

STATE OF TEXAS DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED INTERSECTION IMPROVEMENT

HIGHWAY SAFETY IMPROVEMENT PROJECT

CSJ: 0918-24-267, ETC.

VARIOUS COUNTIES

HARRY HINES BOULEVARD
AT WALNUT HILL LANE
CSJ: 0918-47-350

MIDWAY ROAD
AT ROYAL LANE
CSJ: 0918-47-353

HILLCREST ROAD
AT SPRING VALLEY ROAD
CSJ: 0918-47-355

DALLAS PARKWAY
AT FRANKFORD ROAD
CSJ: 0918-24-267

SH 190
AT MIDWAY ROAD
CSJ: 2964-04-009

PARK LANE
AT SHADY BROOK LANE
CSJ: 0918-47-416

FOR THE CONSTRUCTION OF SAFETY IMPROVEMENT PROJECTS
CONSISTING OF TRAFFIC SIGNAL IMPROVEMENTS

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
STS	6	STP 2024 (741) HESG, ETC	VAR
GRAPHICS	STATE	DISTRICT	COUNTY
DN	TEXAS	DALLAS	COLLIN, ETC.
CHECK	CONTROL	SECTION	JOB
SPM			
CHECK			
STS	0918	24	267, ETC.
			1

NOTE:

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

REGISTERED ACCESSIBILITY SPECIALIST (RAS)
INSPECTION REQUIRED. TDLR NO: TABS2024005820

PLANS PREPARED BY:



BGE, Inc.
2595 Dallas Parkway, Suite 101, Frisco, TX 75034
Tel: 972-464-4800 • www.bgeinc.com
TBPE Registration No. F-1046

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**CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION**

RECOMMENDED FOR LETTING: **12-1-23**

G. A. Webb, P.E.
DIRECTOR, CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION



SUBMITTED FOR LETTING: **12/4/2023**

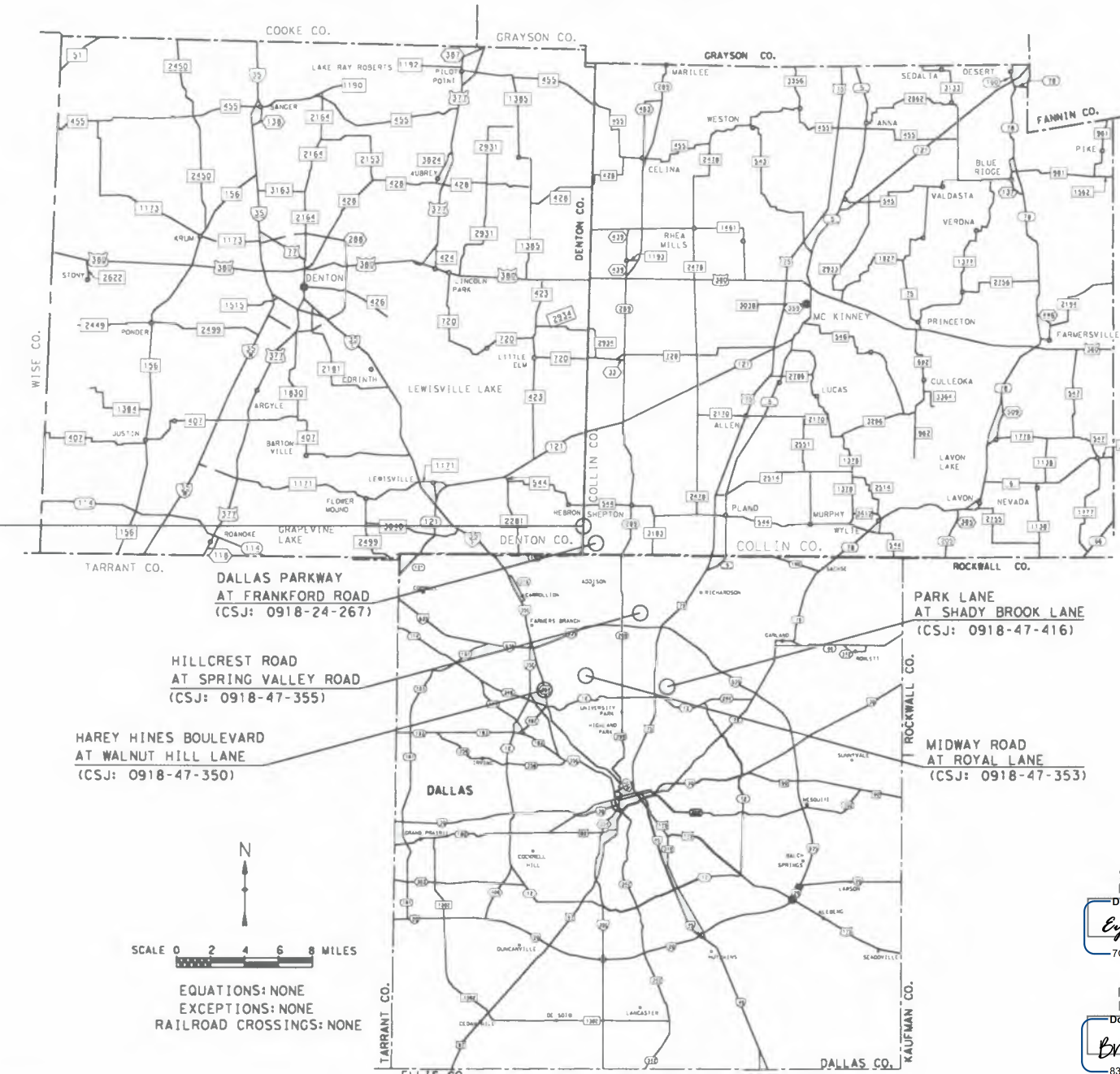
DocuSigned by:
Eyad Fanous, P.E.
TRAFFIC DESIGN SUPERVISOR

APPROVED FOR LETTING: **12/5/2023**

DocuSigned by:
JEFFREY BUSH, P.E.
DIRECTOR OF OPERATIONS

RECOMMENDED FOR LETTING: **12/4/2023**

DocuSigned by:
Brandi A. Bush, P.E.
OPERATIONS ENGINEER



SH 190
AT MIDWAY ROAD
(CSJ: 2964-04-009)

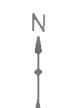
DALLAS PARKWAY
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(CSJ: 0918-47-416)

MIDWAY ROAD
AT ROYAL LANE
(CSJ: 0918-47-353)



SCALE 0 2 4 6 8 MILES

EQUATIONS: NONE
EXCEPTIONS: NONE
RAILROAD CROSSINGS: NONE

WORK WAS COMPLETED ACCORDING TO THE PLANS AND CONTRACT.

Signature of Registrant & Date

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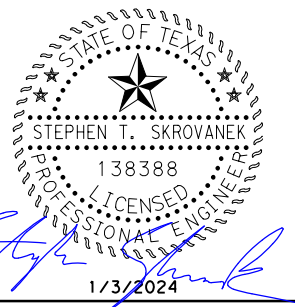
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Stephen T. Skrovanek, P.E. 1/3/2024



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CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION



INDEX OF SHEETS

SCALE: N/A SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	2

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

County: COLLIN, ETC

Highway: VAR

GENERAL

The construction, operation and maintenance of the proposed project will be consistent with the state implementation plan as prepared by the Texas Commission on Environmental Quality.

The disturbed area for this project, as shown on the plans is 0.48 acres. However, **the Total Disturbed Area** (TDA) will establish the required authorization for storm water discharges. The TDA of this project will be determined by the sum of the disturbed area in all project locations in the contract, and all disturbed area on all Project-Specific Locations (PSL) located in the project limits and/or within 1 mile of the project limits. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction site as shown on the plans, according to the TDA of the project. The contractor will obtain any required authorization from the TCEQ for the discharge of storm water from any PSL for construction support activities on or off of the project row according to the TDA of the project. When the TDA for the project exceeds 1 acre, provide a copy of the appropriate application of permit (NOI, or Construction Site Notice) to the engineer, for any PSL located in the project limits or within 1 mile of the project limits. Follow the directives and adhere to all requirements set forth in the TCEQ, Texas Pollution Discharge Elimination System, Construction General Permit (TPDES, CGP).

Leave all right of way areas undisturbed until actual construction is to be performed in said areas.

Provide the Engineer with a copy of all DBE subcontractor agreements prior to commencing work.

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address: <https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors> or Contractor questions on this project are to be addressed to the following individual(s):

Engineer's Email: Christopher.Blain@txdot.gov

Construction Manager's Email: Eric.Herman@txdot.gov

Construction Record-Keeper's Email: Anthony.Block@txdot.gov

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

All contractor questions will be reviewed by the Engineer or Construction Manager. 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.

County: COLLIN, ETC

Highway: VAR

Item 5:

Underground utilities owned by the Texas Department of Transportation may be present within the Right-Of-Way on this project. For signal, illumination, surveillance, and communications & control maintained by TxDOT, call the TxDOT Traffic Signal Office (214-320-6682) for locates a minimum of 48 hours in advance of excavation. For irrigation systems, call TxDOT Maintenance Landscape Office (214-320-6636) for locates a minimum of 48 hours in advance of excavation. If city or town owned irrigation facilities are present, call the appropriate department of the local city or town a minimum of 48 hours in advance of excavation. The Contractor is liable for all damages incurred to the above mentioned utilities when working without having the utilities located prior to excavation.

For the project to be deemed complete, permanently stabilize all unpaved disturbed areas of the project with a vegetative cover at a minimum of 70% density for the control of erosion.

Submit all shop drawings, working drawings, or other documents which require review sufficiently in advance of scheduled construction to allow no less than thirty (30) calendar days for review and response.

Locate all utilities, both underground and above ground, in the project area prior to beginning work so that conflicts are avoided.

Provide to the Engineer, in addition to any submittals required by the specifications and elsewhere in the general notes, a list of pre-qualified material to be used on the project.

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-classificationsheet.html> for clarification on material categorization.

Item 7:

Repair or replace any structures and utilities that might have been damaged by negligence or a failure to have utility locates performed.

County: COLLIN, ETC

Highway: VAR

Perform all electrical work in accordance with the National Electrical Code and Texas Department of Transportation Specifications.

Consult with appropriate electric company representatives according to their respective area to coordinate electrical services installations.

Contractor will be responsible for all costs associated with locating and/or exposing existing utilities. This includes existing utilities that may have been mismarked by the locator and/or utilities that are in the near vicinity of proposed construction. In addition, this includes all costs associated with pot-holing, mechanical vacuuming, hand-digging, etc. as needed to properly locate and protect all existing utilities.

Holiday restrictions – the engineer may decide that no lane closures or construction operations shall be allowed during the restricted periods listed in the following holiday schedule. TxDOT has the right to lengthen, shorten, or otherwise modify these restricted periods as actual, or expected, traffic conditions may warrant. Working days will not be charged for these restricted periods. No additional compensation will be allowed for these closures (i.e., overhead, delays, stand-by, barricades or any other associated cost impacts).

- New Year's Eve & Day (noon on December 31 thru 10:00 pm January 1)
- Easter Holiday weekend (noon on Friday thru 10:00 pm Sunday)
- Memorial Day weekend (noon on Friday thru 10:00pm Monday)
- Independence Day (noon on July 3 thru 10:00 pm on July 5)
- Labor Day weekend (noon on Friday thru 10:00 pm Monday)
- Thanksgiving Holiday (noon on Wednesday thru 10:00 pm Sunday)
- Christmas Holiday (noon on December 23 thru 10:00 pm December 26)

No significant traffic generator events identified.

Item 8:

This project will be a Standard Workweek in accordance with Article 8.3.1.4.

Meet daily with the Engineer to notify him or her of planned work for the day and to provide 24 hour notice of lane closures for planned work for the next day. Do not close lanes for which this requirement is not met. No work is to be performed without prior coordination with the Engineer.

A 90 day construction delay is included in this contract through Special Provision 008-056. This delay is included for material acquisition.

Item 104:

In those areas where the pavement is not to be overlaid, provide a smooth surface after the curb removal. Planing or grinding is considered an acceptable method at these locations. Measurement and payment is in accordance with this item.

Sawing of concrete is not paid for directly, but is considered subsidiary to this item.

County: COLLIN, ETC

Highway: VAR

Item 110:

Excavated shale is not an acceptable material for embankment.

Items 110 and 132:

Scarify and loosen the excavated areas, unpaved surface areas, except rock, to a depth of at least 8 inches and compact in accordance with the specifications.

Excavation and embankment for driveways, sleeper slabs, alleys and intersections will not be paid for directly, but will be considered subsidiary to these items.

Item 162:

Install block sod as directed by the Engineer.

Item 360:

Use of multiple piece tiebars will be required. Provide chairs for multiple piece tiebars, threaded connectors or other adequate devices, used in concrete paving, or tie them to the pavement reinforcing steel. If approved by the engineer for specific areas, in lieu of multiple piece tiebars, drill holes into the pavement and grout straight tiebars in place with epoxy. Use a non-impact, rotary core drill to prevent damage to the pavement unless otherwise directed. Clean the drill holes and then completely fill with epoxy before inserting the tiebar. Do not bend the tiebars or insert them into plastic concrete without the approval of the engineer.

Provide curbs monolithically constructed with the concrete pavement. If continuous monolithic curb has to be temporarily omitted for any reason, provide dowelled curbs in the proposed areas, as detailed in the plans, and apply an approved epoxy resin to the pavement to receive the curb as directed. This work and materials will not be paid for directly, but is considered subsidiary to this item.

If asphalt curing is used, cure the concrete pavement with MS-2.

Stockpile the concrete aggregates at the plant site.

Provide pavement widening joints, as detailed in the plans, at all locations where concrete pavement is placed adjacent to existing concrete pavement. Installation of these joints is not paid for directly, but is considered subsidiary to this item.

Payment for furnishing and installing the pre-molded expansion joint material between the retaining walls and concrete pavement is not paid for directly, but is considered subsidiary to this item.

Provide a curing machine equipped with rubber tires, or other acceptable arrangement, so that the machine will span the pavement and monolithic curb.

County: COLLIN, ETC

Highway: VAR

Curb transition is paid for as Type II curb. The installation of curb openings is not paid for directly, but is considered subsidiary to this item.

Place construction, sawed and contraction joints in accordance with the pavement detail sheet and as directed. Joint locations, other than as shown on the plans, are subject to approval.

Pavement leave outs are required on this project as necessary to provide for traffic at driveways and side streets as shown in the plans or as directed. The cost of providing these leaveouts, including the construction of a suitable crossover connection at each site, is not paid for directly but is considered subsidiary to this item.

If a traveling form paver is used, provide one equipped with an electronically operated horizontal control device.

Use "mechanical steel placing equipment" at the discretion of the engineer.

If more than 30% of an area in any 1000-Ft section of roadway requires grinding, action will be taken by the Contractor to make that 1000-Ft full width section uniform without changing ride quality, compromising quality of pavement and decreasing skid resistance. Approved blasting method or other method approved by the Engineer will be performed at the Contractor's expense.

Item 416:

Drilled shafts shall be drilled and poured on the same day unless directed by the engineer.

Provide a formed smooth finish for all portions of drill shafts extending above proposed ground. Include cost for this work in the unit bid price for this item.

Traffic signal pole and illumination pole foundations will be paid for once regardless of extra work caused by obstructions.

Concrete removal required for installation of drilled shafts will be subsidiary to Item 416.

Contractor is notified that low overhead lines exist in multiple areas. Contractor shall be capable of working below low overhead lines for this project.

Item 421:

Furnish mix designs to the Engineer in a format compatible to the latest version of the Department's Construction Management System (SiteManager). Mix Design templates will be provided by the Engineer.

Provide sulfate resistant concrete for all drilled shafts.

County: COLLIN, ETC

Highway: VAR

Provide all freshly mixed concrete testing equipment as required by subsection 3.3, except as noted here. Curing facilities, maturity meters, and strength-testing equipment will not be required. Air content testing is waived for this project. All testing equipment shall be clean and in like-new condition. Test molds shall be 4" diameter x 8" tall.

Items 440:

Fiber Reinforced Concrete (FRC) can be used as a substitute for Non-Structural Class Reinforced Concrete in Mow-Strip and Rip Rap Items as approved. FRC may also be used for other Non-Structural Class Reinforced Concrete Items as approved.

Item 449:

Use Thomas & Betts Kopr-Shield, MG Chemicals #846, MG Chemicals #8463, NYOGEL #756G, Pro-Shield #7308, Cho-Lube #4220, or other approved electrically conducting lubricant compound.

Item 479:

Salvage and stockpile all existing inlet grates and manhole covers removed under this item at a location designated by the engineer.

Submit a plan detailing proposed methods of handling phased construction at manholes and water valves.

Payment for the phase construction will be considered subsidiary to this item.

Item 500:

Material On Hand (MOH) will not be used in calculating partial payments for Mobilization.

Item 502:

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

Access will be provided to all business and residences at all times. Where turning radii are limited during phased construction at intersections, provide all weather surfaces such as RAP or base in turning movements to accommodate and to protect the traffic from edge drop-offs. Materials, labor, maintenance and removal for these temporary accesses and radii will not be paid for directly but will be considered subsidiary to the various bid items.

County: COLLIN, ETC

Highway: VAR

Place barricades and signs in locations that do not obstruct the sight distance of drivers entering the highway from driveways or side streets.

Do not operate or park any equipment/machinery closer than 30 feet from the traveled roadway after sunset unless authorized by the engineer.

When moving unlicensed equipment on or across any pavement or public highways, protect the pavement from all damage using an acceptable method.

Limit lane closures to the hours between 9:00 am and 3:30 pm. Work in other areas of the project is not restricted to this time frame.

Item 506:

Install Biodegradable Erosion Control Logs as directed by the Engineer.

Item 529:

Provide grooved joints at 10-foot intervals and $\frac{3}{4}$ inch expansion joint material for doweled curb at the same locations as on the existing pavement.

For Curb and Gutter sections, provide grooved joints at 10-foot intervals and $\frac{3}{4}$ inch expansion joint material at a maximum of 50-foot centers and at all radius points and inlets.

Curb and Gutter transitions will be paid for by the foot at the unit price for the corresponding curb or curb and gutter section.

Saw joints at the same location as on the existing pavement.

Item 531:

Joint Sealing is subsidiary to Item 531.

Item 536:

Use Class "B" concrete for concrete medians and directional islands.

Item 610:

Provide 12 circuit Buchanan Type 112SN, Kulka Type 985-GP-10 CU, or equal terminal strip in the luminaire pole access compartment. The conductors for the line and load side of the terminal strip shall be identified with a plastic label with two straps per tag. The load side shall have each signal head and ped head identified on the tag.

Item 618:

The location of conduits and ground boxes are diagrammatic only and may be shifted to accommodate field conditions as directed.

County: COLLIN, ETC

Highway: VAR

Secure permission and approval from the proper authority prior to cutting into or removing any sidewalks or curbs for installation of this Item.

Place conduit under existing pavement by an approved boring method. Do not place boring pits closer than 2 feet from the edge of the pavement unless otherwise directed. Do not use water jetting. When conduits are bored, do not exceed 18 inches in the vertical and horizontal tolerances as measured from the intended target point.

Do not use a pneumatically driven device for punching holes beneath the pavement (commonly known as a "missile").

Furnish and install a flat, high tensile strength polyester fiber pull tape in conduit runs in excess of 50 feet or for future use and protected with standard weather-tight conduit caps, as approved. Acceptable products include Garvin # PT-1250-3K, ComStar PUL 1250P3K, Ideal Part No. 31-315 or equal as approved by the Engineer. This work will not be paid for directly, but is subsidiary to this Item.

Use a colored cleaner-primer on all PVC to PVC joints before application of PVC cement.

Seal all conduit ends with a permanently soft, non-toxic duct seal. Use a duct seal that does not adversely affect other plastic materials or corrode metals. Where sidewalk is removed to install trenched conduit, replace sidewalk to match existing material. This work will be subsidiary to Item 618 except where shown otherwise in the plans.

2" Schedule 80 PVC will be used at the power pole to supply electricity to underground services.

Item 620:

The equipment grounding conductor smaller than 4 AWG shall be identified by a continuous green colored jacket insulation or bare wire. Grounded conductors (Neutral) smaller than 4 AWG shall be identified by a continuous white colored jacket. Ungrounded conductors (Hot) in a 120/240v system shall be identified by each pole or leg. For 240-volt branch circuit fed from 120/240 source, ensure one leg is identified by a continuous black colored jacket and the other leg by a continuous red colored jacket.

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

Item 624:

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

County: COLLIN, ETC

Highway: VAR

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

Item 628:

Contact the appropriate utility company during the first three weeks of the project lead-time period to allow adequate time for any necessary utility adjustments, transformer installation, etc.

Contractor shall submit an online request at ONCOR.com by following the steps below:
 Select Construction and Development tab at top of screen.
 Scroll down to New Construction and select Learn More.
 Select the Start Request icon under the Commercial and Industrial project type.
 Select the One Single Building Facility tab and fill in all required information.
 Submit the request. An ONCOR representative will contact you within a few days.
 Billing responsibility for electrical service at SH 190 and Midway Road shall remain with TxDOT.

The Meter Base or Transocket shall be mounted facing the roadway and the service enclosure shall be mounted on the opposite side of the service pole or pedestal.

The Contractor shall obtain the street address of the new electrical service directly from the applicable City.

Label the service enclosures indicating service address as well as all required information as shown on the Electrical Detail (ED) standard sheets. Labeling shall be silk screening or other acceptable method. This work will not be paid for directly, but is subsidiary to this Item.

A Licensed Master Electrician shall oversee the installation of all electrical services.

On the outside lower front of each electrical service meter base cover, install a 12 gauge minimum thickness stainless steel, aluminum or brass placard. The placard shall be engraved or stamped with the numeric portion of the street address and permanently affixed to the cover with exterior rated adhesive so as not to interfere with the operation of the latch. This work will not be paid for directly, but is subsidiary to this Item.

Prior to application for electrical service connection at all Off-System locations, the Contractor shall apply for an electrical service permit at 320 E. Jefferson Street in Dallas and to have the new electrical service inspected and "green-tagged" at their expense. The Contractor shall apply for inspection of the installed electrical service infrastructure by the utility company, and shall coordinate the installation of underground cable by the utility company. The Contractor shall notify City of Dallas Traffic Signal staff with regular updates about information relevant to setting up electric service accounts for the project.

Upon receipt of "green tag" and after underground cable is installed by the utility company for each location, the Contractor shall provide a copy of the "green tag" to Mr. Alfred Lemon and Mr. Favian Giraldo at the City of Dallas Signal Shop. The City shall submit the request for new electric service to the utility provider upon receipt of a copy of

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the "green tag". Electrical service accounts for each new electrical service shall be established by and billed to the City of Dallas.

Item 644:

Prior to taking elevations to determine lengths for fabrication of sign posts, obtain verification of all proposed locations.

All sign mounts shall have a clamp base system for all small roadside sign assemblies.

A 3 inch strip of red reflective sheeting shall be placed on all Do Not Enter sign assemblies. This sheeting shall be placed directly below the Do Not Enter sign for the entire length of the sign post facing wrong way traffic. This work will be considered subsidiary to Item 644.

Item 656:

Before placing the concrete for the controller foundation, coordinate with the City of Dallas to ensure that the anchor bolt spacing will match the anchor bolts and cabinet supplied by the city.

Form a 3/4-inch chamfer on the top edge of each pedestal pole foundation.

Probe for utilities and underground structures prior to drilling foundations. Foundations shall be paid for once regardless of extra work caused by obstructions.

Item 662 and 672:

Black adhesive will be used on asphalt pavements and white adhesive will be used on concrete pavements.

Item 677:

A water blasting method approved by the Engineer will be the only method allowed for the removal of permanent and temporary pavement markings except on a sealcoat surface. A 2 foot wide sealcoat will be required on sealcoat surfaces to eliminate permanent and temporary pavement markings.

Item 680:

Requirements for this Item include the following work, all of which are subsidiary to this Item:

1. Notify the Traffic Projects Office at DAL_TPO@txdot.gov one week before beginning any work involving traffic signals. Supplement email correspondence with the Construction Office at (214) 319-6406.
2. Notify the City of Dallas Traffic Management Center at (214) 670-3095 and at Alfred.Lemon@dallas.gov one week before beginning any work involving traffic

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signals. When working in City of Dallas Right of Way, obtain approval for traffic control plans (TCPs) and Right of Way (ROW) cut permits with the City of Dallas online system: www.rowmanagement.dallascityhall.com.

3. Provide submittal literature for all traffic signal equipment before installation.
4. Install the supplied traffic signal controller and cabinet.
5. Install the controller cabinet in an orientation as directed by the City of Dallas.
6. Connect all field wiring to the controller assembly. The City will assist in determining how the detection cables are to be connected, and will also program the controller for operation, hook up the malfunction management unit (MMU) or conflict monitor, detector units, and other equipment, and turn on the controller. Pick up the signal cabinet from the City of Dallas Traffic Field Operations facility at 3204 Canton Street, Dallas, TX. Contact the City of Dallas Traffic Field Operations Supervisor with a 8-week notice and at least 48-hour notice of intent to pick-up materials from the City of Dallas. Have a qualified technician and a City staff on the project site to place the traffic signals in operation.
7. Furnish and install all sign panels for mounting on signal poles and mast arms. Fabricate the sign panels in accordance with Item 636, and mount with Astro-Sign Brac, Signfix aluminum channel, or equal as approved by the Engineer. Submit five (5) sets of shop drawings for street name signs.
8. Provide 250W Equivalent LED Fixtures with 120-volt electronic LED drivers as shown on the Material Producers List. If plans specify a wattage other than 250W Equivalent LED Fixtures, confirm with Construction Manager before ordering the Fixtures.
9. Provide notification to the City staff about the start of the thirty-day test period. Use qualified personnel to respond to and diagnose all trouble calls during the thirty-day test period. Repair any malfunction to Contractor-supplied signal equipment. Provide to the Engineer a local telephone number, not subject to frequent changes and available on a 24-hour basis, for reporting trouble calls. Response time to reported calls must be less than 2 hours. Make appropriate repairs within 24 hours. Place a logbook in the controller cabinet and keep a record of each trouble call reported. Notify the Engineer of each trouble call. Do not clear the error log in the conflict monitor or MMU during the thirty-day test period without approval from City staff.
10. When all the work required by this contract has been satisfactorily completed on any individual or inter-connected system of signalized intersections, final clean-up has been performed, and the traffic signal equipment supplied has operated continuously and satisfactorily for at least 30 days, release from further maintenance on that particular intersection is authorized. This partial acceptance, made in writing, does not void or alter any of the terms of the contract.
11. Prevent any damage to property owner's poles, fences, shrubs, mailboxes, etc. Protect all underground and overhead utilities and repair any damage. Provide access to all driveways during construction.
12. Salvage poles, cabinets, service poles and equipment, exposed conduit, and any other equipment as directed. This equipment remains the property of the City of Dallas. Contact the City of Dallas Traffic Field Operations Supervisor, Mr. Alfred Lemon, at (214) 670-3896 with at least 24 hours' notice of intent to drop-off materials at the City of Dallas. The location of the drop-off facility is 3204 Canton Street, Dallas, TX. All other material removed in this project will become the property of the Contractor. Dispose of material off the right of way in accordance with federal, state,

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and local regulations. Maintain the operation of the existing traffic signal until directed to remove it.

13. Contractor is notified that low overhead lines exist in multiple areas. Contractor shall be capable of working below low overhead lines for this project.
14. Contractor shall install a base mounted controller cabinet foundation (Type 332/352i) at each intersection. Payment shall be subsidiary to Item 680.

Item 682:

Install signal head attachments so that the wiring to each signal head passes from the mast arm through the attachment hardware to the signal head. Do not leave cable or wiring exposed.

Provide signal head attachments that allow for adjustment about the horizontal and vertical axis.

Turn down signal heads or cover with burlap or other material, as approved, until traffic signal is placed in operation.

Mount signal heads level and plumb and aim as directed.

Provide black polycarbonate pedestrian and vehicle signal heads with non-painted aluminum tubing. Provide black powder-coated aluminum non-vented back plates for all traffic signal heads.

All backplates shall include a 2 inch wide fluorescent yellow retroreflective border.

Item 684:

Provide stranded 14 AWG Type A signal cables for LED signal heads and stranded 12 AWG Type C cables for APS units.

Provide a separate multi-conductor signal cable (14 AWG) inside pedestal poles and signal poles from the terminal strip to each signal head as shown on the plans.

Identify each cable as shown on the plans (cable 1, etc.) with permanent marking labels (Panduit Type PLM standard single marker tie, Thomas&Betts Type 548M, or equal) at each ground box, pole base, and controller.

Item 686:

Provide 12 circuit Buchanan Type 112SN, Kulka Type 985-GP-12 CU, or equal terminal strips in the signal pole access compartment. Provide additional terminal strips of 8 circuits each when more than 12 circuits are required. The conductors for the line and load side of the terminal strip shall be identified with a plastic label with two straps per tag. The load side shall have each signal head and ped head identified on the tag.

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Mark pole shafts and mast arms with the identification numbers from the plans to facilitate field-assembly. Identify pole shafts and mast arms by intersection for projects with multiple intersections.

Provide nuts on top and bottom (double nuts) of the base plate as shown on the plans. Set anchor bolts for mast arm signal poles and strain poles so that two are in tension and two are in compression. Obtain approval of anchor bolt placement before placing concrete.

Provide vertical clearance of 17 to 19 feet from the roadway to the lowest point of the signal head or mast arm. Except for supplemental nearside signal heads, all signal heads must be installed at least 40' from the stop line. If field adjustments result in the nearest signal head being more than 180' from the stop line, install a supplemental nearside signal head as directed by the engineer. Determine the field measurements and elevations from the actual field location of the poles, considering all above and below ground utilities and existing roadway elevations.

Provide vibration dampers for mast arms 28 feet to 48 feet in length. Install as shown on MA-DPD.

Contractor is notified that low overhead lines exist in multiple areas. Contractor shall be capable of working below low overhead lines for this project.

Item 687:

Provide 12 circuit Buchanan Type 112SN, Kulka Type 985-GP-10 CU, or equal terminal strip in the pedestal pole base. The conductors for the line and load side of the terminal strip shall be identified with a plastic label with two straps per tag. The load side shall have each signal head and ped head identified on the tag.

Item 688:

Verify the location of the APS units and the direction of the arrows on the signs prior to installation.

APS Units shall operate with hardwired connections for the communications path between the APS Units and the APS controller. APS controller will need to have an SDLC port and SDLC cabling for installation in an ATC cabinet.

Contractor shall deliver a digital copy of APS messages to the City of Dallas for archival and maintenance purposes. Contact Srinivasa Veeramallu at s.veeramallu@dallas.gov for delivery instructions.

Item 6007: Fiber Optic Cable

The single mode fiber optic cable will be installed continuous, without splices unless shown in the plans.

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All fiber optic pigtails and patch cords shall have LC (UPC) connectors, will not be paid for separately, and shall be considered subsidiary to Item 6007.

Extra cable length will be included in each run, to provide adequate slack, at each ground box, and the controller cabinet.

Item 6185:

The total number of truck mounted attenuators (TMA) required when utilizing the traffic control standards are shown in the tables below.

WZ (BTS) Series	Scenario	Required TMA
(BTS-1)-13	Near Side Lane Closure	1

Shadow vehicles equipped for truck mounted attenuators (TMA) for stationary operations will be paid for by the day and must be available for use at any time as determined by the Engineer.

Therefore, 1 total shadow vehicle with TMA will be required for this type of work. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project for those times per plan requirements. Additional TMAs used that are not specified in the plans in which the contractor expects compensation will require prior approval from the Engineer.

Item 6186: ITS Ground Box:

The Contractor shall provide a total of 4 keyed sockets for the locking security bolts for the project. This work will not be paid for directly, but is subsidiary to this Item.

Item 6292:

If the radar mounting locations shown on the plans do not allow for proper detection of the proposed zones, relocate the radar units as needed and directed. The labor cost to adjust the units will not be paid for separately but will be considered subsidiary to this Item.

The City of Dallas Standard (Exhibit N) refers to mounting radar using astro-brackets. The word "astro-bracket" shall be replaced with the words "mounting clamp" at all instances on this exhibit.

The Contractor shall install Wavetronix radar detection equipment. The equipment shall include Wavetronix Matrix and Advance Extended Range panels with mounting hardware, cables, junction boxes, and Click cards. The equipment shall also include Wavetronix 65X units and ARCX units with hinged mounting hardware and SDLC cables for a fully functional radar detection system, as called out in the plans. Radar detection equipment location and configuration shall be made by the manufacturer's

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representative in coordination with City Traffic Signal staff to achieve best detection and count accuracy for the site conditions.

The list of material below is for the Contractor's information only.
It is the responsibility of the Contractor to verify all items and quantities listed below.

LIST OF MATERIAL/LABOR
SUBSIDIARY TO ITEM 680

HARRY HINES AT WALNUT HILL

Description	Unit	Quantity
250W EQ LED LUMINAIRE	EA	1
INSTALL CITY-SUPPLIED CABINET AND CONTROLLER	EA	1
CONCRETE FOUNDATION (CITY OF DALLAS CABINET)	CY	0.9
REGULATORY SIGN PANEL (R10-12, ETC)	EA	8
SINGLE STREET NAME SIGN PANEL	EA	4

MIDWAY AT ROYAL

Description	Unit	Quantity
250W EQ LED LUMINAIRE	EA	4
INSTALL CITY-SUPPLIED CABINET AND CONTROLLER	EA	1
CONCRETE FOUNDATION (CITY OF DALLAS CABINET)	CY	0.9
RELOCATE SIGN PANEL	EA	2
SINGLE STREET NAME SIGN PANEL	EA	4

SPRING VALLEY AT HILLCREST

Description	Unit	Quantity
250W EQ LED LUMINAIRE	EA	4
INSTALL CITY-SUPPLIED CABINET AND CONTROLLER	EA	1
CONCRETE FOUNDATION (CITY OF DALLAS CABINET)	CY	0.9
REGULATORY SIGN PANEL (R10-12, ETC)	EA	2
RELOCATE SIGN PANEL	EA	2
SINGLE STREET NAME SIGN PANEL	EA	4

DALLAS PARKWAY AT FRANKFORD

Description	Unit	Quantity
250W EQ LED LUMINAIRE	EA	3
INSTALL CITY-SUPPLIED CABINET AND CONTROLLER	EA	1
CONCRETE FOUNDATION (CITY OF DALLAS CABINET)	CY	0.9
REGULATORY SIGN PANEL (R10-12, ETC)	EA	15
SINGLE STREET NAME SIGN PANEL	EA	6

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SH 190 AT MIDWAY

Description	Unit	Quantity
250W EQ LED LUMINAIRE	EA	4
INSTALL CITY-SUPPLIED CABINET AND CONTROLLER	EA	1
CONCRETE FOUNDATION (CITY OF DALLAS CABINET)	CY	0.9
REGULATORY SIGN PANEL (R10-12, ETC)	EA	12
SINGLE STREET NAME SIGN PANEL	EA	6

PARK AT SHADY BROOK

Description	Unit	Quantity
INSTALL CITY-SUPPLIED CABINET AND CONTROLLER	EA	1
CONCRETE FOUNDATION (CITY OF DALLAS CABINET)	CY	0.9
SINGLE STREET NAME SIGN PANEL	EA	3

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LIST OF MATERIAL
FURNISHED BY THE CITY OF DALLAS

HARRY HINES AT WALNUT HILL

Description	Unit	Quantity
ATC 352i SIGNAL CONTROLLER CABINET	EA	1
2070 TRAFFIC SIGNAL CONTROLLER	EA	1
CABINET-MOUNTED BATTERY BACKUP UNIT	EA	1
PTZ CAMERA	EA	1
ETHERNET CABLE (FOR PTZ CAMERA)	LF	285
RADAR PRESENCE DETECTOR	EA	4
RADAR ADVANCE DETECTOR	EA	4
RADAR DETECTOR CABLE	LF	2175

MIDWAY AT ROYAL

Description	Unit	Quantity
ATC 352i SIGNAL CONTROLLER CABINET	EA	1
2070 TRAFFIC SIGNAL CONTROLLER	EA	1
CABINET-MOUNTED BATTERY BACKUP UNIT	EA	1
PTZ CAMERA	EA	1
ETHERNET CABLE (FOR PTZ CAMERA)	LF	210
RADAR PRESENCE DETECTOR	EA	4
RADAR ADVANCE DETECTOR	EA	4
RADAR DETECTOR CABLE	LF	1570

SPRING VALLEY AT HILCREST

Description	Unit	Quantity
ATC 352i SIGNAL CONTROLLER CABINET	EA	1
2070 TRAFFIC SIGNAL CONTROLLER	EA	1
CABINET-MOUNTED BATTERY BACKUP UNIT	EA	1
PTZ CAMERA	EA	1
ETHERNET CABLE (FOR PTZ CAMERA)	LF	55
RADAR PRESENCE DETECTOR	EA	4
RADAR ADVANCE DETECTOR	EA	4
RADAR DETECTOR CABLE	LF	1495

DALLAS PARKWAY AT FRANKFORD

Description	Unit	Quantity
ATC 352i SIGNAL CONTROLLER CABINET	EA	1
2070 TRAFFIC SIGNAL CONTROLLER	EA	1
CABINET-MOUNTED BATTERY BACKUP UNIT	EA	1
PTZ CAMERA	EA	2
ETHERNET CABLE (FOR PTZ CAMERA)	LF	425
RADAR PRESENCE DETECTOR	EA	6
RADAR ADVANCE DETECTOR	EA	4
RADAR DETECTOR CABLE	LF	2295

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SH 190 AT MIDWAY

Description	Unit	Quantity
ATC 352i SIGNAL CONTROLLER CABINET	EA	1
2070 TRAFFIC SIGNAL CONTROLLER	EA	1
CABINET-MOUNTED BATTERY BACKUP UNIT	EA	1
PTZ CAMERA	EA	2
ETHERNET CABLE (FOR PTZ CAMERA)	LF	640
RADAR PRESENCE DETECTOR	EA	6
RADAR ADVANCE DETECTOR	EA	4
RADAR DETECTOR CABLE	LF	3750

PARK AT SHADY BROOK

Description	Unit	Quantity
ATC 352i SIGNAL CONTROLLER CABINET	EA	1
2070 TRAFFIC SIGNAL CONTROLLER	EA	1
CABINET-MOUNTED BATTERY BACKUP UNIT	EA	1
PTZ CAMERA	EA	1
ETHERNET CABLE (FOR PTZ CAMERA)	LF	120
RADAR PRESENCE DETECTOR	EA	3
RADAR ADVANCE DETECTOR	EA	2
RADAR DETECTOR CABLE	LF	710

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LOCATION	104 6011 REMOVING CONC (MEDIANS) SY	110 6001 EXCAVATION (ROADWAY) CY	162 6002 BLOCK SODDING SY	168 6001 VEGETATIVE WATERING MG	251 6073 REWRKING BS MATL (TY C) (10") (ORD COMP) SY	260 6012 LIME (HYD, COM OR QK) (SLRY) OR (NEW BASE) (10") TON	260 6054 LIME TRT (NEW BASE) (10") SY	334 6073 HMCL ACP TY-D SAC-A AC-0.6 TON	360 6005 CONC PVMT (CONT REINF - CRCP) (11") SY	360 6050 CONC PAV (CONT REINF) (FAST TRK) (11") SY	416 6029 DRILL SHAFT (RDWY ILL POLE) (30 IN) LF	416 6031 DRILL SHAFT (TRF SIG POLE) (30 IN) LF	416 6032 DRILL SHAFT (TRF SIG POLE) (36 IN) LF	416 6034 DRILL SHAFT (TRF SIG POLE) (48 IN) LF	432 6001 RIPRAP (CONC) (4 IN) CY
HARRY HINES AT WALNUT HILL	25	142	32	1	22	9	89	20	22	89	22			88	19
MIDWAY AT ROYAL	52				40				40				56		0.2
SPRING VALLEY AT HILLCREST	57				45				45				42	22	
DALLAS PARKWAY AT FRANKFORD	57				17				17				44	22	0.5
PGBT AT MIDWAY	93												60		
PARK AT SHADY BROOK											8	12	28		
TOTALS	284	142	32	1	124	9	89	20	124	89	30	12	230	132	19.7

LOCATION	479 6005 ADJUSTING MANHOLES (WATER VALVE BOX) EA	500 6001 MOBILIZATION LS	502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING MO	506 6042 BIODEG EROSN CONT LOGS (INSTL) (18") LF	506 6043 BIODEG EROSN CONT LOGS (REMOVE) LF	529 6002 CONC CURB (TY 11) LF	529 6008 CONC CURB & GUTTER (TY 11) LF	531 6003 CONC SIDEWALKS (6") SY	531 6004 CURB RAMPS (TY 1) EA	531 6005 CURB RAMPS (TY 2) EA	531 6008 CURB RAMPS (TY 5) EA	531 6010 CURB RAMPS (TY 7) EA	531 6016 CURB RAMPS (TY 21) EA	531 6017 CURB RAMPS (TY 22) EA	531 6022 CURB RAMPS (TY 5) SY
HARRY HINES AT WALNUT HILL		0.15	2	100	100	21	371	112	1					2	62
MIDWAY AT ROYAL		0.15	2	100	100		9	80.5			3		2		
SPRING VALLEY AT HILLCREST	1	0.15	2	100	100		25	54.5			3				
DALLAS PARKWAY AT FRANKFORD		0.2	3	100	100		40	17	2	1	3	2		1	
PGBT AT MIDWAY		0.2	3	100	100			31	2	1	1	4	2	2	
PARK AT SHADY BROOK		0.15	2	100	100										
TOTALS	1	1	14	600	600	21	445	295	5	2	10	8	2	5	62

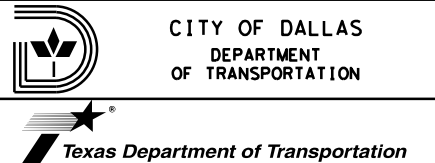
LOCATION	531 6051 CONCRETE RAMP WITH WALL CY	536 6004 CONC DIRECTIONAL ISLAND SY	536 6006 CONC MEDIAN (MONO NOSE) SY	610 6009 REMOVE RD IL ASM (TRANS-BASE) EA	610 6124 IN RD IL (TY SA) 20T-4 (150W EQ) LED EA	610 6162 IN RD IL (TY SA) 30T-8 (250W EQ) LED EA	618 6046 CONDT (PVC) (SCH 80) (2") LF	618 6047 CONDT (PVC) (SCH 80) (2") (BORE) LF	618 6053 CONDT (PVC) (SCH 80) (3") LF	618 6054 CONDT (PVC) (SCH 80) (3") (BORE) LF	618 6058 CONDT (PVC) (SCH 80) (4") LF	618 6059 CONDT (PVC) (SCH 80) (4") (BORE) LF	620 6002 ELEC CONDR (NO. 14) INSULATED LF	620 6004 ELEC CONDR (NO. 12) INSULATED LF	620 6008 ELEC CONDR (NO. 8) INSULATED LF
HARRY HINES AT WALNUT HILL			3		1	2	270		360	700	120	570	740	450	
MIDWAY AT ROYAL			12	1			25	140	205	50	395			240	820
SPRING VALLEY AT HILLCREST			12				70	95	130	100	425			240	950
DALLAS PARKWAY AT FRANKFORD	5	40					120	55	130	110	530			320	1300
PGBT AT MIDWAY		93					315	100	135	450	440			320	1880
PARK AT SHADY BROOK				1			60	75	85	90	225			60	270
TOTALS	5	133	27	1	2	2	860	465	1045	700	920	2585	740	1630	5220

LOCATION	620 6009 ELEC CONDR (NO. 6) BARE LF	620 6010 ELEC CONDR (NO. 6) INSULATED LF	624 6009 GROUND BOX TY D (162922) EA	624 6010 GROUND BOX TY D (162922) W/ APRON EA	624 6028 REMOVE GROUND BOX EA	628 6187 ELC SRV TY D 120/240 070 (NS) SS (E) PS (U) EA	644 6004 IN SM RD SN TY 10BWG (1) SA (T) EA	644 6076 REMOVE SM RD SN SUP&AM EA	666 6018 REFL PAV MRK TY I (W) 6" (DOT) (100MIL) LF	666 6030 REFL PAV MRK TY I (W) 8" (DOT) (100MIL) LF	666 6042 REFL PAV MRK TY I (W) 12" (SLD) (100MIL) LF	666 6048 REFL PAV MRK TY I (W) 24" (SLD) (100MIL) LF	666 6102 REF PAV MRK TY I (W) 36" (YLD TRI) (100MIL) EA	666 6224 PAVEMENT SEALER 4" LF	666 6225 PAVEMENT SEALER 6" LF
HARRY HINES AT WALNUT HILL	945	1610	3	2	5	1	1	1		243				1127	2854
MIDWAY AT ROYAL	795	310	2	3	13	1								1040	1182
SPRING VALLEY AT HILLCREST	815	320	1	5	2	1								985	882
DALLAS PARKWAY AT FRANKFORD	920	310	9	2	11	1			70		25	1042	6	1365	1790
PGBT AT MIDWAY	1345	660	3	8	12	1	4	3	70		90	1062	15	2722	1943
PARK AT SHADY BROOK	485	50	2	3	4	1						330		1028	536
TOTALS	5305	3260	20	23	47	6	6	4	140	243	115	5128	21	8420	9187

LOCATION	666 6226 PAVEMENT SEALER 8" LF	666 6228 PAVEMENT SEALER 12" LF	666 6230 PAVEMENT SEALER 24" LF	666 6231 PAVEMENT SEALER (ARROW) EA	666 6234 PAVEMENT SEALER (DBL ARROW) EA	666 6243 PAVEMENT SEALER (YLD TRI) EA	666 6300 RE PM W/RET REQ TY I (W) 4" (BRK) (100MIL) LF	666 6303 RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL) LF	666 6309 RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL) LF	666 6315 RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL) LF	668 6077 PREFAB PAV MRK TY C (W) (ARROW) EA	668 6078 PREFAB PAV MRK TY C (W) (DBL ARROW) EA	672 6009 REFL PAV MRKR TY II-A-A EA	672 6010 REFL PAV MRKR TY II-C-R EA	677 6001 ELIM EXT PAV MRK & MRKS (4") LF
HARRY HINES AT WALNUT HILL	243		1127	26			640	640	2854		26			815	1039
MIDWAY AT ROYAL			760	8			440	600	1182		8			251	880
SPRING VALLEY AT HILLCREST			807	11			460	525	882		11			392	990
DALLAS PARKWAY AT FRANKFORD		25	1042	28	8	6	590	615	1790	160	28	8	2	668	1075
PGBT AT MIDWAY		90	1062	17	2	15	710	770	1943	1242	17	2	29	395	1685
PARK AT SHADY BROOK			330	6			170	150	536	708	6		40	92	1005
TOTALS	243	115	5128	96	10	21	3010	3300	9187	2110	96	10	71	2613	6674



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PROJECT SUMMARY

SCALE: N/A SHEET 1 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	4

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LOCATION	677 6002 ELIM EXT PAV MRK & MRKS (6")	677 6003 ELIM EXT PAV MRK & MRKS (8")	677 6005 ELIM EXT PAV MRK & MRKS (12")	677 6007 ELIM EXT PAV MRK & MRKS (24")	677 6008 ELIM EXT PAV MRK & MRKS (ARROW)	677 6009 ELIM EXT PAV MRK & MRKS (DBL ARROW)	677 6012 ELIM EXT PAV MRK & MRKS (WORD)	678 6001 PAV SURF PREP FOR MRK (4")	678 6002 PAV SURF PREP FOR MRK (6")	678 6004 PAV SURF PREP FOR MRK (8")	678 6006 PAV SURF PREP FOR MRK (12")	678 6008 PAV SURF PREP FOR MRK (24")	678 6009 PAV SURF PREP FOR MRK (ARROW)	678 6010 PAV SURF PREP FOR MRK (DBL ARROW)	678 6023 PAV SURF PREP FOR MRK (36") (YLD TRI)
	LF	LF	LF	LF	EA	EA	EA	LF	LF	LF	LF	LF	EA	EA	EA
HARRY HINES AT WALNUT HILL	862	1859		888	20		17	1280	2854	243		1127	26		
MIDWAY AT ROYAL	1140			760	4			1040	1182			760	8		
SPRING VALLEY AT HILLCREST	810			180	2		1	985	882			807	11		
DALLAS PARKWAY AT FRANKFORD	2325			1020	37	8	1	1365	1790		25	1042	28	8	6
PGBT AT MIDWAY	1105		525	260	17		9	2722	1943		90	1062	17	2	15
PARK AT SHADY BROOK	530		40	375	6			1028	536			330	6		
TOTALS	6772	1859	565	3483	86	8	28	8420	9187	243	115	5128	96	10	21

LOCATION	678 6033 PAV SURF PREP FOR MRK (RPM)	680 6004 REMOVING TRAFFIC SIGNALS	680 6005 INS HY TRF SIG (DPT SUP CNT & CAB) (ISO)	682 6001 VEH SIG SEC (12")LED(G RN)	682 6002 VEH SIG SEC (12")LED(G RN ARW)	682 6003 VEH SIG SEC (12")LED(Y EL)	682 6004 VEH SIG SEC (12")LED(Y EL ARW)	682 6005 VEH SIG SEC (12")LED(R ED)	682 6006 VEH SIG SEC (12")LED(R ED ARW)	682 6018 PED SIG SEC (LED) (COUN TDOWN)	682 6051 BACKPLATE W/REFL BRDR (3 SEC) ALUM	682 6052 BACKPLATE W/REFL BRDR (4 SEC) ALUM	682 6053 BACKPLATE W/REFL BRDR (5 SEC) ALUM	684 6031 TRF SIG CBL (TY A) (14 AWG) (5 CONDR)	684 6033 TRF SIG CBL (TY A) (14 AWG) (7 CONDR)
	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF	LF
HARRY HINES AT WALNUT HILL	815	1	1	13	9	13	10	14	16	8	13	9		555	630
MIDWAY AT ROYAL	251	1	1	12	4	12	8	12	8	8	12		4	470	245
SPRING VALLEY AT HILLCREST	392	1	1	11	6	11	12	11	12	8	11		6	550	270
DALLAS PARKWAY AT FRANKFORD	670	1	1	16	7	20	6	21	4	12	20	1	2	1065	45
PGBT AT MIDWAY	424	1	1	13	6	17	4	17	4	16	17		2	925	45
PARK AT SHADY BROOK	132	1	1	4	4	4	8	5	6	6	4	1	3	245	155
TOTALS	2684	6	6	69	36	77	48	80	50	58	77	11	17	3810	1390

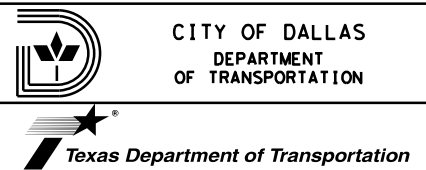
LOCATION	684 6038 TRF SIG CBL (TY A) (14 AWG) (12 CONDR)	684 6046 TRF SIG CBL (TY A) (14 AWG) (20 CONDR)	684 6079 TRF SIG CBL (TY C) (12 AWG) (2 CONDR)	686 6033 INS TRF SIG PL AM(S)1 ARM(32')	686 6039 INS TRF SIG PL AM(S)1 ARM(36')LUM	686 6041 INS TRF SIG PL AM(S)1 ARM(40')	686 6047 INS TRF SIG PL AM(S)1 ARM(44')LUM	686 6049 INS TRF SIG PL AM(S)1 ARM(48')	686 6051 INS TRF SIG PL AM(S)1 ARM(48')LUM	686 6055 INS TRF SIG PL AM(S)1 ARM(50')LUM	686 6065 INS TRF SIG PL AM(S)1 ARM(65')	686 6067 INS TRF SIG PL AM(S)1 ARM(65')LUM	686 6163 INS TRF SIG PL AM(S)2 ARM(44-32')LUM	686 6167 INS TRF SIG PL AM(S)2 ARM(44-36')LUM	686 6251 INS TRF SIG PL AM(S)2 ARM(60-44')LUM
	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
HARRY HINES AT WALNUT HILL	1545	965	1820								1	3			
MIDWAY AT ROYAL	1105	620	1210					1	3						
SPRING VALLEY AT HILLCREST	1110	665	1400					1	2	1					
DALLAS PARKWAY AT FRANKFORD	1985	805	2440		1		1							1	1
PGBT AT MIDWAY	2410	1390	4970		1		1						1	1	
PARK AT SHADY BROOK	245	310	740	1		1		1							
TOTALS	8400	4755	12580	1	2	1	2	3	5	1	1	3	1	2	1

LOCATION	687 6001 PED POLE ASSEMBLY	687 6002 PEDESTRIAN PUSH BUTTON POLE	688 6001 PED DETECT PUSH BUTTON (APS)	688 6003 PED DETECTOR CONTROLLER UNIT	6001 6001 PORTABLE CHANGEABLE MESSAGE SIGN	6007 6010 FIBER OPTIC CBL (SNGLE-MOD E) (6 FIBER)	6007 6026 FIBER OPTIC CABLE ROAD MARKER	6007 6087 FO SPLICE ENCLOSURE (TYPE 1)	6007 6094 FIBER OPTIC FUSION SPLICE	6007 6096 FIBER OPTIC PATCH PANEL (12 POSITION)	6007 6109 FIBER OPTIC JUMPERS	6185 6002 TMA (STATIONAR Y)	6186 6013 ITS GND BOX (POLY) TY 1 (243624)	6186 6014 ITS GND BOX (POLY) TY 1 (243624)W/ APRN	6292 6004 RVDS (PRESE NCE DET ONLY) (INST ALL ONLY)
	EA	EA	EA	EA	DAY	LF	EA	EA	EA	EA	EA	DAY	EA	EA	EA
HARRY HINES AT WALNUT HILL	4		8	1		840	4	1	6	1	4	15	1	3	
MIDWAY AT ROYAL	7		8	1		10						15		1	
SPRING VALLEY AT HILLCREST	5		8	1		10						15		1	
DALLAS PARKWAY AT FRANKFORD	10		12	2		20						30		1	2
PGBT AT MIDWAY	7		14	2		20						30		1	2
PARK AT SHADY BROOK		2	6	1		10						15		1	1
TOTALS	33	2	56	8	80	840	4	1	6	1	4	120	1	8	5

LOCATION	6292 6006 RVDS (PRES AND ADV DET) (INSTA LL ONLY)
	EA
HARRY HINES AT WALNUT HILL	4
MIDWAY AT ROYAL	4
SPRING VALLEY AT HILLCREST	4
DALLAS PARKWAY AT FRANKFORD	4
PGBT AT MIDWAY	4
PARK AT SHADY BROOK	2
TOTALS	22



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PROJECT SUMMARY

SCALE: N/A SHEET 2 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	4A



CONTROLLING PROJECT ID 0918-24-267

DISTRICT Dallas

COUNTY Collin, Dallas, Denton

HIGHWAY FRANKFORD RD W, HARRY HINES, HILLCREST AVE, MIDWAY, SH 190, SHADY BROOK LN

Estimate & Quantity Sheet

CONTROL SECTION JOB				0918-24-267		0918-47-350		0918-47-353		0918-47-355		0918-47-416		2964-04-009	
PROJECT ID				A00179184		A00177498		A00177503		A00177506		A00184499		A00203910	
COUNTY				Collin		Dallas		Dallas		Dallas		Dallas		Denton	
HIGHWAY				FRANKFORD RD W		HARRY HINES		MIDWAY		HILLCREST AVE		SHADY BROOK LN		SH 190	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	104-6011	REMOVING CONC (MEDIANS)	SY	57.000		25.000		52.000		57.000				93.000	
	110-6001	EXCAVATION (ROADWAY)	CY			142.000									
	162-6002	BLOCK SODDING	SY			32.000									
	168-6001	VEGETATIVE WATERING	MG			1.000									
	251-6073	REWRKING BS MATL (TY C)(10")(ORD COMP)	SY	17.000		22.000		40.000		45.000					
	260-6012	LIME(HYD,COM OR QK)(SLRY)OR QK(DRY)	TON			9.000									
	260-6054	LIME TRT (NEW BASE)(10")	SY			89.000									
	334-6073	HMCL ACP TY-D SAC-A AC-0.6	TON			20.000									
	360-6005	CONC PVMT (CONT REINF - CRCP) (11")	SY	17.000		22.000		40.000		45.000					
	360-6050	CONC PAV (CONT REINF)(FAST TRK)(11")	SY			89.000									
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF			22.000						8.000			
	416-6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF									12.000			
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	44.000				56.000		42.000		28.000		60.000	
	416-6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	22.000		88.000				22.000					
	432-6001	RIPRAP (CONC)(4 IN)	CY	0.500		19.000		0.200							
	479-6005	ADJUSTING MANHOLES (WATER VALVE BOX)	EA							1.000					
	500-6001	MOBILIZATION	LS	0.200		0.150		0.150		0.150		0.150		0.200	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	1.200		1.200		1.200		2.000		1.200		1.200	
	506-6042	BIODEG EROSN CONT LOGS (IN STL) (18")	LF	100.000		100.000		100.000		100.000		100.000		100.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	100.000		100.000		100.000		100.000		100.000		100.000	
	529-6002	CONC CURB (TY II)	LF			21.000									
	529-6008	CONC CURB & GUTTER (TY II)	LF	40.000		371.000		9.000		25.000					
	531-6003	CONC SIDEWALKS (6")	SY	17.000		112.000		80.500		54.500				31.000	
	531-6004	CURB RAMPS (TY 1)	EA	2.000		1.000								2.000	
	531-6005	CURB RAMPS (TY 2)	EA	1.000										1.000	
	531-6008	CURB RAMPS (TY 5)	EA	3.000				3.000		3.000				1.000	
	531-6010	CURB RAMPS (TY 7)	EA	2.000				2.000						4.000	
	531-6016	CURB RAMPS (TY 21)	EA											2.000	
	531-6017	CURB RAMPS (TY 22)	EA	1.000		2.000								2.000	
	531-6022	CURB RAMPS (TY 5)	SY			62.000									
	531-6051	CONCRETE RAMP WITH WALL	CY	5.000											
	536-6004	CONC DIRECTIONAL ISLAND	SY	40.000										93.000	
	536-6006	CONC MEDIAN(MONO NOSE)	SY			3.000		12.000		12.000					
	610-6009	REMOVE RD IL ASM (TRANS-BASE)	EA					1.000							
	610-6124	IN RD IL (TY SA) 20T-4 (150W EQ) LED	EA			1.000						1.000			
	610-6162	IN RD IL (TY SA) 30T-8 (250W EQ) LED	EA			2.000									
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	120.000		270.000		25.000		70.000		60.000		315.000	



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0918-24-267

DISTRICT Dallas

COUNTY Collin, Dallas, Denton

HIGHWAY FRANKFORD RD W, HARRY HINES, HILLCREST AVE, MIDWAY, SH 190, SHADY BROOK LN

CONTROL SECTION JOB				0918-24-267		0918-47-350		0918-47-353		0918-47-355		0918-47-416		2964-04-009	
PROJECT ID				A00179184		A00177498		A00177503		A00177506		A00184499		A00203910	
COUNTY				Collin		Dallas		Dallas		Dallas		Dallas		Denton	
HIGHWAY				FRANKFORD RD W		HARRY HINES		MIDWAY		HILLCREST AVE		SHADY BROOK LN		SH 190	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	55.000				140.000		95.000		75.000		100.000	
	618-6053	CONDT (PVC) (SCH 80) (3")	LF	130.000		360.000		205.000		130.000		85.000		135.000	
	618-6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF			700.000									
	618-6058	CONDT (PVC) (SCH 80) (4")	LF	110.000		120.000		50.000		100.000		90.000		450.000	
	618-6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	530.000		570.000		395.000		425.000		225.000		440.000	
	620-6002	ELEC CONDR (NO.14) INSULATED	LF			740.000									
	620-6004	ELEC CONDR (NO.12) INSULATED	LF	320.000		450.000		240.000		240.000		60.000		320.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	1,300.000				820.000		950.000		270.000		1,880.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	920.000		945.000		795.000		815.000		485.000		1,345.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	310.000		1,610.000		310.000		320.000		50.000		660.000	
	624-6009	GROUND BOX TY D (162922)	EA	9.000		3.000		2.000		1.000		2.000		3.000	
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	2.000		2.000		3.000		5.000		3.000		8.000	
	624-6028	REMOVE GROUND BOX	EA	11.000		5.000		13.000		2.000		4.000		12.000	
	628-6187	ELC SRV TY D 120/240 070(NS)SS(E)PS(U)	EA	1.000		1.000		1.000		1.000		1.000		1.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1.000		1.000								4.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA			1.000								3.000	
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF	70.000										70.000	
	666-6030	REFL PAV MRK TY I (W)8"(DOT)(100MIL)	LF			243.000									
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	25.000										90.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	1,042.000		1,127.000		760.000		807.000		330.000		1,062.000	
	666-6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	6.000										15.000	
	666-6224	PAVEMENT SEALER 4"	LF	1,365.000		1,280.000		1,040.000		985.000		1,028.000		2,722.000	
	666-6225	PAVEMENT SEALER 6"	LF	1,790.000		2,854.000		1,182.000		882.000		536.000		1,943.000	
	666-6226	PAVEMENT SEALER 8"	LF			243.000									
	666-6228	PAVEMENT SEALER 12"	LF	25.000										90.000	
	666-6230	PAVEMENT SEALER 24"	LF	1,042.000		1,127.000		760.000		807.000		330.000		1,062.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	28.000		26.000		8.000		11.000		6.000		17.000	
	666-6234	PAVEMENT SEALER (DBL ARROW)	EA	8.000										2.000	
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	6.000										15.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	590.000		640.000		440.000		460.000		170.000		710.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	615.000		640.000		600.000		525.000		150.000		770.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	1,790.000		2,854.000		1,182.000		882.000		536.000		1,943.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	160.000								708.000		1,242.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	28.000		26.000		8.000		11.000		6.000		17.000	
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	8.000										2.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	2.000								40.000		29.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	668.000		815.000		251.000		392.000		92.000		395.000	



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0918-24-267

DISTRICT Dallas

COUNTY Collin, Dallas, Denton

HIGHWAY FRANKFORD RD W, HARRY HINES, HILLCREST AVE, MIDWAY, SH 190, SHADY BROOK LN

CONTROL SECTION JOB				0918-24-267		0918-47-350		0918-47-353		0918-47-355		0918-47-416		2964-04-009	
PROJECT ID				A00179184		A00177498		A00177503		A00177506		A00184499		A00203910	
COUNTY				Collin		Dallas		Dallas		Dallas		Dallas		Denton	
HIGHWAY				FRANKFORD RD W		HARRY HINES		MIDWAY		HILLCREST AVE		SHADY BROOK LN		SH 190	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	1,075.000		1,039.000		880.000		990.000		1,005.000		1,685.000	
	677-6002	ELIM EXT PAV MRK & MRKS (6")	LF	2,325.000		862.000		1,140.000		810.000		530.000		1,105.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF			1,859.000									
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF									40.000		525.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	1,020.000		888.000		760.000		180.000		375.000		260.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	37.000		20.000		4.000		2.000		6.000		17.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	8.000											
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	1.000		17.000				1.000				9.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF	1,365.000		1,280.000		1,040.000		985.000		1,028.000		2,722.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF	1,790.000		2,854.000		1,182.000		882.000		536.000		1,943.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF			243.000									
	678-6006	PAV SURF PREP FOR MRK (12")	LF	25.000										90.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	1,042.000		1,127.000		760.000		807.000		330.000		1,062.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	28.000		26.000		8.000		11.000		6.000		17.000	
	678-6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	8.000										2.000	
	678-6023	PAV SURF PREP FOR MRK (36")(YLD TRI)	EA	6.000										15.000	
	678-6033	PAV SURF PREP FOR MRK (RPM)	EA	670.000		815.000		251.000		392.000		132.000		424.000	
	680-6004	REMOVING TRAFFIC SIGNALS	EA	1.000		1.000		1.000		1.000		1.000		1.000	
	680-6005	INS HY TRF SIG (DPT SUP CNT & CAB)(ISO)	EA	1.000		1.000		1.000		1.000		1.000		1.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	16.000		13.000		12.000		11.000		4.000		13.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	7.000		9.000		4.000		6.000		4.000		6.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	20.000		13.000		12.000		11.000		4.000		17.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	6.000		10.000		8.000		12.000		8.000		4.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	21.000		14.000		12.000		11.000		5.000		17.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	4.000		16.000		8.000		12.000		6.000		4.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	12.000		8.000		8.000		8.000		6.000		16.000	
	682-6051	BACKPLATE W/REFL BRDR(3 SEC)ALUM	EA	20.000		13.000		12.000		11.000		4.000		17.000	
	682-6052	BACKPLATE W/REFL BRDR(4 SEC)ALUM	EA	1.000		9.000						1.000			
	682-6053	BACKPLATE W/REFL BRDR(5 SEC)ALUM	EA	2.000				4.000		6.000		3.000		2.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	1,065.000		555.000		470.000		550.000		245.000		925.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	45.000		630.000		245.000		270.000		155.000		45.000	
	684-6038	TRF SIG CBL (TY A)(14 AWG)(12 CONDR)	LF	1,985.000		1,545.000		1,105.000		1,110.000		245.000		2,410.000	
	684-6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	805.000		965.000		620.000		665.000		310.000		1,390.000	
	684-6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF	2,440.000		1,820.000		1,210.000		1,400.000		740.000		4,970.000	
	686-6033	INS TRF SIG PL AM(S)1 ARM(32')	EA									1.000			
	686-6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA	1.000										1.000	
	686-6041	INS TRF SIG PL AM(S)1 ARM(40')	EA									1.000			



CONTROLLING PROJECT ID 0918-24-267

DISTRICT Dallas

COUNTY Collin, Dallas, Denton

HIGHWAY FRANKFORD RD W, HARRY HINES, HILLCREST AVE, MIDWAY, SH 190, SHADY BROOK LN

Estimate & Quantity Sheet

CONTROL SECTION JOB				0918-24-267		0918-47-350		0918-47-353		0918-47-355		0918-47-416		2964-04-009	
PROJECT ID				A00179184		A00177498		A00177503		A00177506		A00184499		A00203910	
COUNTY				Collin		Dallas		Dallas		Dallas		Dallas		Denton	
HIGHWAY				FRANKFORD RD W		HARRY HINES		MIDWAY		HILLCREST AVE		SHADY BROOK LN		SH 190	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA	1.000										1.000	
	686-6049	INS TRF SIG PL AM(S)1 ARM(48')	EA					1.000		1.000		1.000			
	686-6051	INS TRF SIG PL AM(S)1 ARM(48')LUM	EA					3.000		2.000					
	686-6055	INS TRF SIG PL AM(S)1 ARM(50')LUM	EA							1.000					
	686-6065	INS TRF SIG PL AM(S)1 ARM(65')	EA			1.000									
	686-6067	INS TRF SIG PL AM(S)1 ARM(65')LUM	EA			3.000									
	686-6163	INS TRF SIG PL AM(S)2 ARM(44-32')LUM	EA											1.000	
	686-6167	INS TRF SIG PL AM(S)2 ARM(44-36')LUM	EA	1.000										1.000	
	686-6251	INS TRF SIG PL AM(S)2 ARM(60-44')LUM	EA	1.000											
	687-6001	PED POLE ASSEMBLY	EA	10.000		4.000		7.000		5.000				7.000	
	687-6002	PEDESTRIAN PUSH BUTTON POLE	EA									2.000			
	688-6001	PED DETECT PUSH BUTTON (APS)	EA	12.000		8.000		8.000		8.000		6.000		14.000	
	688-6003	PED DETECTOR CONTROLLER UNIT	EA	2.000		1.000		1.000		1.000		1.000		2.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	20.000		10.000		10.000		10.000		10.000		20.000	
	6007-6010	FIBER OPTIC CBL (SNGLE-MODE)(6 FIBER)	LF			840.000									
	6007-6026	FIBER OPTIC CABLE ROAD MARKER	EA			4.000									
	6007-6087	FO SPLICE ENCLOSURE (TYPE 1)	EA			1.000									
	6007-6094	FIBER OPTIC FUSION SPLICE	EA			6.000									
	6007-6096	FIBER OPTIC PATCH PANEL (12 POSITION)	EA			1.000									
	6007-6109	FIBER OPTIC JUMPERS	EA			4.000									
	6185-6002	TMA (STATIONARY)	DAY	30.000		15.000		15.000		15.000		15.000		30.000	
	6186-6013	ITS GND BOX (POLY) TY 1 (243624)	EA			1.000									
	6186-6014	ITS GND BOX (POLY) TY 1 (243624)W/APRN	EA	1.000		3.000		1.000		1.000		1.000		1.000	
	6292-6004	RVDS(PRESENCE DET ONLY)(INSTALL ONLY)	EA	2.000								1.000		2.000	
	6292-6006	RVDS(PRES AND ADV DET)(INSTALL ONLY)	EA	4.000		4.000		4.000		4.000		2.000		4.000	
	14	PUBLIC UTILITY FORCE ACCT WORK (PARTICIPATING)	LS	1.000		1.000		1.000		1.000		1.000		1.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000		1.000		1.000		1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000		1.000		1.000		1.000		1.000	
	31	MATERIALS FURNISHED BY CITY (PARTICIPATING)	LS	1.000		1.000		1.000		1.000		1.000		1.000	



CONTROLLING PROJECT ID 0918-24-267

DISTRICT Dallas

COUNTY Collin, Dallas, Denton

HIGHWAY FRANKFORD RD W, HARRY HINES, HILLCREST AVE, MIDWAY, SH 190, SHADY BROOK LN

Estimate & Quantity Sheet

CONTROL SECTION JOB				TOTAL EST.	TOTAL FINAL
PROJECT ID					
COUNTY					
HIGHWAY					
ALT	BID CODE	DESCRIPTION	UNIT		
	104-6011	REMOVING CONC (MEDIANS)	SY	284.000	
	110-6001	EXCAVATION (ROADWAY)	CY	142.000	
	162-6002	BLOCK SODDING	SY	32.000	
	168-6001	VEGETATIVE WATERING	MG	1.000	
	251-6073	REWRKING BS MATL (TY C)(10")(ORD COMP)	SY	124.000	
	260-6012	LIME(HYD,COM OR QK)(SLRY)OR QK(DRY)	TON	9.000	
	260-6054	LIME TRT (NEW BASE)(10")	SY	89.000	
	334-6073	HMCL ACP TY-D SAC-A AC-0.6	TON	20.000	
	360-6005	CONC PVMT (CONT REINF - CRCP) (11")	SY	124.000	
	360-6050	CONC PAV (CONT REINF)(FAST TRK)(11")	SY	89.000	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	30.000	
	416-6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	12.000	
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	230.000	
	416-6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	132.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	19.700	
	479-6005	ADJUSTING MANHOLES (WATER VALVE BOX)	EA	1.000	
	500-6001	MOBILIZATION	LS	1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	8.000	
	506-6042	BIODEG EROSN CONT LOGS (IN STL) (18")	LF	600.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	600.000	
	529-6002	CONC CURB (TY II)	LF	21.000	
	529-6008	CONC CURB & GUTTER (TY II)	LF	445.000	
	531-6003	CONC SIDEWALKS (6")	SY	295.000	
	531-6004	CURB RAMPS (TY 1)	EA	5.000	
	531-6005	CURB RAMPS (TY 2)	EA	2.000	
	531-6008	CURB RAMPS (TY 5)	EA	10.000	
	531-6010	CURB RAMPS (TY 7)	EA	8.000	
	531-6016	CURB RAMPS (TY 21)	EA	2.000	
	531-6017	CURB RAMPS (TY 22)	EA	5.000	
	531-6022	CURB RAMPS (TY 5)	SY	62.000	
	531-6051	CONCRETE RAMP WITH WALL	CY	5.000	
	536-6004	CONC DIRECTIONAL ISLAND	SY	133.000	
	536-6006	CONC MEDIAN(MONO NOSE)	SY	27.000	
	610-6009	REMOVE RD IL ASM (TRANS-BASE)	EA	1.000	
	610-6124	IN RD IL (TY SA) 20T-4 (150W EQ) LED	EA	2.000	
	610-6162	IN RD IL (TY SA) 30T-8 (250W EQ) LED	EA	2.000	
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	860.000	



DISTRICT	COUNTY	CCSJ	SHEET
Dallas	Collin	0918-24-267	5D



CONTROLLING PROJECT ID 0918-24-267

DISTRICT Dallas

COUNTY Collin, Dallas, Denton

HIGHWAY FRANKFORD RD W, HARRY HINES, HILLCREST AVE, MIDWAY, SH 190, SHADY BROOK LN

Estimate & Quantity Sheet

CONTROL SECTION JOB				TOTAL EST.	TOTAL FINAL
PROJECT ID					
COUNTY					
HIGHWAY					
ALT	BID CODE	DESCRIPTION	UNIT		
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	465.000	
	618-6053	CONDT (PVC) (SCH 80) (3")	LF	1,045.000	
	618-6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF	700.000	
	618-6058	CONDT (PVC) (SCH 80) (4")	LF	920.000	
	618-6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	2,585.000	
	620-6002	ELEC CONDR (NO.14) INSULATED	LF	740.000	
	620-6004	ELEC CONDR (NO.12) INSULATED	LF	1,630.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	5,220.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	5,305.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	3,260.000	
	624-6009	GROUND BOX TY D (162922)	EA	20.000	
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	23.000	
	624-6028	REMOVE GROUND BOX	EA	47.000	
	628-6187	ELC SRV TY D 120/240 070(NS)SS(E)PS(U)	EA	6.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	6.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	4.000	
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF	140.000	
	666-6030	REFL PAV MRK TY I (W)8"(DOT)(100MIL)	LF	243.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	115.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	5,128.000	
	666-6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	21.000	
	666-6224	PAVEMENT SEALER 4"	LF	8,420.000	
	666-6225	PAVEMENT SEALER 6"	LF	9,187.000	
	666-6226	PAVEMENT SEALER 8"	LF	243.000	
	666-6228	PAVEMENT SEALER 12"	LF	115.000	
	666-6230	PAVEMENT SEALER 24"	LF	5,128.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	96.000	
	666-6234	PAVEMENT SEALER (DBL ARROW)	EA	10.000	
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	21.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	3,010.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	3,300.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	9,187.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	2,110.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	96.000	
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	10.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	71.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	2,613.000	



