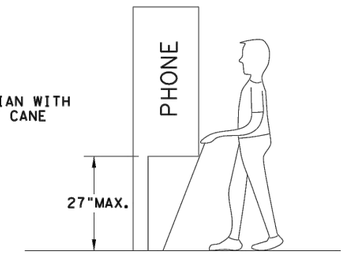
PLAN VIEW

PLACEMENT OF STREET FIXTURES

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



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



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

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

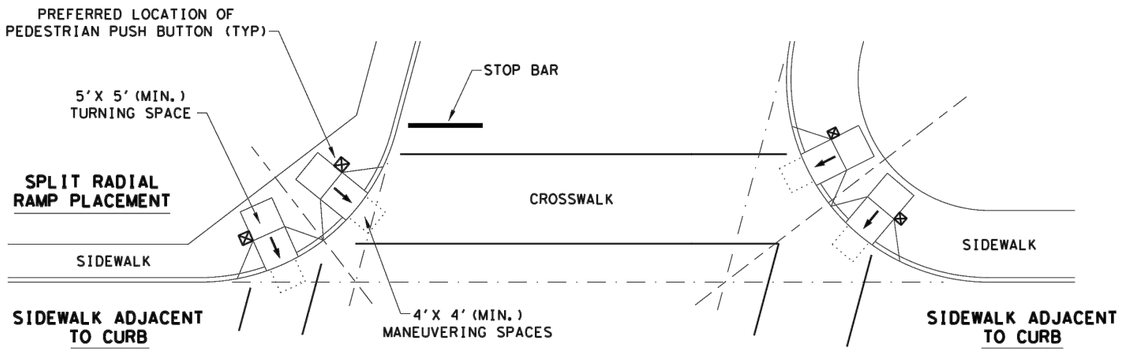
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

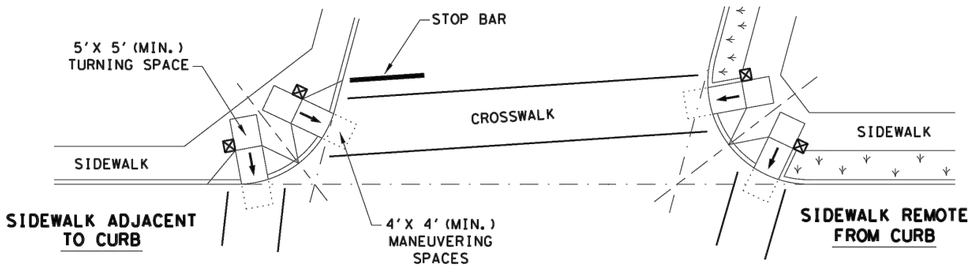
FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		47

DATE:
FILE:

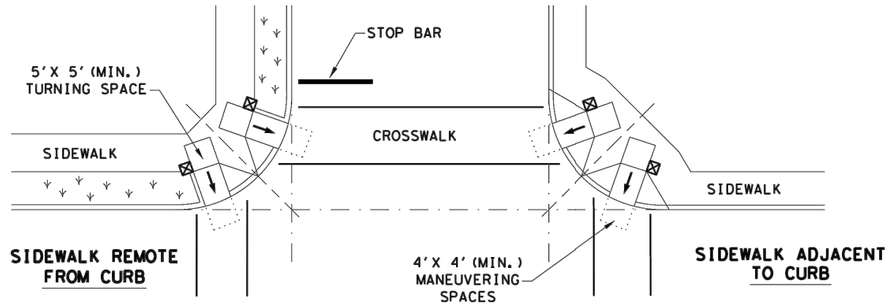
TYPICAL CROSSING LAYOUTS
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



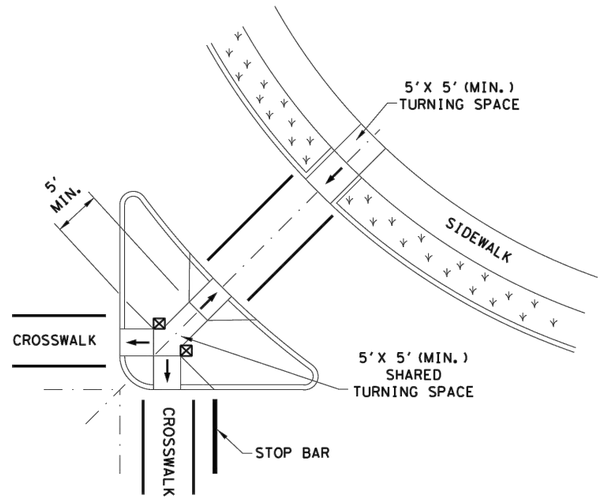
SKEWED INTERSECTION WITH "LARGE" RADIUS



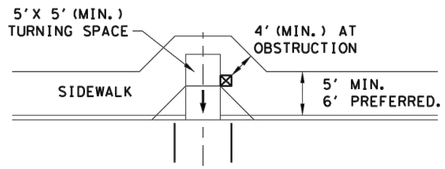
SKEWED INTERSECTION WITH "SMALL" RADIUS

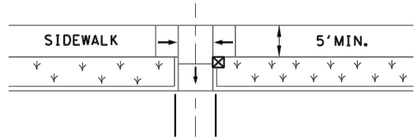


NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND





MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

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

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

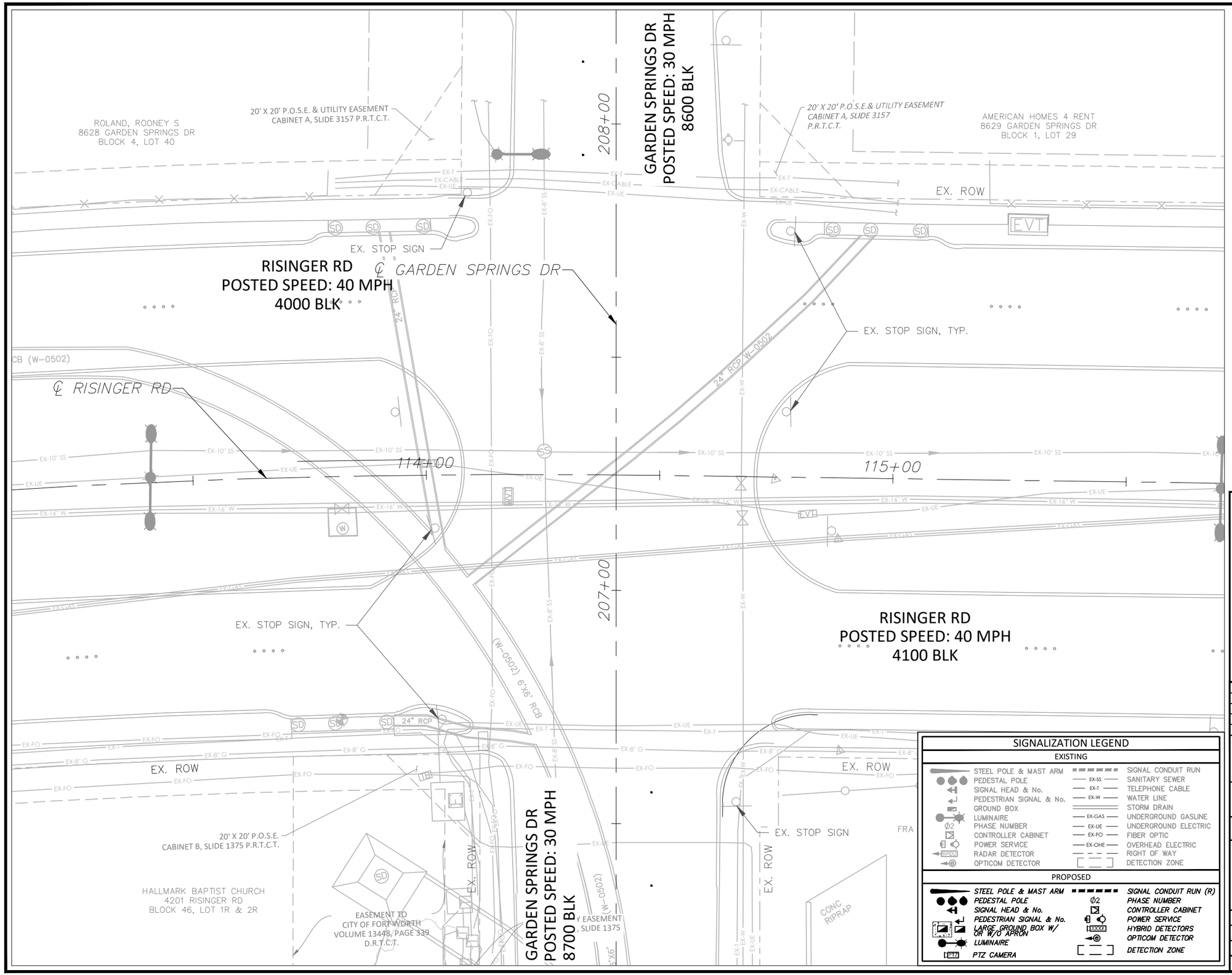
SHEET 4 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		48



10 0 10 20

GRAPHIC SCALE IN FEET

NOTES:

1. EXISTING STOP SIGNS TO BE RELOCATED DURING CONSTRUCTION UNTIL SIGNAL IS OPERATIONAL

SIGNALIZATION LEGEND

EXISTING

	STEEL POLE & MAST ARM		SIGNAL CONDUIT RUN
	PEDESTAL POLE	EX-SS	SANITARY SEWER
	SIGNAL HEAD & No.	EX-T	TELEPHONE CABLE
	PEDESTRIAN SIGNAL & No.	EX-W	WATER LINE
	GROUND BOX		STORM DRAIN
	LUMINAIRE	EX-GAS	UNDERGROUND GASLINE
∅2	PHASE NUMBER	EX-UE	UNDERGROUND ELECTRIC
	CONTROLLER CABINET	EX-FO	FIBER OPTIC
	POWER SERVICE	EX-OHE	OVERHEAD ELECTRIC
RPDD	RADAR DETECTOR		RIGHT OF WAY
	OPTICOM DETECTOR		DETECTION ZONE

PROPOSED

	STEEL POLE & MAST ARM		*SIGNAL CONDUIT RUN (R)*
	PEDESTAL POLE	∅2	*PHASE NUMBER*
	SIGNAL HEAD & No.		*CONTROLLER CABINET*
	PEDESTRIAN SIGNAL & No.		*POWER SERVICE*
	LARGE GROUND BOX W/ OR W/O APRON	HYBRID	*HYBRID DETECTORS*
	LUMINAIRE		*OPTICOM DETECTOR*
PTZ	*PTZ CAMERA*		*DETECTION ZONE*

2/23/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11144
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

RISINGER & GARDEN SPRINGS IMPROVEMENTS

EXISTING SIGNAL LAYOUT

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	49

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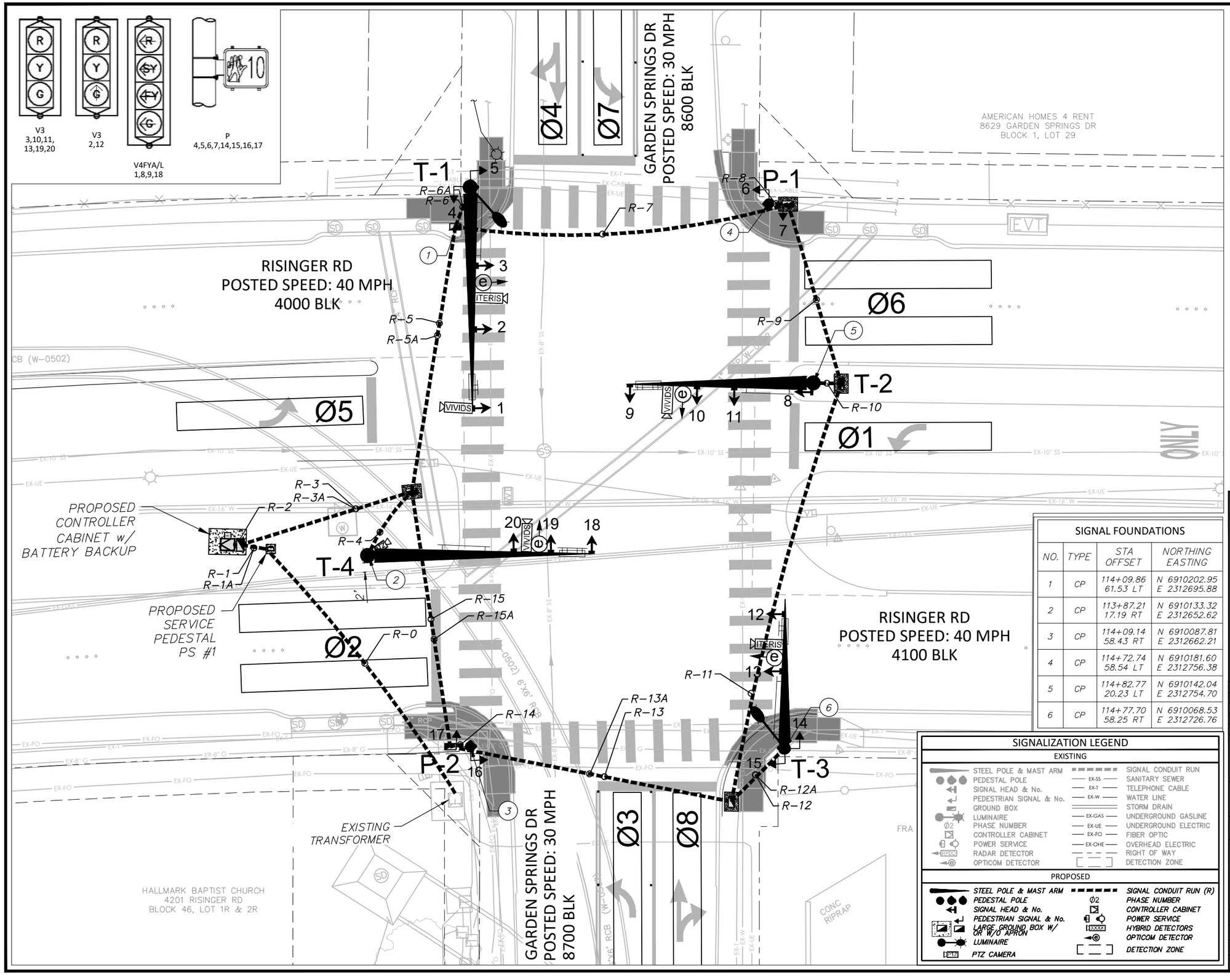

NOTES:

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2. MATERIALS AND CONSTRUCTION OF MAST ARM MOUNTED SIGNS SHALL BE IN ACCORDANCE WITH ITEM 680, INSTALLATION OF HIGHWAY TRAFFIC SIGNALS.
3. INSTALL ALL HYBRID DETECTION DEVICES IN ACCORDANCE WITH THE MANUFACTURE RECOMMENDATIONS.
4. SET DETECTION ZONES AS DIRECTED BY THE CITY.
5. ALL MAST ARMS HAVE MAST ARM DAMPING PLATE AS PER TxDOT DETAIL MA-DPD-20.
6. PUSH BUTTONS SHALL BE APS TYPE
7. CITY TO FURNISH OPTICOM DETECTORS, 4G MODEM, & COMMUNICATION GEAR.
8. PTZ CAMERA CABLE ARE SUPPLIED AND INSTALLED BY THE CONTRACTOR SUBSIDIARY TO ITEM 6010.
9. CABLES FOR OPTICOM DETECTORS ARE SUBSIDIARY TO ITEM 6089.
10. DETECTOR CABLES ARE SUPPLIED AND INSTALLED BY THE CONTRACTOR SUBSIDIARY TO ITEM 6083.

SIGNAL FOUNDATIONS

NO.	TYPE	STA OFFSET	NORTHING EASTING
1	CP	114+09.86 61.53 LT	N 6910202.95 E 2312695.88
2	CP	113+87.21 17.19 RT	N 6910133.32 E 2312652.62
3	CP	114+09.14 58.43 RT	N 6910087.81 E 2312662.21
4	CP	114+72.74 58.54 LT	N 6910181.60 E 2312756.38
5	CP	114+82.77 20.23 LT	N 6910142.04 E 2312754.70
6	CP	114+77.70 58.25 RT	N 6910068.53 E 2312726.76

SIGNALIZATION LEGEND

EXISTING

STEEL POLE & MAST ARM	SIGNAL CONDUIT RUN
PEDESTAL POLE	SANITARY SEWER
SIGNAL HEAD & No.	TELEPHONE CABLE
PEDESTRIAN SIGNAL & No.	WATER LINE
GROUND BOX	STORM DRAIN
LUMINAIRE	UNDERGROUND GASLINE
PHASE NUMBER	UNDERGROUND ELECTRIC
CONTROLLER CABINET	FIBER OPTIC
POWER SERVICE	OVERHEAD ELECTRIC
RADAR DETECTOR	RIGHT OF WAY
OPTICOM DETECTOR	DETECTION ZONE

PROPOSED

STEEL POLE & MAST ARM	SIGNAL CONDUIT RUN (R)
PEDESTAL POLE	PHASE NUMBER
SIGNAL HEAD & No.	CONTROLLER CABINET
PEDESTRIAN SIGNAL & No.	POWER SERVICE
LARGE GROUND BOX W/ OR W/O APRON	HYBRID DETECTORS
LUMINAIRE	OPTICOM DETECTOR
PTZ CAMERA	DETECTION ZONE

2/23/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11172
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

PROPOSED SIGNAL LAYOUT

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	50

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SUMMARY OF SIGNAL CONDUIT AND CABLES

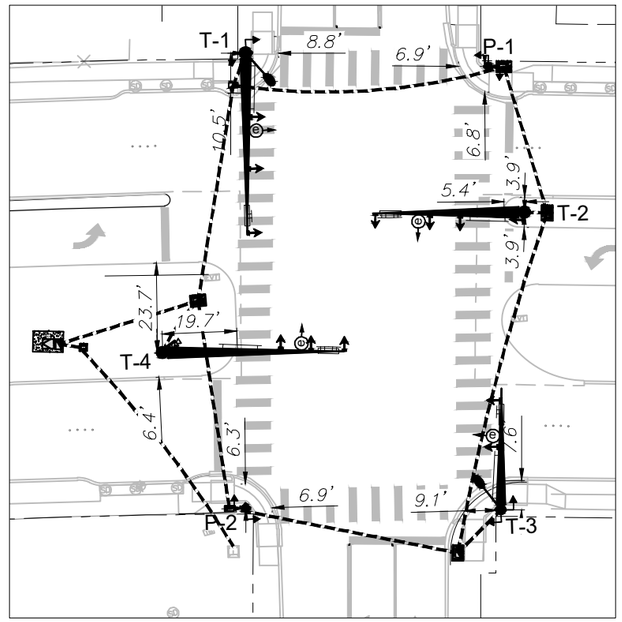
CONDUIT		LENGTH	TYPE	GROUND	GROUND	POLES	POLES	PEDS	SERVICE	SERVICE	ILLUM	ILLUM	DETECT	PREEMP	PTZ
RUN NO.	PROPOSED	(FEET)	BORE (B) TRENCH (T) EXISITNG (E) OVERHEAD (OH)	#6 GROUND (GREEN BARE)	#8 GROUND (GREEN BARE)	20 COND. #14 AWG	5 COND. #14 AWG	3 COND. #14 AWG	#6 XHHW BLACK	#6 XHHW WHITE	#10 XHHW BLACK	#10 XHHW WHITE	CAT5E DETECTION CABLE	OPTICOM CABLE	CAT5E PTZ CAMERA CABLE
R-0	2"	65	B	TO BE PROVIDED BY ONCOR											
R-1	2"	10	T	1					1	1					
R-1A	2"	10	T		1						2	2			
R-2	4"	5	T		1	4	2	8					5	4	1
R-3	4"	40	T		1	4	2	8					5	4	1
R-3A	2"	40	T		1						2	2			
R-4	4"	20	T		1	1							1	1	1
R-5	4"	60	B		1	1	1	4					2	1	
R-5A	2"	60	B		1						1	1			
R-6	4"	10	T		1	1		2					2	1	
R-6A	2"	10	T		1						1	1			
R-7	4"	75	B		1		1	2							
R-8	4"	5	T		1		1	2							
R-9	4"	40	B		1										
R-10	4"	10	T		1	1							1	1	
R-11	4"	95	B		1	1							1	1	
R-12	4"	20	T		1	1		2					1	1	
R-12A	2"	20	T		1						1	1			
R-13	4"	65	B		1	2		2					2	2	
R-13A	2"	65	B		1						1	1			
R-14	4"	5	T		1		1	2							
R-15	4"	55	B		1	2	1	4					2	2	
R-15A	2"	55	B		1						1	1			
CABLE TOTALS (LF)				10	765	635	290	1180	10	10	310	310	750	635	65

CONDUIT TOTALS (LF)	
2" TRENCH	90
2" BORE	245
4" TRENCH	115
4" BORE	390

Notes:

This chart does not reflect the quantities of cable inside the poles and mast arms.

T = Trench, B = Bore, RM = Rigid Metal, OH = Overhead



NOTES:

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3. DETECTOR CABLES ARE SUPPLIED AND INSTALLED BY THE CONTRACTOR SUBSIDIARY TO ITEM 6083.

MINIMUM PEDESTRIAN TIMING				
PED PHASE	SIGNAL HEAD NUMBERS	WALK TIME (SECONDS)	FLASHING DON'T WALK TIME (SECONDS)	TOTAL PED TIMING (SECONDS)
PED 2	4 & 7	7	15	22
PED 2	14 & 17	7	15	22
PED 4	6 & 15	7	31	38
PED 4	5 & 16	7	31	38

NOTE: THE ABOVE PEDESTRAIN TIMINGS ARE BASED ON EXISTING GEOMETRICS AS SHOWN ON THIS LAYOUT

PROPOSED POLE AND HEAD CHART

POLE NUMBERS	T-1					P-1		T-2				T-3				P-2		T-4		
MAST ARM LENGTH (FT)	48					PED POLE		40				32				PED POLE		48		
FOUNDATION TYPE	TxDOT 36-A					TxDOT 24-A		TxDOT 36-A				TxDOT 30-A				TxDOT 24-A		TxDOT 36-A		
WITH LUMINAIRES	YES					NO		NO				YES				NO		NO		
DETECTION	HYBRID / VIVIDS					N/A		VIVIDS				HYBRID				N/A		VIVIDS		
PREEMPTION	OPTICOM					N/A		OPTICOM				OPTICOM				N/A		OPTICOM		
PTZ CAMERA	NONE					N/A		NONE				NONE				N/A		YES		
SIZE OF LENS	12"			N/A		N/A		12"				12"		N/A		N/A		12"		
SIGNAL TYPE	V4FYA	V3↑	V3	P	P	P	P	V4FYA	V4FYA	V3	V3	V3↑	V3	P	P	P	P	V4FYA	V3	V3
SIGNAL FACE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
LED SIGNAL INDICATIONS	<R	R	R	DW	DW	DW	DW	<R	<R	R	R	R	R	DW	DW	DW	DW	<R	R	R
	<Y	Y	Y	W	W	W	W	<Y	<Y	Y	Y	Y	Y	W	W	W	W	<Y	Y	Y
	<FY	↑G	G					<FY	<FY	G	G	↑G	G					<FY	G	G
	<G							<G	<G											
PROPOSED SIGNAL HEAD	X	X	X					X	X	X	X	X	X					X	X	X
APS PUSH BUTTON (PROPOSED)				X	X	X	X							X	X	X	X			

CABLE/WIRE INSIDE POLE AND MAST ARM (FEET)

POLE NUMBER	ITEM 684			#10 XHHW BLACK	#10 XHHW WHITE	CAT5E DETECTION CABLE	CAT5E PTZ CAMERA CABLE	OPTICOM CABLE
	7/C #14 AWG	5/C #14 AWG	3/C #14 AWG					
T-1	160	20	10	40	40	105		35
P-1		20	10					
T-2	165					55		50
T-3	90	20	10	40	40	45		45
P-2		20	10					
T-4	180					55	40	50
TOTAL	595	80	40	80	80	260	40	180

ACCESSABLE PEDESTRIAN SIGNAL (APS) MESSAGE CHART

POLE NUMBER	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE / SOUND DETAILS
T-1 & T-2	PED 2	BUTTON PUSH ON DON'T WALK EXTENED BUTTON PUSH LOCATOR TONE WALK INDICATION	WAIT WAIT GARDEN SPRING DRIVE WALK SIGN IS ON TO CROSS GARDEN GARDEN SPRING
P-2 & T-3	PED 2	BUTTON PUSH ON DON'T WALK EXTENED BUTTON PUSH LOCATOR TONE WALK INDICATION	WAIT WAIT GARDEN SPRING DRIVE WALK SIGN IS ON TO CROSS GARDEN GARDEN SPRING
T-1 & P-2	PED 4	BUTTON PUSH ON DON'T WALK EXTENED BUTTON PUSH LOCATOR TONE WALK INDICATION	WAIT WAIT RISINGER ROAD WALK SIGN IS ON TO CROSS RISINGER RISINGER ROAD
P-1 & T-3	PED 4	BUTTON PUSH ON DON'T WALK EXTENED BUTTON PUSH LOCATOR TONE WALK INDICATION	WAIT WAIT RISINGER ROAD WALK SIGN IS ON TO CROSS RISINGER RISINGER ROAD

Elec. Service No.	Sheet No.	Electrical Service Description	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contactor Amps	Panelbd/ Loadcenter Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
PS #1	58	ELEC SERV TY D(120/240)060(NS)SS(E)PS(U)	2"	3/#6	N/A	2P/60	30	70	Signal Luminaire Luminaire	1P/50 2P/20 2P/20	40 0.71 0.71	5.0

2/23/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

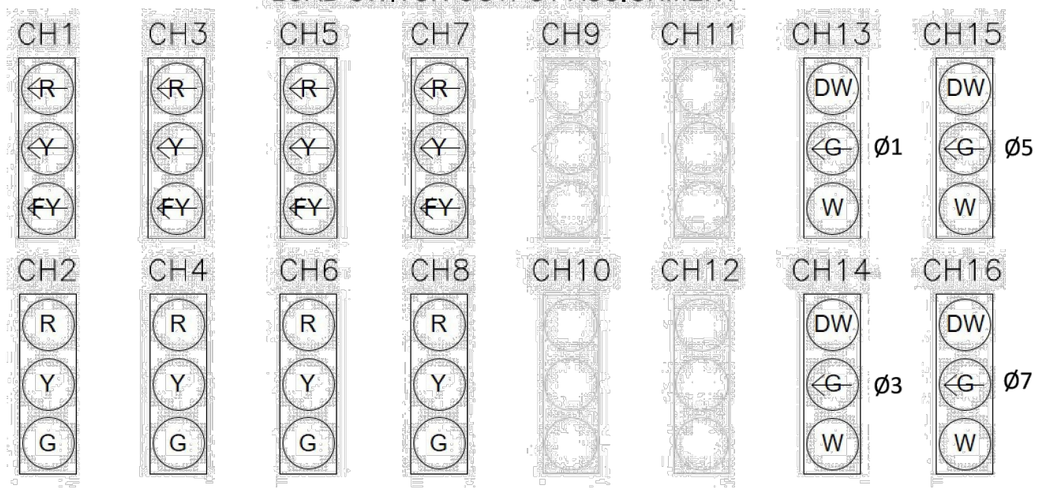
DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1174
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

RISINGER & GARDEN SPRINGS IMPROVEMENTS

SIGNAL DESIGN CHARTS

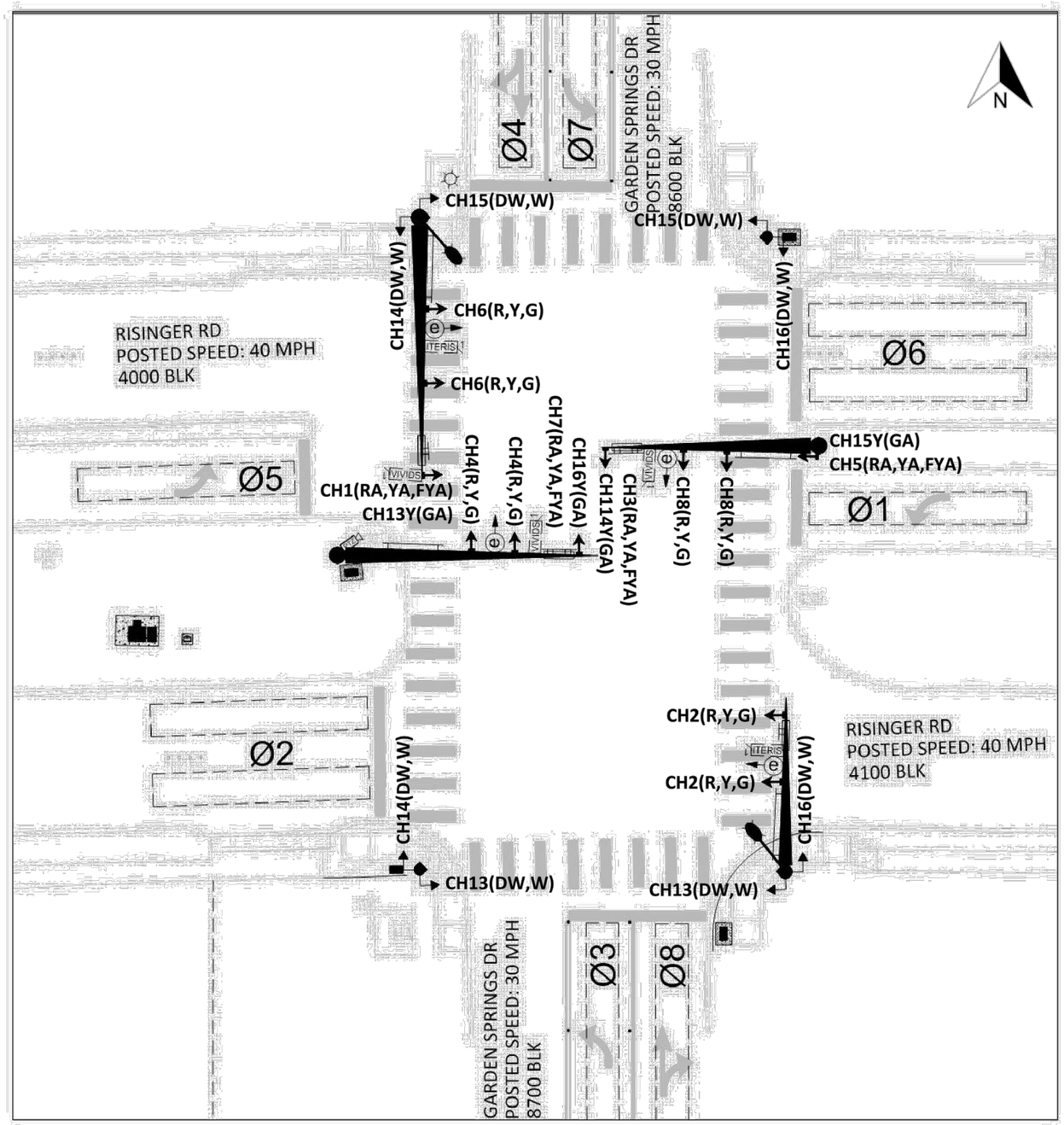
FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	51

LOAD SWITCH OUTPUT ASSIGNMENT



SIGNAL DETECTOR ATTRIBUTE / CHANNEL												
	1	2	3	4	5	6	7	8	9	10	11	12
352i ATC							PED 2 DET 13	PED 6 DET 15			PRE EMPT EB DET 21	PRE EMPT SB DET 23
							PED 4 DET 14	PED 8 DET 16			PRE EMPT WB DET 22	PRE EMPT NB DET 24