DISTRICT	COUNTY	CCSJ	SHEET
Dallas	Collin	0918-24-267	5E



CONTROLLING PROJECT ID 0918-24-267

DISTRICT Dallas

COUNTY Collin, Dallas, Denton

HIGHWAY FRANKFORD RD W, HARRY HINES, HILLCREST AVE, MIDWAY, SH 190, SHADY BROOK LN

Estimate & Quantity Sheet

CONTROL SECTION JOB				TOTAL EST.	TOTAL FINAL
PROJECT ID					
COUNTY					
HIGHWAY					
ALT	BID CODE	DESCRIPTION	UNIT		
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	6,674.000	
	677-6002	ELIM EXT PAV MRK & MRKS (6")	LF	6,772.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	1,859.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	565.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	3,483.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	86.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	8.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	28.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF	8,420.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF	9,187.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	243.000	
	678-6006	PAV SURF PREP FOR MRK (12")	LF	115.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	5,128.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	96.000	
	678-6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	10.000	
	678-6023	PAV SURF PREP FOR MRK (36")(YLD TRI)	EA	21.000	
	678-6033	PAV SURF PREP FOR MRK (RPM)	EA	2,684.000	
	680-6004	REMOVING TRAFFIC SIGNALS	EA	6.000	
	680-6005	INS HY TRF SIG (DPT SUP CNT & CAB)(ISO)	EA	6.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	69.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	36.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	77.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	48.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	80.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	50.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	58.000	
	682-6051	BACKPLATE W/REFL BRDR(3 SEC)ALUM	EA	77.000	
	682-6052	BACKPLATE W/REFL BRDR(4 SEC)ALUM	EA	11.000	
	682-6053	BACKPLATE W/REFL BRDR(5 SEC)ALUM	EA	17.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	3,810.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	1,390.000	
	684-6038	TRF SIG CBL (TY A)(14 AWG)(12 CONDR)	LF	8,400.000	
	684-6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	4,755.000	
	684-6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF	12,580.000	
	686-6033	INS TRF SIG PL AM(S)1 ARM(32')	EA	1.000	
	686-6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA	2.000	
	686-6041	INS TRF SIG PL AM(S)1 ARM(40')	EA	1.000	



DISTRICT	COUNTY	CCSJ	SHEET
Dallas	Collin	0918-24-267	5F



CONTROLLING PROJECT ID 0918-24-267

DISTRICT Dallas

COUNTY Collin, Dallas, Denton

HIGHWAY FRANKFORD RD W, HARRY HINES, HILLCREST AVE, MIDWAY, SH 190, SHADY BROOK LN

Estimate & Quantity Sheet

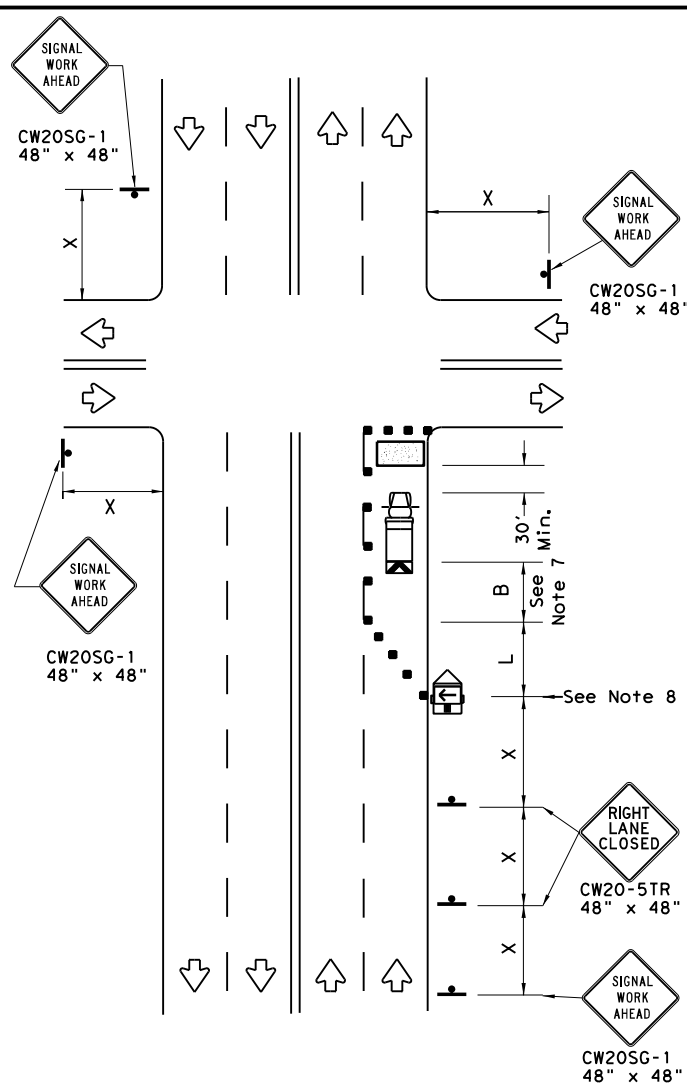
CONTROL SECTION JOB				TOTAL EST.	TOTAL FINAL
PROJECT ID					
COUNTY					
HIGHWAY					
ALT	BID CODE	DESCRIPTION	UNIT		
	686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA	2.000	
	686-6049	INS TRF SIG PL AM(S)1 ARM(48')	EA	3.000	
	686-6051	INS TRF SIG PL AM(S)1 ARM(48')LUM	EA	5.000	
	686-6055	INS TRF SIG PL AM(S)1 ARM(50')LUM	EA	1.000	
	686-6065	INS TRF SIG PL AM(S)1 ARM(65')	EA	1.000	
	686-6067	INS TRF SIG PL AM(S)1 ARM(65')LUM	EA	3.000	
	686-6163	INS TRF SIG PL AM(S)2 ARM(44-32')LUM	EA	1.000	
	686-6167	INS TRF SIG PL AM(S)2 ARM(44-36')LUM	EA	2.000	
	686-6251	INS TRF SIG PL AM(S)2 ARM(60-44')LUM	EA	1.000	
	687-6001	PED POLE ASSEMBLY	EA	33.000	
	687-6002	PEDESTRIAN PUSH BUTTON POLE	EA	2.000	
	688-6001	PED DETECT PUSH BUTTON (APS)	EA	56.000	
	688-6003	PED DETECTOR CONTROLLER UNIT	EA	8.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	80.000	
	6007-6010	FIBER OPTIC CBL (SNGLE-MODE)(6 FIBER)	LF	840.000	
	6007-6026	FIBER OPTIC CABLE ROAD MARKER	EA	4.000	
	6007-6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	1.000	
	6007-6094	FIBER OPTIC FUSION SPLICE	EA	6.000	
	6007-6096	FIBER OPTIC PATCH PANEL (12 POSITION)	EA	1.000	
	6007-6109	FIBER OPTIC JUMPERS	EA	4.000	
	6185-6002	TMA (STATIONARY)	DAY	120.000	
	6186-6013	ITS GND BOX (POLY) TY 1 (243624)	EA	1.000	
	6186-6014	ITS GND BOX (POLY) TY 1 (243624)W/APRN	EA	8.000	
	6292-6004	RVDS(PRESENCE DET ONLY)(INSTALL ONLY)	EA	5.000	
	6292-6006	RVDS(PRES AND ADV DET)(INSTALL ONLY)	EA	22.000	
	14	PUBLIC UTILITY FORCE ACCT WORK (PARTICIPATING)	LS	6.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	6.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	6.000	
	31	MATERIALS FURNISHED BY CITY (PARTICIPATING)	LS	6.000	



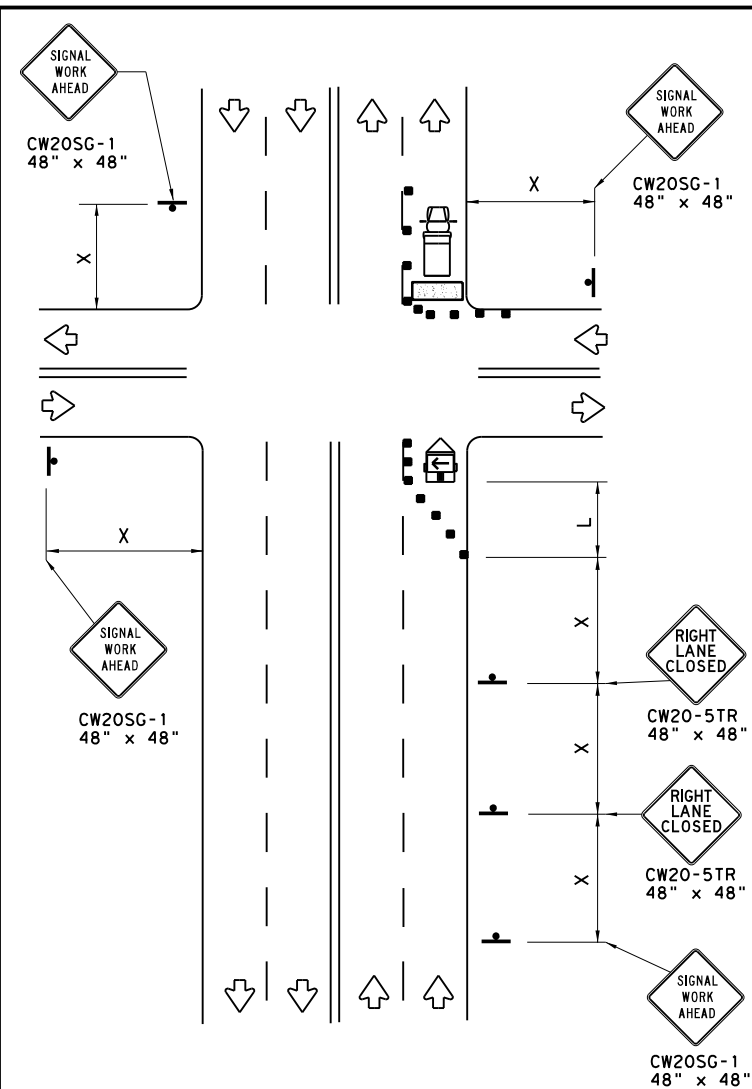
DISTRICT	COUNTY	CCSJ	SHEET
Dallas	Collin	0918-24-267	5G

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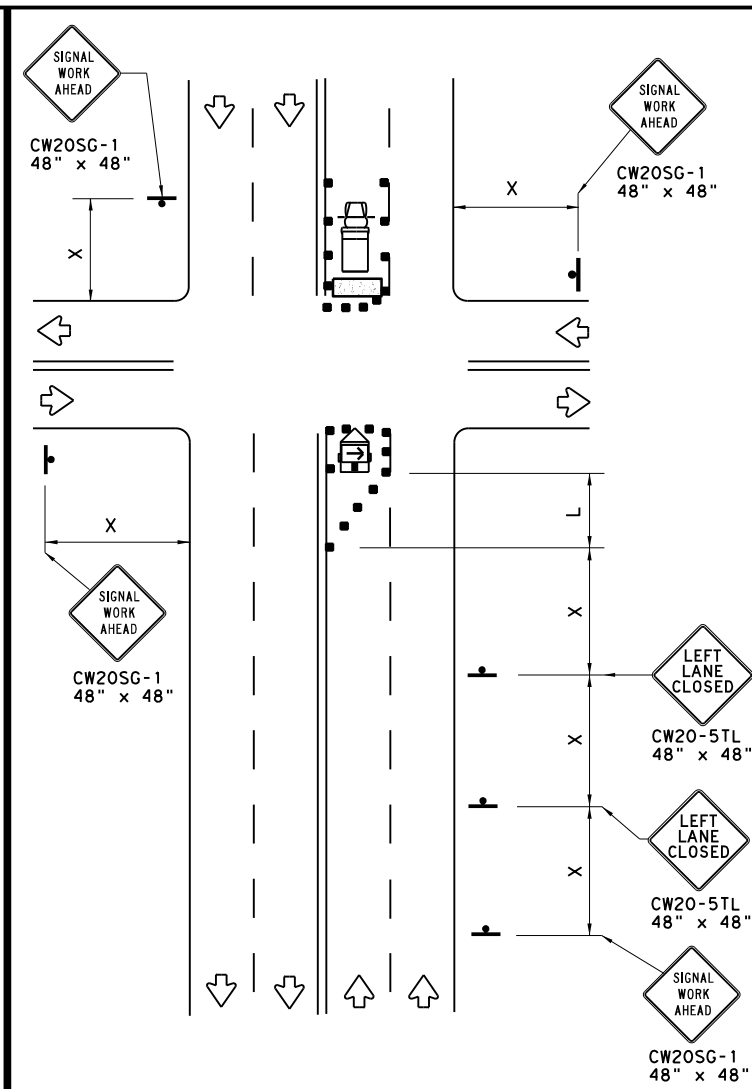
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NEAR SIDE LANE CLOSURE
 SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE RIGHT LANE CLOSURE
 SHORT DURATION OR SHORT TERM STATIONARY



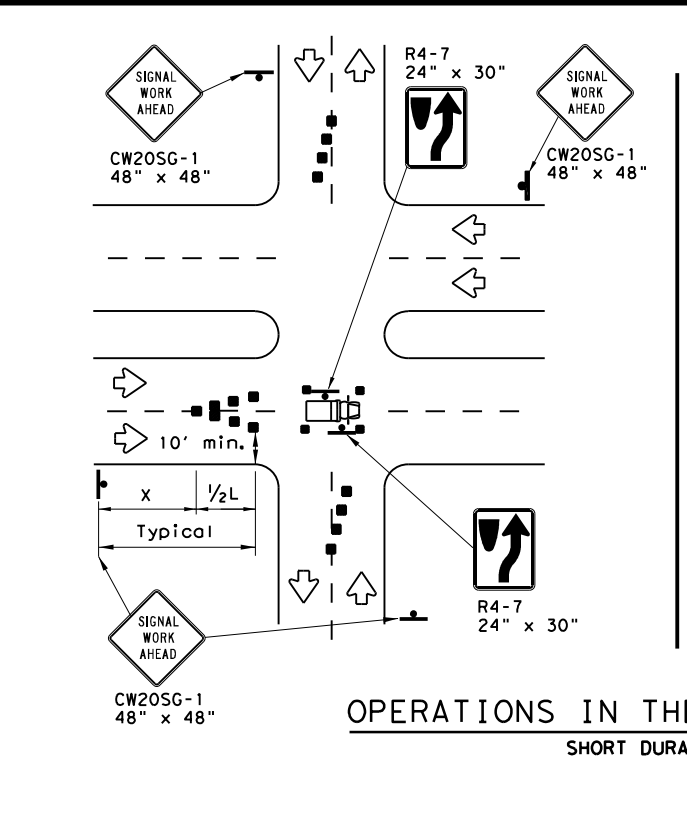
FAR SIDE LEFT LANE CLOSURE
 SHORT DURATION OR SHORT TERM STATIONARY

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

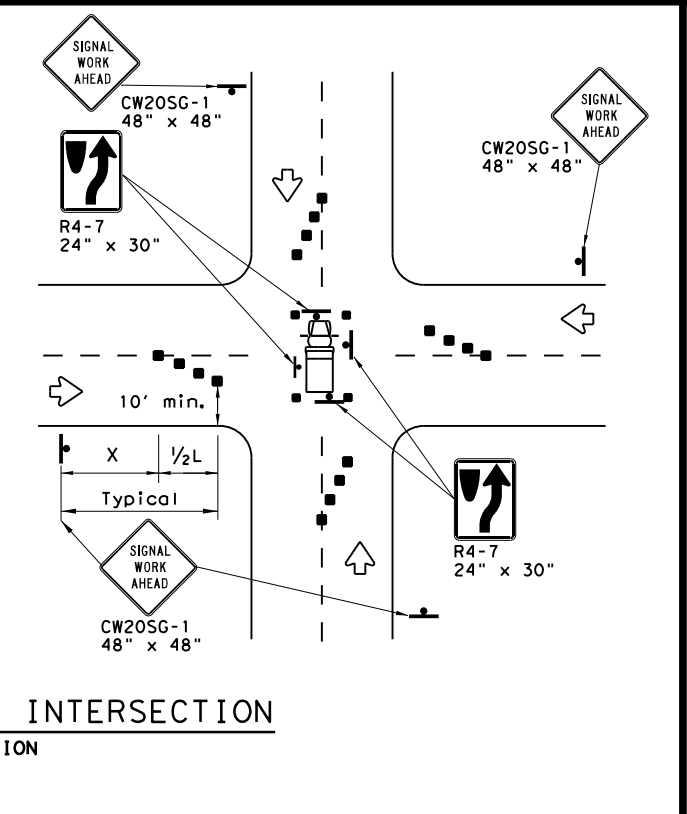
Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'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

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

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



OPERATIONS IN THE INTERSECTION
 SHORT DURATION



GENERAL NOTES

- 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.
- Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
- Flaggers and Flagger Symbol (CW20-7) signs may be required according to field conditions.
- Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
- High level warning devices (flag trees) may be used at corners of the vehicle.
- 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.
- 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.
- 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.
- 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.

TRAFFIC SIGNAL WORK TYPICAL DETAILS

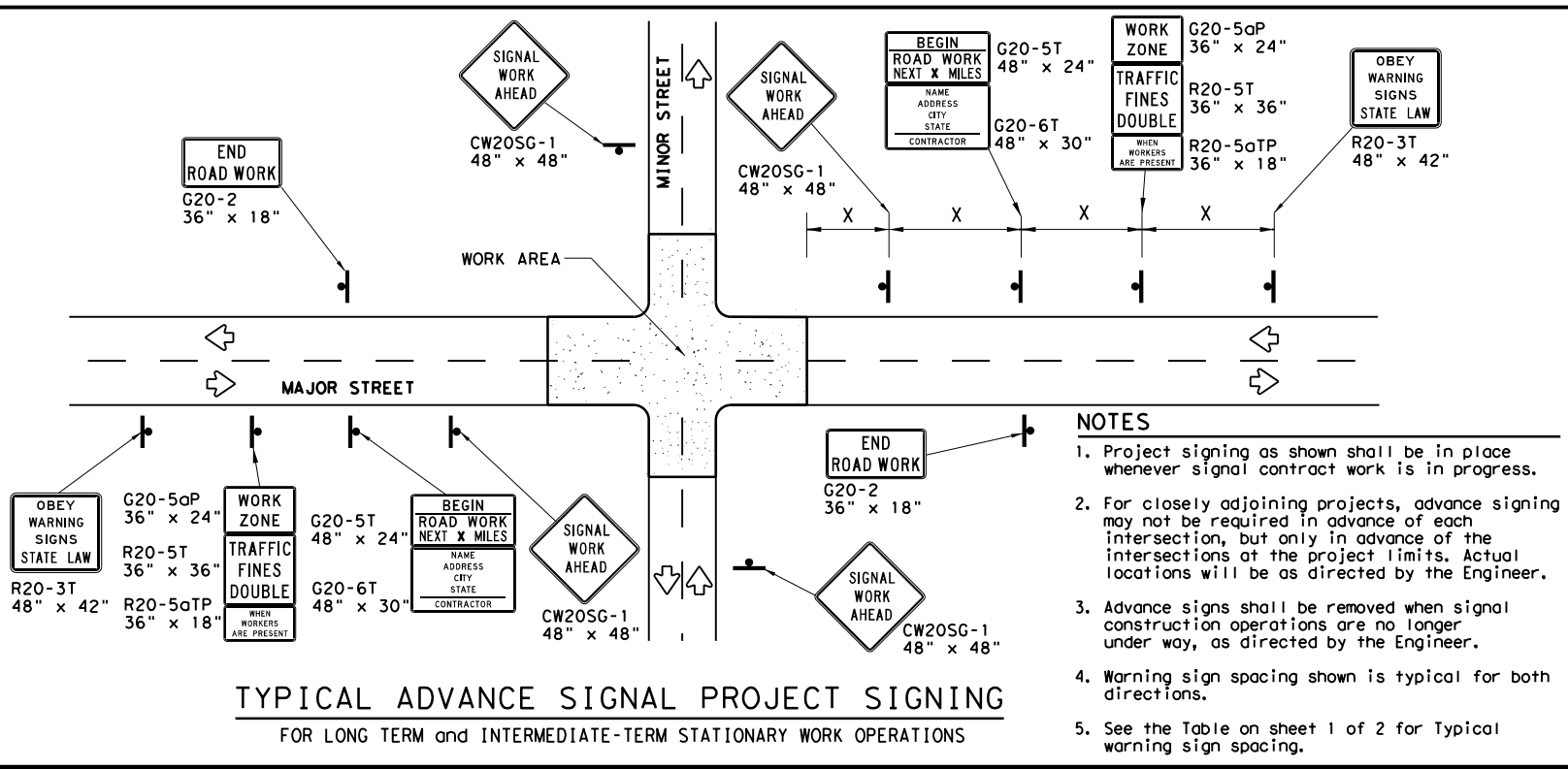
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- NOTES**
- Project signing as shown shall be in place whenever signal contract work is in progress.
 - For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at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

GENERAL NOTES FOR WORK ZONE SIGNS

- Signs shall be installed and maintained in a straight and plumb condition.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- Nails shall NOT be used to attach signs to any support.
- All signs shall be installed in accordance with the plans or as directed by the Engineer.
- The Contractor shall furnish the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD).
- 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.
- Temporary signs that have damaged or cracked substrates and/or damaged or marred reflective sheeting shall be replaced as directed by the Engineer.
- 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".
- Damaged wood posts shall be replaced. Splicing wood posts will not be allowed.

DURATION OF WORK

- Work zone durations are defined in Part 6, Section 60.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

SIGN MOUNTING HEIGHT

- Sign height of Long-term/Intermediate-term warning signs shall be as shown on Figure 6F-1 of the TMUTCD.
- Sign height of Short-term/Short Duration warning signs shall be as shown on Figure 6F-2 of the TMUTCD.
- 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

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
- 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.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

- 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

- Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support weights.
- 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.
- 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.
- 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.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

LEGEND

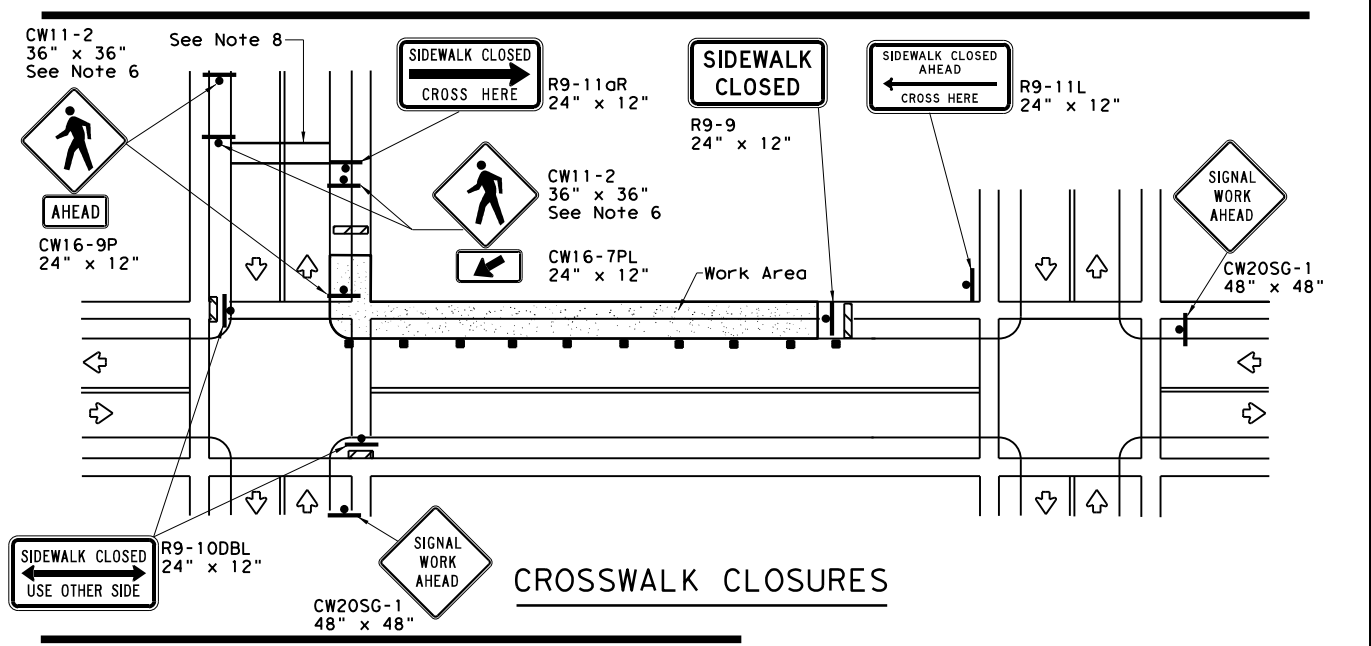
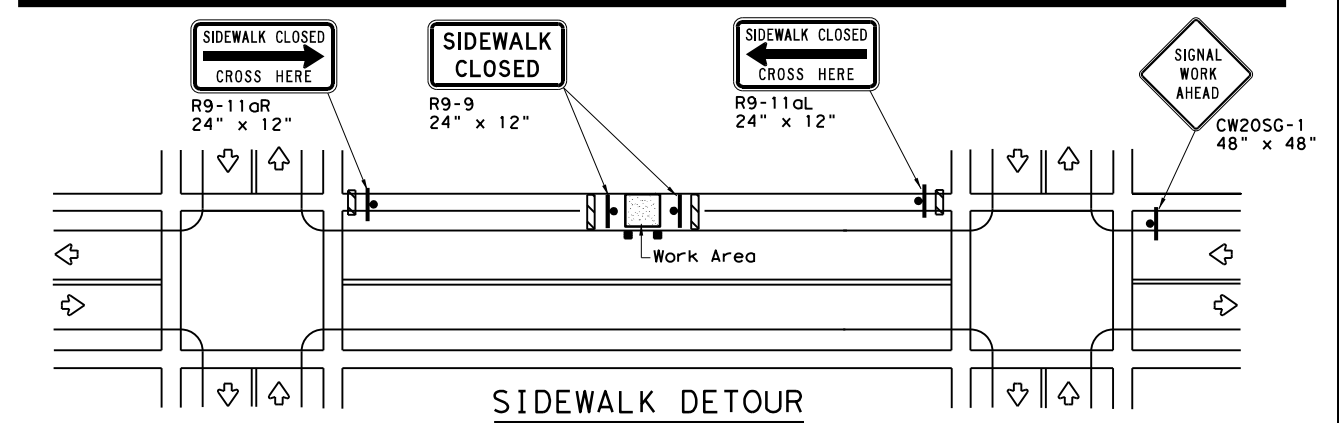
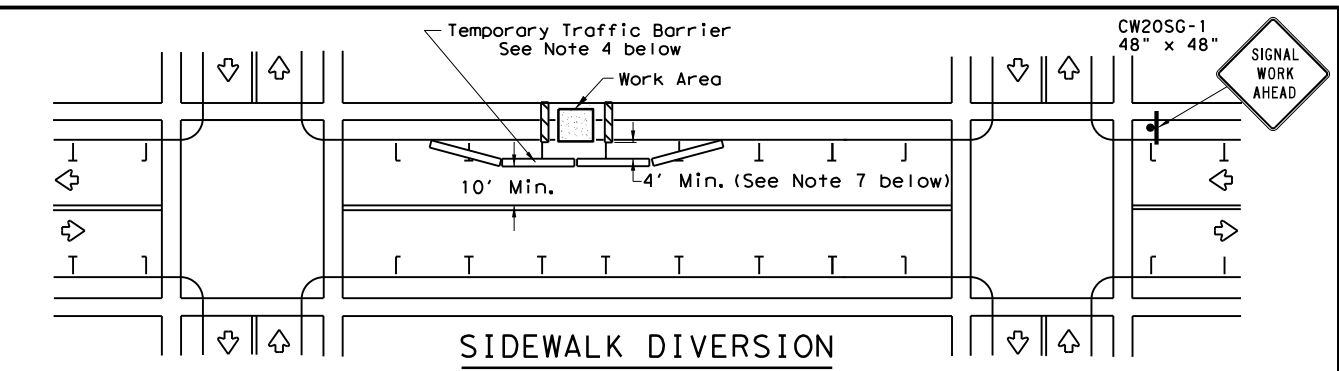
	Sign
	Channelizing Devices
	Type 3 Barricade

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



PEDESTRIAN CONTROL

- 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.
- "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval prior to installation.
- 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.
- 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.
- Location of devices are for general guidance. Actual device spacing and location must be field adjusted to meet actual conditions.
- Where pedestrians with visual disabilities normally use the closed sidewalk Detectable Pedestrian Barricades should be used instead of the Type 3 Barricades shown.
- The width of existing sidewalk should be maintained if practical.
- Pavement markings for mid-block crosswalks shall be paid for under the appropriate bid items.
- 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.

SHEET 2 OF 2

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ (BTS-2) - 13

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- 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).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- 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:

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

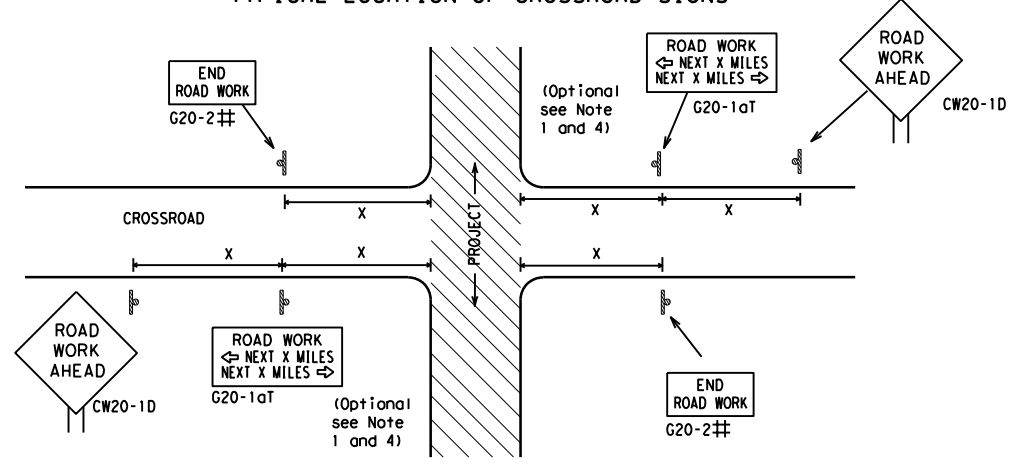
- Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
- Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

<p>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov</p>
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

			
<p>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</p> <p>BC (1) - 21</p>			
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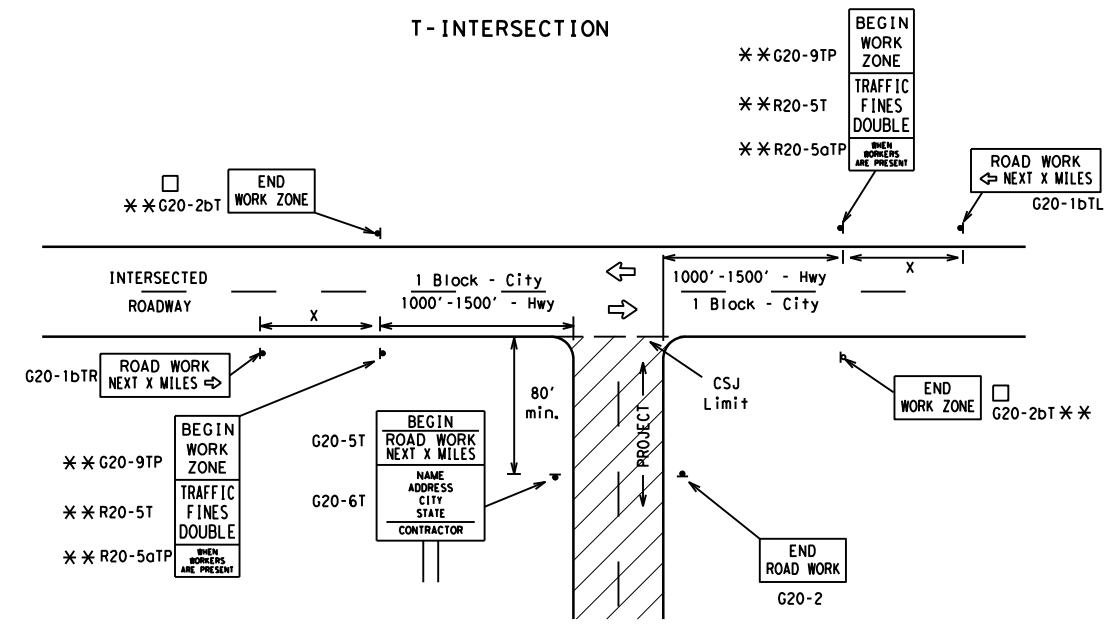
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TYPICAL LOCATION OF CROSSROAD SIGNS



- ## May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)
- 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.
 - 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.
 - 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.
 - 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.
 - Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
 - 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

- 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.
- 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}

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Δ Spacing "x" Feet (Apprx.)
CW20 ⁴	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25			50	400
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	55	500 ²
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	60	600 ²
			65	700 ²
			70	800 ²
			75	900 ²
			80	1000 ²
			*	* ³

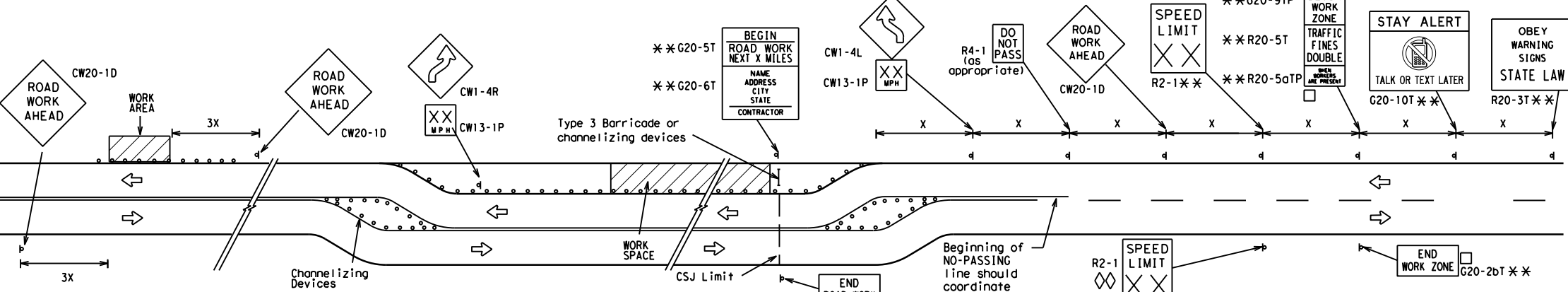
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

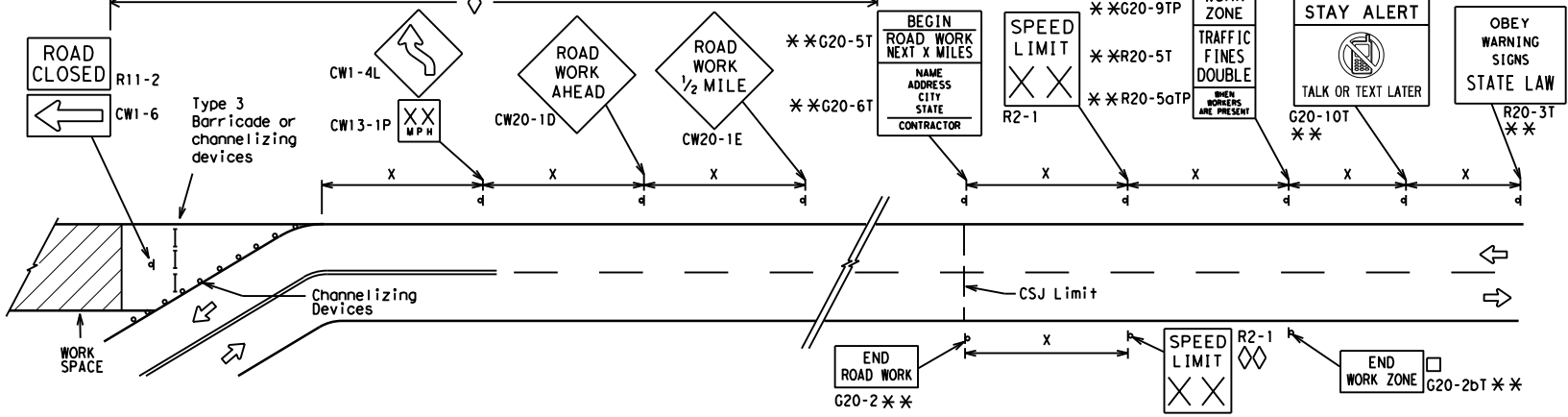
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

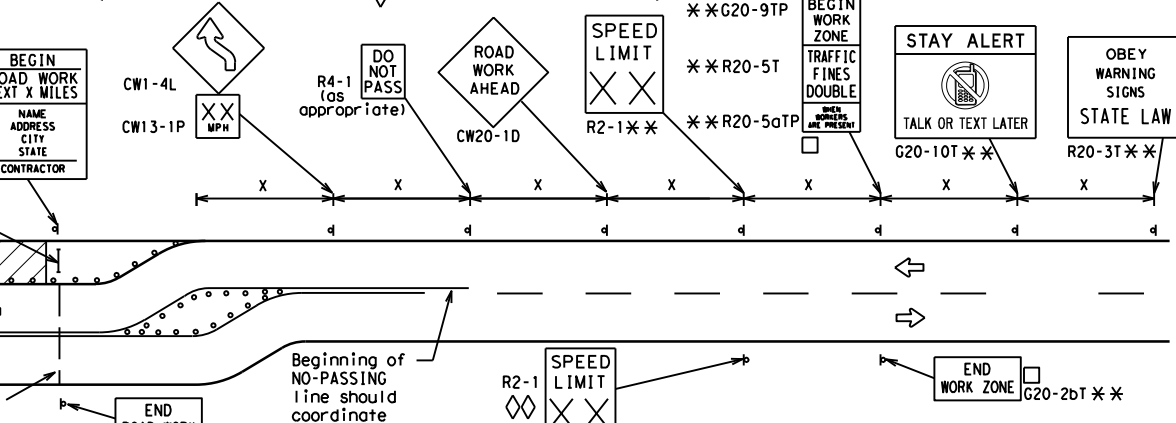


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "x" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
- CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
- Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
- Contractor will install a regulatory speed limit sign at the end of the work zone.

LEGEND

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

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

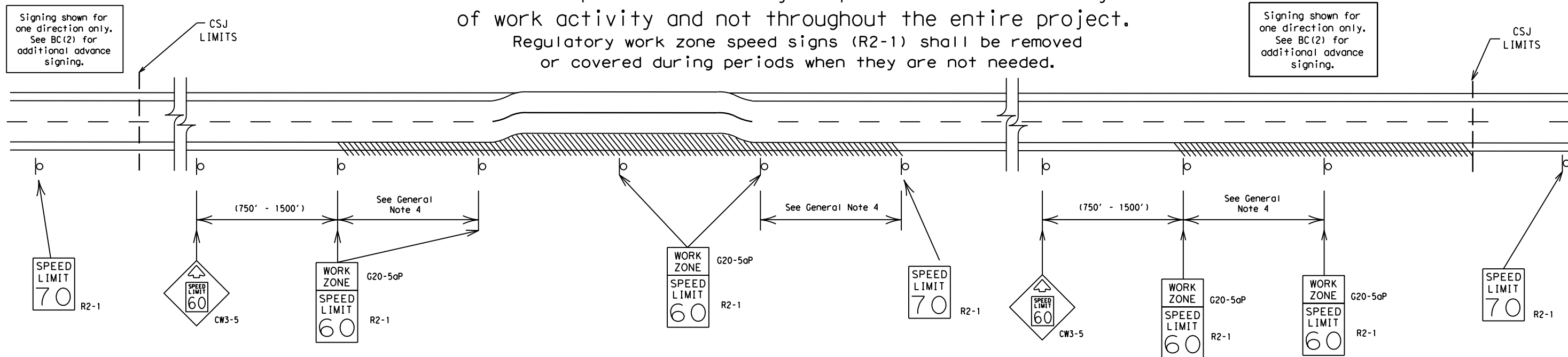
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project. Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- 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

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- 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
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- 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.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
 - Law enforcement.
 - Flagger stationed next to sign.
 - Portable changeable message sign (PCMS).
 - Low-power (drone) radar transmitter.
 - Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

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SHEET 3 OF 12

Texas Department of Transportation
 Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 21

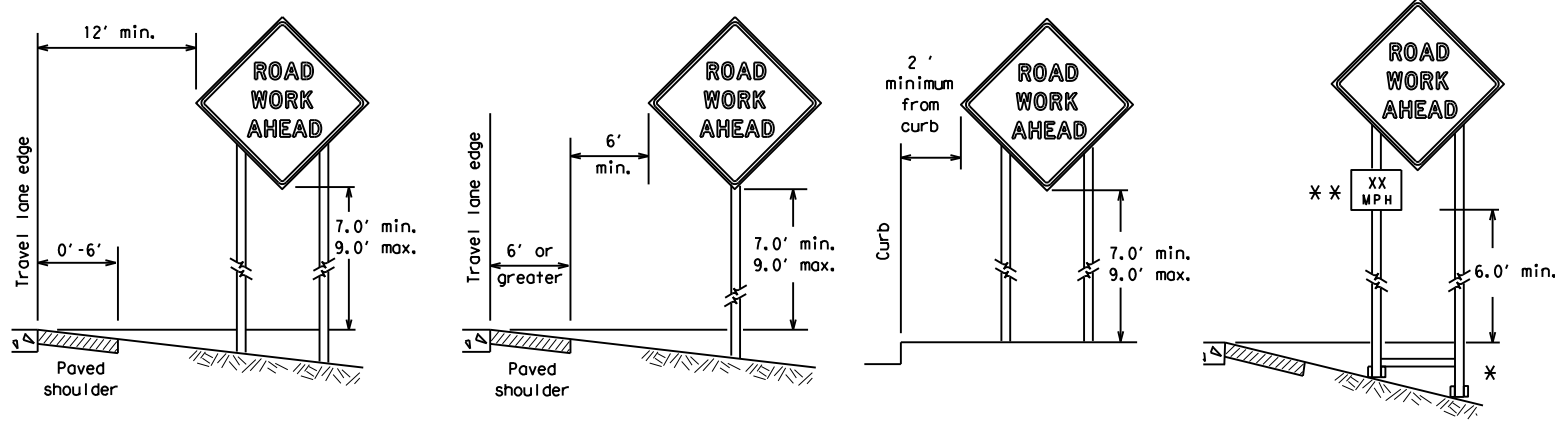
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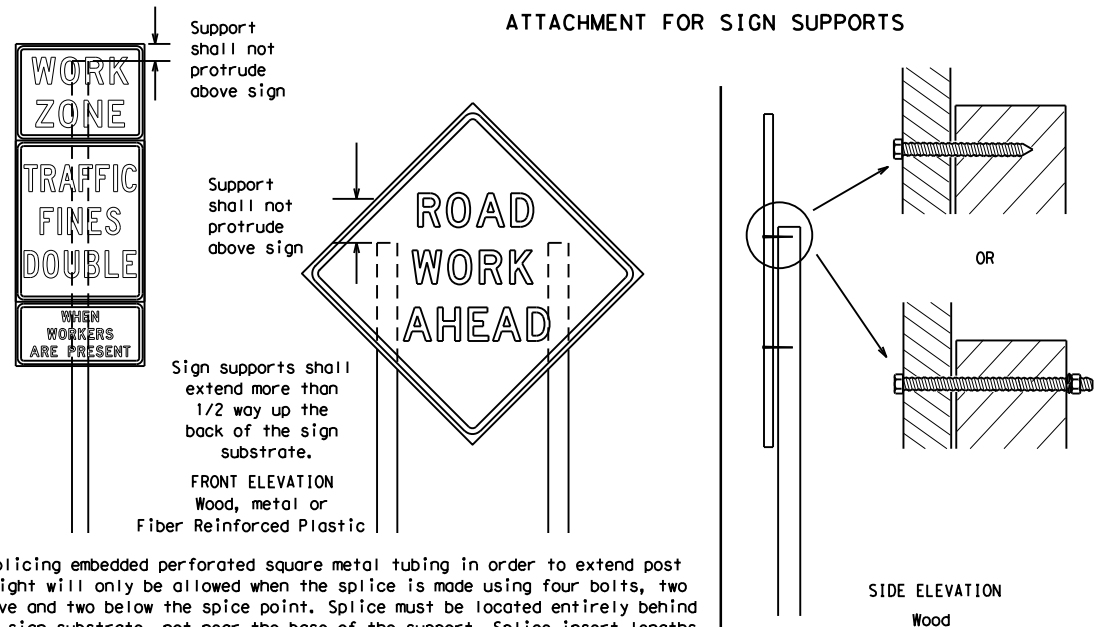
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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 splice 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.

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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)

- 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.
 - Long-term stationary - work that occupies a location more than 3 days.
 - 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.
 - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - Short, duration - work that occupies a location up to 1 hour.
 - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

- 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.
- 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.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- 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.
- 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

- 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

- 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.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- 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

- 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).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- 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

- 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

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- 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.
- 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.
- 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 shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

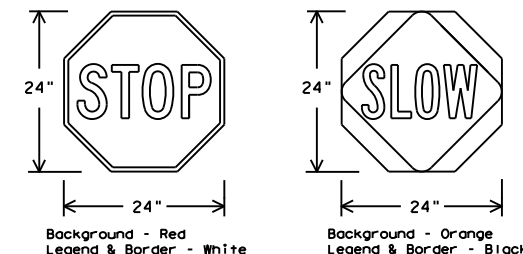
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- 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.
- 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.
- 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.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

- 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.

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- 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.
- 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.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- 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.
- 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.
- 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.

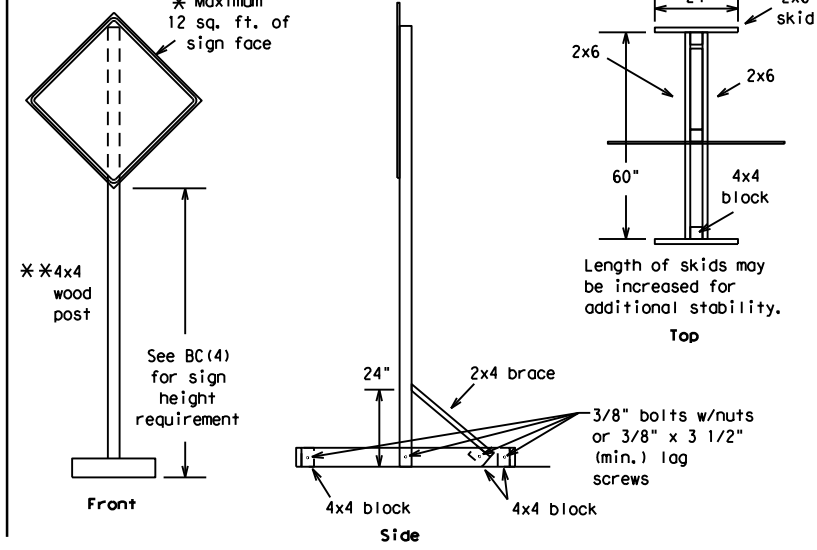
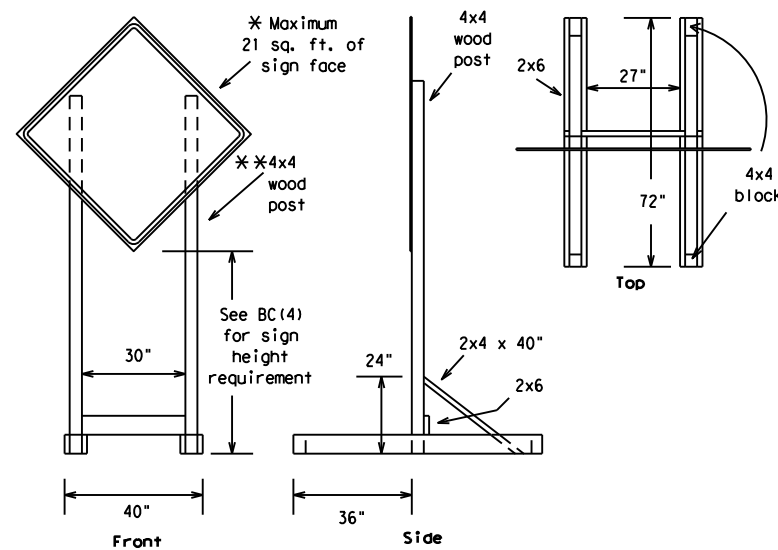
Texas Department of Transportation
 Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

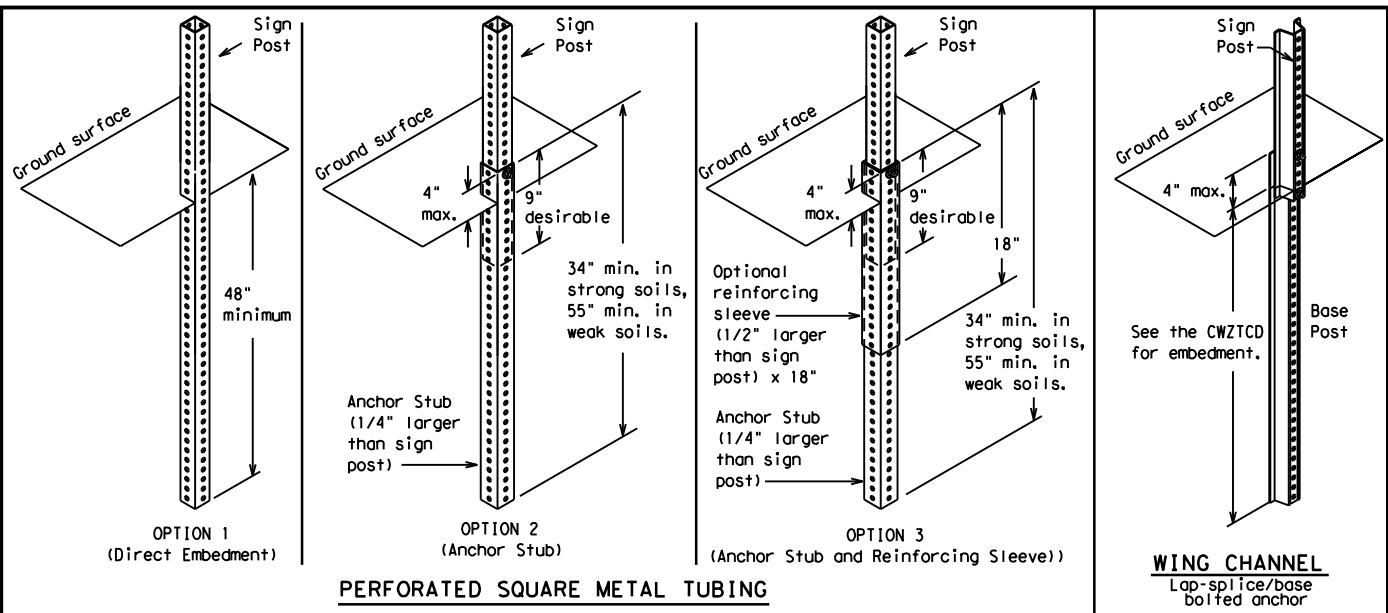
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REVISIONS		0918	24	267, ETC.		VAR			
9-07	8-14	DIST		COUNTY	SHEET NO.				
7-13	5-21	DAL		COL, ETC.	11				

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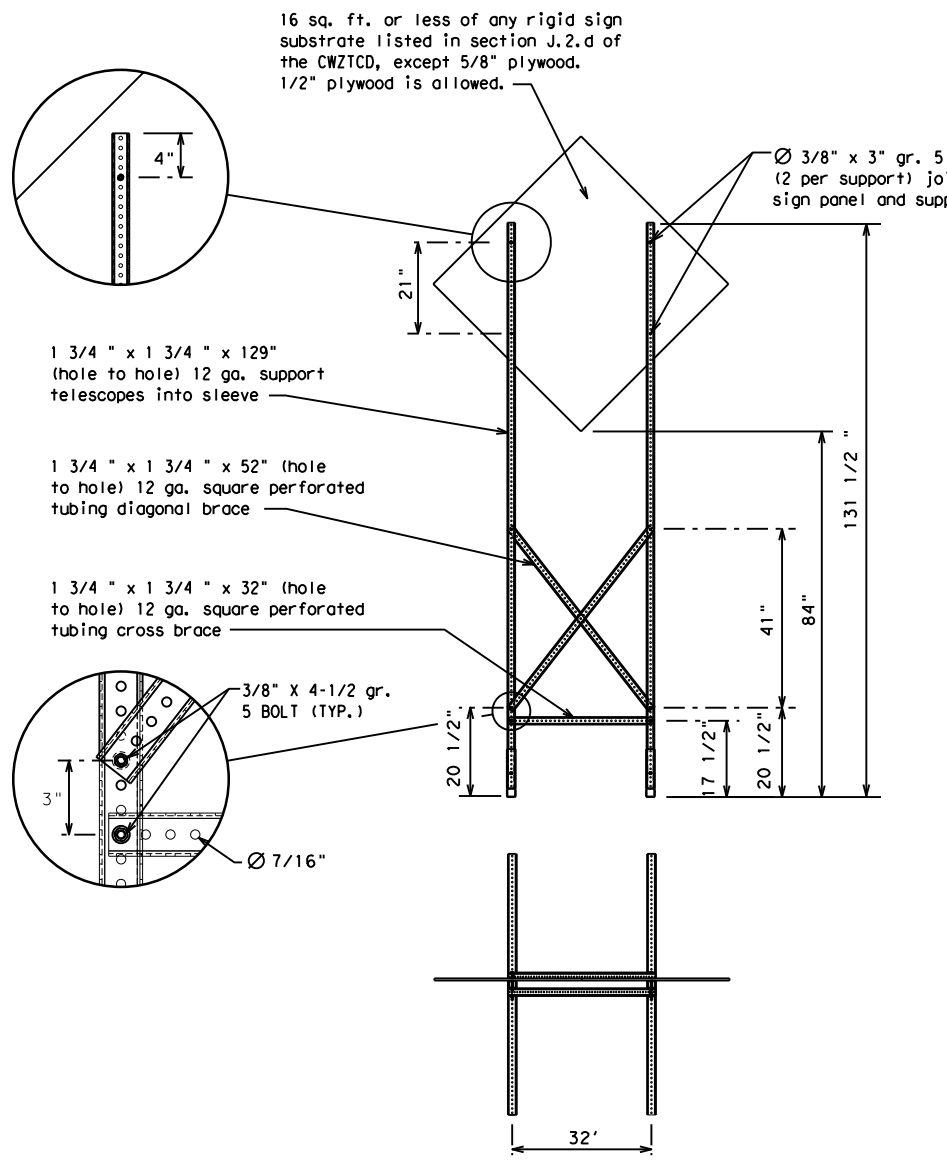
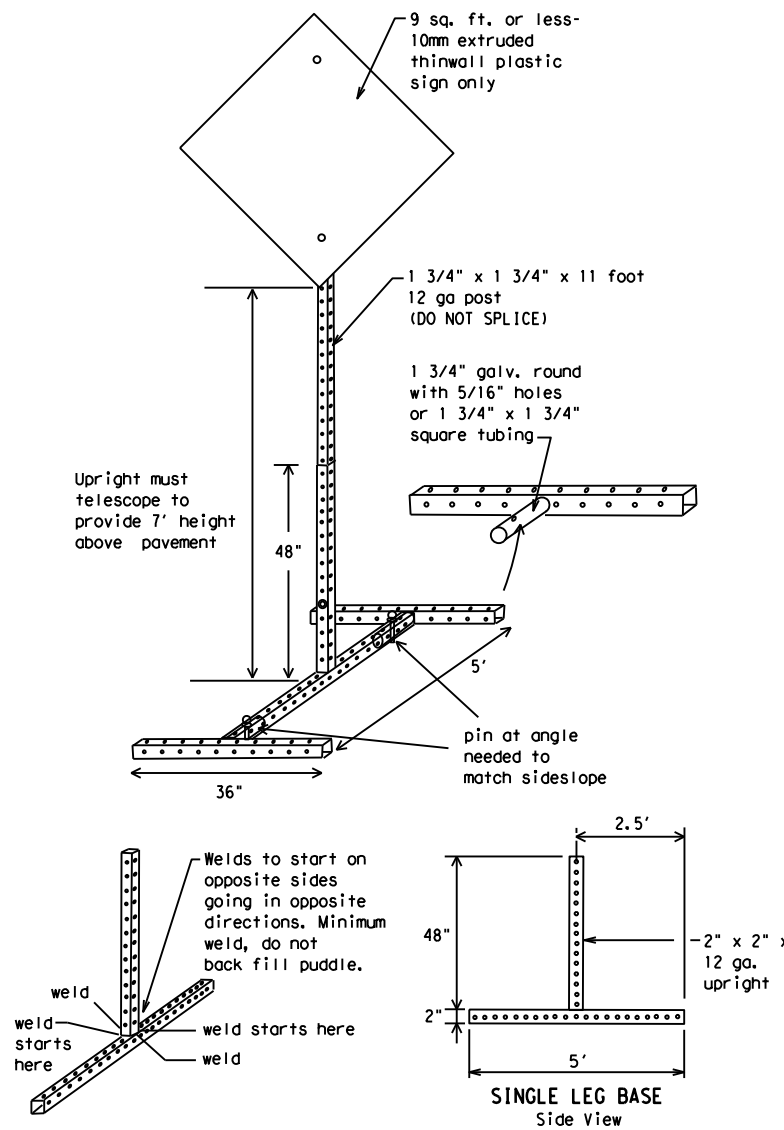
SKID MOUNTED WOOD SIGN SUPPORTS

* 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**
- 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.
 - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
 - 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



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	DAL	COL, ETC.	12	

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- 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.
- 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.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- 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.
- 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.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 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.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- 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.
- 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.
- Each line of text should be centered on the message board rather than left or right justified.
- 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.

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
XXXXXXXX TO XXXXXX
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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- 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.
- 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

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- 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

- 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.
- 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.
- 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.
- 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.

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WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Canot	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLR
High-Occupancy Vehicle	HOV	Tuesday	TUES
Highway	HWY	Time Minutes	TIME MIN
Hour(s)	HR, HRS	Upper Level	UPR LEVEL
Information	INFO	Vehicles (s)	VEH, VEHS
It Is	ITS	Warning	WARN
Junction	JCT	Wednesday	WED
Left	LFT	Weight Limit	WT LIMIT
Left Lane	LFT LN	West	W
Lane Closed	LN CLOSED	Westbound	(route) W
Lower Level	LWR LEVEL	Wet Pavement	WET PVMT
Maintenance	MAINT	Will Not	WONT

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

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

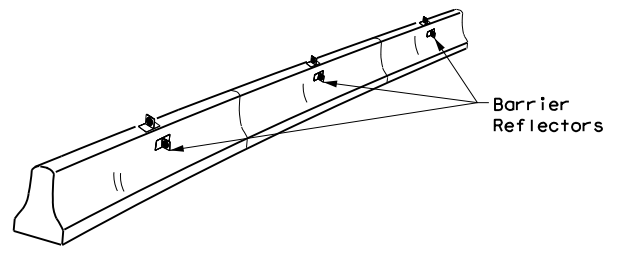
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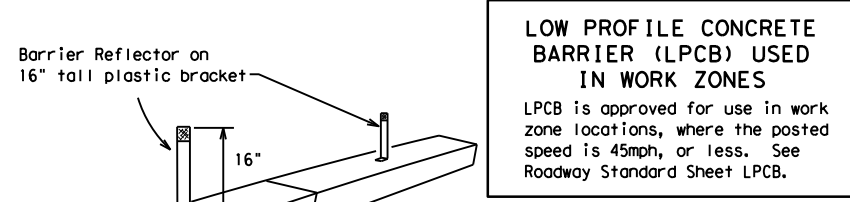
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



CONCRETE TRAFFIC BARRIER (CTB)

- 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.
- 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.
- When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
- Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
- Maximum spacing of Barrier Reflectors is forty (40) feet.
- Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
- Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
- Single slope barriers shall be delineated as shown on the above detail.

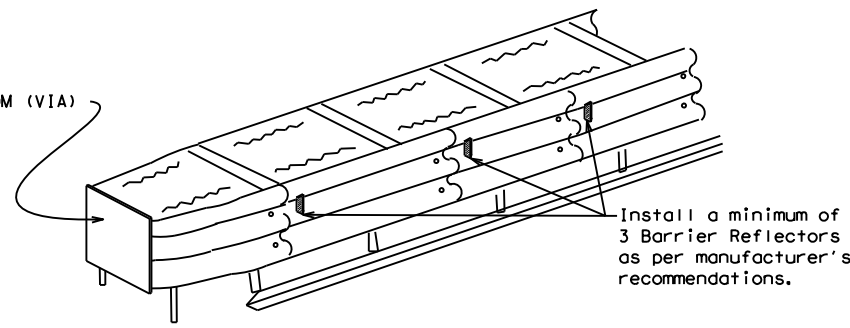


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

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

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

WARNING LIGHTS

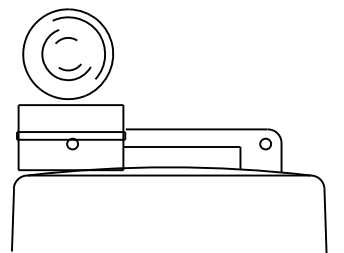
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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.
- 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".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- 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.
- 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.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

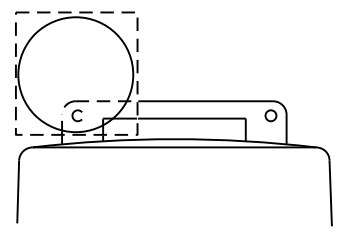
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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.
- 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.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- 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

- 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.
- 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.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- 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.
- 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.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.



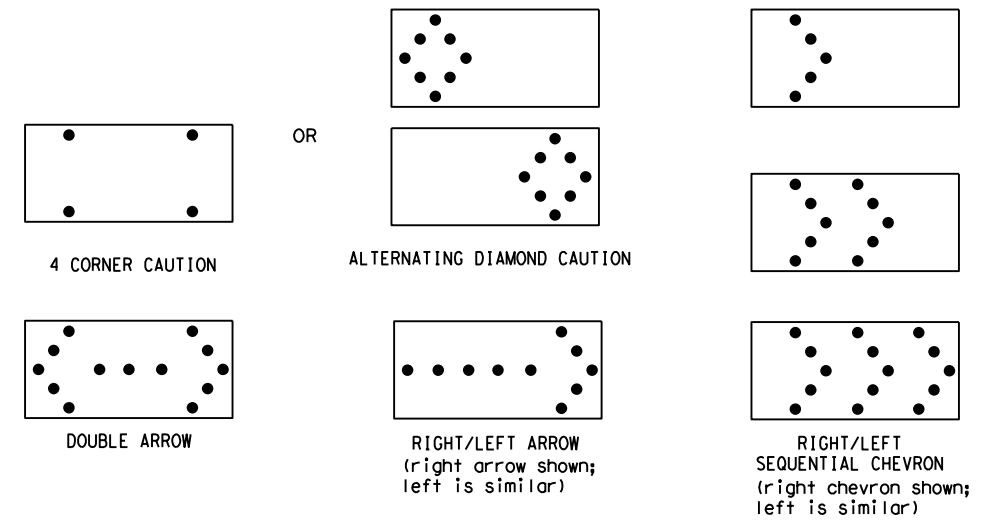
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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.

- 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.
- 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.
- 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.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- 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.
- 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.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- 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.
- 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

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- 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.
- 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.



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

BC (7) - 21

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7-13	5-21	DAL	COL, ETC.		14				

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GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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).
- 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.
- 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

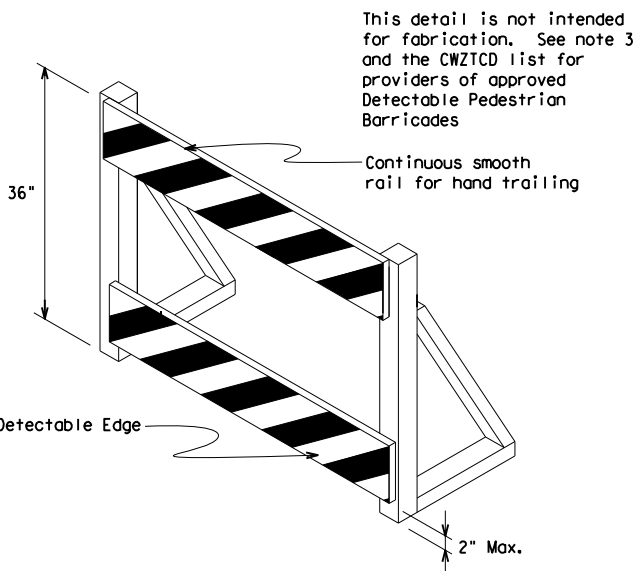
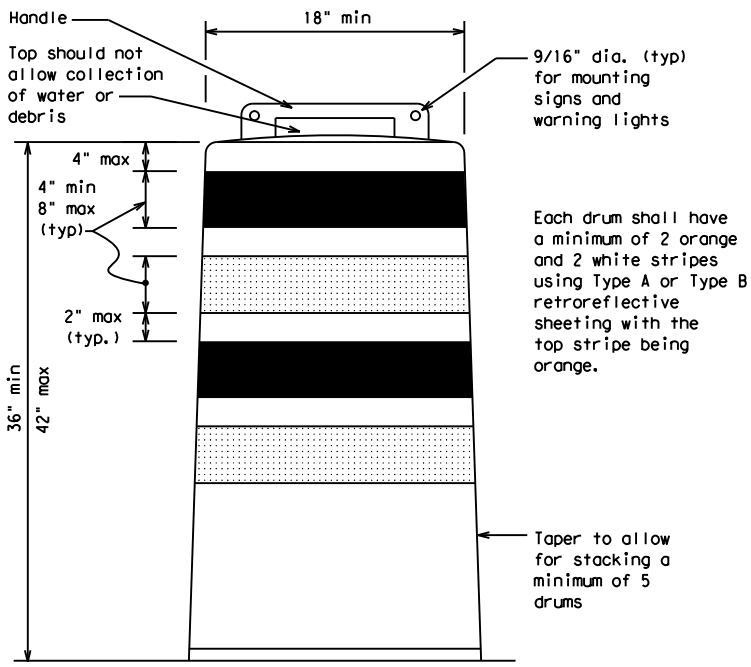
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
 - The body and base shall lock together in such a manner that the body separates from the base when impacted 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.
 - 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.
 - 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.
 - 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.
 - 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.
 - 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.
 - Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
 - Drum body shall have a maximum unballasted weight of 11 lbs.
 - Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

- 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.
- 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.

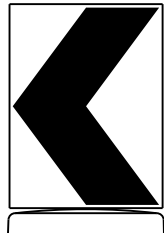
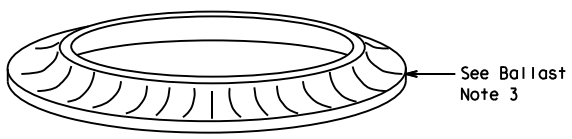
BALLAST

- 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.
- 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.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 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.
- 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.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

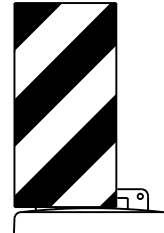


DETECTABLE PEDESTRIAN BARRICADES

- 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.
- 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.
- 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.
- 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.
- Warning lights shall not be attached to detectable pedestrian barricades.
- 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

- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- 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.
- 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.
- 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.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- 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.
- 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.

SHEET 8 OF 12



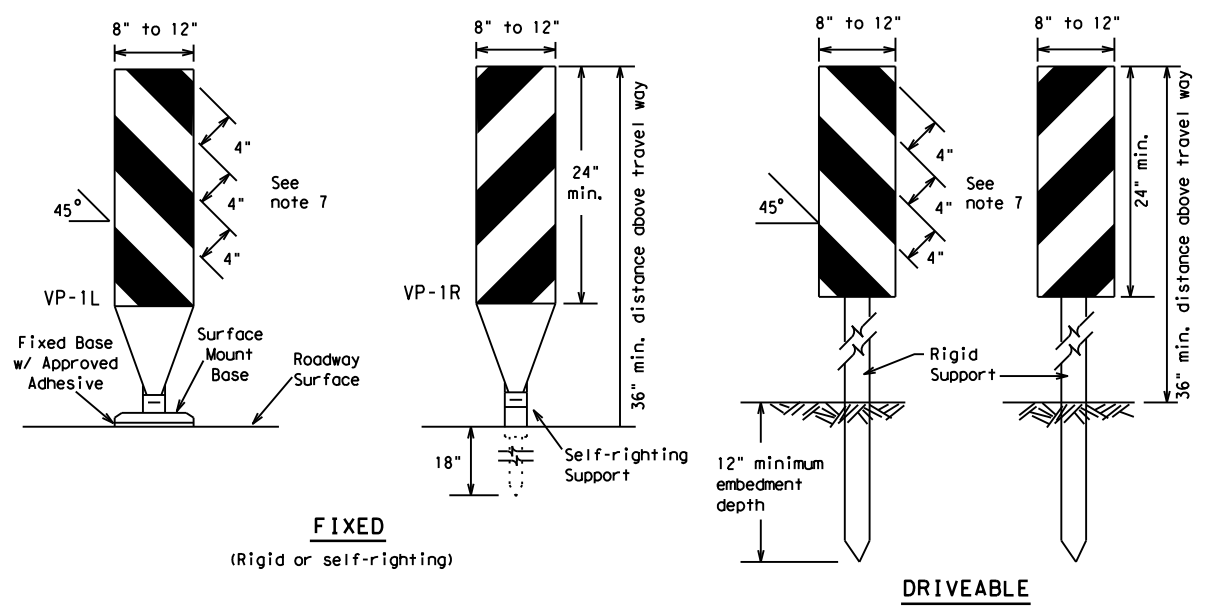
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

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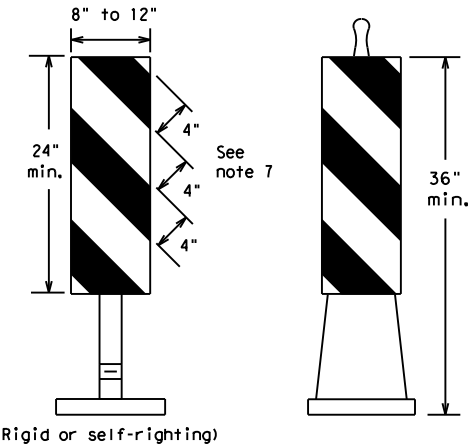
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FIXED
(Rigid or self-righting)

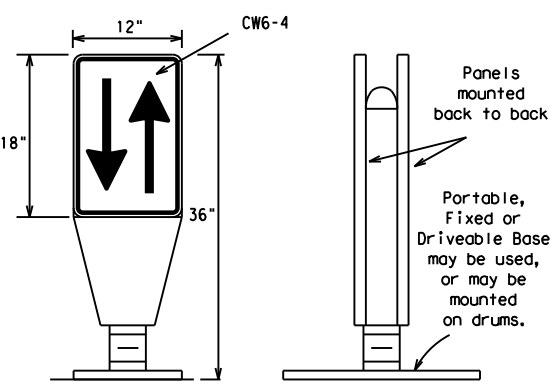
DRIVEABLE



PORTABLE

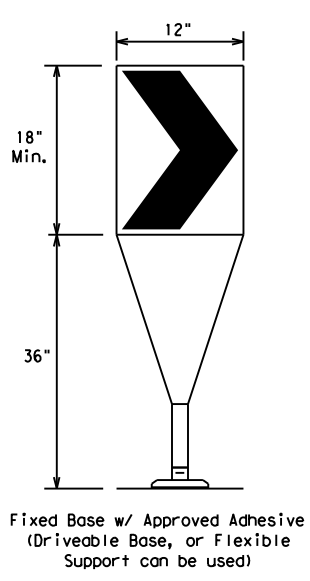
VERTICAL PANELS (VPs)

- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- 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.
- 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.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



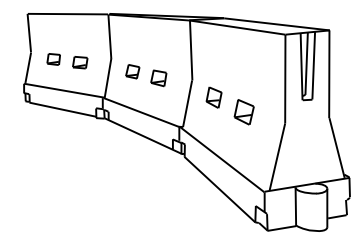
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

- 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.
- The OTLD may be used in combination with 42" cones or VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
- 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.



- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- 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.
- To be effective, the chevron should be visible for at least 500 feet.
- 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.
- For Long Term Stationary use on tapers or transitions on freeways and divided highways, self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 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

- 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.
- 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.
- 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.
- 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.
- When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

GENERAL NOTES

- 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).
- 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.
- 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).
- 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.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 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.
- The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

Posted Speed	Formula	Minimum Desirable Taper Lengths * *			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	L = 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



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

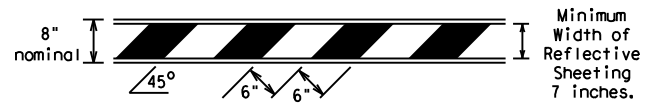
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7-13	5-21	DAL	COL, ETC.	16					

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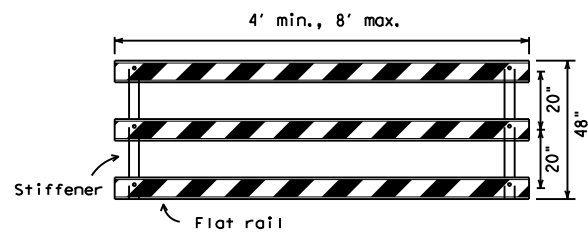
TYPE 3 BARRICADES

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.

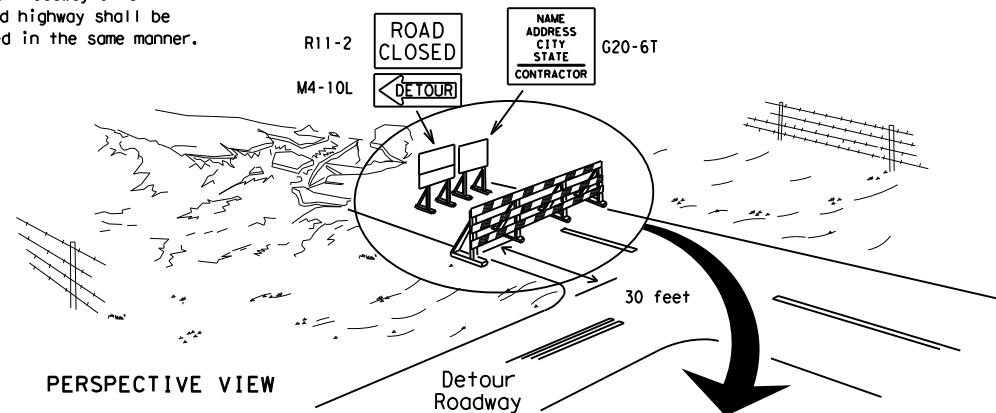


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

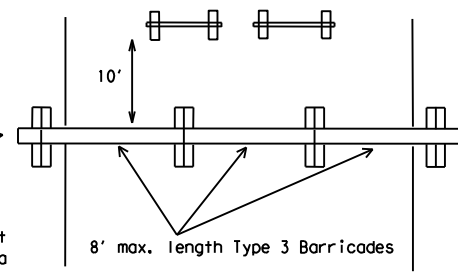
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

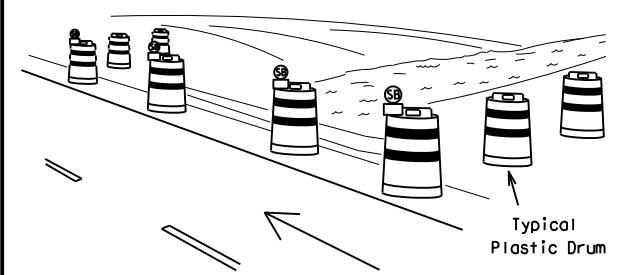
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

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.

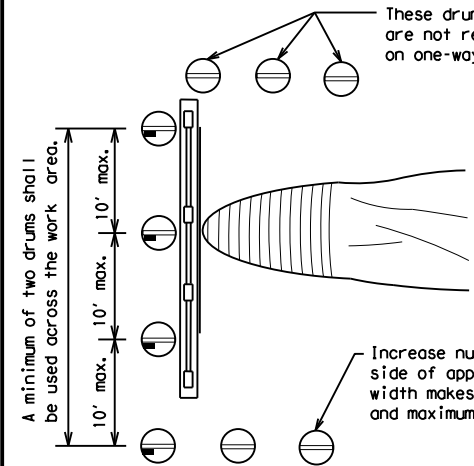


PLAN VIEW

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

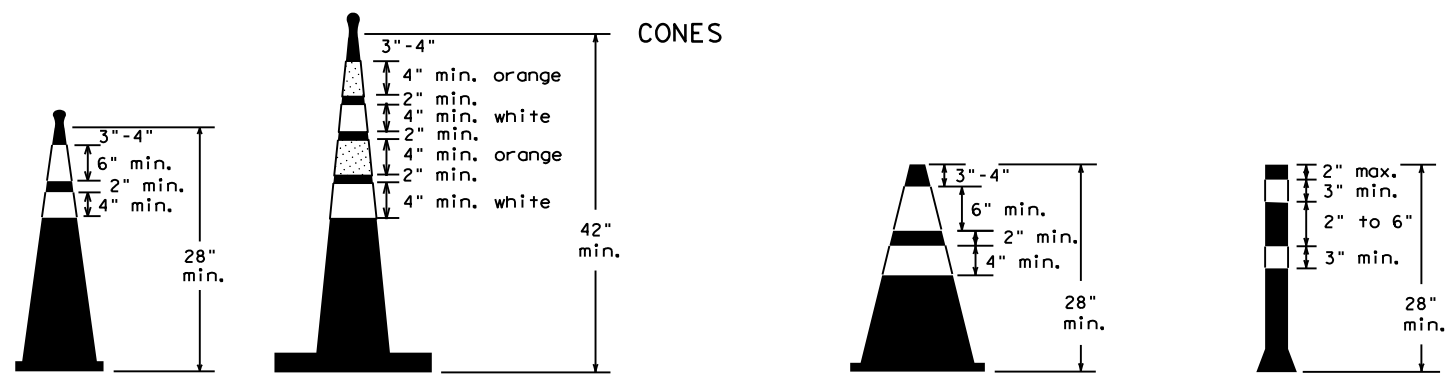


PLAN VIEW

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

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



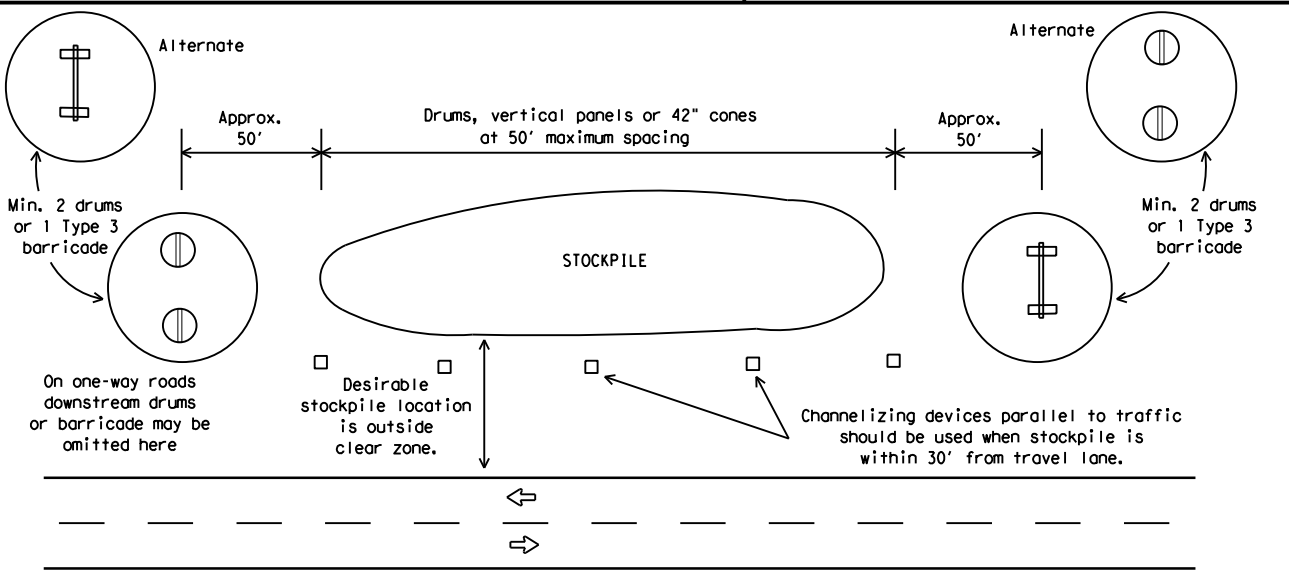
Two-Piece cones

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

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918	24	267, ETC.	VAR
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	DAL	COL, ETC.	17	

WORK ZONE PAVEMENT MARKINGS

GENERAL

- 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.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- 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).
- 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.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- 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

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

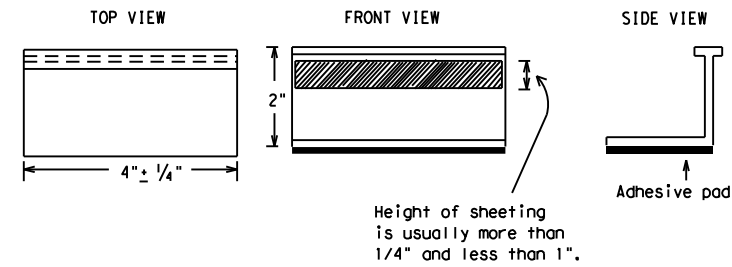
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- 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.
- 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.
- 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

- 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.
- 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.
- 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".
- The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- Over-painting of the markings SHALL NOT BE permitted.
- Removal of raised pavement markers shall be as directed by the Engineer.
- 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.
- 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**

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 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.
 - 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.
 - 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.
- Small design variances may be noted between tab manufacturers.
- 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

- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- 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).

SHEET 11 OF 12



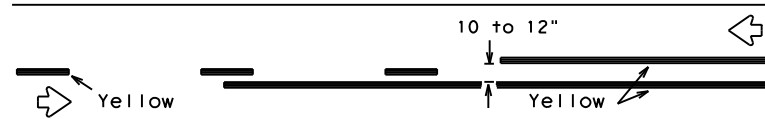
BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

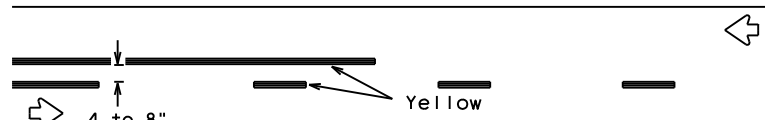
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2-98	9-07	5-21		VAR
1-02	7-13			
11-02	8-14			
	DIST	COUNTY	SHEET NO.	
	DAL	COL, ETC.	18	

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PAVEMENT MARKING PATTERNS

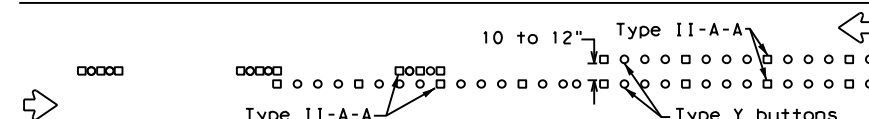


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

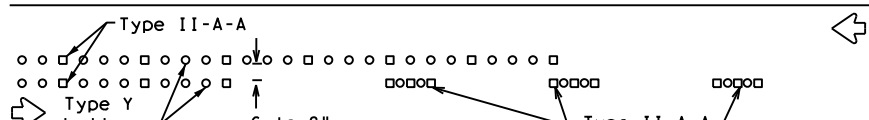


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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.



RAISED PAVEMENT MARKERS - PATTERN A



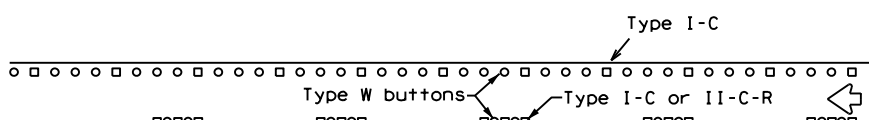
RAISED PAVEMENT MARKERS - PATTERN B

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



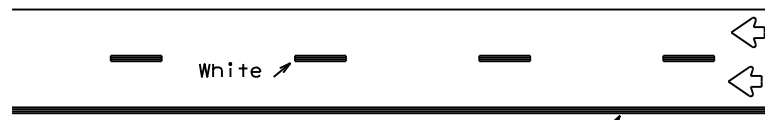
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



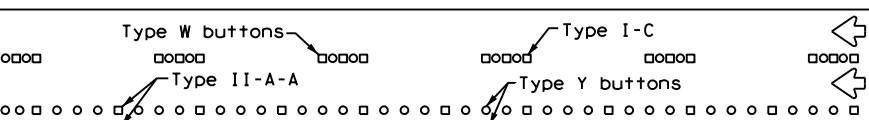
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



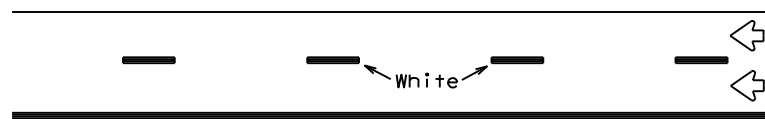
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectorized pavement markings.



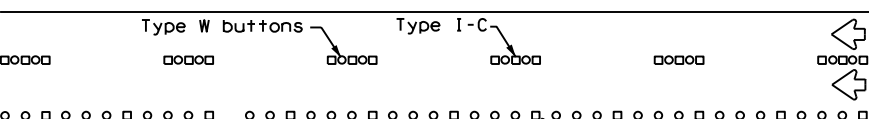
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

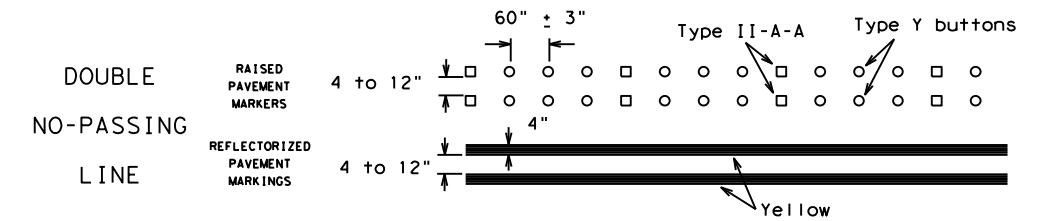
Prefabricated markings may be substituted for reflectorized pavement markings.



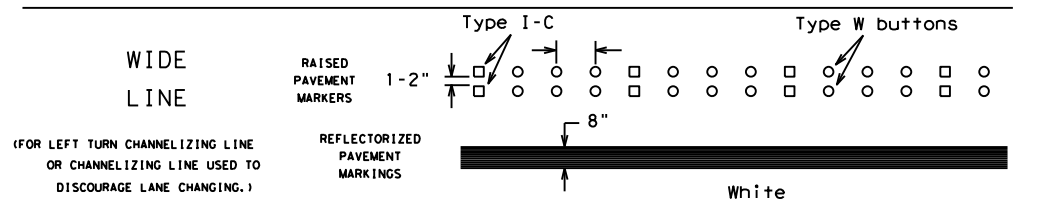
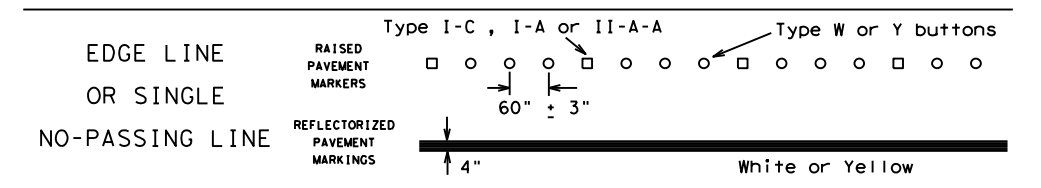
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

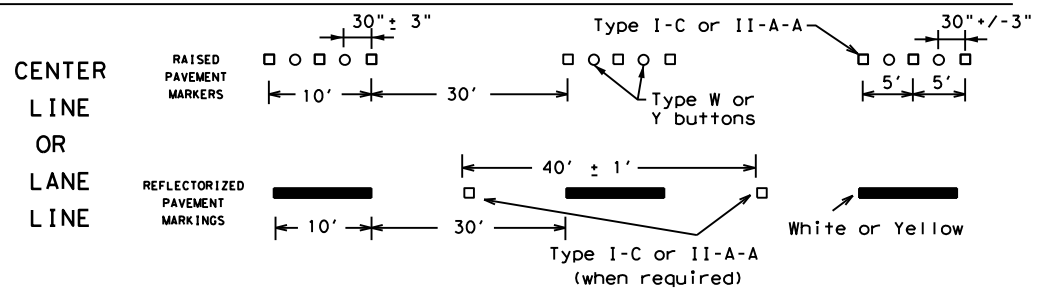
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



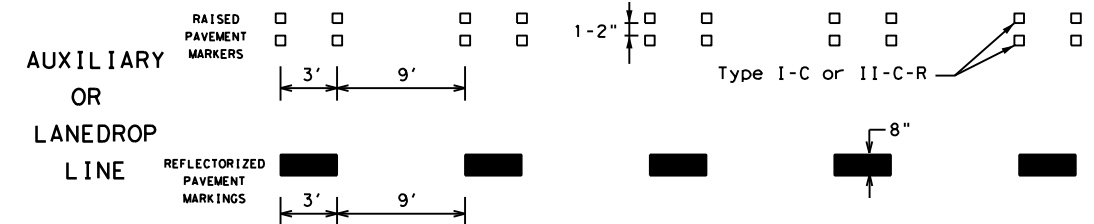
SOLID LINES



BROKEN LINES

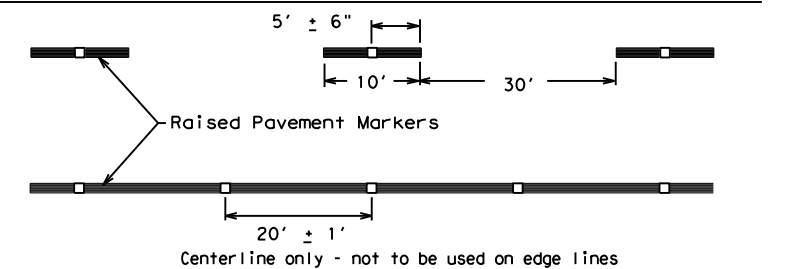


BROKEN LINES



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.



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

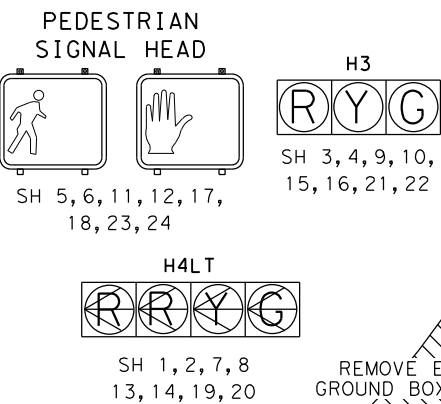
Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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2-98 7-13	DAL	COL, ETC.	19	
11-02 8-14				

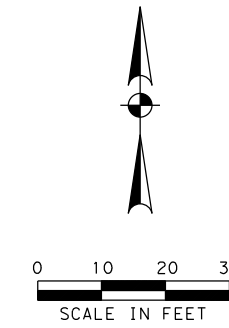
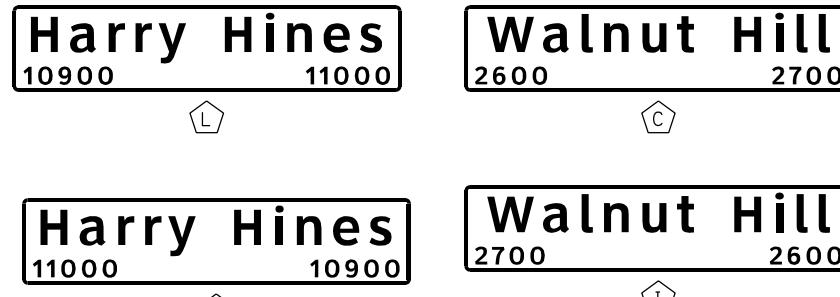
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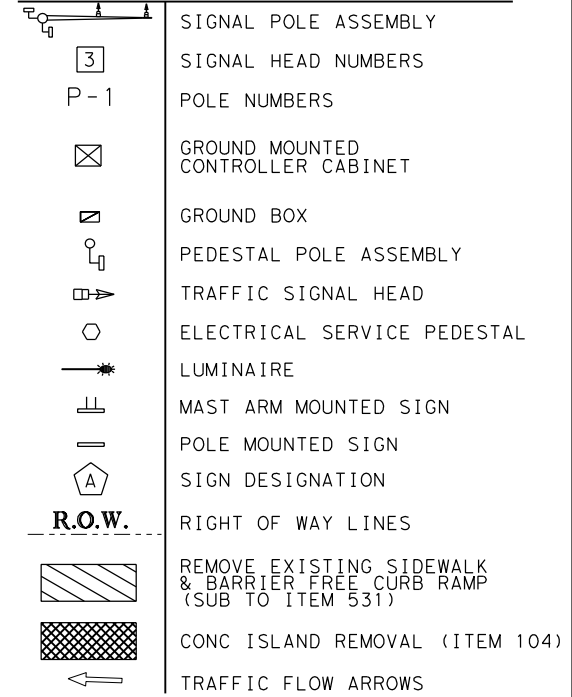
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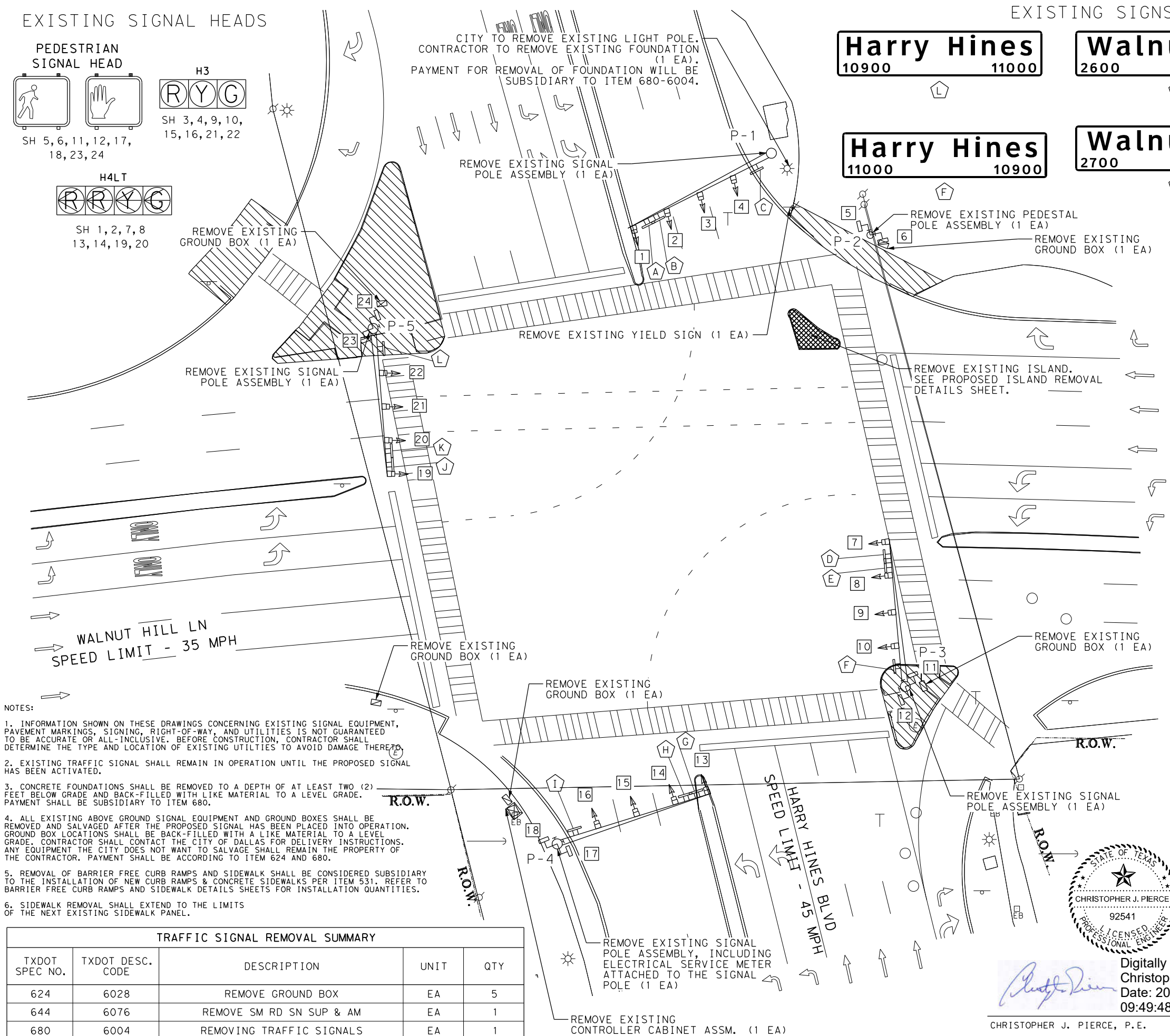
EXISTING SIGNS



LEGEND OF SYMBOLS

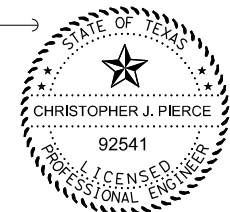


FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Walnut Hill Ln at Harry Hines Blvd (SH 356)\5-Existing Traffic Signal Removal Layout.dgn



- NOTES:
1. INFORMATION SHOWN ON THESE DRAWINGS CONCERNING EXISTING SIGNAL EQUIPMENT, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR SHALL DETERMINE THE TYPE AND LOCATION OF EXISTING UTILITIES TO AVOID DAMAGE THERE TO.
 2. EXISTING TRAFFIC SIGNAL SHALL REMAIN IN OPERATION UNTIL THE PROPOSED SIGNAL HAS BEEN ACTIVATED.
 3. CONCRETE FOUNDATIONS SHALL BE REMOVED TO A DEPTH OF AT LEAST TWO (2) FEET BELOW GRADE AND BACK-FILLED WITH LIKE MATERIAL TO A LEVEL GRADE. PAYMENT SHALL BE SUBSIDIARY TO ITEM 680.
 4. ALL EXISTING ABOVE GROUND SIGNAL EQUIPMENT AND GROUND BOXES SHALL BE REMOVED AND SALVAGED AFTER THE PROPOSED SIGNAL HAS BEEN PLACED INTO OPERATION. GROUND BOX LOCATIONS SHALL BE BACK-FILLED WITH A LIKE MATERIAL TO A LEVEL GRADE. CONTRACTOR SHALL CONTACT THE CITY OF DALLAS FOR DELIVERY INSTRUCTIONS. ANY EQUIPMENT THE CITY DOES NOT WANT TO SALVAGE SHALL REMAIN THE PROPERTY OF THE CONTRACTOR. PAYMENT SHALL BE ACCORDING TO ITEM 624 AND 680.
 5. REMOVAL OF BARRIER FREE CURB RAMP AND SIDEWALK SHALL BE CONSIDERED SUBSIDIARY TO THE INSTALLATION OF NEW CURB RAMP & CONCRETE SIDEWALKS PER ITEM 531. REFER TO BARRIER FREE CURB RAMP AND SIDEWALK DETAILS SHEETS FOR INSTALLATION QUANTITIES.
 6. SIDEWALK REMOVAL SHALL EXTEND TO THE LIMITS OF THE NEXT EXISTING SIDEWALK PANEL.

TRAFFIC SIGNAL REMOVAL SUMMARY				
TXDOT SPEC NO.	TXDOT DESC. CODE	DESCRIPTION	UNIT	QTY
624	6028	REMOVE GROUND BOX	EA	5
644	6076	REMOVE SM RD SN SUP & AM	EA	1
680	6004	REMOVING TRAFFIC SIGNALS	EA	1



Digitally signed by Christopher Pierce
 Date: 2023.11.29 09:49:48-06'00'
 CHRISTOPHER J. PIERCE, P.E.
 LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450

LEE ENGINEERING

CITY OF DALLAS
 DEPARTMENT OF TRANSPORTATION

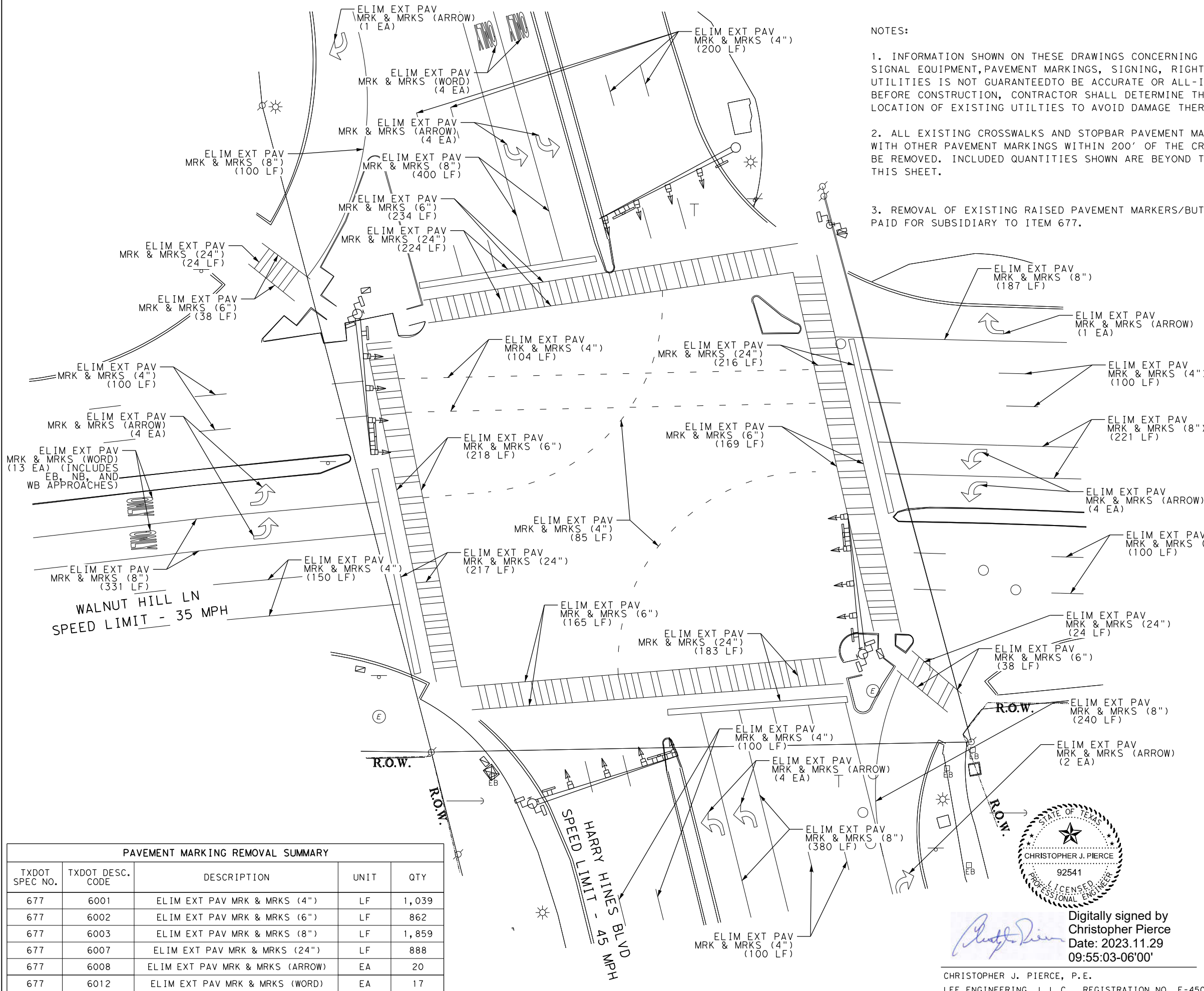
EXISTING TRAFFIC SIGNAL
 REMOVAL LAYOUT

WALNUT HILL LN AT
 HARRY HINES BLVD

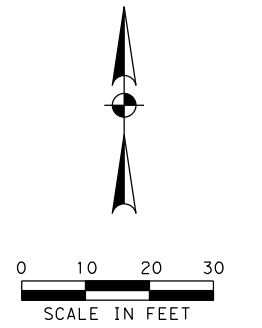
SCALE: 1"=30' SHEET 1 OF 1

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GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
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CHECK	CONTROL	SECTION	JOB	
CJP	0918	24	267, ETC	
CHECK	JPD			

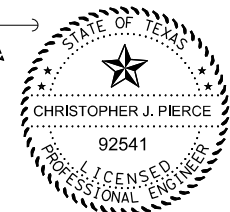
FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Existing Pavement Marking Removal Layout.dgn




- NOTES:
1. INFORMATION SHOWN ON THESE DRAWINGS CONCERNING EXISTING SIGNAL EQUIPMENT, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR SHALL DETERMINE THE TYPE AND LOCATION OF EXISTING UTILITIES TO AVOID DAMAGE THERETO.
 2. ALL EXISTING CROSSWALKS AND STOPBAR PAVEMENT MARKINGS, ALONG WITH OTHER PAVEMENT MARKINGS WITHIN 200' OF THE CROSSWALK, SHALL BE REMOVED. INCLUDED QUANTITIES SHOWN ARE BEYOND THE LIMITS OF THIS SHEET.
 3. REMOVAL OF EXISTING RAISED PAVEMENT MARKERS/BUTTONS SHALL BE PAID FOR SUBSIDIARY TO ITEM 677.




PAVEMENT MARKING REMOVAL SUMMARY				
TXDOT SPEC NO.	TXDOT DESC. CODE	DESCRIPTION	UNIT	QTY
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	1,039
677	6002	ELIM EXT PAV MRK & MRKS (6")	LF	862
677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	1,859
677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	888
677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	20
677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	17



Digitally signed by Christopher Pierce
 Date: 2023.11.29 09:55:03-06'00'
 CHRISTOPHER J. PIERCE, P.E.
 LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450



LEE ENGINEERING



CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

EXISTING PAVEMENT MARKING
REMOVAL LAYOUT

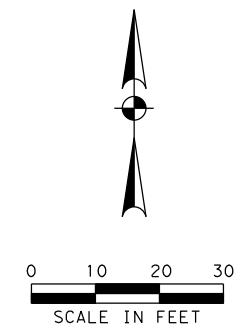
WALNUT HILL LN AT
HARRY HINES BLVD

SCALE: 1"=30' SHEET 1 OF 1

DESIGN EEH	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. (SEE TITLE SHEET)		HIGHWAY NO. VAR
GRAPHICS EEH	STATE TEXAS	DISTRICT 18	COUNTY COLLIN, ETC	SHEET NO.
CHECK CJP	CONTROL 0918	SECTION 24	JOB 267, ETC	

WARNING!!
 CONTRACTOR SHALL BE AWARE OF THE MULTIPLE UTILITIES LOCATED AT THE INTERSECTION. ALL UTILITIES ARE TO BE VISUALLY CONFIRMED PRIOR TO EXCAVATION. USE OF NON-DESTRUCTIVE VACUUM EXCAVATION REQUIRED FOR ALL UTILITIES WHILE PERFORMING POTHOLES EFFORTS. THESE UTILITIES MAY HAVE TO BE ADJUSTED BY HAND TO ENABLE THE FOUNDATIONS TO BE DRILLED.

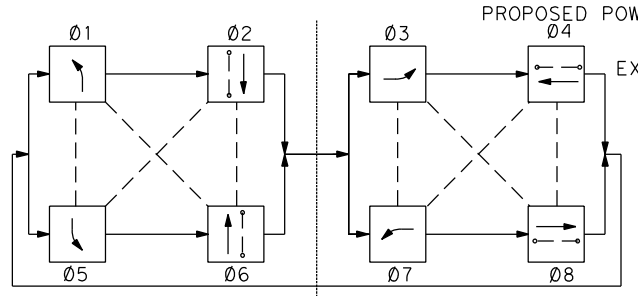
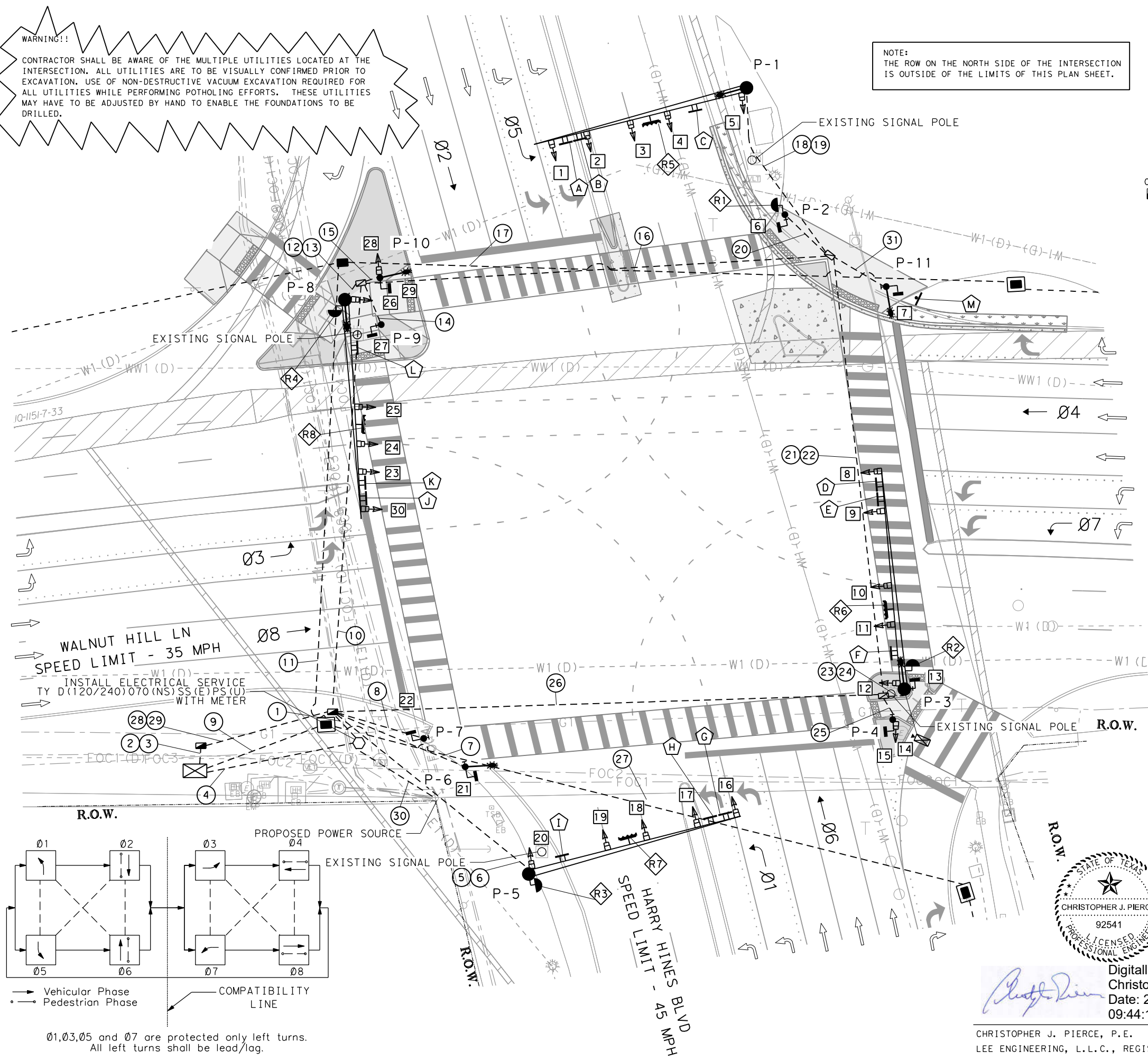
NOTE:
 THE ROW ON THE NORTH SIDE OF THE INTERSECTION IS OUTSIDE OF THE LIMITS OF THIS PLAN SHEET.



LEGEND OF SYMBOLS

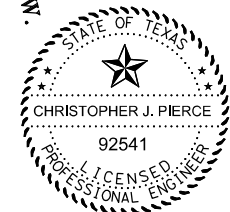
- SIGNAL POLE ASSEMBLY
- SIGNAL HEAD NUMBERS
- POLE NUMBERS
- GROUND MOUNTED CONTROLLER CABINET
- GROUND BOX TY D W/APRON
- GROUND BOX TY D
- GND BOX ITS (POLY) TYPE I W/APRON
- GND BOX ITS (POLY) TYPE I
- PEDESTAL POLE ASSEMBLY
- TRAFFIC SIGNAL HEAD
- ELECTRICAL SERVICE PEDESTAL
- LUMINAIRE
- ROADWAY ILLUMINATION POLE ASSM.
- MAST ARM MOUNTED SIGN
- SIGN DESIGNATION
- R.O.W.
- RIGHT OF WAY LINES
- NEW CONDUIT RUN NUMBERS
- RADAR IDENTIFICATION
- PRESENCE RADAR DETECTOR
- ADVANCE RADAR DETECTOR
- CCTV CAMERA
- PHASE NUMBERS
- NEW CONCRETE SIDEWALK (MAX 1.5% RUNNING SLOPE)
- NEW 11" CONCRETE PAVEMENT
- NEW RIPRAP OR MEDIAN NOSE
- NEW GRASS SODDING
- TRAVEL FLOW ARROWS

FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Walnut Hill Ln at Harry Hines Blvd (SH 356)\5-Proposed Signal Layout.dgn



→ Vehicular Phase
 • Pedestrian Phase
 --- COMPATIBILITY LINE

Ø1, Ø3, Ø5 and Ø7 are protected only left turns.
 All left turns shall be lead/lag.



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 Date: 2023.11.29 09:44:17-06'00'
 CHRISTOPHER J. PIERCE, P.E.
 LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450

LEE ENGINEERING

CITY OF DALLAS
 DEPARTMENT OF TRANSPORTATION

PROPOSED SIGNAL LAYOUT

WALNUT HILL LN AT
 HARRY HINES BLVD

SCALE: 1"=30' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
EEH	6	(SEE TITLE SHEET)		VAR
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	COLLIN, ETC	
CJP	CONTROL	SECTION	JOB	
JPD	0918	24	267, ETC	

FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Proposed Signal Layout.dgn

RUN NO.	CONDUIT STATUS	CONDUIT PERCENT FILL	ITEM 618 CONDUIT SIZE/TYPE (FEET)					CABLE STATUS	ITEM 620 ELECTRICAL CONDUCTORS (FEET)					ITEM 6007 # #	ITEM 684 TRAFFIC SIGNAL CABLES					ITEM 6292				TOTAL LENGTH OF RUN (FEET)	RUN NO.			
			2" PVC - Trenched (SCHD 80)	3" PVC - Trenched (SCHD 80)	3" PVC - Bored (SCHD 80)	4" PVC - Trenched (SCHD 80)	4" PVC - Bored (SCHD 80)		NO. 6 XHHW POWER WIRE	NO. 6 BARE WIRE	NO. 6 XHHW WIRE (LUM.)	NO. 12 XHHW WIRE (LUM)	NO. 14 XHHW WIRE (TRACER WIRE)		FIBER OPTIC CABLE (SINGLE-MODE) (6 FIBER)	TY A 5 CNDR. CABLE (#14 AWG)	TY A 7 CNDR. CABLE (#14 AWG)	TY A 12 CNDR. CABLE (#14 AWG)	TY A 20 CNDR. CABLE (#14 AWG)	TY C 2 CNDR. CABLE (#12 AWG)	CAT 5 ETHERNET CABLE FOR PTZ CAMERA ***	RADAR PRESENCE DETECTOR CABLE (RPDD) **	RADAR ADVANCE DETECTION CABLE (RADD) **					
																										1.939	2.900	2.900
			LF	LF	LF	LF	LF		QTY	LF	QTY	LF	QTY		LF	QTY	LF	QTY	LF	QTY	LF	QTY	LF			QTY	LF	
1	I	8%	15																					15	1			
2	I	37%																							15	2		
3	I	18%																							15	3		
4	I	4%	55																						55	4		
5	I	11%		80																					80	5		
6	I	0%	80																						80	6		
7	I	11%		45																					45	7		
8	I	7%		30																					30	8		
9 # #	I	1%		40																					40	9 # #		
10	I	30%																							130	10		
11 # #	I	1%			140																				140	11 # #		
12	I	15%		10																					10	12		
13	I	0%	10																						10	13		
14	I	7%		20																					20	14		
15	I	11%		10																					10	15		
16	I	16%																							140	16		
17 # #	I	1%			210																				210	17 # #		
18	I	13%		60																					60	18		
19	I	0%	60																						60	19		
20	I	9%		20																					20	20		
21	I	0%																							135	21		
22 # #	I	0%			135																				135	22 # #		
23	I	16%		10																					10	23		
24	I	0%	10																						10	24		
25	I	7%		10																					10	25		
26	I	13%																							165	26		
27 # #	I	0%			215																				215	27 # #		
28	I	37%																							45	28		
29	I	18%																							45	29		
30	I	0%	40																						40	30		
31	I	9%		25																					25	31		
SUBTOTAL	---	---	270	360	700	120	570	---	110	945	1,500		740	840	0	0	1,545	965	1,780	235	925	965			SUBTOTAL			
WIRE INSIDE POLE																												
P-1								P					90													50	VARIES	P-1
P-2								P																		20	VARIES	P-2
P-3								P					90													50	VARIES	P-3
P-4								P																		5	VARIES	P-4
P-5								P																		20	VARIES	P-5
P-6								P					60													5	VARIES	P-6
P-7								P																		5	VARIES	P-7
P-8								P					90													20	VARIES	P-8
P-9								P																		5	VARIES	P-9
P-10								P					60													24	VARIES	P-10
P-11								P					60													10	VARIES	P-11
SUBTOTAL	---	---	270	360	700	120	570	---	0	0	0	450	0	0	555	630	0	0	40	50	80	203				SUBTOTAL		
TOTAL	---	---	270	360	700	120	570	---	110	945	1,500	450	740	840	555	630	1,545	965	1,820	285	1,005	1,168				TOTAL		

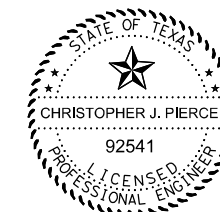
CONDUIT / CABLE STATUS: E=EXISTING; I=INSTALL; A=ABANDON; AC=AERIAL CABLE; R=REMOVE AND SALVAGE; P=INSTALL WIRE INSIDE STEEL POLE

CONDUIT RUN AND FIBER OPTIC CABLE RESERVED FOR FUTURE USE AS PART OF THE CITY'S INTERCONNECT COMMUNICATION SYSTEM. AN ADDITIONAL 100' OF SLACK SHALL BE INCLUDED ON EACH END OF THE CONDUIT RUNS WITH AN ADDITIONAL 25' OF SLACK INSIDE THE CONTROLLER CABINET. CONTRACTOR SHALL ALSO INSTALL A NON-METALLIC MULE TAPE INSIDE THE CONDUIT FOR FUTURE USE.


** SUPPLIED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR. PAID FOR SUBSIDIARY TO ITEM 6292.

*** FURNISHED BY THE CITY AND INSTALLED BY THE CONTRACTOR. PAID FOR SUBSIDIARY TO ITEM 680. WIRE INSIDE THE POLE QUANTITY INCLUDES 10' OF ADDITIONAL LENGTH TO ALLOW FOR VARIABLE MOUNTING HEIGHTS BASED ON MAST ARM POLE MOUNTING METHOD SELECTED BY THE CONTRACTOR.


RUN #30 INCLUDES A 10' RISER UP THE UTILITY POLE.



Digitally signed by Christopher Pierce
 Date: 2023.11.29 09:47:47-06'00'
 CHRISTOPHER J. PIERCE, P.E.
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LEE ENGINEERING



CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED SIGNAL TABLES

WALNUT HILL LN AT
HARRY HINES BLVD

SCALE: 1"=30' SHEET 1 OF 6

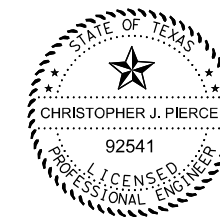
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
EEH	6	(SEE TITLE SHEET)	VAR
GRAPHICS	STATE	DISTRICT	COUNTY
EEH	TEXAS	18	COLLIN, ETC
CHECK	CONTROL	SECTION	JOB
CJP	0918	24	267, ETC
CHECK	JPD		

FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Proposed Signal Layout.dgn

CABLE TERMINATION CHART

	CONDUCTOR COLOR	CABLE 1 FROM POLE P-1 TO CNTRL 20 CNDR	CABLE 2 FROM POLE P-2 TO CNTRL 12 CNDR	CABLE 3 FROM POLE P-3 TO CNTRL 20 CNDR	CABLE 4 FROM POLE P-4 TO CNTRL 12 CNDR	CABLE 5 FROM POLE P-5 TO CNTRL 20 CNDR	CABLE 6 FROM POLE P-6 TO CNTRL 12 CNDR	CABLE 7 FROM POLE P-7 TO CNTRL 12 CNDR	CABLE 8 FROM POLE P-8 TO CNTRL 20 CNDR	CABLE 9 FROM POLE P-9 TO CNTRL 12 CNDR	CABLE 10 FROM POLE P-10 TO CNTRL 12 CNDR	CABLE 11 FROM POLE P-11 TO CNTRL 12 CNDR
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SIG COMMON	SIG COMMON	SIG COMMON	SIG COMMON	SIG COMMON	SIG COMMON	SIG COMMON	SIG COMMON	SIG COMMON	SIG COMMON	SIG COMMON
3	RED	SH 3, 4, 5 PH 6 R	SH 6 PH 4 DW	SH 10, 11, 12 PH 8 R	SH 15 PH 8 DW	SH 18, 19, 20 PH 2 R	SH 21 PH 8 DW	SPARE	SH 24, 25, 26 PH 4 R	SPARE	SH 29 PH 4 DW	SPARE
4	GREEN	SH 3, 4, 5 PH 6 G	SH 6 PH 4 W	SH 10, 11, 12 PH 8 G	SH 15 PH 8 W	SH 18, 19, 20 PH 2 G	SH 21 PH 8 W	SPARE	SH 24, 25 PH 4 G	SPARE	SH 29 PH 4 W	SPARE
5	ORANGE	SH 3, 4, 5 PH 6 Y	SPARE	SH 10, 11, 12 PH 8 Y	SPARE	SH 18, 19, 20 PH 2 Y	SPARE	SPARE	SH 24, 25 PH 4 Y	SPARE	SPARE	SPARE
6	BLUE	SH 1, 2 PH 1 GA LT	SPARE	SH 8, 9 PH 3 GA LT	SPARE	SH 16, 17 PH 5 GA LT	SPARE	SPARE	SH 23, 30 PH 7 GA LT	SPARE	SPARE	SPARE
7	WHITE/BLACK	SH 1, 2 PH 1 YA LT	SPARE	SH 8, 9 PH 3 YA LT	SPARE	SH 16, 17 PH 5 YA LT	SPARE	SPARE	SH 23, 30 PH 7 YA LT	SPARE	SPARE	SPARE
8	RED/BLACK	SH 1, 2 PH 1 RA LT	SPARE	SH 8, 9 PH 3 RA LT	SH 14 PH 6 R	SH 16, 17 PH 5 RA LT	SPARE	SH 22 PH 2 DW	SH 23, 30 PH 7 RA LT	SH 27 PH 2 DW	SH 28 PH 2 R	SH 7 PH 6 DW
9	GREEN/BLACK	SPARE	SPARE	SH 13 PH 6 DW	SH 14 PH 6 G	SPARE	SPARE	SH 22 PH 2 W	SPARE	SH 27 PH 2 W	SH 28 PH 2 G	SH 7 PH 6 W
10	ORANGE/BLACK	SPARE	SPARE	SH 13 PH 6 W	SH 14 PH 6 Y	SPARE	SPARE	SPARE	SPARE	SPARE	SH 28 PH 2 Y	SPARE
11	BLUE/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
12	BLACK/WHITE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
13	RED/WHITE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
14	GREEN/WHITE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SH 26 PH 4 GA RT	SPARE	SPARE	SPARE
15	BLUE/WHITE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SH 26 PH 4 YA RT	SPARE	SPARE	SPARE
16	BLACK/RED	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SH 26 PH 4 FYA RT	SPARE	SPARE	SPARE
17	WHITE/RED	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
18	ORANGE/RED	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
19	BLUE/RED	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
20	RED/GREEN	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE

R = RED BALL; Y = YELLOW BALL; G = GREEN BALL; RA = RED ARROW; YA = YELLOW ARROW; GA = GREEN ARROW
 FYA = FLASHING YELLOW ARROW; RT = RIGHT TURN; LT = LEFT TURN



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 CHRISTOPHER J. PIERCE, P.E.
 LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450



CITY OF DALLAS
 DEPARTMENT OF TRANSPORTATION

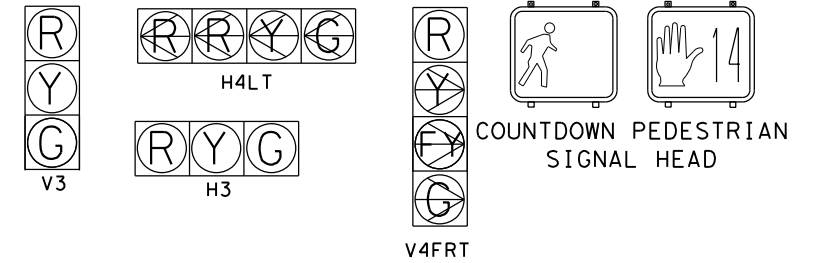
PROPOSED SIGNAL TABLES

WALNUT HILL LN AT
 HARRY HINES BLVD

SCALE: 1"=30' SHEET 2 OF 6

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
EEH	6	(SEE TITLE SHEET)		VAR
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
EEH	TEXAS	18	COLLIN, ETC	
CHECK	CONTROL	SECTION	JOB	
CJP	0918	24	267, ETC	
CHECK				
JPD				

ITEM 682 - SIGNAL HEADS											
SIGNAL HEAD NO.	SIGNAL HEAD TYPE	12" SIGNAL INDICATION			VEHICLE SIGNAL SECTIONS						PEDESTRIAN SIGNAL SECTIONS
		BACKPLATE			RED BALL	YELLOW BALL	GREEN BALL	RED ARROW	YELLOW ARROW	GREEN ARROW	
		3 SEC (EA)	4 SEC (EA)	5 SEC (EA)							
1, 2, 8, 9, 16, 17, 23, 30	H4LT		8				16	8	8		
3, 4, 10, 11, 18, 19, 24, 25	H3	8			8	8	8				
5, 12, 14, 20, 28	V3	5			5	5	5				
26	V4FRT		1		1			2	1		
6, 7, 13, 15, 21, 22, 27, 29	COUNTDOWN										8
	TOTAL	13	9	0	14	13	13	16	10	9	8



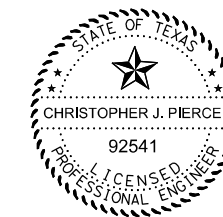
ALL NEW BACKPLATES SHALL INCLUDE A 2" RETROREFLECTIVE BORDER.

NOTES:


- INFORMATION SHOWN ON THESE DRAWINGS CONCERNING SIGNAL EQUIPMENT, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL-INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR SHALL DETERMINE THE TYPE AND LOCATION OF EXISTING UTILITIES TO AVOID DAMAGE THERETO.
- CONTRACTOR SHALL CONTACT THE CITY OF DALLAS TRAFFIC MANAGEMENT CENTER AT 214-670-3095 AND TXDOT TRAFFIC SIGNAL OFFICE AT 214-320-6682 AT LEAST 48 HOURS IN ADVANCE TO COORDINATE WORK.
- THE LOCATIONS OF PROPOSED SIGNAL EQUIPMENT IS DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMODATE FIELD CONDITIONS.
- CONTRACTOR SHALL COORDINATE WITH ONCOR ELECTRIC DELIVERY TO ARRANGE ELECTRICAL SERVICE. CONTACT CATHY GAONA AT 469-506-7115 OR CATHY.GAONA2@ONCOR.COM REGARDING ELECTRICAL POWER SOURCE AND PEDESTAL SERVICE. REFERENCE PROJECT NUMBER 16093771.
- CONTRACTOR SHALL FURNISH AND INSTALL A BASE MOUNTED CONTROLLER CABINET FOUNDATION (TYPE 332/352i).
- THE CITY OF DALLAS SHALL SUPPLY THE FOLLOWING EQUIPMENT: TRAFFIC SIGNAL CONTROLLER AND CABINET ASSEMBLY AND ALL INTERNAL HARDWARE, BATTERY BACK-UP UNITS (BBUS), RADAR DETECTORS AND CABLE. CONTACT MR. ALFRED LEMON AT 214-670-4812 TO ARRANGE PICKUP. PAYMENT FOR INSTALLING SAID ITEMS SHALL BE SUBSIDIARY TO ITEM 680.
- RADAR DETECTION ZONES WILL BE PROGRAMMED BY THE CITY OF DALLAS. CONTACT SRINIVAS VEERAMALLU, P.E. AT 214-670-5892 AT LEAST 1 WEEK IN ADVANCE TO SCHEDULE PROGRAMMING.
- WIRING SHALL BE IN ACCORDANCE WITH THE CITY OF DALLAS STANDARDS. CABINET PREPARATION NOTES WILL BE SUPPLIED BY THE CITY OF DALLAS.
- CONTRACTOR SHALL COORDINATE ALL TRAFFIC SIGNAL POLE ASSEMBLY FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED PRIOR TO DRILLING OF FOUNDATIONS, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER TO ARRANGE A FIELD MEETING TO DETERMINE IF THE FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL FOUNDATIONS ARE Poured PRIOR TO INSTALLATION OF THE CURB RAMPS, THE CURB RAMPS AND SIDEWALKS SHALL BE ADJUSTED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS IS 10" OR LESS.
- PROPOSED APS UNITS SHALL BE PLACED ADJACENT TO A LEVEL LANDING AREA (2% MAX SLOPE IN ANY DIRECTION). IF THE DISTANCE FROM THE PUSH BUTTON TO THE EDGE OF THE ACCESSIBLE PATH EXCEEDS 10", THE CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON EXTENDER TO MAKE THE REACH 10" OR LESS. PAYMENT FOR THE EXTENDER SHALL BE CONSIDERED SUBSIDIARY TO ITEM 680.
- CONTRACTOR SHALL ENSURE THE MINIMUM DRILL SHAFT LENGTH IS INSTALLED BELOW GRADE AND 3" OF FOUNDATION REMAINS ABOVE GRADE PER TXDOT STANDARD TS-FD. ANY ADDITIONAL CONCRETE REQUIRED TO MEET THESE REQUIREMENTS SHALL BE PAID FOR SUBSIDIARY TO ITEM 416.

- PROPOSED CURB RAMP LANDINGS SHALL BE Poured UP TO THE SIGNAL FOUNDATIONS, LEAVING NO GAPS.
- ALL SIGNAL POLES SHALL HAVE A GALVANIZED STEEL FINISH.
- ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BLACK ALUMINUM VISORS AND NON-VENTED BACKPLATES. BACKPLATES SHALL INCLUDE A 2" FLOURESCENT YELLOW RETROREFLECTIVE BORDER.
- THE CITY OF DALLAS WILL FURNISH AND CONTRACTOR WILL INSTALL A CCTV/PTZ CAMERA AND ETHERNET CABLE. CONTRACTOR SHALL FURNISH AND INSTALL EQUIPMENT FOR MOUNTING THE CCTV CAMERA ON THE MAST ARM. THE CCTV CAMERA SHALL BE INSTALLED ON THE MAST ARM, 20' FROM THE SIGNAL POLE. PAYMENT FOR FURNISHING AND INSTALLING MOUNTING EQUIPMENT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 680.
- ETHERNET CABLE SHALL BE INSTALLED FROM THE CAMERA TO THE TRAFFIC SIGNAL CONTROLLER CABINET. PAYMENT FOR INSTALLING THE ETHERNET CABLE SHALL BE CONSIDERED SUBSIDIARY TO ITEM 680.
- FIBER OPTIC ROAD MARKERS SHALL BE INSTALLED AS SHOWN ON TXDOT MODIFIED STANDARD ITS(42)-16. PROVIDE ALL ORANGE FIBER OPTIC ROAD MARKERS AT NON-SPLICE LOCATIONS AND ORANGE FIBER OPTIC ROAD MARKERS WITH A WHITE DOME AT SPLICE LOCATIONS.

FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Walnut Hill Ln at Harry Hines Blvd (SH 356)\5-Proposed Signal Layout.dgn



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 Date: 2023.11.29 09:46:16-06'00'
 CHRISTOPHER J. PIERCE, P.E.
 LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450



CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED SIGNAL TABLES

WALNUT HILL LN AT
HARRY HINES BLVD

SCALE: 1"=30' SHEET 3 OF 6

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
EEH	6	(SEE TITLE SHEET)		VAR
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
EEH	TEXAS	18	COLLIN, ETC	
CHECK	CONTROL	SECTION	JOB	
CJP	0918	24	267, ETC	
JPD				

ITEM 628 - ELECTRICAL SERVICE DATA

ELECTRIC SERVICE NO.	ELECTRICAL SERVICE DESCRIPTION	SERVICE CONDUIT SIZE (PVC)	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CIRCUIT BREAKER POLE/AMP	TWO-POLE CONTACTOR AMPS	PANELBD. / LOADCENTER AMP RATING	CIRCUIT NO.	BRANCH CIRCUIT BREAKER POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
	SEE ED(5) & (6)-14										
1	ELEC SRV TY D 120/240 070 (NS)SS(E)PS(U)	2"	3/#4	N/A	2P/70	30	100	T.S. LIGHT	1P/50 1P/20	40	< 7.1

CONTRACTOR SHALL CONTACT CATHY GAONA WITH ONCOR AT 214-506-7115 FOR ASSISTANCE WITH THE ELECTRICAL SERVICE. REFERENCE PROJECT #16093771.

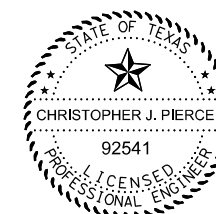
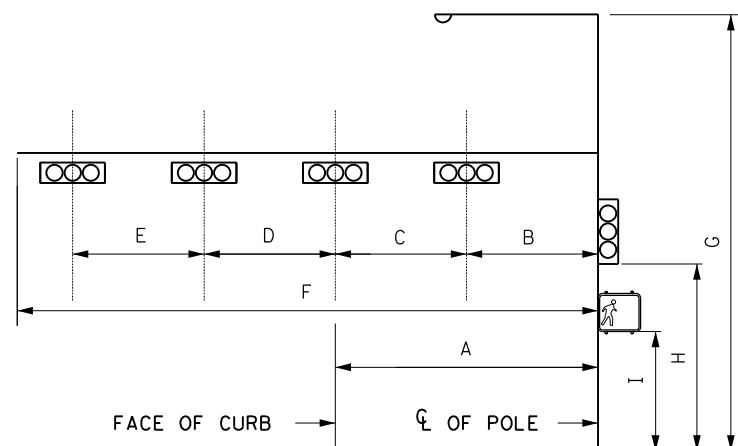
SIGNAL HEAD AND POLE PLACEMENT (FEET)

ITEM 416 - DRILL SHAFTS (FEET)

POLE NUMBER	DISTANCE FROM CURBLINE EXTENSIONS	A	B	C	D	E	F	G	H	I	NO. OF HEADS ON MAST ARM/POLE	LUM-A	ITEM 416 - DRILL SHAFTS (FEET)			
													TYPE 24-A *	TYPE 30-A (RDWY ILLUM POLE)	TYPE 48-A	
P-1	72N, 12E	12	24	11	13	11	65	30	14	---	4/1	1	---	---	22	
P-2	34N, 11.5E	---	PEDESTAL POLE ASSEMBLY					20	---	10	---	---	---	6	---	---
P-3	4.5S, 11E	5	19	12	22	12	65	30	14	10	4/1	1	---	---	22	
P-4	14S, 6E	---	PEDESTAL POLE ASSEMBLY					14	14	10	---	---	---	6	---	---
P-5	62S, 13W	10	24.5	12	15.5	12	65	20	14	---	4/1	---	---	---	22	
P-6	30S, 27W	---	ROADWAY ILLUM POLE ASSEMBLY (TY SA 20-T-4)					20	---	10	---	---	1	---	6	---
P-7	20S, 34W	---	PEDESTAL POLE ASSEMBLY					10	---	10	---	---	---	6	---	---
P-8	18.5N, 20W	18.5	32	11	9	11	65	30	14	---	4/1	1	---	---	22	
P-9	10.5N, 12W	---	PEDESTAL POLE ASSEMBLY					10	---	10	---	---	---	6	---	---
P-10	24.5N, 9W	---	ROADWAY ILLUM POLE ASSEMBLY (TY SA 30-T-8)					30	14	10	---	---	1	---	8	---
P-11	13N, 33.5E	---	ROADWAY ILLUM POLE ASSEMBLY (TY SA 30-T-8)					30	---	10	---	---	1	---	8	---
TOTAL														24	22	88

- P-1: 72N, 12E - 72' NORTH OF EXISTING WALNUT HILL LN CURBLINE EXTENSION, 12' EAST OF EXISTING HARRY HINES BLVD CURBLINE EXTENSION.
- P-2: 34N, 11.5E - 34' NORTH OF EXISTING WALNUT HILL LN CURBLINE EXTENSION, 11.5' EAST OF EXISTING HARRY HINES BLVD CURBLINE EXTENSION.
- P-3: 4.5S, 11E - 4.5' SOUTH OF EXISTING WALNUT HILL LN CURBLINE EXTENSION, 11' EAST OF EXISTING HARRY HINES BLVD CURBLINE EXTENSION.
- P-4: 14S, 6E - 14' SOUTH OF EXISTING WALNUT HILL LN CURBLINE EXTENSION, 6' EAST OF EXISTING HARRY HINES BLVD CURBLINE EXTENSION.
- P-5: 62S, 13W - 62' SOUTH OF EXISTING WALNUT HILL LN CURBLINE EXTENSION, 13' WEST OF EXISTING HARRY HINES BLVD CURBLINE EXTENSION.
- P-6: 30S, 27W - 30' SOUTH OF EXISTING WALNUT HILL LN CURBLINE EXTENSION, 27' WEST OF EXISTING HARRY HINES BLVD CURBLINE EXTENSION.
- P-7: 20S, 34W - 20' SOUTH OF EXISTING WALNUT HILL LN CURBLINE EXTENSION, 34' WEST OF EXISTING HARRY HINES BLVD CURBLINE EXTENSION.
- P-8: 18.5N, 20W - 18.5' NORTH OF EXISTING WALNUT HILL LN CURBLINE EXTENSION, 20' WEST OF EXISTING HARRY HINES BLVD CURBLINE EXTENSION.
- P-9: 10.5N, 12W - 10.5' NORTH OF EXISTING WALNUT HILL LN CURBLINE EXTENSION, 12' WEST OF EXISTING HARRY HINES BLVD CURBLINE EXTENSION.
- P-10: 24.5N, 9W - 24.5' NORTH OF EXISTING WALNUT HILL LN CURBLINE EXTENSION, 9' WEST OF EXISTING HARRY HINES BLVD CURBLINE EXTENSION.
- P-11: 13N, 33.5E - 13' NORTH OF EXISTING WALNUT HILL LN CURBLINE EXTENSION, 33.5' EAST OF EXISTING HARRY HINES BLVD CURBLINE EXTENSION.

* PAID FOR SUBSIDIARY TO ITEM 687.
CONTRACTOR SHALL ENSURE THE MINIMUM DRILL SHAFT LENGTH IS INSTALLED BELOW GRADE AND 3" OF FOUNDATION REMAINS ABOVE GRADE PER TXDOT STANDATD TS-FD. ANY ADDITIONAL CONCRETE REQUIRED TO MEET THESE REQUIREMENTS SHALL BE PAID FOR SUBSIDIARY TO ITEM 416.



Digitally signed by Christopher Pierce
Date: 2023.11.29 09:45:42-06'00'
CHRISTOPHER J. PIERCE, P.E.
LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450



CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED SIGNAL TABLES

WALNUT HILL LN AT
HARRY HINES BLVD

SCALE: 1"=30' SHEET 4 OF 6

DESIGN EEH	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. (SEE TITLE SHEET)		HIGHWAY NO. VAR
GRAPHICS EEH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK CJP	TEXAS	18	COLLIN, ETC	
CHECK JPD	CONTROL	SECTION	JOB	
	0918	24	267, ETC	

FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Walnut Hill Ln at Harry Hines Blvd (SH 356)\5-Proposed Signal Layout.dgn

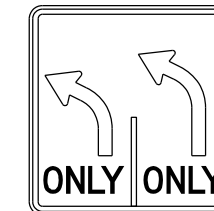
SIGN SUMMARY

ID	TYPE	LEGEND	EXIST	REM	REL	REP	INST	HARDWARE & SUPPORT	LOCATION
A	R3-8LL	LANE CONFIGURATION SIGN					1	1	P-1 MAST ARM
B	R10-5	LEFT ON GREEN ARROW ONLY					1	1	P-1 MAST ARM
C	ST NAME	2600 WALNUT HILL 2700					1	1	P-1 MAST ARM
D	R3-8LL	LANE CONFIGURATION SIGN					1	1	P-3 MAST ARM
E	R10-5	LEFT ON GREEN ARROW ONLY					1	1	P-3 MAST ARM
F	ST NAME	11000 HARRY HINES 10900					1	1	P-3 MAST ARM
G	R3-8LL	LANE CONFIGURATION SIGN					1	1	P-5 MAST ARM
H	R10-5	LEFT ON GREEN ARROW ONLY					1	1	P-5 MAST ARM
I	ST NAME	2700 WALNUT HILL 2600					1	1	P-5 MAST ARM
J	R3-8LL	LANE CONFIGURATION SIGN					1	1	P-8 MAST ARM
K	R10-5	LEFT ON GREEN ARROW ONLY					1	1	P-8 MAST ARM
L	ST NAME	10900 HARRY HINES 11000					1	1	P-8 MAST ARM
M	R10-6L	STOP HERE ON RED					1	1	TY10BWG(1)SA(T) POST ASSEMBLY

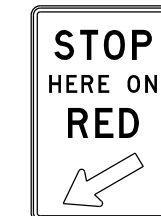
EXIST = EXISTING, REM = REMOVE, REL = RELOCATE, REP = REPLACE, INST = INSTALL



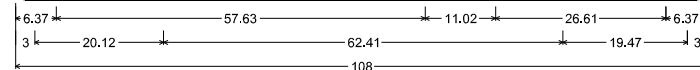
TMUTCD SIGN R10-5
30"X36"
SIGNS B, E, H, K



TMUTCD SIGN R3-8 LL
30"X30"
SIGNS A, D, G, J

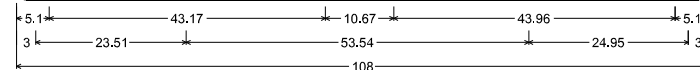


TMUTCD SIGN R10-6L
24"X36"
SIGN M



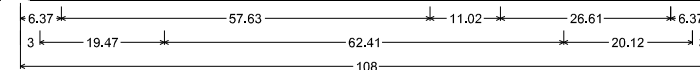
1.50" Radius, 1.00" Border, White on Green;
[Walnut Hill] ClearviewHwy-5-W; [2600] ClearviewHwy-5-W;
[2700] ClearviewHwy-5-W;

SIGN C



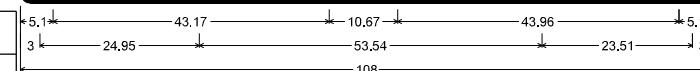
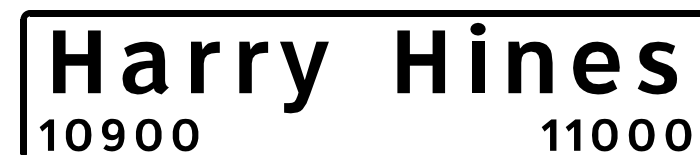
1.50" Radius, 1.00" Border, White on Green;
[Harry Hines] ClearviewHwy-5-W; [11000] ClearviewHwy-5-W;
[10900] ClearviewHwy-5-W;

SIGN F



1.50" Radius, 1.00" Border, White on Green;
[Walnut Hill] ClearviewHwy-5-W; [2700] ClearviewHwy-5-W;
[2600] ClearviewHwy-5-W;

SIGN I



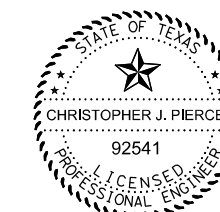
1.50" Radius, 1.00" Border, White on Green;
[Harry Hines] ClearviewHwy-5-W; [10900] ClearviewHwy-5-W;
[11000] ClearviewHwy-5-W;

SIGN L

GROUND BOX SUMMARY	
TYPE	EACH
ITEM 624	
TYPE D	3
TYPE D W/APRON	2
ITEM 6186	
TYPE 1 ITS (POLY)	1
TYPE 1 ITS (POLY) W/APRON	3

ITEM 6292 - DETECTION INFORMATION				
RADAR PRESENCE DETECTION (RPDD)	STATUS	PHASES	LOCATION	DISTANCE - NEAREST TO FURTHEST LANE
R1	I	PH 2 & 5 PRESENCE	P-2 PEDESTAL POLE	70' TO 115'
R2	I	PH 4 & 7 PRESENCE	P-3 SIGNAL POLE	40' TO 100'
R3	I	PH 1 & 6 PRESENCE	P-5 SIGNAL POLE	50' TO 110'
R4	I	PH 3 & 8 PRESENCE	P-8 SIGNAL POLE	55' TO 105'
RADAR ADVANCE DETECTION (RADD)	STATUS	PHASES	LOCATION	---
R5	I	PH 6 ADVANCE	P-1 MAST ARM	---
R6	I	PH 8 ADVANCE	P-3 MAST ARM	---
R7	I	PH 2 ADVANCE	P-5 MAST ARM	---
R8	I	PH 4 ADVANCE	P-8 MAST ARM	---

I = INSTALL



Digitally signed by Christopher Pierce
Date: 2023.11.29 09:55:37-06'00'
CHRISTOPHER J. PIERCE, P.E.
LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450



CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED SIGNAL TABLES

WALNUT HILL LN AT
HARRY HINES BLVD

SCALE: 1"=30' SHEET 5 OF 6

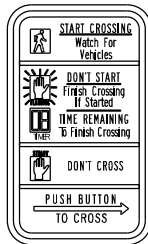
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EEH	6	(SEE TITLE SHEET)		VAR
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
EEH	TEXAS	18	COLLIN, ETC	
CHECK	CONTROL	SECTION	JOB	
CJP	0918	24	267, ETC	
CHECK				
JPD				

FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Walnut Hill Ln at Harry Hines Blvd (SH 356)\5--Proposed Signal Layout.dgn

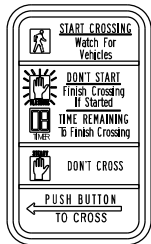
APS MESSAGE CHART			
POLE NUMBER	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
P-2	PHASE 4	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS HARRY HINES BOULEVARD AT WALNUT HILL LANE.
		EXTENDED BUTTON PUSH	WAIT TO CROSS HARRY HINES BOULEVARD AT WALNUT HILL LANE.
		LOCATOR TONE	SLOW TICK
		WALK INDICATION *	HARRY HINES BOULEVARD. WALK SIGN IS ON TO CROSS HARRY HINES BOULEVARD.
P-11	PHASE 6	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS WALNUT HILL LANE AT HARRY HINES BOULEVARD.
		EXTENDED BUTTON PUSH	WAIT TO CROSS WALNUT HILL LANE AT HARRY HINES BOULEVARD.
		LOCATOR TONE	SLOW TICK
		WALK INDICATION *	WALNUT HILL LANE. WALK SIGN IS ON TO CROSS WALNUT HILL LANE.
P-3	PHASE 6	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS WALNUT HILL LANE AT HARRY HINES BOULEVARD.
		EXTENDED BUTTON PUSH	WAIT TO CROSS WALNUT HILL LANE AT HARRY HINES BOULEVARD.
		LOCATOR TONE	SLOW TICK
		WALK INDICATION *	WALNUT HILL LANE. WALK SIGN IS ON TO CROSS WALNUT HILL LANE.
P-4	PHASE 8	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS HARRY HINES BOULEVARD AT WALNUT HILL LANE.
		EXTENDED BUTTON PUSH	WAIT TO CROSS HARRY HINES BOULEVARD AT WALNUT HILL LANE.
		LOCATOR TONE	SLOW TICK
		WALK INDICATION *	HARRY HINES BOULEVARD. WALK SIGN IS ON TO CROSS HARRY HINES BOULEVARD.
P-6	PHASE 8	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS HARRY HINES BOULEVARD AT WALNUT HILL LANE.
		EXTENDED BUTTON PUSH	WAIT TO CROSS HARRY HINES BOULEVARD AT WALNUT HILL LANE.
		LOCATOR TONE	SLOW TICK
		WALK INDICATION *	HARRY HINES BOULEVARD. WALK SIGN IS ON TO CROSS HARRY HINES BOULEVARD.
P-7	PHASE 2	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS WALNUT HILL LANE AT HARRY HINES BOULEVARD.
		EXTENDED BUTTON PUSH	WAIT TO CROSS WALNUT HILL LANE AT HARRY HINES BOULEVARD.
		LOCATOR TONE	SLOW TICK
		WALK INDICATION *	WALNUT HILL LANE. WALK SIGN IS ON TO CROSS WALNUT HILL LANE.
P-9	PHASE 2	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS WALNUT HILL LANE AT HARRY HINES BOULEVARD.
		EXTENDED BUTTON PUSH	WAIT TO CROSS WALNUT HILL LANE AT HARRY HINES BOULEVARD.
		LOCATOR TONE	SLOW TICK
		WALK INDICATION *	WALNUT HILL LANE. WALK SIGN IS ON TO CROSS WALNUT HILL LANE.
P-10	PHASE 4	BUTTON PUSH ON DON'T WALK	WAIT TO CROSS HARRY HINES BOULEVARD AT WALNUT HILL LANE.
		EXTENDED BUTTON PUSH	WAIT TO CROSS HARRY HINES BOULEVARD AT WALNUT HILL LANE.
		LOCATOR TONE	SLOW TICK
		WALK INDICATION *	HARRY HINES BOULEVARD. WALK SIGN IS ON TO CROSS HARRY HINES BOULEVARD.