ALL VEHICULAR DETECTION SHALL BE ON SDLC



FORT WORTH
5001 JAMES AVENUE
FORT WORTH, TX 76115
PHONE: (817) 392-8656
FAX: (817) 392-2533

LEGEND

- SIGNAL HEAD
- PED HEAD
- PED POLE
- MAST ARM

STATE OF TEXAS
MOHAMMAD AZIZUR RAHMAN
118252
LICENSED PROFESSIONAL ENGINEER
11-3-2022

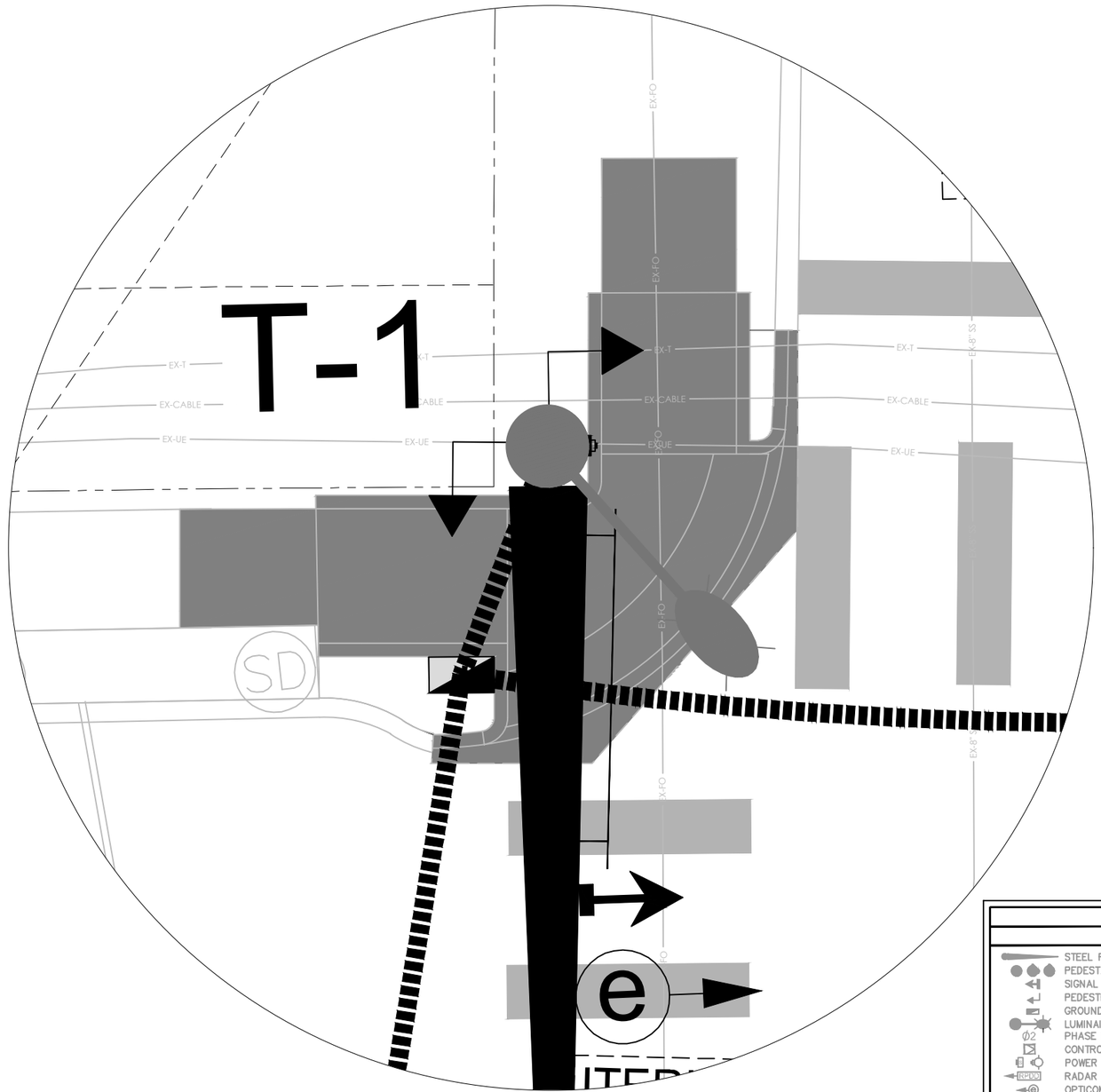
CITY OF FORT WORTH

DEPARTMENT OF TRANSPORATION AND PUBLIC WORKS
TRAFFIC MANAGEMENT DIVISION

W RISINGER RD & GARDEN SPRINGS DR

CHANNEL ASSIGNMENT DRAWING

NOTES	NAME	DATE
DESIGN BY	Shannon H	11/3/2022
ENGINEER	Sagar M	11/3/2022
APPROVED	Aziz R	11/3/2022
SHEET No.	52	



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SIGNALIZATION LEGEND

EXISTING

STEEL POLE & MAST ARM	SIGNAL CONDUIT RUN
PEDESTAL POLE	SANITARY SEWER
SIGNAL HEAD & No.	TELEPHONE CABLE
PEDESTRIAN SIGNAL & No.	WATER LINE
GROUND BOX	STORM DRAIN
LUMINAIRE	UNDERGROUND GASLINE
PHASE NUMBER	UNDERGROUND ELECTRIC
CONTROLLER CABINET	FIBER OPTIC
POWER SERVICE	OVERHEAD ELECTRIC
RADAR DETECTOR	RIGHT OF WAY
OPTICOM DETECTOR	DETECTION ZONE

PROPOSED

STEEL POLE & MAST ARM	SIGNAL CONDUIT RUN (R)
PEDESTAL POLE	PHASE NUMBER
SIGNAL HEAD & No.	CONTROLLER CABINET
PEDESTRIAN SIGNAL & No.	POWER SERVICE
LARGE GROUND BOX W/ OR W/O APRON	HYBRID DETECTORS
LUMINAIRE	OPTICOM DETECTOR
PTZ CAMERA	DETECTION ZONE

2/23/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
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817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

PROPOSED SIGNAL
CORNER DETAIL (T-1)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	53

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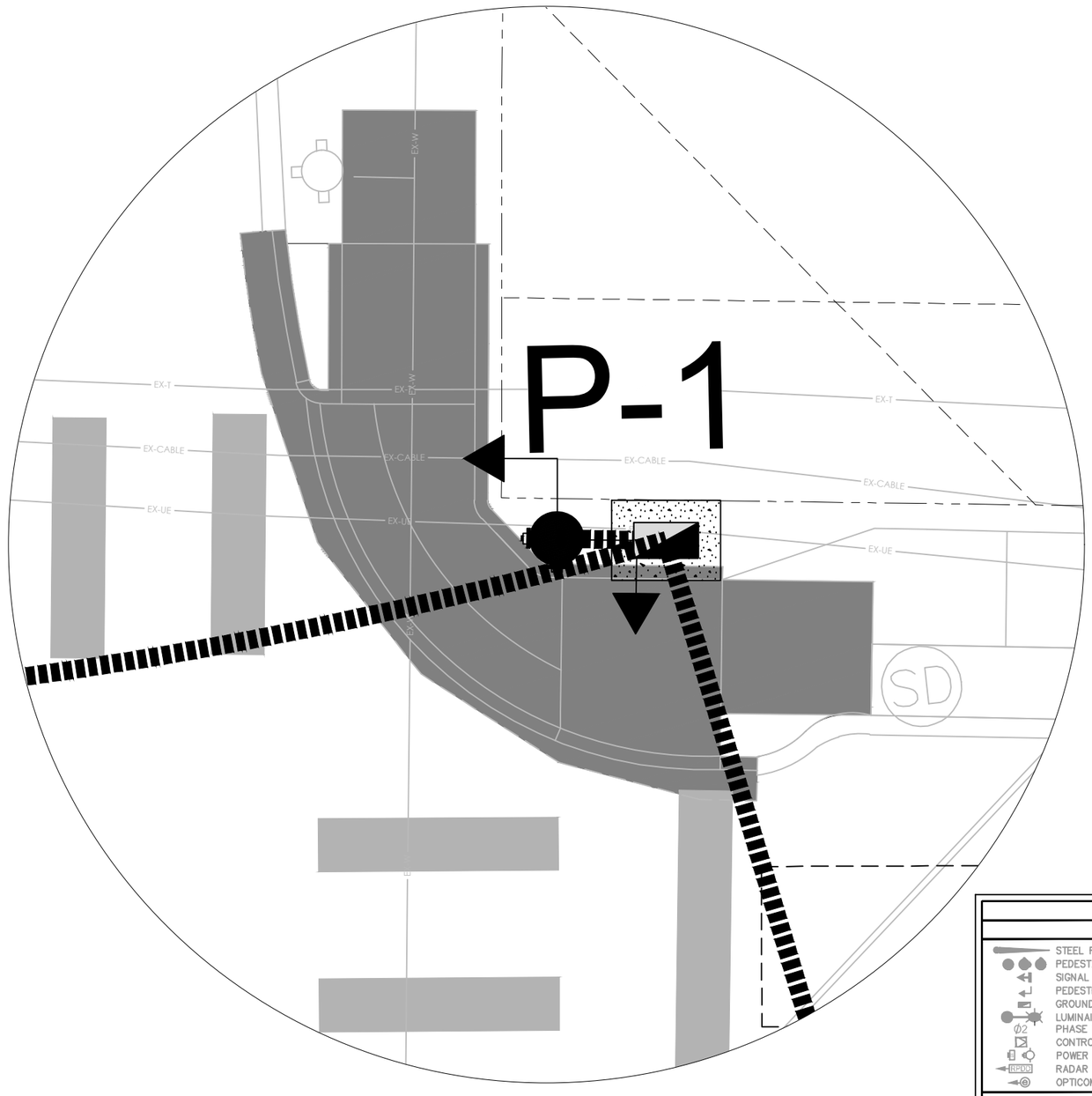

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GRAPHIC SCALE IN FEET

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SIGNALIZATION LEGEND

EXISTING

STEEL POLE & MAST ARM		SIGNAL CONDUIT RUN	
PEDESTAL POLE		EX-SS	SANITARY SEWER
SIGNAL HEAD & No.		EX-T	TELEPHONE CABLE
PEDESTRIAN SIGNAL & No.		EX-W	WATER LINE
GROUND BOX			STORM DRAIN
LUMINAIRE		EX-GAS	UNDERGROUND GASLINE
Ø2	PHASE NUMBER	EX-UE	UNDERGROUND ELECTRIC
	CONTROLLER CABINET	EX-FO	FIBER OPTIC
	POWER SERVICE	EX-OHE	OVERHEAD ELECTRIC
RADAR	RADAR DETECTOR		RIGHT OF WAY
	OPTICOM DETECTOR		DETECTION ZONE

PROPOSED

STEEL POLE & MAST ARM		SIGNAL CONDUIT RUN (R)	
PEDESTAL POLE	Ø2	PHASE NUMBER	
SIGNAL HEAD & No.		CONTROLLER CABINET	
PEDESTRIAN SIGNAL & No.		POWER SERVICE	
LARGE GROUND BOX W/ OR W/O APRON	XXXX	HYBRID DETECTORS	
LUMINAIRE		OPTICOM DETECTOR	
PTZ CAMERA		DETECTION ZONE	

2/23/23

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RISINGER & GARDEN SPRINGS IMPROVEMENTS

PROPOSED SIGNAL CORNER DETAIL (P-1)

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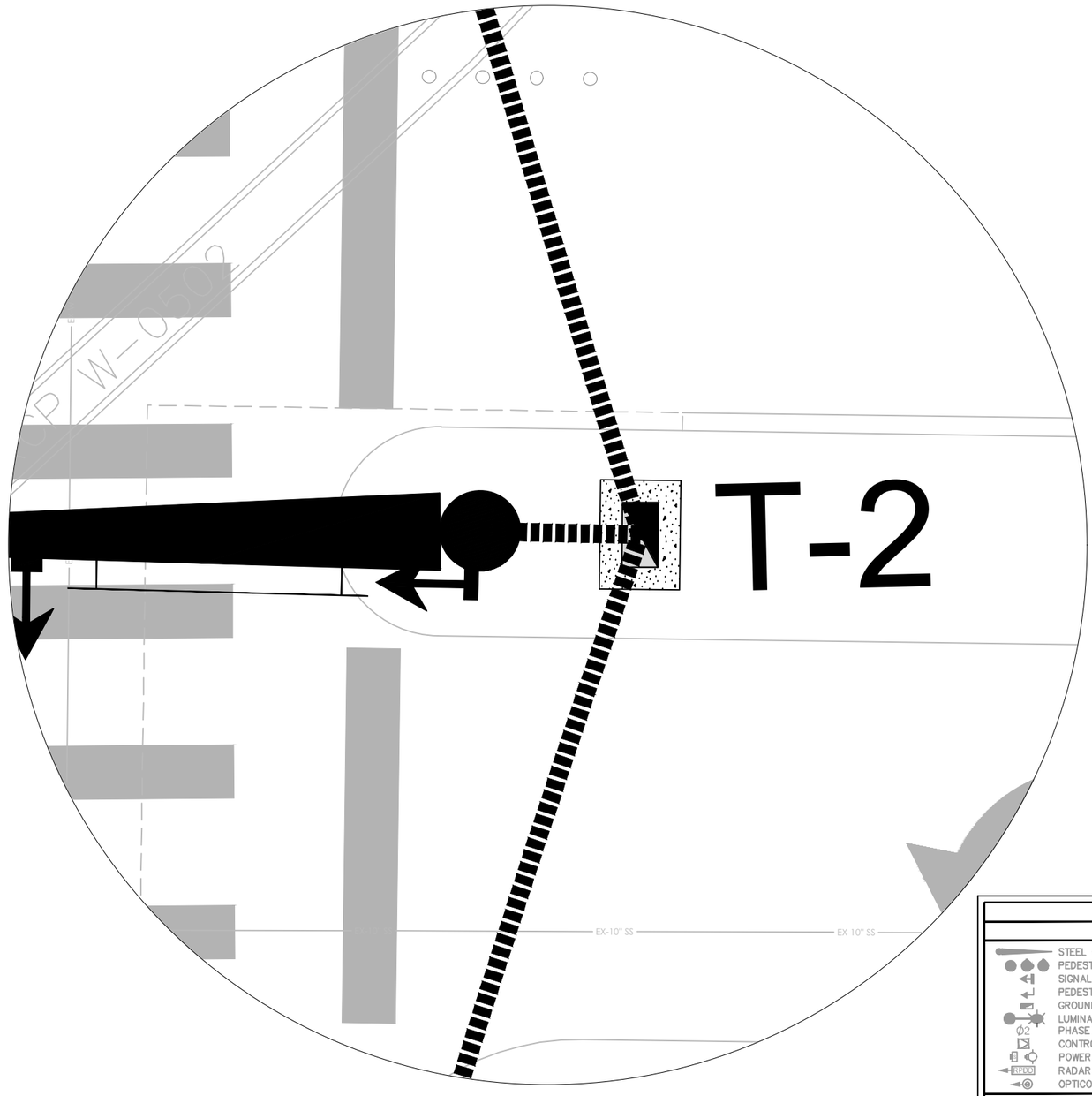

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SIGNALIZATION LEGEND

EXISTING

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	PEDESTAL POLE	EX-SS	SANITARY SEWER
	SIGNAL HEAD & No.	EX-T	TELEPHONE CABLE
	PEDESTRIAN SIGNAL & No.	EX-W	WATER LINE
	GROUND BOX		STORM DRAIN
	LUMINAIRE	EX-GAS	UNDERGROUND GASLINE
ϕ2	PHASE NUMBER	EX-UE	UNDERGROUND ELECTRIC
	CONTROLLER CABINET	EX-FO	FIBER OPTIC
	POWER SERVICE	EX-OHE	OVERHEAD ELECTRIC
RADAR	RADAR DETECTOR		RIGHT OF WAY
	OPTICOM DETECTOR		DETECTION ZONE

PROPOSED

	STEEL POLE & MAST ARM		*SIGNAL CONDUIT RUN (R)*
	PEDESTAL POLE	ϕ2	*PHASE NUMBER*
	SIGNAL HEAD & No.		*CONTROLLER CABINET*
	PEDESTRIAN SIGNAL & No.		*POWER SERVICE*
	LARGE GROUND BOX W/ OR W/O APRON	XXXX	*HYBRID DETECTORS*
	LUMINAIRE		*OPTICOM DETECTOR*
PTZ	*PTZ CAMERA*		*DETECTION ZONE*

2/23/23

STATE OF TEXAS
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TX REGISTERED ENGINEERING FIRM F-1174
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817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

PROPOSED SIGNAL CORNER DETAIL (T-2)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	55

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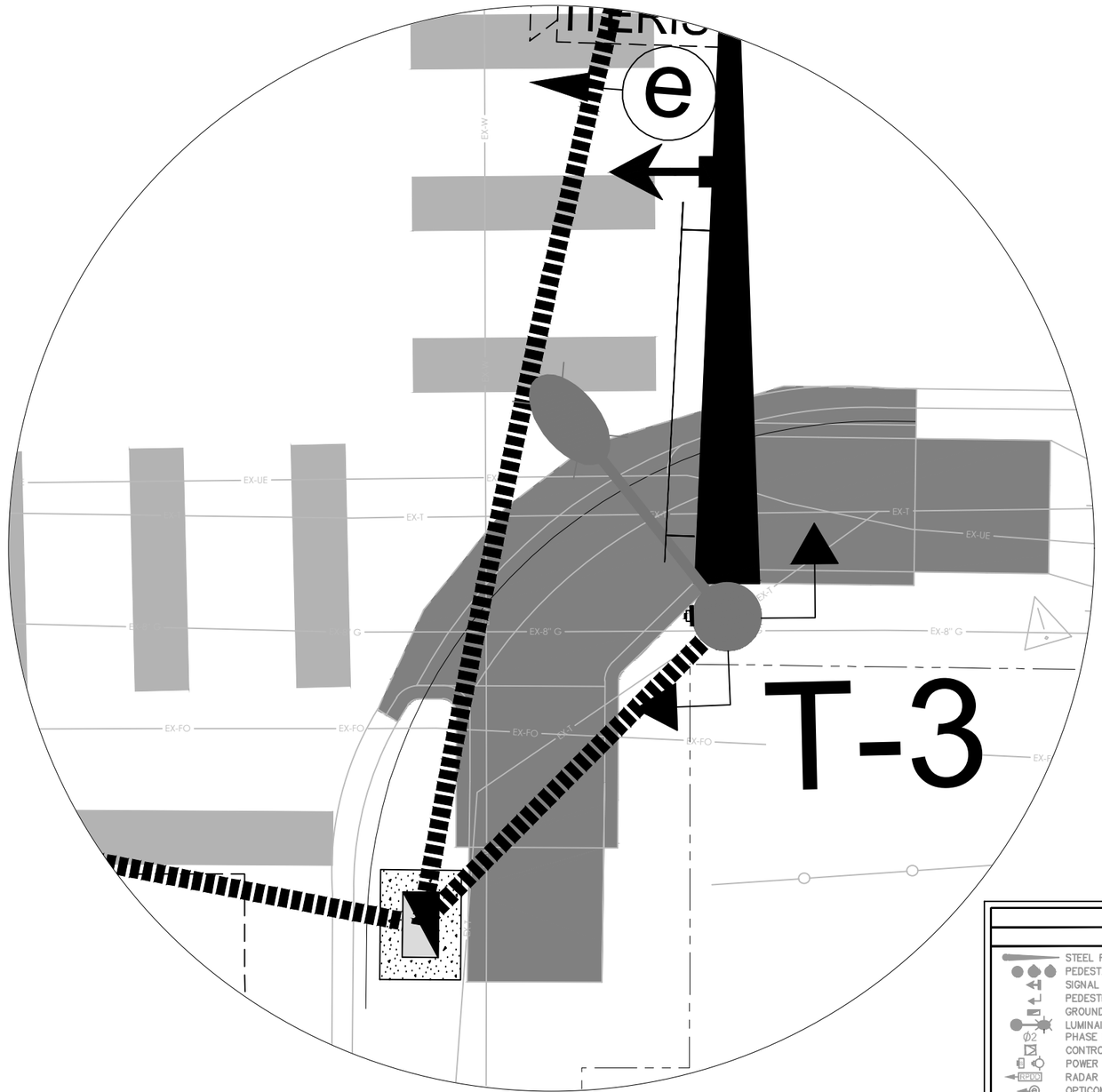

NOTES:

1. LOCATIONS OF CONDUITS, AND ALL SIGNAL RELATED ITEMS ARE DIAGRAMMATIC ONLY AND MAY NE ADJUSTED IN THE FIELD IN ORDER TO ACCOMMODATE FIELD CONDITIONS AND TO ACHIEVE THE BEST POSSIBLE CONFIGURATION AS DIRECTED BY THE TRAFFIC ENGINEER.
2. MATERIALS AND CONSTRUCTION OF MAST ARM MOUNTED SIGNS SHALL BE IN ACCORDANCE WITH ITEM 680, INSTALLATION OF HIGHWAY TRAFFIC SIGNALS.
3. INSTALL ALL HYBRID DETECTION DEVICES IN ACCORDANCE WITH THE MANUFACTURE RECOMMENDATIONS.
4. SET DETECTION ZONES AS DIRECTED BY THE CITY.
5. ALL MAST ARMS HAVE MAST ARM DAMPING PLATE AS PER TxDOT DETAIL MA-DPD-20.
6. PUSH BUTTONS SHALL BE APS TYPE
7. CITY TO FURNISH OPTICOM DETECTORS, 4G MODEM, & COMMUNICATION GEAR.
8. PTZ CAMERA CABLE ARE SUPPLIED AND INSTALLED BY THE CONTRACTOR SUBSIDIARY TO ITEM 6010.
9. CABLES FOR OPTICOM DETECTORS ARE SUBSIDIARY TO ITEM 6089.
10. DETECTOR CABLES ARE SUPPLIED AND INSTALLED BY THE CONTRACTOR SUBSIDIARY TO ITEM 6083.

SIGNALIZATION LEGEND

EXISTING

	STEEL POLE & MAST ARM		SIGNAL CONDUIT RUN
	PEDESTAL POLE	EX-SS	SANITARY SEWER
	SIGNAL HEAD & No.	EX-T	TELEPHONE CABLE
	PEDESTRIAN SIGNAL & No.	EX-W	WATER LINE
	GROUND BOX		STORM DRAIN
	LUMINAIRE	EX-GAS	UNDERGROUND GASLINE
Ø2	PHASE NUMBER	EX-UE	UNDERGROUND ELECTRIC
	CONTROLLER CABINET	EX-FO	FIBER OPTIC
	POWER SERVICE	EX-OHE	OVERHEAD ELECTRIC
RPDT	RADAR DETECTOR		RIGHT OF WAY
	OPTICOM DETECTOR		DETECTION ZONE

PROPOSED

	STEEL POLE & MAST ARM		*SIGNAL CONDUIT RUN (R)*
	PEDESTAL POLE	Ø2	*PHASE NUMBER*
	SIGNAL HEAD & No.		*CONTROLLER CABINET*
	PEDESTRIAN SIGNAL & No.		*POWER SERVICE*
	LARGE GROUND BOX W/ OR W/O APRON	XXXX	*HYBRID DETECTORS*
	LUMINAIRE		*OPTICOM DETECTOR*
PTZ	*PTZ CAMERA*		*DETECTION ZONE*

2/23/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11144
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Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

PROPOSED SIGNAL CORNER DETAIL (T-3)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	56

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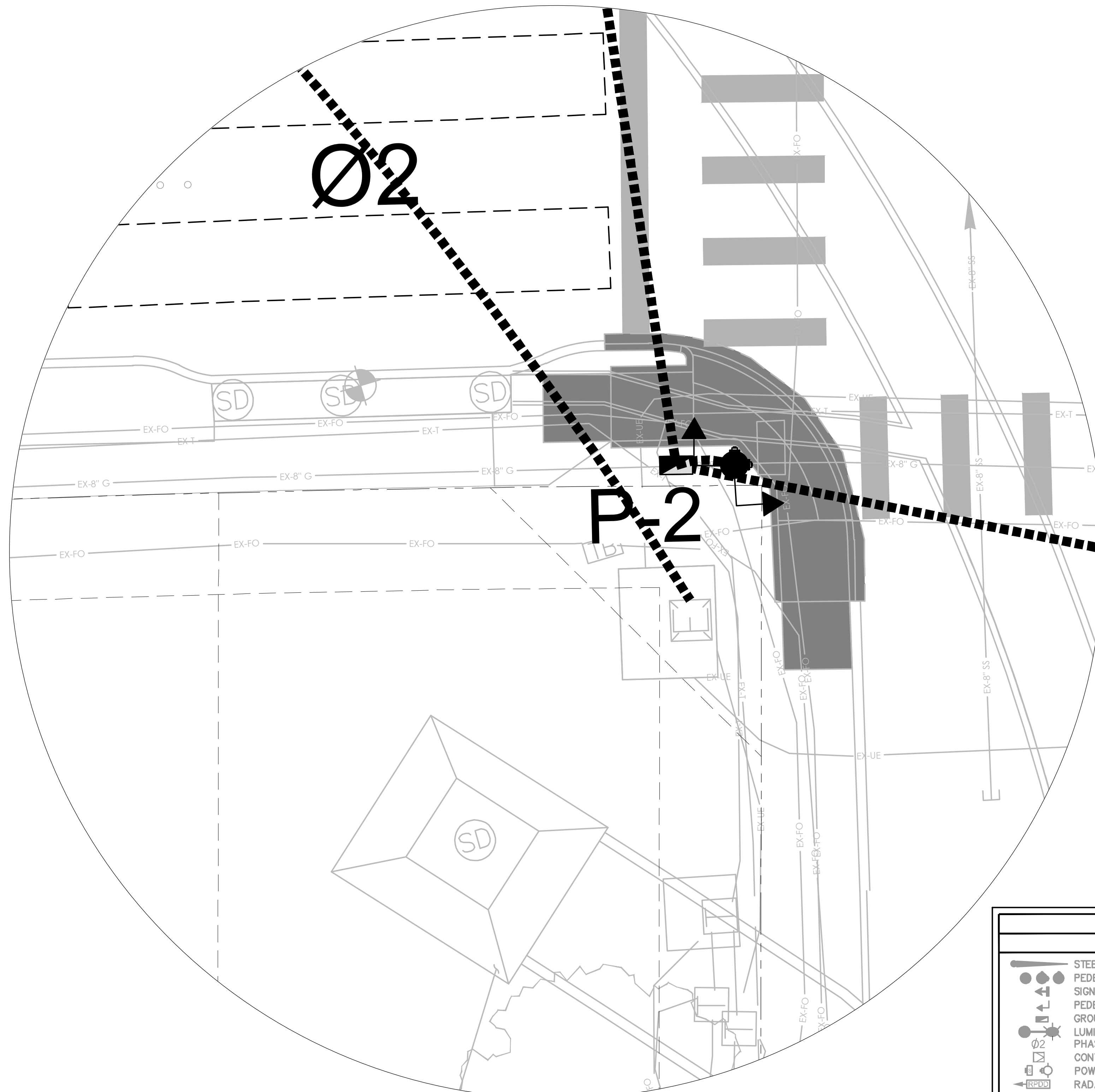

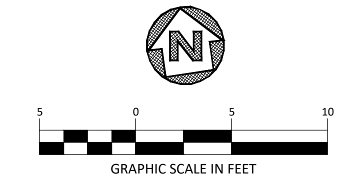

NOTES:

1. LOCATIONS OF CONDUITS, AND ALL SIGNAL RELATED ITEMS ARE DIAGRAMMATIC ONLY AND MAY NE ADJUSTED IN THE FIELD IN ORDER TO ACCOMMODATE FIELD CONDITIONS AND TO ACHIEVE THE BEST POSSIBLE CONFIGURATION AS DIRECTED BY THE TRAFFIC ENGINEER.
2. MATERIALS AND CONSTRUCTION OF MAST ARM MOUNTED SIGNS SHALL BE IN ACCORDANCE WITH ITEM 680, INSTALLATION OF HIGHWAY TRAFFIC SIGNALS.
3. INSTALL ALL HYBRID DETECTION DEVICES IN ACCORDANCE WITH THE MANUFACTURE RECOMMENDATIONS.
4. SET DETECTION ZONES AS DIRECTED BY THE CITY.
5. ALL MAST ARMS HAVE MAST ARM DAMPING PLATE AS PER TxDOT DETAIL MA–DPD–20.
6. PUSH BUTTONS SHALL BE APS TYPE
7. CITY TO FURNISH OPTICOM DETECTORS, 4G MODEM, & COMMUNICATION GEAR.
8. PTZ CAMERA CABLE ARE SUPPLIED AND INSTALLED BY THE CONTRACTOR SUBSIDIARY TO ITEM 6010.
9. CABLES FOR OPTICOM DETECTORS ARE SUBSIDIARY TO ITEM 6089.
10. DETECTOR CABLES ARE SUPPLIED AND INSTALLED BY THE CONTRACTOR SUBSIDIARY TO ITEM 6083.

SIGNALIZATION LEGEND

EXISTING

	STEEL POLE & MAST ARM		SIGNAL CONDUIT RUN
	PEDESTAL POLE	EX-SS	SANITARY SEWER
	SIGNAL HEAD & No.	EX-T	TELEPHONE CABLE
	PEDESTRIAN SIGNAL & No.	EX-W	WATER LINE
	GROUND BOX		STORM DRAIN
	LUMINAIRE	EX-GAS	UNDERGROUND GASLINE
Ø2	PHASE NUMBER	EX-UE	UNDERGROUND ELECTRIC
	CONTROLLER CABINET	EX-FO	FIBER OPTIC
	POWER SERVICE	EX-OHE	OVERHEAD ELECTRIC
RPDD	RADAR DETECTOR		RIGHT OF WAY
	OPTICOM DETECTOR		DETECTION ZONE

PROPOSED

	STEEL POLE & MAST ARM		SIGNAL CONDUIT RUN (R)
	PEDESTAL POLE	Ø2	PHASE NUMBER
	SIGNAL HEAD & No.		CONTROLLER CABINET
	PEDESTRIAN SIGNAL & No.		POWER SERVICE
	LARGE GROUND BOX W/ OR W/O APRON	XXXX	HYBRID DETECTORS
	LUMINAIRE		OPTICOM DETECTOR
PTZ	PTZ CAMERA		DETECTION ZONE

2/23/23

STATE OF TEXAS
DONALD J. SZCZESNY
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DATE	BY	REV	REVISION

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817-335-1121

Texas Department of Transportation
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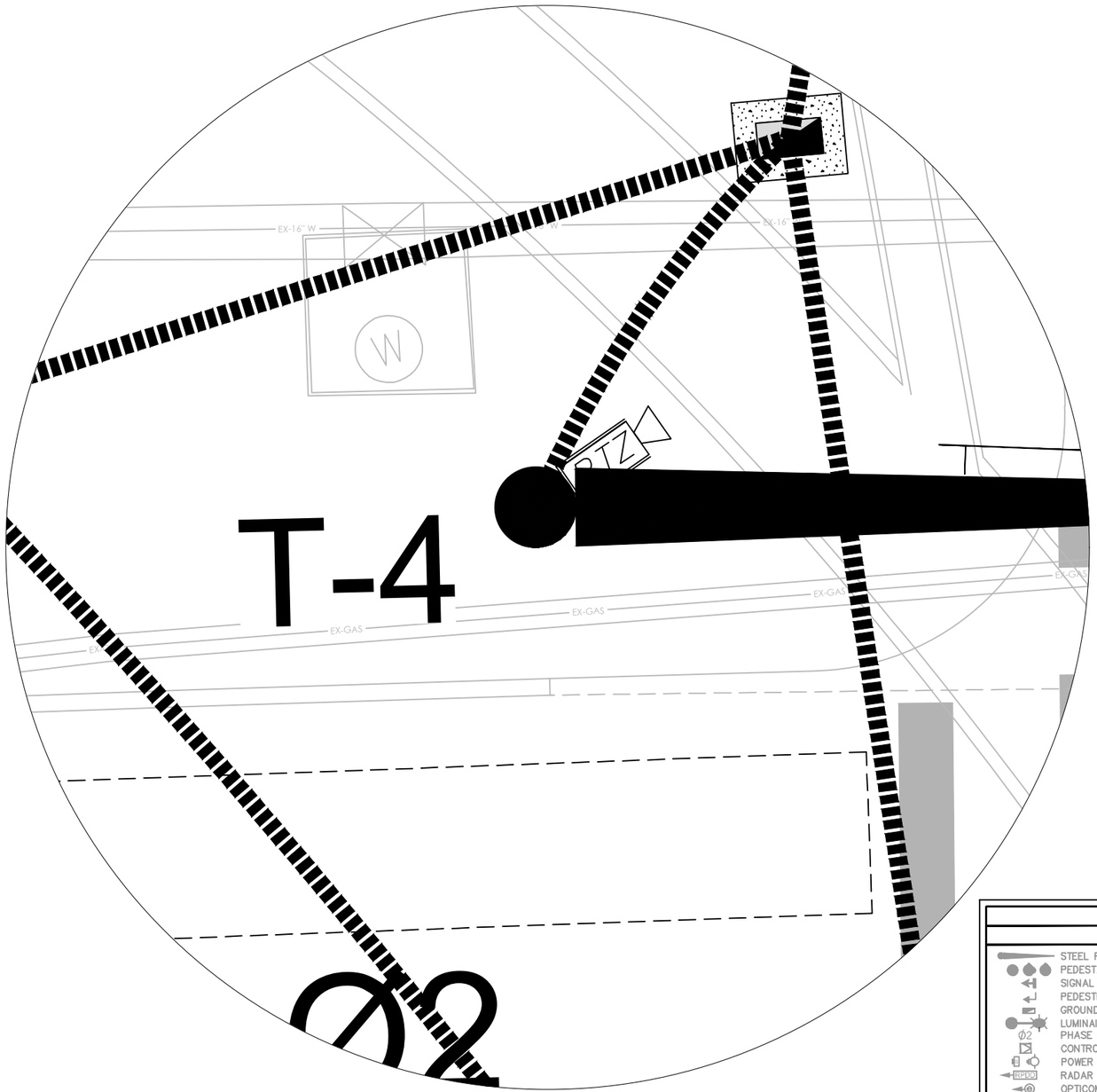
RISINGER & GARDEN SPRINGS IMPROVEMENTS

PROPOSED SIGNAL CORNER DETAIL (P-2)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	57



5 0 5 10

GRAPHIC SCALE IN FEET

GENERAL NOTES:

1. LOCATIONS OF CONDUITS, AND ALL SIGNAL RELATED ITEMS ARE DIAGRAMMATIC ONLY AND MAY NE ADJUSTED IN THE FIELD IN ORDER TO ACCOMMODATE FIELD CONDITIONS AND TO ACHIEVE THE BEST POSSIBLE CONFIGURATION AS DIRECTED BY THE TRAFFIC ENGINEER.
2. MATERIALS AND CONSTRUCTION OF MAST ARM MOUNTED SIGNS SHALL BE IN ACCORDANCE WITH ITEM 680, INSTALLATION OF HIGHWAY TRAFFIC SIGNALS.
3. ALL TRAFFIC SIGNAL POLES, MAST ARMS, AND PEDESTRIAN POLES SHALL BE POWDER COATED BLACK (SUBSIDIARY TO ITEMS 686 AND 687, RESPECTIVELY).
4. INSTALL ALL HYBRID DETECTION DEVICES IN ACCORDANCE WITH THE MANUFACTURE RECOMMENDATIONS.
5. SET DETECTION ZONES AS DIRECTED BY THE CITY.
6. ALL MAST ARMS HAVE MAST ARM DAMPING PLATE AS PER TxDOT DETAIL MA-DPD-20.
7. PUSH BUTTONS SHALL BE APS TYPE
8. CITY TO FURNISH OPTICOM DETECTORS, 4G MODEM, & COMMUNICATION GEAR.
9. CONTRACTOR WILL FURNISH AND INSTALL PTZ CAMERA. THIS ITEM WILL BE PAID UNDER PAY ITEM 6010.
10. CABLES FOR OPTICOM DETECTORS ARE SUBSIDIARY TO ITEM 6396.
11. DETECTOR CABLES ARE SUPPLIED AND INSTALLED BY THE CONTRACTOR SUBSIDIARY TO ITEM 6292.