* COUNTDOWN SPEECH MESSAGE = "OFF" FOR ALL UNITS

ITEM 688 - ACCESSIBLE PEDESTRIAN SIGNAL UNITS (APS)	
PED BUTTON PHASE	FURNISH & INSTALL
PHASE 2	2
PHASE 4	2
PHASE 6	2
PHASE 8	2
TOTAL	8



TMUTCD SIGN R10-3ER
9"X15"
MOUNT ON POLES P-3,
P-4, P-7, P-9, P-10, P-11



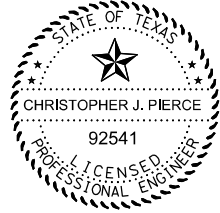
TMUTCD SIGN R10-3EL
9"X15"
MOUNT ON POLES
P-2, P-6



CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED SIGNAL TABLES
WALNUT HILL LN AT
HARRY HINES BLVD

SCALE: 1"=30' SHEET 6 OF 6

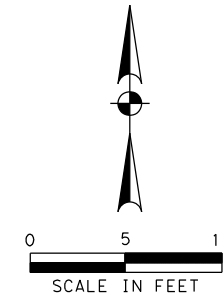
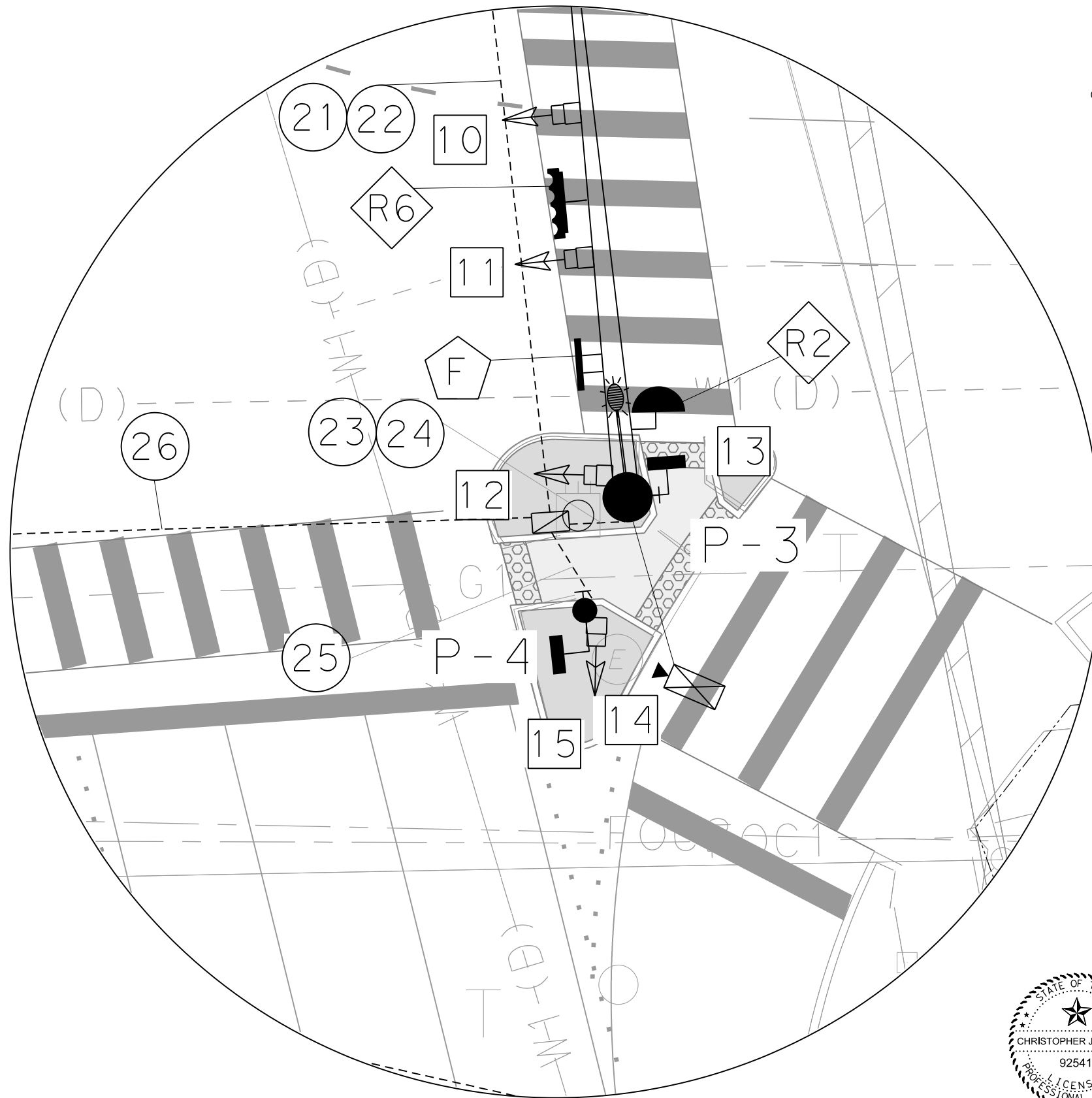


Digitally signed by
Christopher Pierce
Date: 2023.11.29
09:56:43-06'00'

CHRISTOPHER J. PIERCE, P.E.
LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450

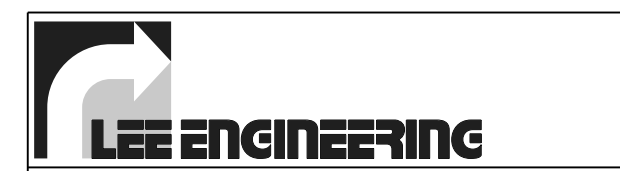
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EEH	6	(SEE TITLE SHEET)		VAR
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
EEH	TEXAS	18	COLLIN, ETC	
CHECK	CONTROL	SECTION	JOB	
CJP	0918	24	267, ETC	
CHECK				
JPD				

FILE: H:\T1630.10 - Walnut Hill Signals and Fiber\5 - Walnut Hill Ln at Harry Hines Blvd (SH 356)\5-Proposed SE Corner Layout.dgn



LEGEND OF SYMBOLS

	SIGNAL POLE ASSEMBLY
	SIGNAL HEAD NUMBERS
	POLE NUMBERS
	GROUND MOUNTED CONTROLLER CABINET
	GROUND BOX TY D W/APRON
	GROUND BOX TY D
	GND BOX ITS (POLY) TYPE I W/APRON
	GND BOX ITS (POLY) TYPE I
	PEDESTAL POLE ASSEMBLY
	TRAFFIC SIGNAL HEAD
	ELECTRICAL SERVICE PEDESTAL
	LUMINAIRE
	ROADWAY ILLUMINATION POLE ASSM.
	MAST ARM MOUNTED SIGN
	SIGN DESIGNATION
	RIGHT OF WAY LINES
	NEW CONDUIT RUN NUMBERS
	RADAR IDENTIFICATION
	PRESENCE RADAR DETECTOR
	ADVANCE RADAR DETECTOR
	CCTV CAMERA
	PHASE NUMBERS
	NEW CONCRETE SIDEWALK (MAX 1.5% RUNNING SLOPE)
	NEW 11" CONCRETE PAVEMENT
	NEW RIPRAP OR MEDIAN NOSE
	NEW GRASS SODDING
	TRAVEL FLOW ARROWS



CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED SOUTHEAST CORNER LAYOUT

WALNUT HILL LN AT HARRY HINES BLVD

SCALE: 1"=10' SHEET 1 OF 1

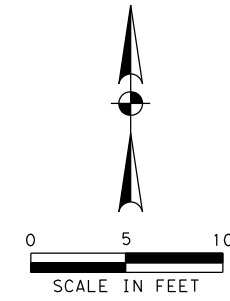
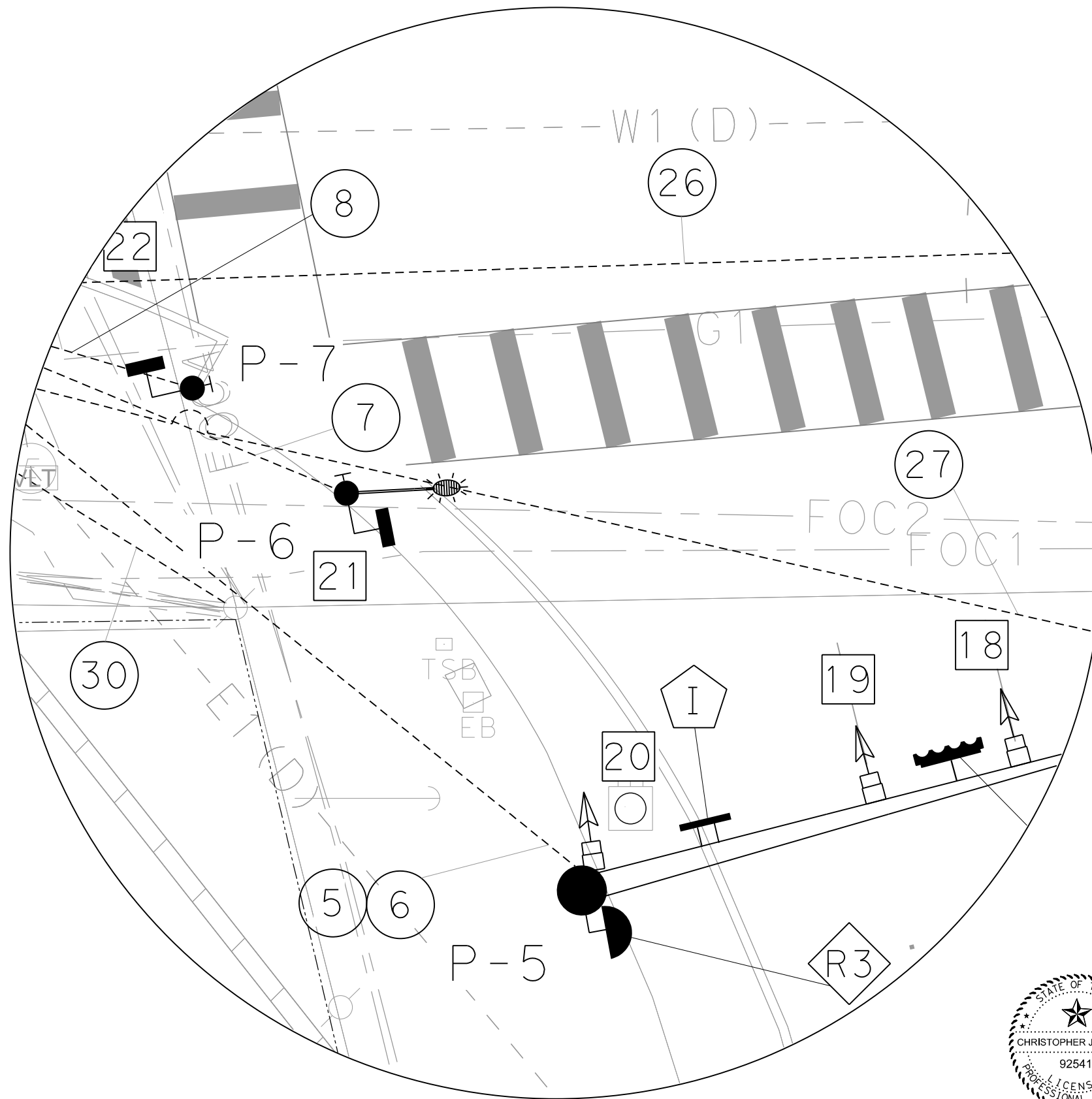


Digitally signed by Christopher Pierce
Date: 2023.11.29 09:51:48-06'00'

CHRISTOPHER J. PIERCE, P.E.
LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
EEH	6	(SEE TITLE SHEET)		VAR
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
EEH	TEXAS	18	COLLIN, ETC	
CHECK	CONTROL	SECTION	JOB	
CJP	0918	24	267, ETC	
CHECK	JPD			

FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Walnut Hill Ln at Harry Hines Blvd (SH 356)\5-Proposed SW Corner Layout.dgn



LEGEND OF SYMBOLS

	SIGNAL POLE ASSEMBLY
	SIGNAL HEAD NUMBERS
	POLE NUMBERS
	GROUND MOUNTED CONTROLLER CABINET
	GROUND BOX TY D W/APRON
	GROUND BOX TY D
	GND BOX ITS (POLY) TYPE I W/APRON
	GND BOX ITS (POLY) TYPE I
	PEDESTAL POLE ASSEMBLY
	TRAFFIC SIGNAL HEAD
	ELECTRICAL SERVICE PEDESTAL
	LUMINAIRE
	ROADWAY ILLUMINATION POLE ASSM.
	MAST ARM MOUNTED SIGN
	SIGN DESIGNATION
	RIGHT OF WAY LINES
	NEW CONDUIT RUN NUMBERS
	RADAR IDENTIFICATION
	PRESENCE RADAR DETECTOR
	ADVANCE RADAR DETECTOR
	CCTV CAMERA
	PHASE NUMBERS
	NEW CONCRETE SIDEWALK (MAX 1.5% RUNNING SLOPE)
	NEW 11" CONCRETE PAVEMENT
	NEW RIPRAP OR MEDIAN NOSE
	NEW GRASS SODDING
	TRAVEL FLOW ARROWS

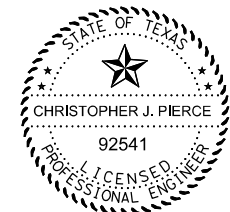


CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED SOUTHWEST CORNER LAYOUT

WALNUT HILL LN AT HARRY HINES BLVD

SCALE: 1"=10' SHEET 1 OF 1

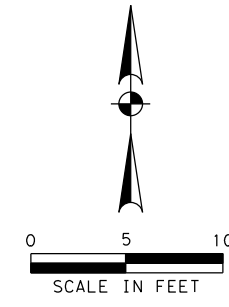
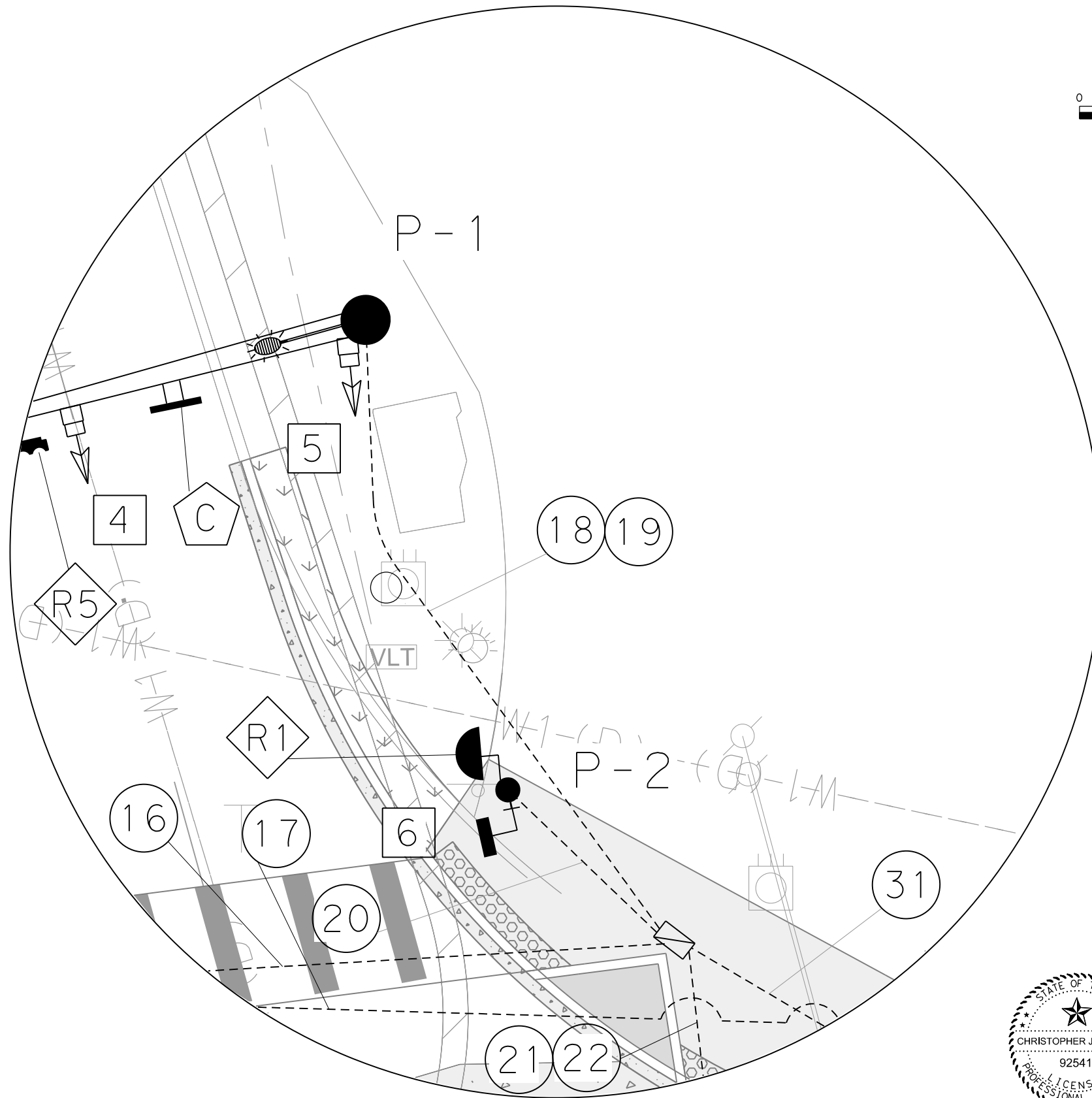


Digitally signed by Christopher Pierce
Date: 2023.11.29 09:52:19-06'00'

CHRISTOPHER J. PIERCE, P.E.
LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450

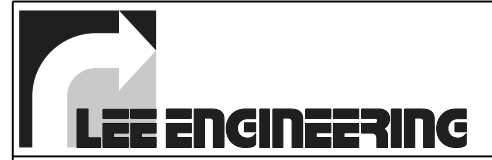
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EEH	6	(SEE TITLE SHEET)		VAR
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
EEH	TEXAS	18	COLLIN, ETC	
CHECK	CONTROL	SECTION	JOB	
CJP				
CHECK	JPD	0918	24	267, ETC

FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Walnut Hill Ln at Harry Hines Blvd (SH 356)\5--Proposed NE Corner Layout.dgn



LEGEND OF SYMBOLS

	SIGNAL POLE ASSEMBLY
	SIGNAL HEAD NUMBERS
	POLE NUMBERS
	GROUND MOUNTED CONTROLLER CABINET
	GROUND BOX TY D W/APRON
	GROUND BOX TY D
	GND BOX ITS (POLY) TYPE I W/APRON
	GND BOX ITS (POLY) TYPE I
	PEDESTAL POLE ASSEMBLY
	TRAFFIC SIGNAL HEAD
	ELECTRICAL SERVICE PEDESTAL
	LUMINAIRE
	ROADWAY ILLUMINATION POLE ASSM.
	MAST ARM MOUNTED SIGN
	SIGN DESIGNATION
	RIGHT OF WAY LINES
	NEW CONDUIT RUN NUMBERS
	RADAR IDENTIFICATION
	PRESENCE RADAR DETECTOR
	ADVANCE RADAR DETECTOR
	CCTV CAMERA
	PHASE NUMBERS
	NEW CONCRETE SIDEWALK (MAX 1.5% RUNNING SLOPE)
	NEW 11" CONCRETE PAVEMENT
	NEW RIPRAP OR MEDIAN NOSE
	NEW GRASS SODDING
	TRAVEL FLOW ARROWS

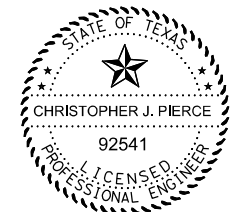


CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED NORTHEAST CORNER LAYOUT

WALNUT HILL LN AT HARRY HINES BLVD

SCALE: 1"=10' SHEET 1 OF 1

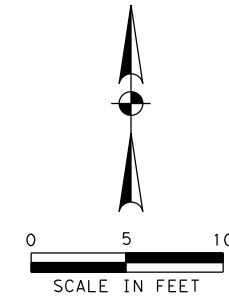
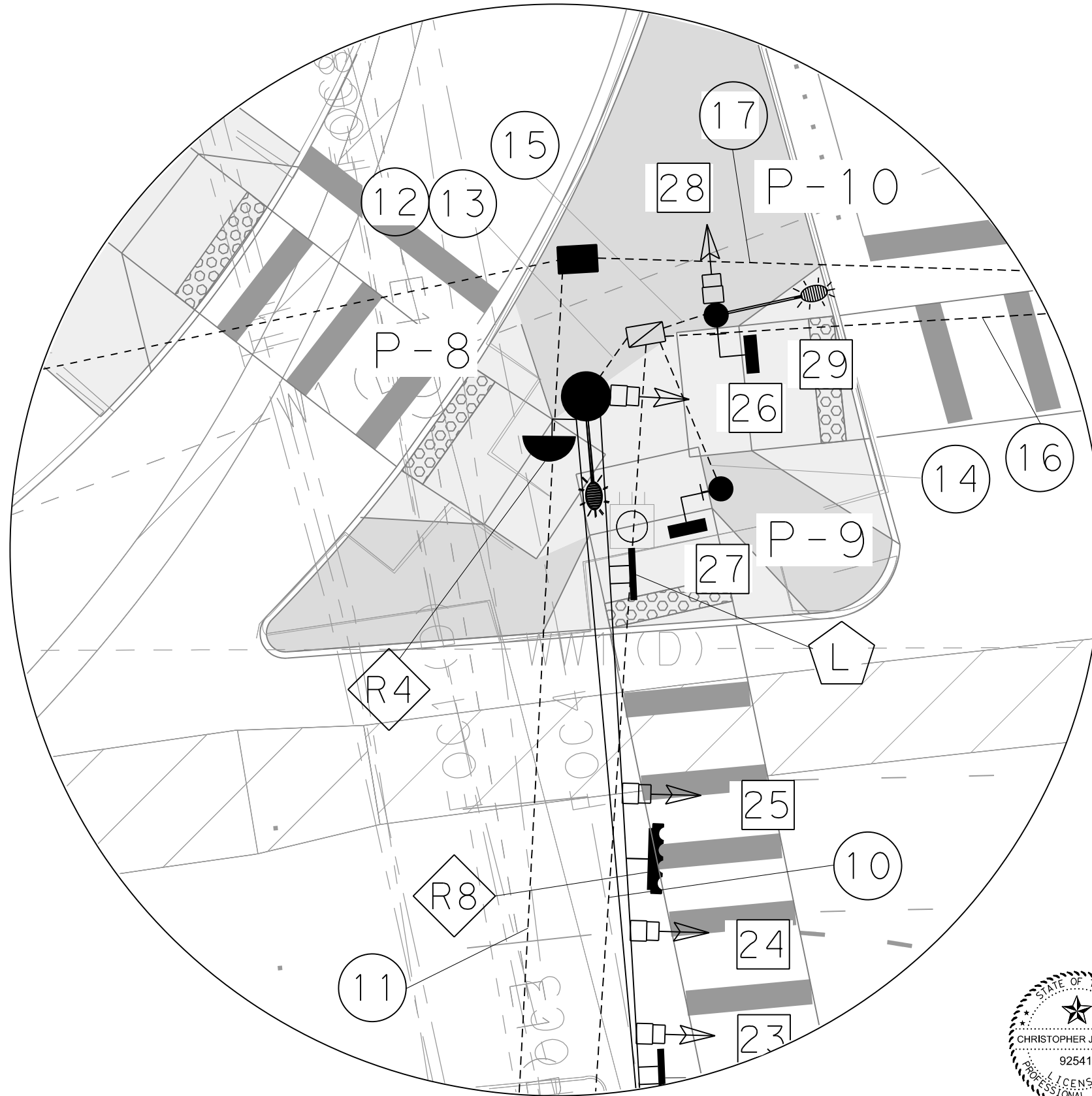


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Date: 2023.11.29 09:51:18-06'00'




























CHRISTOPHER J. PIERCE, P.E.
LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450

DESIGN	EEL	FED. RD. DIV. NO.	6	FEDERAL AID PROJECT NO.	(SEE TITLE SHEET)	HIGHWAY NO.	VAR
GRAPHICS	EEL	STATE	TEXAS	DISTRICT	18	COUNTY	COLLIN, ETC
CHECK	CJP	CONTROL		SECTION		JOB	
CHECK	JPD		0918		24		267, ETC

FILE: H:\T1630.10 - Walnut Hill Signals and Fiber\5 - Walnut Hill Ln at Harry Hines Blvd (SH 356)\5--Proposed NW Corner Layout.dgn



LEGEND OF SYMBOLS

-  SIGNAL POLE ASSEMBLY
-  SIGNAL HEAD NUMBERS
-  POLE NUMBERS
-  GROUND MOUNTED CONTROLLER CABINET
-  GROUND BOX TY D W/APRON
-  GROUND BOX TY D
-  GND BOX ITS (POLY) TYPE I W/APRON
-  GND BOX ITS (POLY) TYPE I
-  PEDESTAL POLE ASSEMBLY
-  TRAFFIC SIGNAL HEAD
-  ELECTRICAL SERVICE PEDESTAL
-  LUMINAIRE
-  ROADWAY ILLUMINATION POLE ASSM.
-  MAST ARM MOUNTED SIGN
-  SIGN DESIGNATION
-  R.O.W. RIGHT OF WAY LINES
-  NEW CONDUIT RUN NUMBERS
-  RADAR IDENTIFICATION
-  PRESENCE RADAR DETECTOR
-  ADVANCE RADAR DETECTOR
-  CCTV CAMERA
-  PHASE NUMBERS
-  NEW CONCRETE SIDEWALK (MAX 1.5% RUNNING SLOPE)
-  NEW 11" CONCRETE PAVEMENT
-  NEW RIPRAP OR MEDIAN NOSE
-  NEW GRASS SODDING
-  TRAVEL FLOW ARROWS



CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED NORTHWEST CORNER LAYOUT

WALNUT HILL LN AT HARRY HINES BLVD

SCALE: 1"=10' SHEET 1 OF 1



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Date: 2023.11.29 09:50:22-06'00'

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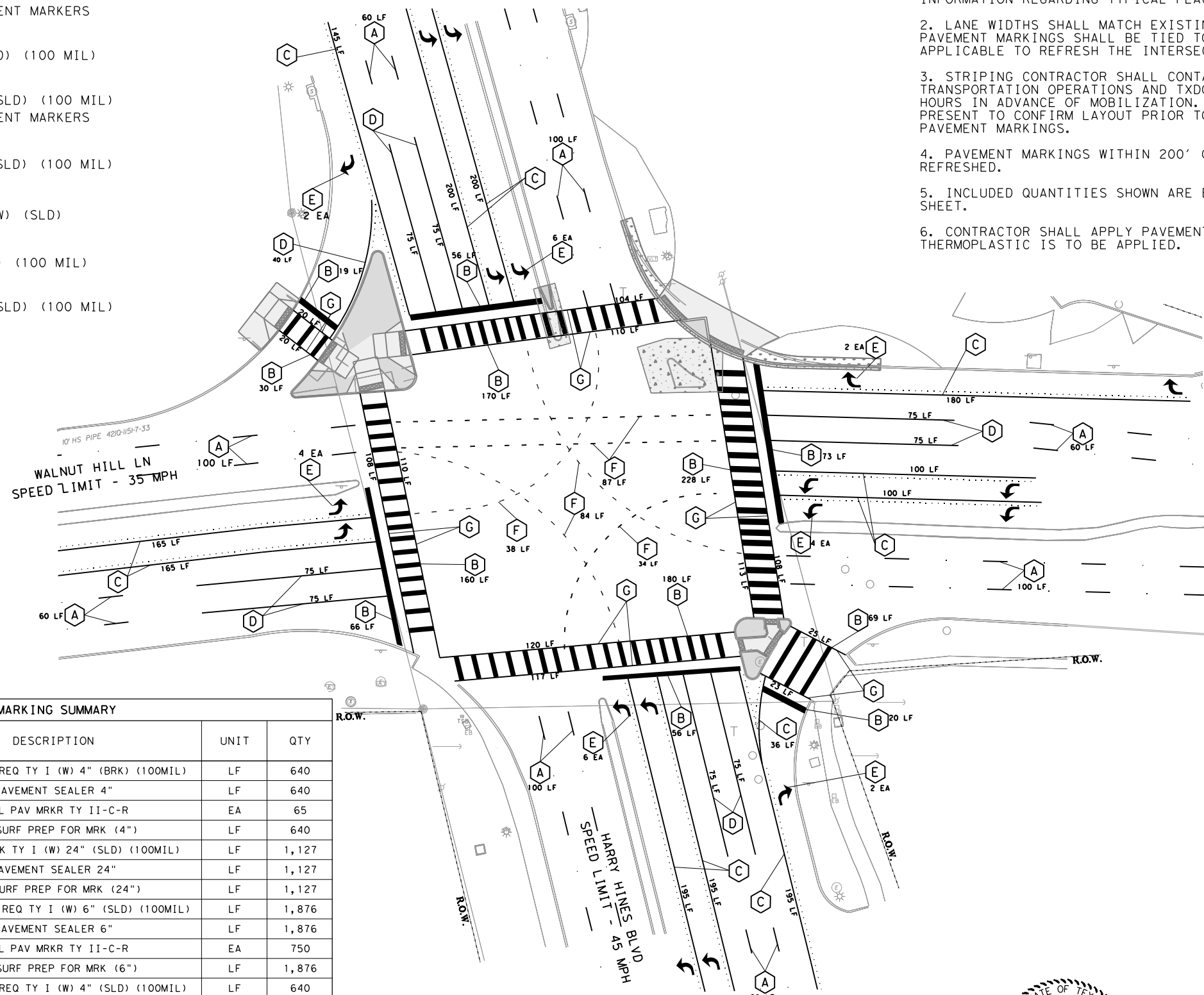
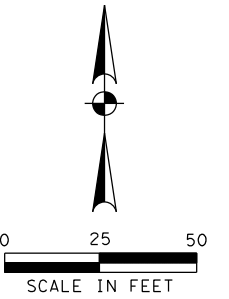
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GRAPHICS	EEL	STATE	TEXAS	DISTRICT	18	COUNTY	COLLIN, ETC
CHECK	CJP	CONTROL		SECTION	24	JOB	267, ETC
CHECK	JPD						

PAVEMENT MARKINGS LEGEND

- A** RE PM W/RET REQ TY I (W) 4" (BRK) (100 MIL) WITH TYPE II C-R RAISED PAVEMENT MARKERS ON 40' CENTERS & PAV SEALER
- B** REFL PAV MRK TY I (W) 24" (SLD) (100 MIL) & PAV SEALER
- C** RE PM W/RET REQ TY I (W) 6" (SLD) (100 MIL) WITH TYPE II-C-R RAISED PAVEMENT MARKERS ON 30" CENTERS & PAV SEALER
- D** RE PM W/RET REQ TY I (W) 4" (SLD) (100 MIL) & PAV SEALER
- E** PREFAB PAV MRK TY C (W) (ARROW) (SLD) & PAV SEALER
- F** REFL PAV MRK TY I (W) 8" (DOT) (100 MIL) & PAV SEALER
- G** RE PM W/RET REQ TY I (W) 6" (SLD) (100 MIL) & PAV SEALER

NOTES:

1. REFER TO CITY OF DALLAS 251-D STANDARDS FOR ADDITIONAL INFORMATION REGARDING TYPICAL PLACEMENT OF PAVEMENT MARKINGS.
2. LANE WIDTHS SHALL MATCH EXISTING LANES. ALL PROPOSED PAVEMENT MARKINGS SHALL BE TIED TO EXISTING MARKINGS WHERE APPLICABLE TO REFRESH THE INTERSECTION PAVEMENT MARKINGS.
3. STRIPING CONTRACTOR SHALL CONTACT THE CITY OF DALLAS TRANSPORTATION OPERATIONS AND TXDOT SIGNAL OFFICE AT LEAST 24 HOURS IN ADVANCE OF MOBILIZATION. CITY OF DALLAS STAFF MUST BE PRESENT TO CONFIRM LAYOUT PRIOR TO THE APPLICATION OF ANY PAVEMENT MARKINGS.
4. PAVEMENT MARKINGS WITHIN 200' OF THE CROSSWALK ARE TO BE REFRESHED.
5. INCLUDED QUANTITIES SHOWN ARE BEYOND THE LIMITS OF THIS SHEET.
6. CONTRACTOR SHALL APPLY PAVEMENT SEALER IN AREAS WHERE NEW THERMOPLASTIC IS TO BE APPLIED.




PAVEMENT MARKING SUMMARY


ID	TXDOT SPEC NO.	TXDOT DESC. CODE	DESCRIPTION	UNIT	QTY
A	666	6300	RE PM W/RET REQ TY I (W) 4" (BRK) (100MIL)	LF	640
	666	6224	PAVEMENT SEALER 4"	LF	640
	672	6010	REFL PAV MRKR TY II-C-R	EA	65
	678	6001	PAV SURF PREP FOR MRK (4")	LF	640
B	666	6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	1,127
	666	6230	PAVEMENT SEALER 24"	LF	1,127
	678	6008	PAV SURF PREP FOR MRK (24")	LF	1,127
C	666	6309	RE PM W./RET REQ TY I (W) 6" (SLD) (100MIL)	LF	1,876
	666	6225	PAVEMENT SEALER 6"	LF	1,876
	672	6010	REFL PAV MRKR TY II-C-R	EA	750
	678	6002	PAV SURF PREP FOR MRK (6")	LF	1,876
D	666	6303	RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)	LF	640
	666	6224	PAVEMENT SEALER 4"	LF	640
E	666	6231	PAVEMENT SEALER (ARROW)	EA	26
	668	6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	26
	678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	26
F	666	6030	REFL PAV MRK TY I (W) 8" (DOT) (100MIL)	LF	243
	666	6226	PAVEMENT SEALER 8"	LF	243
	678	6004	PAV SURF PREP FOR MRK (8")	LF	243
G	666	6309	RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)	LF	978
	666	6225	PAVEMENT SEALER 6"	LF	978
	678	6002	PAV SURF PREP FOR MRK (6")	LF	978



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LEE ENGINEERING



CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED PAVEMENT MARKING LAYOUT

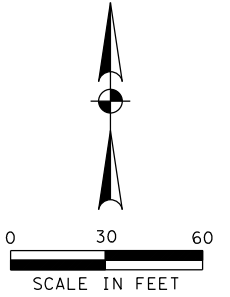
WALNUT HILL LN AT HARRY HINES BLVD

SCALE: 1"=50' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
EEH	6	(SEE TITLE SHEET)		VAR
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
EEH	TEXAS	18	COLLIN, ETC	
CHECK	CONTROL	SECTION	JOB	
CJP	0918	24	267, ETC	
CHECK				
JPD				

FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Proposed Pavement Marking Layout.dgn

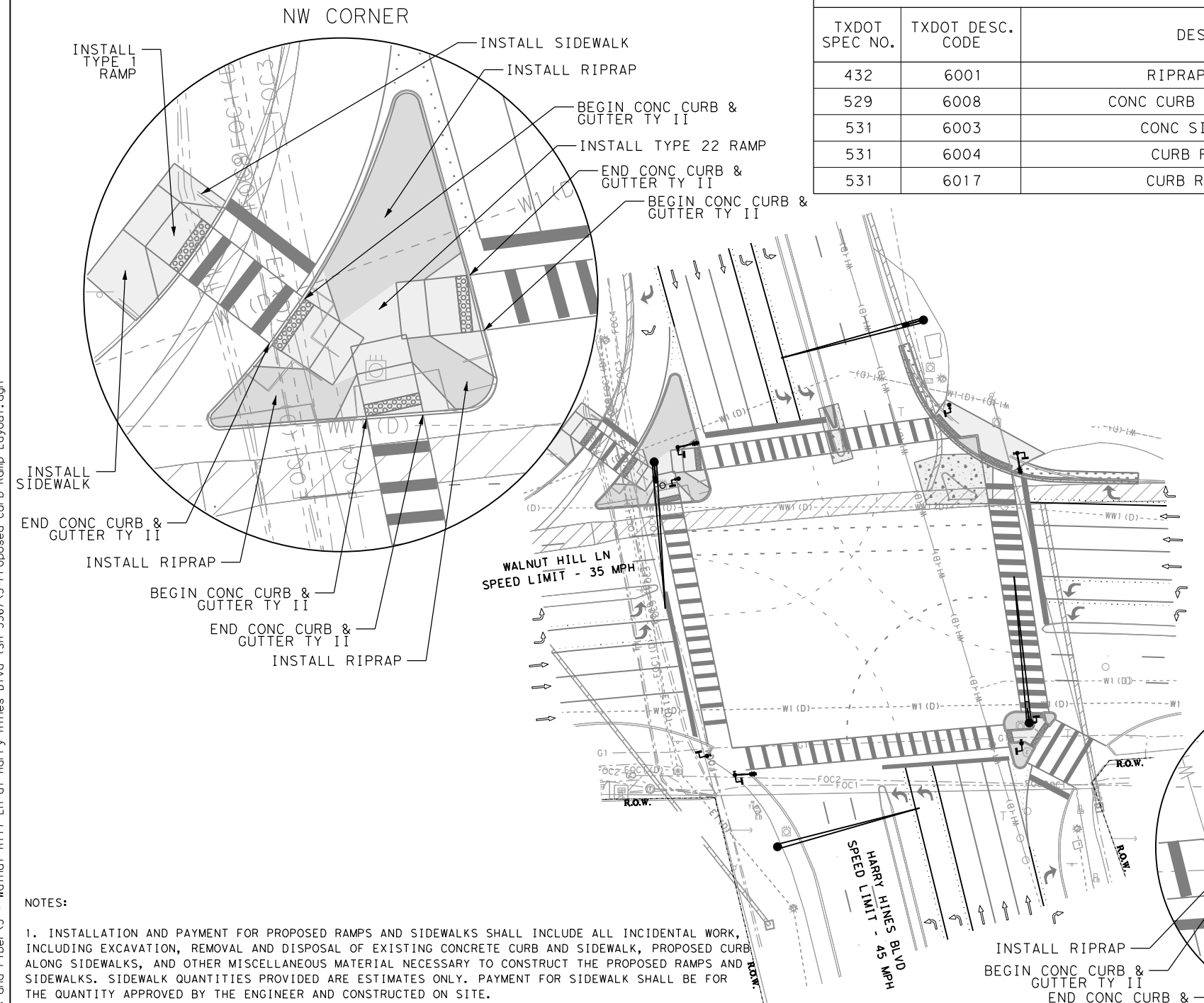
NW CORNER				
TXDOT SPEC NO.	TXDOT DESC. CODE	DESCRIPTION	UNIT	QTY
432	6001	RIPRAP (CONC) (4")	CY	15
529	6008	CONC CURB & GUTTER (TY II)	LF	102
531	6003	CONC SIDEWALKS (6")	SY	112
531	6004	CURB RAMPS (TY 1)	EA	1
531	6017	CURB RAMPS (TY 22)	EA	1



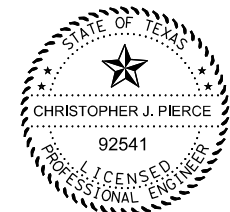
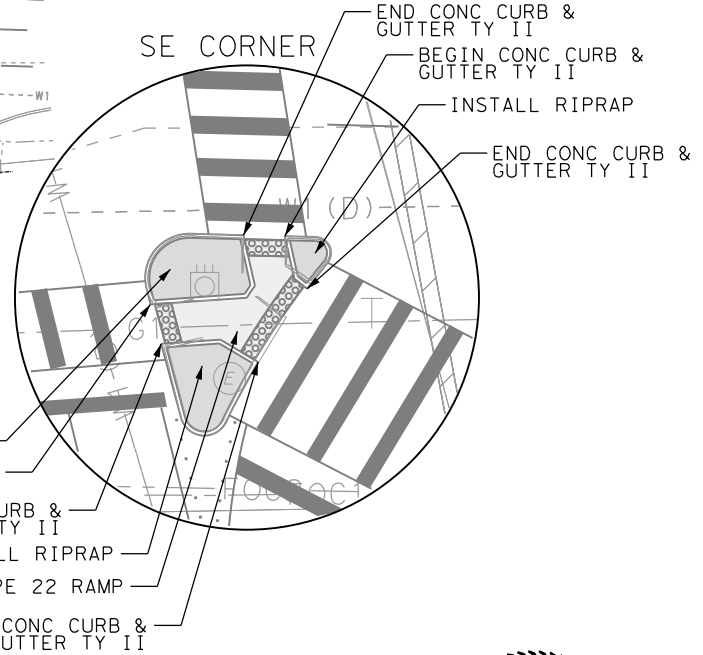
CURB RAMPS AND SIDEWALK LEGEND

- TRUNCATED DOMES
- NEW CONCRETE SIDEWALK (MAX 1.5% RUNNING SLOPE)
- NEW 11" CONCRETE PAVEMENT
- NEW RIPRAP OR MEDIAN NOSE
- NEW GRASS SODDING
- TRAFFIC FLOW ARROWS


SE CORNER				
TXDOT SPEC NO.	TXDOT DESC. CODE	DESCRIPTION	UNIT	QTY
432	6001	RIPRAP (CONC) (4")	CY	2
529	6008	CONC CURB & GUTTER (TY II)	LF	142
531	6017	CURB RAMPS (TY 22)	EA	1



- NOTES:**
1. INSTALLATION AND PAYMENT FOR PROPOSED RAMPS AND SIDEWALKS SHALL INCLUDE ALL INCIDENTAL WORK, INCLUDING EXCAVATION, REMOVAL AND DISPOSAL OF EXISTING CONCRETE CURB AND SIDEWALK, PROPOSED CURB ALONG SIDEWALKS, AND OTHER MISCELLANEOUS MATERIAL NECESSARY TO CONSTRUCT THE PROPOSED RAMPS AND SIDEWALKS. SIDEWALK QUANTITIES PROVIDED ARE ESTIMATES ONLY. PAYMENT FOR SIDEWALK SHALL BE FOR THE QUANTITY APPROVED BY THE ENGINEER AND CONSTRUCTED ON SITE.
 2. CONTRACTOR IS RESPONSIBLE FOR REPAIRS AND SUBSTITUTION OF DAMAGED IRRIGATION EQUIPMENT.
 3. CONTRACTOR SHALL ENSURE THAT ALL PEDESTRIAN RAMPS DRAIN TOWARDS THE STREET WITHOUT PONDING IN THE RAMP OR GUTTER AREA.
 4. RAMP LANDINGS AND PROPOSED SIDEWALKS SHALL NOT EXCEED 2% MAX CROSS SLOPE AND 2% RUNNING SLOPE.
 5. CONTRACTOR SHALL COORDINATE ALL TRAFFIC SIGNAL POLE ASSEMBLY FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED PRIOR TO DRILLING OF FOUNDATIONS, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER TO ARRANGE A FIELD MEETING TO DETERMINE IF THE FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL FOUNDATIONS ARE POURED PRIOR TO INSTALLATION OF THE CURB RAMPS, THE CURB RAMPS AND SIDEWALKS SHALL BE ADJUSTED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS IS 10" OR LESS.
 6. PROPOSED APS UNITS SHALL BE PLACED ADJACENT TO A LEVEL LANDING AREA (2% MAX SLOPE IN ANY DIRECTION). IF THE DISTANCE FROM THE PUSH BUTTON TO THE EDGE OF THE ACCESSIBLE PATH EXCEEDS 10", THE CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON EXTENDER TO MAKE THE REACH 10" OR LESS. PAYMENT FOR THE EXTENDER SHALL BE CONSIDERED SUBSIDIARY TO ITEM 680.
 7. PROPOSED CURB RAMP LANDINGS SHALL BE POURED UP TO THE SIGNAL FOUNDATIONS, LEAVING NO GAPS.
 8. IF SIGNAL POLES CANNOT BE INSTALLED IN THE LOCATIONS SHOWN ON THE PLANS, THE CONTRACTOR SHALL CONTACT THE CITY AND ENGINEER TO MEET ON SITE TO DISCUSS NEW LOCATIONS.



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CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

BARRIER FREE CURB RAMPS
AND SIDEWALK LAYOUT

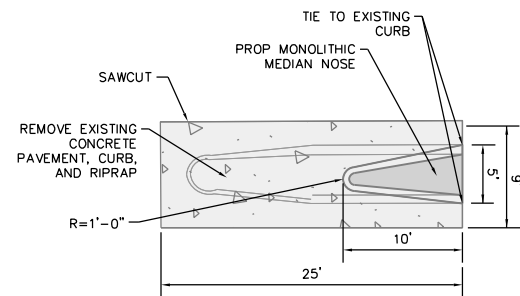
WALNUT HILL LN AT
HARRY HINES BLVD

SCALE: 1"=50' SHEET 1 OF 1

DESIGN EEH	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. (SEE TITLE SHEET)		HIGHWAY NO. VAR
GRAPHICS EEH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK CJP	TEXAS	18	COLLIN, ETC	
CHECK JPD	CONTROL	SECTION	JOB	
	0918	24	267, ETC	

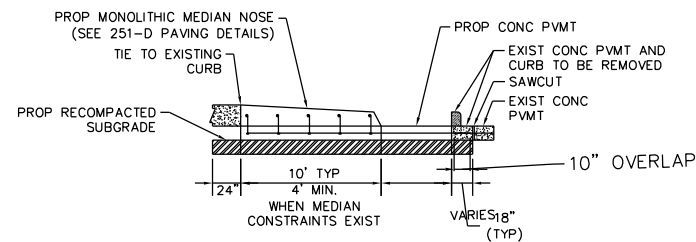
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FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Walnut Hill Ln at Harry Hines Blvd (SH 356)\5-Proposed Median Details.dgn



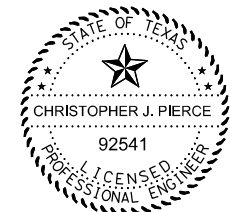
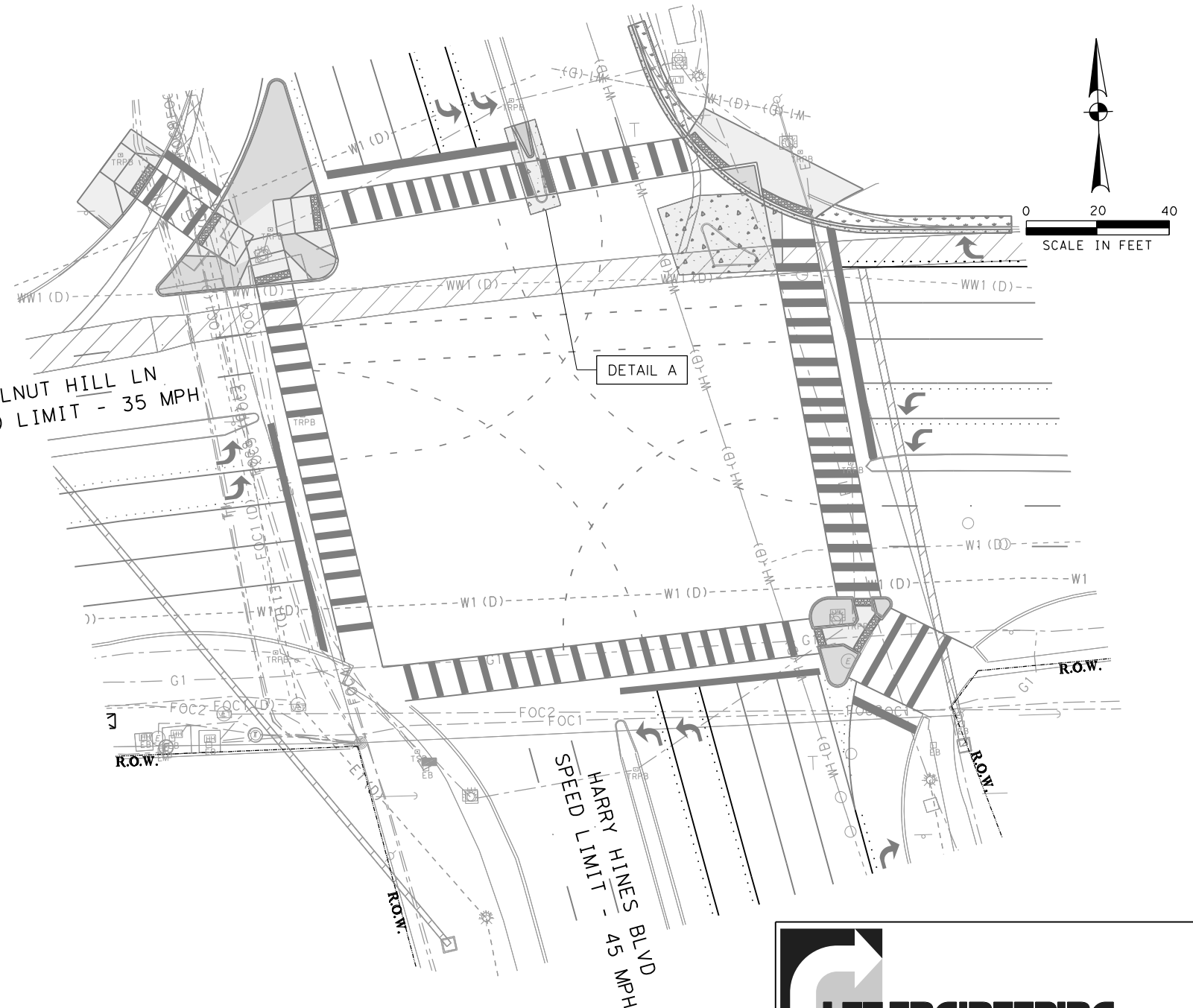
DETAIL A NTS

MEDIAN NOSE SUMMARY				
TXDOT SPEC NO.	TXDOT DESC. CODE	DESCRIPTION	UNIT	QTY
104	6011	REMOVING CONC (MEDIANS)	SY	13
110	6001	EXCAVATION (ROADWAY)	CY	17
251	6073	REWRKING BS MATL (TY C) (10") (ORD COMP)	SY	22
360	6005	CONC PVMT (CONT REINF - CRCP) (11")	SY	22
536	6006	CONC MEDIAN (MONO NOSE)	SY	3




TYPICAL CROSS SECTION FOR MONOLITHIC MEDIAN NOSE IMPROVEMENT
NOT TO SCALE


WALNUT HILL LN
SPEED LIMIT - 35 MPH



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Christopher Pierce
Date: 2023.11.29
09:54:26-06'00'
CHRISTOPHER J. PIERCE, P.E.
LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450



LEE ENGINEERING



CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED MEDIAN DETAILS

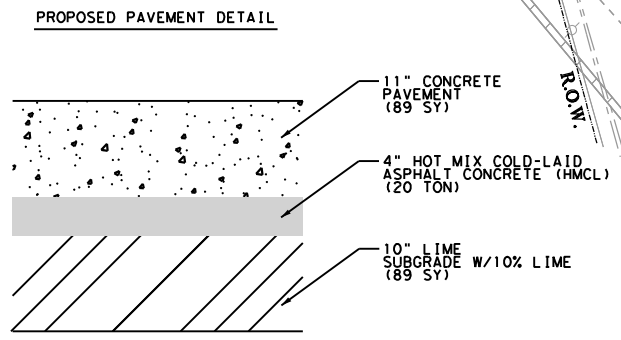
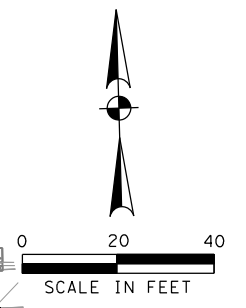
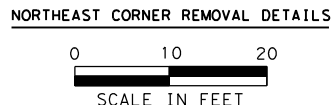
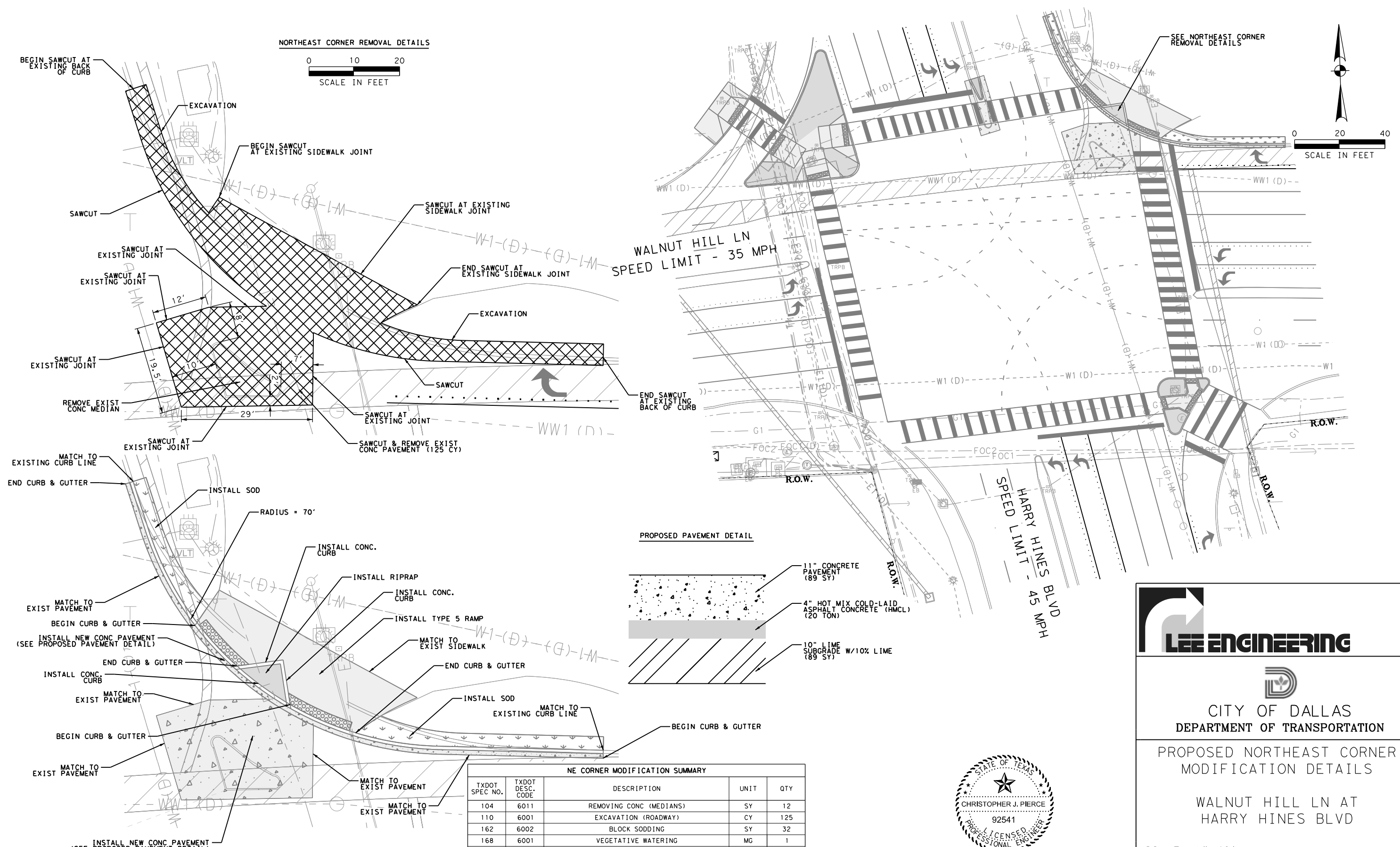
WALNUT HILL LN AT
HARRY HINES BLVD

SCALE: 1"=40'

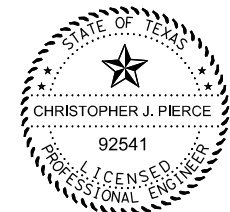
SHEET 1 OF 1

DESIGN EEH	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. (SEE TITLE SHEET)		HIGHWAY NO. VAR
GRAPHICS EEH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK CJP	TEXAS	18	COLLIN, ETC	
CHECK JPD	CONTROL	SECTION	JOB	
	0918	24	267, ETC	


FILE: H:\1630.10 - Walnut Hill Signals and Fiber\5 - Proposed NE Corner Removal Details.dgn



NE CORNER MODIFICATION SUMMARY				
TXDOT SPEC NO.	TXDOT DESC. CODE	DESCRIPTION	UNIT	QTY
104	6011	REMOVING CONC (MEDIANS)	SY	12
110	6001	EXCAVATION (ROADWAY)	CY	125
162	6002	BLOCK SODDING	SY	32
168	6001	VEGETATIVE WATERING	MG	1
260	6012	LIME (HYD, COM OR OK) (SLRY) OR OK (DRY)	TON	9
260	6054	LIME TRT (NEW BASE) (10")	SY	89
334	6073	HMCL ACP TY-D SAC-A AC-0.6	TON	20
360	6050	CONC PVMT (CONT REINF) (FAST TRK) (11")	SY	89
432	6001	RIPRAP (CONC) (4")	CY	2
529	6002	CONC CURB (TY II)	LF	21
529	6008	CONC CURB & GUTTER (TY II)	LF	105
531	6022	CURB RAMPS (TY 5)	SY	62



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CITY OF DALLAS
 DEPARTMENT OF TRANSPORTATION

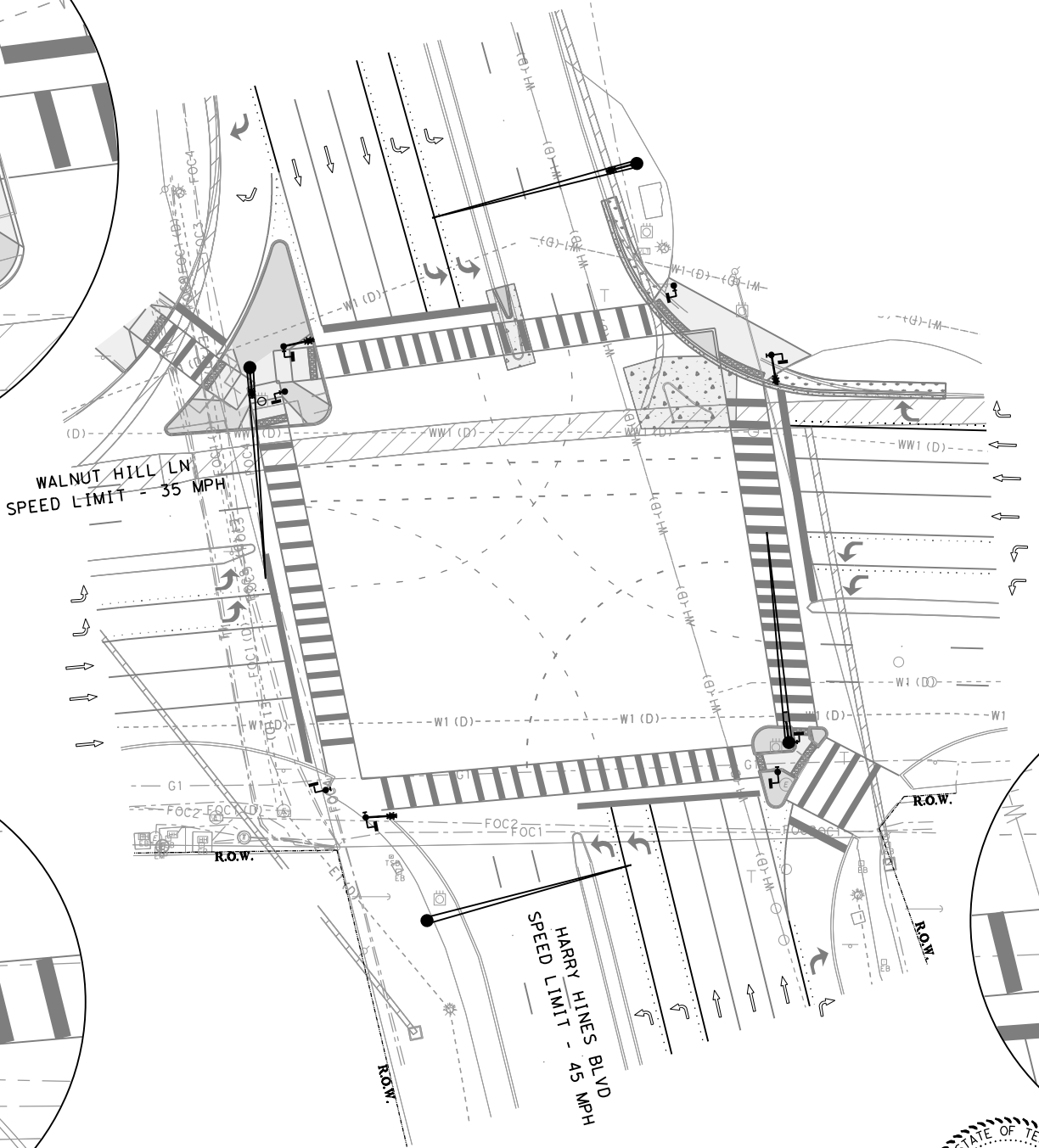
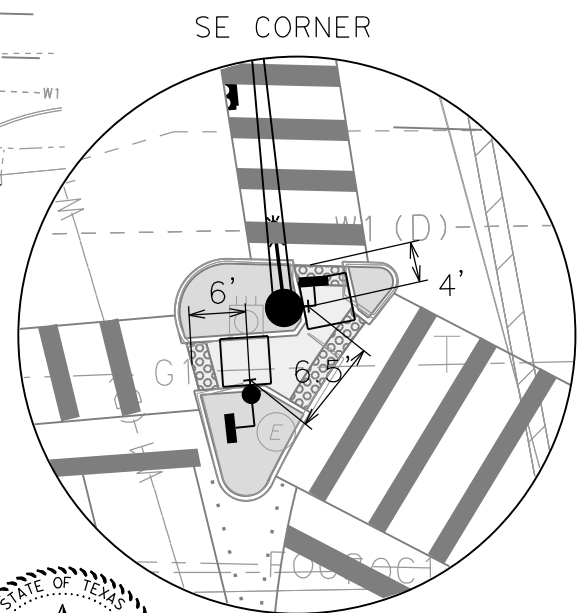
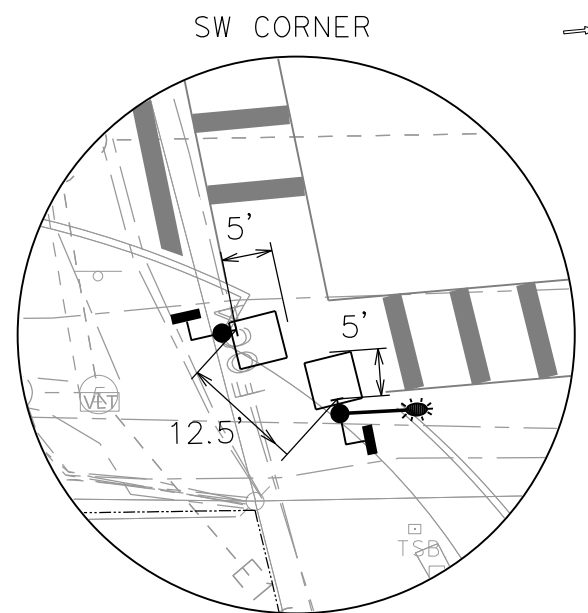
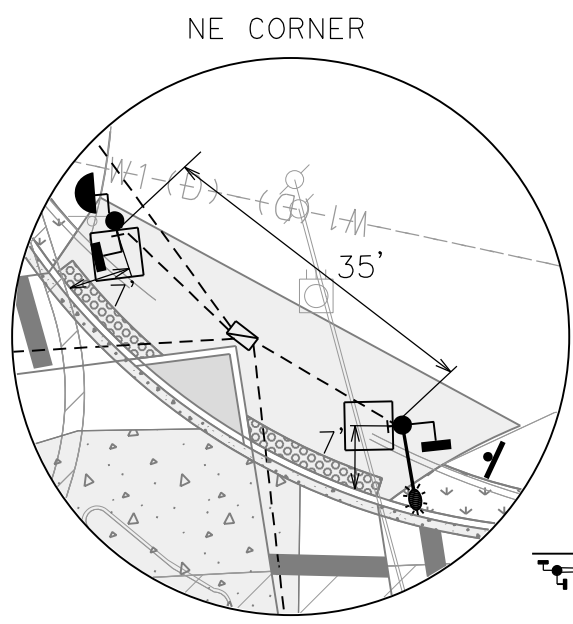
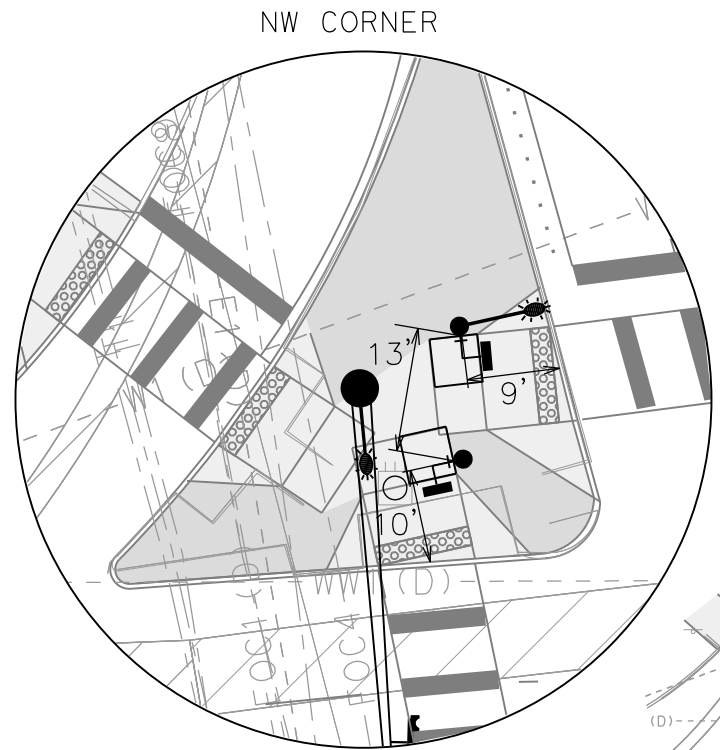
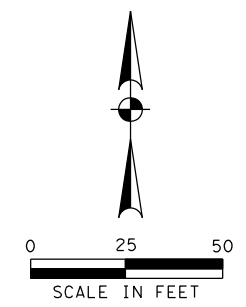
PROPOSED NORTHEAST CORNER
 MODIFICATION DETAILS

WALNUT HILL LN AT
 HARRY HINES BLVD

SCALE: 1" = 40' SHEET 1 OF 1

DESIGN EEH	FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. (SEE TITLE SHEET)	HIGHWAY NO. VAR
GRAPHICS EEH	STATE	DISTRICT	COUNTY
CHECK CJP	TEXAS	18	COLLIN, ETC
CHECK JPD	CONTROL	SECTION	JOB
	0918	24	267, ETC

FILE: H:\11630.10 - Walnut Hill Signals and Fiber\5 - Walnut Hill Ln at Harry Hines Blvd (SH 356)\5-Proposed APS Locations.dgn



LEGEND OF SYMBOLS

- SIGNAL POLE ASSEMBLY
- GROUND MOUNTED CONTROLLER CABINET
- PEDESTAL POLE ASSEMBLY
- LUMINAIRE
- 5' X 5' LANDING
- R.O.W.** RIGHT OF WAY LINES
- NEW CONCRETE SIDEWALK (MAX 1.5% RUNNING SLOPE)
- NEW 11" CONCRETE PAVEMENT
- NEW RIPRAP OR MEDIAN NOSE
- NEW GRASS SODDING
- TRAFFIC FLOW ARROWS

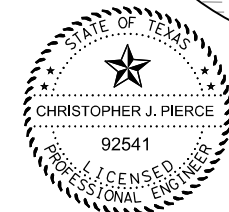


CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

PROPOSED APS UNIT LOCATIONS
WALNUT HILL LN AT HARRY HINES BLVD

SCALE: 1"=50' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
EEH	6	(SEE TITLE SHEET)		VAR
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
EEH	TEXAS	18	COLLIN, ETC	
CHECK	CONTROL	SECTION	JOB	
CJP	0918	24	267, ETC	
CHECK				
JPD				



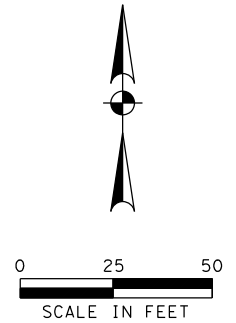
Digitally signed by Christopher Pierce
Date: 2023.11.29 09:52:50-06'00'

CHRISTOPHER J. PIERCE, P.E.
LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450

WARNING!!

CONTRACTOR SHALL BE AWARE OF THE MULTIPLE UTILITIES LOCATED AT THE INTERSECTION. ALL UTILITIES ARE TO BE VISUALLY CONFIRMED PRIOR TO EXCAVATION. USE OF NON-DESTRUCTIVE VACUUM EXCAVATION REQUIRED FOR ALL UTILITIES WHILE PERFORMING POTHOLING EFFORTS. THESE UTILITIES MAY HAVE TO BE ADJUSTED BY HAND TO ENABLE THE FOUNDATIONS TO BE DRILLED.

NOTE:
THE ROW ON THE NORTH SIDE OF THE INTERSECTION IS OUTSIDE OF THE LIMITS OF THIS PLAN SHEET.



LEGEND OF SYMBOLS

- GROUND MOUNTED CONTROLLER CABINET
- GND BOX ITS (POLY) TYPE I W/APRON
- GND BOX ITS (POLY) TYPE I
- R.O.W. RIGHT OF WAY LINES
- NEW CONDUIT RUN NUMBERS
- NEW CONCRETE SIDEWALK (MAX 1.5% RUNNING SLOPE)
- NEW 11" CONCRETE PAVEMENT
- NEW RIPRAP OR MEDIAN NOSE
- NEW GRASS SODDING
- TRAVEL FLOW ARROWS

INSTALL FIBER OPTIC ROAD MARKER ITEM 6007-626 (1 EA)
INSTALL ITS GND BOX (POLY) TY 1 (243624) (1 EA)
INCLUDE 100' SLACK ALONG BRANCH FIBER COILED IN BOX

FUTURE WALNUT HILL FIBER SIGNAL INTERCONNECT BACKBONE (BY OTHERS)

INSTALL FIBER OPTIC ROAD MARKER ITEM 6007-626 (1 EA)
INSTALL ITS GND BOX (POLY) TY 1 (243624) W/APRON (1 EA)
INSTALL FO SPLICE ENCLOSURE (TYPE 1) (1 EA) AND SEAL FIBER ENDS IN ENCLOSURE FOR FUTURE SPLICING
INCLUDE 100' SLACK ALONG BRANCH FIBER COILED IN BOX

FUTURE WALNUT HILL FIBER SIGNAL INTERCONNECT BACKBONE (BY OTHERS)

INSTALL FIBER OPTIC ROAD MARKER ITEM 6007-626 (1 EA)
INSTALL ITS GND BOX (POLY) TY 1 W/APRON (243624) (1 EA)
INCLUDE 100' SLACK ALONG BRANCH FIBER COILED IN BOX

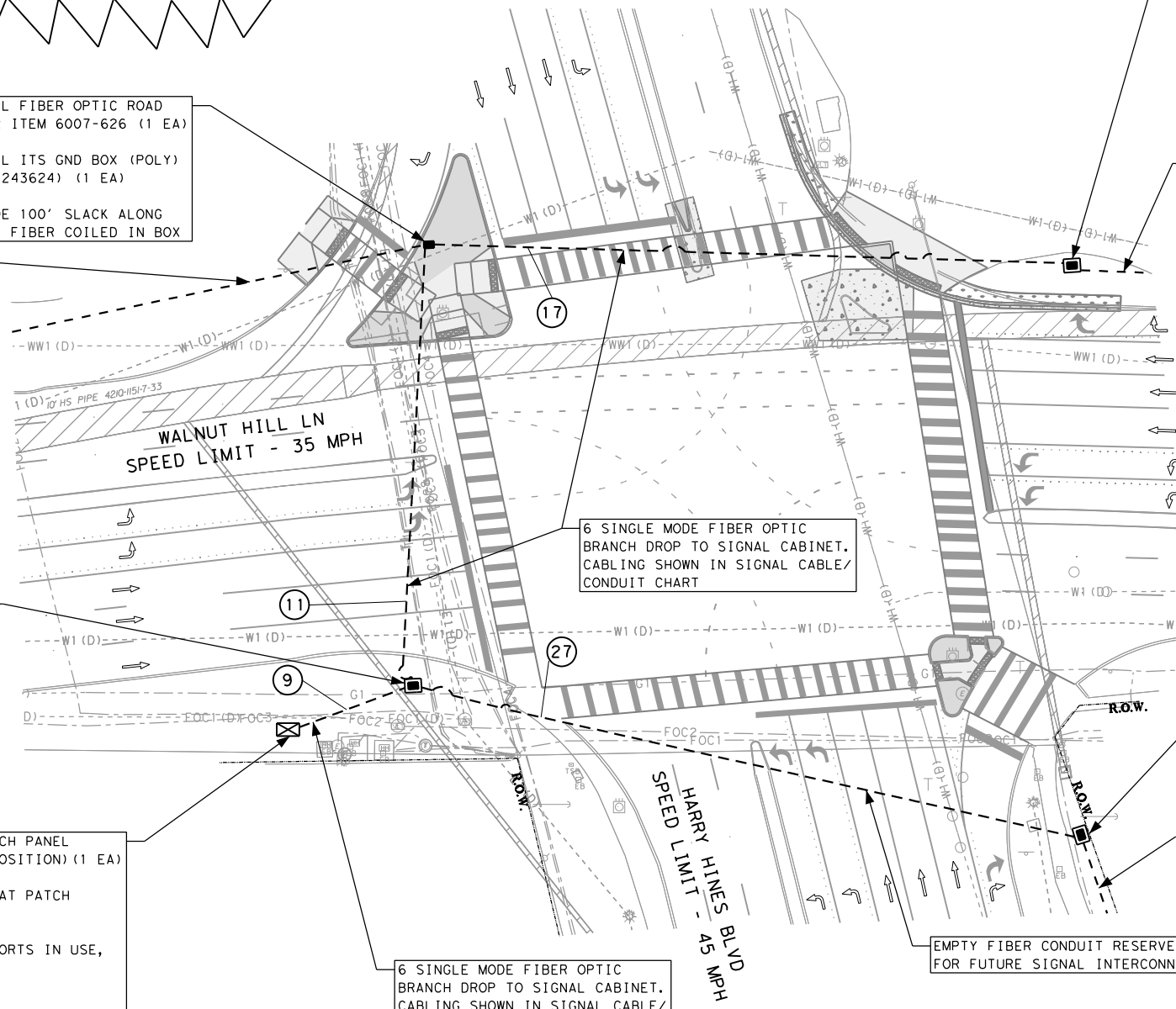
INSTALL FIBER OPTIC PATCH PANEL IN SIGNAL CABINET (12 POSITION) (1 EA)
INSTALL FUSION SPLICES AT PATCH PANEL (6 EA)
PER CITY OF DALLAS, 6 PORTS IN USE, 6 LABELED AS SPARE
PROVIDE 4 LC-LC JUMPERS
LEAVE 25' SLACK FOR BRANCH FIBER COILED IN CABINET

6 SINGLE MODE FIBER OPTIC BRANCH DROP TO SIGNAL CABINET. CABLING SHOWN IN SIGNAL CABLE/ CONDUIT CHART

INSTALL FIBER OPTIC ROAD MARKER ITEM 6007-626 (1 EA)
INSTALL ITS GND BOX (POLY) TY 1 W/APRON (243624) (1 EA)
FUTURE CONNECTION TO HARRY HINES SIGNAL INTERCONNECT BACKBONE

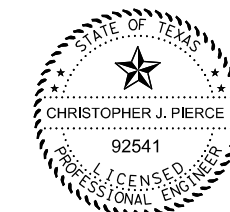
FUTURE HARRY HINES FIBER SIGNAL INTERCONNECT BACKBONE (BY OTHERS)

EMPTY FIBER CONDUIT RESERVED FOR FUTURE SIGNAL INTERCONNECT USE



FIBER OPTIC COMMUNICATION SUMMARY				
ITEM NO.	DESC. CODE	DESCRIPTION	UNIT	QTY
6007	6026	FIBER OPTIC CABLE ROAD MARKER	EA	4
6007	6087	FO SPLICE ENCLOSURE (TYPE 1)	EA	1
6007	6094	FIBER OPTIC FUSION SPLICE	EA	6
6007	6096	FIBER OPTIC PATCH PANEL (12 POSITION)	EA	1
6007	6109	FIBER OPTIC JUMPERS	EA	4
6186	6013	ITS GND BOX (POLY) TY 1 (243624)	EA	1
6186	6014	ITS GND BOX (POLY) TY 1 (243624) W/APRN	EA	3

SEE PROPOSED SIGNAL TABLES SHEET 1 OF 6 FOR CONDUIT AND FIBER OPTIC CABLE QUANTITIES AT THIS LOCATION.



Digitally signed by Christopher Pierce
Date: 2023.11.29 09:49:14-06'00'
CHRISTOPHER J. PIERCE, P.E.
LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450



CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

FIBER SCHEMATIC LAYOUT
WALNUT HILL LN AT HARRY HINES BLVD

SCALE: 1"=50' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
EEH	6	(SEE TITLE SHEET)		VAR
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
EEH	TEXAS	18	COLLIN, ETC	
CHECK	CONTROL	SECTION	JOB	
CJP	0918	24	267, ETC	
CHECK				
JPD				

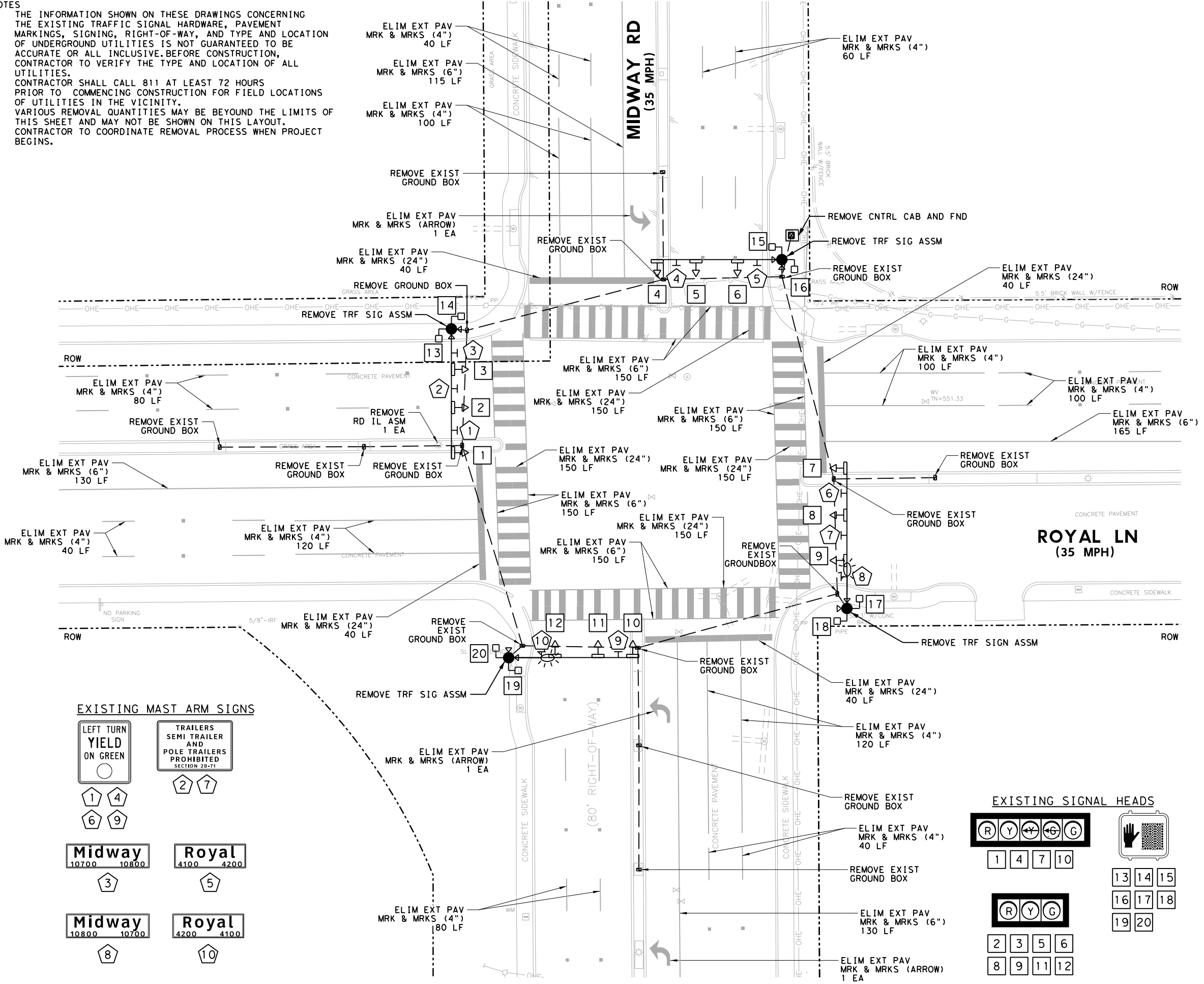
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- NOTES**
1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
 2. CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.
 3. VARIOUS REMOVAL QUANTITIES MAY BE BEYOND THE LIMITS OF THIS SHEET AND MAY NOT BE SHOWN ON THIS LAYOUT.
 4. CONTRACTOR TO COORDINATE REMOVAL PROCESS WHEN PROJECT BEGINS.

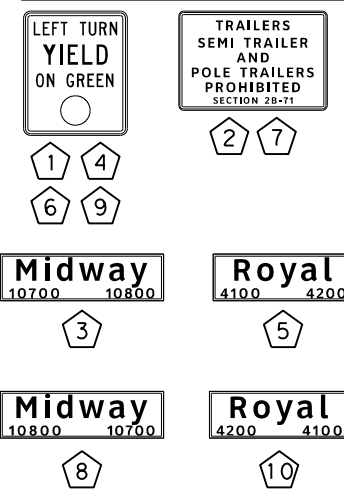


EXISTING LEGEND

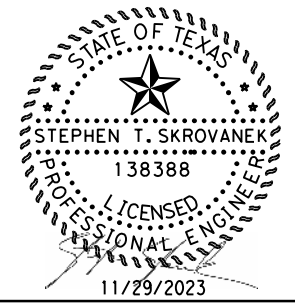
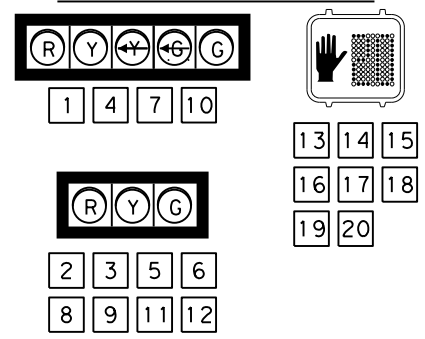
- POLE-MOUNTED CONTROLLER
- GROUND-MOUNTED CONTROLLER
- GROUND BOX
- MAST ARM POLE
- PEDESTRIAN SIGNAL POLE
- HORIZONTAL SIGNAL HEAD
- VERTICAL SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- LUMINAIRE
- OVERHEAD SIGN
- SERVICE METER & DISCONNECT
- PTZ CAMERA
- CONDUIT TO BE ABANDONED



EXISTING MAST ARM SIGNS



EXISTING SIGNAL HEADS



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Texas Department of Transportation

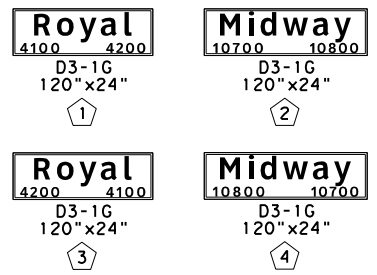
EXISTING CONDITIONS & REMOVALS
MIDWAY RD AT ROYAL LN

SCALE: 1" = 30' SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	39

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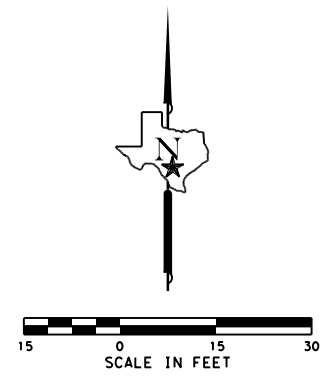
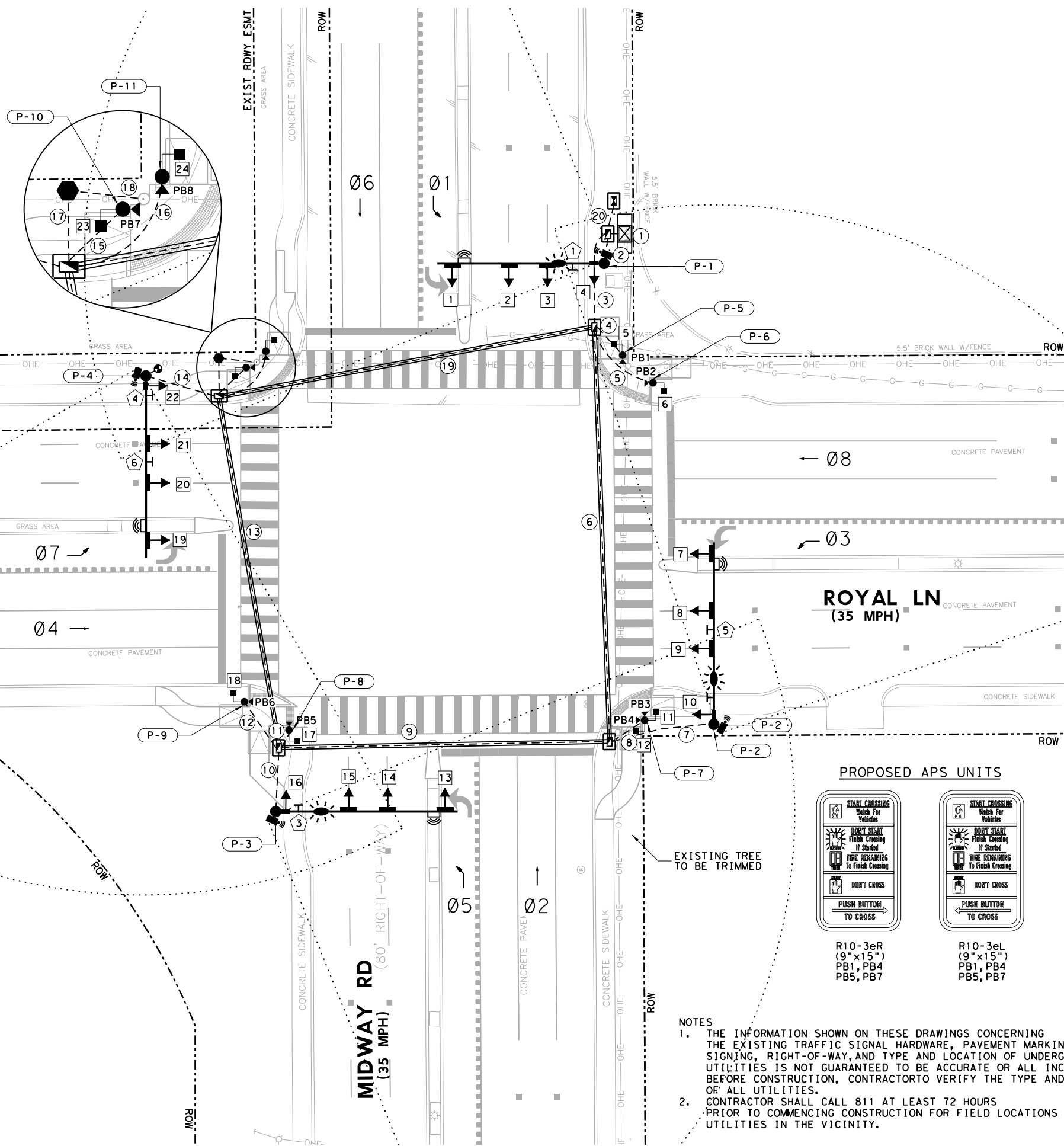
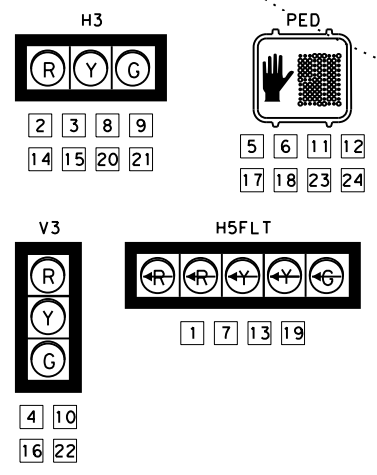
PROPOSED MAST ARM SIGNS



RELOCATED MAST ARM SIGNS



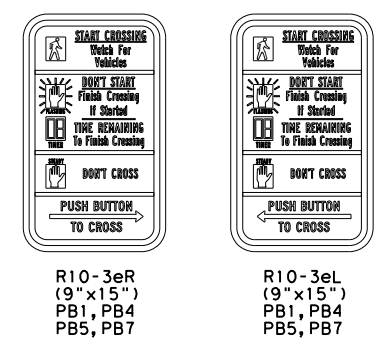
PROPOSED SIGNAL HEADS



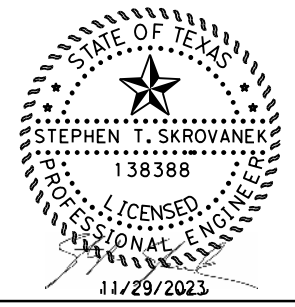
PROPOSED LEGEND

- CONTROLLER CABINET W/BBU
- TY D GROUND BOX
- TY D GROUND BOX W/APRON
- MAST ARM POLE
- PEDESTRIAN SIGNAL POLE
- HORIZONTAL SIGNAL HEAD
- VERTICAL SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- LUMINAIRE
- OVERHEAD SIGN
- SERVICE METER & DISCONNECT
- CONDUIT TRENCH
- CONDUIT BORE
- PRESENCE RADAR
- ADVANCE RADAR
- PTZ CAMERA
- ITS GROUND BOX TY 1 W/APRON

PROPOSED APS UNITS



- NOTES**
- THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
 - CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.



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DEPARTMENT OF TRANSPORTATION
Texas Department of Transportation

TRAFFIC SIGNAL LAYOUT
MIDWAY RD AT ROYAL LN

SCALE: 1" = 30' SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	40

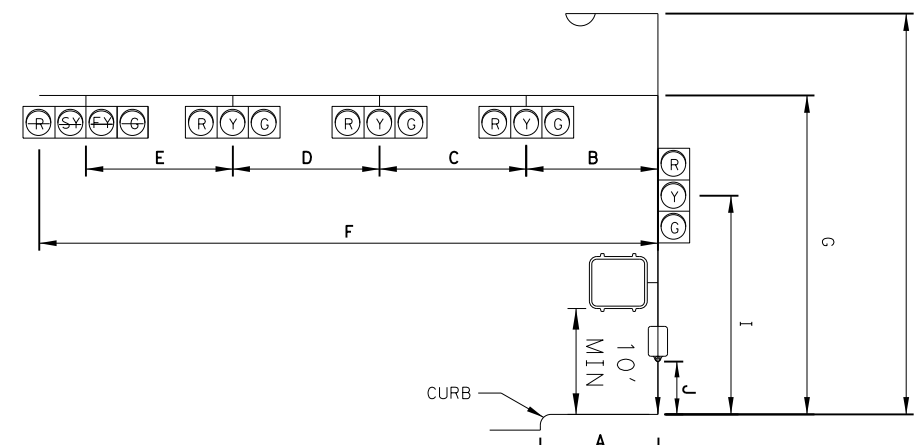
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RUN ID	LENGTH	SUMMARY OF CONDUIT AND CABLES																																	
		ITEM 618 CONDUIT												ITEM 620 ELECTRICAL CONDUCTORS						ITEM 684 TRAFFIC SIGNAL CABLES								ITEM 6004 ITS CABLE		SUB TO ITEM 6292 RVDS					
		2" (SCH 80)		3" (SCH 80)		4" (SCH 80)		#6 BARE		#12 INSULATED		#8 INSULATED		#6 INSULATED		TYPE A				TYPE C		ETHERNET CABLE**		PRES. RADAR CABLE **		ADV. RADAR CABLE **									
		TRENCH EA	BORE LF	TRENCH EA	BORE LF	TRENCH EA	BORE LF	EA	LF	EA	LF	EA	LF	EA	LF	5/C #14 EA	7/C #14 EA	12/C #14 EA	20/C #14 EA	2/C #12 EA	2/C #12 LF	EA	LF	EA	LF	EA	LF								
1	10'		1 10'				3 30'													1 10'															
2	10'			1 10'			1 10'						2 20'																						
3	30'		1 30'				2 60'						2 60'							1 30'				3 90'											
4	15'			1 15'			1 15'						1 15'																						
5	25'			1 25'			1 25'						1 25'																						
6	110'								1 110'																										
7	30'			1 30'			1 30'						2 60'											2 220'											
8	15'			1 15'			1 15'						2 60'												2 220'										
9	90'								1 90'				2 180'													2 220'									
10	20'			1 20'			1 20'						2 40'												1 90'										
11	10'			1 10'			1 10'																		1 20'										
12	15'			1 15'			1 15'																		1 90'										
13	95'								1 95'				2 190'												1 20'										
14	20'			1 20'			1 20'						2 40'											1 20'		1 20'									
15	15'			1 15'			1 15'																		1 20'										
16	20'			1 20'			1 20'																	1 20'											
17	15'	1	15'				1 15'						2 30'																						
18	10'	1	10'				1 10'						2 20'																						
19	100'			1 100'			1 100'					2 200'													1 100'										
20	10'			1 10'			1 10'																												
FUTURE FIBER																																			
TO BE INSTALLED BY ONCOR																																			
CONDUIT AND CABLES INSIDE POLES																																			
POLE ID																																			
P-1														2 80'													1 20'								
P-2														2 80'													1 20'								
P-3														2 80'													1 20'								
P-4																										1 30'									
P-5																																			
P-6																																			
P-7																																			
P-8																																			
P-9																																			
P-10																																			
P-11																																			
TOTALS:			25'		140'		205'		50'		395'		795'		240'		820'		310'		470'		245'		1105'		620'		1210'		190'		700'		870'

** FURNISHED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR.

POLE ID	DIMENSIONS (SEE FIGURE)											HEADS ON MAST ARM	LUM ARM	ILSN ARM	ITEM 688 APS UNITS	ITEM 416 DRILLED SHAFT FOUNDATIONS					FDN TYPE														
	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	I (FT)	J (FT)	24" *					30"	36"	42"	48"																
	P-1	4	13.5	10	15		48	19	30	15						3	1																		
P-2	9	20	10	15		48	19	30	15		3	1																							
P-3	9	19	10	15		48	19	30	15		3	1																							
P-4	7	10	10	15		48	19	30	15		3	1																							
P-5	PEDESTAL POLE										3.5										1	6'													
P-6	PEDESTAL POLE										3.5										1	6'													
P-7	PEDESTAL POLE										3.5										2	6'													
P-8	PEDESTAL POLE										3.5										1	6'													
P-9	PEDESTAL POLE										3.5										1	6'													
P-10	PEDESTAL POLE										3.5										1	6'													
P-11	PEDESTAL POLE										3.5										1	6'													
TOTALS:												3									8	42'													

* SUBSIDIARY TO ITEM 687.

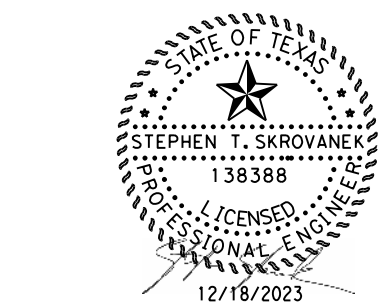


ITEM 628 ELECTRICAL SERVICES											
ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED (5) - 14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CKT. BKR. POLE/AMPS	TWO-POLE CONTACTOR AMPS	PANELBD/ LOADCENTER AMP RATING	BRANCH CIRCUIT ID	BRANCH CKT. BKR. POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-1	ELEC SRV TY D 120/240 070 (NS)SS(E)PS(U)	2"	*	N/A	2P/70	30	100	SIG	1P/50	40	5.31
								LUM	1P/20	4.26	

* FURNISHED AND INSTALLED BY ONCOR

ITEM 682 VEHICLE AND PEDESTRIAN SIGNAL HEADS											
SIGNAL HEAD NO.	SIGNAL HEAD TYPE	BACKPLATES			12" LED SIGNAL INDICATIONS						PED SIGNAL COUNTDOWN (EA)
		3 SEC (EA)	4 SEC (EA)	5 SEC (EA)	R (EA)	Y (EA)	G (EA)	R ARW (EA)	Y ARW (EA)	G ARW (EA)	
		2, 3, 8, 9, 14, 15, 20, 21	H3	8			8	8	8		
4, 10, 16, 22	V3	4			4	4	4				
1, 7, 13, 19	H5FLT			4				8	8	4	
5, 6, 17, 18, 11, 12, 23, 24	PED										8
TOTALS:		12		4	12	12	12	8	8	4	8

ITEM 624 / 6186 GROUND BOXES	
DESCRIPTION	QTY
GROUND BOX TY D (162922)	2
GROUND BOX TY D (162922)W/APRON	3
ITS GND BOX (POLY) TY 1 (243624)W/APRN	1



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TRAFFIC SIGNAL DETAILS
 MIDWAY RD AT ROYAL LN

SCALE: N/A SHEET 1 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	41

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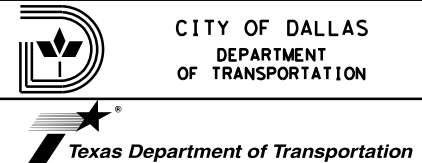
CABLE TERMINATION												
CNDR NO.	CNDR COLOR	CABLE 1 FROM CNTRL TO POLE 1 20/C #14	CABLE 2 FROM CNTRL TO POLE 2 20/C #14	CABLE 3 FROM CNTRL TO POLE 3 20/C #14	CABLE 4 FROM CNTRL TO POLE 4 20/C #14	CABLE 5 FROM CNTRL TO POLE 5 12/C #14	CABLE 6 FROM CNTRL TO POLE 6 12/C #14	CABLE 7 FROM CNTRL TO POLE 7 12/C #14	CABLE 8 FROM CNTRL TO POLE 8 12/C #14	CABLE 9 FROM CNTRL TO POLE 9 12/C #14	CABLE 10 FROM CNTRL TO POLE 10 12/C #14	CABLE 11 FROM CNTRL TO POLE 11 12/C #14
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON
3	RED	SH 2,3,4 PHASE 2 RED	SH 8,9,10 PHASE 4 RED	SH 14,15,16 PHASE 6 RED	SH 20,21,22 PHASE 8 RED	SH 5 PHASE 8 DONT WALK	SPARE	SH 12 PHASE 4 DONT WALK	SH 17 PHASE 4 DONT WALK	SPARE	SPARE	SH 24 PHASE 8 DONT WALK
4	GREEN	SH 2,3,4 PHASE 2 GREEN	SH 8,9,10 PHASE 4 GREEN	SH 14,15,16 PHASE 6 GREEN	SH 20,21,22 PHASE 8 GREEN	SH 5 PHASE 8 WALK	SPARE	SH 12 PHASE 4 WALK	SH 17 PHASE 4 WALK	SPARE	SPARE	SH 24 PHASE 8 WALK
5	ORANGE	SH 2,3,4 PHASE 2 YELLOW	SH 8,9,10 PHASE 4 YELLOW	SH 14,15,16 PHASE 6 YELLOW	SH 20,21,22 PHASE 8 YELLOW	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
6	BLUE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
7	WHITE/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
8	RED/BLACK	SH 1 PHASE 5 RED ARW	SH 7 PHASE 7 RED ARW	SH 13 PHASE 1 RED ARW	SH 19 PHASE 3 RED ARW	SPARE	SH 6 PHASE 2 DONT WALK	SH 11 PHASE 2 DONT WALK	SPARE	SH 18 PHASE 6 DONT WALK	SH 23 PHASE 6 DONT WALK	SPARE
9	GREEN/BLACK	SH 1 PHASE 5 GRN ARW	SH 7 PHASE 7 GRN ARW	SH 6 PHASE 1 GRN ARW	SH 19 PHASE 3 GRN ARW	SPARE	SH 6 PHASE 2 WALK	SH 11 PHASE 2 WALK	SPARE	SH 18 PHASE 6 WALK	SH 23 PHASE 6 WALK	SPARE
10	ORANGE/BLACK	SH 1 PHASE 5 YEL ARW	SH 7 PHASE 7 YEL ARW	SH 6 PHASE 1 YEL ARW	SH 19 PHASE 3 YEL ARW	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
11	BLUE/BLACK	SH 1 PHASE 5 FL YEL ARW	SH 7 PHASE 7 FL YEL ARW	SH 6 PHASE 1 FL YEL ARW	SH 19 PHASE 3 FL YEL ARW	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
12	BLACK/WHITE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
13	RED/WHITE	SPARE	SPARE	SPARE	SPARE							
14	GREEN/WHITE	SPARE	SPARE	SPARE	SPARE							
15	BLUE/WHITE	SPARE	SPARE	SPARE	SPARE							
16	BLACK/RED	SPARE	SPARE	SPARE	SPARE							
17	WHITE/RED	SPARE	SPARE	SPARE	SPARE							
18	ORANGE/RED	SPARE	SPARE	SPARE	SPARE							
19	BLUE/RED	SPARE	SPARE	SPARE	SPARE							
20	RED/GREEN	SPARE	SPARE	SPARE	SPARE							

APS MESSAGE INFORMATION			
APS UNIT NO.	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
PB2 PB4	PHASE 2	BUTTON PUSH ON DW	WAIT TO CROSS ROYAL LANE AT MIDWAY ROAD
		EXTENDED BUTTON PUSH	WAIT TO CROSS ROYAL LANE AT MIDWAY ROAD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	ROYAL LANE. WALK SIGN IS ON TO CROSS ROYAL LANE
PB3 PB5	PHASE 4	BUTTON PUSH ON DW	WAIT TO CROSS MIDWAY ROAD AT ROYAL LANE
		EXTENDED BUTTON PUSH	WAIT TO CROSS MIDWAY ROAD AT ROYAL LANE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	MIDWAY ROAD. WALK SIGN IS ON TO CROSS MIDWAY ROAD
PB6 PB7	PHASE 6	BUTTON PUSH ON DW	WAIT TO CROSS ROYAL LANE AT MIDWAY ROAD
		EXTENDED BUTTON PUSH	WAIT TO CROSS ROYAL LANE AT MIDWAY ROAD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	ROYAL LANE. WALK SIGN IS ON TO CROSS ROYAL LANE
PB1 PB8	PHASE 8	BUTTON PUSH ON DW	WAIT TO CROSS MIDWAY ROAD AT ROYAL LANE
		EXTENDED BUTTON PUSH	WAIT TO CROSS MIDWAY ROAD AT ROYAL LANE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	MIDWAY ROAD. WALK SIGN IS ON TO CROSS MIDWAY ROAD

* COUNTDOWN SPEECH MESSAGE = "OFF" FOR ALL UNITS.



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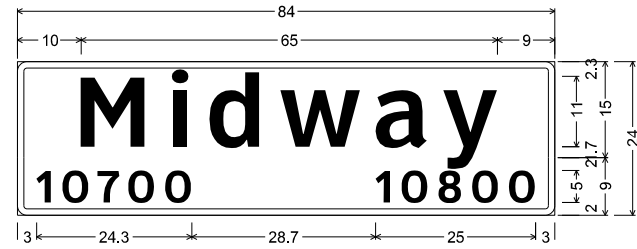
**TRAFFIC SIGNAL
DETAILS
MIDWAY RD AT ROYAL LN**

SCALE: N/A SHEET 2 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	42

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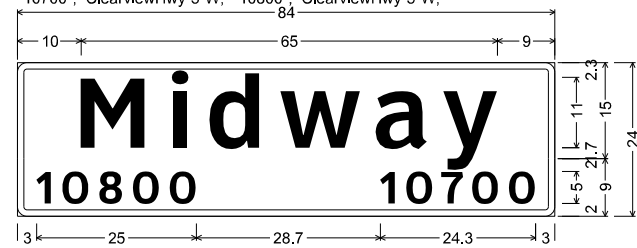
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D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Midway", ClearviewHwy-5-W;

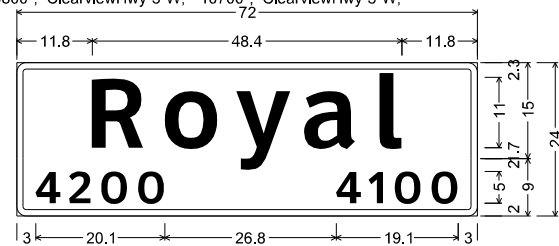
1.5" Radius, 1.0" Border, White on Green;
"10700", ClearviewHwy-5-W; "10800", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Midway", ClearviewHwy-5-W;

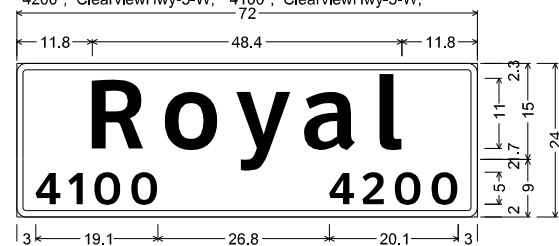
1.5" Radius, 1.0" Border, White on Green;
"10800", ClearviewHwy-5-W; "10700", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Royal", ClearviewHwy-5-W;

1.5" Radius, 1.0" Border, White on Green;
"4200", ClearviewHwy-5-W; "4100", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Royal", ClearviewHwy-5-W;

1.5" Radius, 1.0" Border, White on Green;
"4100", ClearviewHwy-5-W; "4200", ClearviewHwy-5-W;



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OF TRANSPORTATION

Texas Department of Transportation

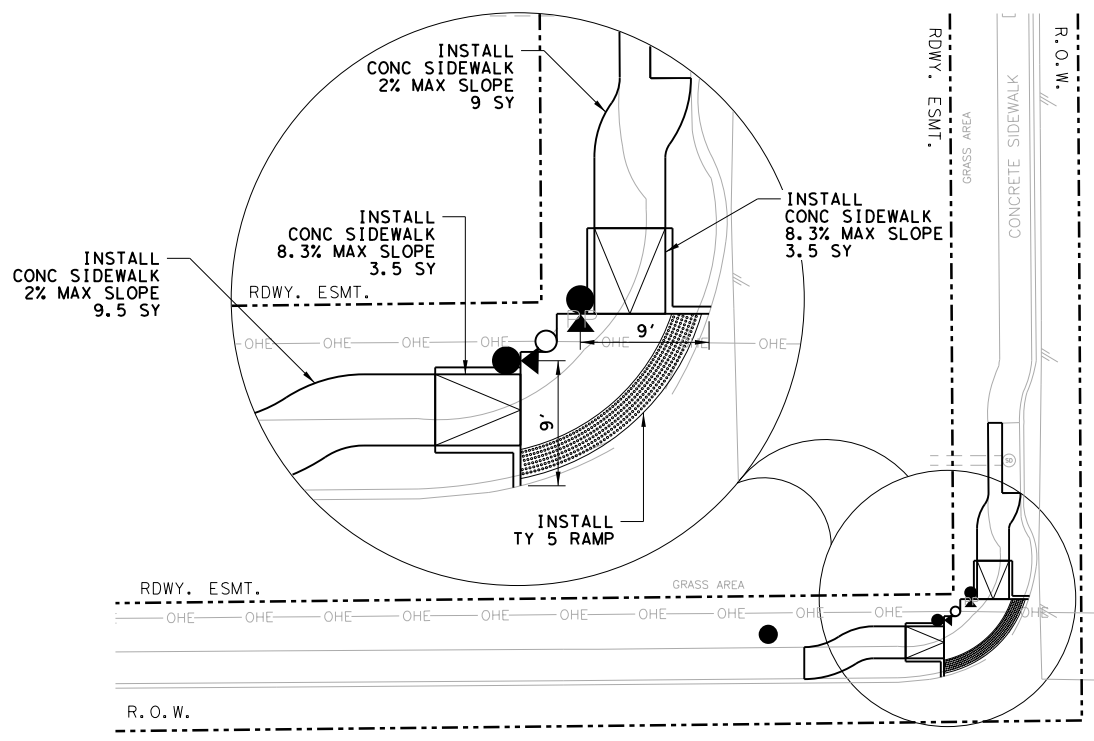
**TRAFFIC SIGNAL
DETAILS
MIDWAY RD AT ROYAL LN**

SCALE: N/A SHEET 3 OF 3

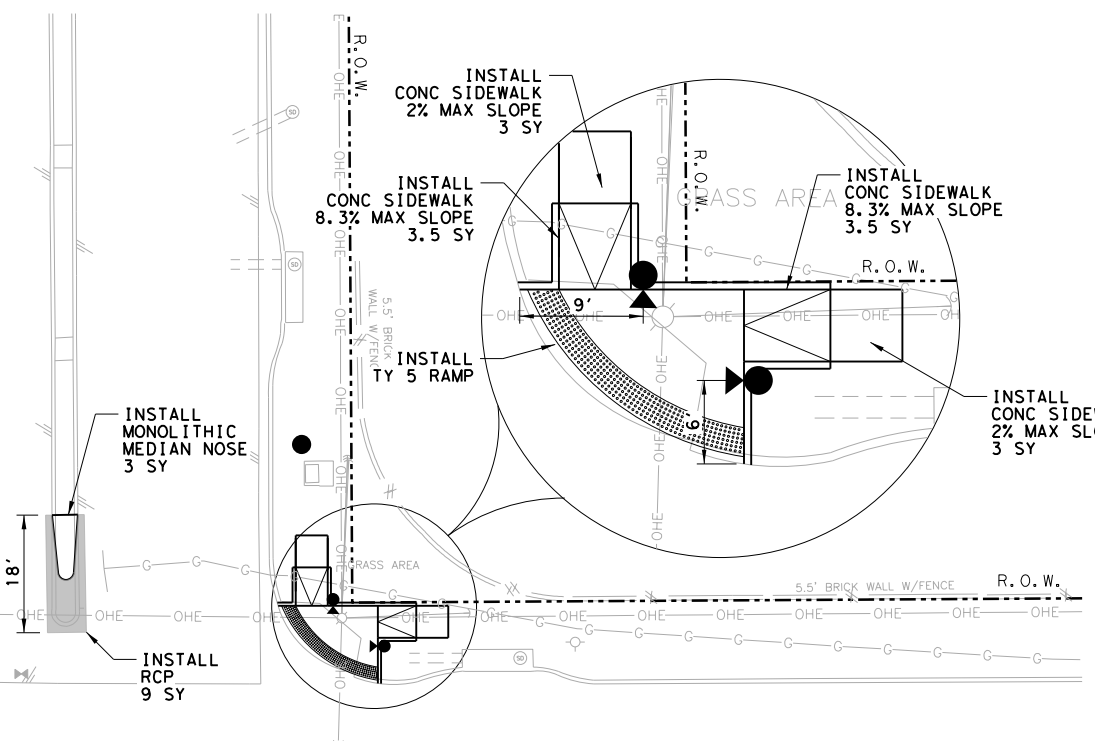
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	43

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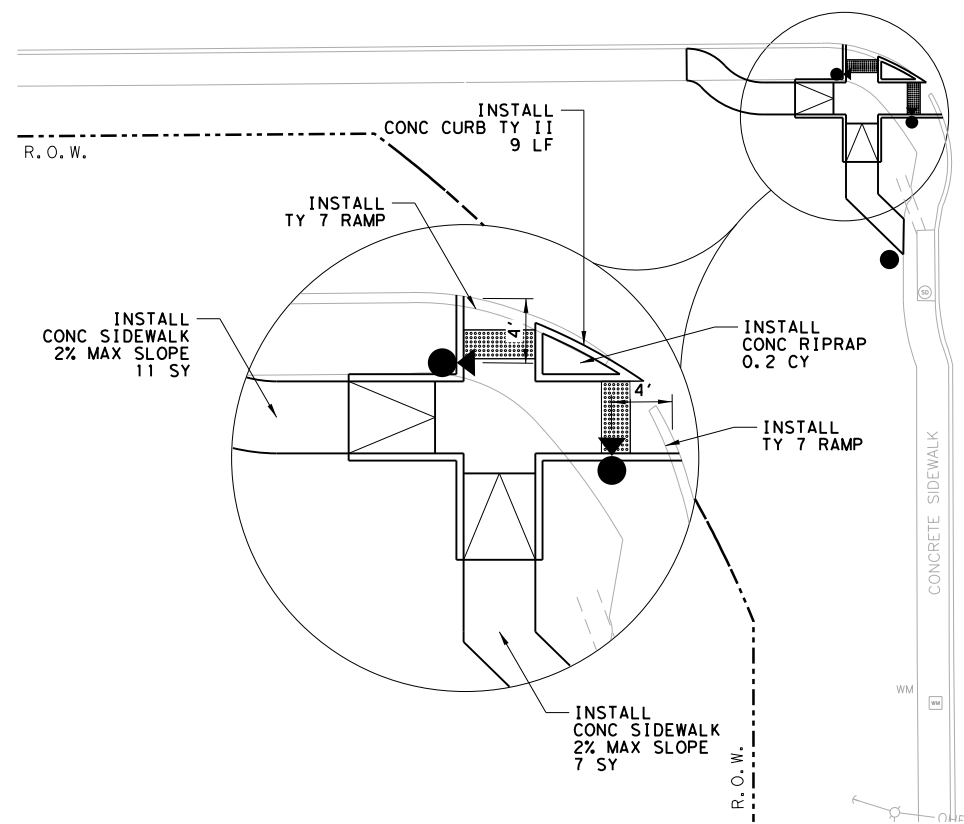
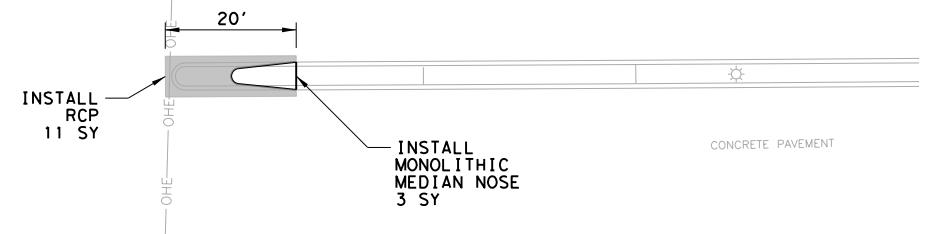
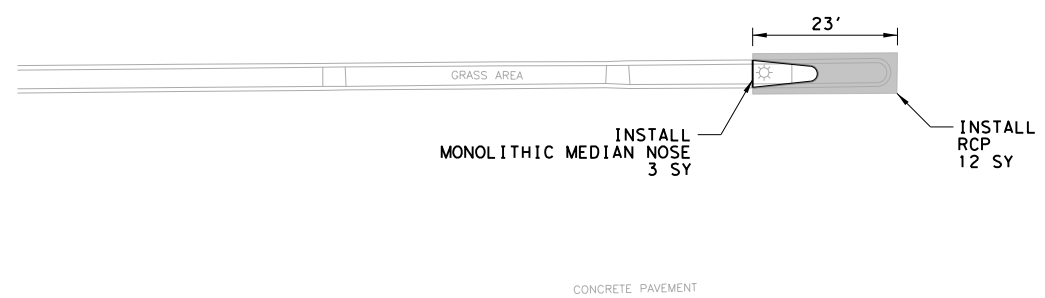
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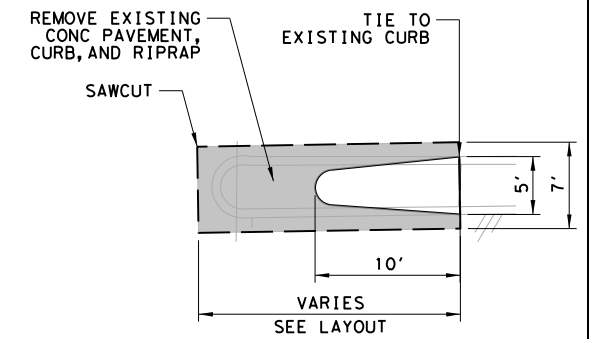
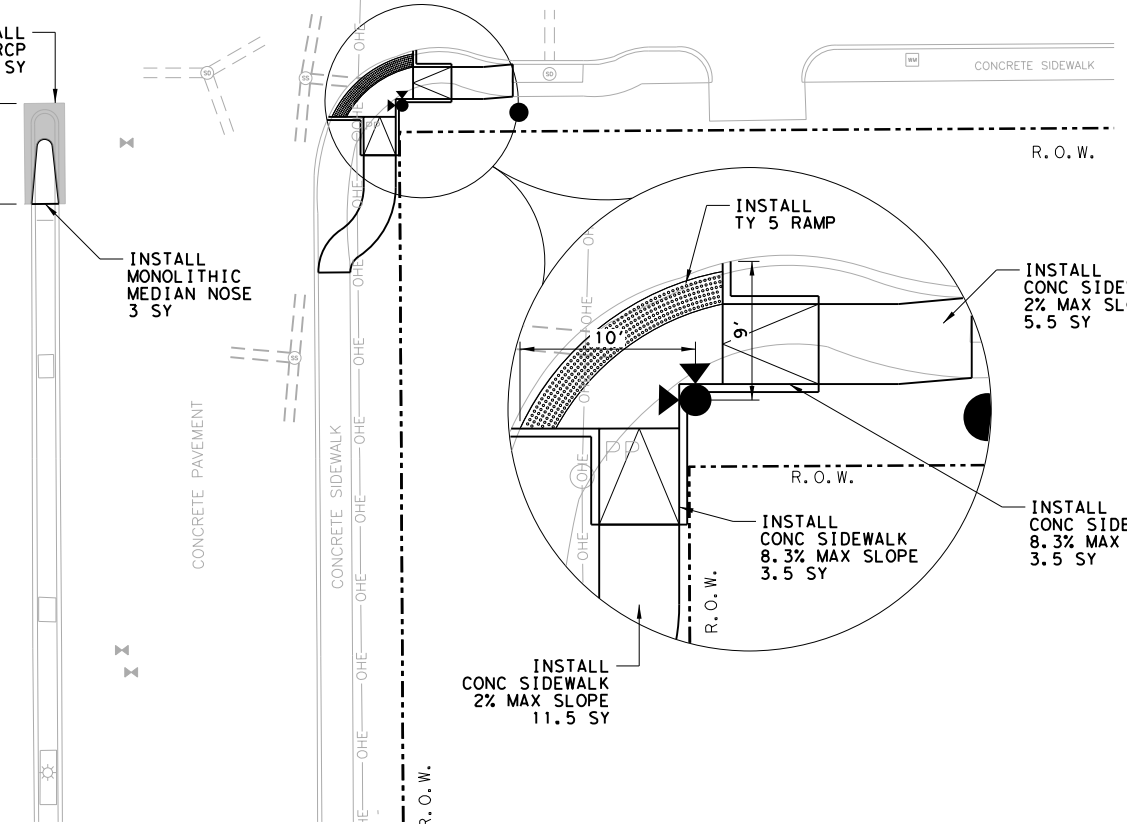
MIDWAY RD
(35 MPH)



ROYAL LN
(35 MPH)



(80' RIGHT-OF-WAY)



TYPICAL
MEDIAN NOSE
PULLBACK



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**PEDESTRIAN RAMPS
LAYOUT
MIDWAY RD AT ROYAL LN**

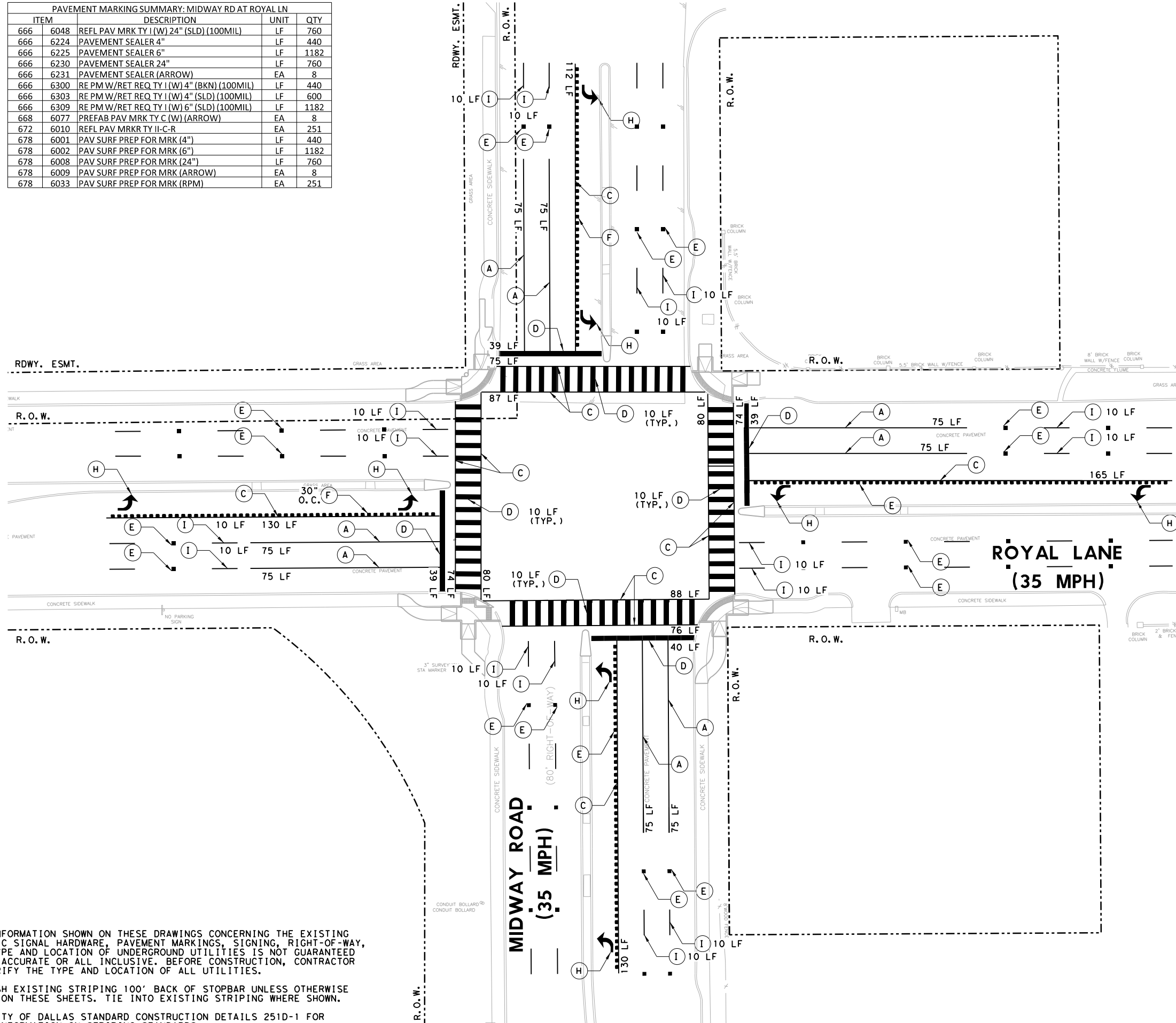
SCALE: 1" = 30' SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
			JOB NO.
			267, ETC.
			SHEET NO.
			44

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PAVEMENT MARKING SUMMARY: MIDWAY RD AT ROYAL LN				
ITEM		DESCRIPTION	UNIT	QTY
666	6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	760
666	6224	PAVEMENT SEALER 4"	LF	440
666	6225	PAVEMENT SEALER 6"	LF	1182
666	6230	PAVEMENT SEALER 24"	LF	760
666	6231	PAVEMENT SEALER (ARROW)	EA	8
666	6300	RE PM W/RET REQ TY I (W) 4" (BKN) (100MIL)	LF	440
666	6303	RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)	LF	600
666	6309	RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)	LF	1182
668	6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	8
672	6010	REFL PAV MRKR TY II-C-R	EA	251
678	6001	PAV SURF PREP FOR MRK (4")	LF	440
678	6002	PAV SURF PREP FOR MRK (6")	LF	1182
678	6008	PAV SURF PREP FOR MRK (24")	LF	760
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	8
678	6033	PAV SURF PREP FOR MRK (RPM)	EA	251



PROPOSED LEGEND

- (A) RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)
- (B) RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)
- (C) RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
- (D) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
- (E) REFL PAV MRKR (TY II-C-R)
- (F) REFL PAV MRKR (TY I-C)
- (G) REFL PAV MRKR (TY II-A-A)
- (H) PREFAB PAV MRK TY C (W) (ARROW)
- (I) RE PM W/RET REQ TY I (W) 4" (BRK) (100MIL)
- (J) REFL PAV MRK TY I (W) 6" (DOT) (100MIL)
- (K) REFL PAV MRK TY I (W) 12" (SLD) (100MIL)
- (L) PREFAB PAV MRK TY C (W) (DBL ARROW)
- (M) REF PAV MRK TY I (W) 36" (YLDTRI) (100MIL)
- IN SM RD SN SUP&AMTY10BWG(1)SA(T)



1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
2. REFRESH EXISTING STRIPING 100' BACK OF STOPBAR UNLESS OTHERWISE SHOWN ON THESE SHEETS. TIE INTO EXISTING STRIPING WHERE SHOWN.
3. SEE CITY OF DALLAS STANDARD CONSTRUCTION DETAILS 251D-1 FOR MORE INFORMATION ON STRIPING STANDARDS.

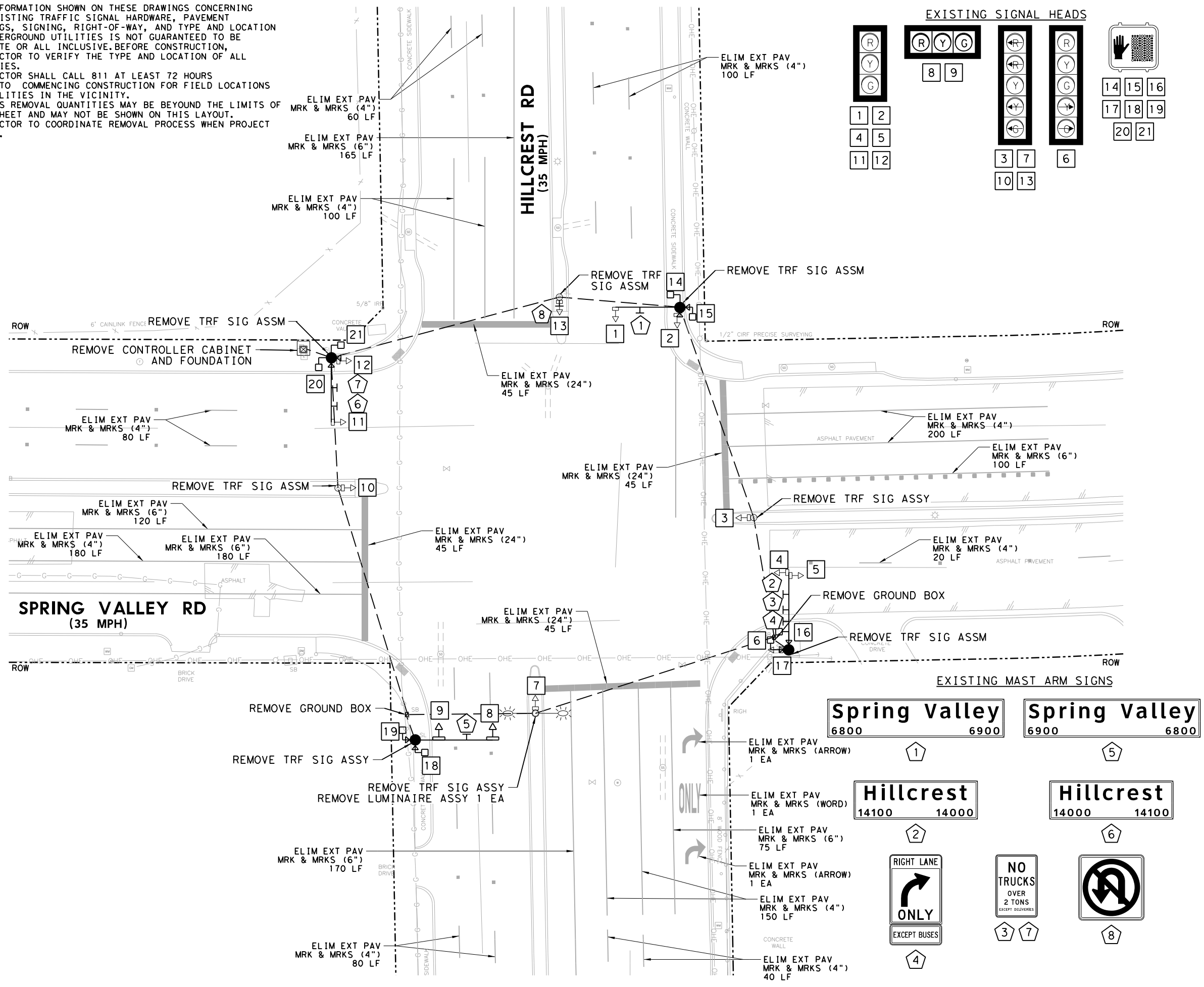
BGE, Inc. 2595 Dallas Parkway, Suite 101, Frisco, TX 75034 Tel: 972-464-4800 • www.bgeinc.com TBPE Registration No. F-1046 Copyright 2023				
CITY OF DALLAS DEPARTMENT OF TRANSPORTATION				
Texas Department of Transportation				
PAVEMENT MARKING LAYOUT MIDWAY RD AT ROYAL LN				
SCALE: 1" = 40'			SHEET 1 OF 1	
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.	
6	TEXAS	SEE TITLE SHEET	VAR	
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.
				SHEET NO.
				45

NOTES

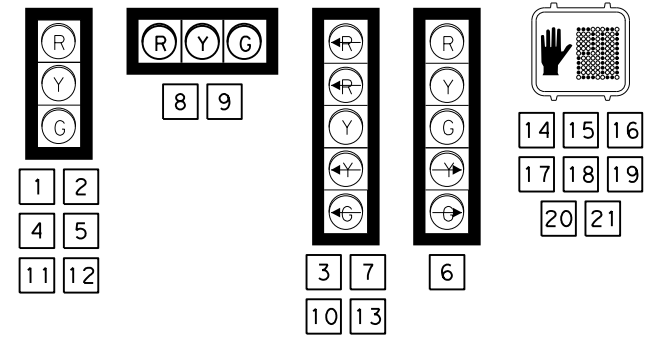
1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
2. CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.
3. VARIOUS REMOVAL QUANTITIES MAY BE BEYOND THE LIMITS OF THIS SHEET AND MAY NOT BE SHOWN ON THIS LAYOUT.
4. CONTRACTOR TO COORDINATE REMOVAL PROCESS WHEN PROJECT BEGINS.

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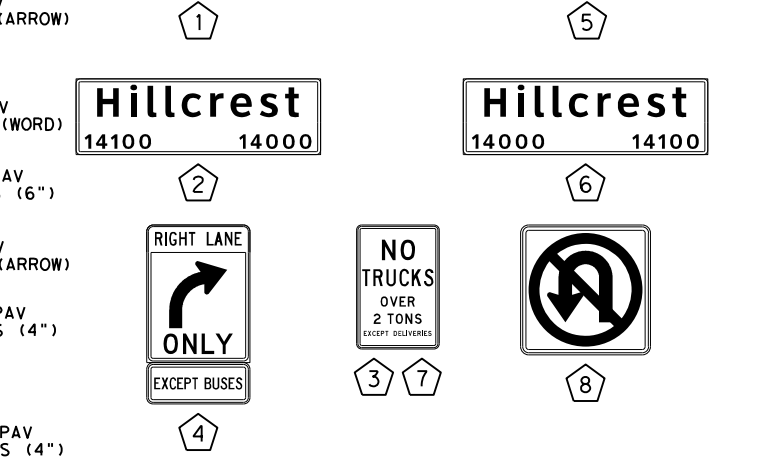
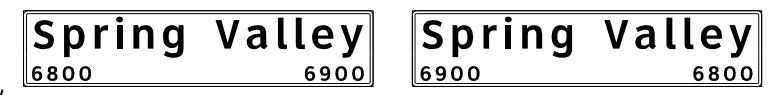
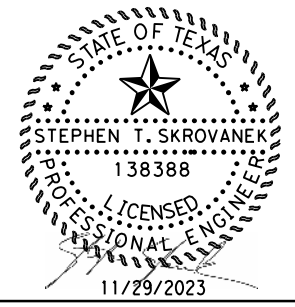


EXISTING SIGNAL HEADS



EXISTING LEGEND

- POLE-MOUNTED CONTROLLER
- GROUND-MOUNTED CONTROLLER
- GROUND BOX
- MAST ARM POLE
- PEDESTRIAN SIGNAL POLE
- HORIZONTAL SIGNAL HEAD
- VERTICAL SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- LUMINAIRE
- OVERHEAD SIGN
- SERVICE METER & DISCONNECT
- PTZ CAMERA
- CONDUIT TO BE ABANDONED



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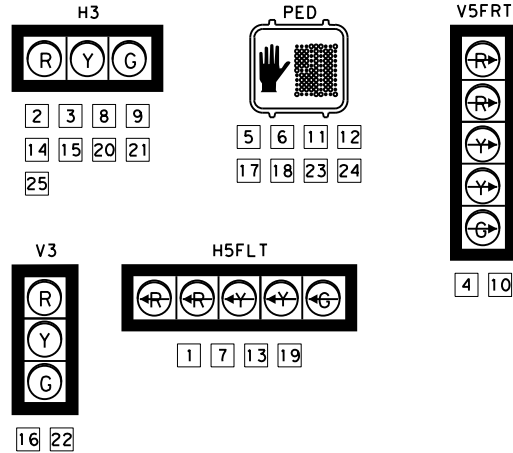
EXISTING CONDITIONS AND REMOVALS
SPRING VALLEY AT HILLCREST

SCALE: 1"=30' SHEET 1 OF 1

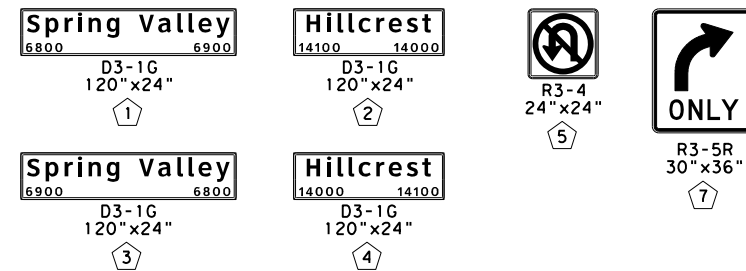
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLLIN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	46

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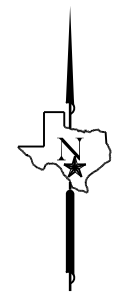
PROPOSED SIGNAL HEADS



PROPOSED MAST ARM SIGNS



RELOCATED MAST ARM SIGNS

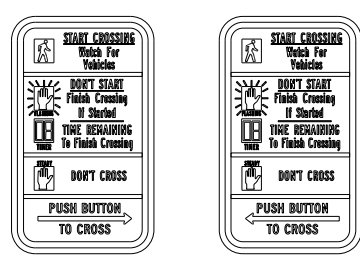


PROPOSED LEGEND

- CONTROLLER CABINET W/BBU
- TY D GROUND BOX
- TY D GROUND BOX W/APRON
- MAST ARM POLE
- PEDESTRIAN SIGNAL POLE
- HORIZONTAL SIGNAL HEAD
- VERTICAL SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- LUMINAIRE
- OVERHEAD SIGN
- SERVICE METER & DISCONNECT
- CONDUIT TRENCH
- CONDUIT BORE
- PRESENCE RADAR
- ADVANCE RADAR
- PTZ CAMERA
- ITS GROUND BOX TY 1 W/APRON

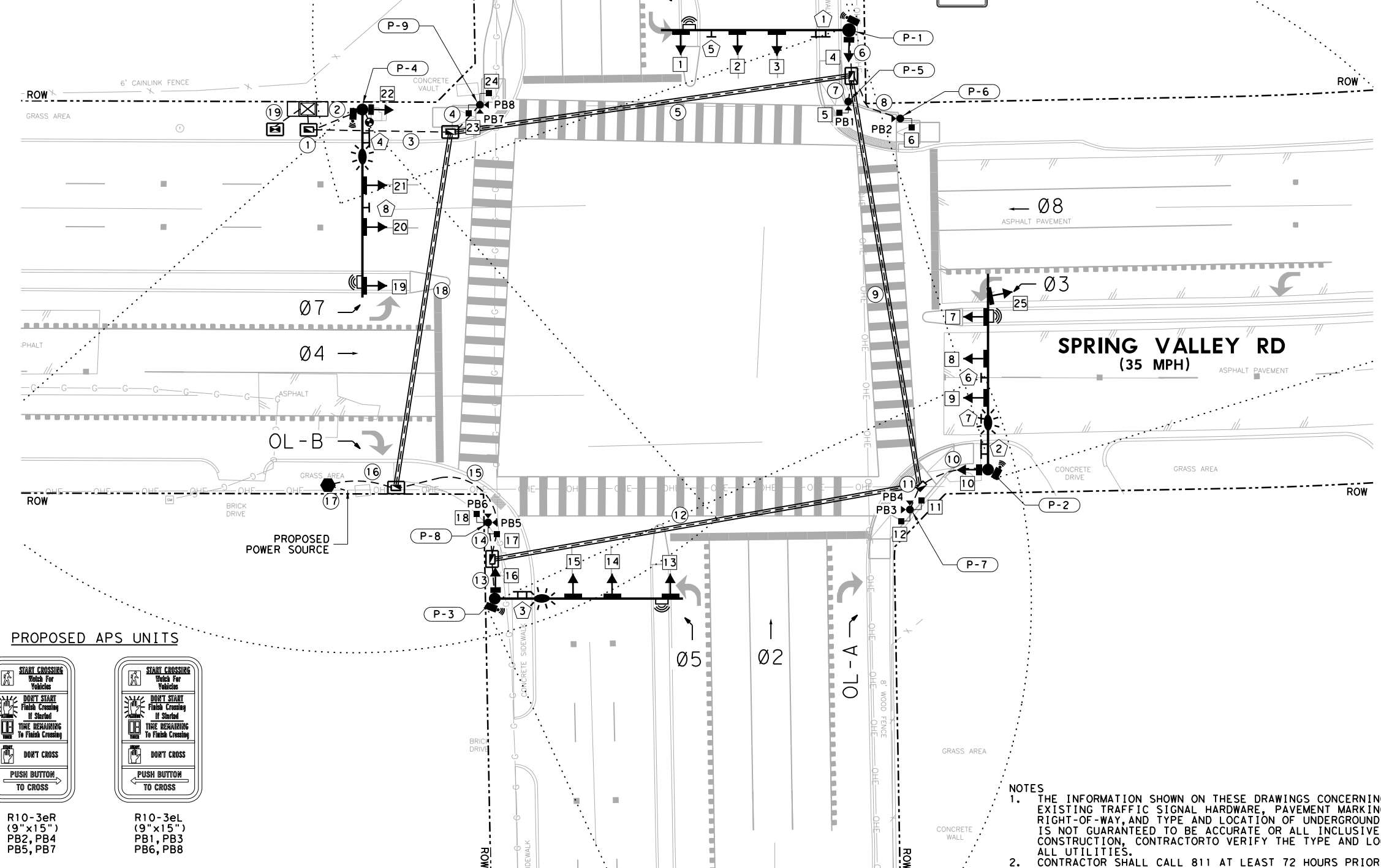


PROPOSED APS UNITS



R10-3eR (9"x15")
PB2, PB4
PB5, PB7

R10-3eL (9"x15")
PB1, PB3
PB6, PB8



NOTES

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- CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.

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TRAFFIC SIGNAL LAYOUT
SPRING VALLEY AT HILLCREST
SCALE: 1" = 30' SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	47

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RUN ID	LENGTH	SUMMARY OF CONDUIT AND CABLES																																		
		ITEM 618 CONDUIT												ITEM 620 ELECTRICAL CONDUCTORS								ITEM 684 TRAFFIC SIGNAL CABLES								ITEM 6004 ITS CABLE		SUB TO ITEM 6292 RVDS				
		2" (SCH 80)				3" (SCH 80)				4" (SCH 80)				#6 BARE		#12 INSULATED		#8 INSULATED		#6 INSULATED		TYPE A				TYPE C		ETHERNET CABLE**		PRES. RADAR CABLE		ADV. RADAR CABLE				
		TRENCH		BORE		TRENCH		BORE		TRENCH		BORE		EA	LF	EA	LF	EA	LF	EA	LF	5/C #14	7/C #14	12/C #14	20/C #14	2/C #12	EA	LF	EA	LF	EA	LF	EA	LF		
1	10'	1	10'									3	30'																							
2	15'					1	15'																													
3	35'	1	35'																																	
4	10'					1	10'																													
5	105'											1	105'																							
6	10'					1	10'																													
7	10'					1	10'																													
8	20'					1	20'																													
9	110'											1	110'																							
10	20'					1	20'																													
11	10'					1	10'																													
12	115'											1	115'																							
13	15'					1	15'																													
14	10'					1	10'																													
15	45'											1	45'																							
16	20'	1	20'																																	
17	5'	1	5'																																	
18	95'			1	95'																															
19	10'					1	10'																													
FUTURE FIBER																																				
CONDUIT AND CABLES INSIDE POLES																																				
P-1																																				
P-2																																				
P-3																																				
P-4																																				
P-5																																				
P-6																																				
P-7																																				
P-8																																				
P-9																																				
TOTALS:		70'		95'		130'				100'		425'		810'		240'		950'		320'		550'		270'		1110'		665'		1400'		55'		570'		925'

** FURNISHED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR.

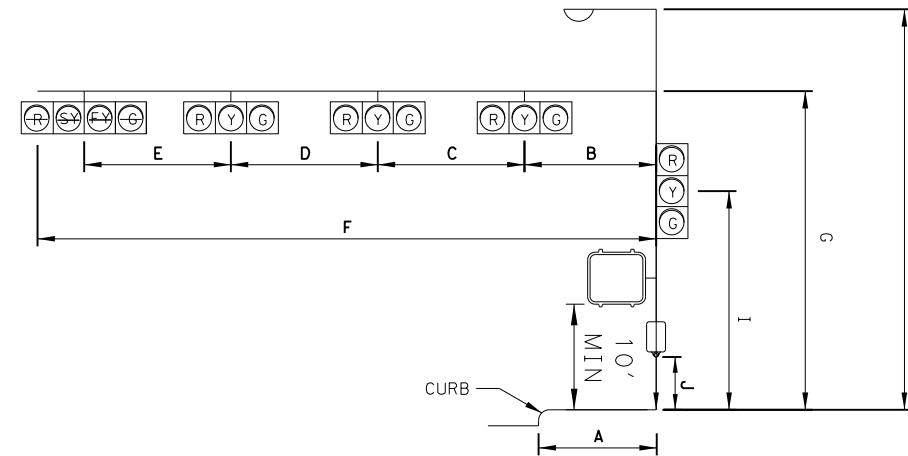
POLE ID	DIMENSIONS (SEE FIGURE)										HEADS ON MAST ARM	LUM ARM	ILSN ARM	ITEM 688 APS UNITS	ITEM 416 DRILLED SHAFT FOUNDATIONS					FDN TYPE															
	A	B	C	D	E	F	G	H	I	J					24"	30"	36"	42"	48"																
	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)					*																				
P-1	8	18.5	10	15		48	19		15		3																								
P-2	8	18.5	10	10	6	50	19	30	15		4	1																							
P-3	10	20	10	15		48	19	30	15		3	1																							
P-4	9	19.5	10	15		48	19	30	15		3	1																							
P-5	PEDESTAL POLE										3.5																								
P-6	PEDESTAL POLE										3.5																								
P-7	PEDESTAL POLE										3.5																								
P-8	PEDESTAL POLE										3.5																								
P-9	PEDESTAL POLE										3.5																								
TOTALS:											3																								

* SUBSIDIARY TO ITEM 687.