SIGNALIZATION LEGEND

EXISTING

	STEEL POLE & MAST ARM		SIGNAL CONDUIT RUN
	PEDESTAL POLE	EX-SS	SANITARY SEWER
	SIGNAL HEAD & No.	EX-T	TELEPHONE CABLE
	PEDESTRIAN SIGNAL & No.	EX-W	WATER LINE
	GROUND BOX		STORM DRAIN
	LUMINAIRE	EX-GAS	UNDERGROUND GASLINE
Ø2	PHASE NUMBER	EX-UE	UNDERGROUND ELECTRIC
	CONTROLLER CABINET	EX-FO	FIBER OPTIC
	POWER SERVICE	EX-OHE	OVERHEAD ELECTRIC
RADAR	RADAR DETECTOR		RIGHT OF WAY
	OPTICOM DETECTOR		DETECTION ZONE

PROPOSED

	STEEL POLE & MAST ARM		*SIGNAL CONDUIT RUN (R)*
	PEDESTAL POLE	Ø2	*PHASE NUMBER*
	SIGNAL HEAD & No.		*CONTROLLER CABINET*
	PEDESTRIAN SIGNAL & No.		*POWER SERVICE*
	LARGE GROUND BOX W/ OR W/O APRON	XXXX	*HYBRID DETECTORS*
	LUMINAIRE		*OPTICOM DETECTOR*
PTZ	*PTZ CAMERA*		*DETECTION ZONE*

2/23/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
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DATE	BY	REV	REVISION

DUNAWAY
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817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

PROPOSED SIGNAL CORNER DETAIL (T-4)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	58

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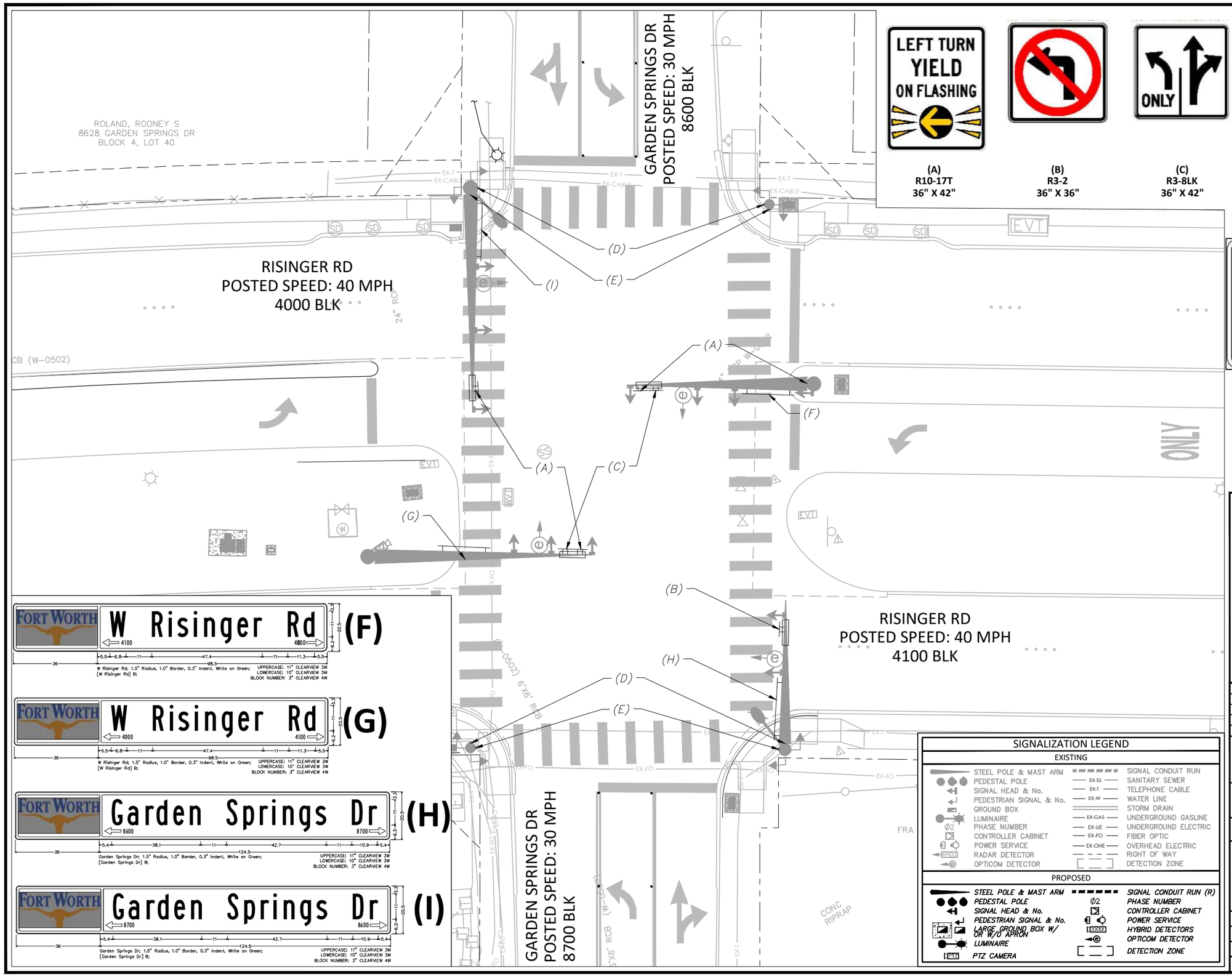
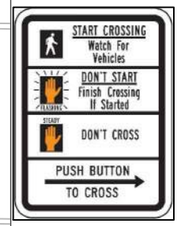
PLOTTED WITH: _DWG To PDF.pc3



(A)
R10-17T
36" X 42"

(B)
R3-2
36" X 36"

(C)
R3-8LK
36" X 42"



(D)
R10-3eR
9" X 15"

(E)
R10-3eL
9" X 15"

(F)

(G)

(H)

(I)

SIGNALIZATION LEGEND

EXISTING

STEEL POLE & MAST ARM			SIGNAL CONDUIT RUN
PEDESTAL POLE		EX-SS	SANITARY SEWER
SIGNAL HEAD & No.		EX-T	TELEPHONE CABLE
PEDESTRIAN SIGNAL & No.		EX-W	WATER LINE
GROUND BOX			STORM DRAIN
LUMINAIRE		EX-GAS	UNDERGROUND GASLINE
PHASE NUMBER	Ø2	EX-UE	UNDERGROUND ELECTRIC
CONTROLLER CABINET		EX-FO	FIBER OPTIC
POWER SERVICE		EX-OHE	OVERHEAD ELECTRIC
RADAR DETECTOR	RADAR		RIGHT OF WAY
OPTICOM DETECTOR			DETECTION ZONE

PROPOSED

STEEL POLE & MAST ARM			SIGNAL CONDUIT RUN (R)
PEDESTAL POLE		Ø2	PHASE NUMBER
SIGNAL HEAD & No.			CONTROLLER CABINET
PEDESTRIAN SIGNAL & No.			POWER SERVICE
LARGE GROUND BOX W/ OR W/O APRON		XXXX	HYBRID DETECTORS
LUMINAIRE			OPTICOM DETECTOR
PTZ CAMERA	PTZ		DETECTION ZONE

2/23/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
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550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

RISINGER & GARDEN SPRINGS IMPROVEMENTS

SIGNAL SIGNING PLAN

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	59

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PLOTTED BY: Lee Monastesse
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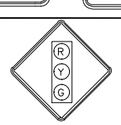
SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
59	A	D3-1G		134.5" X 20.5"	X							
59	B	D3-1G		134.5" X 20.5"	X							
59	C	D3-1G		160.5" X 20.5"	X							
59	D	D3-1G		160.5" X 20.5"	X							
59	E	R10-17T		GARDEN SPRINGS 36" X 42" RISINGER 36" X 42"	X							
59				36" X 36"	X							
59				36" X 42"	X							
59	F	R10-3eL		9" X 15"	X							
59	G	R10-3eR		9" X 15"	X							
59	H	R2-1L R2-1R		30'X36'	X		10BWG	1	SA	P		
59	I	W3-3		36"X36"	X		10BWG	1	SA	P		
59	J	R3-20L(MOD)		24"X36"	X		10BWG	1	SA	P		

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

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

http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0902	90	208	RISINGER RD
4-16 8-16		DIST	COUNTY		SHEET NO.
		FTW	TARRANT		60

DATE:
FILE:

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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DATE:
FILE:

71A

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 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.

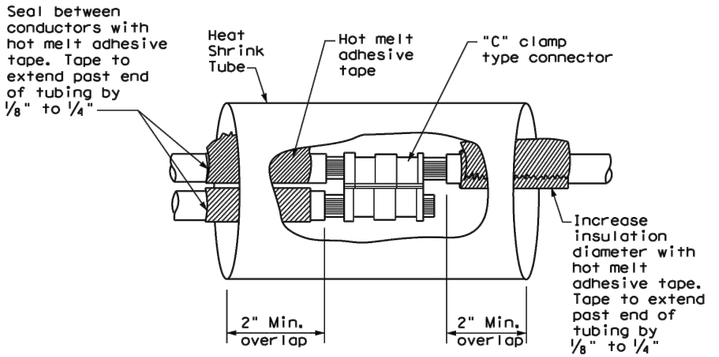
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

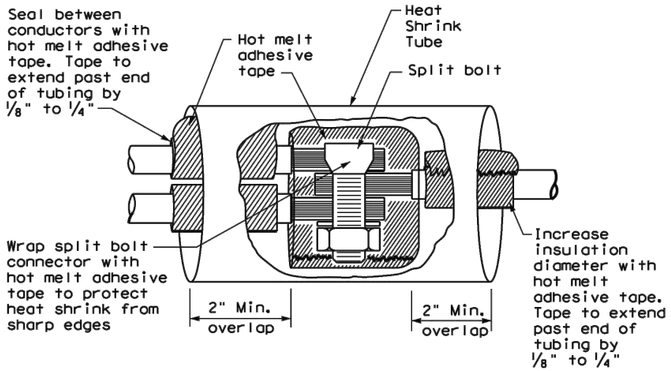
1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in specific locations including electrical service, see individual plan sheets.

B. CONSTRUCTION METHODS

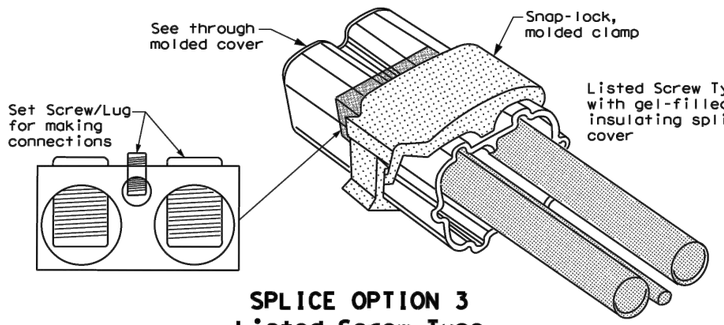
1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, 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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DATE:
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71C

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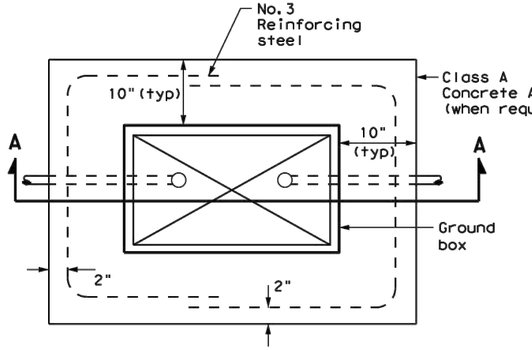
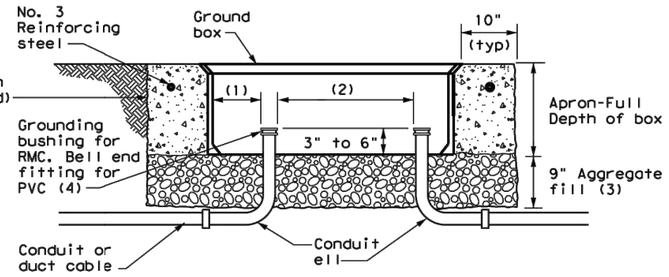


PLAN VIEW



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.

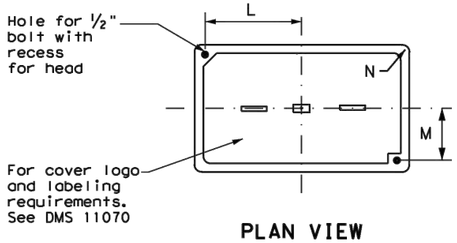
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

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

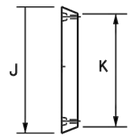
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

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

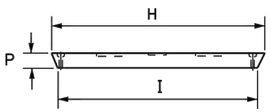
GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



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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FILE:

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

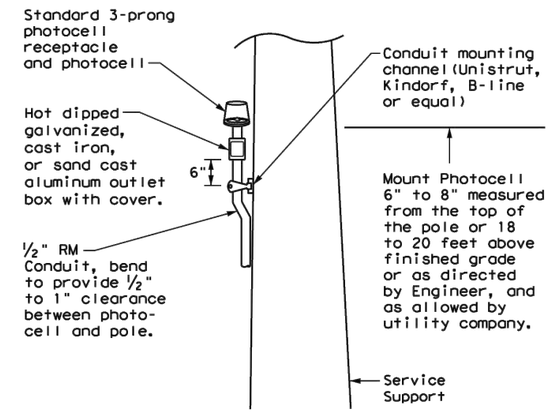
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

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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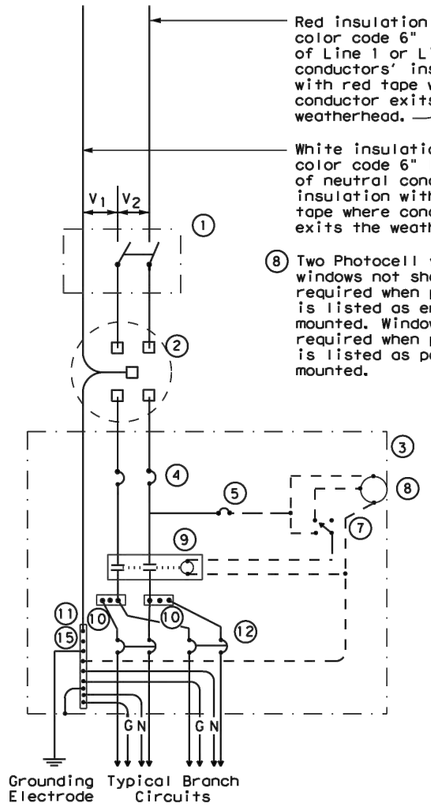
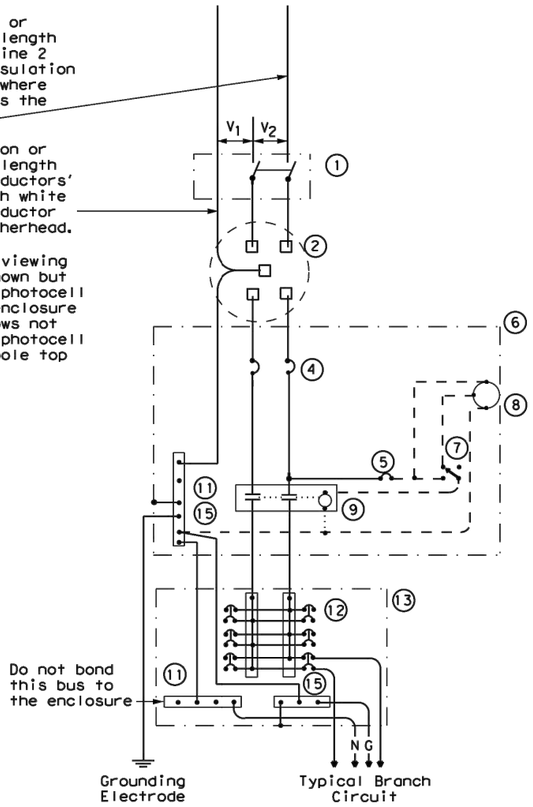
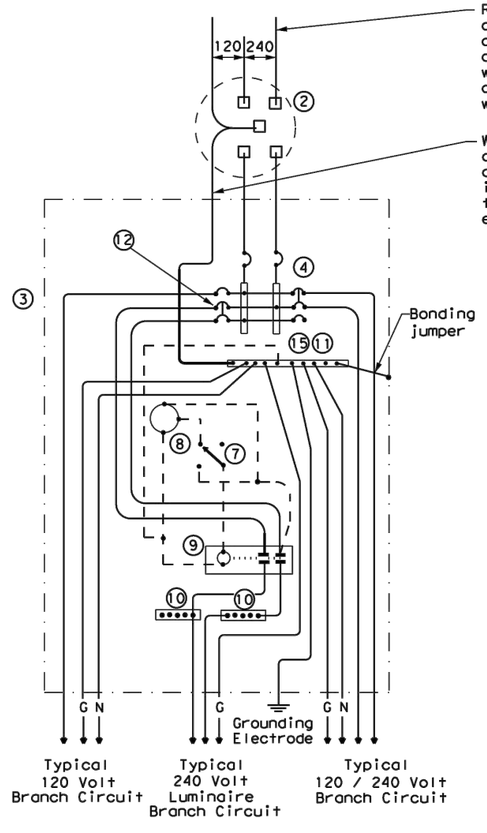


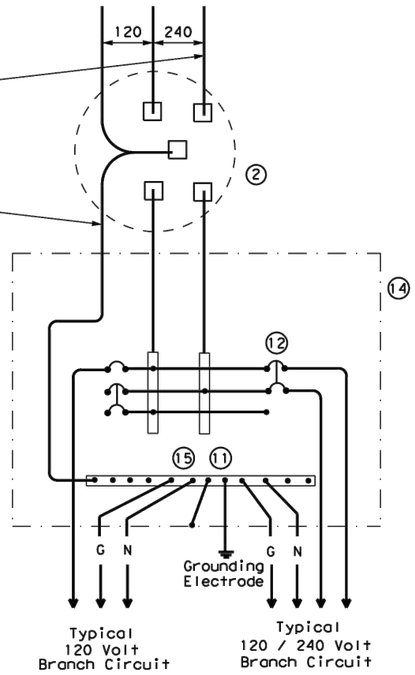
SCHEMATIC TYPE A
THREE WIRE



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

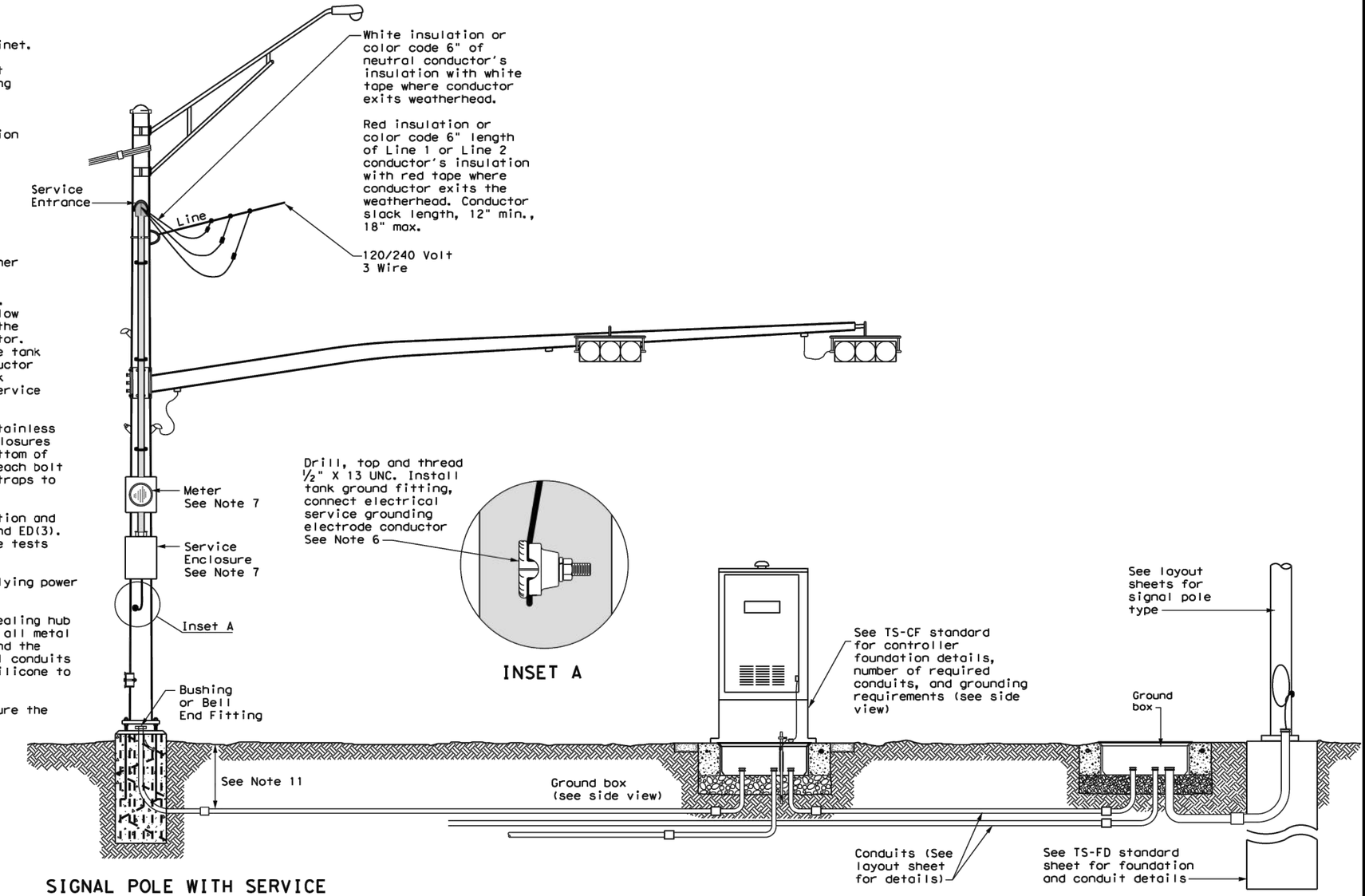
FILE: ed6-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		65

71F

DATE:
FILE:

TRAFFIC SIGNAL NOTES

1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".

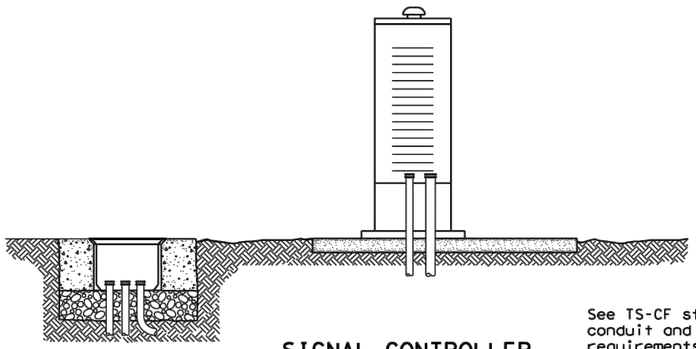


SIGNAL POLE WITH SERVICE

Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE



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.

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
REVISIONS	0902	90	208	RISINGER RD
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		66

71H

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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.

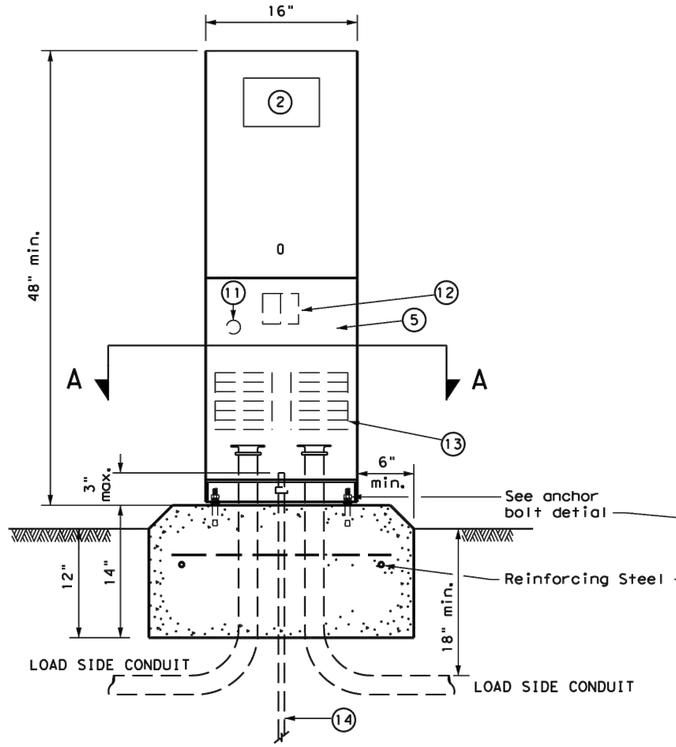
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install ½ in. X 2 5/16 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.

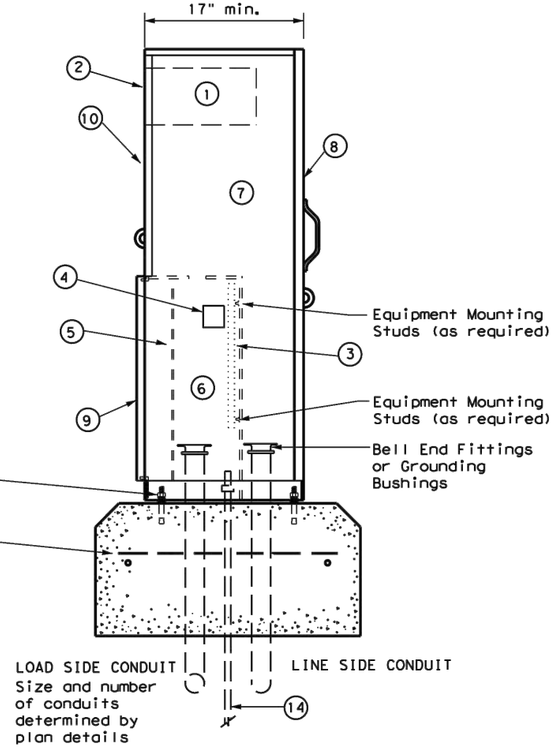
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to 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.

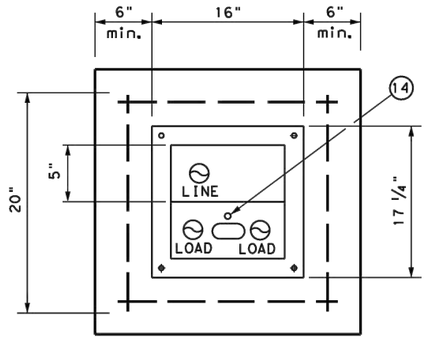


FRONT VIEW

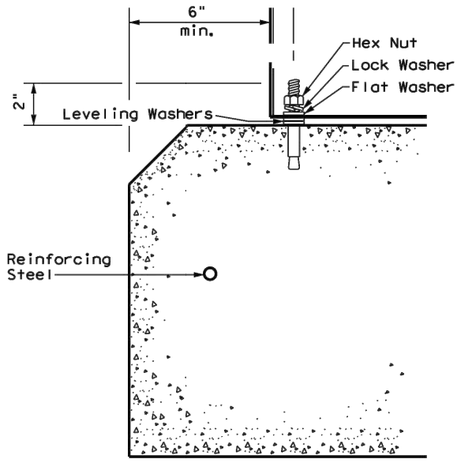


SIDE VIEW

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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REVISIONS	0902	90	208	RISINGER RD
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		67

71J

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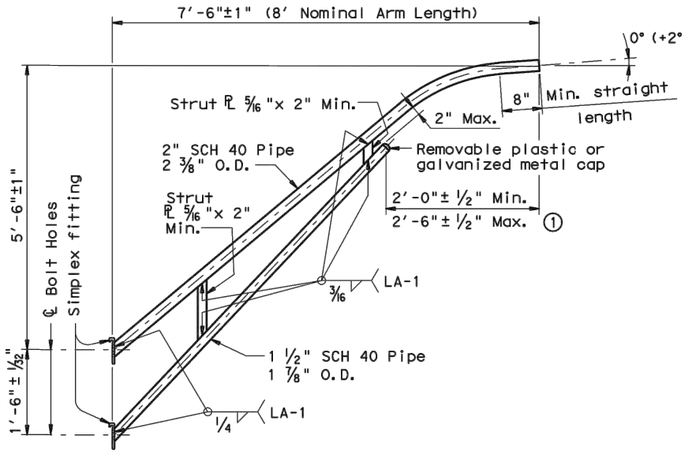
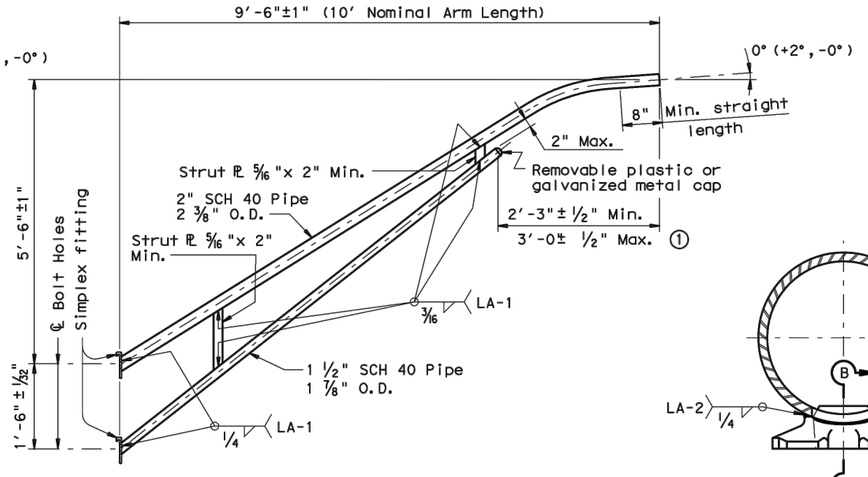


8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM

DIRECT ATTACHMENT DETAIL

MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr.65-35 or A148 Gr.80-50, A576 Gr.1021 (3), or A36 (Arm only)
Arm Pipes	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50 (4), or A1011 HSLAS-F Gr.50 (4)
Arm Strut Plates (2)	ASTM A36, A572 Gr.50 (4), or A588
Misc.	ASTM designations as noted

(1) Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

(2) Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

(3) A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

(4) ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft.

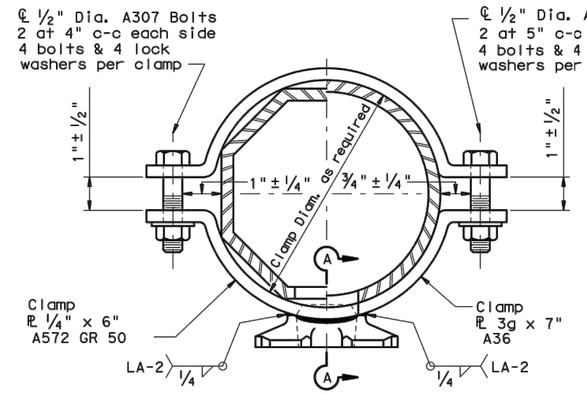
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absense of specified Fabricaton tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

Unless otherwise noted, all parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing".

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

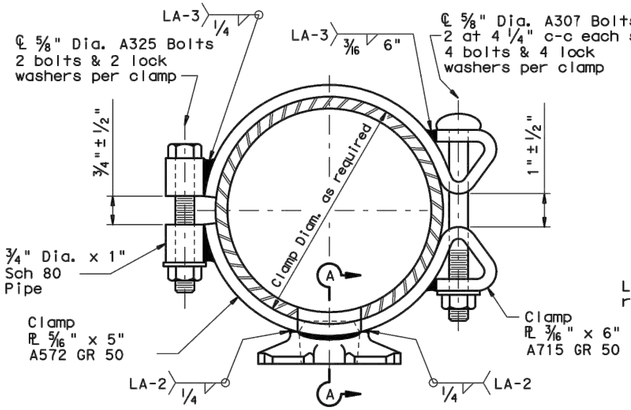
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.