SIGNAL HEAD NO.	SIGNAL HEAD TYPE	ITEM 682 VEHICLE AND PEDESTRIAN SIGNAL HEADS																																	
		BACKPLATES			12" LED SIGNAL INDICATIONS						PED SIGNAL COUNTDOWN																								
		3 SEC (EA)	4 SEC (EA)	5 SEC (EA)	R (EA)	Y (EA)	G (EA)	R ARW (EA)	Y ARW (EA)	G ARW (EA)																									
2, 3, 8, 9, 14, 15, 20, 21, 25	H3	9																																	
16, 22	V3	2																																	
4, 10	V5FRT										2																								
1, 7, 13, 19	H5FLT										4																								
5, 6, 11, 12, 17, 18, 23, 24	PED																																		
TOTALS:		11				6					11																								

ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED (5) - 14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CKT. BKR. POLE/AMPS	TWO-POLE CONTACTOR AMPS	PANELBD/LOADCENTER AMP RATING	BRANCH CIRCUIT ID	BRANCH CKT. BKR. POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-2	ELEC SRV TY D 120/240 070 (NS)SS(E)PS(U)	2"	*	N/A	2P/70	30	100	SIG	1P/50	40	5.31
								LUM	1P/20	4.26	

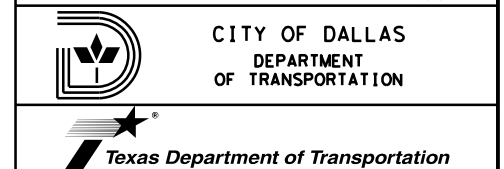
* FURNISHED AND INSTALLED BY ONCOR



ITEM 624 / 6186 GROUND BOXES	
DESCRIPTION	QTY
GROUND BOX TY D (162922)	1
GROUND BOX TY D (162922) W/APRON	5
ITS GND BOX (POLY) TY 1 (243624) W/APRN	1



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TRAFFIC SIGNAL DETAILS
SPRING VALLEY AT HILLCREST
 SCALE: N/A SHEET 1 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	48

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CNDR NO.	CNDR COLOR	CABLE TERMINATION								
		CABLE 1 FROM CNTRL TO POLE 1 20/C #14	CABLE 2 FROM CNTRL TO POLE 2 20/C #14	CABLE 3 FROM CNTRL TO POLE 3 20/C #14	CABLE 4 FROM CNTRL TO POLE 4 20/C #14	CABLE 5 FROM CNTRL TO POLE 5 12/C #14	CABLE 6 FROM CNTRL TO POLE 6 12/C #14	CABLE 7 FROM CNTRL TO POLE 7 12/C #14	CABLE 8 FROM CNTRL TO POLE 8 12/C #14	CABLE 9 FROM CNTRL TO POLE 9 12/C #14
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON
3	RED	SH 2,3 PHASE 2 RED	SH 8,9 PHASE 4 RED	SH 14,15,16 PHASE 6 RED	SH 20,21,22 PHASE 8 RED	SH 5 PHASE 8 DONT WALK	SPARE	SH 12 PHASE 4 DONT WALK	SH 17 PHASE 4 DONT WALK	SPARE
4	GREEN	SH 2,3 PHASE 2 GREEN	SH 8,9 PHASE 4 GREEN	SH 14,15,16 PHASE 6 GREEN	SH 20,21,22 PHASE 8 GREEN	SH 5 PHASE 8 WALK	SPARE	SH 12 PHASE 4 WALK	SH 17 PHASE 4 WALK	SPARE
5	ORANGE	SH 2,3 PHASE 2 YELLOW	SH 8,9 PHASE 4 YELLOW	SH 14,15,16 PHASE 6 YELLOW	SH 20,21,22 PHASE 8 YELLOW	SPARE	SPARE	SPARE	SPARE	SPARE
6	BLUE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
7	WHITE/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
8	RED/BLACK	SH 1 PHASE 5 RED ARW	SH 7 PHASE 7 RED ARW	SH 13 PHASE 1 RED ARW	SH 19 PHASE 3 RED ARW	SPARE	SH 6 PHASE 2 DONT WALK	SH 11 PHASE 2 DONT WALK	SH 18 PHASE 6 DONT WALK	SH 23 PHASE 6 DONT WALK
9	GREEN/BLACK	SH 1 PHASE 5 GRN ARW	SH 7 PHASE 7 GRN ARW	SH 6 PHASE 1 GRN ARW	SH 19 PHASE 3 GRN ARW	SPARE	SH 6 PHASE 2 WALK	SH 11 PHASE 2 WALK	SH 18 PHASE 6 WALK	SH 23 PHASE 6 WALK
10	ORANGE/BLACK	SH 1 PHASE 5 YEL ARW	SH 7 PHASE 7 YEL ARW	SH 6 PHASE 1 YEL ARW	SH 19 PHASE 3 YEL ARW	SPARE	SPARE	SPARE	SPARE	SPARE
11	BLUE/BLACK	SH 1 PHASE 5 FL YEL ARW	SH 7 PHASE 7 FL YEL ARW	SH 6 PHASE 1 FL YEL ARW	SH 19 PHASE 3 FL YEL ARW	SPARE	SPARE	SPARE	SPARE	SPARE
12	BLACK/WHITE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
13	RED/WHITE	SH 4 OL-A RED ARW	SH 10 OL-B RED ARW	SPARE	SPARE					
14	GREEN/WHITE	SH 4 OL-A GRN ARW	SH 10 OL-B GRN ARW	SPARE	SPARE					
15	BLUE/WHITE	SH 4 OL-A YEL ARW	SH 10 OL-B YEL ARW	SPARE	SPARE					
16	BLACK/RED	SH 4 OL-A FL YEL ARW	SH 10 OL-B FL YEL ARW	SPARE	SPARE					
17	WHITE/RED	SPARE	SPARE	SPARE	SPARE					
18	ORANGE/RED	SPARE	SH 25 PHASE 8 RED	SPARE	SPARE					
19	BLUE/RED	SPARE	SH 25 PHASE 8 GREEN	SPARE	SPARE					
20	RED/GREEN	SPARE	SH 25 PHASE 8 YELLOW	SPARE	SPARE					

APS MESSAGE INFORMATION			
APS UNIT NO.	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
PB2 PB3	PHASE 2	BUTTON PUSH ON DW	WAIT TO CROSS SPRING VALLEY ROAD AT HILLCREST ROAD
		EXTENDED BUTTON PUSH	WAIT TO CROSS SPRING VALLEY ROAD AT HILLCREST ROAD
		LOCATOR TONE	SLOW TICK
PB4 PB6	PHASE 4	WALK INDICATION*	SPRING VALLEY ROAD. WALK SIGN IS ON TO CROSS SPRING
		BUTTON PUSH ON DW	WAIT TO CROSS HILLCREST ROAD AT SPRING VALLEY ROAD
		EXTENDED BUTTON PUSH	WAIT TO CROSS HILLCREST ROAD AT SPRING VALLEY ROAD
PB5 PB8	PHASE 6	LOCATOR TONE	SLOW TICK
		WALK INDICATION*	HILLCREST ROAD. WALK SIGN IS ON TO CROSS HILLCREST
		BUTTON PUSH ON DW	WAIT TO CROSS SPRING VALLEY ROAD AT HILLCREST ROAD
PB1 PB7	PHASE 8	EXTENDED BUTTON PUSH	WAIT TO CROSS SPRING VALLEY ROAD AT HILLCREST ROAD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	SPRING VALLEY ROAD. WALK SIGN IS ON TO CROSS SPRING
		BUTTON PUSH ON DW	WAIT TO CROSS HILLCREST ROAD AT SPRING VALLEY ROAD
		EXTENDED BUTTON PUSH	WAIT TO CROSS HILLCREST ROAD AT SPRING VALLEY ROAD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	HILLCREST ROAD. WALK SIGN IS ON TO CROSS HILLCREST

* COUNTDOWN SPEECH MESSAGE = "OFF" FOR ALL UNITS.



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DEPARTMENT OF TRANSPORTATION
Texas Department of Transportation

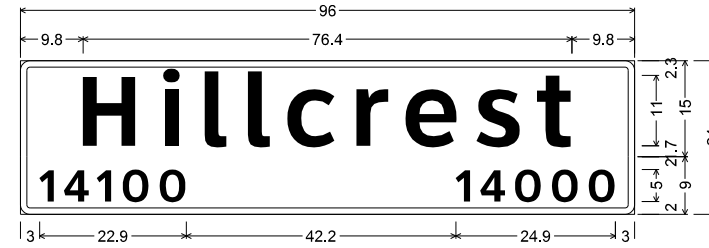
TRAFFIC SIGNAL DETAILS
SPRING VALLEY AT HILLCREST

SCALE: N/A SHEET 2 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT		HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET		VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.
				SHEET NO.
				49

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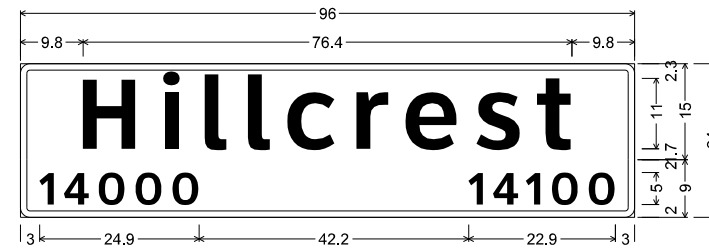
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D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Hillcrest", ClearviewHwy-5-W;

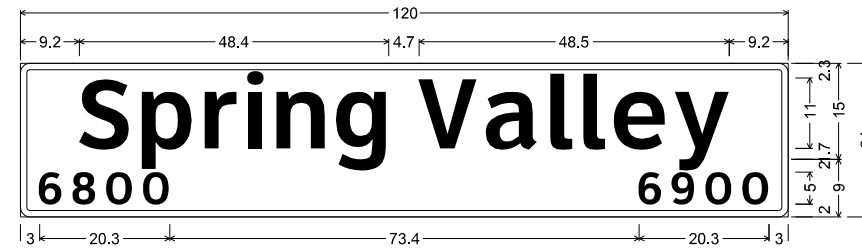
1.5" Radius, 1.0" Border, White on Green;
"14100", ClearviewHwy-5-W; "14000", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Hillcrest", ClearviewHwy-5-W;

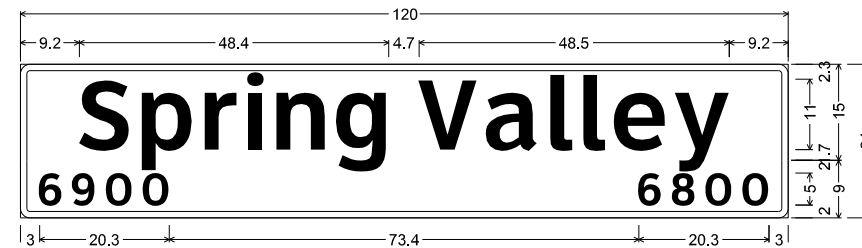
1.5" Radius, 1.0" Border, White on Green;
"14000", ClearviewHwy-5-W; "14100", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Spring Valley", ClearviewHwy-5-W 50% spacing;

1.5" Radius, 1.0" Border, White on Green;
"6800", ClearviewHwy-5-W; "6900", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Spring Valley", ClearviewHwy-5-W 50% spacing;

1.5" Radius, 1.0" Border, White on Green;
"6900", ClearviewHwy-5-W; "6800", ClearviewHwy-5-W;



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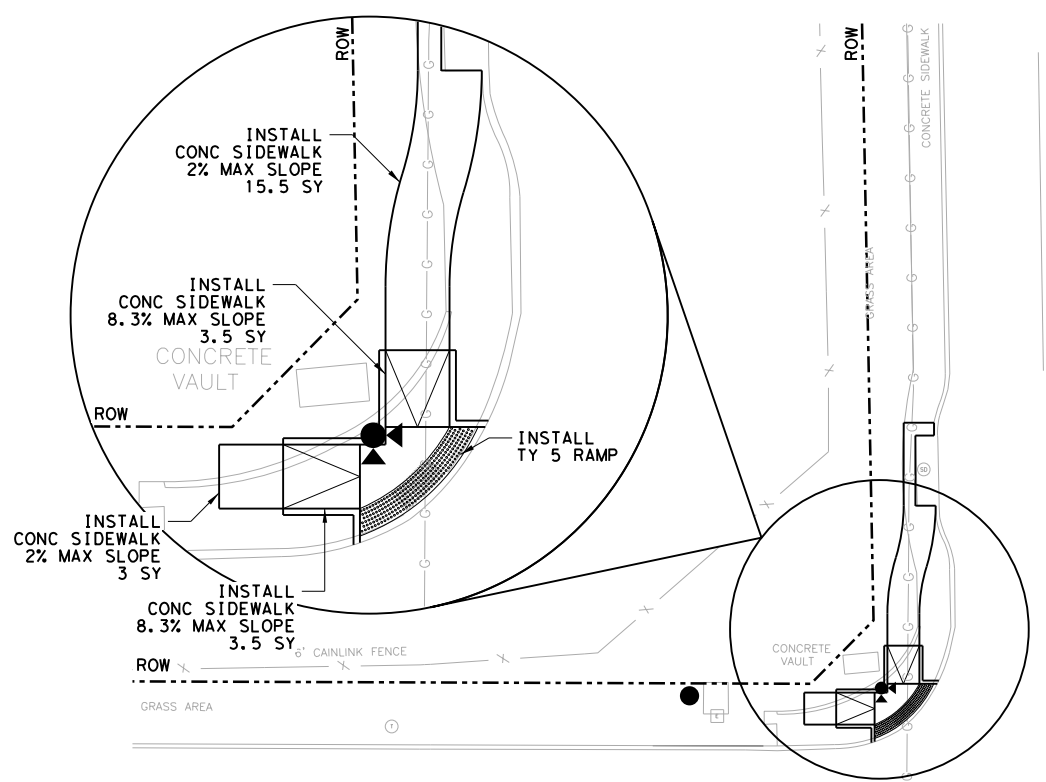
Texas Department of Transportation

**TRAFFIC SIGNAL
DETAILS
SPRING VALLEY AT HILLCREST**

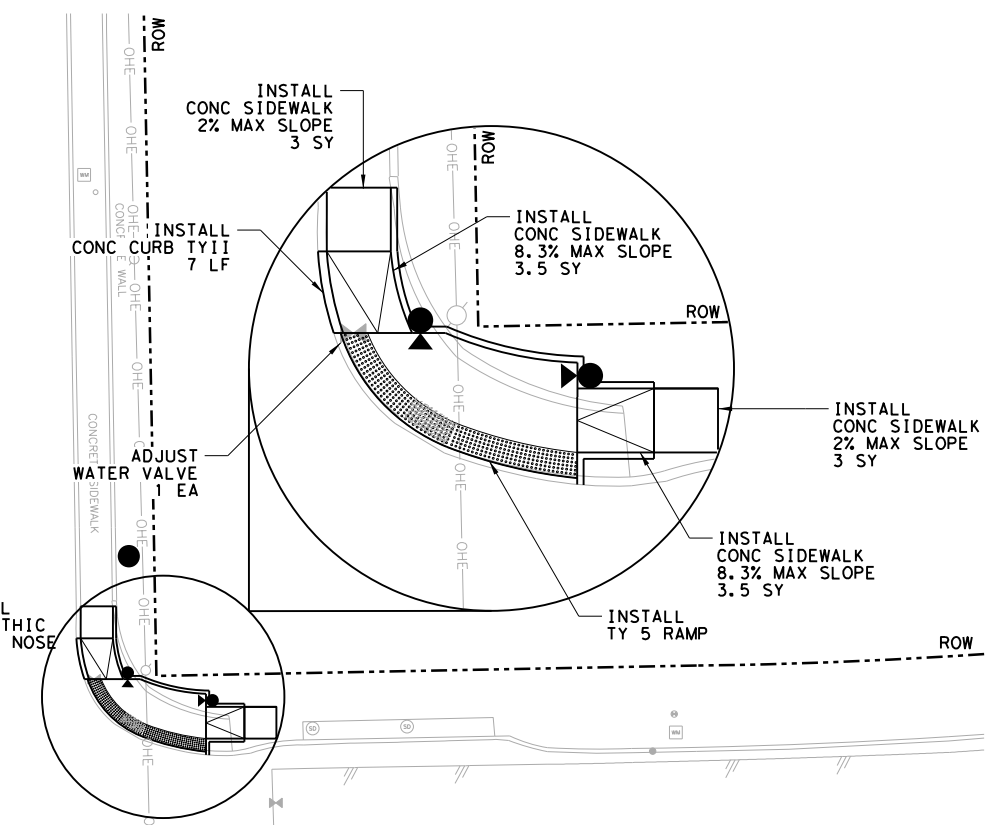
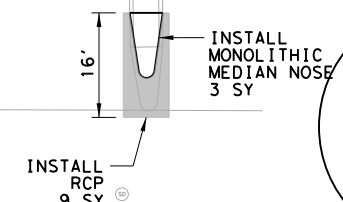
SCALE: N/A SHEET 3 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	50

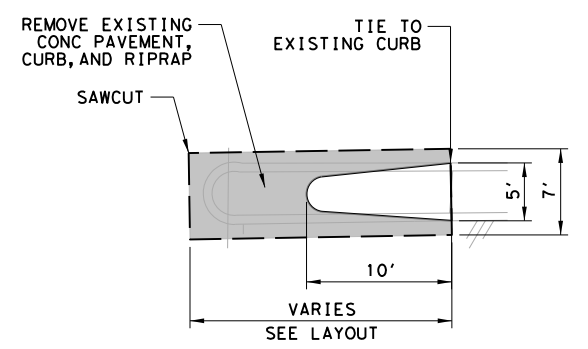
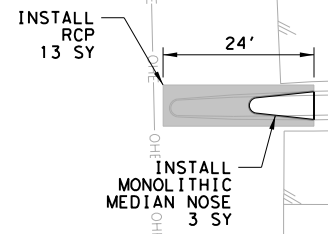
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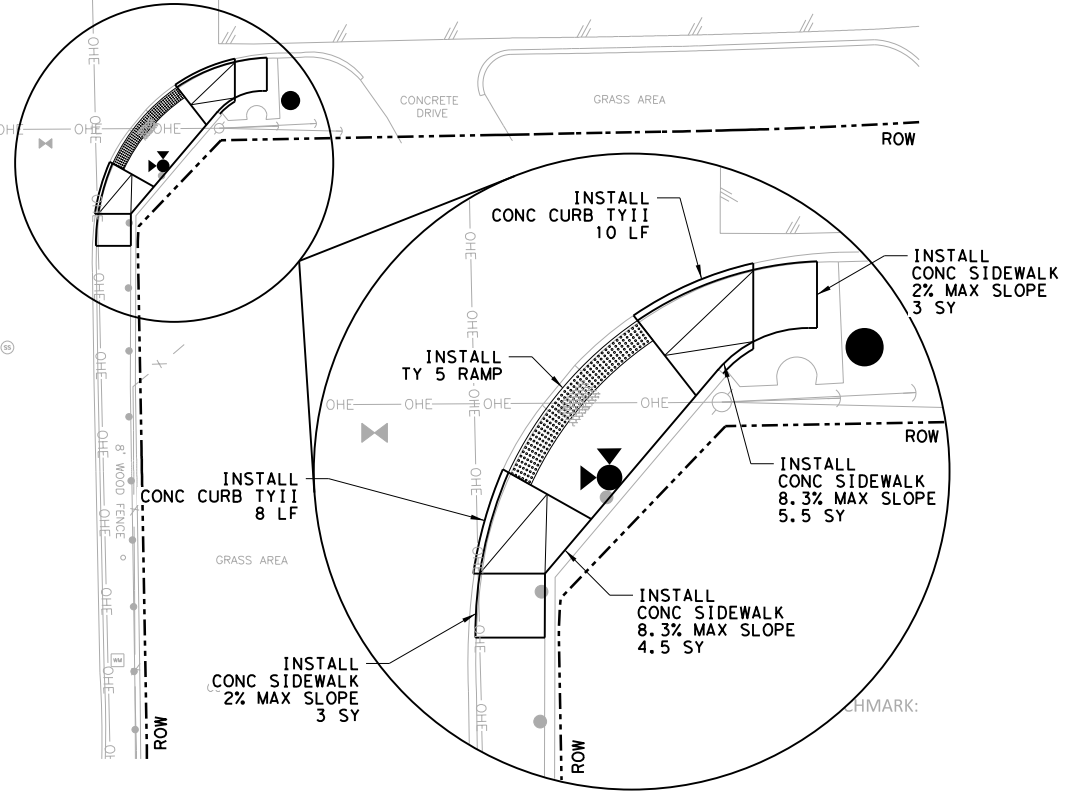
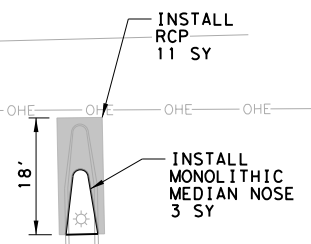
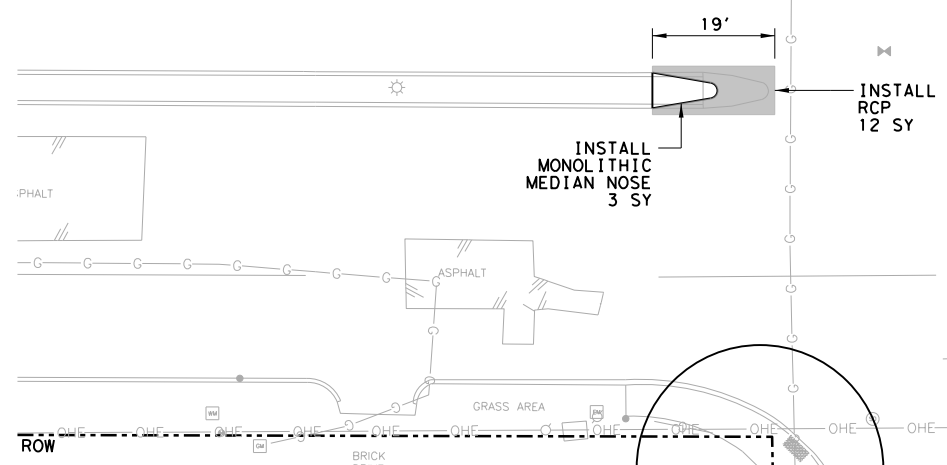
**HILLCREST RD
(35 MPH)**



**SPRING VALLEY RD
(35 MPH)**



**TYPICAL
MEDIAN NOSE
PULLBACK**



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**PEDESTRIAN RAMPS
LAYOUT
SPRING VALLEY AT HILLCREST**

SCALE: 1"=30' SHEET 1 OF 1

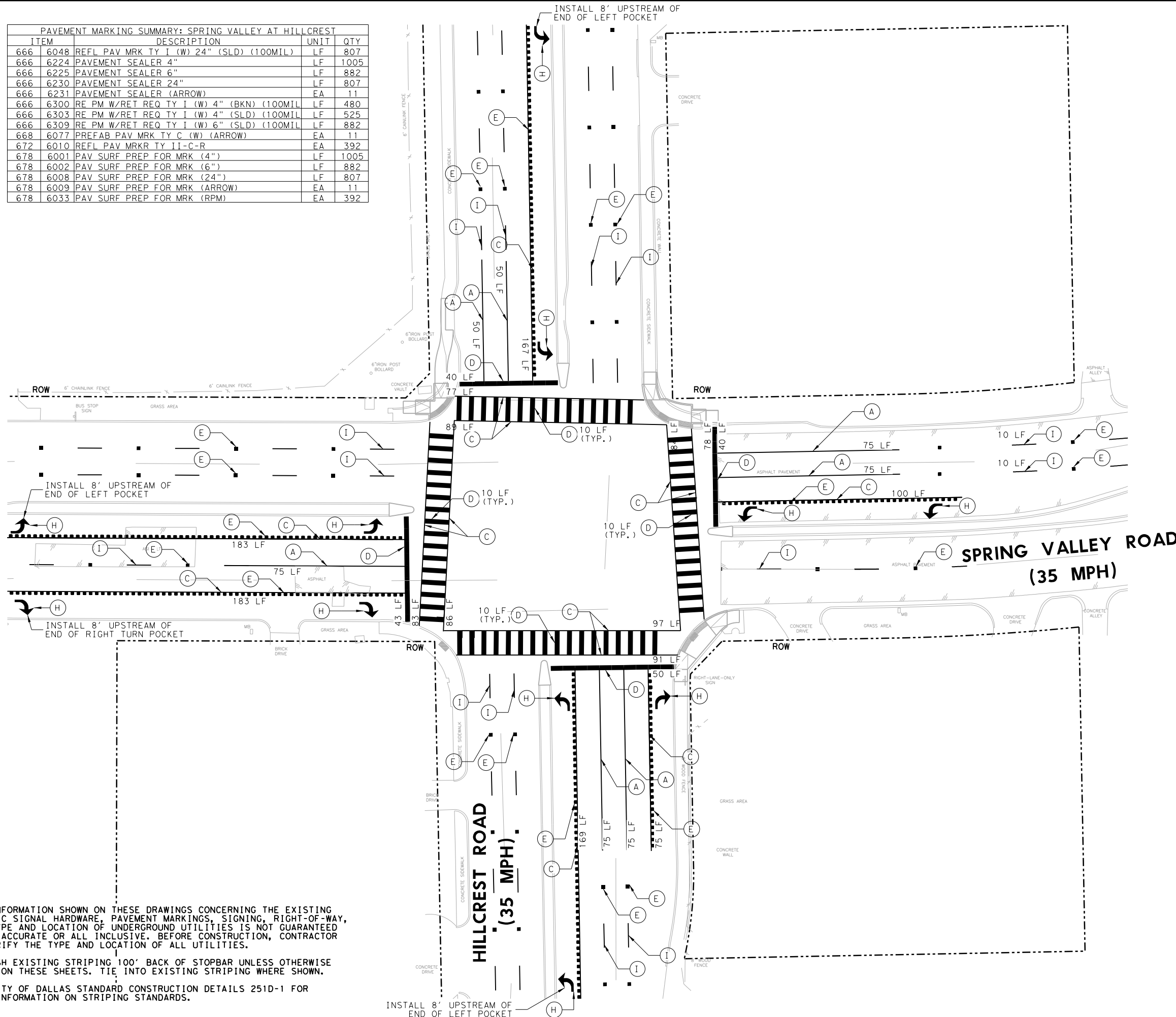
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6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
			JOB NO.
			267, ETC.
			SHEET NO.
			51

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PAVEMENT MARKING SUMMARY: SPRING VALLEY AT HILLCREST

ITEM	DESCRIPTION	UNIT	QTY
666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	807
666 6224	PAVEMENT SEALER 4"	LF	1005
666 6225	PAVEMENT SEALER 6"	LF	882
666 6230	PAVEMENT SEALER 24"	LF	807
666 6231	PAVEMENT SEALER (ARROW)	EA	11
666 6300	RE PM W/RET REQ TY I (W) 4" (BKN) (100MIL)	LF	480
666 6303	RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)	LF	525
666 6309	RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)	LF	882
668 6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	11
672 6010	REFL PAV MRKR TY II-C-R	EA	392
678 6001	PAV SURF PREP FOR MRK (4")	LF	1005
678 6002	PAV SURF PREP FOR MRK (6")	LF	882
678 6008	PAV SURF PREP FOR MRK (24")	LF	807
678 6009	PAV SURF PREP FOR MRK (ARROW)	EA	11
678 6033	PAV SURF PREP FOR MRK (RPM)	EA	392



PROPOSED LEGEND

- (A) RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)
- (B) RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)
- (C) RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
- (D) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
- (E) REFL PAV MRKR (TY II-C-R)
- (F) REFL PAV MRKR (TY I-C)
- (G) REFL PAV MRKR (TY II-A-A)
- (H) PREFAB PAV MRK TY C (W) (ARROW)
- (I) RE PM W/RET REQ TY I (W) 4" (BRK) (100MIL)
- (J) REFL PAV MRK TY I (W) 6" (DOT) (100MIL)
- (K) REFL PAV MRK TY I (W) 12" (SLD) (100MIL)
- (L) PREFAB PAV MRK TY C (W) (DBL ARROW)
- (M) REF PAV MRK TY I (W) 36" (YLDTRI) (100MIL)
- IN SM RD SN SUP&AMTY10BWG(1)SA(T)



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Texas Department of Transportation

PAVEMENT MARKING LAYOUT
SPRING VALLEY AT HILLCREST

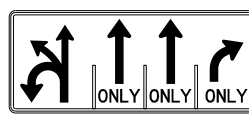
SCALE: 1" = 40' SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	52

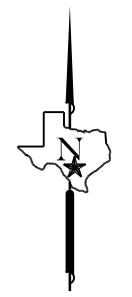
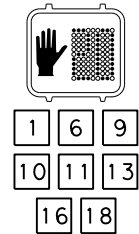
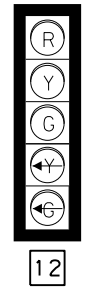
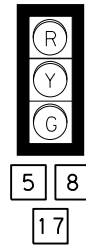
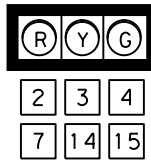
- THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
- REFRESH EXISTING STRIPING 100' BACK OF STOPBAR UNLESS OTHERWISE SHOWN ON THESE SHEETS. TIE INTO EXISTING STRIPING WHERE SHOWN.
- SEE CITY OF DALLAS STANDARD CONSTRUCTION DETAILS 251D-1 FOR MORE INFORMATION ON STRIPING STANDARDS.

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EXISTING MAST ARM SIGNS



EXISTING SIGNAL HEADS



SCALE IN FEET
20 0 20 40

EXISTING LEGEND

- POLE-MOUNTED CONTROLLER
- GROUND-MOUNTED CONTROLLER
- GROUND BOX
- MAST ARM POLE
- PEDESTRIAN SIGNAL POLE
- HORIZONTAL SIGNAL HEAD
- VERTICAL SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- LUMINAIRE
- OVERHEAD SIGN
- SERVICE METER & DISCONNECT
- PTZ CAMERA
- CONDUIT TO BE ABANDONED

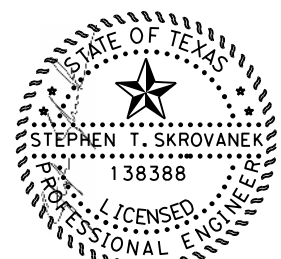
FRANKFORD RD
(40 MPH)

DALLAS PKWY
(45 MPH)

MATCH LINE A-A

NOTES:

- THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
- CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.
- VARIOUS REMOVAL QUANTITIES INCLUDED IN THE TABLE MAY BE BEYOND THE LIMITS OF THIS SHEET AND MAY NOT BE SHOWN ON THIS LAYOUT.



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EXISTING CONDITIONS & REMOVALS
DALLAS PKWY AT FRANKFORD RD
SCALE: 1"=30' SHEET 1 OF 2

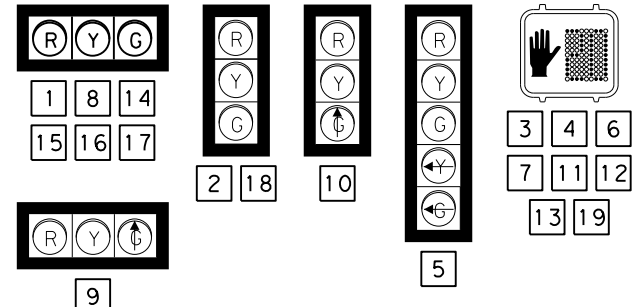
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6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL.IN, ETC.	0918	24
			JOB NO.
			267, ETC.
			SHEET NO.
			53

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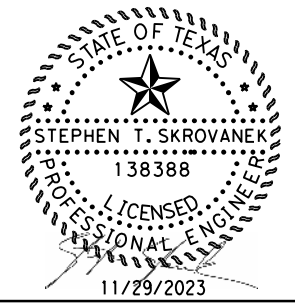
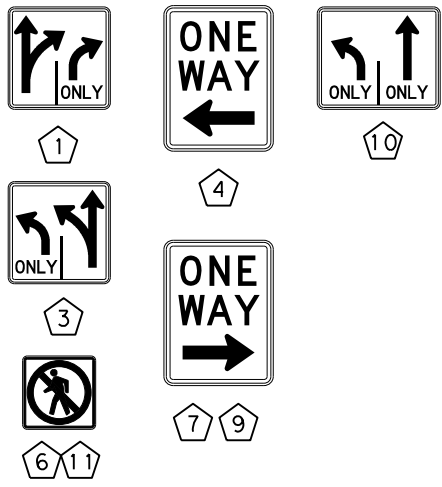
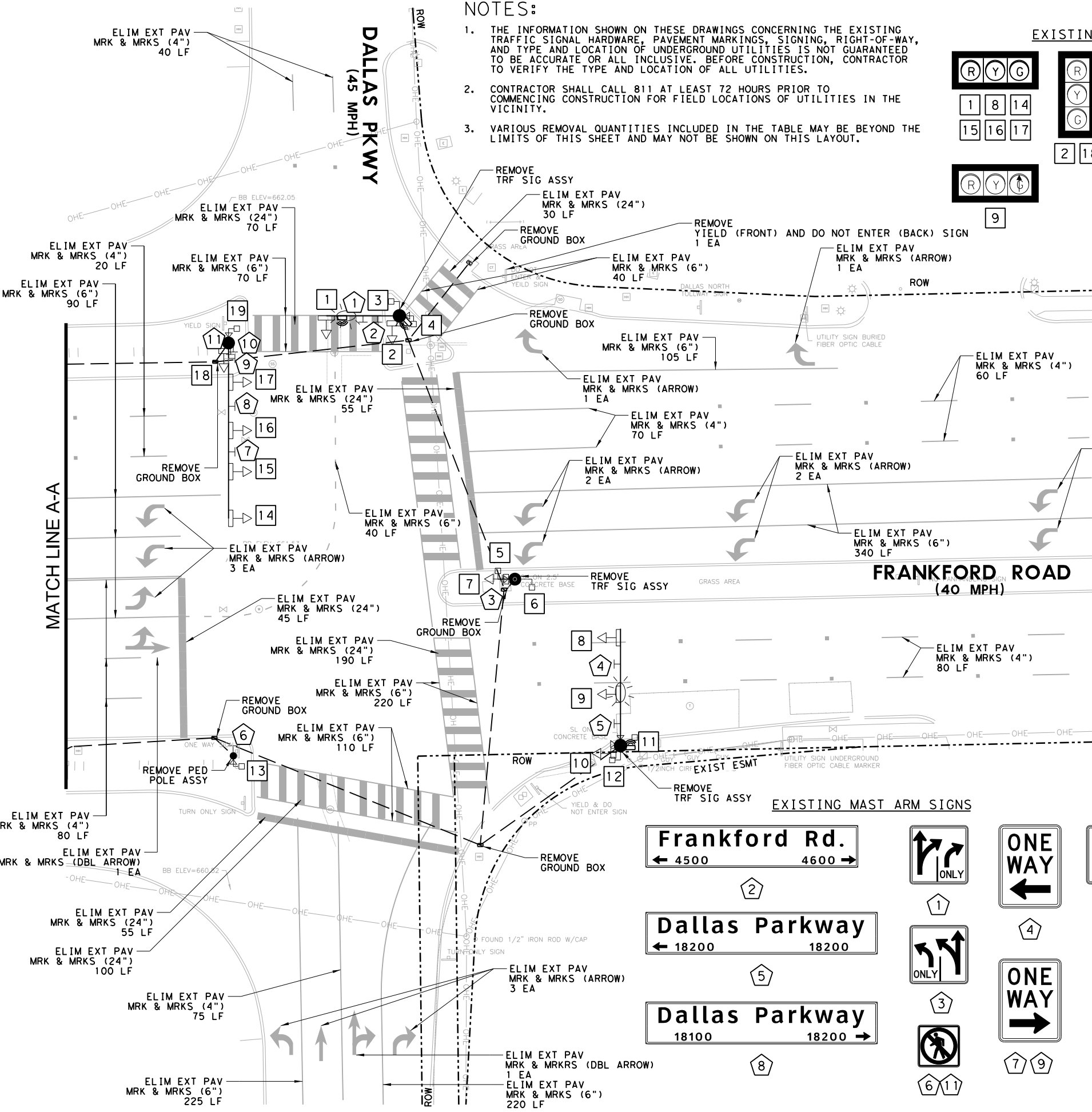
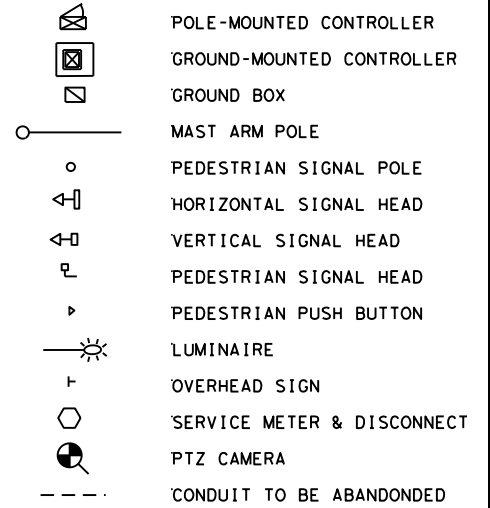
NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
2. CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.
3. VARIOUS REMOVAL QUANTITIES INCLUDED IN THE TABLE MAY BE BEYOND THE LIMITS OF THIS SHEET AND MAY NOT BE SHOWN ON THIS LAYOUT.

EXISTING SIGNAL HEADS



EXISTING LEGEND



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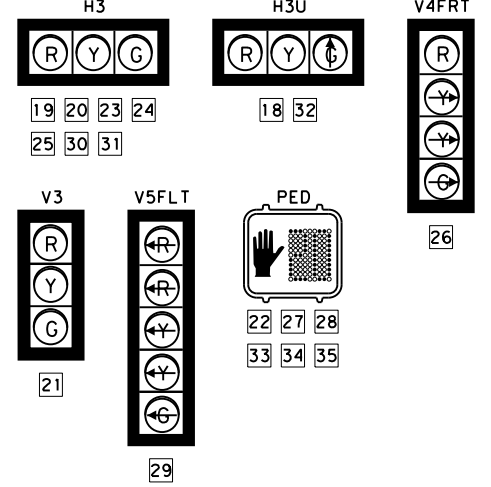
Texas Department of Transportation

EXISTING CONDITIONS & REMOVALS
DALLAS PKWY AT FRANKFORD RD
SCALE: 30' = 1" SHEET 2 OF 2

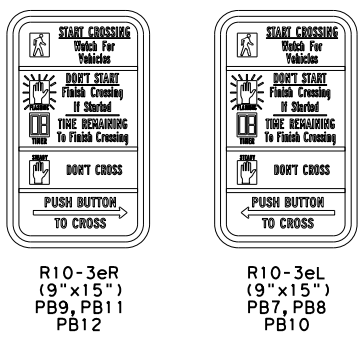
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6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	54

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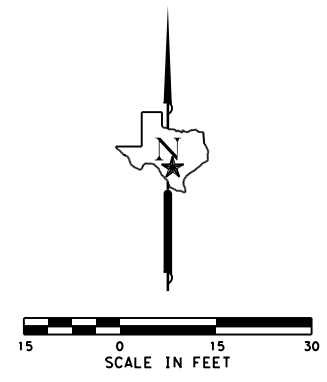
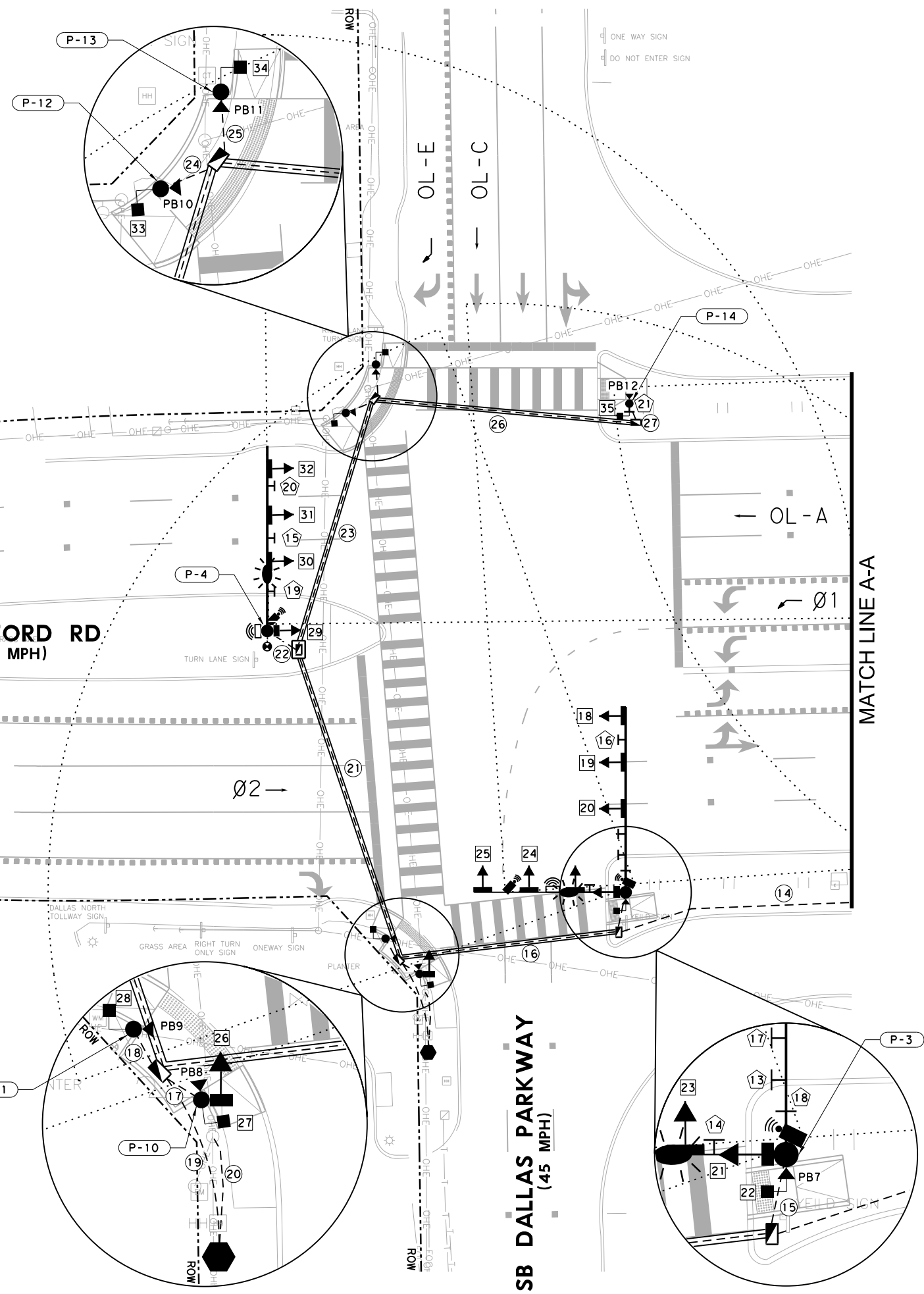
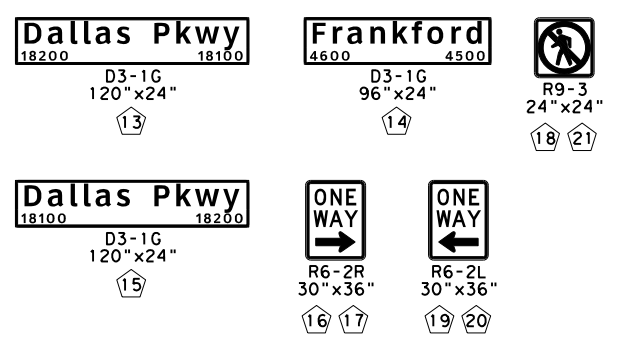
PROPOSED SIGNAL HEADS



PROPOSED APS UNITS



PROPOSED MAST ARM SIGNS



PROPOSED LEGEND

- CONTROLLER CABINET W/BBU
- TY D GROUND BOX
- TY D GROUND BOX W/APRON
- MAST ARM POLE
- PEDESTRIAN SIGNAL POLE
- HORIZONTAL SIGNAL HEAD
- VERTICAL SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- LUMINAIRE
- OVERHEAD SIGN
- SERVICE METER & DISCONNECT
- CONDUIT TRENCH
- CONDUIT BORE
- PRESENCE RADAR
- ADVANCE RADAR
- PTZ CAMERA
- ITS GROUND BOX TY 1 W/APRON



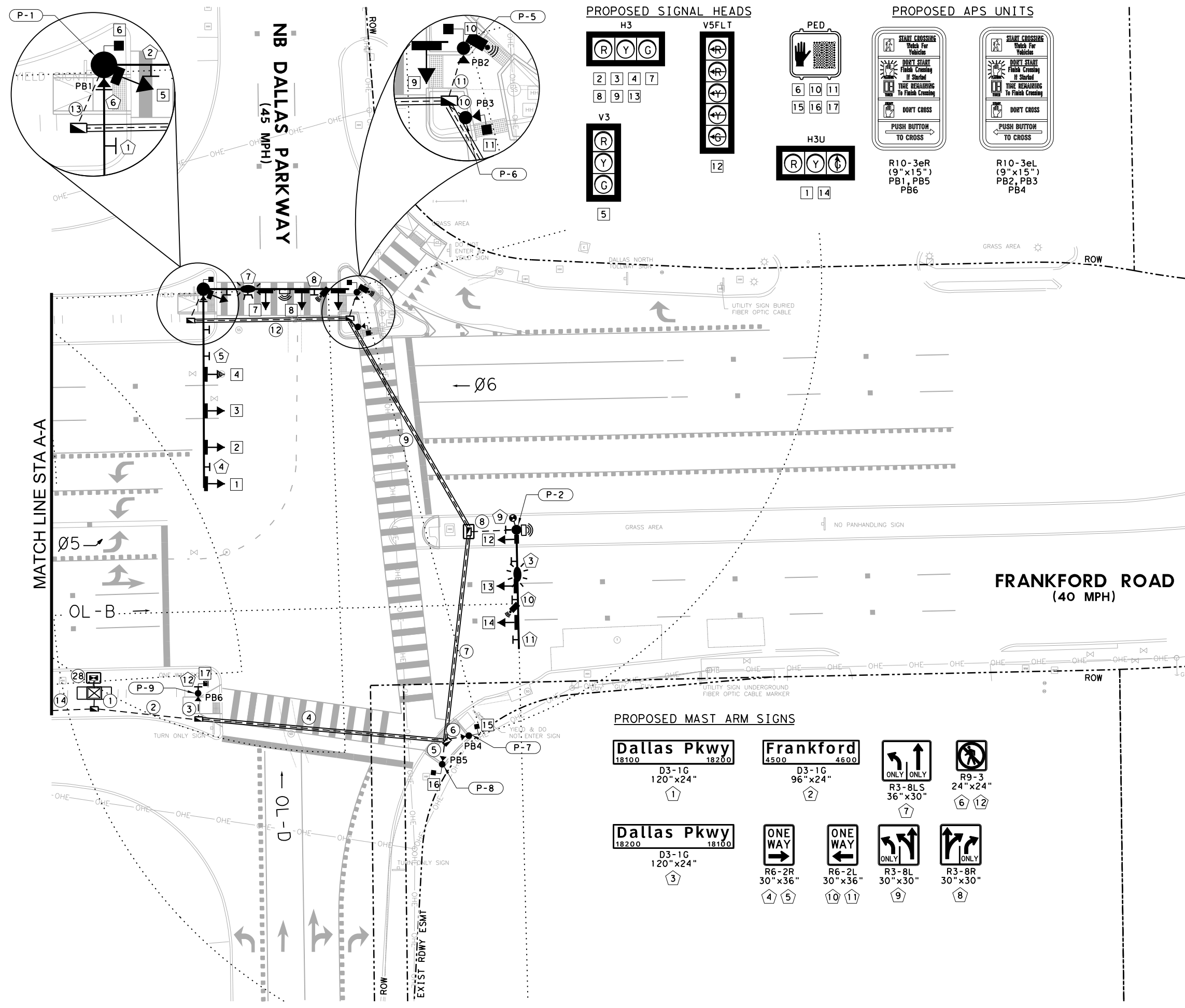
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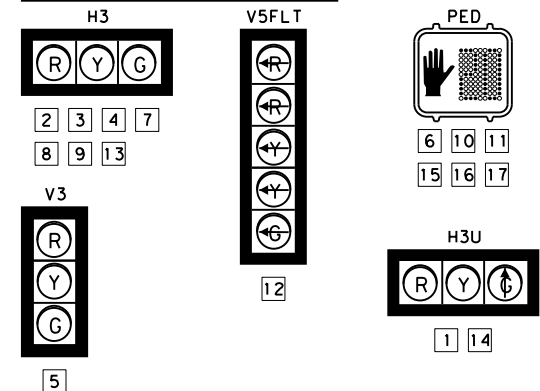
TRAFFIC SIGNAL LAYOUT
 DALLAS PKWY AT FRANKFORD RD
 SCALE: 1"=30' SHEET 1 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	55

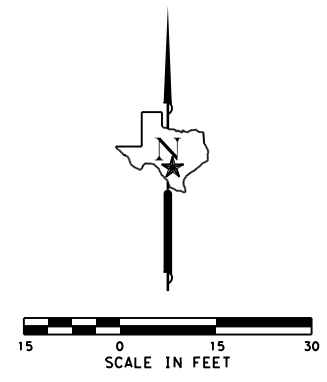
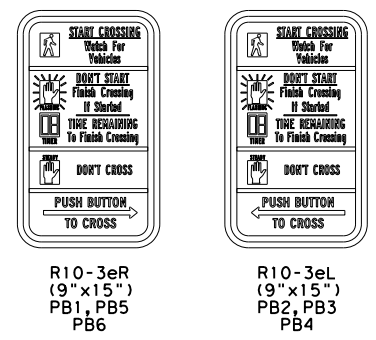
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PROPOSED SIGNAL HEADS



PROPOSED APS UNITS

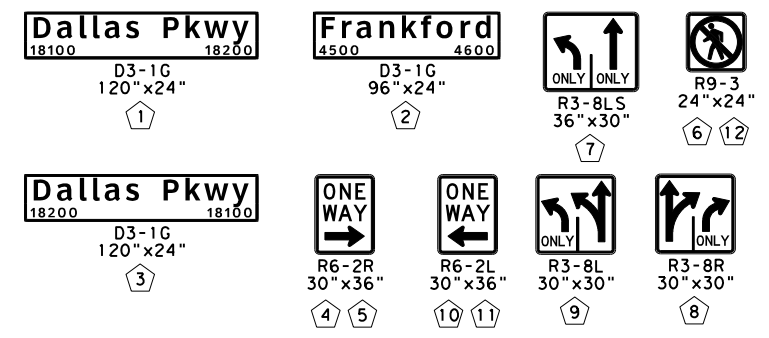


PROPOSED LEGEND

- CONTROLLER CABINET W/BBU
- TY D GROUND BOX
- TY D GROUND BOX W/APRON
- MAST ARM POLE
- PEDESTRIAN SIGNAL POLE
- HORIZONTAL SIGNAL HEAD
- VERTICAL SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- LUMINAIRE
- OVERHEAD SIGN
- SERVICE METER & DISCONNECT
- CONDUIT TRENCH
- CONDUIT BORE
- PRESENCE RADAR
- ADVANCE RADAR
- PTZ CAMERA
- ITS GROUND BOX TY 1 W/APRON



PROPOSED MAST ARM SIGNS



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DEPARTMENT OF TRANSPORTATION

Texas Department of Transportation

TRAFFIC SIGNAL LAYOUT
DALLAS PKWY AT FRANKFORD RD
SCALE: 1"=30' SHEET 2 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	56

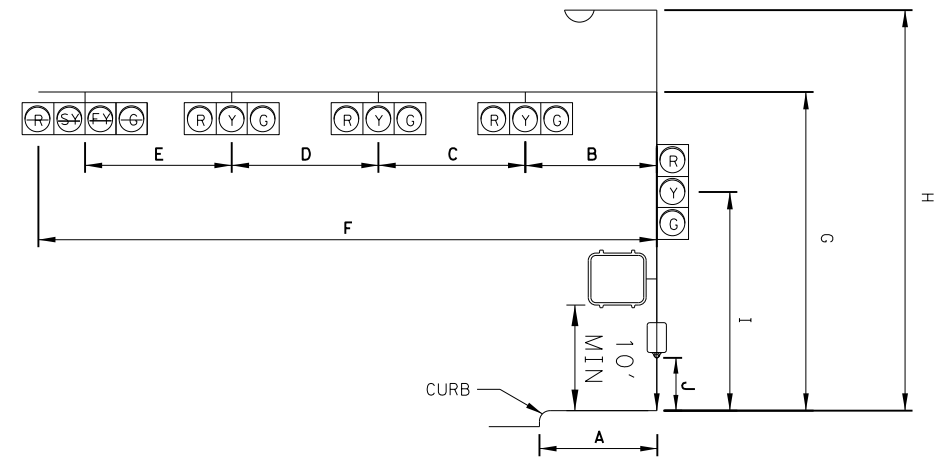
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RUN ID	LENGTH	SUMMARY OF CONDUIT AND CABLES																														
		ITEM 618 CONDUIT												ITEM 620 ELECTRICAL CONDUCTORS						ITEM 684 TRAFFIC SIGNAL CABLES						ITEM 6004 ITS CABLE		SUB TO ITEM 6292 RVDS				
		2" (SCH 80)				3" (SCH 80)				4" (SCH 80)				#6 BARE	#12 INSULATED	#8 INSULATED	#6 INSULATED	TYPE A						ETHERNET CABLE**	PRES. RADAR CABLE**	ADV. RADAR CABLE**						
		TRENCH		BORE		TRENCH		BORE		TRENCH		BORE						5/C #14	7/C #14	12/C #14	20/C #14	TYPE C										
EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF			
1	5'	1	5'									3	15'							10	50'	4	20'	12	60'	2	10'	6	30'	4	20'	
2	30'											1	30'			2	60'			5	150'	2	60'	6	180'	1	30'	3	90'	2	60'	
3	10'					1	10'					1	10'							1	10'			1	10'							
4	75'							1	75'			1	75'			2	150'			4	300'	2	150'	5	375'	1	75'	3	225'	2	150'	
5	10'					1	10'					1	10'							1	10'			1	10'							
6	10'					1	10'					1	10'							1	10'			1	10'							
7	65'							1	65'			1	65'			2	130'			2	130'	2	130'	3	195'	1	65'	3	195'	2	130'	
8	15'					1	15'					1	15'			2	30'									1	15'	1	15'	1	15'	
9	75'							1	75'			1	75'			2	150'			2	150'	1	75'	3	225'			2	150'	1	75'	
10	5'					1	5'					1	5'							1	5'			1	5'							
11	10'					1	10'					1	10'							1	10'			1	10'							
12	50'							1	50'			1	50'			2	100'						1	50'	1	50'			1	50'	1	50'
13	10'					1	10'					1	10'			2	20'						1	10'	1	10'			1	10'	1	10'
14	70'	1	70'							1	70'			2	140'			2	140'	2	140'	2	140'	6	420'	1	70'	3	210'	2	140'	
15	10'					1	10'					1	10'			2	20'						1	10'	1	10'			2	20'	1	10'
16	55'			1	55'					1	55'			2	110'			4	220'	2	110'			5	275'	1	55'	5	275'	1	55'	
17	5'					1	5'					1	5'							1	5'			1	5'							
18	5'					1	5'					1	5'							1	5'			1	5'							
19	25'	1	25'									1	25'			4	100'	2	50'													
20	20'	1	20'																													
21	80'							1	80'			1	80'			2	160'					3	240'	1	80'	3	240'	1	80'	1	80'	
22	10'					1	10'					1	10'			2	20'						1	10'	1	10'	1	10'	1	10'		
23	65'							1	65'			1	65'									3	195'			3	195'					
24	10'					1	10'					1	10'									1	10'			1	10'					
25	10'					1	10'					1	10'									1	10'			1	10'					
26	65'							1	65'			1	65'									1	65'			1	65'					
27	5'					1	5'					1	5'									1	5'			1	5'					
28	5'					1	5'					1	5'									1	5'			1	5'					
TO BE INSTALLED BY ONCOR																																
21	80'							1	80'			1	80'			2	160'					3	240'	1	80'	3	240'	1	80'	1	80'	
22	10'					1	10'					1	10'			2	20'						1	10'	1	10'	1	10'	1	10'		
23	65'							1	65'			1	65'									3	195'			3	195'					
24	10'					1	10'					1	10'									1	10'			1	10'					
25	10'					1	10'					1	10'									1	10'			1	10'					
26	65'							1	65'			1	65'									1	65'			1	65'					
27	5'					1	5'					1	5'									1	5'			1	5'					
28	5'					1	5'					1	5'									1	5'			1	5'					
FUTURE FIBER																																

ITEM 624 / 6186 GROUND BOXES	
DESCRIPTION	QTY
GROUND BOX TY D (162922)	9
GROUND BOX TY D (162922)W/APRON	1
ITS GND BOX (POLY) TY 1 (243624)W/APRN	1

POLE ID	DIMENSIONS (SEE FIGURE)											HEADS ON MAST ARM	LUM ARM	ITEM 688 APS UNITS	ITEM 416 DRILLED SHAFT FOUNDATIONS					FDN TYPE												
	A	B	C	D	E	F	G	H	I	J	24"				30"	36"	42"	48"														
	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	(FT)	*																					
P-1 WB	15.5	25.5	11	11	11	60	19				30	15	3.5	4																	48-A	
P-1 NB	4	19	11	11		44	19				30			1																	36-A	
P-2	5	17	11			36	19				30	15		2			14'														36-B	
P-3 EB	9	20	11	11		44	19				30		3.5	3			16'														36-A	
P-3 SB	4	11	11	11		36	19				30			3			14'														24-A	
P-4	9	16.5	11	11		44	19				30	15		3			14'														24-A	
P-5	PEDESTAL POLE											-	20			3.5		1	6'					24-A								
P-6	PEDESTAL POLE											-	15			3.5		1	6'					24-A								
P-7	PEDESTAL POLE											-	15			3.5		1	6'					24-A								
P-8	PEDESTAL POLE											-	15			3.5		1	6'					24-A								
P-9	PEDESTAL POLE											-	15			3.5		1	6'					24-A								
P-10	PEDESTAL POLE											-	15		15	3.5		1	6'					24-A								
P-11	PEDESTAL POLE											-	15			3.5		1	6'					24-A								
P-12	PEDESTAL POLE											-	15			3.5		1	6'					24-A								
P-13	PEDESTAL POLE											-	15			3.5		1	6'					24-A								
P-14	PEDESTAL POLE											-	15			3.5		1	6'					24-A								
TOTALS:												4	12	60'		44'		22'														

* SUBSIDIARY TO ITEM 687.



ITEM 628 ELECTRICAL SERVICES											
ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED (5) - 14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CKT. BKR. POLE/AMPS	TWO-POLE CONTACTOR AMPS	PANELBD/LOADCENTER AMP RATING	BRANCH CIRCUIT ID	BRANCH CKT. BKR. POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-4	ELEC SRV TY D 120/240 070 (NS)SS(E)PS(U)	2"	*	N/A	2P/70	30	100	SIG	1P/50	40	5.48
								NBFR LUM	1P/20	2.84	
								SBFR LUM	1P/20	2.84	

* FURNISHED AND INSTALLED BY ONCOR



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Texas Department of Transportation

TRAFFIC SIGNAL DETAILS
DALLAS PKWY AT FRANKFORD RD
SCALE: N/A SHEET 1 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	57

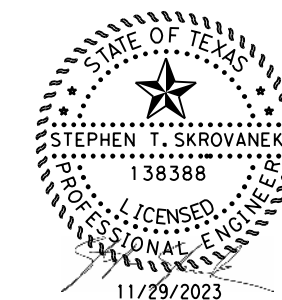
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CABLE TERMINATION															
CNDR NO.	CNDR COLOR	CABLE 1 FROM CNTRL TO POLE 1 20/C #14	CABLE 2 FROM CNTRL TO POLE 2 20/C #14	CABLE 3 FROM CNTRL TO POLE 3 20/C #14	CABLE 4 FROM CNTRL TO POLE 4 20/C #14	CABLE 5 FROM CNTRL TO POLE 5 12/C #14	CABLE 6 FROM CNTRL TO POLE 6 12/C #14	CABLE 7 FROM CNTRL TO POLE 7 12/C #14	CABLE 8 FROM CNTRL TO POLE 8 12/C #14	CABLE 9 FROM CNTRL TO POLE 9 12/C #14	CABLE 10 FROM CNTRL TO POLE 10 12/C #14	CABLE 11 FROM CNTRL TO POLE 11 12/C #14	CABLE 12 FROM CNTRL TO POLE 12 12/C #14	CABLE 13 FROM CNTRL TO POLE 13 12/C #14	CABLE 14 FROM CNTRL TO POLE 14 12/C #14
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON
3	RED	SH 1, 2, 3, 4, 5 PHASE 6 RED	SH 13, 14 OL-B RED	SH 18, 19, 20, 21 PHASE 2 RED	SH 30, 31 OL-A RED	SPARE	SH 11 PHASE 8 DONT WALK	SH 15 PHASE 8 DONT WALK	SPARE	SPARE	SH 26 OL-E RED	SH 28 PHASE 4 DONT WALK	SH 33 PHASE 4 DONT WALK	SPARE	SPARE
4	GREEN	SH 1, 2, 3, 4, 5 PHASE 6 GRN (ARW)	SH 13, 14 OL-B GRN (ARW)	SH 18, 19, 20, 21 PHASE 2 GRN (ARW)	SH 30, 31 OL-A GRN (ARW)	SPARE	SH 11 PHASE 8 WALK	SH 15 PHASE 8 WALK	SPARE	SPARE	SH 26 OL-E GREEN ARW	SH 28 PHASE 4 WALK	SH 33 PHASE 4 WALK	SPARE	SPARE
5	ORANGE	SH 1, 2, 3, 4, 5 PHASE 6 YELLOW	SH 13, 14 OL-B YELLOW	SH 18, 19, 20, 21 PHASE 2 YELLOW	SH 30, 31 OL-A YELLOW	SPARE	SPARE	SPARE	SPARE	SPARE	SH 26 OL-E YEL ARW	SPARE	SPARE	SPARE	SPARE
6	BLUE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SH 26 OL-E FL YEL ARW	SPARE	SPARE	SPARE	SPARE
7	WHITE/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
8	RED/BLACK	SH 7, 8, 9 OL-D RED	SH 12 PHASE 5 RED ARW	SH 23, 24, 25 OL-C RED	SH 29 PHASE 1 RED ARW	SH 10 PHASE 6 DONT WALK	SPARE	SPARE	SH 16 PHASE 6 DONT WALK	SH 17 PHASE 6 DONT WALK	SH 27 PHASE 2 DONT WALK	SPARE	SPARE	SH 34 PHASE 2 DONT WALK	SH 35 PHASE 2 DONT WALK
9	GREEN/BLACK	SH 7, 8, 9 OL-D GREEN	SH 12 PHASE 5 GRN ARW	SH 23, 24, 25 OL-C GREEN	SH 29 PHASE 1 GRN ARW	SH 10 PHASE 6 WALK	SPARE	SPARE	SH 16 PHASE 6 WALK	SH 17 PHASE 6 WALK	SH 27 PHASE 2 WALK	SPARE	SPARE	SH 34 PHASE 2 WALK	SH 35 PHASE 2 WALK
10	ORANGE/BLACK	SH 7, 8, 9 OL-D YELLOW	SH 12 PHASE 5 YEL ARW	SH 23, 24, 25 OL-C YELLOW	SH 29 PHASE 1 YEL ARW	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
11	BLUE/BLACK	SPARE	SH 12 PHASE 5 FL YEL ARW	SPARE	SH 29 PHASE 1 FL YEL ARW	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
12	BLACK/WHITE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
13	RED/WHITE	SH 6 PHASE 6 DONT WALK	SPARE	SH 22 PHASE 2 DONT WALK	SPARE										
14	GREEN/WHITE	SH 6 PHASE 6 WALK	SPARE	SH 22 PHASE 2 WALK	SPARE										
15	BLUE/WHITE	SPARE	SPARE	SPARE	SPARE										
16	BLACK/RED	SPARE	SPARE	SPARE	SPARE										
17	WHITE/RED	SPARE	SPARE	SPARE	SPARE										
18	ORANGE/RED	SPARE	SPARE	SPARE	SPARE										
19	BLUE/RED	SPARE	SPARE	SPARE	SPARE										
20	RED/GREEN	SPARE	SPARE	SPARE	SPARE										

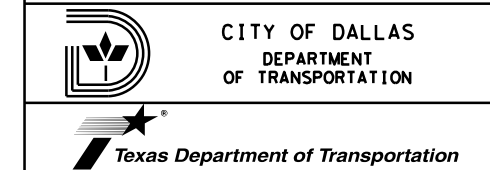
APS MESSAGE INFORMATION			
APS UNIT NO.	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
PB7 PB8 PB11 PB12	PHASE 2	BUTTON PUSH ON DW	WAIT TO CROSS DALLAS PARKWAY AT FRANKFORD ROAD
		EXTENDED BUTTON PUSH	WAIT TO CROSS DALLAS PARKWAY AT FRANKFORD ROAD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	DALLAS PARKWAY, WALK SIGN IS ON TO CROSS DALLAS PARKWAY
PB9 PB10	PHASE 4	BUTTON PUSH ON DW	WAIT TO CROSS FRANKFORD ROAD AT DALLAS PARKWAY
		EXTENDED BUTTON PUSH	WAIT TO CROSS FRANKFORD ROAD AT DALLAS PARKWAY
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	FRANKFORD ROAD, WALK SIGN IS ON TO CROSS FRANKFORD ROAD
PB1 PB2 PB5 PB6	PHASE 6	BUTTON PUSH ON DW	WAIT TO CROSS DALLAS PARKWAY AT FRANKFORD ROAD
		EXTENDED BUTTON PUSH	WAIT TO CROSS DALLAS PARKWAY AT FRANKFORD ROAD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	DALLAS PARKWAY, WALK SIGN IS ON TO CROSS DALLAS PARKWAY
PB3 PB4	PHASE 8	BUTTON PUSH ON DW	WAIT TO CROSS FRANKFORD ROAD AT DALLAS PARKWAY
		EXTENDED BUTTON PUSH	WAIT TO CROSS FRANKFORD ROAD AT DALLAS PARKWAY
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	FRANKFORD ROAD, WALK SIGN IS ON TO CROSS FRANKFORD ROAD

* COUNTDOWN SPEECH MESSAGE = "OFF" FOR ALL UNITS.

ITEM 682 VEHICLE AND PEDESTRIAN SIGNAL HEADS												
SIGNAL HEAD NO.	SIGNAL HEAD TYPE	BACKPLATES			12" LED SIGNAL INDICATIONS						PED SIGNAL COUNTDOWN (EA)	
		3 SEC (EA)	4 SEC (EA)	5 SEC (EA)	R (EA)	Y (EA)	G (EA)	R ARW (EA)	Y ARW (EA)	G ARW (EA)		
2, 3, 4, 7, 8, 9, 13, 19, 20, 23, 24, 25, 30, 31	H3	14			14	14	14					
1, 14, 18, 32	H3U	4			4	4					4	
5, 21	V3	2			2	2	2					
26	V4FRT		1		1				2	1		
12, 29	V5FLT			2					4	4	2	
6, 10, 11, 15, 16, 17, 22, 27, 28, 33, 34, 35	PED										12	
TOTALS:		20	1	2	21	20	16	4	6	7	12	



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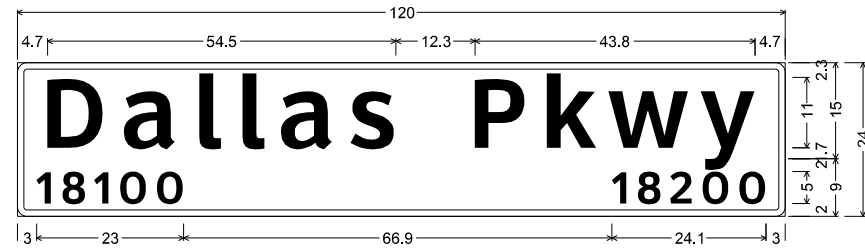


**TRAFFIC SIGNAL
DETAILS**
DALLAS PKWY AT FRANKFORD RD
SCALE: N/A SHEET 2 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	58

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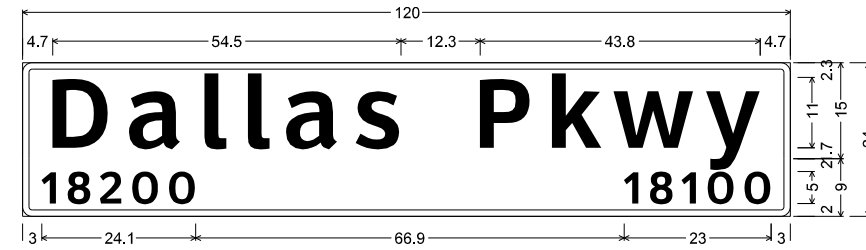
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D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Dallas Pkwy", ClearviewHwy-5-W;

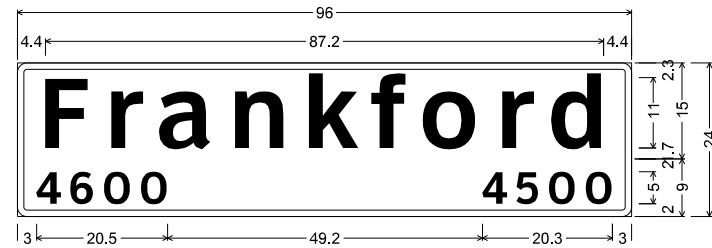
1.5" Radius, 1.0" Border, White on Green;
"18100", ClearviewHwy-5-W; "18200", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Dallas Pkwy", ClearviewHwy-5-W;

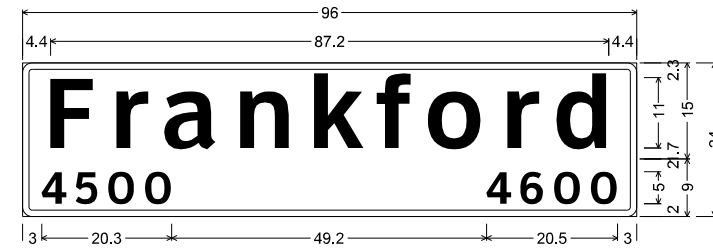
1.5" Radius, 1.0" Border, White on Green;
"18200", ClearviewHwy-5-W; "18100", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Frankford", ClearviewHwy-5-W;

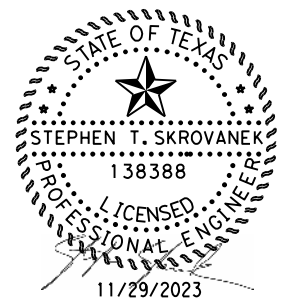
1.5" Radius, 1.0" Border, White on Green;
"4600", ClearviewHwy-5-W; "4500", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
"Frankford", ClearviewHwy-5-W;

1.5" Radius, 1.0" Border, White on Green;
"4500", ClearviewHwy-5-W; "4600", ClearviewHwy-5-W;



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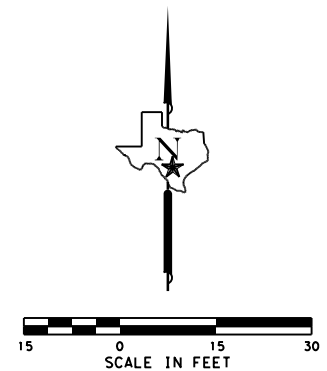
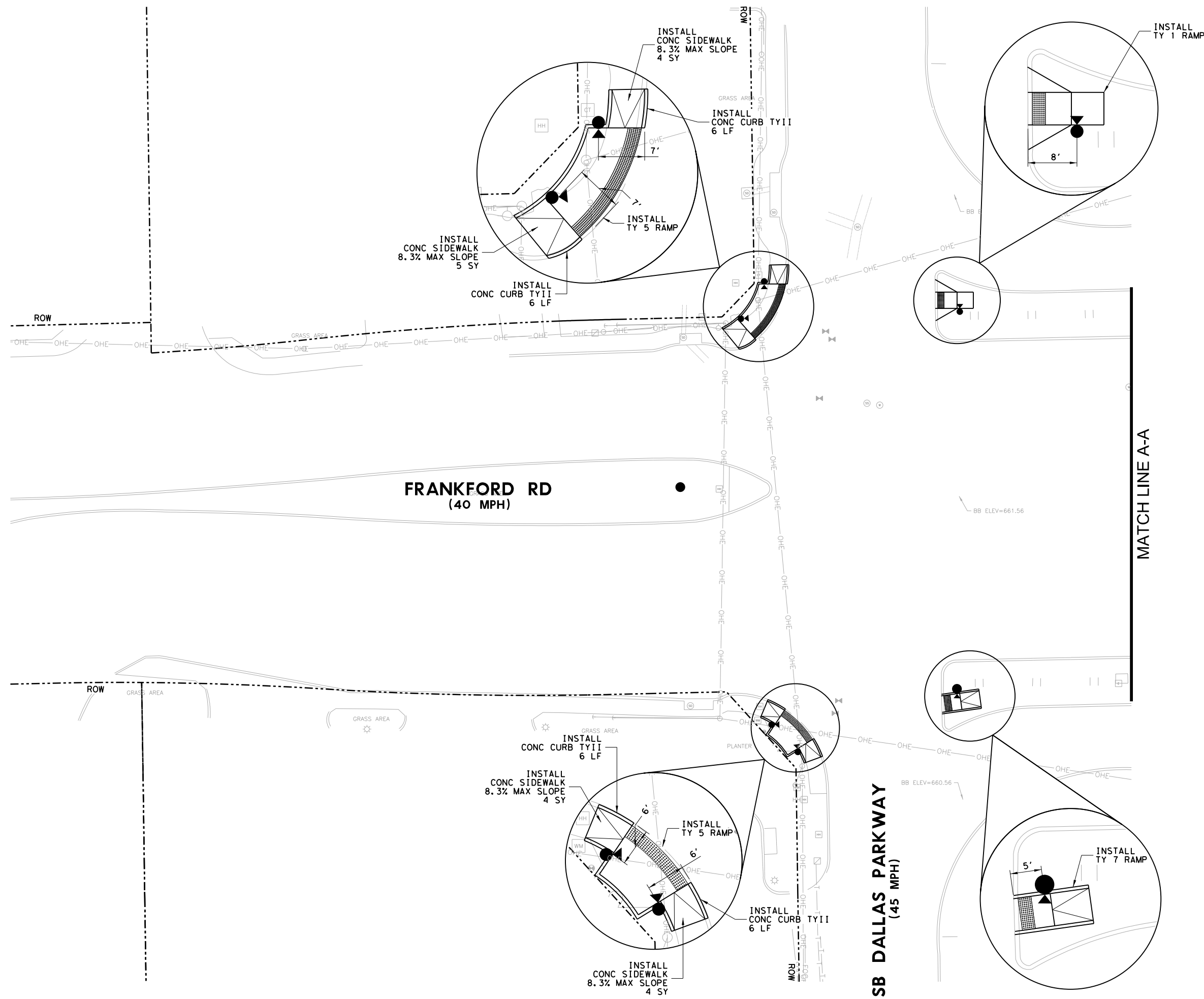
CITY OF DALLAS
DEPARTMENT
OF TRANSPORTATION

Texas Department of Transportation

**TRAFFIC SIGNAL
DETAILS
DALLAS PKWY AT FRANKFORD RD**

SCALE: N/A SHEET 3 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	59



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Texas Department of Transportation

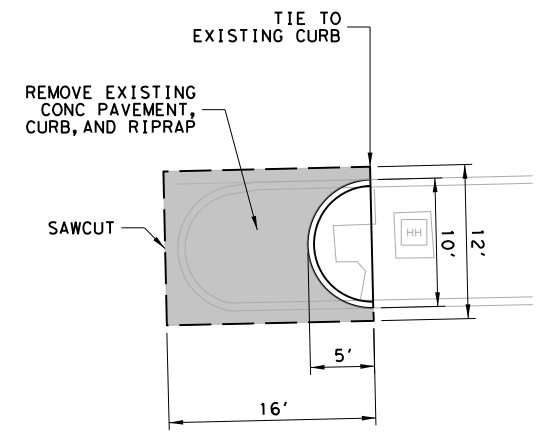
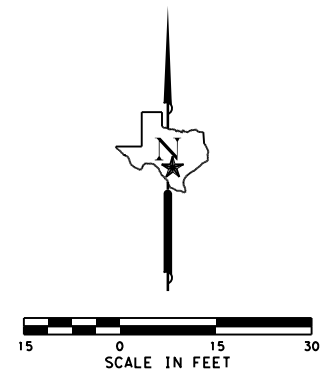
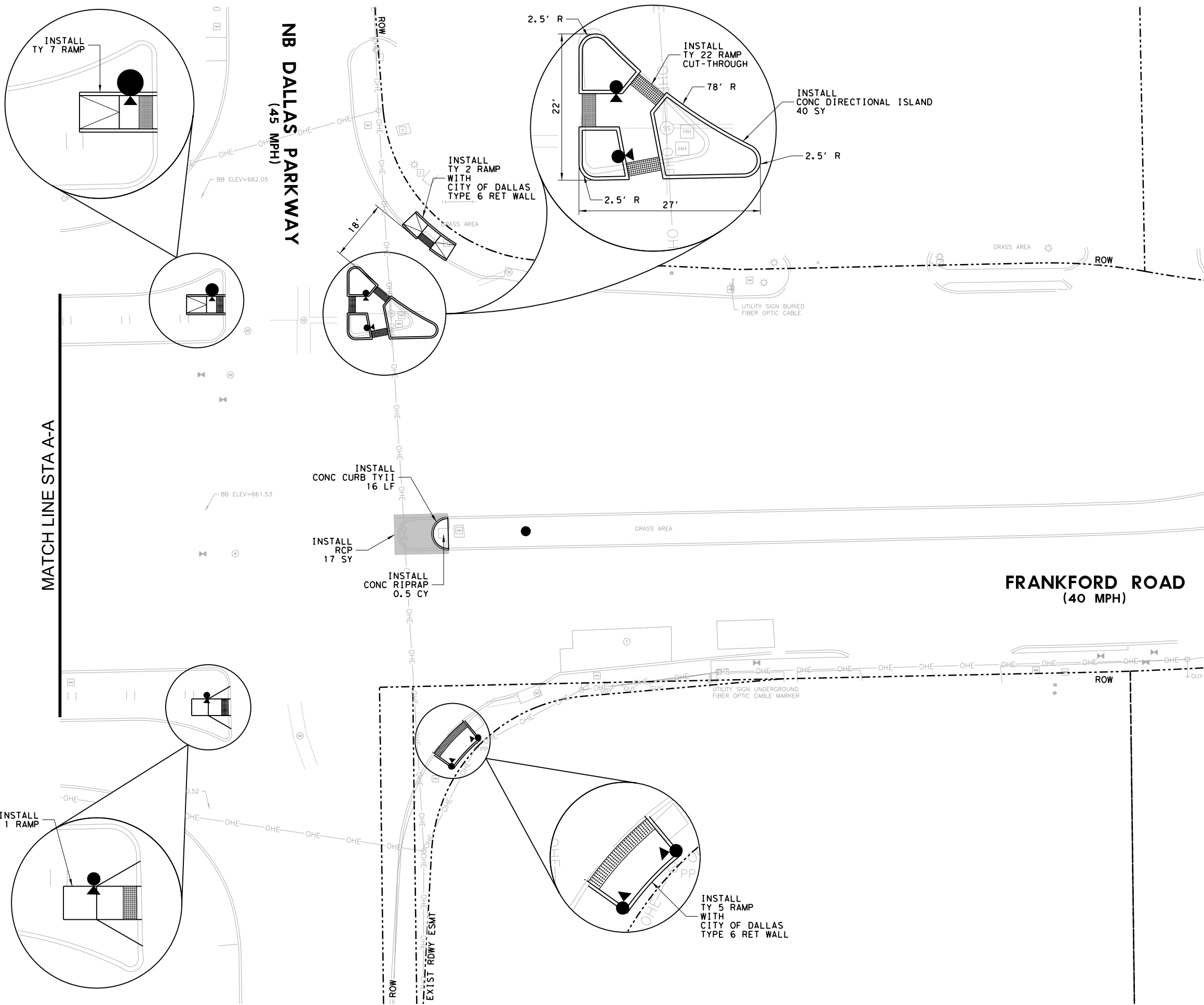
PEDESTRIAN RAMP DETAILS
 DALLAS PKWY AT FRANKFORD RD

SCALE: 1"=30' SHEET 1 OF 2

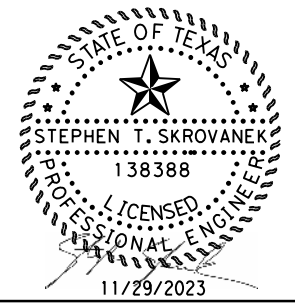
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLLIN, ETC.	0918	24
			JOB NO.
			267, ETC.
			SHEET NO.
			60

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MEDIAN NOSE PULLBACK DETAIL



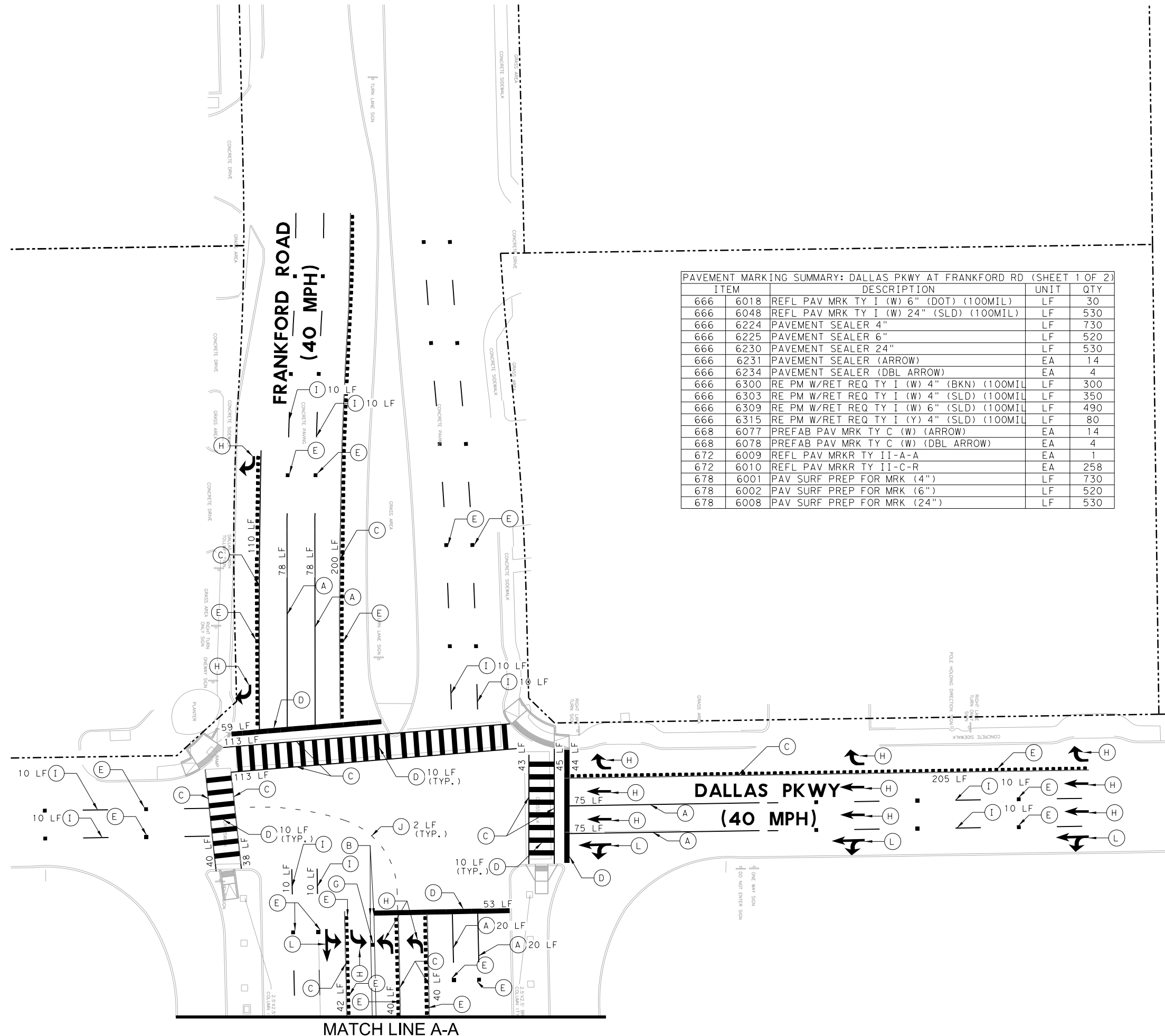
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CITY OF DALLAS
 DEPARTMENT OF TRANSPORTATION

Texas Department of Transportation

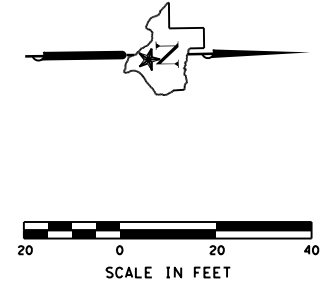
PEDESTRIAN RAMP DETAILS
DALLAS PKWY AT FRANKFORD RD
 SCALE: 1"=30' SHEET 2 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLLIN, ETC.	0918	24
			JOB NO.
			267, ETC.
			SHEET NO.
			61



PAVEMENT MARKING SUMMARY: DALLAS PKWY AT FRANKFORD RD (SHEET 1 OF 2)

ITEM	DESCRIPTION	UNIT	QTY
666 6018	REFL PAV MRK TY I (W) 6" (DOT) (100MIL)	LF	30
666 6048	REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	530
666 6224	PAVEMENT SEALER 4"	LF	730
666 6225	PAVEMENT SEALER 6"	LF	520
666 6230	PAVEMENT SEALER 24"	LF	530
666 6231	PAVEMENT SEALER (ARROW)	EA	14
666 6234	PAVEMENT SEALER (DBL ARROW)	EA	4
666 6300	RE PM W/RET REQ TY I (W) 4" (BKN) (100MIL)	LF	300
666 6303	RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)	LF	350
666 6309	RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)	LF	490
666 6315	RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)	LF	80
668 6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	14
668 6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	4
672 6009	REFL PAV MRKR TY II-A-A	EA	1
672 6010	REFL PAV MRKR TY II-C-R	EA	258
678 6001	PAV SURF PREP FOR MRK (4")	LF	730
678 6002	PAV SURF PREP FOR MRK (6")	LF	520
678 6008	PAV SURF PREP FOR MRK (24")	LF	530



- PROPOSED LEGEND**
- (A) RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)
 - (B) RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)
 - (C) RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
 - (D) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
 - (E) REFL PAV MRKR (TY II-C-R)
 - (F) REFL PAV MRKR (TY I-C)
 - (G) REFL PAV MRKR (TY II-A-A)
 - (H) PREFAB PAV MRK TY C (W) (ARROW)
 - (I) RE PM W/RET REQ TY I (W) 4" (BRK) (100MIL)
 - (J) REFL PAV MRK TY I (W) 6" (DOT) (100MIL)
 - (K) REFL PAV MRK TY I (W) 12" (SLD) (100MIL)
 - (L) PREFAB PAV MRK TY C (W) (DBL ARROW)
 - (M) REF PAV MRK TY I (W) 36" (YLDTRI) (100MIL)
 - IN SM RD SN SUP&AMTY10BWG(1)SA(T)



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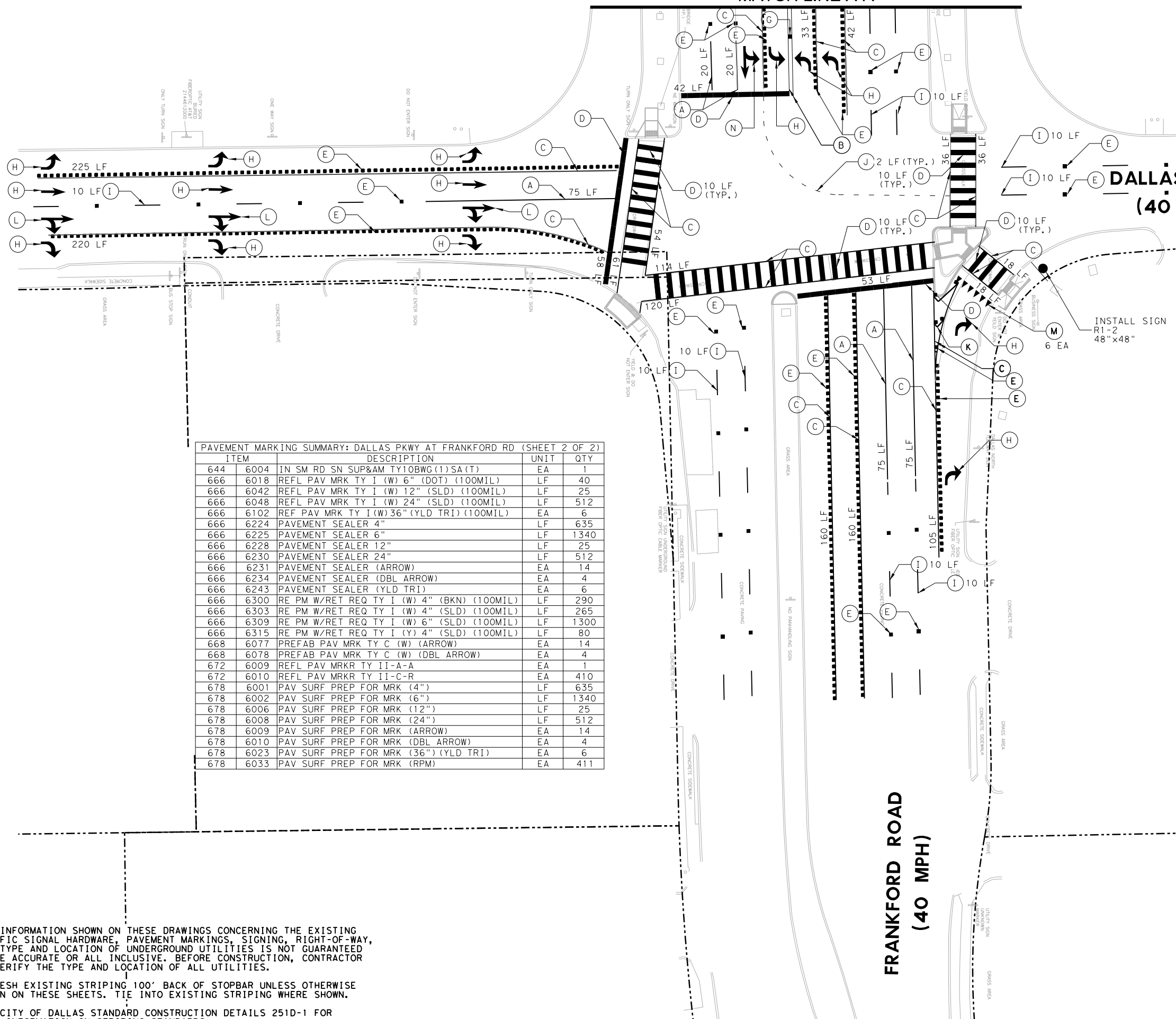
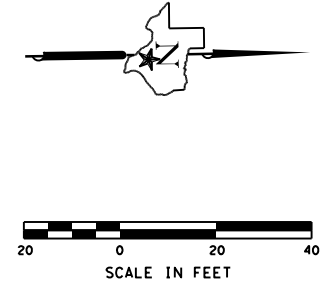
CITY OF DALLAS
 DEPARTMENT OF TRANSPORTATION

Texas Department of Transportation

PAVEMENT MARKING LAYOUT
 DALLAS PKWY AT FRANKFORD RD
 SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLLIN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	62

MATCH LINE A-A



DALLAS PKWY
(40 MPH)

FRANKFORD ROAD
(40 MPH)

PROPOSED LEGEND

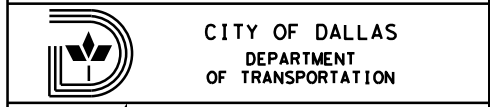
- (A) RE PM W/RET REQ TY I(W)4" (SLD) (100MIL)
- (B) RE PM W/RET REQ TY I(Y)4" (SLD) (100MIL)
- (C) RE PM W/RET REQ TY I(W)6" (SLD) (100MIL)
- (D) REFL PAV MRK TY I (W)24" (SLD) (100MIL)
- (E) REFL PAV MRKR (TY II-C-R)
- (F) REFL PAV MRKR (TY I-C)
- (G) REFL PAV MRKR (TY II-A-A)
- (H) PREFAB PAV MRK TY C(W) (ARROW)
- (I) RE PM W/RET REQ TY I(W)4" (BRK) (100MIL)
- (J) REFL PAV MRK TY I (W)6" (DOT) (100MIL)
- (K) REFL PAV MRK TY I(W)12" (SLD) (100MIL)
- (L) PREFAB PAV MRK TY C(W) (DBL ARROW)
- (M) REF PAV MRK TY I(W)36" (YLDTRI) (100MIL)
- IN SM RD SN SUP&AMTY10BWG(1)SA(T)

PAVEMENT MARKING SUMMARY: DALLAS PKWY AT FRANKFORD RD (SHEET 2 OF 2)

ITEM	DESCRIPTION	UNIT	QTY
644	6004 IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1
666	6018 REFL PAV MRK TY I (W) 6" (DOT) (100MIL)	LF	40
666	6042 REFL PAV MRK TY I (W) 12" (SLD) (100MIL)	LF	25
666	6048 REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	512
666	6102 REF PAV MRK TY I(W)36" (YLD TRI) (100MIL)	EA	6
666	6224 PAVEMENT SEALER 4"	LF	635
666	6225 PAVEMENT SEALER 6"	LF	1340
666	6228 PAVEMENT SEALER 12"	LF	25
666	6230 PAVEMENT SEALER 24"	LF	512
666	6231 PAVEMENT SEALER (ARROW)	EA	14
666	6234 PAVEMENT SEALER (DBL ARROW)	EA	4
666	6243 PAVEMENT SEALER (YLD TRI)	EA	6
666	6300 RE PM W/RET REQ TY I (W) 4" (BKN) (100MIL)	LF	290
666	6303 RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)	LF	265
666	6309 RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)	LF	1300
666	6315 RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)	LF	80
668	6077 PREFAB PAV MRK TY C (W) (ARROW)	EA	14
668	6078 PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	4
672	6009 REFL PAV MRKR TY II-A-A	EA	1
672	6010 REFL PAV MRKR TY II-C-R	EA	410
678	6001 PAV SURF PREP FOR MRK (4")	LF	635
678	6002 PAV SURF PREP FOR MRK (6")	LF	1340
678	6006 PAV SURF PREP FOR MRK (12")	LF	25
678	6008 PAV SURF PREP FOR MRK (24")	LF	512
678	6009 PAV SURF PREP FOR MRK (ARROW)	EA	14
678	6010 PAV SURF PREP FOR MRK (DBL ARROW)	EA	4
678	6023 PAV SURF PREP FOR MRK (36") (YLD TRI)	EA	6
678	6033 PAV SURF PREP FOR MRK (RPM)	EA	411



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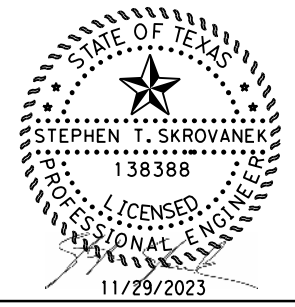
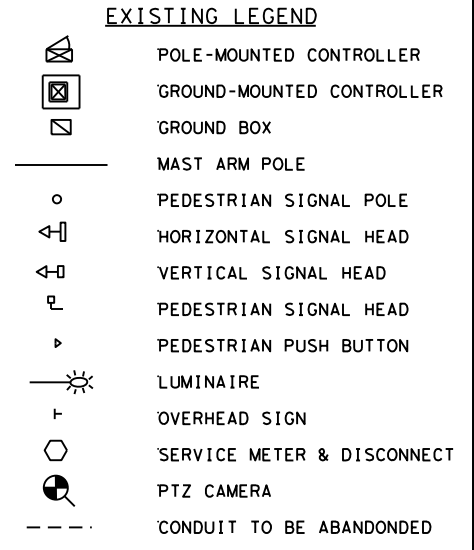
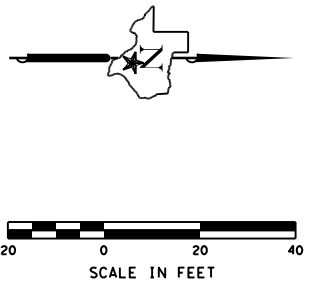
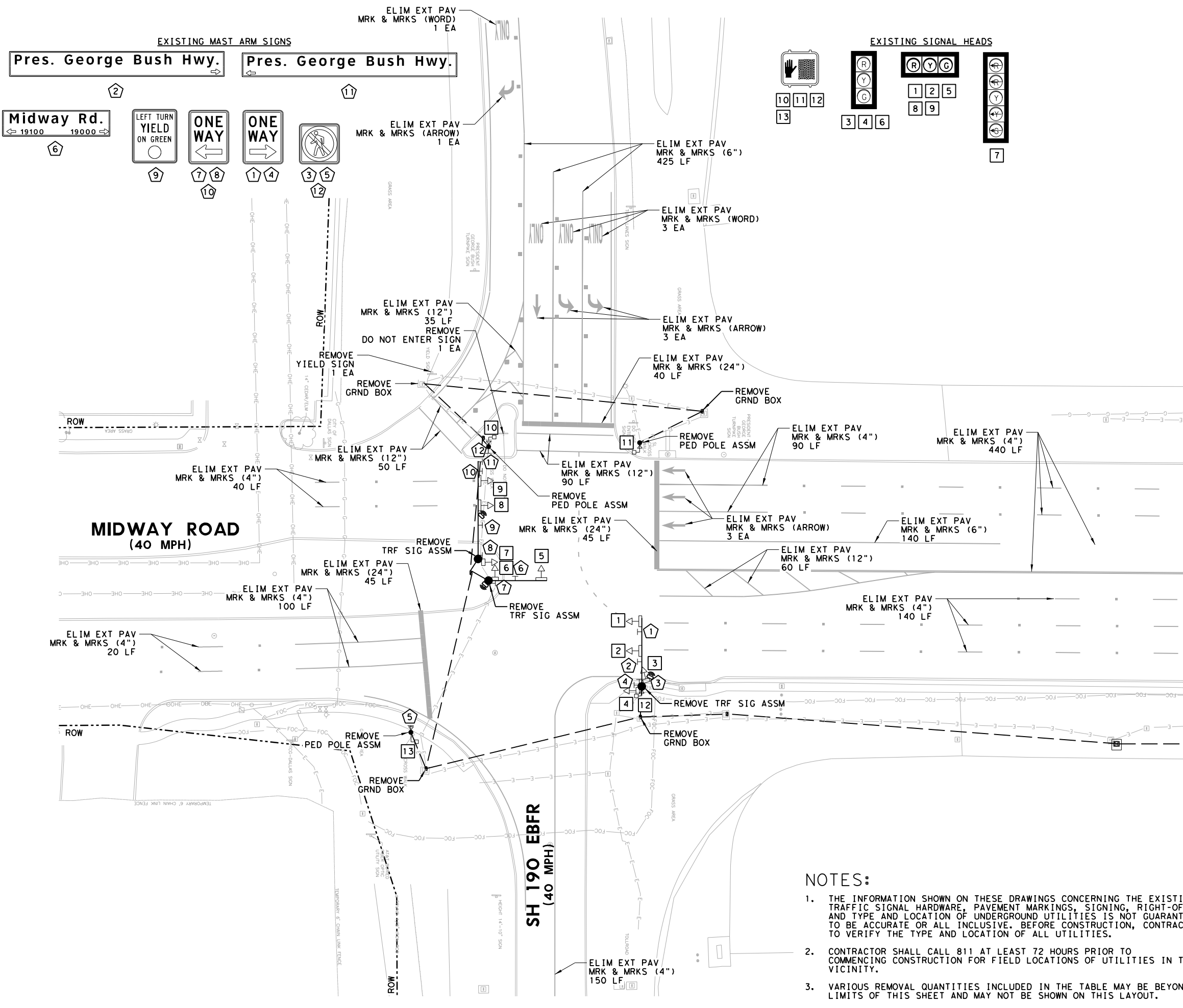
PAVEMENT MARKING LAYOUT
DALLAS PKWY AT FRANKFORD RD
SCALE: 1"=40' SHEET 2 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLLIN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	63

- THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
- REFRESH EXISTING STRIPING 100' BACK OF STOPBAR UNLESS OTHERWISE SHOWN ON THESE SHEETS. TIE INTO EXISTING STRIPING WHERE SHOWN.
- SEE CITY OF DALLAS STANDARD CONSTRUCTION DETAILS 251D-1 FOR MORE INFORMATION ON STRIPING STANDARDS.

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EXISTING CONDITIONS & REMOVALS
 SH 190 EBFR AT MIDWAY RD

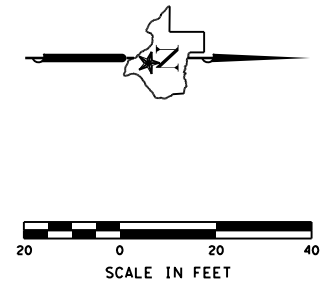
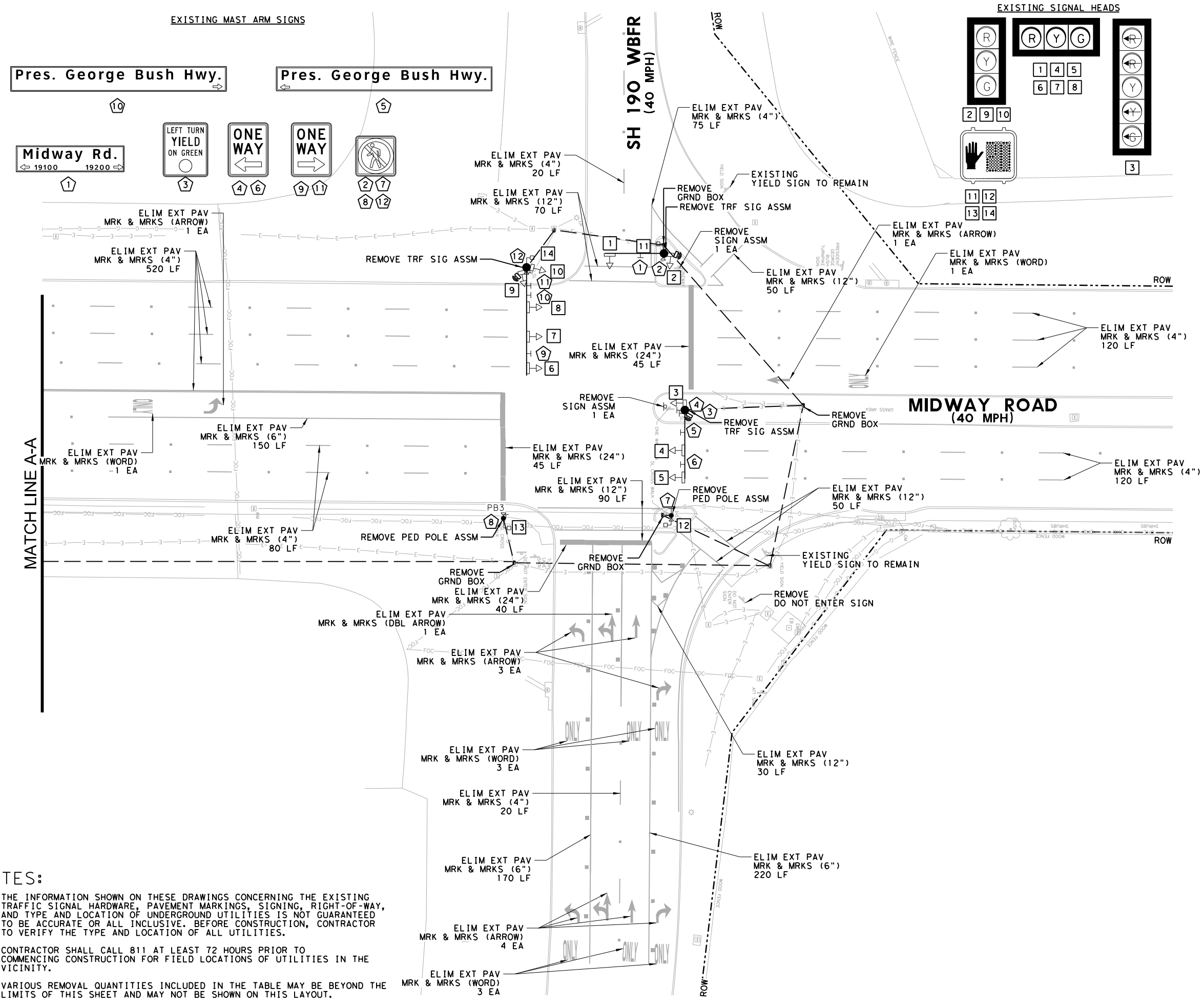
SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL. IN, ETC.	0918	24	267, ETC.	64

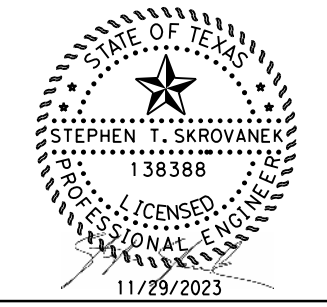
- NOTES:**
- THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
 - CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.
 - VARIOUS REMOVAL QUANTITIES INCLUDED IN THE TABLE MAY BE BEYOND THE LIMITS OF THIS SHEET AND MAY NOT BE SHOWN ON THIS LAYOUT.

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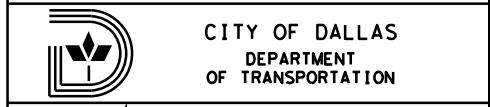
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- EXISTING LEGEND**
- POLE-MOUNTED CONTROLLER
 - GROUND-MOUNTED CONTROLLER
 - GROUND BOX
 - MAST ARM POLE
 - PEDESTRIAN SIGNAL POLE
 - HORIZONTAL SIGNAL HEAD
 - VERTICAL SIGNAL HEAD
 - PEDESTRIAN SIGNAL HEAD
 - PEDESTRIAN PUSH BUTTON
 - LUMINAIRE
 - OVERHEAD SIGN
 - SERVICE METER & DISCONNECT
 - PTZ CAMERA
 - CONDUIT TO BE ABANDONED



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EXISTING CONDITIONS & REMOVALS
PGBT AT MIDWAY RD

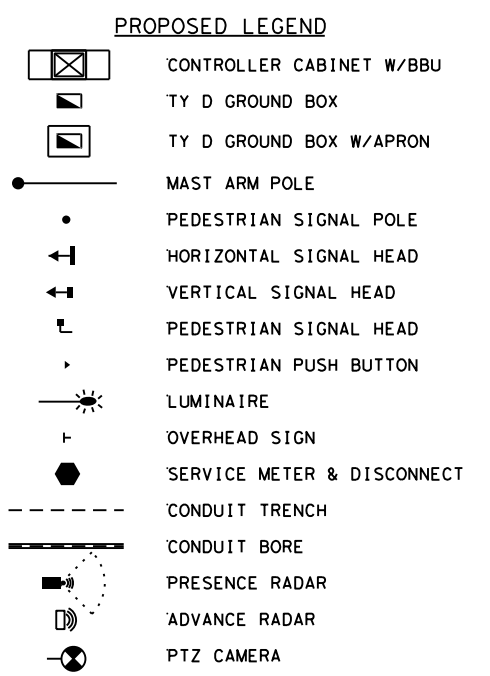
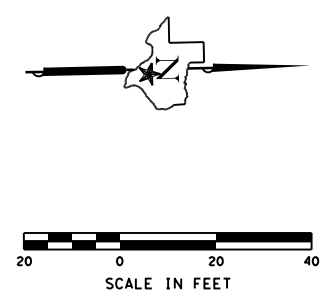
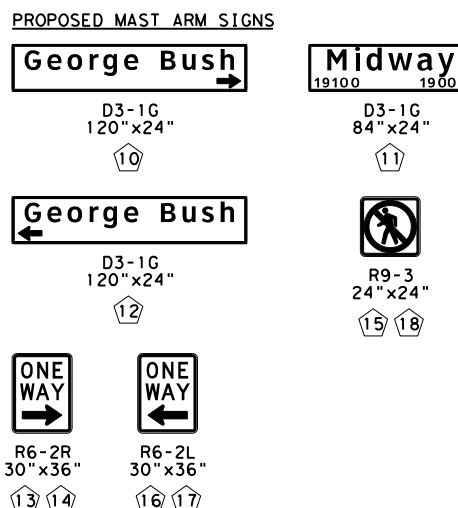
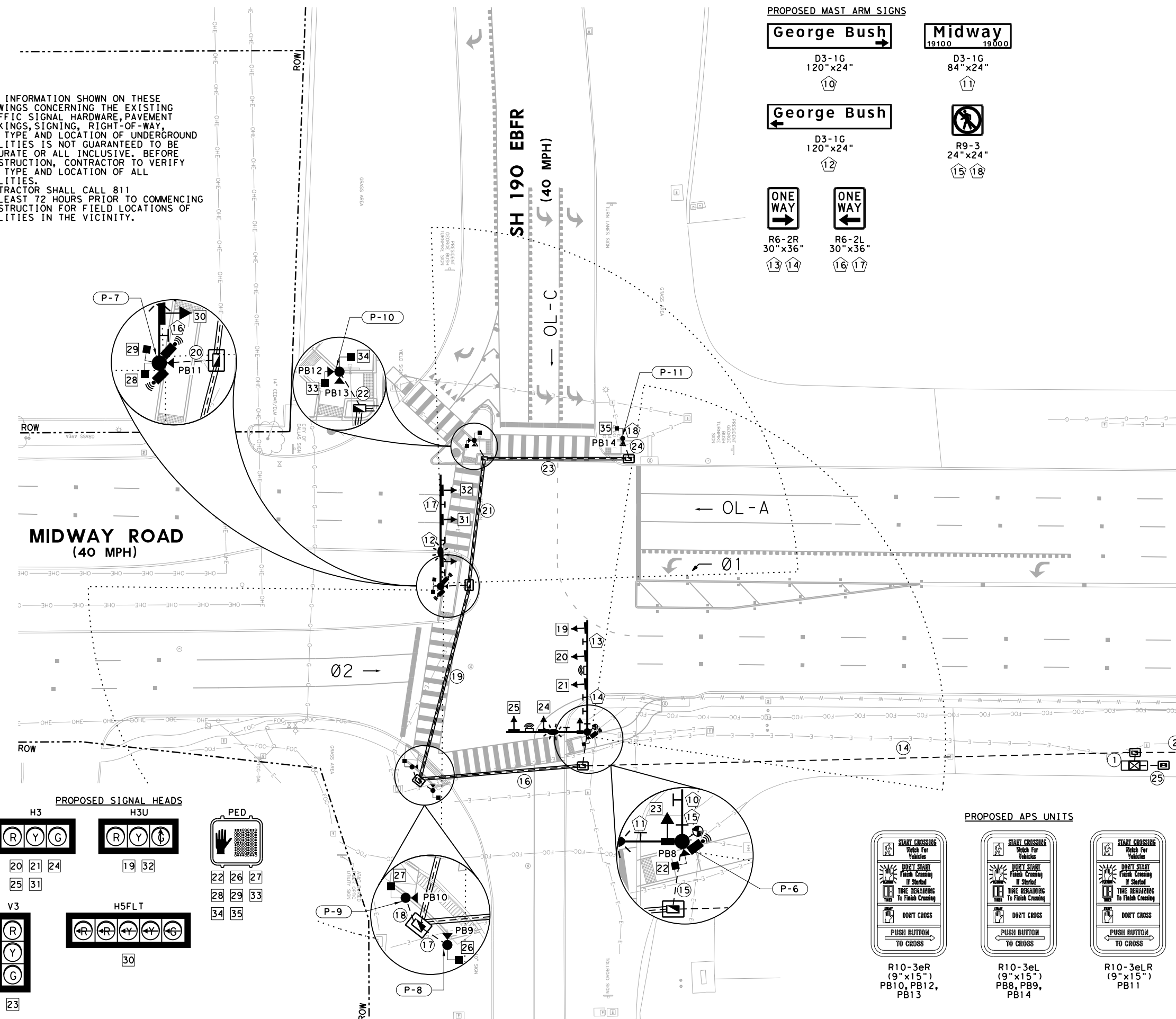
SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	65

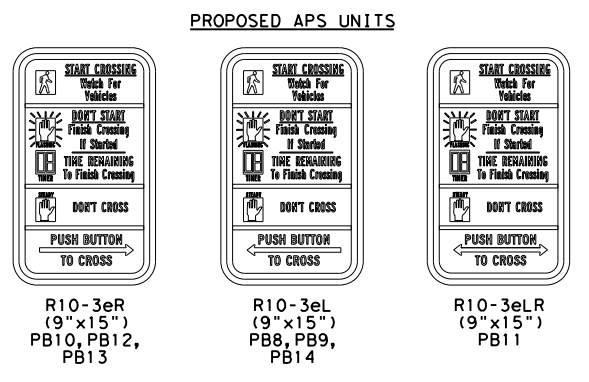
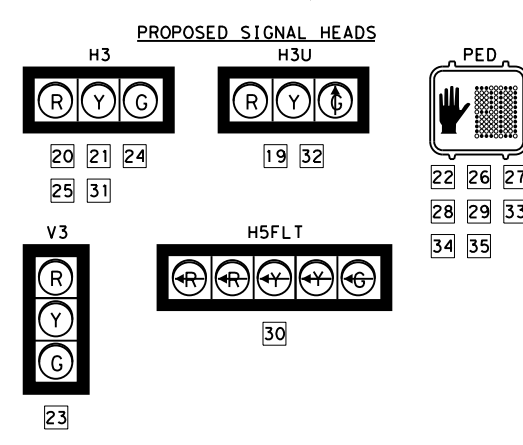
- NOTES:**
- THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
 - CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.
 - VARIOUS REMOVAL QUANTITIES INCLUDED IN THE TABLE MAY BE BEYOND THE LIMITS OF THIS SHEET AND MAY NOT BE SHOWN ON THIS LAYOUT.

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NOTES
 1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
 2. CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.



MATCH LINE A-A



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TRAFFIC SIGNAL LAYOUT
 SH 190 EBFR AT MIDWAY RD

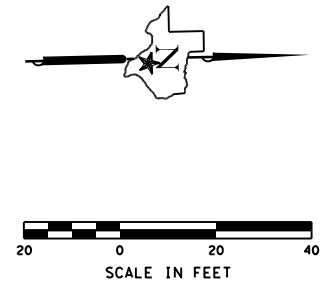
SCALE: 1"=40' SHEET 1 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL. IN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	66

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NOTES

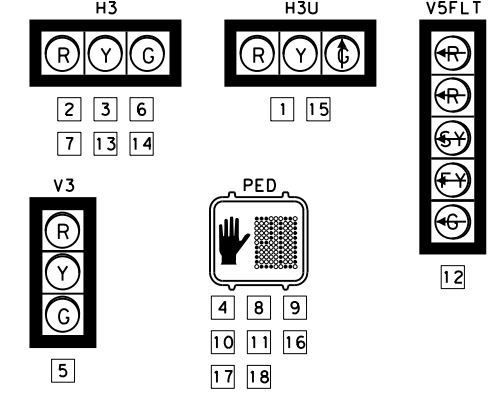
1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
2. CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.



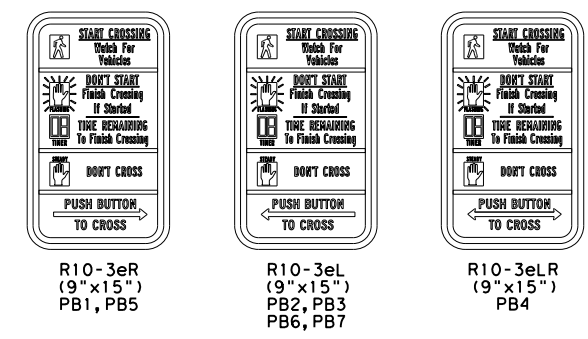
PROPOSED LEGEND

- CONTROLLER CABINET W/BBU
- TY D GROUND BOX
- TY D GROUND BOX W/APRON
- MAST ARM POLE
- PEDESTRIAN SIGNAL POLE
- HORIZONTAL SIGNAL HEAD
- VERTICAL SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- LUMINAIRE
- OVERHEAD SIGN
- SERVICE METER & DISCONNECT
- CONDUIT TRENCH
- CONDUIT BORE
- PRESENCE RADAR
- ADVANCE RADAR
- PTZ CAMERA

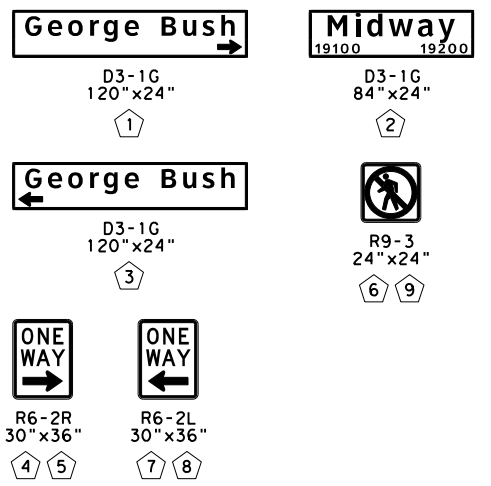
PROPOSED SIGNAL HEADS



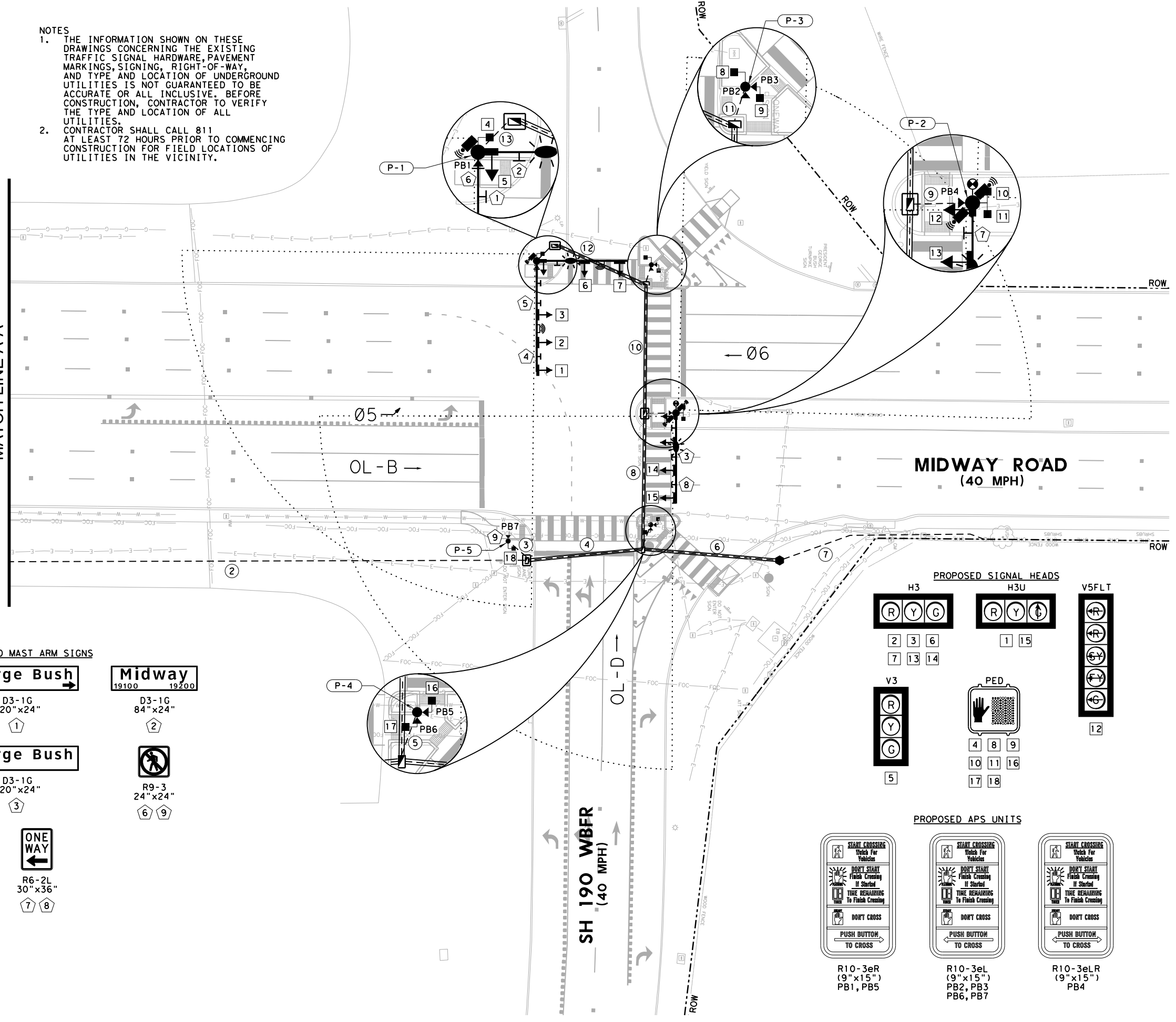
PROPOSED APS UNITS



PROPOSED MAST ARM SIGNS



MATCH LINE A-A



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TRAFFIC SIGNAL LAYOUT
 SH 190 WBFR @ MIDWAY RD

SCALE: 1"=40' SHEET 2 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	67

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RUN ID	LENGTH	SUMMARY OF CONDUIT AND CABLES																												
		ITEM 618 CONDUIT						ITEM 620 ELECTRICAL CONDUCTORS						ITEM 684 TRAFFIC SIGNAL CABLES						ITEM 6004 ITS CABLE		SUB TO ITEM 6292 RVDS								
		2" (SCH 80)		3" (SCH 80)		4" (SCH 80)		#6 BARE	#12 INSULATED	#8 INSULATED	#6 INSULATED	TYPE A			TYPE C			ETHERNET CABLE**		PRES. RADAR CABLE		ADV. RADAR CABLE								
		TRENCH	BORE	TRENCH	BORE	TRENCH	BORE					EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF			
1	5'	1	5'																											
2	225'	1	225'									2	15'																	
3	10'																													
4	45'			1	45'																									
5	10'					1	10'																							
6	55'			1	55'																									
7	85'	1	85'																											
8	55'																													
9	15'																													
10	50'																													
11	10'																													
12	40'																													
13	10'																													
14	215'																													
15	15'																													
16	65'																													
17	10'																													
18	10'																													
19	80'																													
20	15'																													
21	50'																													
22	10'																													
23	55'																													
24	10'																													
25	10'																													
TO BE INSTALLED BY ONCOR																														
FUTURE FIBER																														

ITEM 624 / 6186 GROUND BOXES		
DESCRIPTION	QTY	
GROUND BOX TY D (162922)	3	
GROUND BOX TY D (162922)W/APRON	8	
ITS GND BOX (POLY) TY 1 (243624)W/APRN	1	

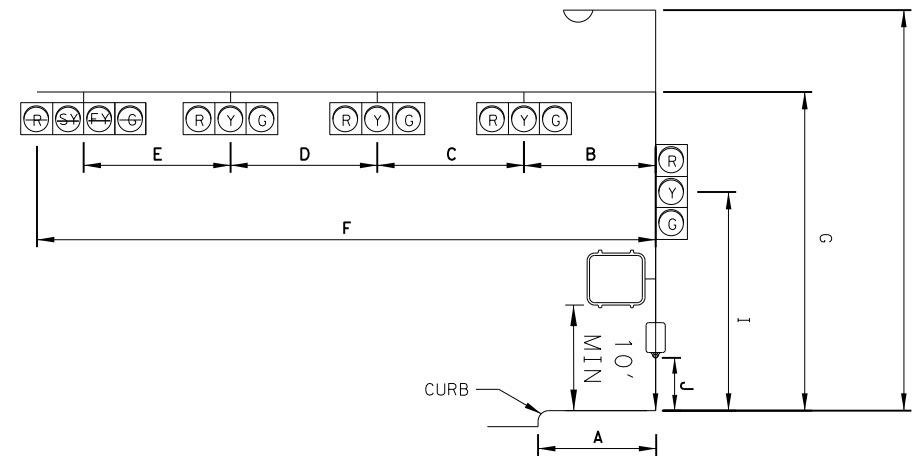
** FURNISHED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR.

POLE ID	DIMENSIONS (SEE FIGURE)										HEADS ON MAST ARM	LUM ARM	ITEM 688 APS UNITS	ITEM 416 DRILLED SHAFT FOUNDATIONS					FDN TYPE																			
	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	I (FT)	J (FT)				24" *	30"	36"	42"	48"		80 MPH ZONE																		
P-1 SB	10	21	11	11		44				19	30		3																									36-B
P-1 WB	12.5	19	12			36				19	30	15	2	1																							24-A	
P-2	6.5	12	11	11		36	19	30	15	3.5	3	1	1																								24-A	
P-3													2	6'																							24-A	
P-4													2	6'																							24-A	
P-5													1	6'																							24-A	
P-6 NB	15	19	11	11		44				19	30		3																								36-B	
P-6 EB	9	17	12			32				19	30	15	2	1																							36-A	
P-7	14	10	16	11		44	19	30		3.5	3	1	1																							24-A		
P-8													1	6'																							24-A	
P-9													1	6'																							24-A	
P-10													2	6'																							24-A	
P-11													1	6'																							24-A	
TOTALS:											4	14	42'		60'																							

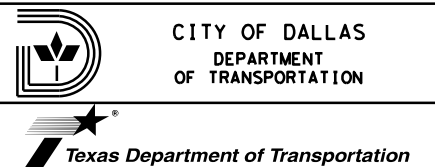
* SUBSIDIARY TO ITEM 687.

ITEM 628 ELECTRICAL SERVICES											
ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED (5) - 14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CKT. BKR. POLE/AMPS	TWO-POLE CONTACTOR AMPS	PANEL BD/LOADCENTER AMP RATING	BRANCH CIRCUIT ID	BRANCH CKT. BKR. POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-5	ELEC SRV TY D 120/240 070 (NS)SS(E)PS(U)	2"	*	N/A	2P/70	30	100	SIG	1P/50	40	5.48
								WBFR LUM	1P/20	2.84	
								EBFR LUM	1P/20	2.84	

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TRAFFIC SIGNAL DETAILS
 SH 190 AT MIDWAY RD

SCALE: N/A SHEET 1 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	68

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CABLE TERMINATION												
CNDR NO.	CNDR COLOR	CABLE 1 FROM CNTRL TO POLE 1 20/C #14	CABLE 2 FROM CNTRL TO POLE 2 20/C #14	CABLE 6 FROM CNTRL TO POLE 6 20/C #14	CABLE 7 FROM CNTRL TO POLE 7 20/C #14	CABLE 3 FROM CNTRL TO POLE 3 12/C #14	CABLE 4 FROM CNTRL TO POLE 4 12/C #14	CABLE 5 FROM CNTRL TO POLE 5 12/C #14	CABLE 8 FROM CNTRL TO POLE 8 12/C #14	CABLE 9 FROM CNTRL TO POLE 9 12/C #14	CABLE 10 FROM CNTRL TO POLE 10 12/C #14	CABLE 11 FROM CNTRL TO POLE 11 12/C #14
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON
3	RED	SH 1,2,3 PHASE 6 RED	SH 13,14,15 OL-B RED	SH 19,20,21 PHASE 2 RED	SH 31,32 OL-A RED	SH 9 PHASE 8 DONT WALK	SH 16 PHASE 8 DONT WALK	SPARE	SPARE	SH 27 PHASE 4 DONT WALK	SH 33 PHASE 4 DONT WALK	SPARE
4	GREEN	SH 1,2,3 PHASE 6 GRN (ARW)	SH 13,14,15 OL-B GRN (ARW)	SH 19,20,21 PHASE 2 GRN (ARW)	SH 31,32 OL-A GRN (ARW)	SH 9 PHASE 8 WALK	SH 16 PHASE 8 WALK	SPARE	SPARE	SH 27 PHASE 4 WALK	SH 33 PHASE 4 WALK	SPARE
5	ORANGE	SH 1,2,3 PHASE 6 YELLOW	SH 13,14,15 OL-B YELLOW	SH 19,20,21 PHASE 2 YELLOW	SH 31,32 OL-A YELLOW	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
6	BLUE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
7	WHITE/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
8	RED/BLACK	SH 5,6,7 OL-D RED	SH 12 PHASE 5 RED ARW	SH 23,24,25 OL-C RED	SH 30 PHASE 1 RED ARW	SH 8 PHASE 6 DONT WALK	SH 17 PHASE 6 DONT WALK	SH 18 PHASE 6 DONT WALK	SH 26 PHASE 2 DONT WALK	SPARE	SH 34 PHASE 2 DONT WALK	SH 35 PHASE 2 DONT WALK
9	GREEN/BLACK	SH 5,6,7 OL-D GREEN	SH 12 PHASE 5 GRN ARW	SH 23,24,25 OL-C GREEN	SH 30 PHASE 1 GRN ARW	SH 8 PHASE 6 WALK	SH 17 PHASE 6 WALK	SH 18 PHASE 6 WALK	SH 26 PHASE 2 WALK	SPARE	SH 34 PHASE 2 WALK	SH 35 PHASE 2 WALK
10	ORANGE/BLACK	SH 5,6,7 OL-D YELLOW	SH 12 PHASE 5 YEL ARW	SH 23,24,25 OL-C YELLOW	SH 30 PHASE 1 YEL ARW	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
11	BLUE/BLACK	SPARE	SH 12 PHASE 5 FL YEL ARW	SPARE	SH 30 PHASE 1 FL YEL ARW	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
12	BLACK/WHITE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
13	RED/WHITE	SH 4 PHASE 6 DONT WALK	SH 10,11 PHASE 8 DONT WALK	SH 22 PHASE 2 DONT WALK	SH 28,29 PHASE 4 DONT WALK							
14	GREEN/WHITE	SH 4 PHASE 6 WALK	SH 10,11 PHASE 8 WALK	SH 22 PHASE 2 WALK	SH 28,29 PHASE 4 WALK							
15	BLUE/WHITE	SPARE	SPARE	SPARE	SPARE							
16	BLACK/RED	SPARE	SPARE	SPARE	SPARE							
17	WHITE/RED	SPARE	SPARE	SPARE	SPARE							
18	ORANGE/RED	SPARE	SPARE	SPARE	SPARE							
19	BLUE/RED	SPARE	SPARE	SPARE	SPARE							
20	RED/GREEN	SPARE	SPARE	SPARE	SPARE							

APS MESSAGE INFORMATION			
APS UNIT NO.	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
PB8 PB9 PB13 PB14	PHASE 2	BUTTON PUSH ON DW	WAIT TO CROSS PRESIDENT GEORGE BUSH HIGHWAY AT MIDWAY ROAD
		EXTENDED BUTTON PUSH	WAIT TO CROSS PRESIDENT GEORGE BUSH HIGHWAY AT MIDWAY ROAD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	PRESIDENT GEORGE BUSH HIGHWAY. WALK SIGN IS ON TO CROSS PRESIDENT GEORGE BUSH HIGHWAY
PB10 PB11 PB12	PHASE 4	BUTTON PUSH ON DW	WAIT TO CROSS MIDWAY ROAD AT PRESIDENT GEORGE BUSH HIGHWAY
		EXTENDED BUTTON PUSH	WAIT TO CROSS MIDWAY ROAD AT PRESIDENT GEORGE BUSH HIGHWAY
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	MIDWAY ROAD. WALK SIGN IS ON TO CROSS MIDWAY ROAD
PB1 PB2 PB6 PB7	PHASE 6	BUTTON PUSH ON DW	WAIT TO CROSS PRESIDENT GEORGE BUSH HIGHWAY AT MIDWAY ROAD
		EXTENDED BUTTON PUSH	WAIT TO CROSS PRESIDENT GEORGE BUSH HIGHWAY AT MIDWAY ROAD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	PRESIDENT GEORGE BUSH HIGHWAY. WALK SIGN IS ON TO CROSS PRESIDENT GEORGE BUSH HIGHWAY
PB3 PB4 PB5	PHASE 8	BUTTON PUSH ON DW	WAIT TO CROSS MIDWAY ROAD AT PRESIDENT GEORGE BUSH HIGHWAY
		EXTENDED BUTTON PUSH	WAIT TO CROSS MIDWAY ROAD AT PRESIDENT GEORGE BUSH HIGHWAY
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	MIDWAY ROAD. WALK SIGN IS ON TO CROSS MIDWAY ROAD

* COUNTDOWN SPEECH MESSAGE = "OFF" FOR ALL UNITS.



ITEM 682 VEHICLE AND PEDESTRIAN SIGNAL HEADS											
SIGNAL HEAD NO.	SIGNAL HEAD TYPE	BACKPLATES			12" LED SIGNAL INDICATIONS						PED SIGNAL COUNTDOWN (EA)
		3 SEC (EA)	4 SEC (EA)	5 SEC (EA)	R (EA)	Y (EA)	G (EA)	R ARW (EA)	Y ARW (EA)	G ARW (EA)	
2, 3, 6, 7, 13, 14, 20, 21, 24, 25, 31	H3	11			11	11	11				
1, 15, 19, 32	H3U	4			4	4				4	
5, 23	V3	2			2	2	2				
12	V5FLT			1				2	2	1	
30	H5FLT			1				2	2	1	
4, 8, 9, 10, 11, 16, 17, 18, 22, 26, 27, 28, 29, 33, 34, 35	PED									16	
TOTALS:		17		2	17	17	13	4	4	6	

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Texas Department of Transportation

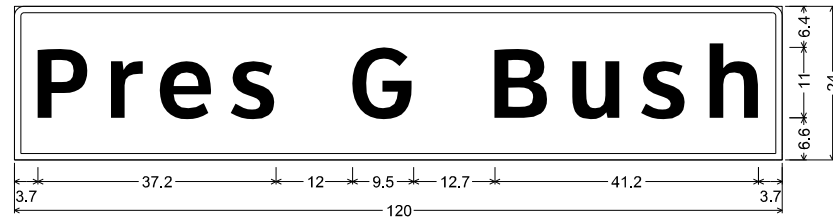
TRAFFIC SIGNAL DETAILS
SH 190 AT MIDWAY RD

SCALE: N/A SHEET 2 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLLIN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	69

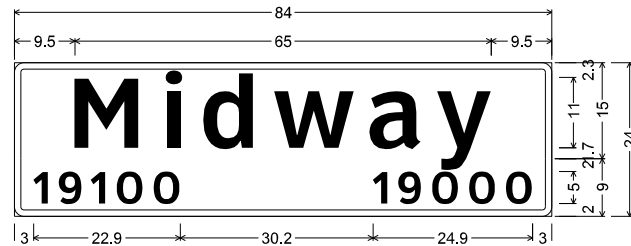
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D3-1;

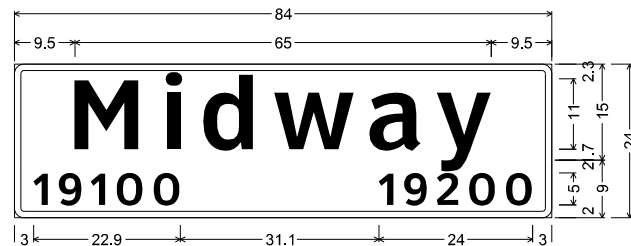
1.5" Radius, 1.0" Border, White on Green;
 "Pres G Bush", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
 "Midway", ClearviewHwy-5-W;

1.5" Radius, 1.0" Border, White on Green;
 "19100", ClearviewHwy-5-W; "19000", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
 "Midway", ClearviewHwy-5-W;

1.5" Radius, 1.0" Border, White on Green;
 "19100", ClearviewHwy-5-W; "19200", ClearviewHwy-5-W;



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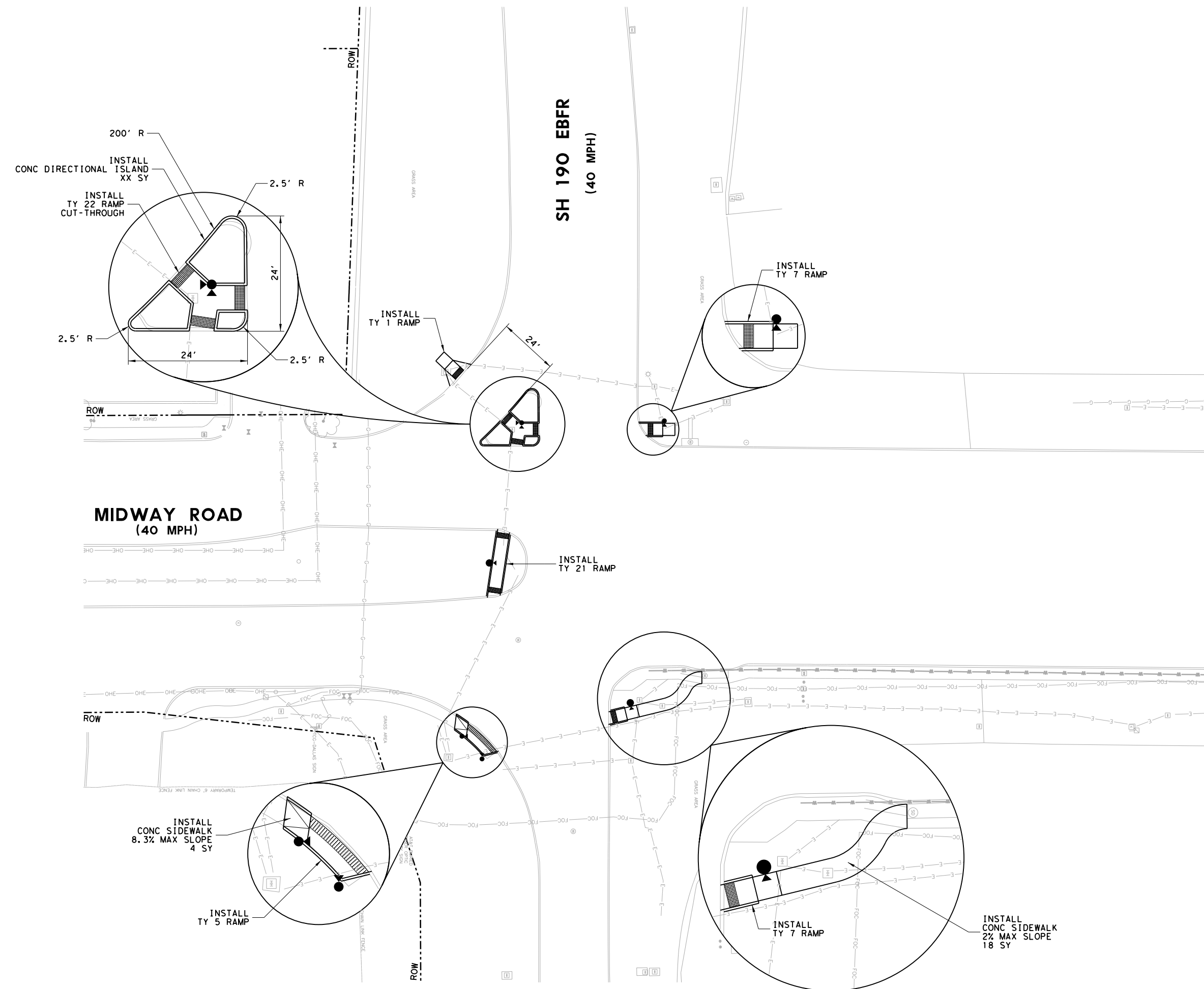
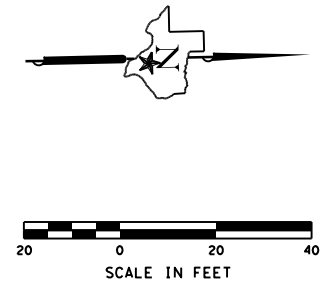
**TRAFFIC SIGNAL
 DETAILS
 SH 190 AT MIDWAY RD**

SCALE: N/A SHEET 3 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	70

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MATCH LINE A-A



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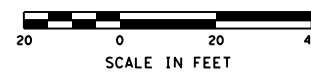
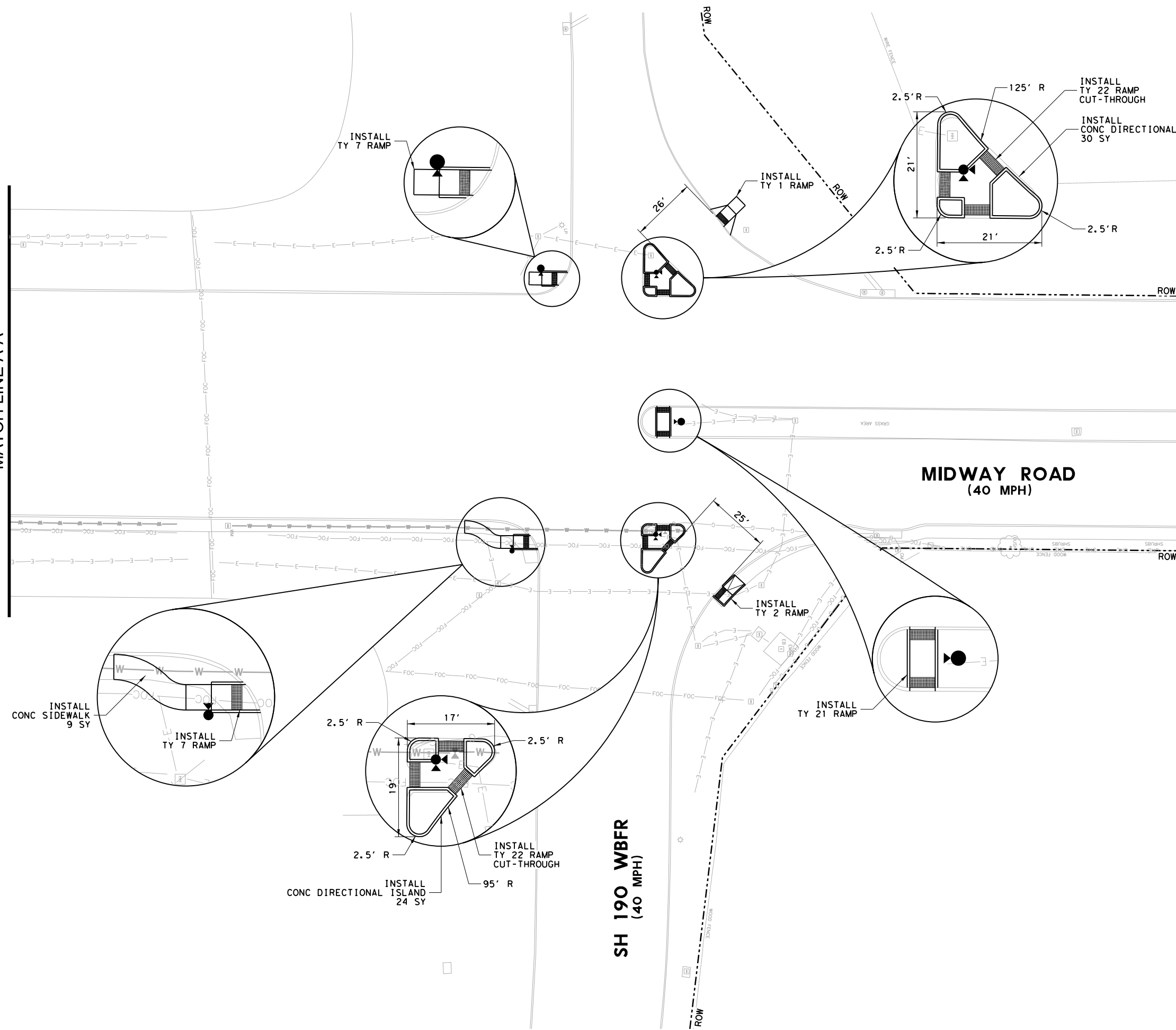
PEDESTRIAN RAMP
DETAILS
SH 190 EBFR AT MIDWAY RD
SCALE: 1"=40' SHEET 1 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT		HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET		VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.
				SHEET NO.
				71