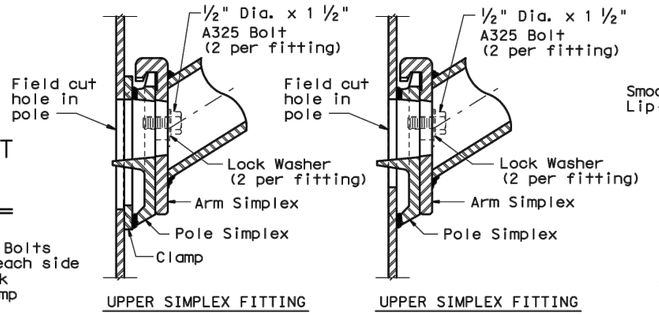
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



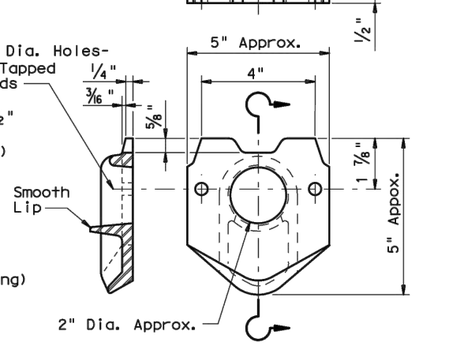
CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)

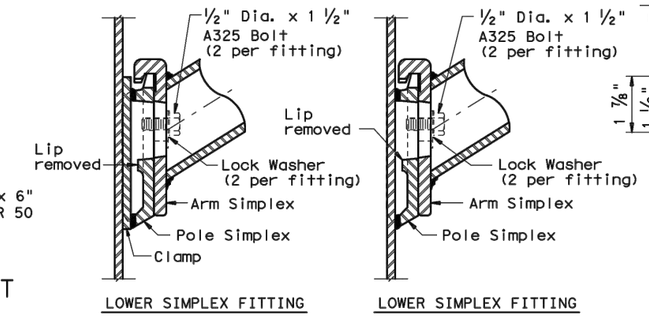


UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING



POLE SIMPLEX DETAIL

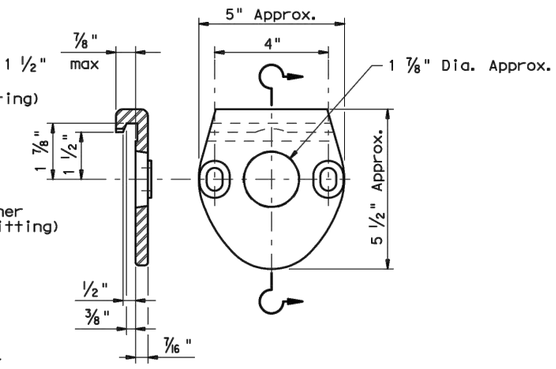


LOWER SIMPLEX FITTING

LOWER SIMPLEX FITTING

SECTON A-A

SECTON B-B



ARM SIMPLEX DETAIL

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

LUM-A-12

REVISIONS	DN: LEH	CK: JSY	DW: LTT	CK: TEB
5-96	CONT	SECT	JOB	HIGHWAY
1-99	0902	90	208	RISINGER RD
1-12	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		68

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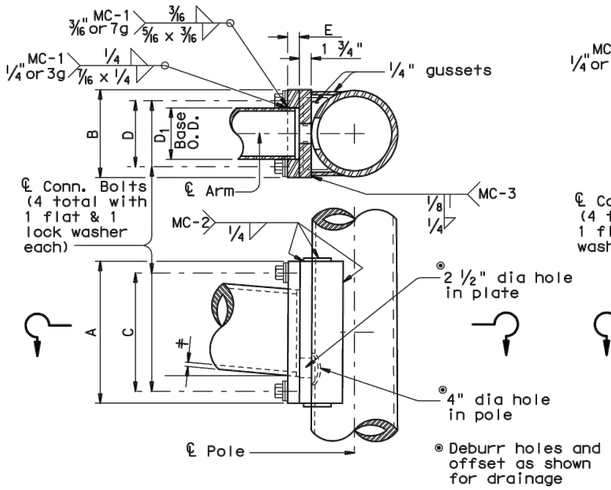
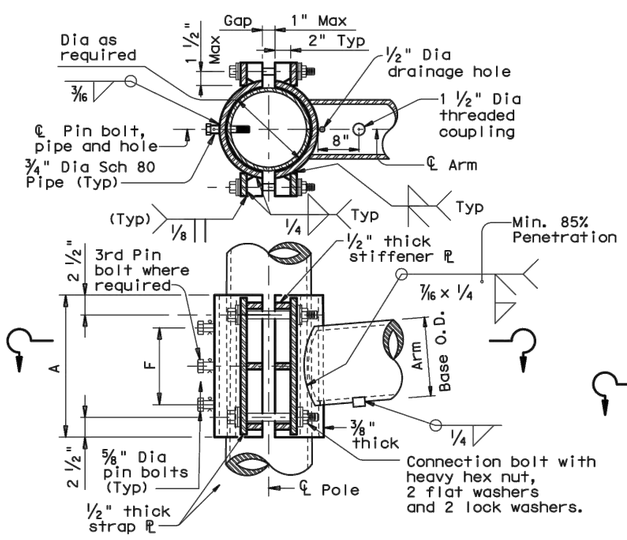
DATE:
FILE:

ARM SIZE D_1 in.	ARM SIZE ∓ in.	A in.	B in.	C in.	D in.	E in.	CONN BOLT DIA in.
6.5	.179	12	9	9	6	1 3/4	1
7.5	.179	13	9	10	6	1 3/4	1
8.0	.179	14	10	11	7	2	1 1/4
9.0	.179	16	11	13	8	2	1 1/4
9.5	.179	17	12	14	9	2	1 1/4
9.5	.239	18	12	15	9	2	1 1/4
10.0	.239	18	12	15	9	2	1 1/4
10.5	.239	18	13	15	10	3	1 1/2
11.0	.239	18	13	15	10	3	1 1/2



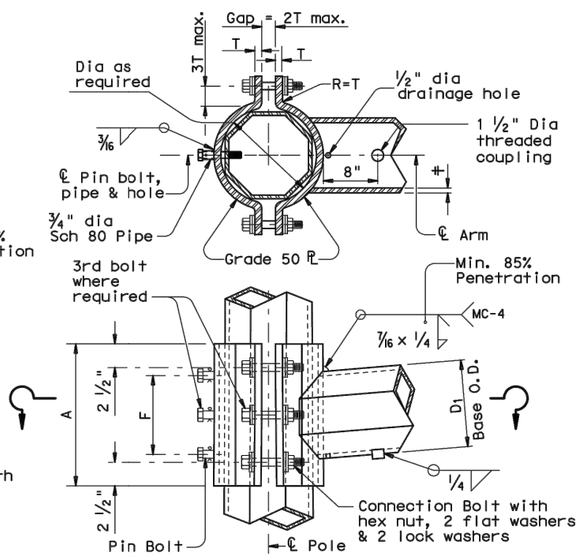
FIXED MOUNT DETAIL 1

ARM SIZE D_1 in.	ARM SIZE ∓ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	4	1 1/4	3	5/8
9.5	.239	18	12	4	1 1/4	3	5/8
10.0	.239	18	12	4	1 1/4	3	5/8



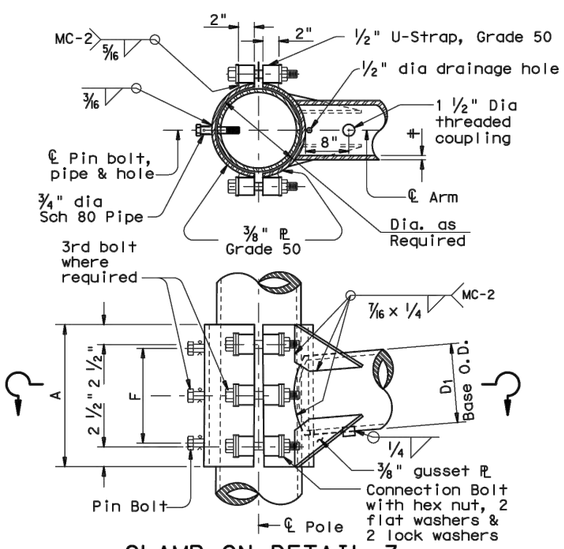
CLAMP-ON DETAIL 1

ARM SIZE D_1 in.	ARM SIZE ∓ in.	A in.	F in.	T in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
7.0	.179	12	6	3/4	4	3/4	2	5/8
7.5	.179	14	8	3/4	4	3/4	2	5/8
8.0	.179	14	8	3/4	4	3/4	2	5/8
9.0	.179	16	10	7/8	4	1	2	5/8
10.0	.179	18	10	7/8	4	1	2	5/8
9.5	.239	18	10	1	6	1	3	5/8
10.0	.239	18	10	1	6	1	3	5/8

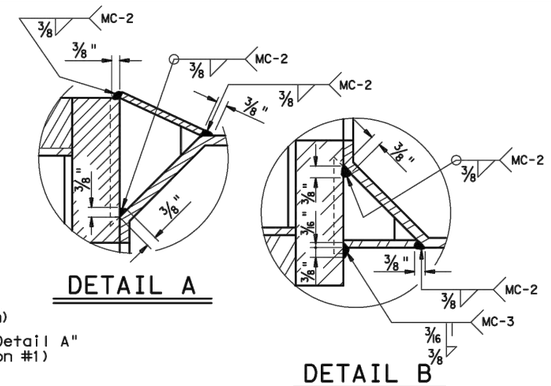


CLAMP-ON DETAIL 2

ARM SIZE D_1 in.	ARM SIZE ∓ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	6	1	3	5/8
9.5	.239	18	12	6	1	3	5/8
10.0	.239	18	12	6	1	3	5/8

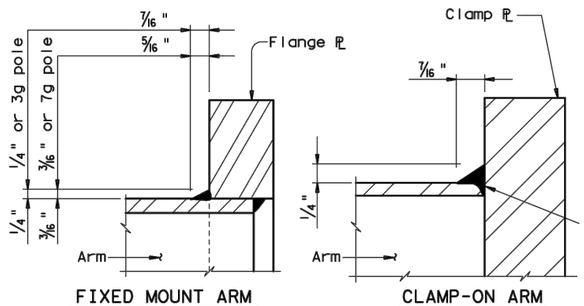


CLAMP-ON DETAIL 3



DETAIL A

DETAIL B



FIXED MOUNT ARM

CLAMP-ON ARM

ARM BASE WELD DETAILS

MATERIALS	
Round Shafts or Polygonal Shafts ①	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 ②
Plates ①	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 or A449, except where noted
Pin Bolts	ASTM A325
Pipe ①	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

① ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

② ASTM A1011 SS Gr.50 material shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 1/2" wide vertical slotted hole shall be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

Where duplicate parts occur on a detail, welds shown for one part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and 3/4" dia pipe shall have 3/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a 3/4" dia hole for each pin bolt. An 11/16" dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST ARM CONNECTIONS

MA-C-12

REVISIONS	DN: MS	CK: JSY	DW: MMF	CK: JSY
5-96	CONT	SECT	JOB	HIGHWAY
5-09	0902	90	208	RISINGER RD
1-12	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		69

126A

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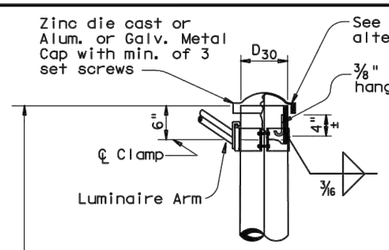
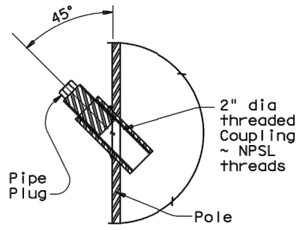
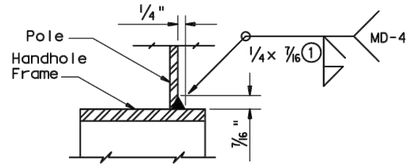


DETAIL A

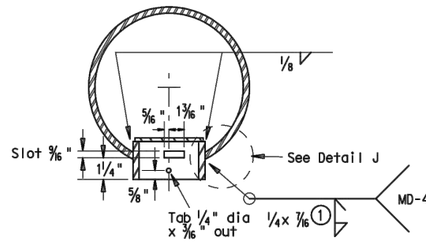
(for pole with luminaire)



POLE COUPLING DETAIL

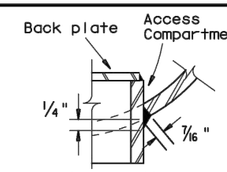


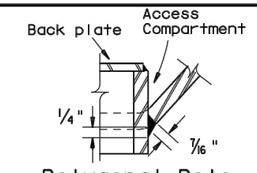
DETAIL G



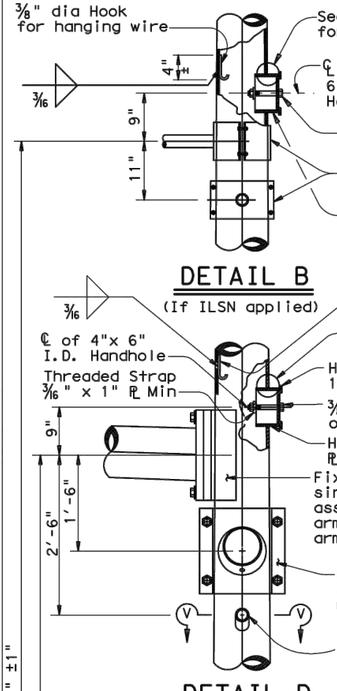
SECTION X-X

Opening for access compartment shall be no more than 1⁄16 inch wider than the access compartment itself.



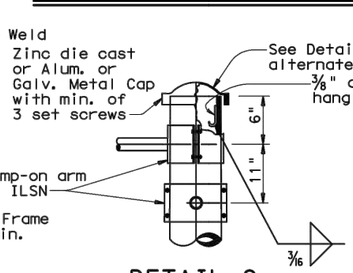


DETAIL J

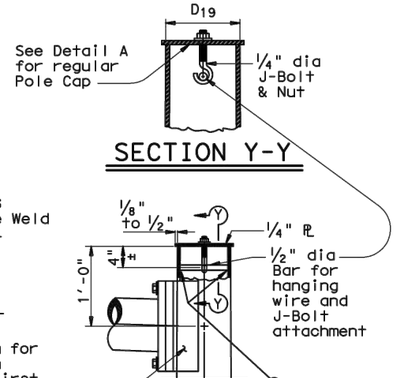


DETAIL B

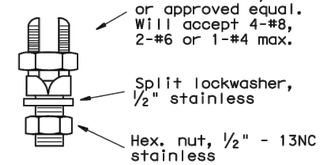
(If ILSN applied)



DETAIL C



SECTION Y-Y

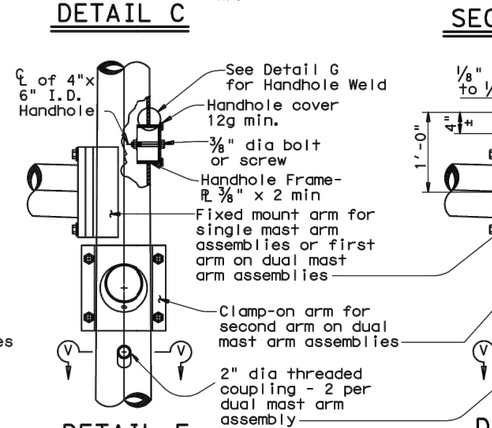


COPPER GROUND CONNECTOR

ACCESS COMPARTMENT

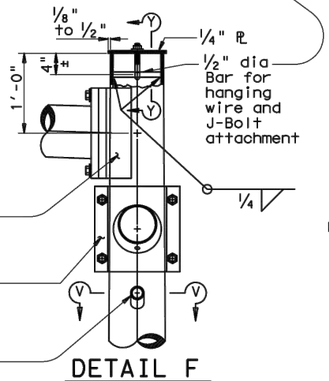
DETAIL D

(for 30' pole with luminaire and ILSN sign)



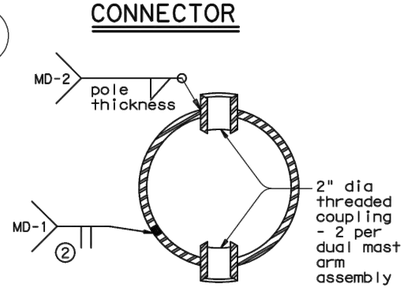
DETAIL E

(for 24' pole with ILSN sign and no luminaire)



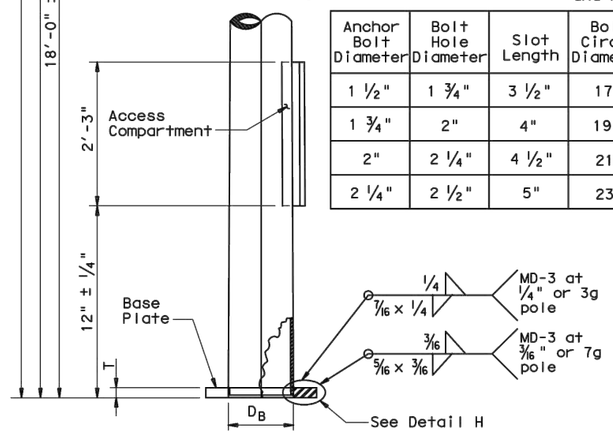
DETAIL F

(for 19' pole with no ILSN sign and no luminaire)

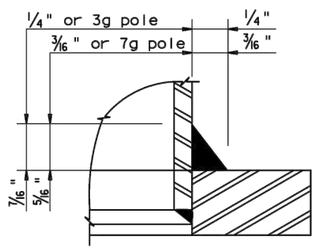


SECTION V-V

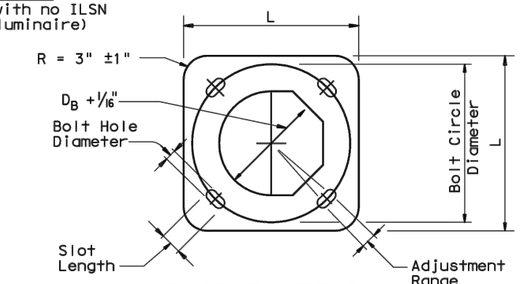
Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base ℞ Dim. L x T	Adjust. Range
1 ½"	1 ¾"	3 ½"	17"	18" x 1 ½"	13.4°
1 ¾"	2"	4"	19"	20" x 1 ¾"	13.5°
2"	2 ¼"	4 ½"	21"	22" x 2"	13.6°
2 ¼"	2 ½"	5"	23"	24" x 2 ¼"	13.7°



POLE ELEVATION



DETAIL H



BASE PLATE PLAN

① 85% Min. penetration

② 60% Min. penetration 100% pemetration within 6" of circumferential base welds.

NOTES:

1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 ¼" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

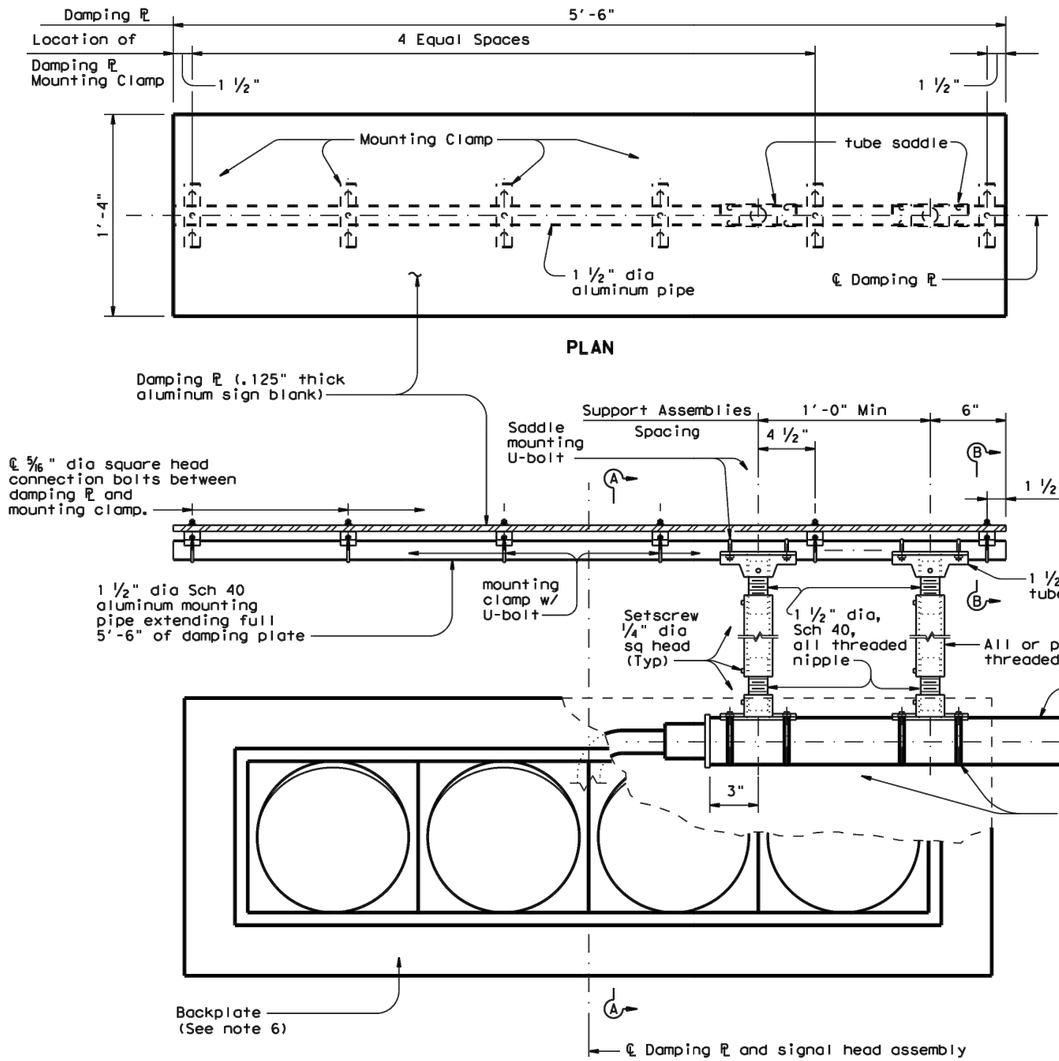
MA-D-12

REVISIONS
8-99
1-12

DN: MS	CK: JSY	DW: FDN	CK: CAL

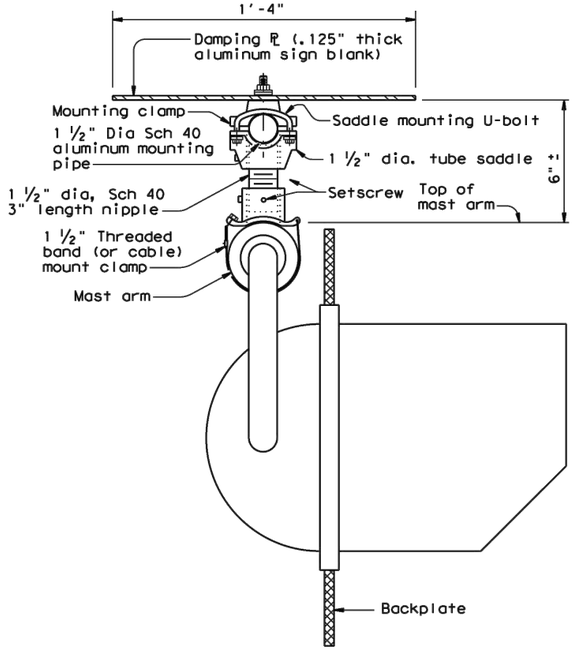
CONT	SECT	JOB	HIGHWAY
0902	90	208	RISINGER RD
DIST	COUNTY		SHEET NO.
FTW	TARRANT		70

DATE:
FILE:



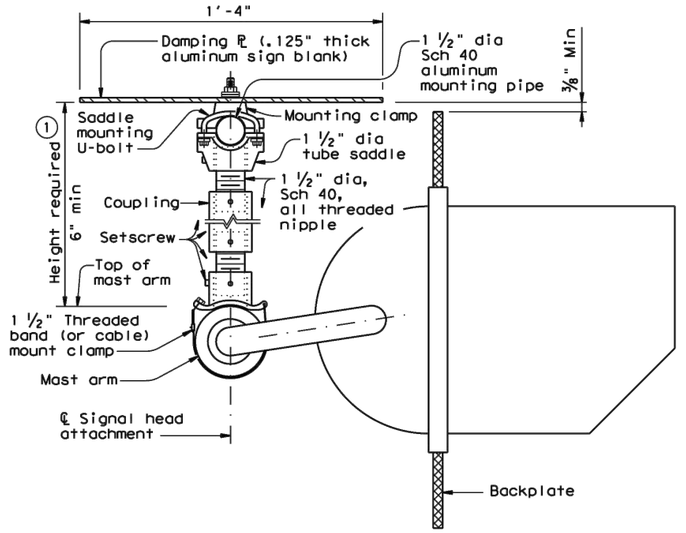
DAMPING PLATE MOUNTING DETAILS

(Showing alternate placement of signal head)



SECTION A-A

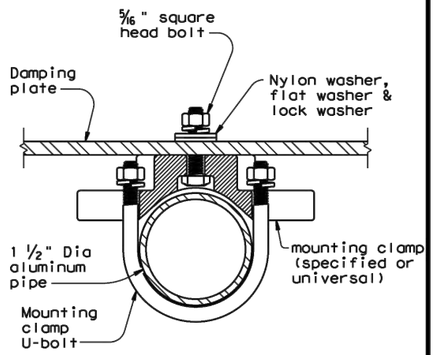
(Showing standard placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)



SECTION A-A

(Showing alternate placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)

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



SECTION B-B

(Showing damping plate attachment)

GENERAL NOTES:

1. In accordance with the findings of TxDOT sponsored research, the installation of a damping plate in accordance with the details shown here at the end of signal mast arms of SMA and DMA standard structures reduces excessive harmonic vertical vibration, and thus fatigue damage. Any deviation from these details may reduce the effectiveness of this damping device.
2. Aluminum sign blank for damping plate will conform to Departmental Material Specifications DMS-7110. Materials for mast arm mounting clamp and tube saddle will be aluminum castings or aluminum alloys as in accordance with manufacturers' stipulations. Mounting pipe, pipe nipple and coupling will be aluminum alloy 6061-T6 or 6063-T6. Damping plate mounting clamp and u-bolt assemblies will conform to Standard sheet SMD(GEN). U-bolts for saddle mounting will have a minimum yield strength of 36 ksi.
3. Damping plate will be mounted horizontally. Position centerline of damping plate to align with centerline of mast arm or horizontal signal head assembly. Vertical clearance between signal head (with or without backing plate)and bottom of damping plate will be maintained as shown. The attachments shown here are examples only, other supporting details which meet both alignment and vertical clearance requirements are also acceptable.
4. Unless stipulated by the manufacturers, all steel parts will be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".
5. Contractor will verify applicable field dimensions before the installation.
6. Backplates are optional for traffic signals. When backplates are used, Backplates will have a 2-inch fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 "Sign Face Materials." See Sheet TS-BP-20 for backplate details.

Texas Department of Transportation

Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

FILE: ma-dpd-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
6-20	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		71

ROADWAY ILLUMINATION ASSEMBLY NOTES

1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.

2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. 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, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.

4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.

5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.

   a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.

   b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25' above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 6th Edition (2013) of the AASHTO Design Specifications. For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25' above the surrounding terrain, provide poles meeting the following requirements:

      i. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).

      ii. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to resist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.

6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.

7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.

8. Install T-Base with following procedure:

   a. Anchor Bolt Tightening.

      i. Coat the threads of the anchor bolts with electrically conductive lubricant.

      ii. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.

      iii. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.

      iv. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.

      v. Check top of T-base for level. If not level then foundation must be leveled.

   b. Top Bolt Procedure

      i. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.

      ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."

      iii. Tighten each nut to 150 ft-lb. using a torque wrench.

   c. Level and Plumb

      i. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.

9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).

10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150W HPS or 150W EQ LED.

11. Mount luminaires on arms level as shown by the luminaire level indicator.

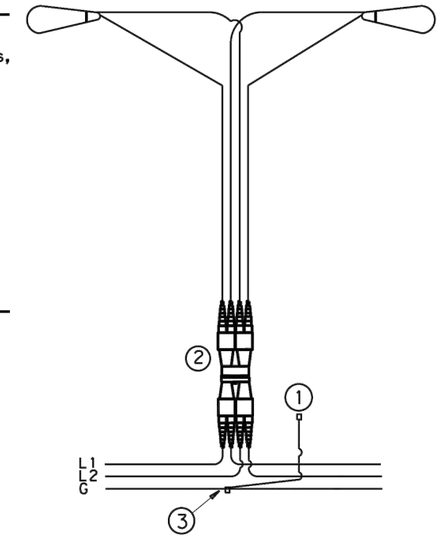
12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

Wiring Diagram Notes:

(1) Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.

(2) Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.

(3) Split Bolt or other connector.



L1,L2 = Hot Conductors
G = Grounding Conductor

TYPICAL WIRING DIAGRAM

LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.

Decorative LED Lighting Notes:

1. LED Drivers in Remote Outdoor enclosures (for drivers that do not include an enclosure as part of a factory assembly):

   a. Provide NEMA 3R outdoor enclosure or as approved.

   b. Install enclosure at least 12" above ground or other horizontal surface. Mount vertically or on ceiling, and avoid direct sun where possible.

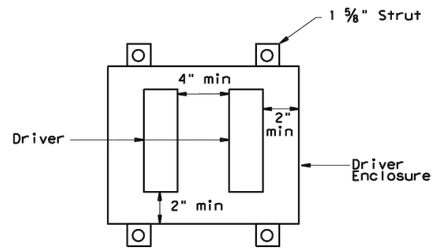
   c. Install drivers with at least 2 inches of space from enclosure walls.

   d. For multiple drivers in an enclosure, provide at least 4 inches side to side and 1 inch end to end from other drivers or electronic equipment

   e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.

   f. Provide remote drivers with a maximum of 100 watts

   g. Provide drivers with documentation of 100,000 hr lifetime at Tcase of 65C or higher.



Driver Spacing In Remote Enclosure

Texas Department of Transportation — Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS

RID(1)-20

FILE: rid1-20.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
7-17	DIST	COUNTY		SHEET NO.
12-20	FTW	TARRANT		72

72A

DATE:
FILE:

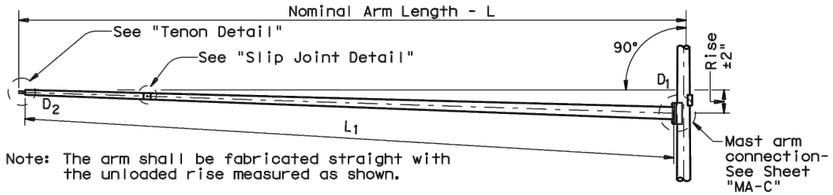
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
32	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
36	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
40	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
44	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
48	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	① thk	Rise	L_1	D_1	② D_2	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"
48	47.0	10.5	4.1	.239	3'-4"	47.0	11.0	3.5	.239	2'-9"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.

② D_2 may be increased by up to 1" for polygonal arms.



Note: The arm shall be fabricated straight with the unloaded rise measured as shown.

TRAFFIC SIGNAL ARM

(Fixed Mount)

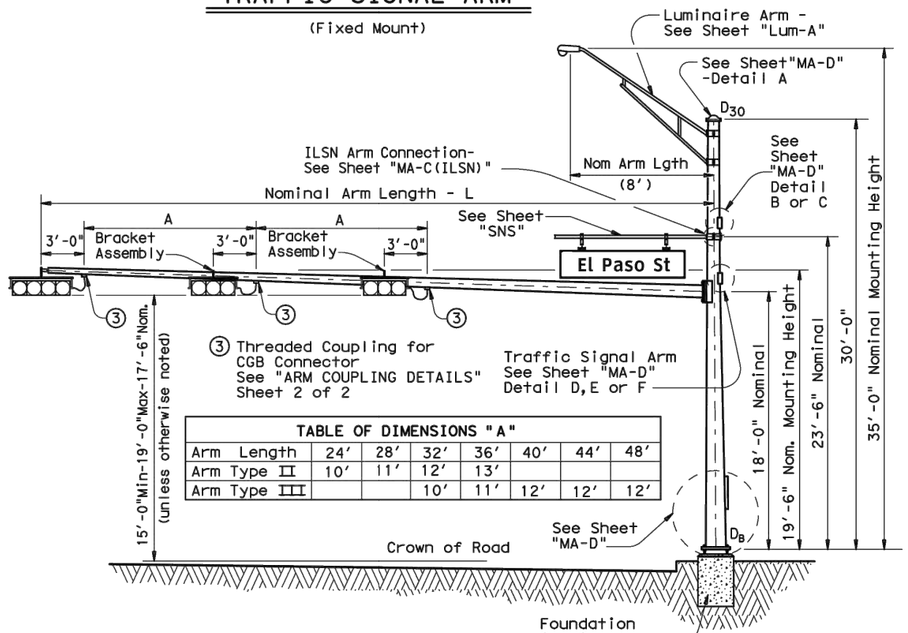


TABLE OF DIMENSIONS "A"

Arm Length	24'	28'	32'	36'	40'	44'	48'
Arm Type II	10'	11'	12'	13'			
Arm Type III			10'	11'	12'	12'	12'

STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-80		20S-80		20-80	
24	24L-80		24S-80		24-80	
28	28L-80		28S-80		28-80	
32	32L-80	1	32S-80		32-80	
36	36L-80		36S-80		36-80	
40	40L-80		40S-80		40-80	1
44	44L-80		44S-80		44-80	
48	48L-80	1	48S-80		48-80	1

Traffic Signal Arms (1 per Pole) Ship each arm with the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors		2 Bracket Assemblies and 3 CGB Connectors	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80	1	32III-80	
36			36II-80		36III-80	
40					40III-80	1
44					44III-80	
48					48III-80	2

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	2

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

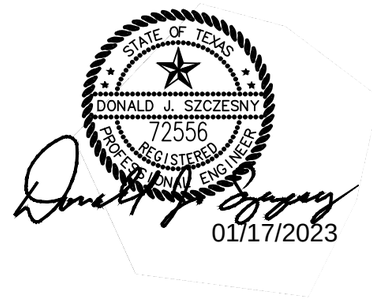
Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ½"	3'-4"	1
1 ¾"	3'-10"	3

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

SHEET 1 OF 2



Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(1)-12

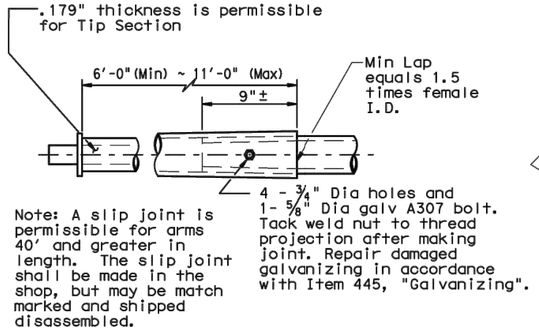
DN: MS	CK: JSY	DW: MWF	CK: JSY

REVISIONS
5-96
11-99
1-12

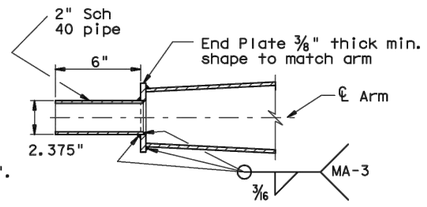
CONT	SECT	JOB	HIGHWAY
0902	90	208	RISINGER RD
DIST	COUNTY		SHEET NO.
FTW	TARRANT		73

DATE:
FILE:

122A



SLIP JOINT DETAIL



TENON DETAIL

VIBRATION WARNING

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

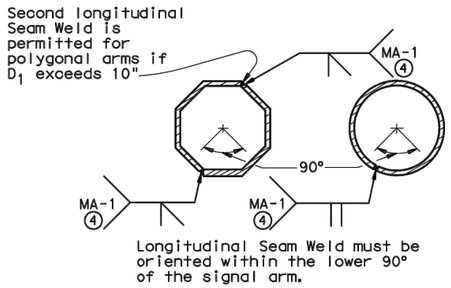
If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backpates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

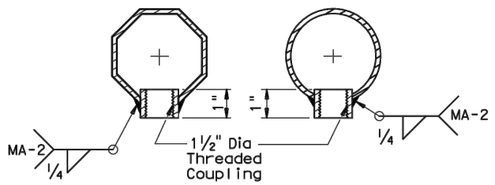
Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

④ 60% Min. penetration 100% pemetration within 6" of circumferential base welds.



ARM COUPLING DETAILS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor.

Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective projected area of 1.6 sq ft. The specified internally lighted street name sign load applied 4.5 ft from the centerline of the pole equals 85 lbs vertical dead load plus horizontal wind load on an effective projected area of 11.5 sq ft. The specified signal load applied at the end of the traffic signal arm equals 180 lbs vertical dead load plus the horizontal wind load on an effective projected area of 32.4 sq ft (actual area times drag coefficient).

See Standard Sheet "MA-D" for pole details, "MA-C" for traffic signal arm connection details, "MA-C (ILSN)" for internally lighted street name sign arm connection details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details. See "MA-C" for material specifications.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(2)-12

DN: MS	CK: JSY	DW: MMF	CK: JSY

REVISIONS
5-96
1-12

CONT	SECT	JOB	HIGHWAY
0902	90	208	RISINGER RD
DIST	COUNTY		SHEET NO.
FTW	TARRANT		74

DATE:
FILE:

122B

FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④,⑤,⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft 10	15	40	ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

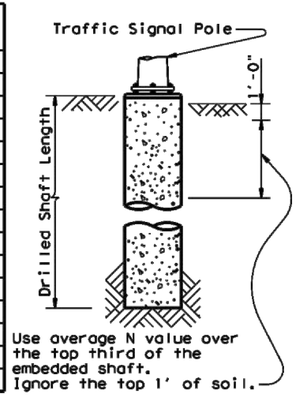
FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET) 24-A	30-A	36-A	36-B	42-A
T-1 at Risinger	15	36-A	1			13		
P-1 at Risinger	15	24-A	1	6				
T-2 at Risinger	15	36-A	1			13		
T-3 at Risinger	15	36-A	1		11			
P-2 at Risinger	15	24-A	1	6				
T-4 at Risinger	15	36-A	1			13		
TOTAL DRILLED SHAFT LENGTHS				12*	11	39		

*subsidiary

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'



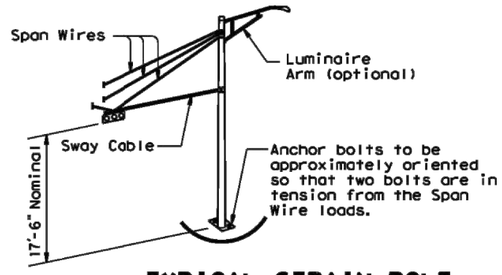
Use average N value over the top third of the embedded shaft. Ignore the top 1' of soil.

ANCHOR BOLT & TEMPLATE SIZES

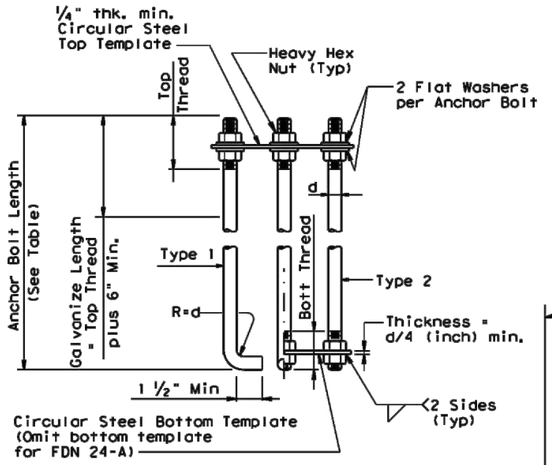
BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

EXAMPLE:
1. For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
2. For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



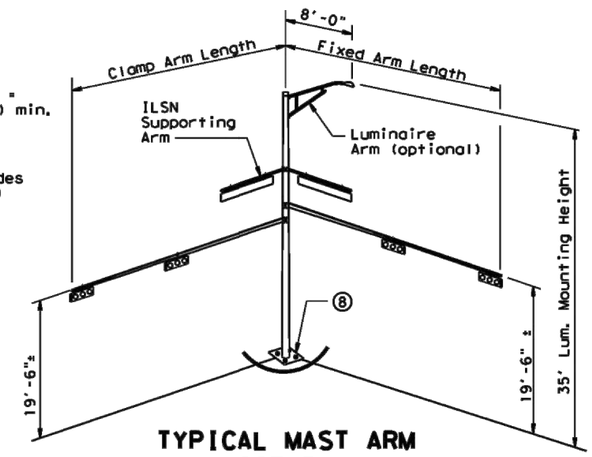
TYPICAL STRAIN POLE ASSEMBLY



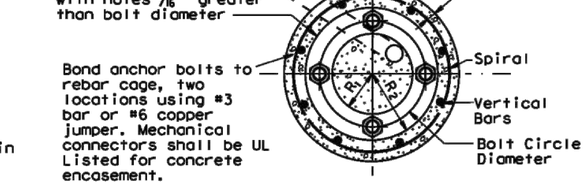
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

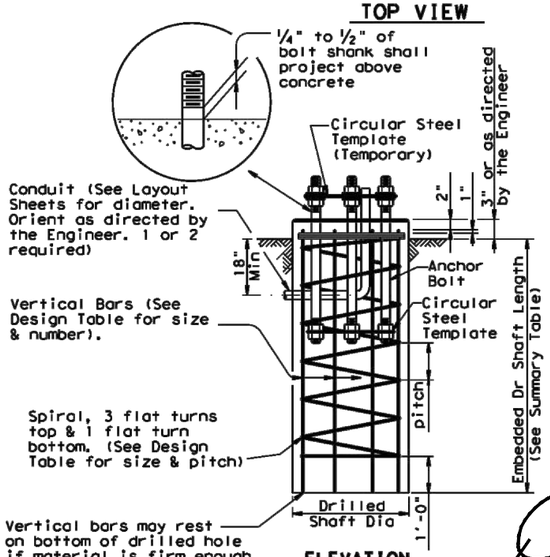
⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.



TYPICAL MAST ARM ASSEMBLY



TOP VIEW



ELEVATION

FOUNDATION DETAILS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED PROFESSIONAL ENGINEER
01/17/2023

Texas Department of Transportation
Traffic Operations Division

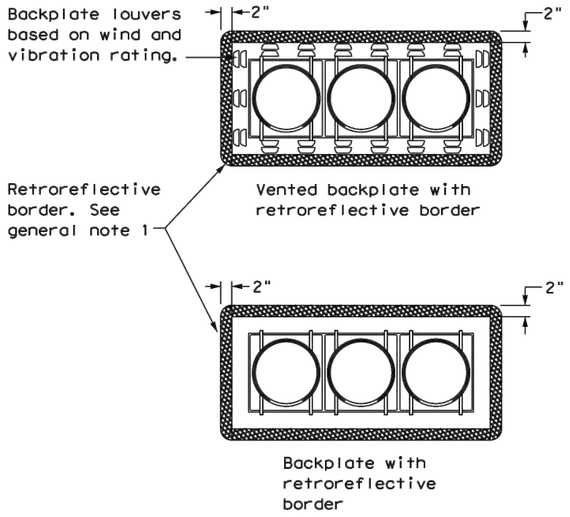
TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

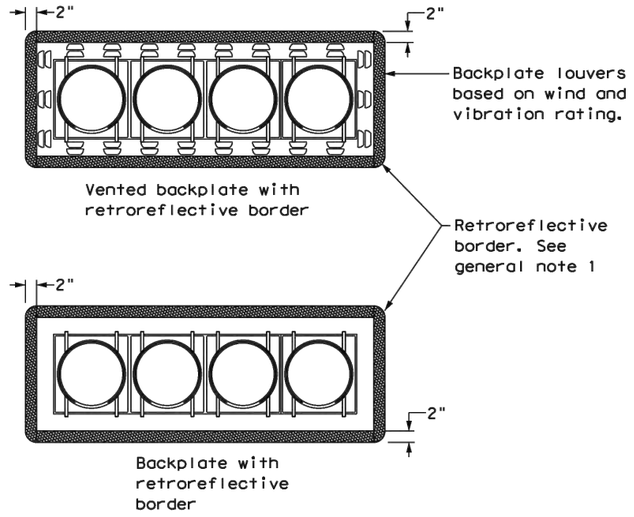
REVISIONS	DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB
5-96 11-98 1-12	CONT	SECT	JOB	HIGHWAY
	0902	90	208	RISINGER RD
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		75

DATE:
FILE:

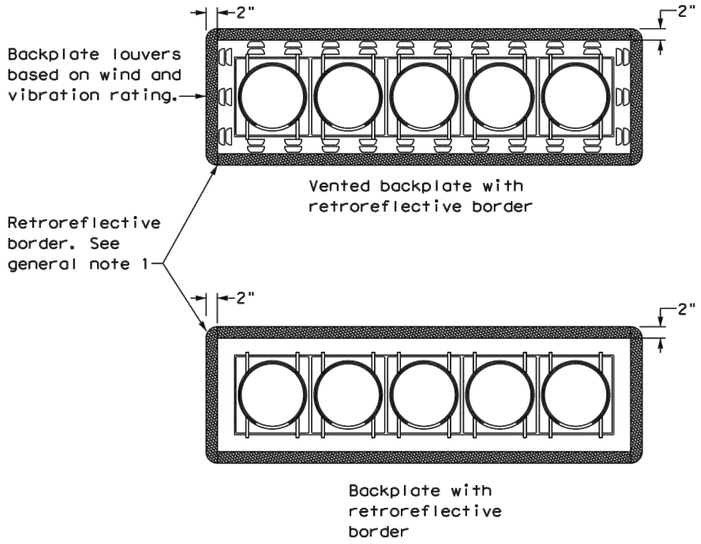
DATE:
FILE:



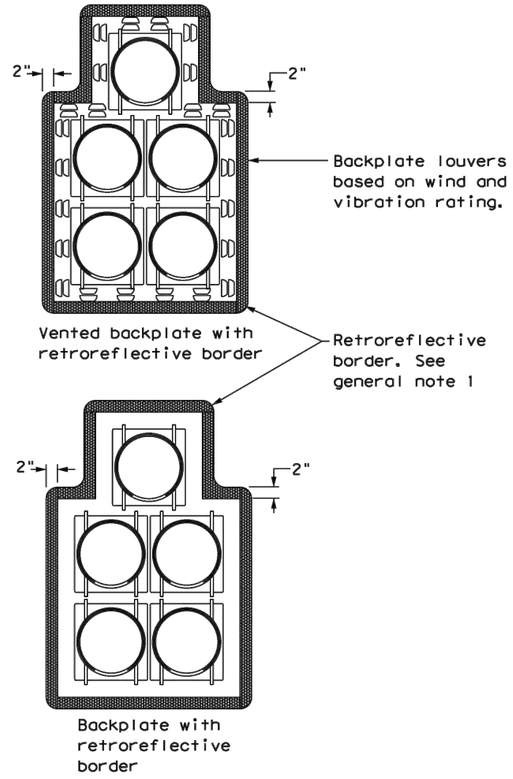
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



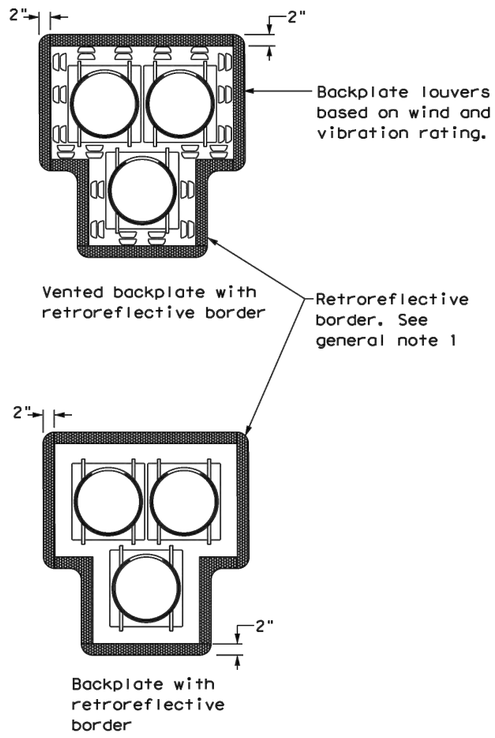
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



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

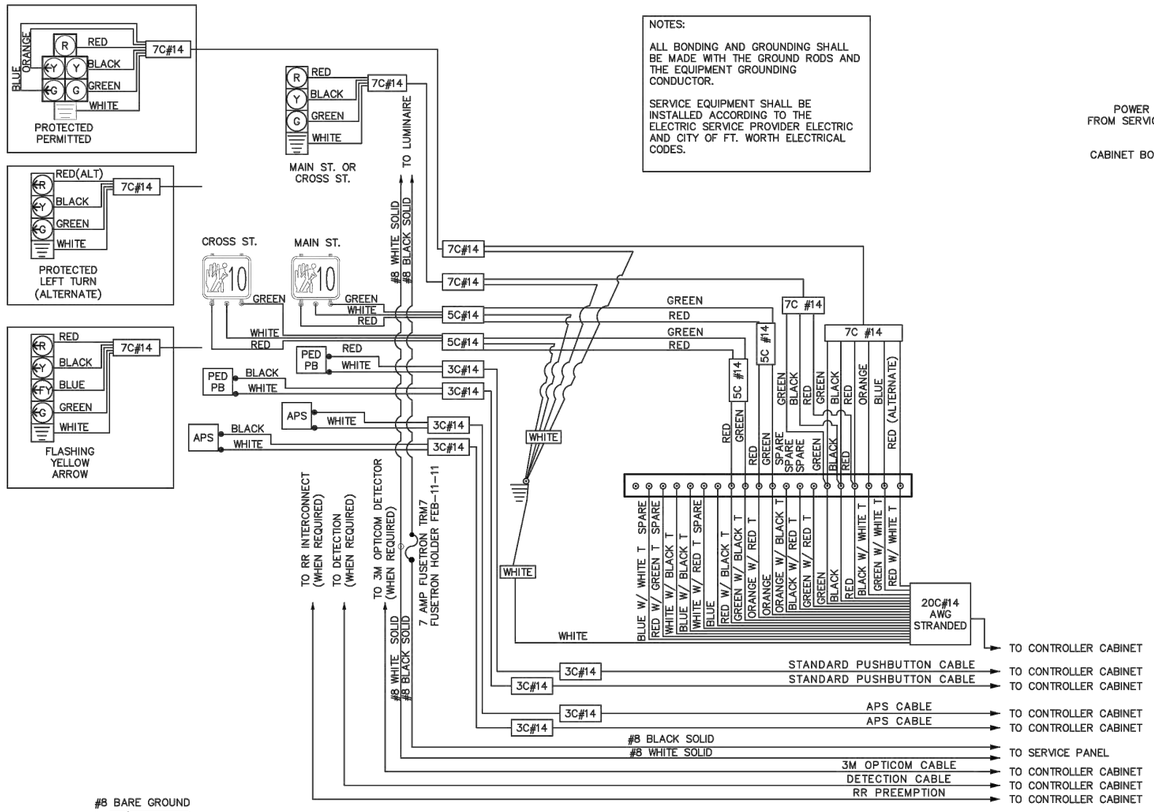
Texas Department of Transportation

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
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		76



NOTES:

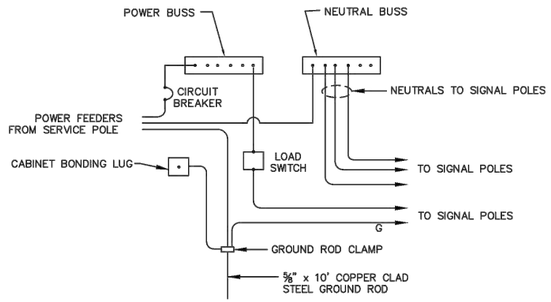
ALL BONDING AND GROUNDING SHALL BE MADE WITH THE GROUND RODS AND THE EQUIPMENT GROUNDING CONDUCTOR.

SERVICE EQUIPMENT SHALL BE INSTALLED ACCORDING TO THE ELECTRIC SERVICE PROVIDER ELECTRIC AND CITY OF FT. WORTH ELECTRICAL CODES.

CONNECTIONS AT POLE BASE

TYPICAL POLE WIRING SCHEMATIC

NOTE:
1. ALL WIRING CABLES SHALL BE AS SHOWN UNLESS NOTED OTHERWISE IN THE DRAWINGS.
2. USE 2C#12 AWG FOR APS PUSH BUTTON FOR LARGER LENGTHS BETWEEN PUSH BUTTONS AND CONTROLLER TO MINIMIZE VOLTAGE DROP.



CONNECTIONS AT SIGNAL CABINETS

POLE TO CABINET WIRING COLOR CHART
FOR 20 CONDUCTOR CABLE

SIGNAL NEUTRAL	WHITE
MAIN ST. OR CROSS ST. – RED	RED
MAIN ST. OR CROSS ST. – YELLOW	BLACK
MAIN ST. OR CROSS ST. – GREEN	GREEN
MAIN ST. OR CROSS ST. – LEFT TURN RED	RED/WHITE
MAIN ST. OR CROSS ST. – LEFT TURN YELLOW ARROW	BLACK/WHITE
MAIN ST. OR CROSS ST. – LEFT TURN GREEN ARROW	GREEN/WHITE
DW – MAIN ST.	ORANGE/RED
W – MAIN ST.	ORANGE
DW – CROSS ST.	RED/BLACK
W – CROSS ST.	GREEN/BLACK
SPARE RED NEAR SIDE HEAD	RED/GREEN
SPARE YELLOW	BLACK/RED
SPARE GREEN	GREEN/RED
SPARE	ORANGE/BLACK
SPARE FLASHING YELLOW ARROW	BLUE/WHITE

NOTE:

WRAP COLORED ELECTRICAL TAPE ON BOTH ENDS OF EACH 20 CONDUCTOR CABLE (AT CABINET AND AT SIGNAL POLE) AS FOLLOWS:
NORTH BOUND = GREEN,
SOUTH BOUND = RED,
WEST BOUND = BLUE AND
EAST BOUND = YELLOW.

NO SPLICES ARE ALLOWED

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL WIRING CONNECTION DETAILS

REVISED: 07-26-2021

34 41 10-D604

1/17/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1114
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

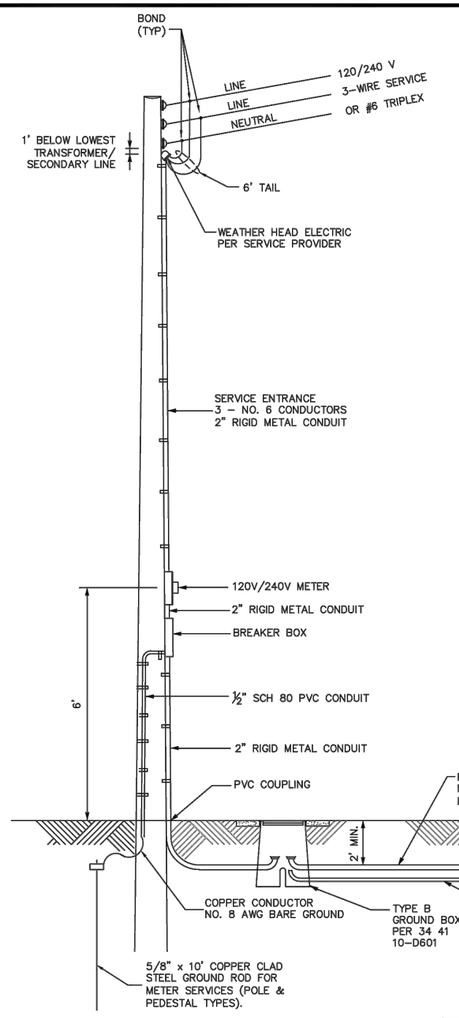
Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

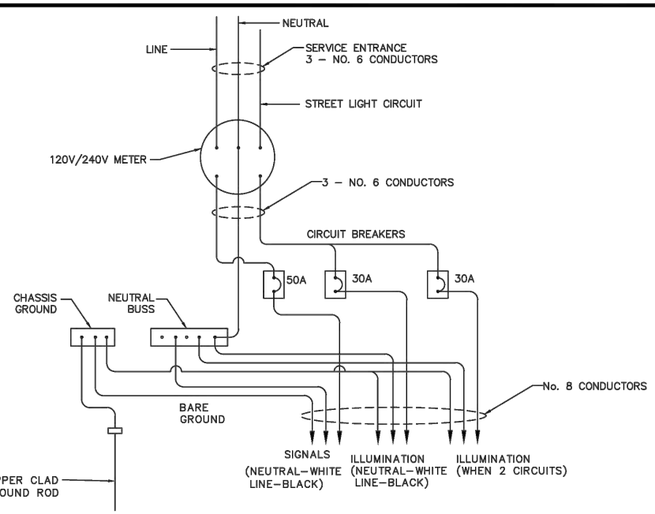
WIRING CONNECTION DETAILS - D604 (CITY OF FORT WORTH)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	77

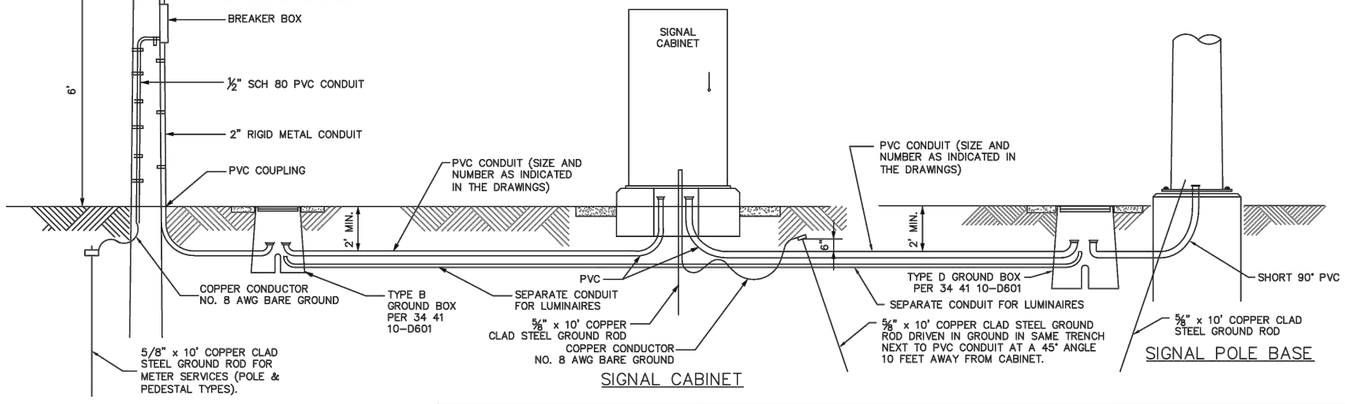
FULL PATH: G:\Production4000\005000\5081\017 - Risinger Rd & Garden Springs Dr Signal\Civil\Drawings\Plot Sheets
FILENAME: SGNL-DT.dwg
PLOTTED BY: Nick Stevens
PLOTTED WITH: _Adobe PDF.pc3



WOOD POLE SERVICE



120V/240V SERVICE ASSEMBLY SCHEMATIC



SIGNAL CABINET

SIGNAL POLE BASE

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL ELECTRICAL SERVICE DETAILS

REVISED: 11-19-2015

34 41 10-D602

1/17/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
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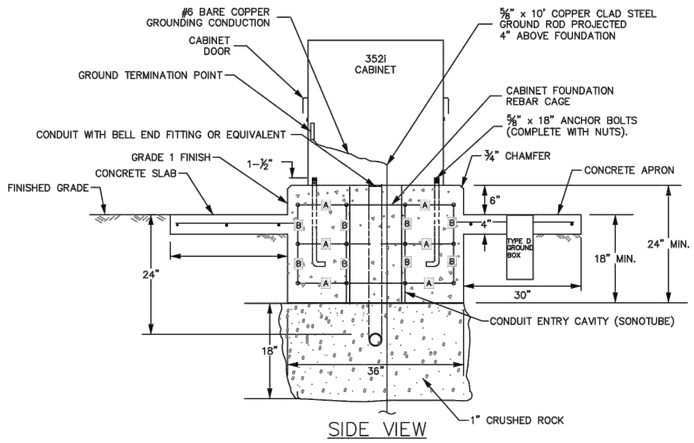
DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1174
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

RISINGER & GARDEN SPRINGS IMPROVEMENTS

ELECTRICAL SERVICE DETAILS - D602
(CITY OF FORT WORTH)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	78



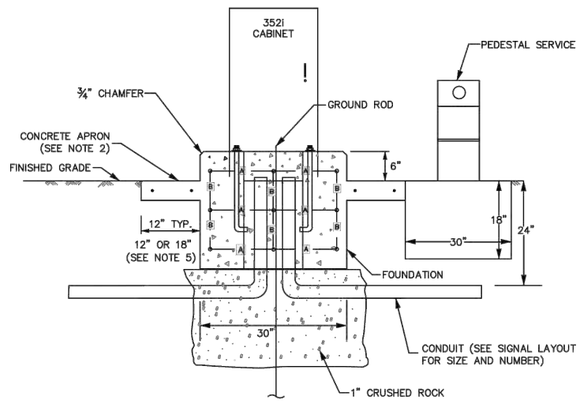
SIDE VIEW

NOTES:
1. ANCHOR BOLT THREADS SHALL BE TAPED PRIOR TO POURING CONCRETE.
2. ALL OR PART OF CONCRETE APRON MAY BE REQUIRED DEPENDING ON THE PLACEMENT OF CABINET FOUNDATION IN RELATION TO EXISTING CONDITIONS.
3. CAVITY IN FOUNDATION (SONOTUBE) ALLOWS FOR FUTURE PLACEMENT OF CONDUIT. CAVITY EXTENDS FROM TOP TO BOTTOM OF FOUNDATION. PLACE 1" CRUSHED STONE IN CAVITY TO WITHIN 4" FROM THE TOP OF THE FOUNDATION.
4. CONTROLLER FOUNDATION APRON SHALL BE CONSTRUCTED OF CLASS B CONCRETE RIP-RAP AND SHALL BE SUBSIDIARY TO THE CONTROLLER FOUNDATION.
5. CABINET FOUNDATION SHALL BE 8' x 5.5' IF A BATTERY BACK-UP UNIT IS ATTACHED TO THE CABINET.
6. FIELD TERMINATIONS SIDE OF CABINET SHALL FACE TOWARDS INTERSECTION.
7. INSTALL TYPE B GROUND BOX FOR ILLUMINATION CIRCUIT AS DETERMINED BY CITY TRAFFIC ENGINEER.
8. INSTALL PEDESTAL SERVICE ON THE SAME PAD AS CABINET FOUNDATION UNLESS THERE ARE OTHER SITE CONSTRAINTS.
9. LOCATION OF TYPE D GROUND BOX IN CONCRETE APRON WILL BE DETERMINED BY CITY TRAFFIC ENGINEER.
10. CONCRETE MIX DESIGN SHALL BE IN ACCORDANCE WITH CITY OF FORTH WORTH STANDARD SPECIFICATIONS DIVISION 03 30 00, CAST-IN-PLACE CONCRETE. CONTRACTOR SHALL USE A PRE-APPROVED CONCRETE MIX DESIGN OR SUBMIT PROPOSED MIX DESIGN FOR APPROVAL PRIOR TO CONSTRUCTION. CONCRETE FOR STRUCTURES SHALL BE CLASS S AND HAVE A MINIMUM 28-DAY COMPRESSION STRENGTH OF 3,600 PSI.

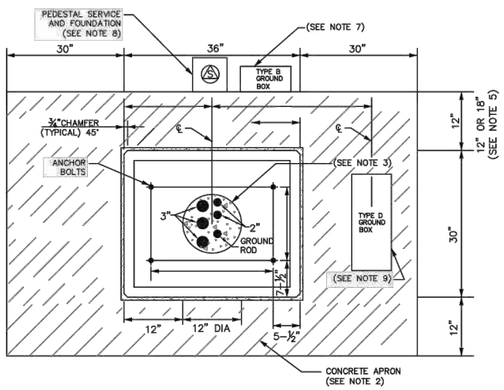
STEEL SUMMARY TABLE

BAR	NO. BARS	SIZE	LENGTH	SPACING
A	3	5	9'-8"	8" C.C.
B	10	5	2'-2"	VAR.
*C	6	3	1'- 8"	8.5" C.C.
**D	6	3	4'-0"	10" C.C.
E	6	3	0'-8"	10" C.C.
F	4	3	6'-8"	8" C.C.

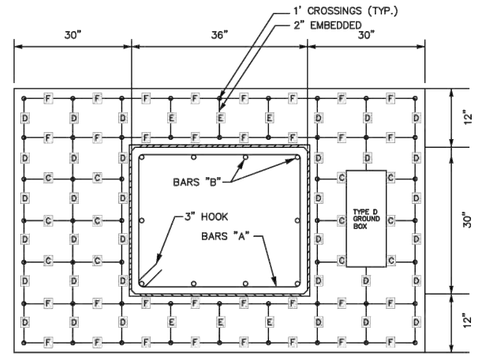
PROVIDE 2" MIN. COVER FOR TOP AND SIDES
* ADJUST THREE "C" BAR LENGTHS TO 9"-11" FOR GROUND BOX INSTALLATION
** ADJUST ONE "D" BAR LENGTH TO 14"-16" FOR GROUND BOX INSTALLATION



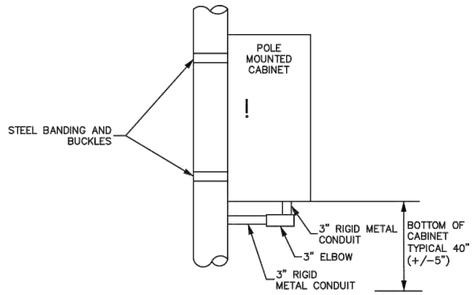
FRONT VIEW



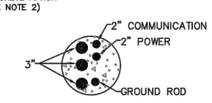
SIDEWALK / STREET SIDE
TOP VIEW
30" X 36"
CABINET FOUNDATION
WITH APRON



TOP VIEW
CONCRETE EMBEDDED REBAR AND CAGE DETAIL



POLE MOUNTED CABINET
(CABINET IS BANDED TO POLE)
FOR CABINETS MOUNTED TO TIMBER POLES, USE ATTACHMENT METHODS APPROVED BY ENGINER



CONDUIT DETAIL

FORT WORTH

CITY OF FORT WORTH, TEXAS
TRAFFIC SIGNAL
TYPE 352i SINGLE GROUND BOX FOUNDATION DETAIL

REVISED: 07-26-2021

34 41 10-D606

1/17/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

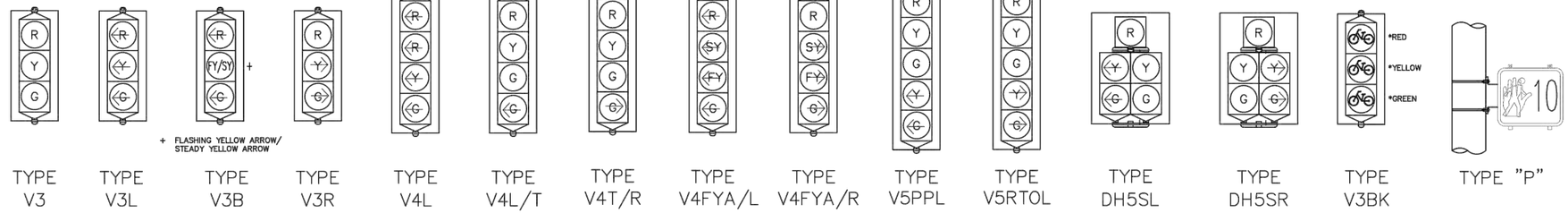
DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1114
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

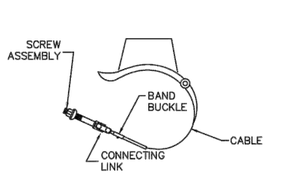
RISINGER & GARDEN SPRINGS IMPROVEMENTS

TYPE 352i CABINET - D606
(CITY OF FORT WORTH)

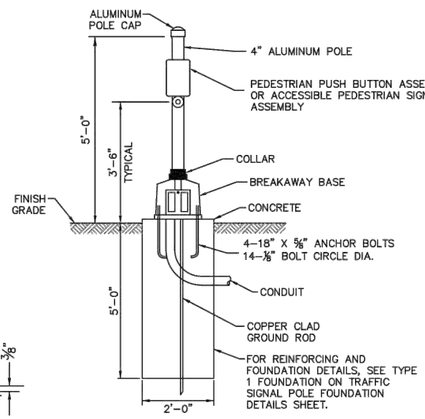
FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	79



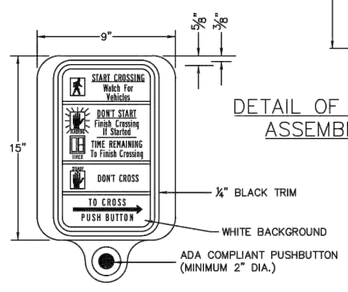
TRAFFIC SIGNAL HEADS



ASTRO BRAC ASSEMBLY

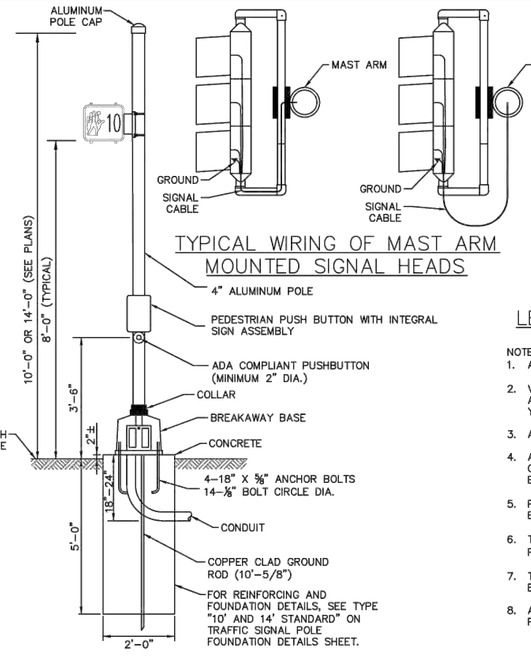


DETAIL OF 5' PUSH BUTTON POLE ASSEMBLY AND FOUNDATION



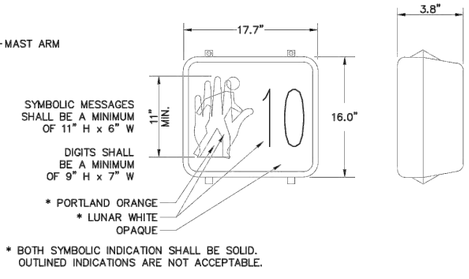
THE SIGN SHOWN SHALL BE USED ON MAST ARM POLES AND ON PEDESTAL POLES. THE PUSH BUTTON SHALL BE INSTALLED 3'-6" ABOVE GROUND LEVEL.

PEDESTRIAN PUSH BUTTON SIGN DETAILS R10-3e



DETAIL OF PEDESTAL POLE ASSEMBLY (10'/14') AND FOUNDATION

TYPICAL WIRING OF MAST ARM MOUNTED SIGNAL HEADS



* BOTH SYMBOLIC INDICATION SHALL BE SOLID. OUTLINED INDICATIONS ARE NOT ACCEPTABLE.

LED COUNTDOWN PEDESTRIAN SIGNAL HEAD

NOTES:

1. ALL SIGNAL HEAD LENSES SHALL BE 12" IN DIAMETER UNLESS OTHERWISE SHOWN.
2. VEHICLE SIGNAL HEADS SHALL BE MOUNTED WITH "ASTRO BRACS" AND APPROPRIATE TUBING. ALL SIGNAL HEADS SHALL BE ALUMINUM, PAINTED FEDERAL YELLOW AND HAVE LED DISPLAYS MEETING THE LATEST I.T.E. STANDARDS.
3. ALL VISORS SHALL BE TUNNEL VISORS, UNLESS OTHERWISE SPECIFIED.
4. ALL POLE MOUNTED VEHICLE AND PEDESTRIAN SIGNAL HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE UNLESS ENGINEER APROVES OTHERWISE.
5. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH "CLAM-SHELL" MOUNTING BRACKET.
6. THE PEDESTAL POLE TRANSFORMER BASE SHALL BE BREAKAWAY DESIGN (PELCO PART No. PB-5335 OR EQUAL) AND SHALL CONFORM TO ASTM B241 STANDARDS.
7. THE ADA COMPLIANT PUSHBUTTON (MINIMUM 2" DIA.) SHALL BE POLARA ENGINEERING, INC. PART No. BDLM2-Y OR EQUIVALANT.
8. ALL SIGNAL HEADS SHALL HAVE ALUMINUM, ONE-PIECE BLACK VENTED BACK PLATES.

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL MISCELLANEOUS DETAILS

REVISED: 07-26-2021

34 41 10-D607

1/17/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1114
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

RISINGER & GARDEN SPRINGS IMPROVEMENTS

MISCELLANEOUS DETAILS - D607
(CITY OF FORT WORTH)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	80

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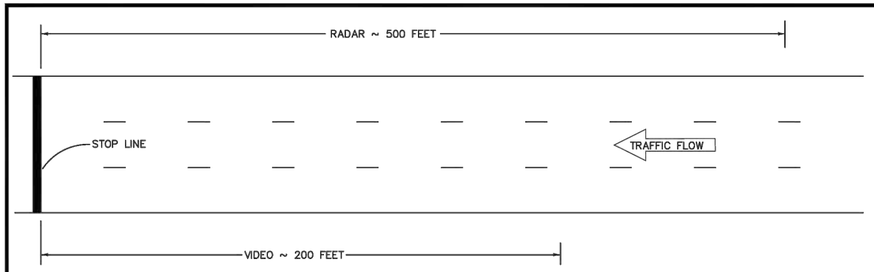
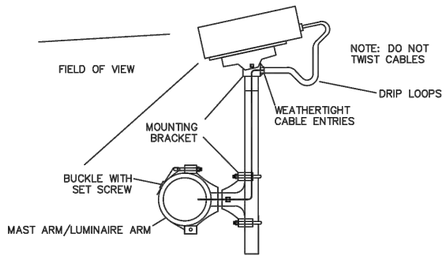
PLOTTED BY: Nick Stevens
PLOTTED WITH: _Adobe PDF.pc3



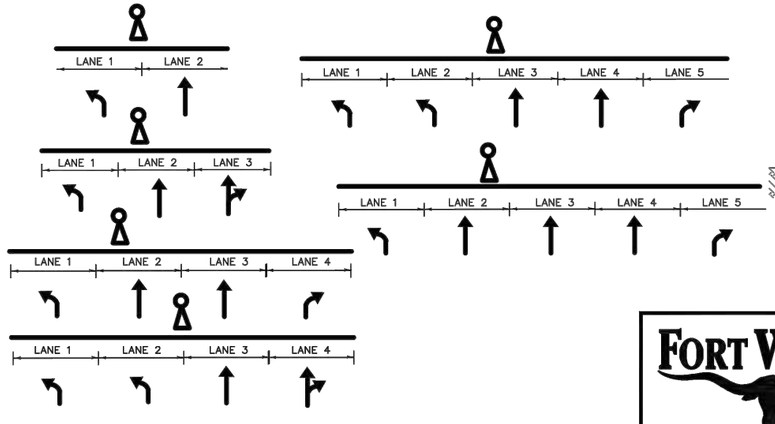
DETECTION LIMITS



NOTES:

1. THE CAMERA IS REQUIRED TO BE PLACED IN CENTER TO THE VEHICLE APPROACH AS MUCH AS POSSIBLE OR PER DIRECTION OF ENGINEER.
2. THE MAST ARM MOUNTING WOULD END UP WITH A CAMERA HEIGHT OF ABOUT 25 FEET WHEN USING A 5 FOOT EXTENSION WITH BRACKET.
3. THE CAMERA SHOULD BE ZOOMED IN UNTIL A MINIMUM OF 4 LANES ARE VISIBLE.
4. THE HORIZON SHOULD NOT BE INCLUDED AS PART OF THE FIELD OF VIEW.
5. THE ZONES SHOULD BE DRAWN WITHIN THE LANE LINES AND SHOULD BE THE SIZE OF A MEDIUM VEHICLE.
6. THE AREA BETWEEN THE STOP BAR AND THE BOTTOM OF THE SCREEN WILL NOT BE 40% OR LESS THAN THE TOTAL COVERAGE AREA.
7. THE CAMERA SUN SHIELD (VISOR) BE PLACED ENOUGH FORWARD TO GIVE THE CAMERA MAXIMUM PROTECTION FROM THE SUN.
8. USE ASTRO-BRAC TYPE MOUNTING BRACKET TO THE DESIRED LOCATION.
9. MANUFACTURER REPRESENTATIVE SHALL BE ON-SITE DURING INSTALLATION AND SETUP.
10. A SELF MOUNT OR RACK MOUNT DETECTION CONTROL UNIT WITH FOUR PORTS FOR ETHERNET CONNECTIVITY WILL BE REQUIRED.
11. THE DETECTION CONTROL UNIT WILL COMMUNICATE WITH CONTROLLERS VIA SDLC.
12. APPROACH WITH SPEED LIMIT 35MPH OR HIGHER USUALLY NEED VANTAGE VECTOR IN NEXT CAMERA.
13. INSTALL PTZ CAMERA ON POLE AS DIRECTED BY CITY.
14. ANY DETECTION OR PTZ CAMERA THAT USES CAT5E CABLES SHALL USE SHIELDED, GEL FILLED, AND UV RESISTANT CAT5E CABLES.

CAMERA PLACEMENT BASED ON LANE GEOMETRY



VANTAGE VECTOR IN NEXT

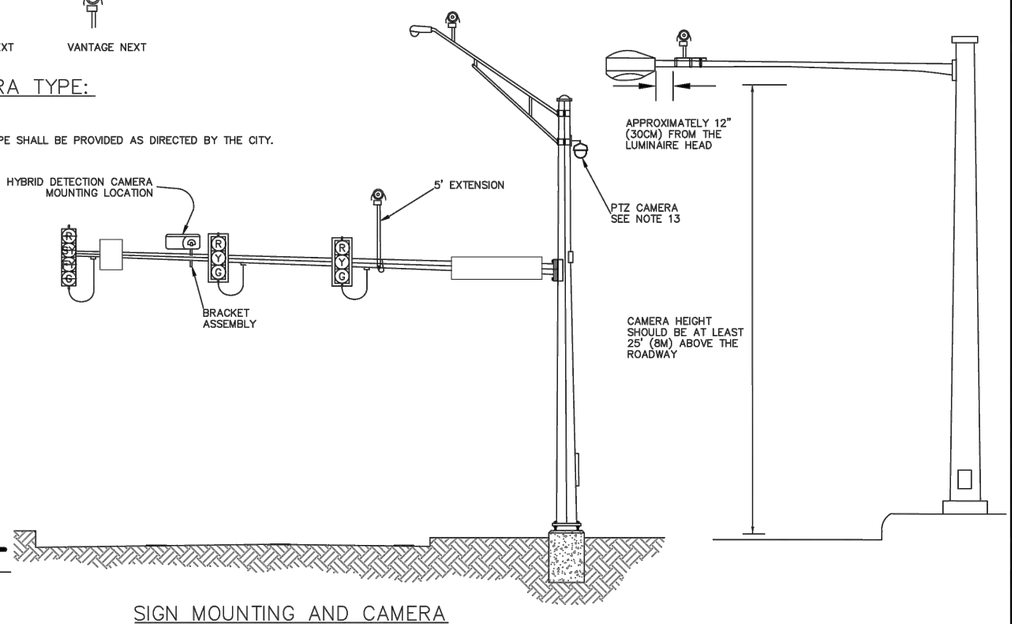
VANTAGE NEXT

CAMERA TYPE:

NOTE:

CAMERA TYPE SHALL BE PROVIDED AS DIRECTED BY THE CITY.

TYPICAL WIRING OF VIDEO VEHICLE DETECTION CAMERAS



SIGN MOUNTING AND CAMERA MOUNTING LOCATION ON MAST ARM

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL VIDEO/ HYBRID DETECTION DETAILS

REVISED: 07-26-2021

34 41 10-D611

1/17/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11178
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

RISINGER & GARDEN SPRINGS IMPROVEMENTS

VIDEO/HYBRID DETECTION - D611
(CITY OF FORT WORTH)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	81

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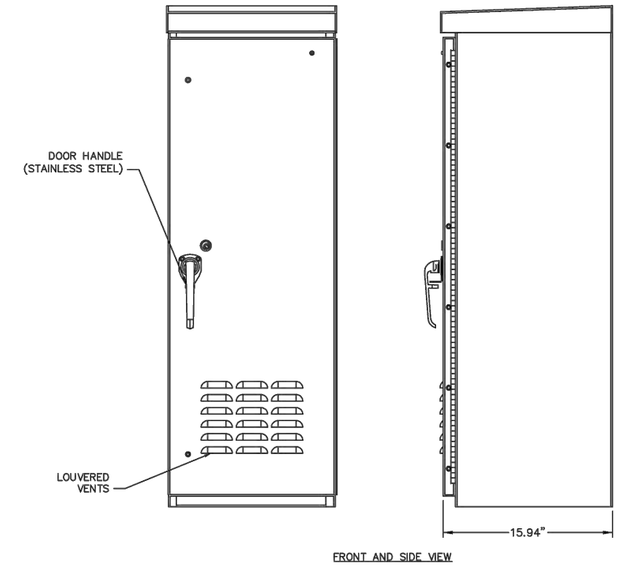
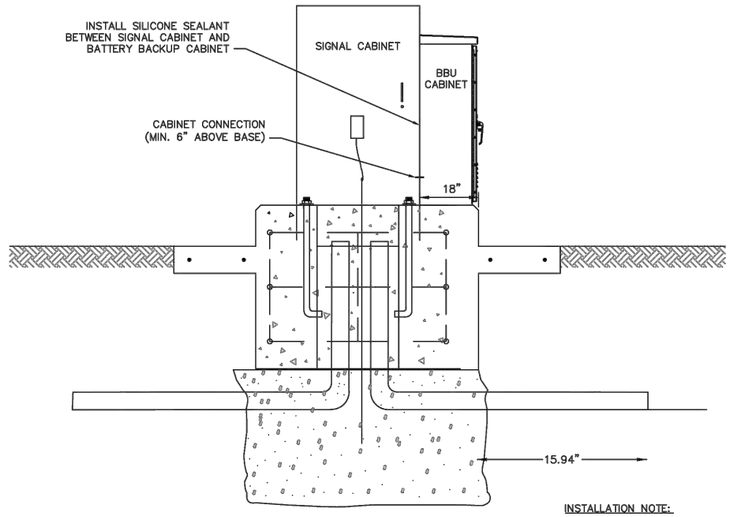
PLOTTED WITH: _Adobe PDF.pc3



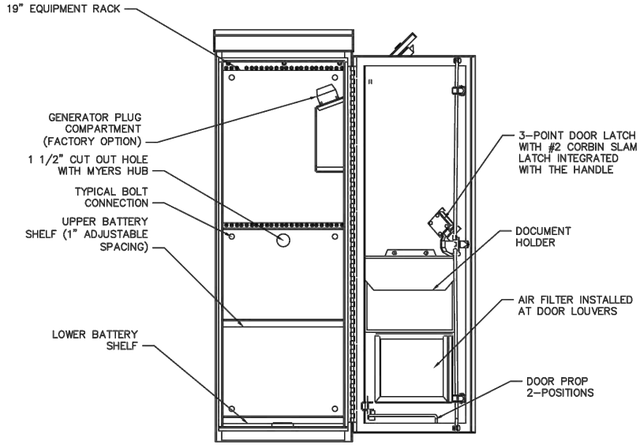
FRONT AND SIDE VIEW



CABINET MOUNTED TO TRAFFIC
SIGNAL CONTROLLER CABINET

INSTALLATION NOTE:

1. MOUNTING HOLES MUST BE DRILLED ON SITE AND MOUNTED WITH 6 SETS OF 1/4"–20 18–8 STAINLESS STEEL HEX HEAD BOLTS AND NUTS ASSEMBLY (SUPPLIED WITH SYSTEM).
2. BOLT SPACING SHOWN IN FRONT VIEW SHOWS TYPICAL LOCATIONS. LOCATION OF BOLTS MAY VARY TO ACCOMMODATE CONFLICTS.
3. INSPECTOR MUST APPROVE MOUNTING PRIOR TO INSTALLATION TO ENSURE PEDESTRIAN PATHWAYS ARE NOT BLOCKED AND THE MINIMUM CLEARANCE FROM FACE OF CURB OR EDGE OF PAVEMENT IS MET.
4. REFER TO DETAIL D606 FOR CABINET FOUNDATION DETAILS.
5. INSTALL 3" HOLE SAW CUT WITH THREADED NIPPLE ON EACH SIDE FOR CONNECTION BETWEEN CABINETS. CONNECTION POITN SHALL BE A MINIMUM OF 6" ABOVE BOTTOM OF CABINET.



FRONT VIEW
(SHOWN WITH DOOR OPENED)

NOTE:
INTERNAL BATTERY BACK UP SHALL BE ZINC 5 OR APPROVED EQUIVALENT. COORDINATE WITH CITY ON THE TYPE OF BATTERY BACK UP TO UTILIZE.

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL
BATTERY BACK UP DETAIL

DATE: 07-26-2021

34 41 10-D620

1/17/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

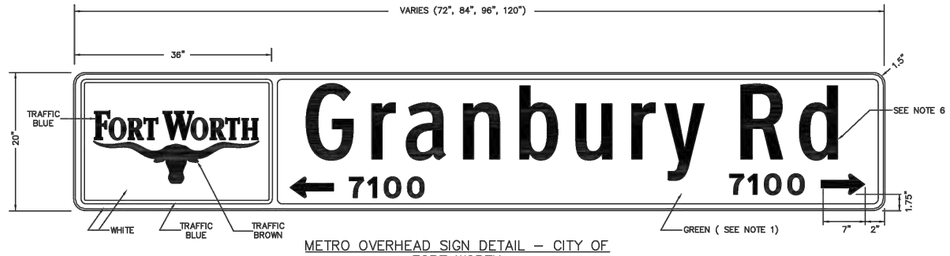
DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1114
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

RISINGER & GARDEN SPRINGS IMPROVEMENTS

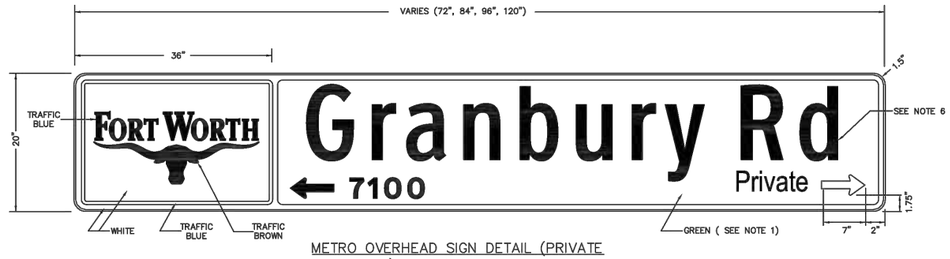
BATTERY BACK UP - D620
(CITY OF FORT WORTH)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	82



METRO OVERHEAD SIGN DETAIL – CITY OF FORT WORTH

UPPERCASE: 11" CLEARVIEW 3W
LOWERCASE: 10" CLEARVIEW 3W
BLOCK NUMBER: 3" CLEARVIEW 4W

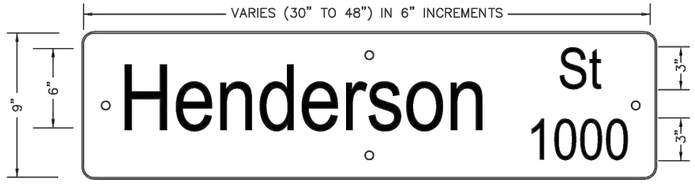


METRO OVERHEAD SIGN DETAIL (PRIVATE STREET) – CITY OF FORT WORTH

UPPERCASE: 11" CLEARVIEW 3W
LOWERCASE: 10" CLEARVIEW 3W
BLOCK NUMBER: 3" CLEARVIEW 4W

NOTES:

1. METRO SIGN SHEETING SHALL BE WHITE 3M DIAMOND GRADE CUBED (DG3) WITH GREEN ELECTRO–CUT (EC) TRANSPARENT FILM AS AN OVERLAY OR APPROVED EQUAL BY TRAFFIC MANAGEMENT.
2. FONT: HIGHWAY GOTHIC 'C' OR 'B' (DEPENDING ON LENGTH OF NAME)
3. SIGN BLANK FOR 2 INCH POST INSTALL: 0.08 FEDERAL SPEC. ALUM. (LP/SP INSTALL 0.125 UNDRILLED)
4. SIGNS LONGER THAN 10'–0" FOR STREET NAME METROS OR 4'–0" FOR STREET NAME BLADES SHALL HAVE TRAFFIC MANAGEMENT APPROVAL.



STREET NAME BLADE DETAIL

FORT WORTH

CITY OF FORT WORTH, TEXAS
STREET NAME SIGN DETAILS

DATE: 6-11-2015

34 41 30-D633

1/17/23

STATE OF TEXAS
DONALD J. SZCZESNY
72556
REGISTERED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

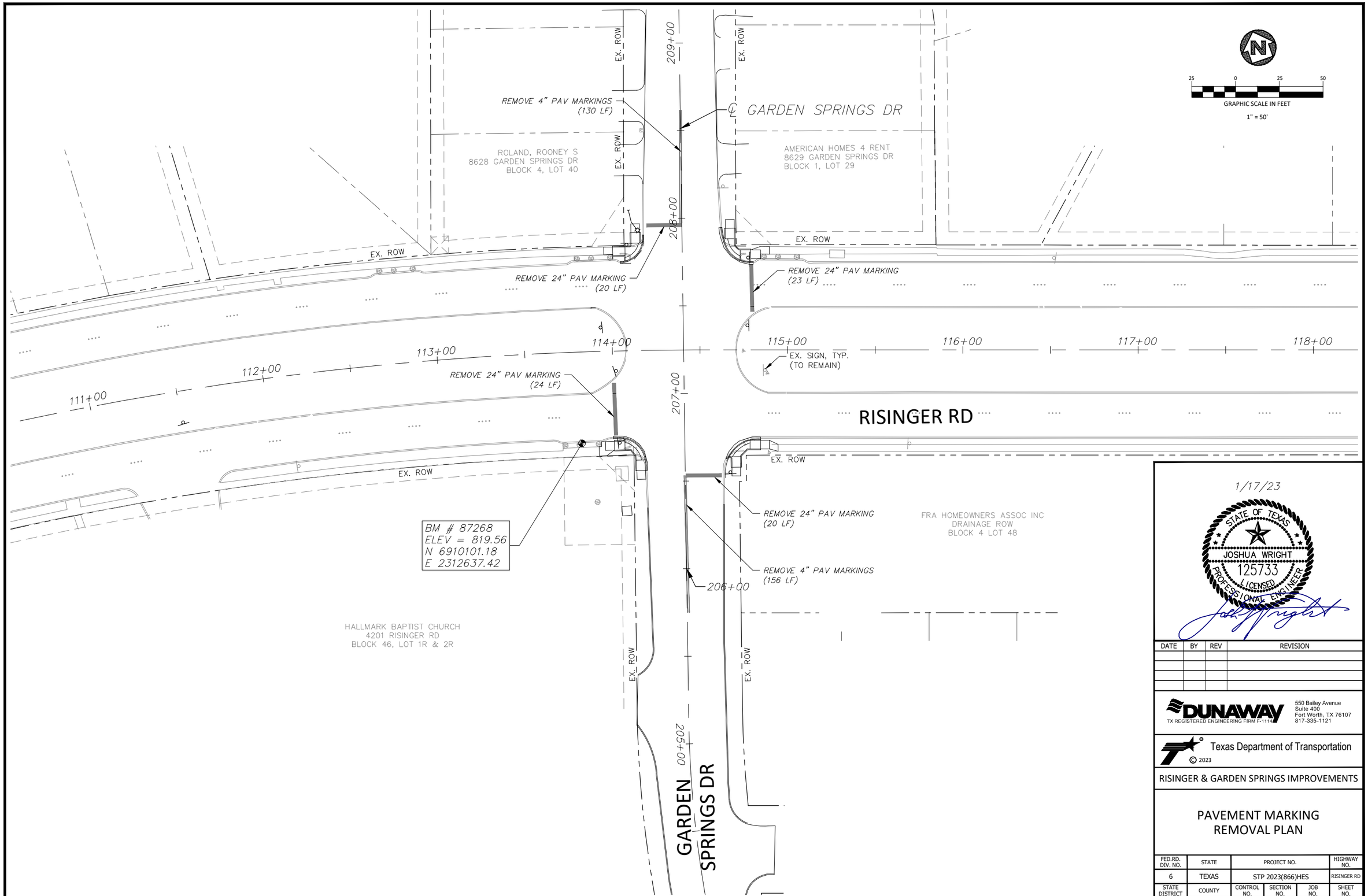
DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11144
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation
© 2023

RISINGER & GARDEN SPRINGS IMPROVEMENTS

STREET NAME SIGN DETAIL - D633
(CITY OF FORT WORTH)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	83



1/17/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

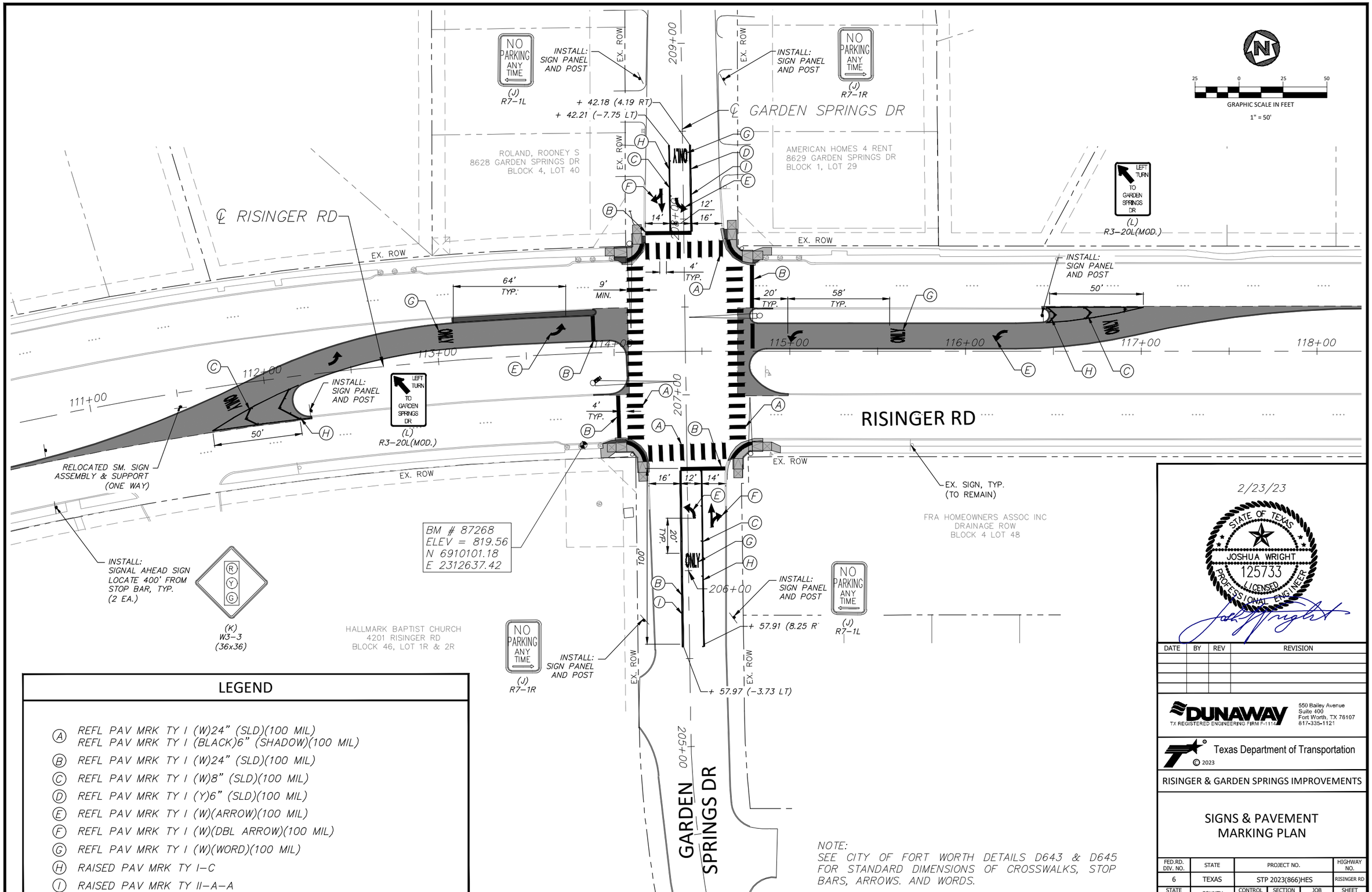
DUNAWAY
TX REGISTERED ENGINEERING FIRM F-11144
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

PAVEMENT MARKING REMOVAL PLAN

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	84



LEGEND

- (A) REFL PAV MRK TY I (W)24" (SLD)(100 MIL)
  REFL PAV MRK TY I (BLACK)6" (SHADOW)(100 MIL)
- (B) REFL PAV MRK TY I (W)24" (SLD)(100 MIL)
- (C) REFL PAV MRK TY I (W)8" (SLD)(100 MIL)
- (D) REFL PAV MRK TY I (Y)6" (SLD)(100 MIL)
- (E) REFL PAV MRK TY I (W)(ARROW)(100 MIL)
- (F) REFL PAV MRK TY I (W)(DBL ARROW)(100 MIL)
- (G) REFL PAV MRK TY I (W)(WORD)(100 MIL)
- (H) RAISED PAV MRK TY I-C
- (I) RAISED PAV MRK TY II-A-A

NOTE:
SEE CITY OF FORT WORTH DETAILS D643 & D645 FOR STANDARD DIMENSIONS OF CROSSWALKS, STOP BARS, ARROWS. AND WORDS.

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1117
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

RISINGER & GARDEN SPRINGS IMPROVEMENTS

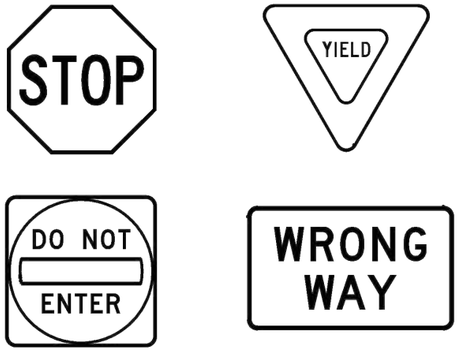
SIGNS & PAVEMENT MARKING PLAN

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	85

DATE:
FILE:

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

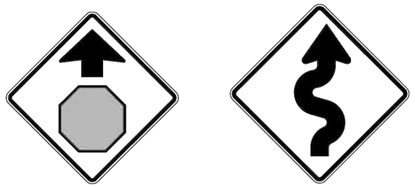
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(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/

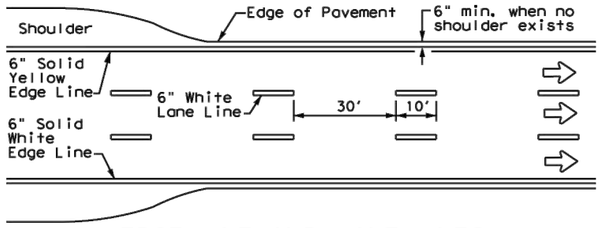
Texas Department of Transportation

Traffic Operations Division Standard

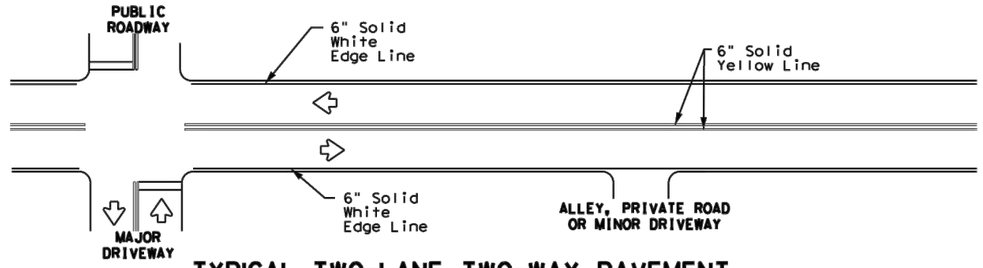
TYPICAL SIGN REQUIREMENTS

TSR(4)-13

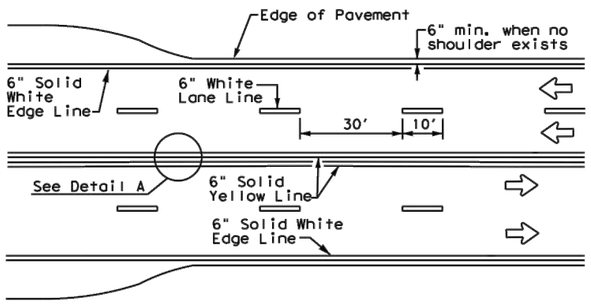
FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
12-03 7-13 9-08	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		86

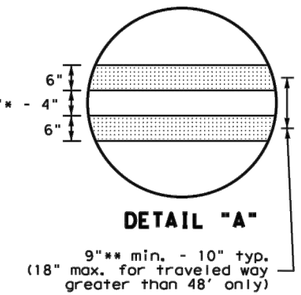


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





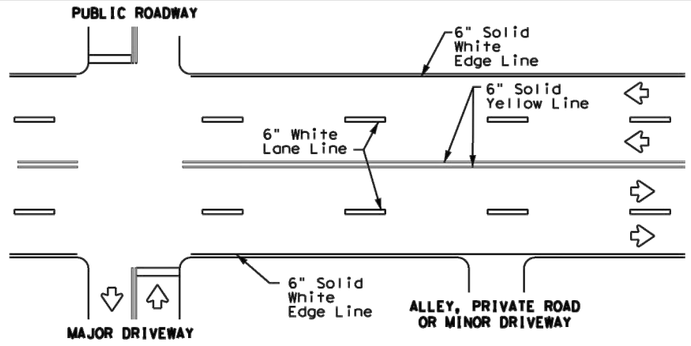
DETAIL "A"

9"** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

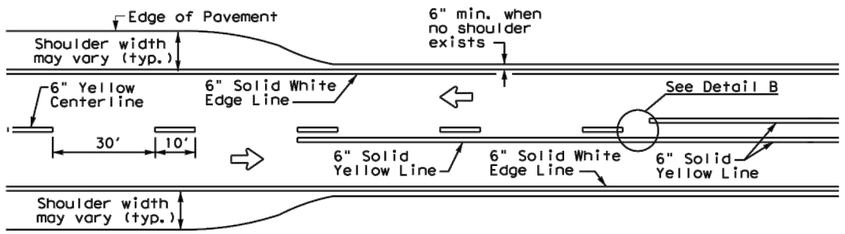
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

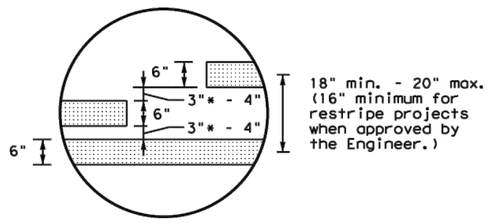
** 8" minimum for restripe projects when approved by the Engineer.



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



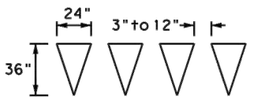
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



18" min. - 20" max.
(16" minimum for restripe projects when approved by the Engineer.)

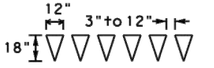
DETAIL "B"

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

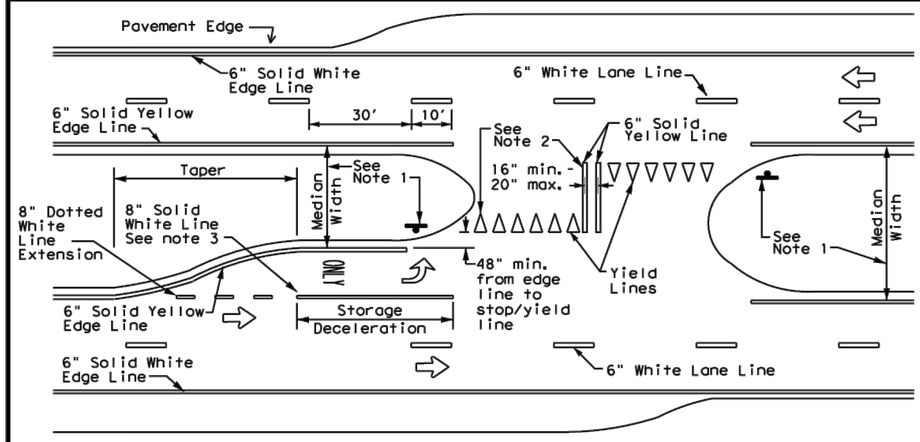


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

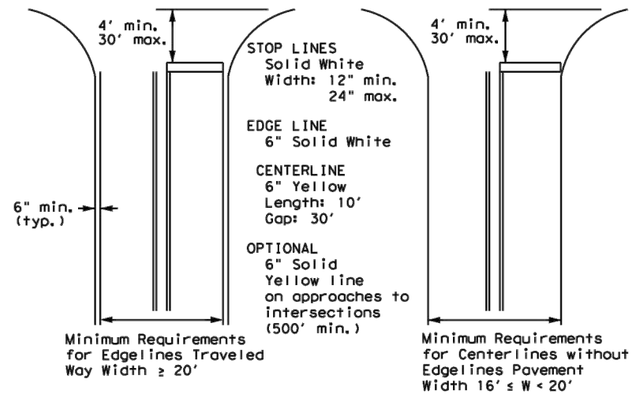
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

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

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



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

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

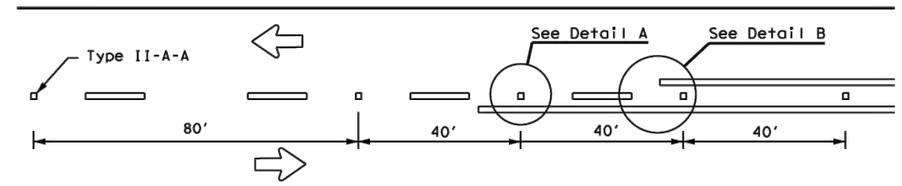
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
11-78 8-00 6-20	DIST	COUNTY		SHEET NO.
8-95 3-03 12-22	FTW	TARRANT		87
5-00 2-12				

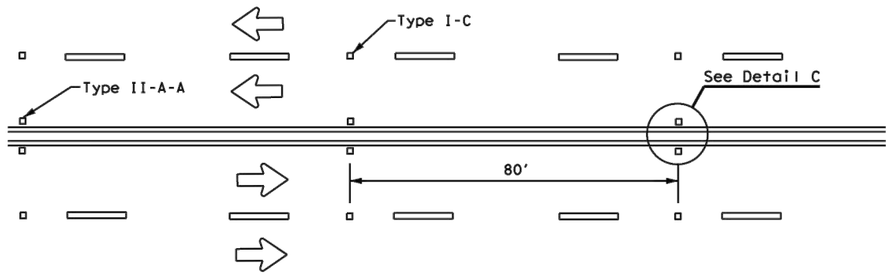
22A

DATE:
FILE:

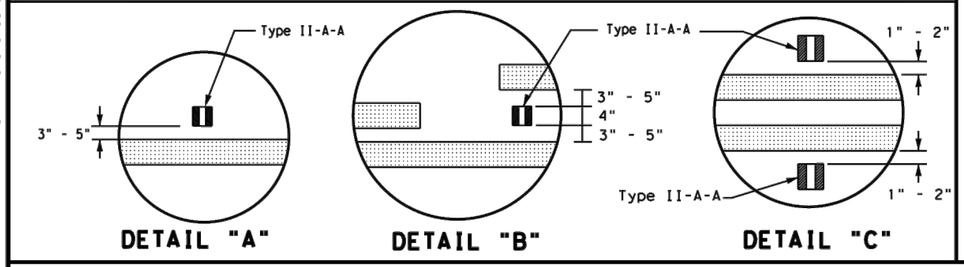
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



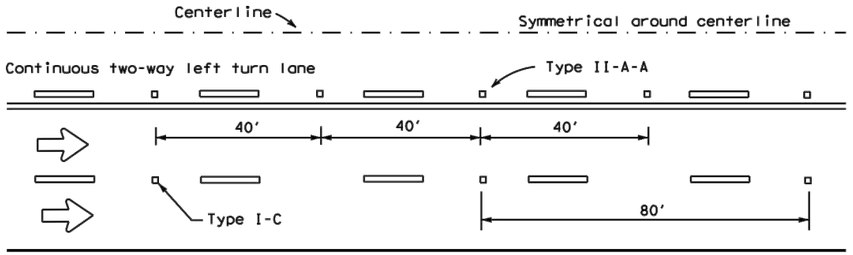
CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS



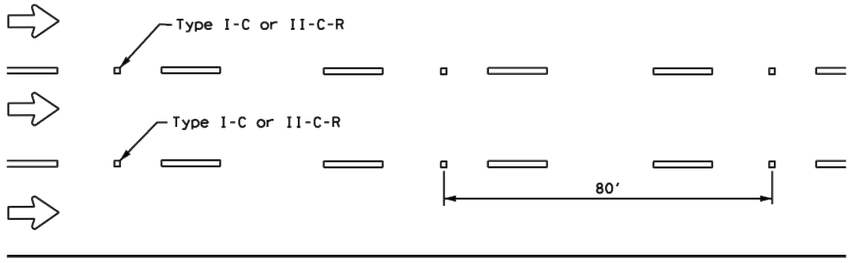
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



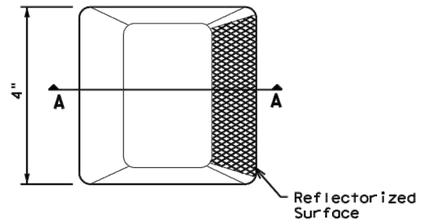
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

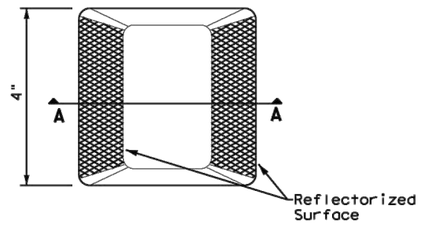
See Note 3.

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

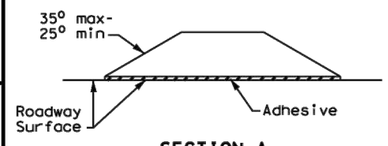
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

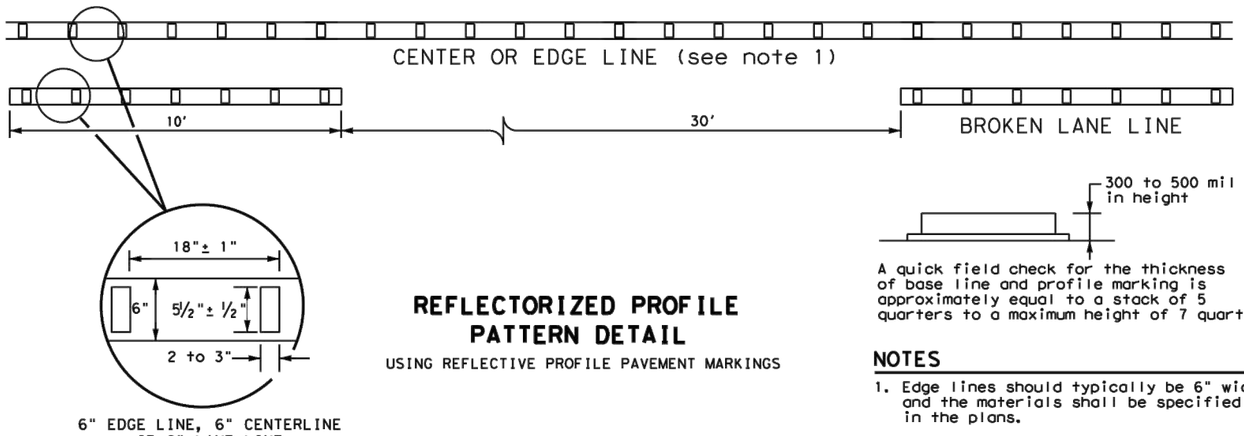


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



6" EDGE LINE, 6" CENTERLINE OR 6" LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

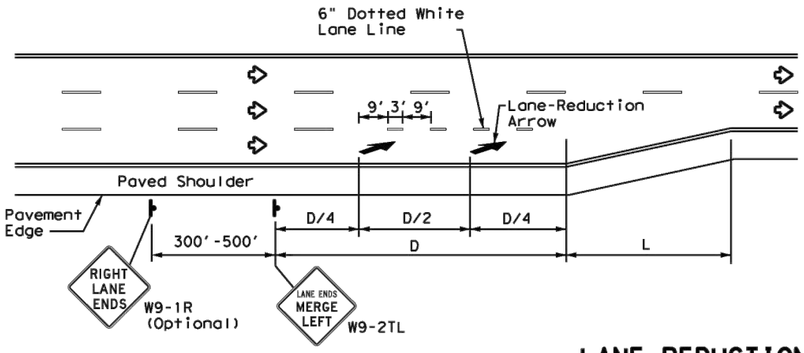
Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0902	90	208	RISINGER RD
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		88

22B

DATE:
FILE:

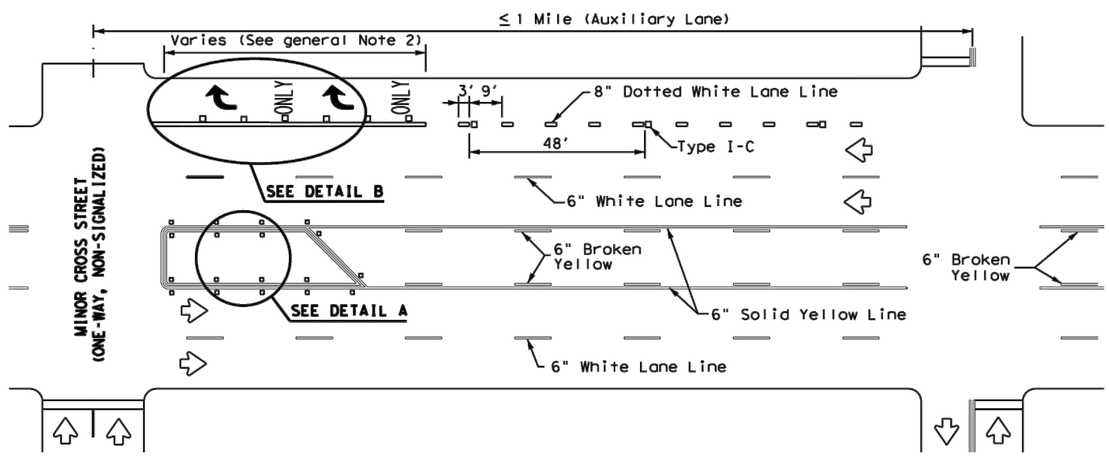


LANE REDUCTION

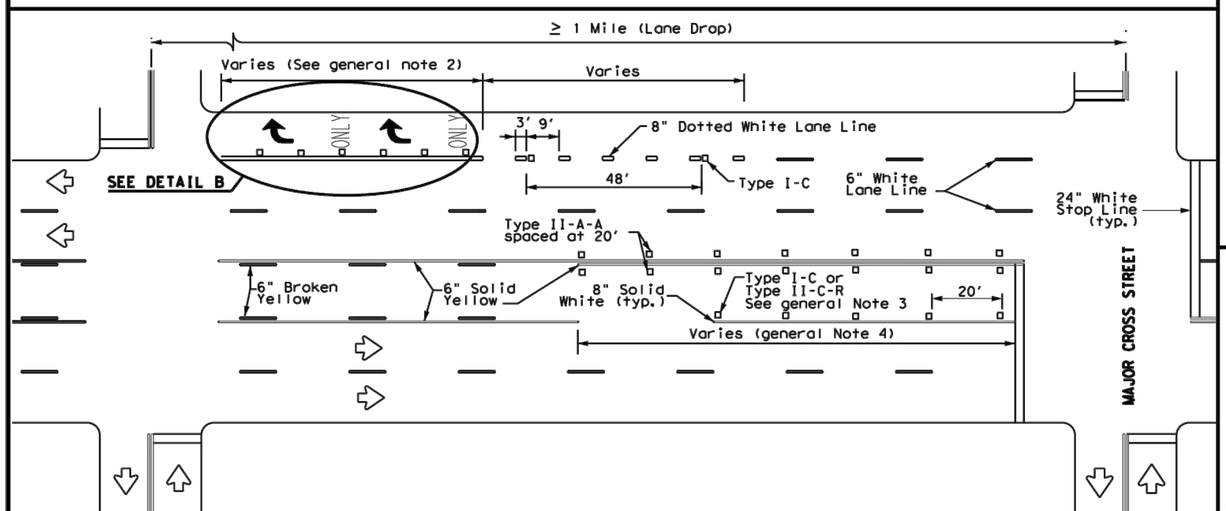
NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

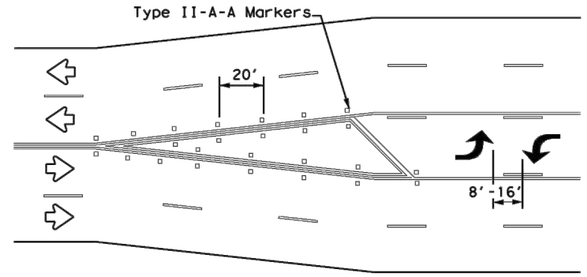
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	



TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

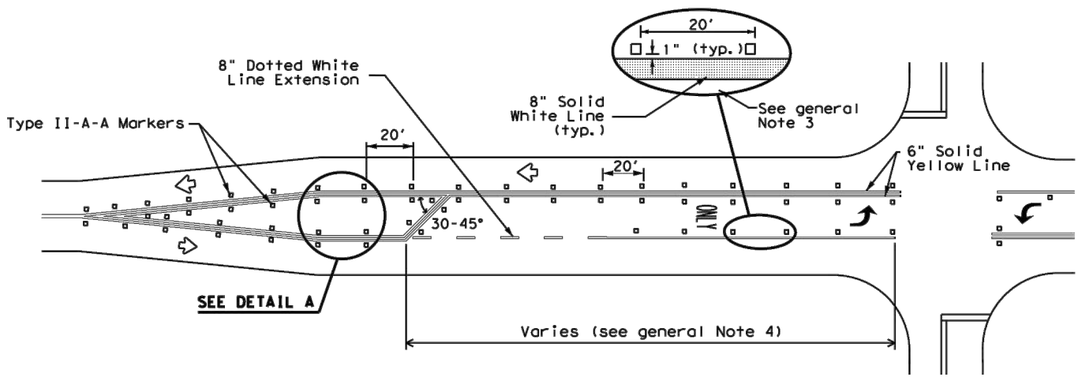
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

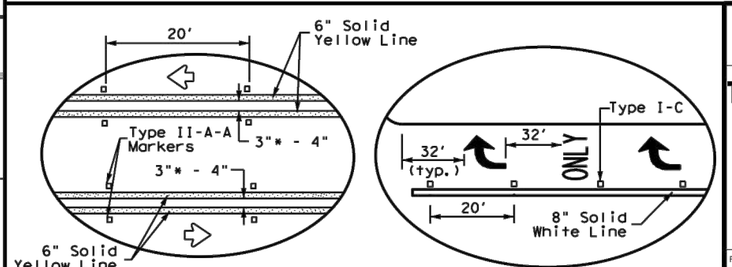
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

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

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



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



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

Texas Department of Transportation

Traffic Safety Division Standard

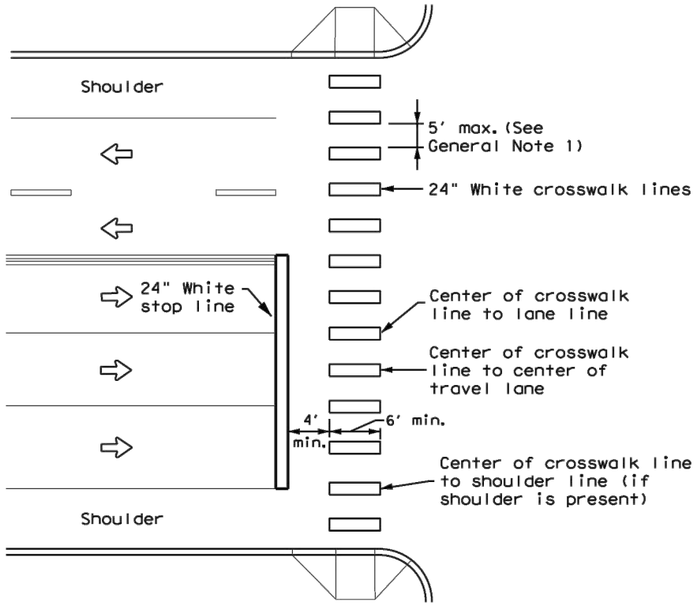
TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0902	90	208	RISINGER RD
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		89

22C

DATE:
FILE:



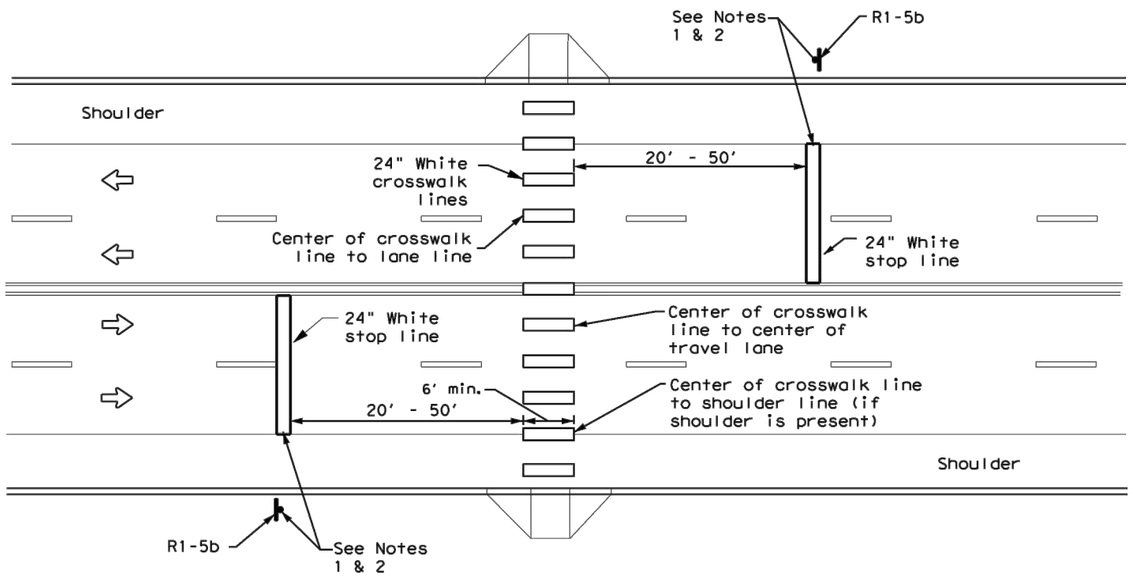
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

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

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



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	208	RISINGER RD
6-20	DIST	COUNTY		SHEET NO.
6-22	FTW	TARRANT		90
12-22				

220

DATE:
FILE:

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

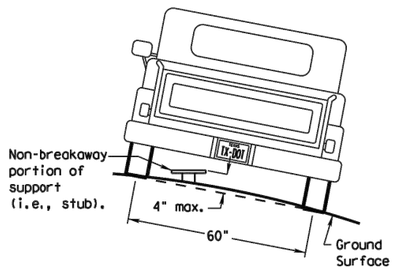
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1))

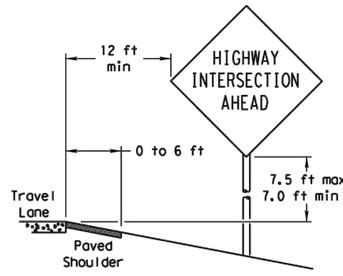
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

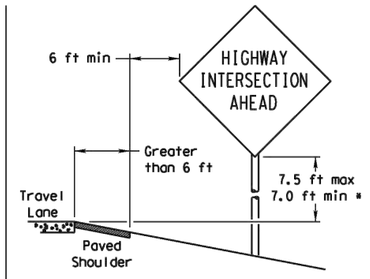
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

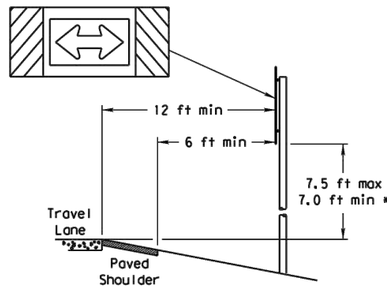
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



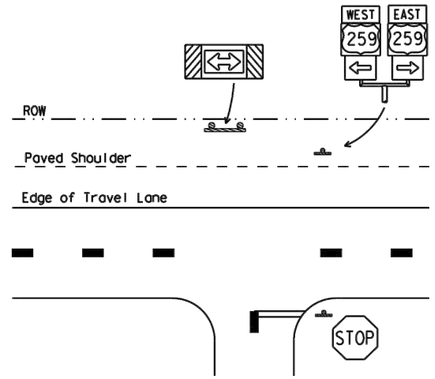
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

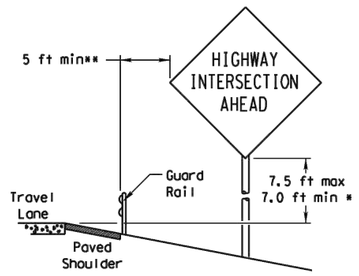
T-INTERSECTION



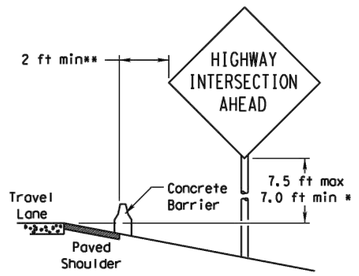
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

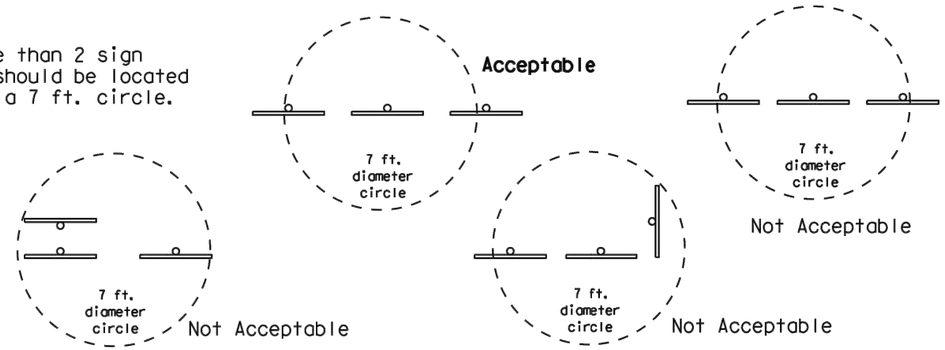
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

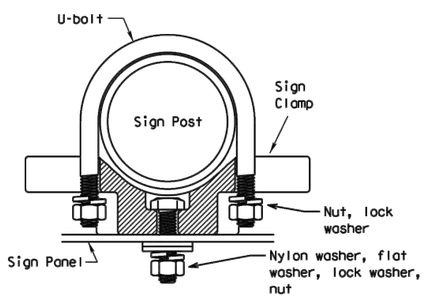
The website address is:
http://www.txdot.gov/publications/traffic.htm

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

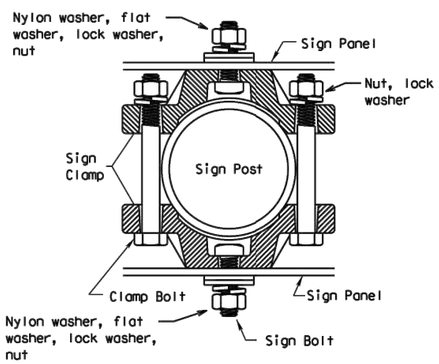


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

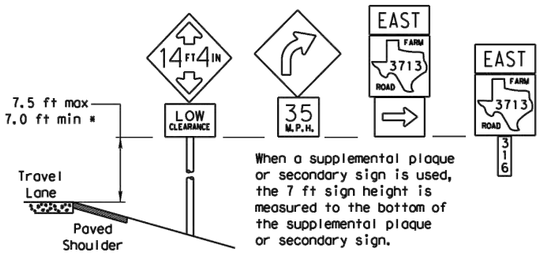
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



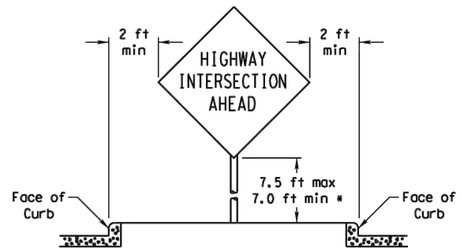
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



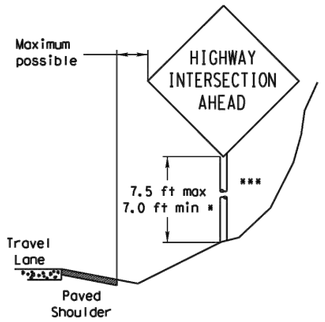
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

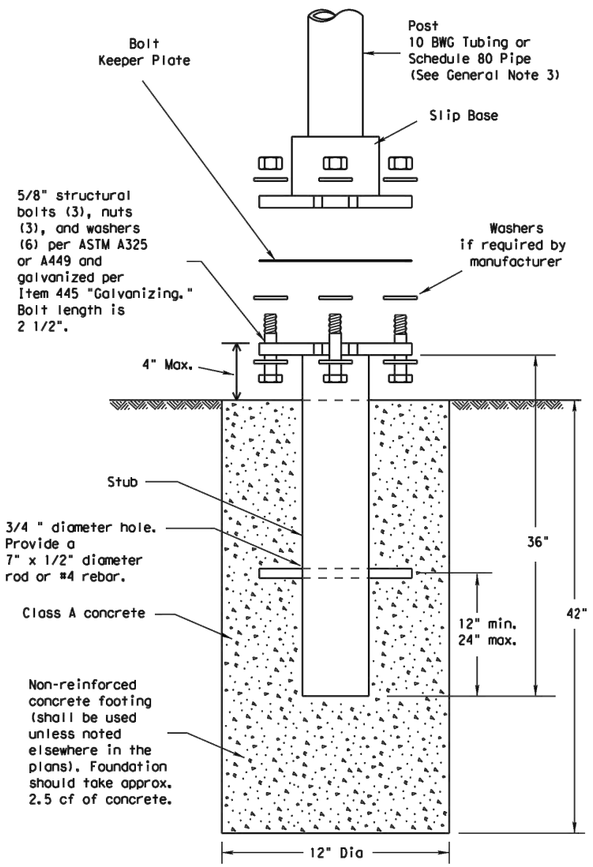
SMD(GEN)-08

REVISIONS
9-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
0902	90	208	RISINGER RD
DIST	COUNTY		SHEET NO.
FTW	TARRANT		91

DATE:
FILE:

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

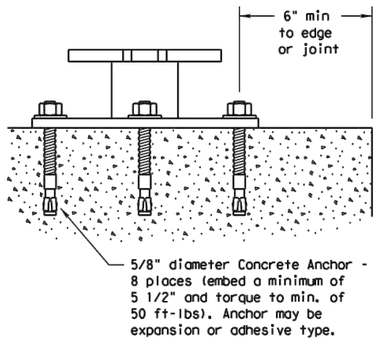
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   20% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
   46,000 PSI minimum yield strength
   62,000 PSI minimum tensile strength
   21% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



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

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

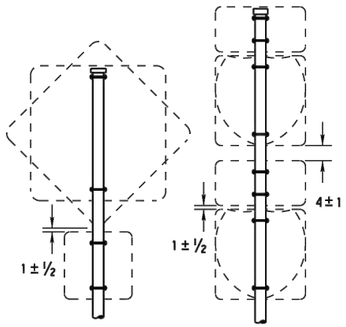
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

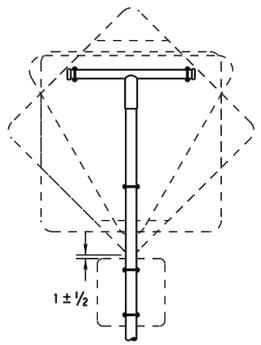
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
REVISIONS			
9-08			

CONT	SECT	JOB	HIGHWAY
0902	90	208	RISINGER RD
DIST	COUNTY		SHEET NO.
FTW	TARRANT		92

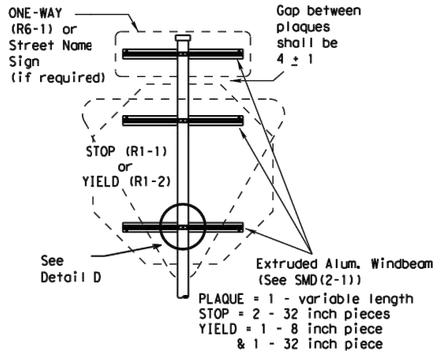
DATE:
FILE:



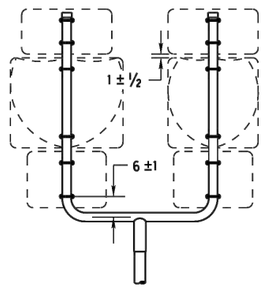
SM RD SGN ASSM TY XXXXX(1)XX(P)



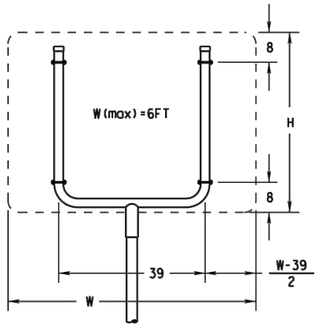
SM RD SGN ASSM TY XXXXX(1)XX(T)



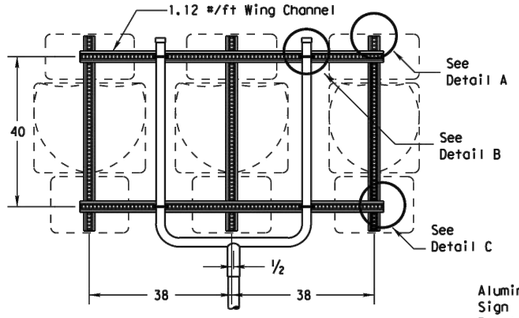
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



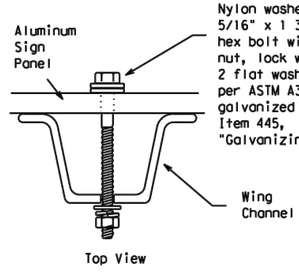
SM RD SGN ASSM TY XXXXX(1)XX(U)



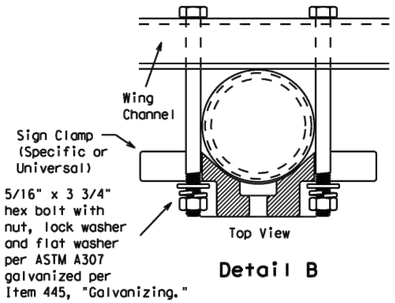
SM RD SGN ASSM TY XXXXX(1)XX(U)



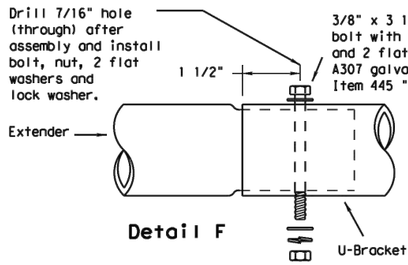
SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)



Detail A

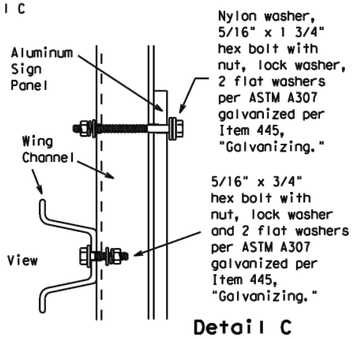


Detail B

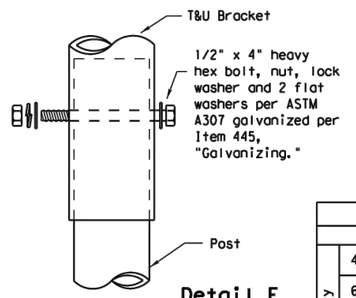


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C



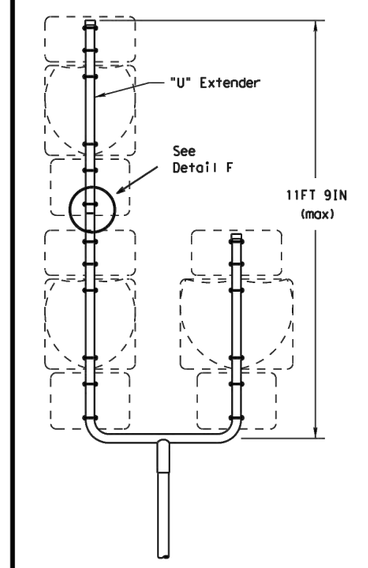
Detail E

GENERAL NOTES:

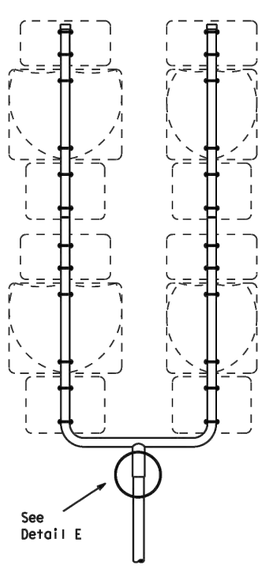
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



SM RD SGN ASSM TY S80(1)XX(U-1EXT)



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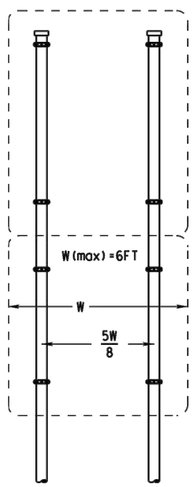
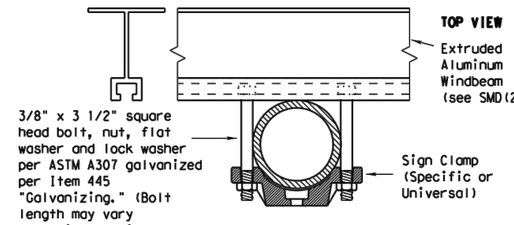
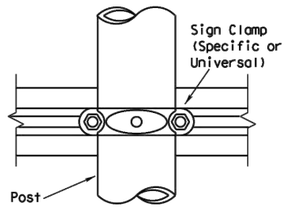


SM RD SGN ASSYM TY XXXXX(2)XX(P)

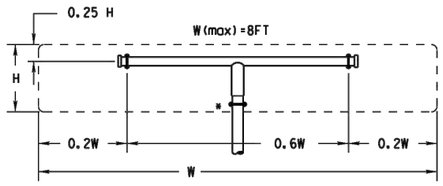
SIDE VIEW



Detail D



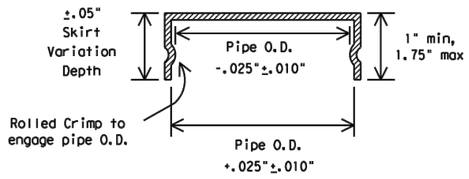
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

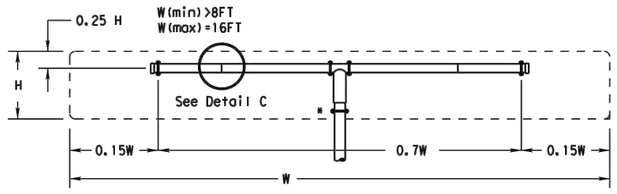
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0902	90	208	RISINGER RD

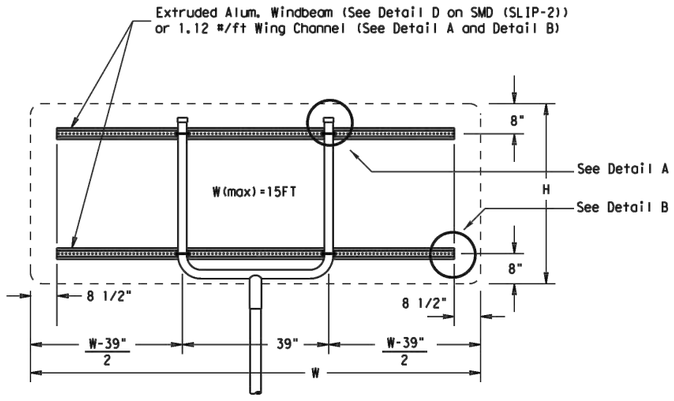
DIST	COUNTY	SHEET NO.
FTW	TARRANT	93

9-08 REVISIONS

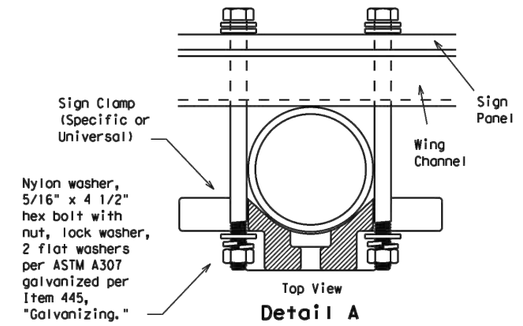
DATE:
FILE:



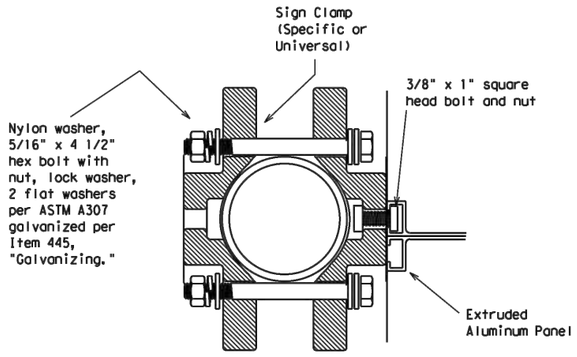
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



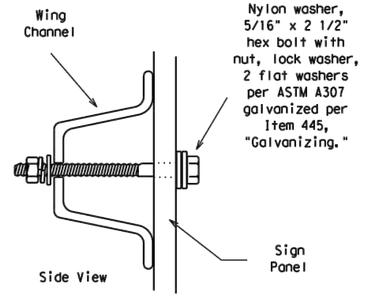
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



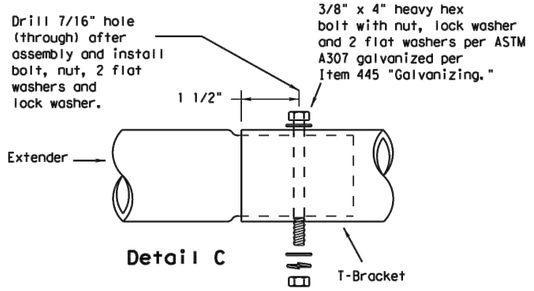
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

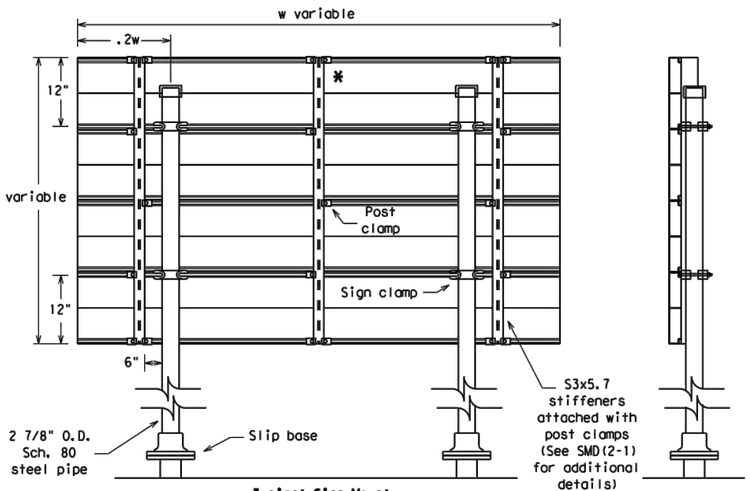


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

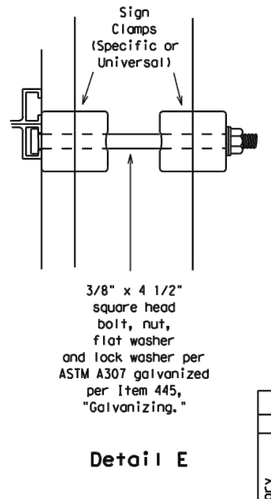


Typical Sign Mount

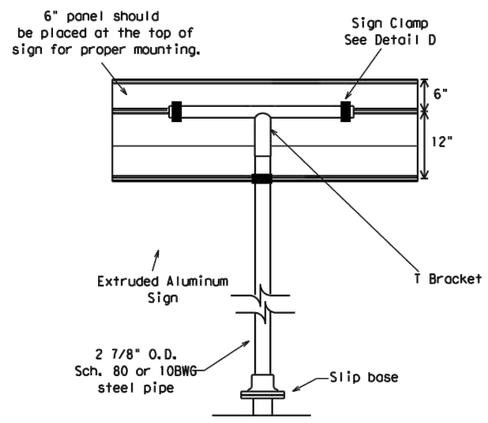
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

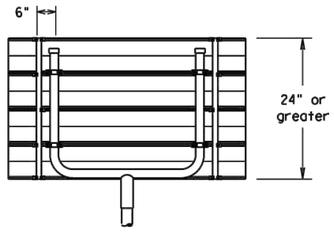
See Detail E
for clamp installation



Detail E



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
6. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
11. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

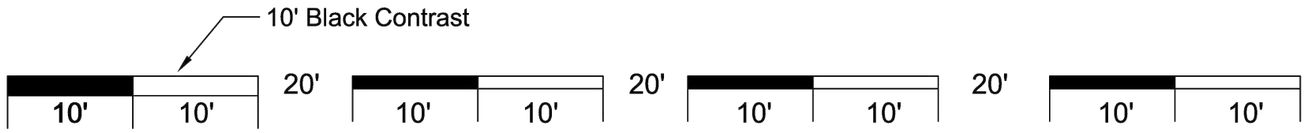
REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0902	90	208	RISINGER RD
DIST	COUNTY		SHEET NO.
FTW	TARRANT		94

DATE:
FILE:

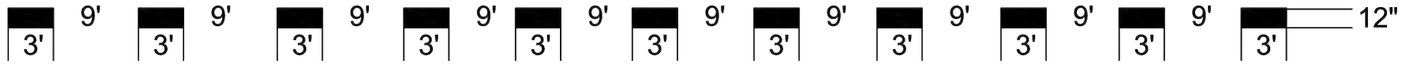
Solid Edge Line or Lane Line

Double Solid Lines



10' White Skip With 10' Black Contrast and 20' Gaps

10'–30' Skip Line



3'–9' Dotted Lane Drop Line

2'–4' Dotted Guide Line

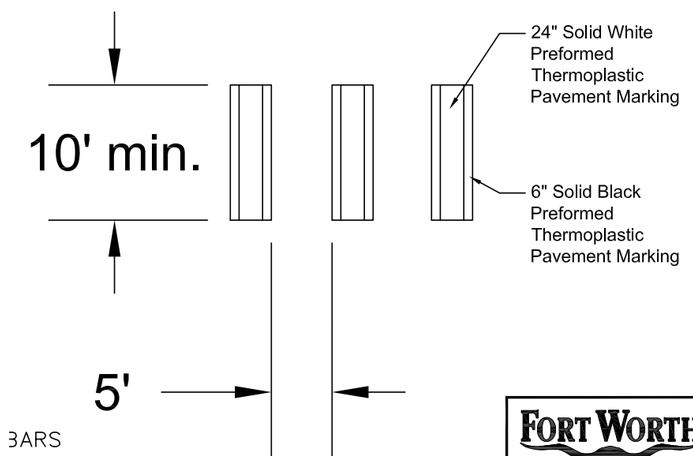
FORT WORTH

CITY OF FORT WORTH, TEXAS

PAVEMENT MARKINGS DETAILS
SHEET 1 of 6

REVISED: 12-18-2020

32 17 23-D642



3ARS

NOTES:

1. CROSSWALKS AND STOP BARS SHALL BE WHITE.
2. PREFORMED THERMOPLASTIC SHALL BE USED FOR ALL CROSSWALK PAVEMENT MARKINGS.
3. PREFORMED THERMOPLASTIC MATERIAL SHALL BE SUPPLIED BY A MANUFACTURER LISTED ON TxDOT'S MATERIAL PRODUCER LIST (MPL).

FORT WORTH

CITY OF FORT WORTH, TEXAS

PAVEMENT MARKINGS DETAILS
SHEET 5 of 6

REVISED: 12-18-2020

32 17 23-D642

1/17/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1114
550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

Texas Department of Transportation
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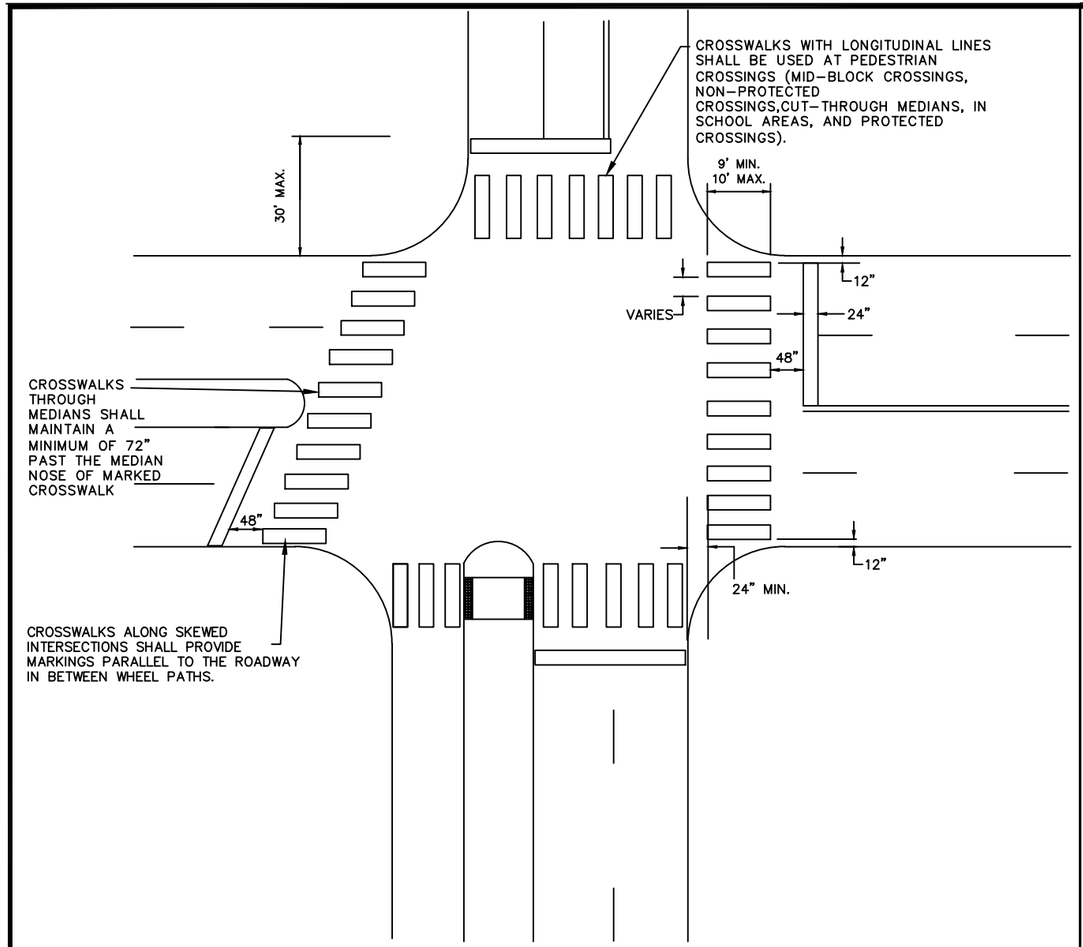
RISINGER & GARDEN SPRINGS IMPROVEMENTS

PAVEMENT MARKING DETAILS - D642
(CITY OF FORT WORTH)

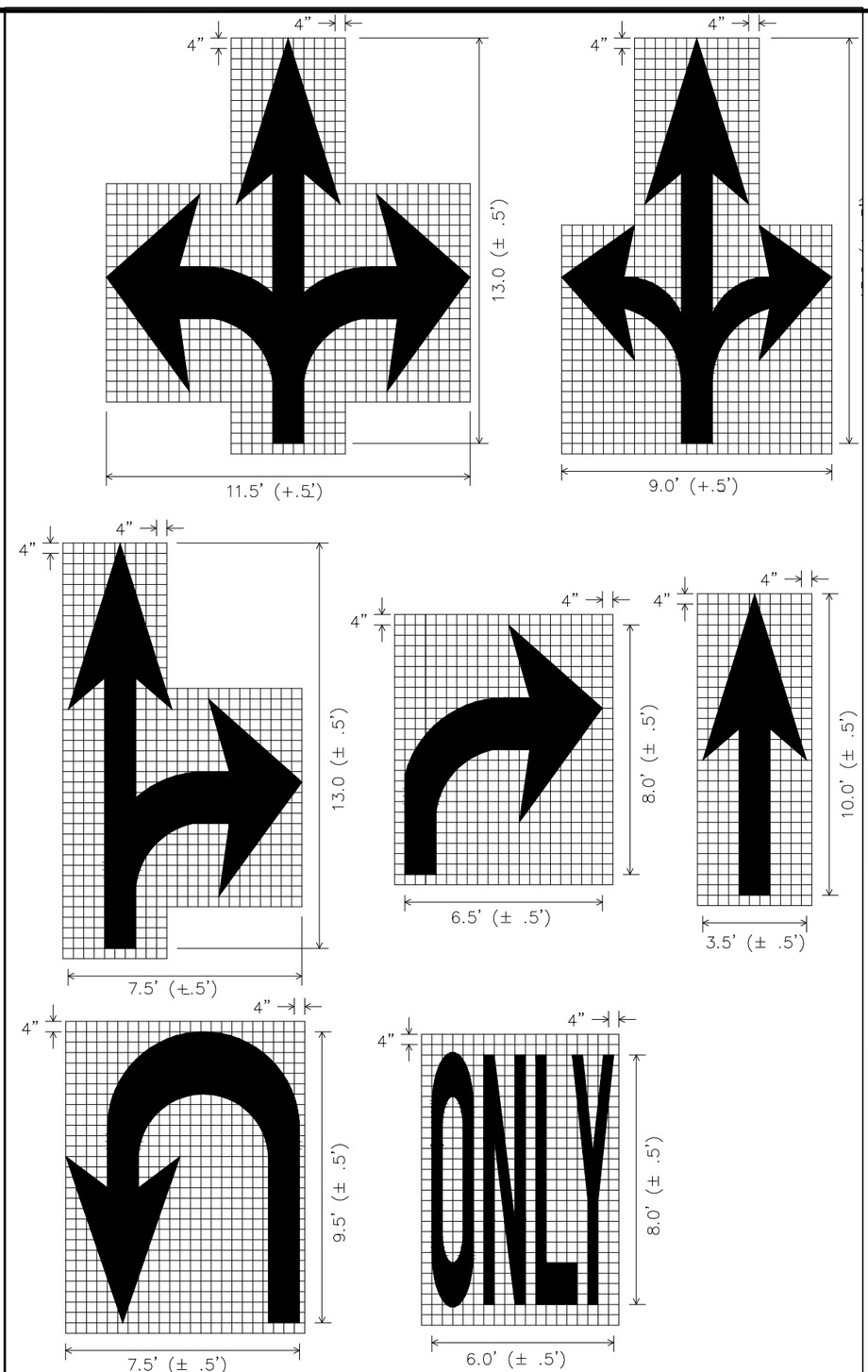
FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	95



STANDARD CROSSWALKS AND
STOP BAR PAVEMENT MARKINGS

CROSSWALKS, STOP BARS
AND YIELD LINES
CITY OF FORT WORTH–D643

SCALE: N.T.S. REVISED: 10–21–2013



PAVEMENT MARKINGS – ARROWS
CITY OF FORT WORTH–D645

SCALE: N.T.S. REVISED: 08–31–2012

1/17/23

STATE OF TEXAS
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817-335-1121

Texas Department of Transportation

RISINGER & GARDEN SPRINGS IMPROVEMENTS

PAVEMENT MARKING DETAILS
D643 & D645
(CITY OF FORT WORTH)

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	96

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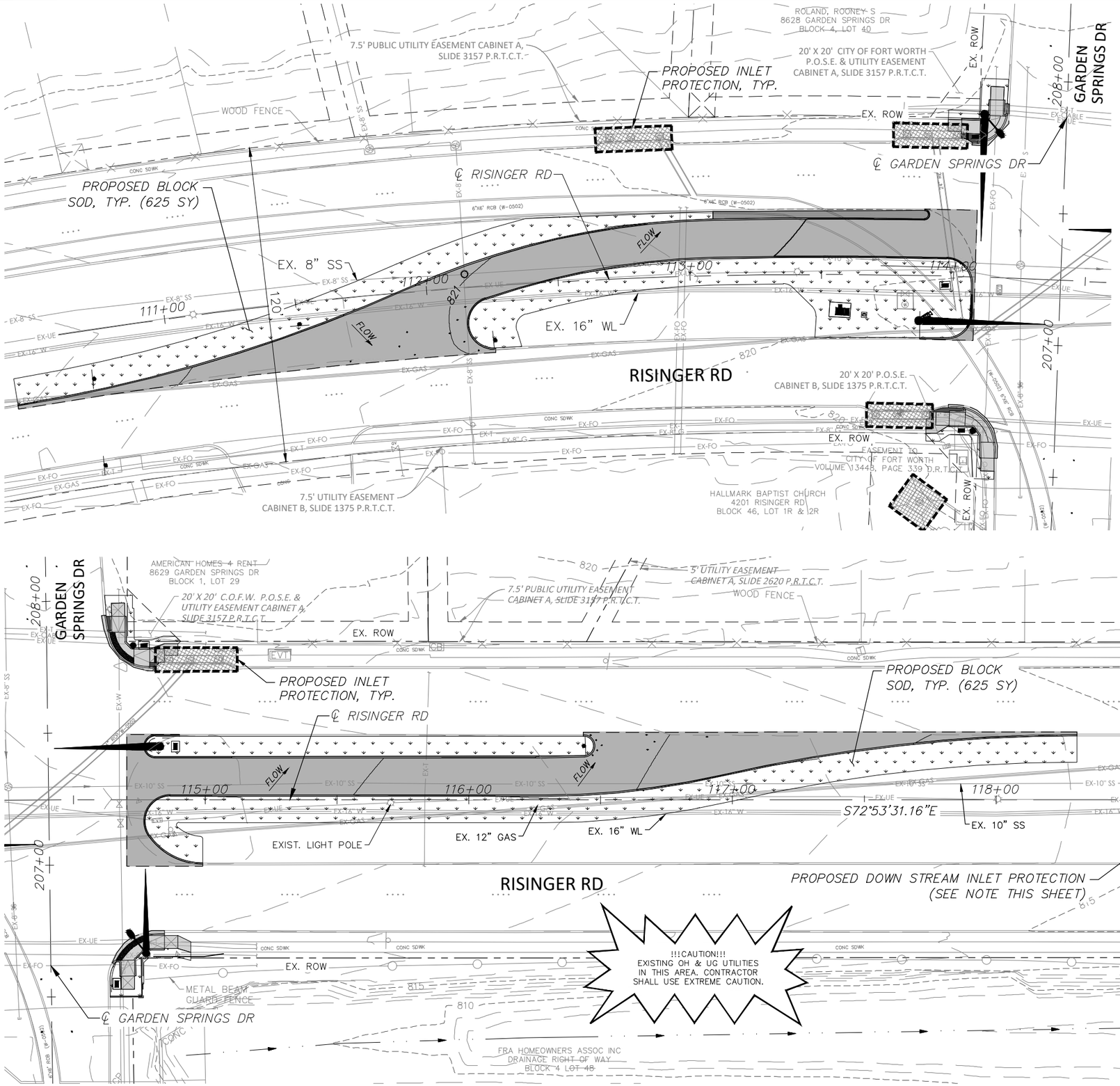
PLOTTED BY: Nick Stevens
PLOTTED WITH: _Adobe PDF.pc3



NOTE:

CONTRACTOR TO PROTECT 2 DOWNSTREAM INLETS LOCATED 700 LF = +/- EAST OF INTERSECTION

20 0 20 40

GRAPHIC SCALE IN FEET
HORIZONTAL
1" = 40'

EROSION CONTROL LEGEND

600	EXISTING MAJOR CONTOUR (5 FT)
	EXISTING MINOR CONTOUR (1 FT)
600	PROPOSED MAJOR CONTOUR (5 FT)
	PROPOSED MINOR CONTOUR (1 FT)
	EXISTING STORM DRAIN
FLOW	STORMWATER FLOW DIRECTION
	CHANNEL FLOWLINE
	SOLID SLAB SODDING
	PROPOSED INLET PROTECTION

2/23/23

STATE OF TEXAS
JOSHUA WRIGHT
125733
LICENSED
PROFESSIONAL ENGINEER

DATE	BY	REV	REVISION

DUNAWAY
TX REGISTERED ENGINEERING FIRM F-1117

550 Bailey Avenue
Suite 400
Fort Worth, TX 76107
817-335-1121

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RISINGER & GARDEN SPRINGS IMPROVEMENTS

EROSION CONTROL PLAN

FED.RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS	STP 2023(866)HES			RISINGER RD
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
FTW	TARRANT	0902	90	208	97

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FILENAME: ERSN-PLAN.dwg
PLOTTED BY: Lee Monastesse

PLOTTED WITH: DWG To PDF.pc3

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. *CITY OF FORT WORTH – (817) 884-2634, 200 TEXAS STREET, FORT WORTH, TEXAS 76102*
2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

☒ No Permit Required

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

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

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☐ No Action Required ☒ Required Action

Action No.

1. *TOPSOIL AND BLOCKSOD WILL BE INSTALLED 5'-10' FROM BACK OF CURB ALONG PROPOSED TURN LANES*

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

☐ No Action Required ☒ Required Action

Action No.

1. *NONE.*
2. *THE SPECIES ANALYSIS HAS NOT BEEN APPROVED BY TXDOT YET. NO SPECIES ARE ANTICIPATED BASED ON ON ORIGINAL SPECIES ANALYSIS AND ARE SUBJECT TO CHANGE.*
3. *WE ARE NOT ANTICIPATING ANY IMPACT TO SPECIES DUE TO THE CURRENT USE OF THE PROJECT FOOTPRINT.*
4.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

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

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

☐ Yes ☒ No

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

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

☐ Yes ☐ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0902	90	208	RISINGER RD
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	FTW	TARRANT		98

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0902-90-208

1.2 PROJECT LIMITS:
From: 0.1 MILES WEST OF GARDEN SPRINGS DR.

To: 0.1 MILES EAST OF GARDEN SPRINGS DR.

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 32.61716266783425 ,(Long) -97.38473386831419

END: (Lat) 32.61650560646417 ,(Long) -97.38141960050149

1.4 TOTAL PROJECT AREA (Acres): 0.28

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.28

1.6 NATURE OF CONSTRUCTION ACTIVITY:
NEW TRAFFIC SIGNAL, ADA RAMPS, SEPARATE LEFT-TURN LANES FOR NB/SB/EB/WB, INTERSECTION SAFETY LIGHTING, PED CROSSINGS ON ALL SIDES, REFRESH/MODIFY PAVEMENT MARKING.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
PoB	Ponder clay loam, 1 to 3 percent slopes
SaB	Sanger clay, 1 to 3 percent slopes

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

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

Type	Sheet #s
Silt Fence (Inlet Protection)	97

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

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

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

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

Tributaries	Classified Waterbody
SYCAMORE CREEK	WEST FORK TRINITY RIVER BELOW LAKE WORTH DAM (0806_01)(DIOXIN AND PCBs IN EDIBLE TISSUE)

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

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

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	STP 2023(866)HES		99
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0902	90	208	RISINGER RD

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 INSPECTIONS:

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

2.9 MAINTENANCE:

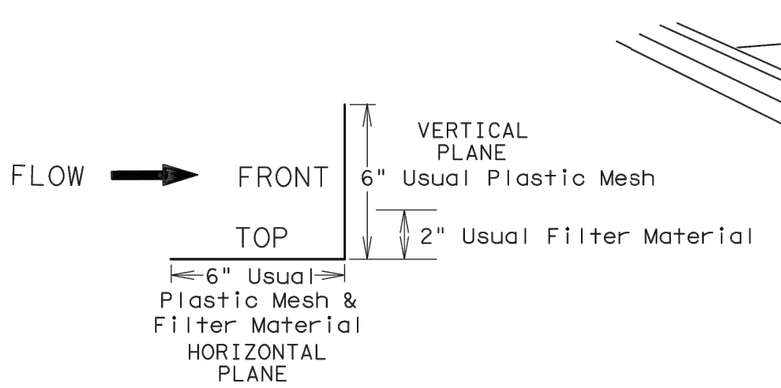
Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being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

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

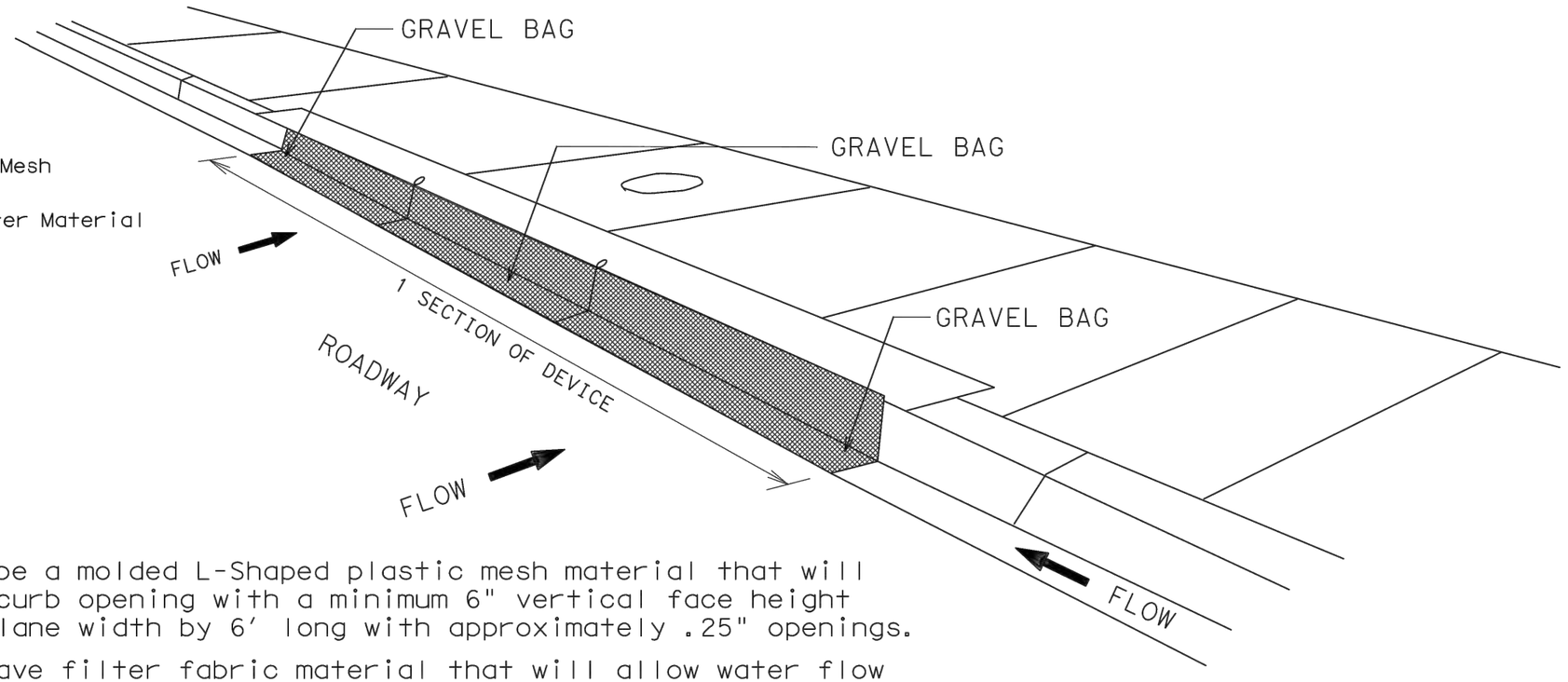
Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	STP 2023(866)HES		100
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0902	90	208	RISINGER RD

cisedprot.dgn



PLASTIC MESH L-SHAPE
CROSS SECTION



NOTES:

1. The device shall be a molded L-Shaped plastic mesh material that will cover the entire curb opening with a minimum 6" vertical face height by 6" horizonal plane width by 6' long with approximately .25" openings.
2. The device must have filter fabric material that will allow water flow but stop sediment. It will extend from bottom up vertical plane a minimum of 2" and full width of horizontal bottom plane. The filter fabric shall be attached to the back of the plastic mesh. It shall not cover more than 1/3 of the height of the vertical plane opening to allow overflow in larger strom events to prevent flooding of travel lanes.

Filter Fabric Physical Requirements Table

Apparent Opening Size (AOS)	400 to 600 microns
Percent Open Area (POA)	>10%
Flow Rate	130 gallons per SF per minute with clean water or greater.

3. Place with horizontal plane pointing away from curb.
4. For high openings, the device or attachment should extend above opening.
5. For long curb openings, overlap the segments 6". Tie together with 4 zip ties in 4 places, 2 at the top and 2 at the bottom.
6. Install gravel, not sand, bags at each end, at overlaps and in the middle of each section. Use 1/3 full bags for low profile and best traffic avoidance.
7. Use bags that will have long-term resistance to UV exposure.
8. Sediment should be removed and device cleaned when sediment reaches 1" in depth.

REVISED ON 9/10/08

DALLAS DISTRICT STANDARD

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CURB INLET SEDIMENT PROTECTION

FED. RD. DIV. NO.	PROJECT NUMBER		SHEET NUMBER
18	STP 2023(866)HES		101
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	SECTION	HIGHWAY NUMBER
0902	90	208	RISINGER RD

FILENAME: $FILE$