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MATCH LINE A-A



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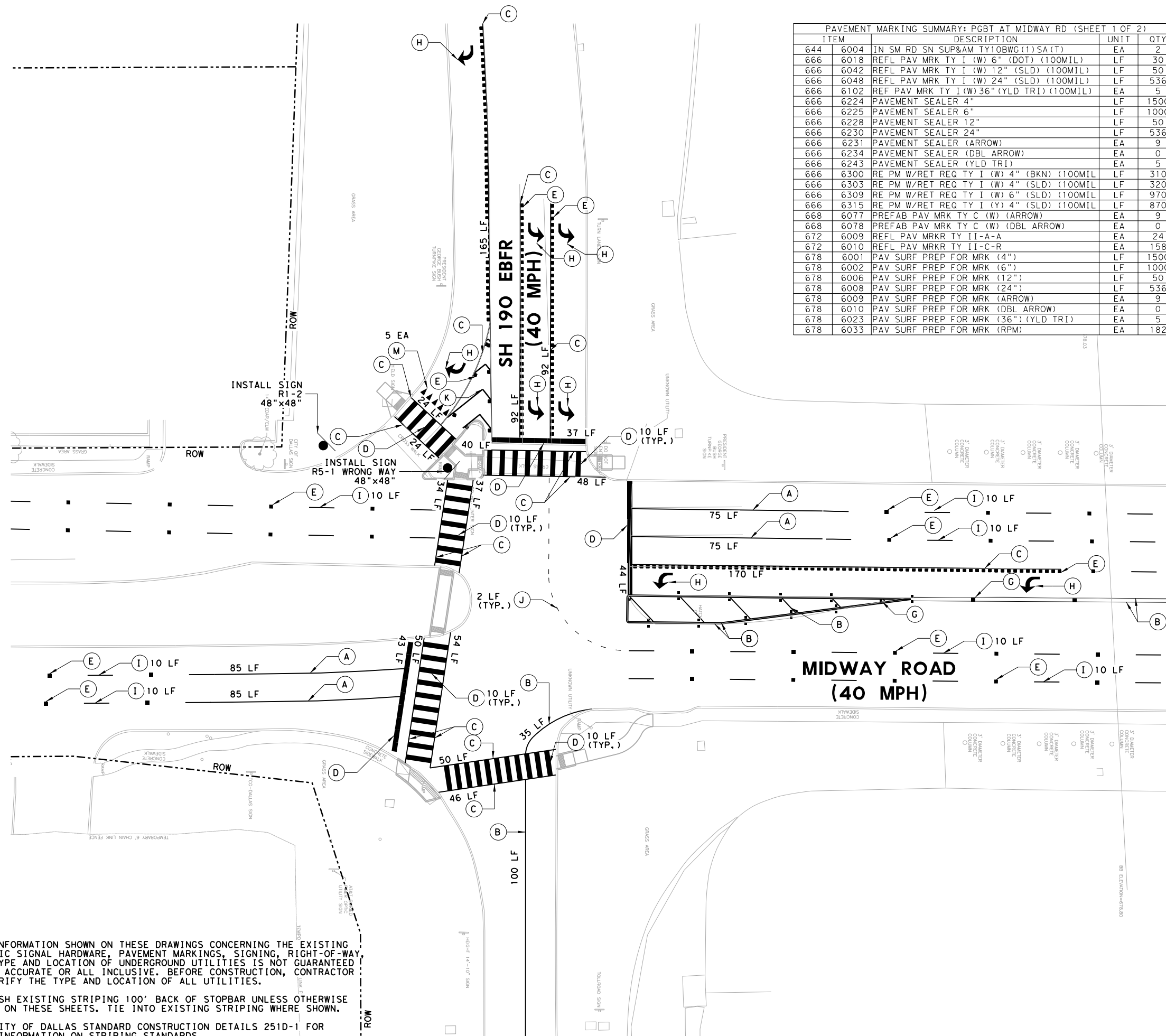
CITY OF DALLAS
 DEPARTMENT OF TRANSPORTATION

Texas Department of Transportation

PEDESTRIAN RAMP DETAILS
 SH 190 WBFR AT MIDWAY RD

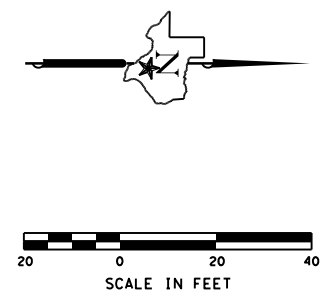
SCALE: 1"=40' SHEET 2 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	72



PAVEMENT MARKING SUMMARY: PGBT AT MIDWAY RD (SHEET 1 OF 2)

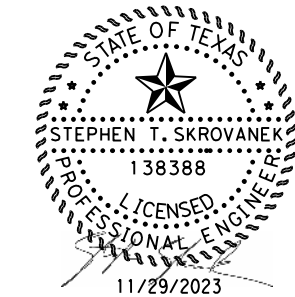
ITEM	DESCRIPTION	UNIT	QTY
644	6004 IN SM RD SN SUP&AMTY10BWG(1)SA(T)	EA	2
666	6018 REFL PAV MRK TY I (W) 6" (DOT) (100MIL)	LF	30
666	6042 REFL PAV MRK TY I (W) 12" (SLD) (100MIL)	LF	50
666	6048 REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	536
666	6102 REFL PAV MRK TY I (W) 36" (YLD TRI) (100MIL)	EA	5
666	6224 PAVEMENT SEALER 4"	LF	1500
666	6225 PAVEMENT SEALER 6"	LF	1000
666	6228 PAVEMENT SEALER 12"	LF	50
666	6230 PAVEMENT SEALER 24"	LF	536
666	6231 PAVEMENT SEALER (ARROW)	EA	9
666	6234 PAVEMENT SEALER (DBL ARROW)	EA	0
666	6243 PAVEMENT SEALER (YLD TRI)	EA	5
666	6300 RE PM W/RET REQ TY I (W) 4" (BKN) (100MIL)	LF	310
666	6303 RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)	LF	320
666	6309 RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)	LF	970
666	6315 RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)	LF	870
668	6077 PREFAB PAV MRK TY C (W) (ARROW)	EA	9
668	6078 PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	0
672	6009 REFL PAV MRKR TY II-A-A	EA	24
672	6010 REFL PAV MRKR TY II-C-R	EA	158
678	6001 PAV SURF PREP FOR MRK (4")	LF	1500
678	6002 PAV SURF PREP FOR MRK (6")	LF	1000
678	6006 PAV SURF PREP FOR MRK (12")	LF	50
678	6008 PAV SURF PREP FOR MRK (24")	LF	536
678	6009 PAV SURF PREP FOR MRK (ARROW)	EA	9
678	6010 PAV SURF PREP FOR MRK (DBL ARROW)	EA	0
678	6023 PAV SURF PREP FOR MRK (36") (YLD TRI)	EA	5
678	6033 PAV SURF PREP FOR MRK (RPM)	EA	182



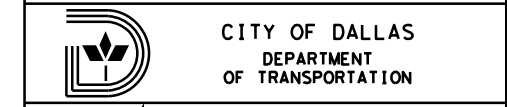
PROPOSED LEGEND

- (A) RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)
- (B) RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)
- (C) RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
- (D) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
- (E) REFL PAV MRKR (TY II-C-R)
- (F) REFL PAV MRKR (TY I-C)
- (G) REFL PAV MRKR (TY II-A-A)
- (H) PREFAB PAV MRK TY C (W) (ARROW)
- (I) RE PM W/RET REQ TY I (W) 4" (BRK) (100MIL)
- (J) REFL PAV MRK TY I (W) 6" (DOT) (100MIL)
- (K) REFL PAV MRK TY I (W) 12" (SLD) (100MIL)
- (L) PREFAB PAV MRK TY C (W) (DBL ARROW)
- (M) REF PAV MRK TY I (W) 36" (YLDTRI) (100MIL)
- IN SM RD SN SUP&AMTY10BWG(1)SA(T)

MATCH LINE A-A



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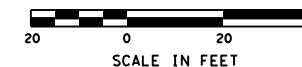
Texas Department of Transportation

PAVEMENT MARKING LAYOUT
 SH 190 EBFR AT MIDWAY RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
			JOB NO.
			267, ETC.
			SHEET NO.
			73

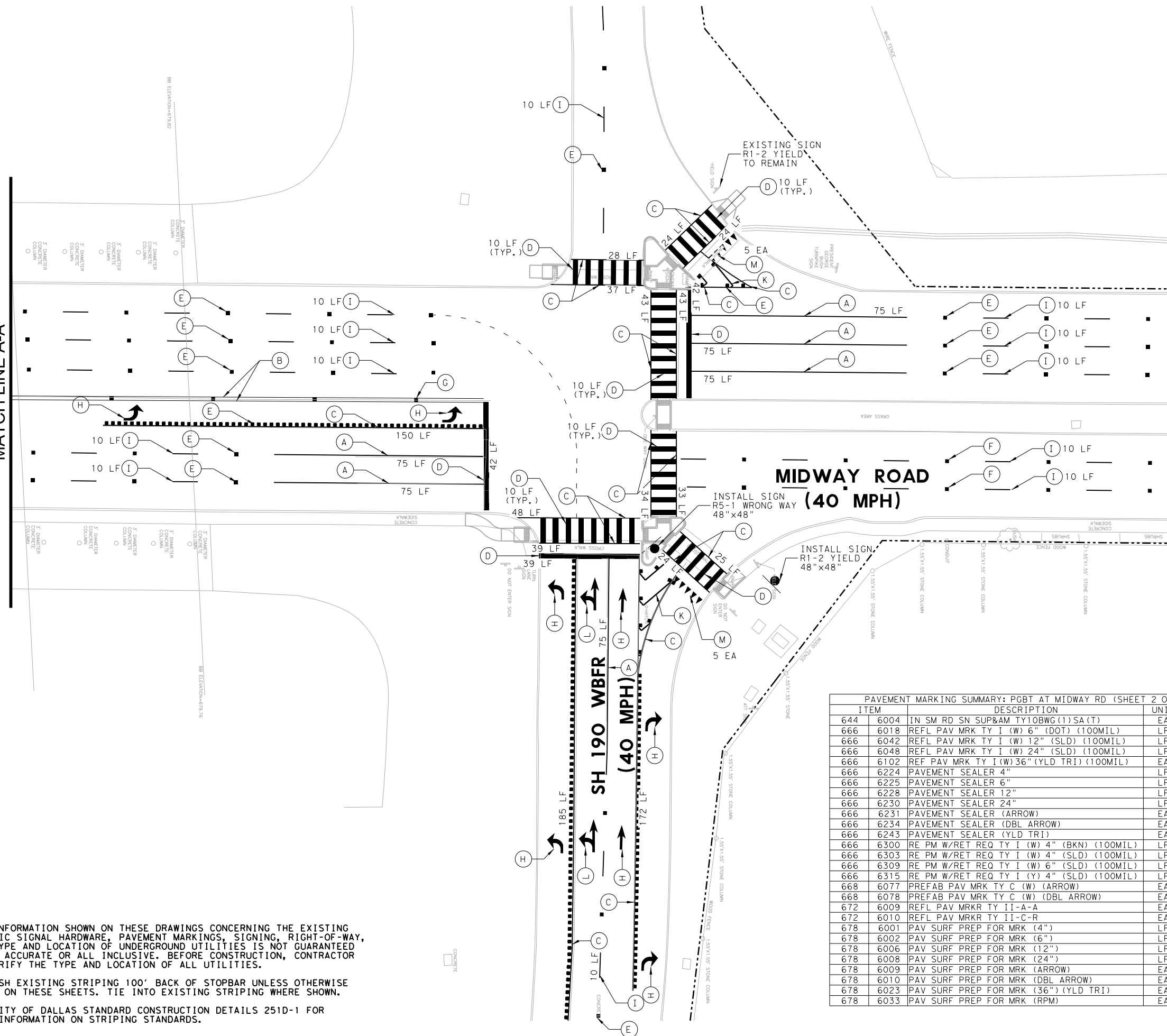
- THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
- REFRESH EXISTING STRIPING 100' BACK OF STOPBAR UNLESS OTHERWISE SHOWN ON THESE SHEETS. TIE INTO EXISTING STRIPING WHERE SHOWN.
- SEE CITY OF DALLAS STANDARD CONSTRUCTION DETAILS 251D-1 FOR MORE INFORMATION ON STRIPING STANDARDS.



PROPOSED LEGEND

- (A) RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)
- (B) RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)
- (C) RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
- (D) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
- (E) REFL PAV MRKR (TY II-C-R)
- (F) REFL PAV MRKR (TY I-C)
- (G) REFL PAV MRKR (TY II-A-A)
- (H) PREFAB PAV MRK TY C (W) (ARROW)
- (I) RE PM W/RET REQ TY I (W) 4" (BRK) (100MIL)
- (J) REFL PAV MRK TY I (W) 6" (DOT) (100MIL)
- (K) REFL PAV MRK TY I (W) 12" (SLD) (100MIL)
- (L) PREFAB PAV MRK TY C (W) (DBL ARROW)
- (M) REF PAV MRK TY I (W) 36" (YLDTRI) (100MIL)
- IN SM RD SN SUP&AMTY10BWG (1) SA (T)

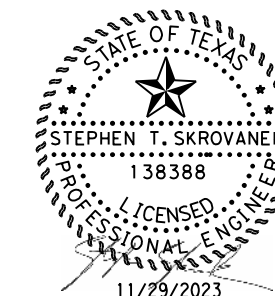
MATCH LINE A-A



PAVEMENT MARKING SUMMARY: PGBT AT MIDWAY RD (SHEET 2 OF 2)

ITEM	DESCRIPTION	UNIT	QTY
644	6004 IN SM RD SN SUP&AMTY10BWG (1) SA (T)	EA	2
666	6018 REFL PAV MRK TY I (W) 6" (DOT) (100MIL)	LF	40
666	6042 REFL PAV MRK TY I (W) 12" (SLD) (100MIL)	LF	40
666	6048 REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	526
666	6102 REF PAV MRK TY I (W) 36" (YLD TRI) (100MIL)	EA	10
666	6224 PAVEMENT SEALER 4"	LF	1222
666	6225 PAVEMENT SEALER 6"	LF	1013
666	6228 PAVEMENT SEALER 12"	LF	40
666	6230 PAVEMENT SEALER 24"	LF	526
666	6231 PAVEMENT SEALER (ARROW)	EA	8
666	6234 PAVEMENT SEALER (DBL ARROW)	EA	2
666	6243 PAVEMENT SEALER (YLD TRI)	EA	10
666	6300 RE PM W/RET REQ TY I (W) 4" (BKN) (100MIL)	LF	400
666	6303 RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)	LF	450
666	6309 RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)	LF	973
666	6315 RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)	LF	372
668	6077 PREFAB PAV MRK TY C (W) (ARROW)	EA	8
668	6078 PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	2
672	6009 REFL PAV MRKR TY II-A-A	EA	5
672	6010 REFL PAV MRKR TY II-C-R	EA	237
678	6001 PAV SURF PREP FOR MRK (4")	LF	1222
678	6002 PAV SURF PREP FOR MRK (6")	LF	1013
678	6006 PAV SURF PREP FOR MRK (12")	LF	40
678	6008 PAV SURF PREP FOR MRK (24")	LF	526
678	6009 PAV SURF PREP FOR MRK (ARROW)	EA	8
678	6010 PAV SURF PREP FOR MRK (DBL ARROW)	EA	2
678	6023 PAV SURF PREP FOR MRK (36") (YLD TRI)	EA	10
678	6033 PAV SURF PREP FOR MRK (RPM)	EA	242

- THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
- REFRESH EXISTING STRIPING 100' BACK OF STOPBAR UNLESS OTHERWISE SHOWN ON THESE SHEETS. TIE INTO EXISTING STRIPING WHERE SHOWN.
- SEE CITY OF DALLAS STANDARD CONSTRUCTION DETAILS 251D-1 FOR MORE INFORMATION ON STRIPING STANDARDS.



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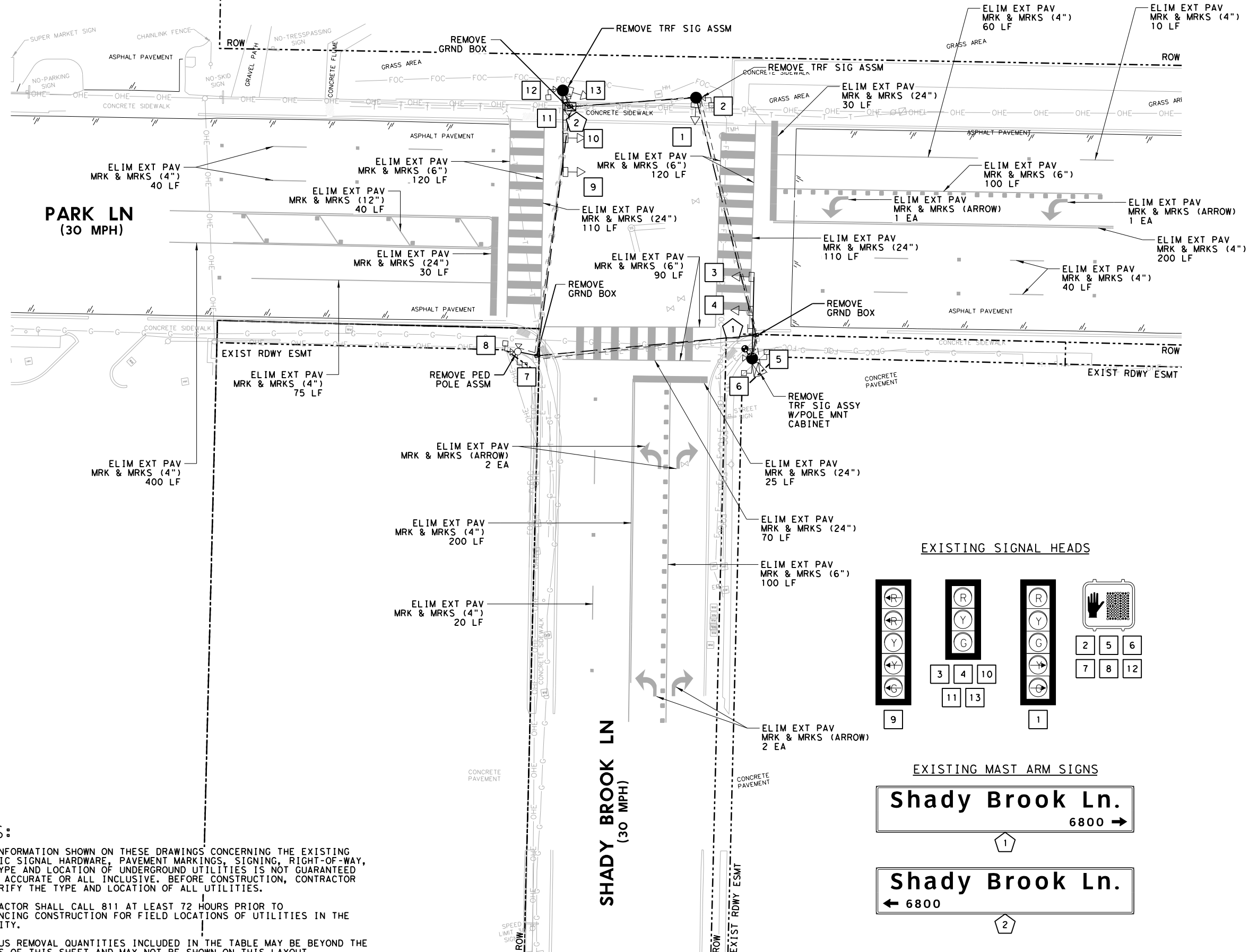
PAVEMENT MARKING LAYOUT
 SH 190 WBFR AT MIDWAY RD

SCALE: 1"=40' SHEET 2 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	74

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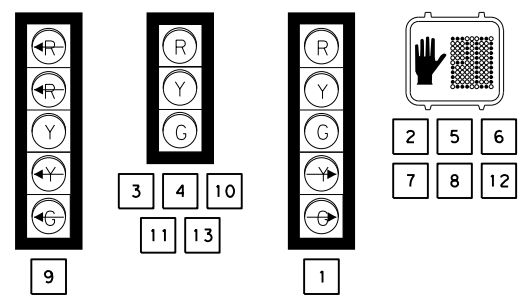
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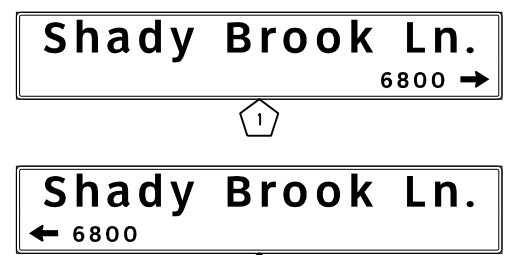
EXISTING LEGEND

- POLE-MOUNTED CONTROLLER
- GROUND-MOUNTED CONTROLLER
- GROUND BOX
- MAST ARM POLE
- PEDESTRIAN SIGNAL POLE
- HORIZONTAL SIGNAL HEAD
- VERTICAL SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- LUMINAIRE
- OVERHEAD SIGN
- SERVICE METER & DISCONNECT
- PTZ CAMERA
- CONDUIT TO BE ABANDONDED

EXISTING SIGNAL HEADS

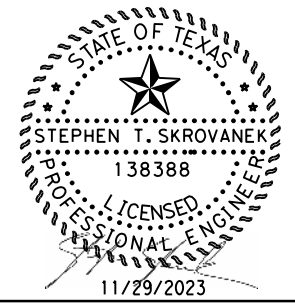


EXISTING MAST ARM SIGNS



NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
2. CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.
3. VARIOUS REMOVAL QUANTITIES INCLUDED IN THE TABLE MAY BE BEYOND THE LIMITS OF THIS SHEET AND MAY NOT BE SHOWN ON THIS LAYOUT.



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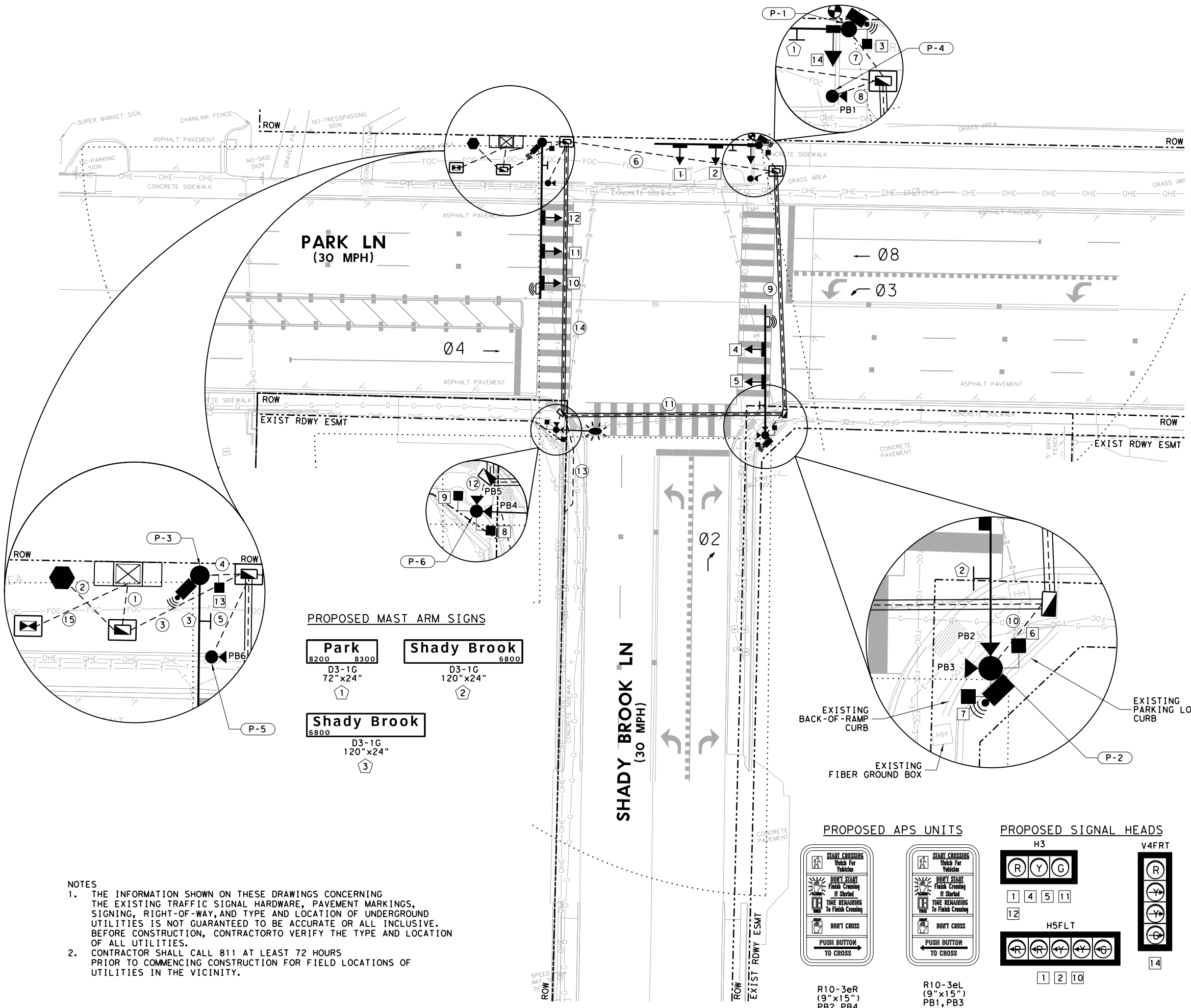
CITY OF DALLAS
 DEPARTMENT OF TRANSPORTATION

EXISTING CONDITIONS & REMOVALS
PARK LN AT SHADY BROOK LN

SCALE: 1" = 30' SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL.IN, ETC.	0918	24	267, ETC.	75

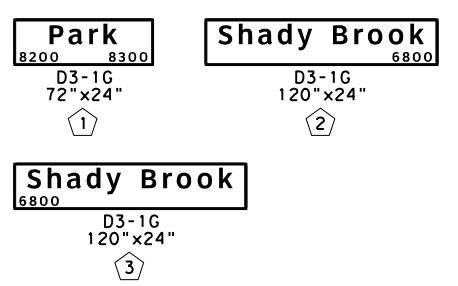
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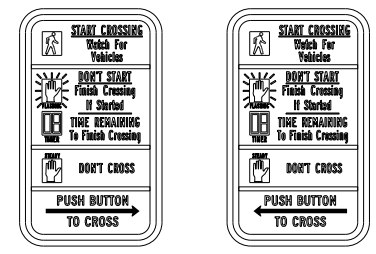
PROPOSED LEGEND

- CONTROLLER CABINET W/BBU
- TY D GROUND BOX
- TY D GROUND BOX W/APRON
- MAST ARM POLE
- PEDESTRIAN SIGNAL POLE
- HORIZONTAL SIGNAL HEAD
- VERTICAL SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- LUMINAIRE
- OVERHEAD SIGN
- SERVICE METER & DISCONNECT
- CONDUIT TRENCH
- CONDUIT BORE
- PRESENCE RADAR
- ADVANCE RADAR
- PTZ CAMERA
- ITS GROUND BOX TY 1 W/APRON

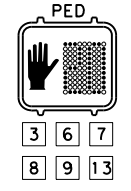
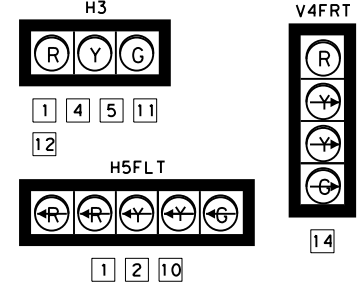
PROPOSED MAST ARM SIGNS



PROPOSED APS UNITS



PROPOSED SIGNAL HEADS



NOTES

- THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
- CONTRACTOR SHALL CALL 811 AT LEAST 72 HOURS PRIOR TO COMMENCING CONSTRUCTION FOR FIELD LOCATIONS OF UTILITIES IN THE VICINITY.



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Texas Department of Transportation

TRAFFIC SIGNAL LAYOUT
PARK LN AT SHADY BROOK LN

SCALE: 1"=30' SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	76

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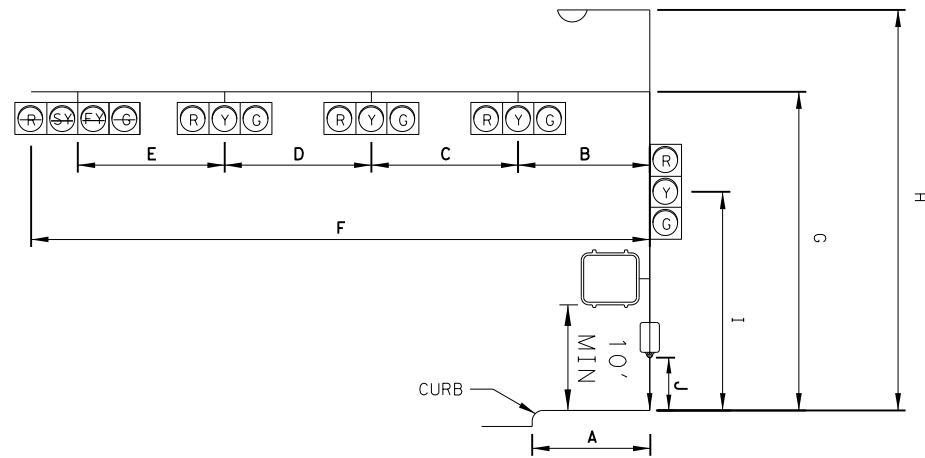
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RUN ID	LENGTH	SUMMARY OF CONDUIT AND CABLES																																		
		ITEM 618 CONDUIT												ITEM 620 ELECTRICAL CONDUCTORS						ITEM 684 TRAFFIC SIGNAL CABLES								ITEM 6004 ITS CABLE		SUB TO ITEM 6292 RVDS						
		2" (SCH 80)				3" (SCH 80)				4" (SCH 80)				#6 BARE		#12 INSULATED		#8 INSULATED		#6 INSULATED		TYPE A				TYPE C		ETHERNET CABLE**		PRES. RADAR CABLE **		ADV. RADAR CABLE **				
		TRENCH		BORE		TRENCH		BORE		TRENCH		BORE		EA	LF	EA	LF	EA	LF	EA	LF	5/C #14	7/C #14	12/C #14	20/C #14	2/C #12	EA	LF	EA	LF	EA	LF	EA	LF		
1	10'	1	10'									2	20'																							
2	15'	1	15'									1	15'			2	30'	2	30'																	
3	20'											1	20'			2	40'																			
4	15'					1	15'					1	15'			2	30'																			
5	10'					1	10'					1	10'																							
6	50'											1	50'																							
7	10'					1	10'					1	10'																							
8	10'					1	10'					1	10'																							
9	80'											1	80'																							
10	15'					1	15'					1	15'																							
11	70'											1	70'																							
12	10'					1	10'					1	10'			2	20'																			
13	35'	1	35'																																	
14	75'			1	75'							1	75'			2	150'			2	150'															
15	15'					1	15'																													
POLE ID		CONDUIT AND CABLES INSIDE POLES																																		
P-1																																				
P-2																																				
P-3																																				
P-4																																				
P-5																																				
P-6																																				
TOTALS:		60'	75'	85'	90'	225'	485'	60'	270'	50'	245'	155'	245'	310'	740'	120'	370'	340'																		

** FURNISHED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR.

POLE ID	DIMENSIONS (SEE FIGURE)											HEADS ON MAST ARM	LUM ARM	ITEM 688 APS UNITS	ITEM 416 DRILLED SHAFT FOUNDATIONS					FDN TYPE															
	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	I (FT)	J (FT)	24" *				30"	30" ILL	36"	42"	48"																
	P-1	-	10	11			32	19		15					2																				
P-2	10.5	16.5	10			40	19				2																								36-A
P-3	18	23	10	10		48	19				3																								36-A
P-4	PUSHBUTTON POLE					-	5				3.5																								24-A
P-5	PUSHBUTTON POLE					-	5				3.5																								24-A
P-6	STREETLIGHT POLE					-	20	20			3.5																								30" ILL
TOTALS:											1	6	8'	12'	8'	28'																			

* SUBSIDIARY TO ITEM 687.

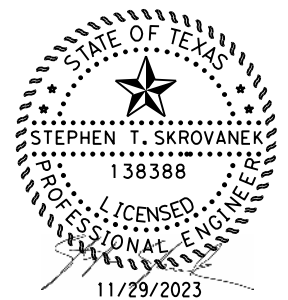


ITEM 628 ELECTRICAL SERVICES											
ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED (5) - 14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CKT. BKR. POLE/AMPS	TWO-POLE CONTACTOR AMPS	PANELBD/LOADCENTER AMP RATING	BRANCH CIRCUIT ID	BRANCH CKT. BKR. POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-5	ELEC SRV TY D 120/240 070 (NS)SS(E)PS(U)	2"	*	N/A	2P/70	30	100	SIG	1P/50	40	4.97
								LUM	1P/20	1.42	

* FURNISHED AND INSTALLED BY ONCOR

SIGNAL HEAD NO.	SIGNAL HEAD TYPE	ITEM 682 VEHICLE AND PEDESTRIAN SIGNAL HEADS										
		BACKPLATES			12" LED SIGNAL INDICATIONS						PED SIGNAL COUNTDOWN (EA)	
		3 SEC (EA)	4 SEC (EA)	5 SEC (EA)	R (EA)	Y (EA)	G (EA)	R ARW (EA)	Y ARW (EA)	G ARW (EA)		
4, 5, 11, 12	H3	4			4	4	4					
14	V4FRT		1		1				2	1		
1, 2, 10	H5FLT			3				6	6	3		
3, 6, 7, 8, 9, 13	PED										6	
TOTALS:		4	1	3	5	4	4	6	8	4	6	6

ITEM 624 / 6186 GROUND BOXES	
DESCRIPTION	QTY
GROUND BOX TY D (162922)	2
GROUND BOX TY D (162922)W/APRON	3
ITS GND BOX (POLY) TY 1 (243624)W/APRN	1



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 DEPARTMENT OF TRANSPORTATION

Texas Department of Transportation

TRAFFIC SIGNAL DETAILS
 PARK LN AT SHADY BROOK LN

SCALE: N/A SHEET 1 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	77

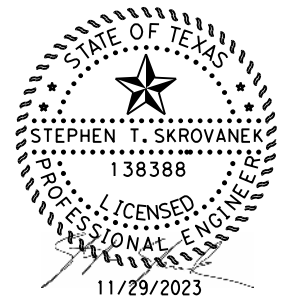
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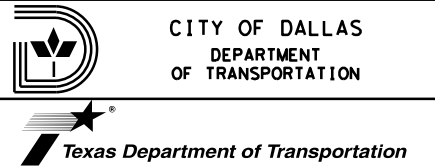
CABLE TERMINATION					
CNDR NO.	CNDR COLOR	CABLE 1 FROM CNTRL TO POLE 1 20/C #14	CABLE 2 FROM CNTRL TO POLE 2 20/C #14	CABLE 3 FROM CNTRL TO POLE 3 20/C #14	CABLE 5 FROM CNTRL TO POLE 5 12/C #14
1	BLACK	SPARE	SPARE	SPARE	SPARE
2	WHITE	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON	SIGNAL COMMON
3	RED	SH 13 PHASE 2 RED	SH 4,5 PHASE 4 RED	SH 11,12 PHASE 8 RED	SH 8 PHASE 4 DONT WALK
4	GREEN	SPARE	SH 4,5 PHASE 4 GREEN	SH 11,12 PHASE 8 GREEN	SH 8 PHASE 4 WALK
5	ORANGE	SPARE	SH 4,5 PHASE 4 YELLOW	SH 11,12 PHASE 8 YELLOW	SPARE
6	BLUE	SPARE	SPARE	SPARE	SPARE
7	WHITE/BLACK	SPARE	SPARE	SPARE	SPARE
8	RED/BLACK	SH 1,2 PHASE 2 RED ARW	SH 6 PHASE 2 DONT WALK	SPARE	SH 9 PHASE 2 DONT WALK
9	GREEN/BLACK	SH 1,2,13 PHASE 2 GRN ARW	SH 6 PHASE 2 WALK	SPARE	SH 9 PHASE 2 WALK
10	ORANGE/BLACK	SH 1,2,13 PHASE 2 YEL ARW	SPARE	SPARE	SPARE
11	BLUE/BLACK	SPARE	SPARE	SPARE	SPARE
12	BLACK/WHITE	SPARE	SPARE	SPARE	SPARE
13	RED/WHITE	SPARE	SH 7 PHASE 4 DONT WALK	SPARE	
14	GREEN/WHITE	SPARE	SH 7 PHASE 4 WALK	SPARE	
15	BLUE/WHITE	SPARE	SPARE	SPARE	
16	BLACK/RED	SH 3 PHASE 2 DONT WALK	SPARE	SH 13 PHASE 2 DONT WALK	
17	WHITE/RED	SH 3 PHASE 2 WALK	SPARE	SH 13 PHASE 2 WALK	
18	ORANGE/RED	SPARE	SPARE	SPARE	
19	BLUE/RED	SPARE	SPARE	SPARE	
20	RED/GREEN	SPARE	SPARE	SPARE	

APS MESSAGE INFORMATION			
APS UNIT NO.	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
PB1 PB3 PB4 PB6	PHASE 2	BUTTON PUSH ON DW	WAIT TO CROSS PARK LANE AT SHADY BROOK LANE
		EXTENDED BUTTON PUSH	WAIT TO CROSS PARK LANE AT SHADY BROOK LANE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	PARK LANE. WALK SIGN IS ON TO CROSS PARK LANE
PB2 PB5	PHASE 4	BUTTON PUSH ON DW	WAIT TO CROSS SHADY BROOK LANE AT PARK LANE
		EXTENDED BUTTON PUSH	WAIT TO CROSS SHADY BROOK LANE AT PARK LANE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	SHADY BROOK LANE. WALK SIGN IS ON TO CROSS SHADY BROOK LANE

* COUNTDOWN SPEECH MESSAGE = "OFF" FOR ALL UNITS.



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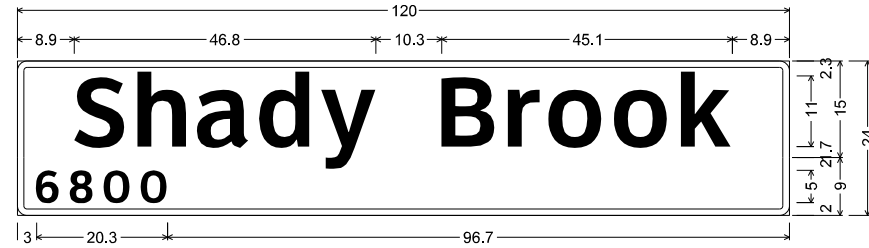
**TRAFFIC SIGNAL
 DETAILS
 PARK LN AT SHADY BROOK LN**

SCALE: N/A SHEET 2 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	78

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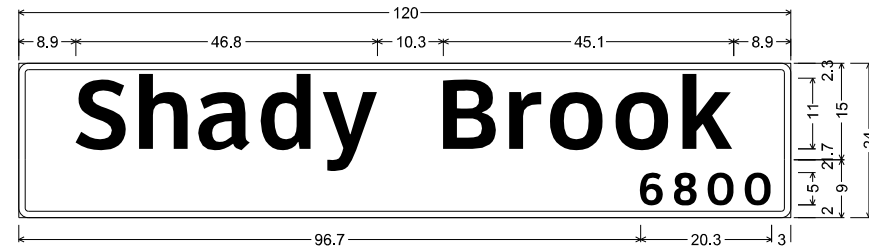
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D3-1;

1.5" Radius, 1.0" Border, White on Green;
 "Shady Brook", ClearviewHwy-5-W 50% spacing;

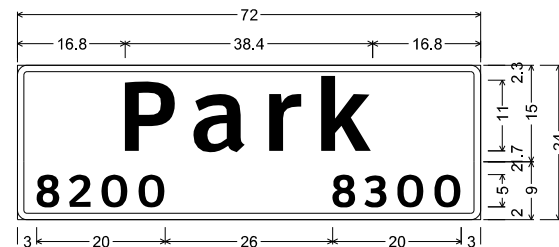
1.5" Radius, 1.0" Border, White on Green;
 "6800", ClearviewHwy-5-W; " ", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
 "Shady Brook", ClearviewHwy-5-W 50% spacing;

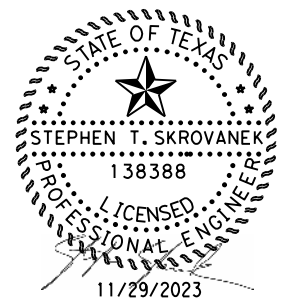
1.5" Radius, 1.0" Border, White on Green;
 " ", ClearviewHwy-5-W; "6800", ClearviewHwy-5-W;



D3-1;

1.5" Radius, 1.0" Border, White on Green;
 "Park", ClearviewHwy-5-W;

1.5" Radius, 1.0" Border, White on Green;
 "8200", ClearviewHwy-5-W; "8300", ClearviewHwy-5-W;



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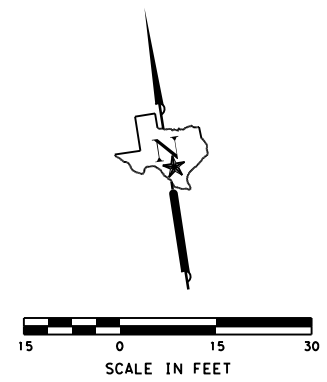
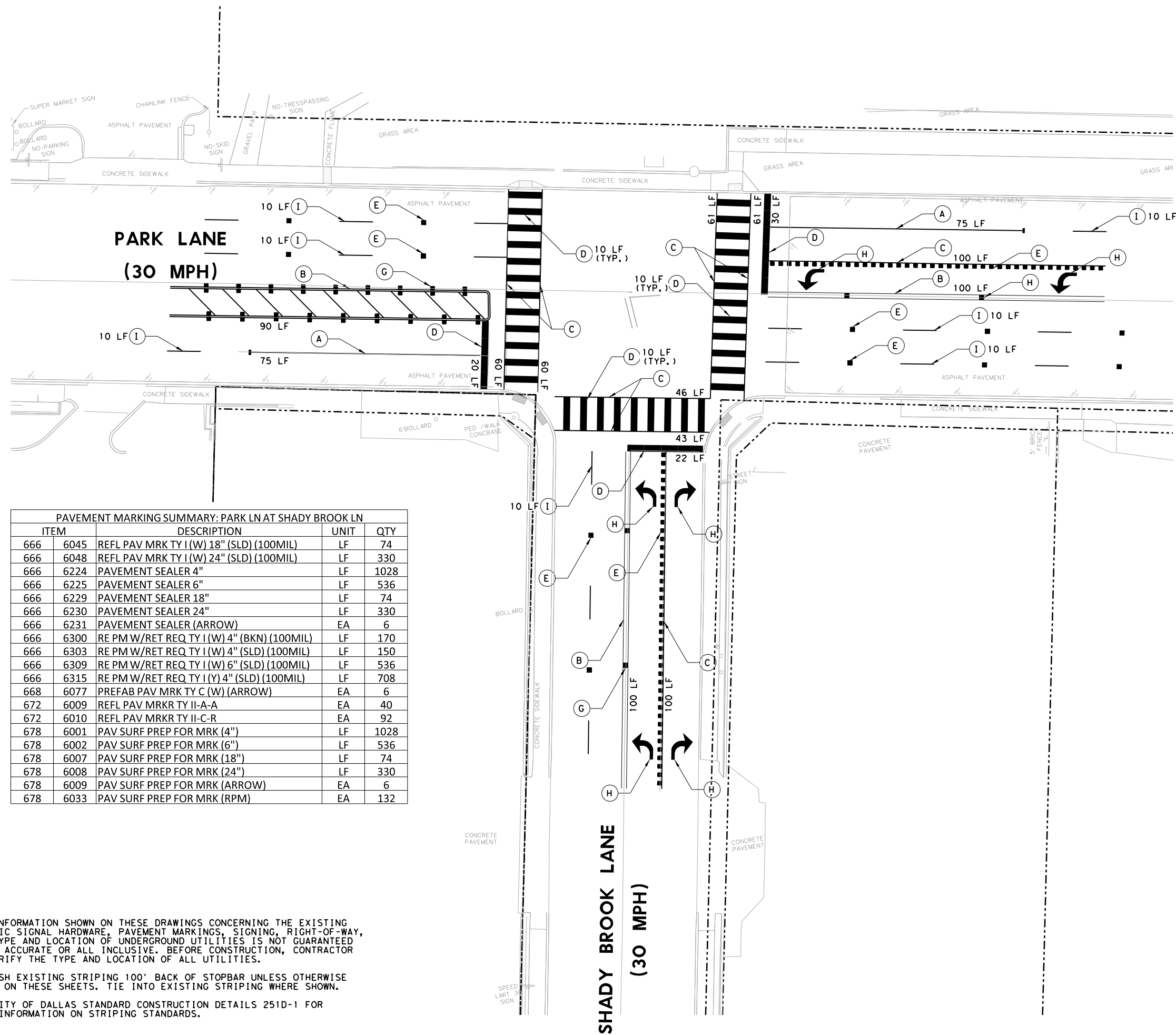
**TRAFFIC SIGNAL
 DETAILS
 PARK LN AT SHADY BROOK LN**

SCALE: N/A SHEET 3 OF 3

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL LN, ETC.	0918	24	267, ETC.	79

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- PROPOSED LEGEND**
- (A) RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)
 - (B) RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)
 - (C) RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)
 - (D) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
 - (E) REFL PAV MRKR (TY II-C-R)
 - (F) REFL PAV MRKR (TY I-C)
 - (G) REFL PAV MRKR (TY II-A-A)
 - (H) PREFAB PAV MRK TY C(W) (ARROW)
 - (I) RE PM W/RET REQ TY I (W) 4" (BRK) (100MIL)

PAVEMENT MARKING SUMMARY: PARK LN AT SHADY BROOK LN

ITEM	DESCRIPTION	UNIT	QTY
666	6045 REFL PAV MRK TY I (W) 18" (SLD) (100MIL)	LF	74
666	6048 REFL PAV MRK TY I (W) 24" (SLD) (100MIL)	LF	330
666	6224 PAVEMENT SEALER 4"	LF	1028
666	6225 PAVEMENT SEALER 6"	LF	536
666	6229 PAVEMENT SEALER 18"	LF	74
666	6230 PAVEMENT SEALER 24"	LF	330
666	6231 PAVEMENT SEALER (ARROW)	EA	6
666	6300 RE PM W/RET REQ TY I (W) 4" (BKN) (100MIL)	LF	170
666	6303 RE PM W/RET REQ TY I (W) 4" (SLD) (100MIL)	LF	150
666	6309 RE PM W/RET REQ TY I (W) 6" (SLD) (100MIL)	LF	536
666	6315 RE PM W/RET REQ TY I (Y) 4" (SLD) (100MIL)	LF	708
668	6077 PREFAB PAV MRK TY C (W) (ARROW)	EA	6
672	6009 REFL PAV MRKR TY II-A-A	EA	40
672	6010 REFL PAV MRKR TY II-C-R	EA	92
678	6001 PAV SURF PREP FOR MRK (4")	LF	1028
678	6002 PAV SURF PREP FOR MRK (6")	LF	536
678	6007 PAV SURF PREP FOR MRK (18")	LF	74
678	6008 PAV SURF PREP FOR MRK (24")	LF	330
678	6009 PAV SURF PREP FOR MRK (ARROW)	EA	6
678	6033 PAV SURF PREP FOR MRK (RPM)	EA	132

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO VERIFY THE TYPE AND LOCATION OF ALL UTILITIES.
2. REFRESH EXISTING STRIPING 100' BACK OF STOPBAR UNLESS OTHERWISE SHOWN ON THESE SHEETS. TIE INTO EXISTING STRIPING WHERE SHOWN.
3. SEE CITY OF DALLAS STANDARD CONSTRUCTION DETAILS 251D-1 FOR MORE INFORMATION ON STRIPING STANDARDS.



BGE, Inc.
 2595 Dallas Parkway, Suite 101, Frisco, TX 75034
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CITY OF DALLAS
 DEPARTMENT OF TRANSPORTATION

Texas Department of Transportation

PAVEMENT MARKING LAYOUT
 PARK LN AT SHADY BROOK LN
 SCALE: 1" = 40' SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
			JOB NO.
			267, ETC.
			SHEET NO.
			80

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APPLICABLE STANDARDS SHEETS

OVERHEAD SIGN BRIDGE STANDARDS:

- OSB-SE
- OSB-Z#
- OSB-Z#1
- HOSB-Z#
- HOSB-Z1L
- HOSB-Z#1
- OSBT
- OSBC
- OSBC-SC-Z#
- OSBS-SC
- OSB-FD
- OSB-FD-SC

CANTILEVER OVERHEAD SIGN SUPPORT STANDARDS:

- COSS-SE
- COSS-Z#-10
- HCOSS-Z#-10
- COSS-Z21-10
- COSS-Z#&Z#1-10
- COSSD
- COSSF
- COSS-FD

Note: # = Wind Zone number 1, 2, 3 or 4

HIGH MAST ILLUMINATION POLE STANDARDS:

- HMIP-98
- HMIF-98

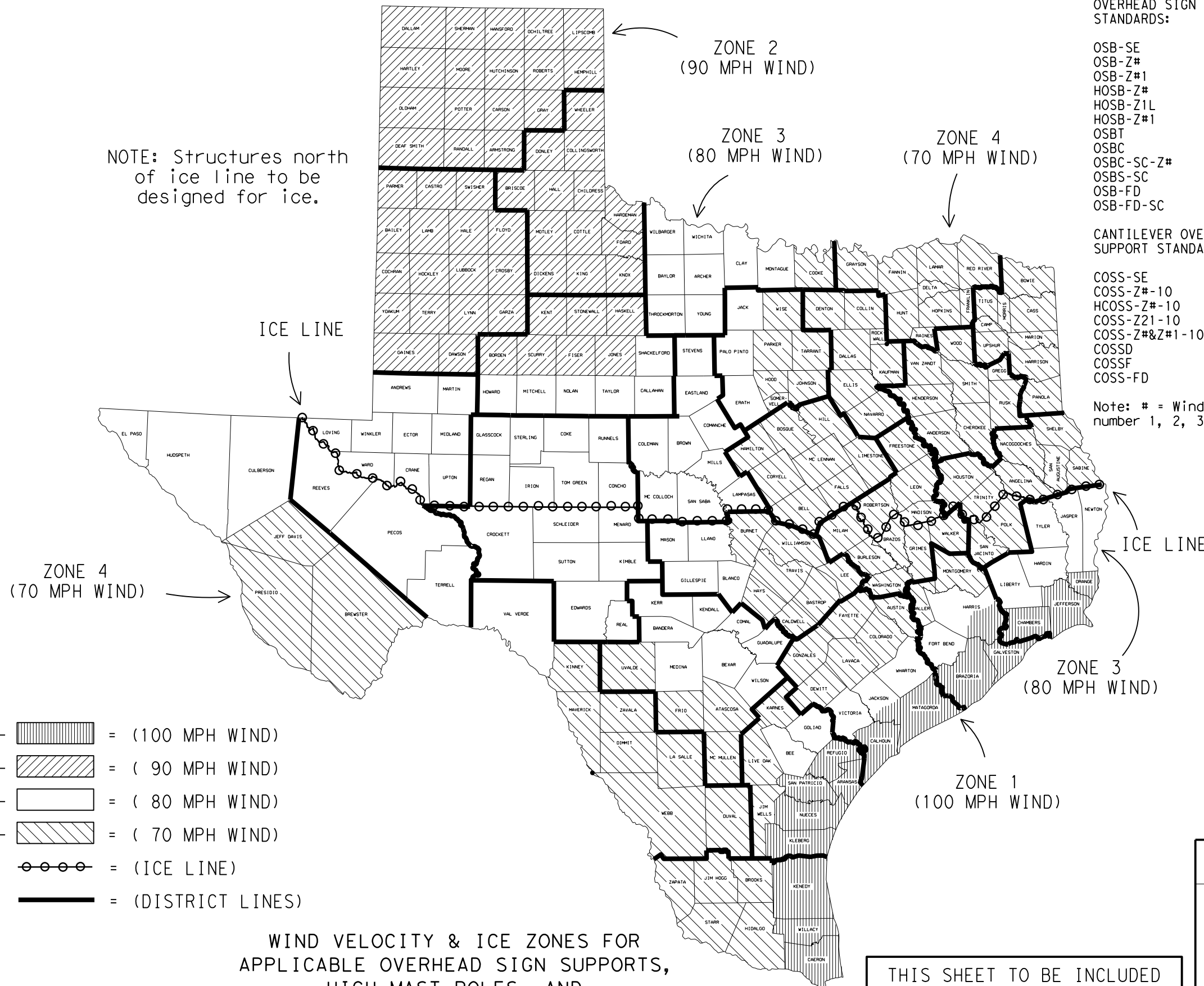
WALKWAYS AND BRACKETS STANDARDS:

- SWW
- SB(SWL-1)

TRAFFIC SIGNAL POLE STANDARDS:

- SP-80
- SP-100
- SMA-80
- SMA-100
- DMA-80
- DMA-100
- MA-C
- MAC (ILSN)
- MAD-D
- TS-FD
- LUM-A
- CFA
- LMA
- TS-C
- MA-DPD

NOTE: Structures north of ice line to be designed for ice.



LEGEND

- ZONE 1 - [Hatching] = (100 MPH WIND)
- ZONE 2 - [Hatching] = (90 MPH WIND)
- ZONE 3 - [Hatching] = (80 MPH WIND)
- ZONE 4 - [Hatching] = (70 MPH WIND)
- [Dashed line with circles] = (ICE LINE)
- [Solid black line] = (DISTRICT LINES)

WIND VELOCITY & ICE ZONES FOR APPLICABLE OVERHEAD SIGN SUPPORTS, HIGH MAST POLES, AND TRAFFIC SIGNAL POLES

Based on 50 Year Mean Recurrence Interval of Fastest Mile Wind Velocity at 33 feet height.

THIS SHEET TO BE INCLUDED IN ALL P.S.&E. PACKAGES CONTAINING ONE OR MORE OF THE APPLICABLE STANDARD SHEETS LISTED HEREON

FOR HARRIS CO. ONLY
 Zone line is just North of US 90, around on the North, West and South sides of IH 610 and down the West side of SH 288.

FOR JACKSON CO. ONLY
 Zone line is just North of SH 616.

		Traffic Operations Division Standard	
<h2>WIND VELOCITY AND ICE ZONES</h2> <h3>WV & IZ-14</h3>			
FILE:	windice.dgn	DN: TxDOT	CK: TxDOT
© TxDOT	April 1996	CONT	SECT
REVISIONS	0918	24	267, ETC.
8-14-Added list of applicable standards, restricting use to structures designed for Fastest Mile wind speeds.	DIST	COUNTY	SHEET NO.
	DAL	COL, ETC.	81

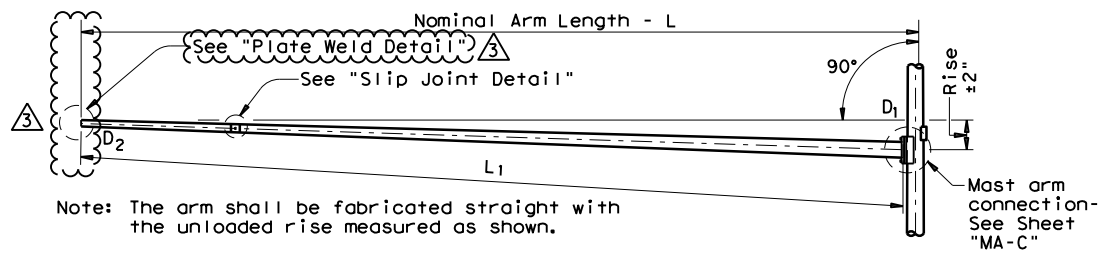
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Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	D _B	D ₁₉	D ₂₄	D ₃₀	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	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

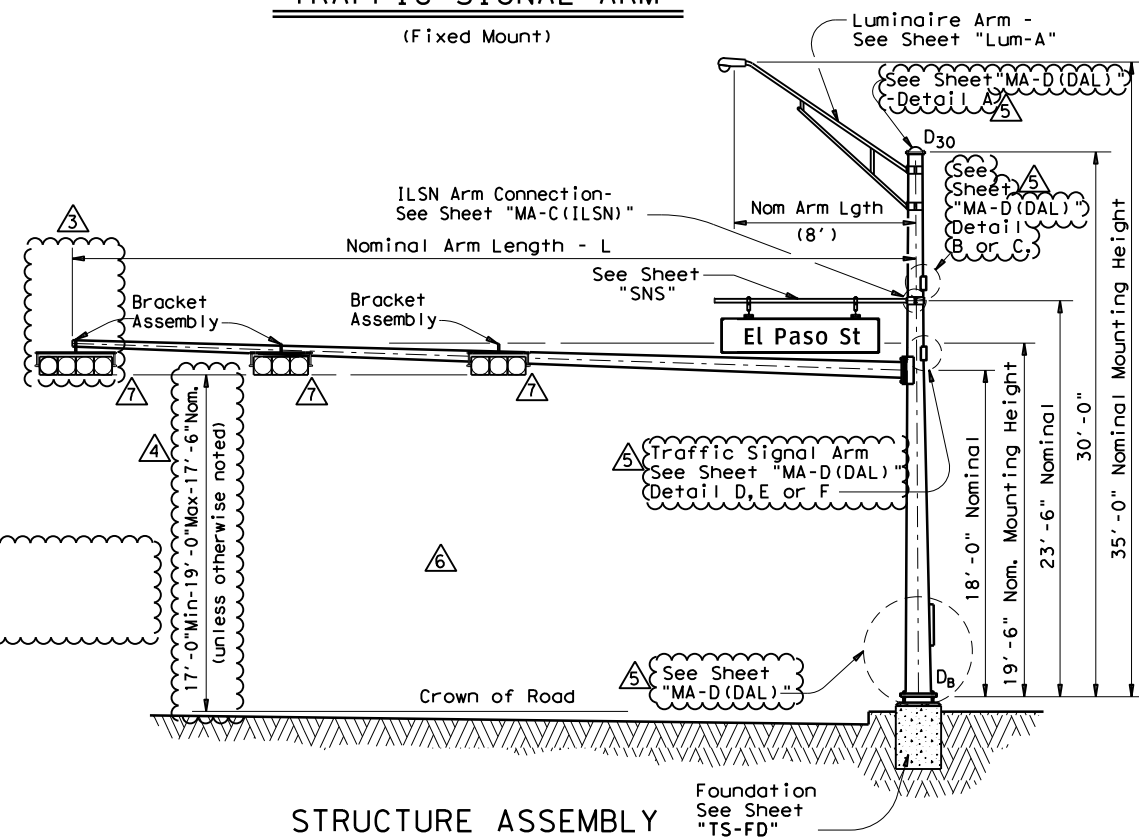
Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L ₁	D ₁	D ₂	① thk	Rise	L ₁	D ₁	② D ₂	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.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.
D₁₉ = Pole Top O.D. with no Luminaire and no ILSN
D₂₄ = Pole Top O.D. with ILSN w/out Luminaire
D₃₀ = Pole Top O.D. with Luminaire
D₁ = Arm Base O.D.
D₂ = Arm End O.D.
L₁ = Shaft Length
L = Nominal Arm Length

- ① Thickness shown are minimums, thicker materials may be used.
- ② D₂ may be increased by up to 1" for polygonal arms.



TRAFFIC SIGNAL ARM
(Fixed Mount)



STRUCTURE ASSEMBLY



I AM SEALING THIS SHEET ONLY FOR THE SHIPPING PARTS LIST

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	
	Designation	Quantity	Designation	Quantity	Designation	Quantity
ft						
20	20L-80		20S-80		20-80	
24	24L-80		24S-80		24-80	
28	28L-80		28S-80		28-80	
32	32L-80		32S-80		32-80	1
36	36L-80	2	36S-80		36-80	
40	40L-80		40S-80		40-80	1
44	44L-80	2	44S-80		44-80	
48	48L-80	5	48S-80		48-80	3

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)	
	Designation	Quantity	Designation	Quantity	Designation	Quantity
ft						
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	1
36			36II-80	1	36III-80	1
40			40II-80		40III-80	1
44			44II-80		44III-80	2
48					48III-80	8

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	9

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 1/2"	3'-4"	1
1 3/4"	3'-10"	13

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.

MODIFICATIONS:

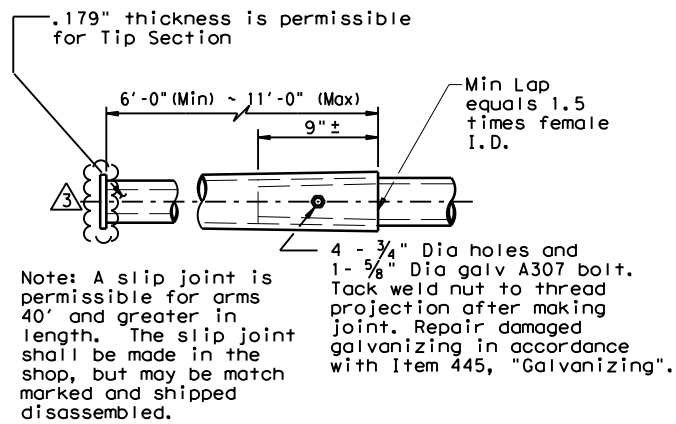
- ① REPLACED CGB CONNECTOR WITH BRACKET ASSEMBLY. (2/12)
- ② ADDITIONAL OPTION. (3/12)
- ③ REPLACED TENON DETAIL WITH PLATE WELD DETAIL. (2/12)
- ④ REVISED MINIMUM SIGNAL HEIGHT. (3/12)
- ⑤ REPLACED "MA-D" WITH "MA-D(DAL)". (2/12)
- ⑥ REMOVED TABLE OF DIMENSIONS "A". (2/12)
- ⑦ REMOVED CGB CONNECTORS. (2/12)

Texas Department of Transportation

TRAFFIC SIGNAL SUPPORT STRUCTURES
SINGLE MAST ARM ASSEMBLY
(80 MPH WIND ZONE)
SMA-80(1)-12(DAL)

© TxDOT August 1995		DN: MS	CK: JSY	DW: MMF	CK: JSY
REVISIONS					
5-96	11-99	0918	24	267, ETC.	VAR
11-12		DAL		COL, ETC.	82

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SLIP JOINT DETAIL

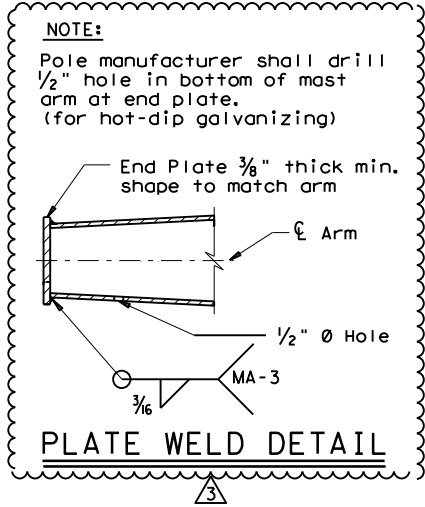


PLATE WELD DETAIL

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 1/2" Dia Threaded Coupling.

BRACKET ASSEMBLY

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 backplates. 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-DP-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.

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.

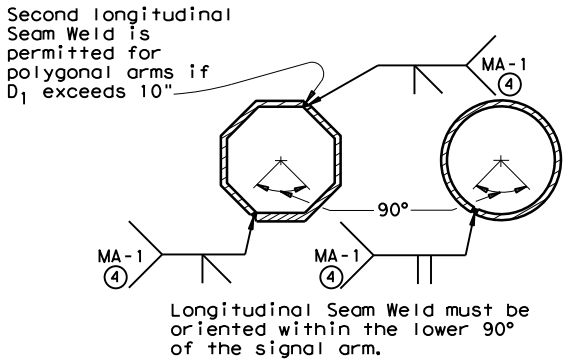
Poles are designed to support one 8'-0" luminaire arm, one 9'-0" internally lighted street name sign and one traffic signal arm with a length as tabulated. The specified luminaire load applied at the end of the luminaire arm equals 60 lbs vertical dead load plus the horizontal wind load on an effective 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(DAL)" 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)".

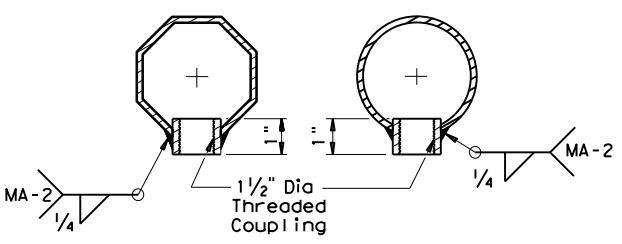
Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing", after fabrication.

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.



ARM WELD DETAIL

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



ARM COUPLING DETAILS

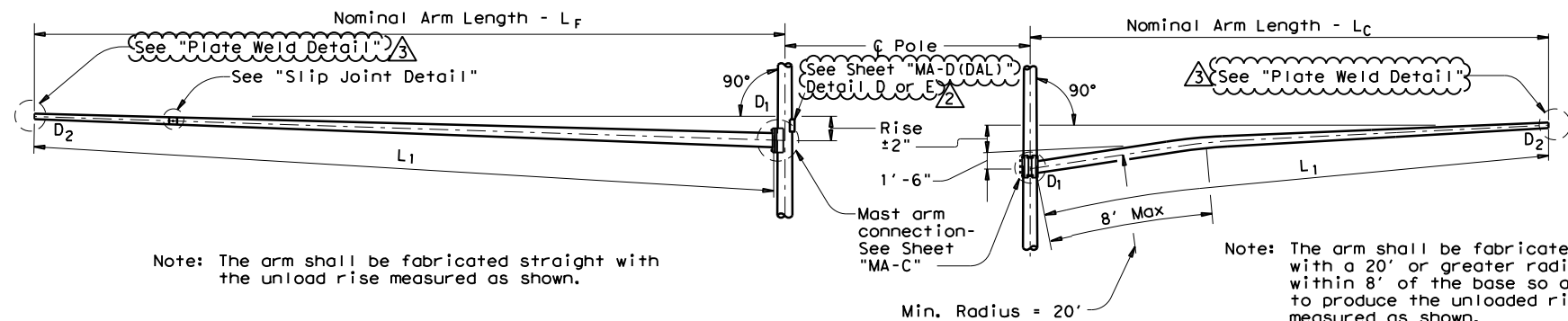
REPLACED TENON DETAIL WITH PLATE WELD DETAIL (2/12).
REPLACED "MA-D" WITH "MA-D(DAL)" (2/12).

Texas Department of Transportation
TRAFFIC SIGNAL SUPPORT STRUCTURES
SINGLE MAST ARM ASSEMBLY
(80 MPH WIND ZONE)
SMA-80(2) - 12(DAL)

© TxDOT August 1995		DN: MS	CK: JSY	DW: MMF	CK: JSY
REVISIONS					
5-96 1-12	0918	24	267, ETC.	VAR	HIGHWAY
		DIST	COUNTY	SHEET NO.	
		DAL	COL, ETC.	83	

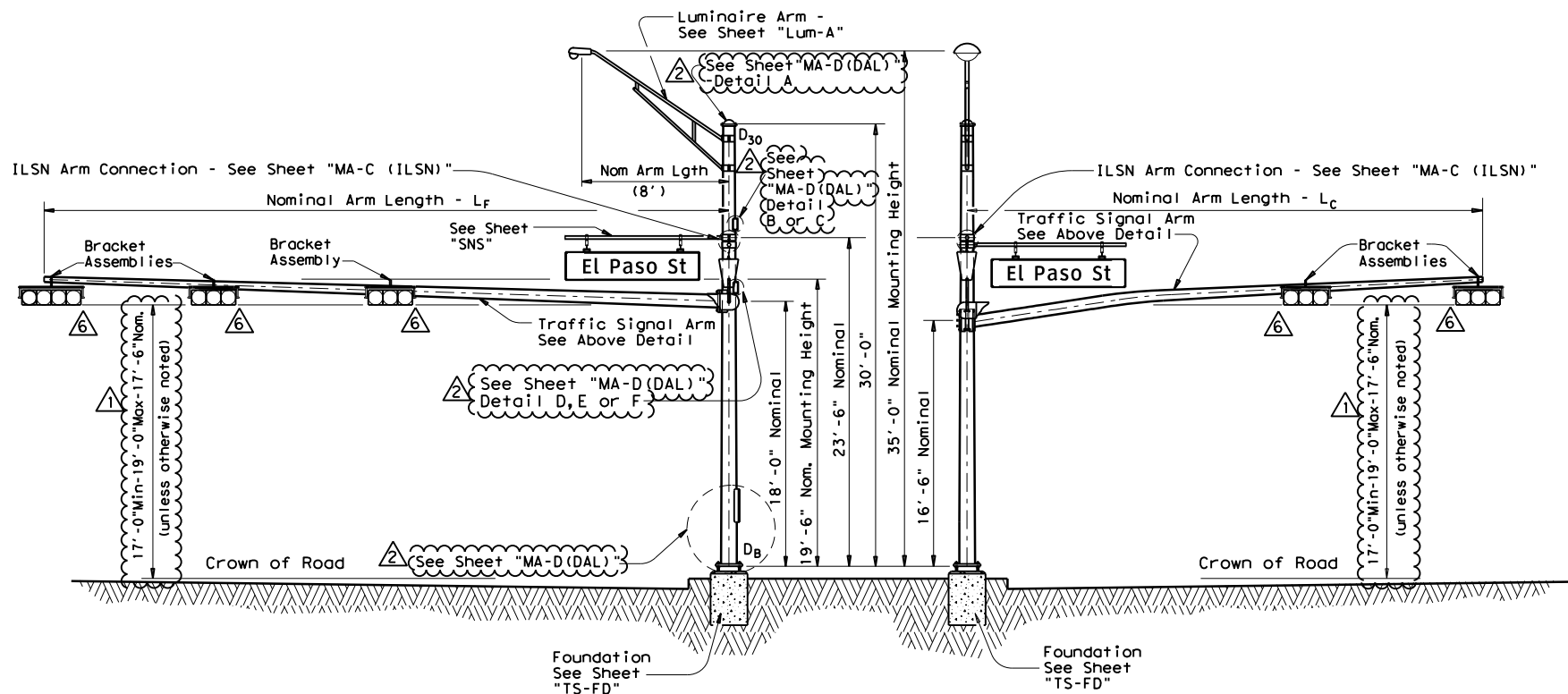
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FIXED MOUNT TRAFFIC SIGNAL ARM

CLAMP-ON TRAFFIC SIGNAL ARM



ELEVATION
(Showing fixed mount arm)

STRUCTURE ASSEMBLY

ELEVATION
(Showing clamp mount arm)

MODIFICATIONS:

- 1 REVISED MINIMUM SIGNAL HEIGHT. (3/12)
- 2 REPLACED "MA-D" WITH "MA-D(DAL)". (2/12)
- 3 REPLACED TENON DETAIL WITH PLATE WELD DETAIL. (2/12)
- 4 NOT USED
- 5 REMOVED TABLE OF DIMENSIONS "A". (2/12)
- 6 REMOVED CGB CONNECTORS. (2/12)

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. Designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

Poles are designed to support one 8'-0" luminaire arm, two 9'-0" internally lighted street name signs and two traffic signal arms with length combinations as tabulated. The specified luminaire load applied at the end of 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 applied 4'-6" from the centerline of the pole equals 85 lbs vertical dead load plus the 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(DAL)" 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.

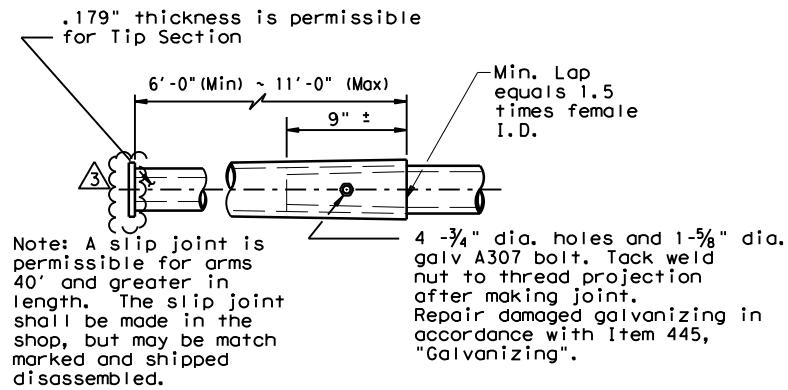
Texas Department of Transportation
 Dallas District Standard
TRAFFIC SIGNAL SUPPORT STRUCTURES
 DUAL MAST ARM ASSEMBLY
 (80 MPH WIND ZONE)
DMA-80 (1)-12(DAL)

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REVISIONS		CONT	SECT	JOB	HIGHWAY
5-96		0918	24	267, ETC.	VAR
1-12		DIST	COUNTY		SHEET NO.
		DAL	COL, ETC.		84

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SLIP JOINT DETAIL

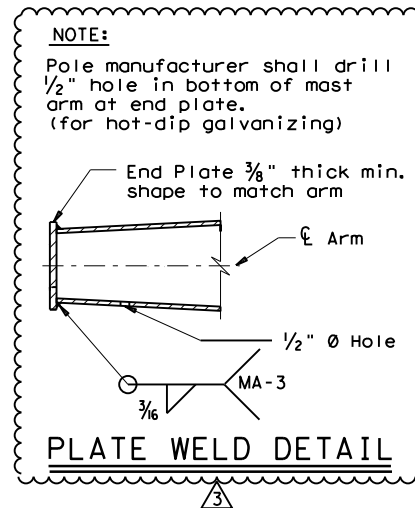


PLATE WELD DETAIL

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 1/2" Dia Threaded Coupling.

BRACKET ASSEMBLY

VIBRATION WARNING

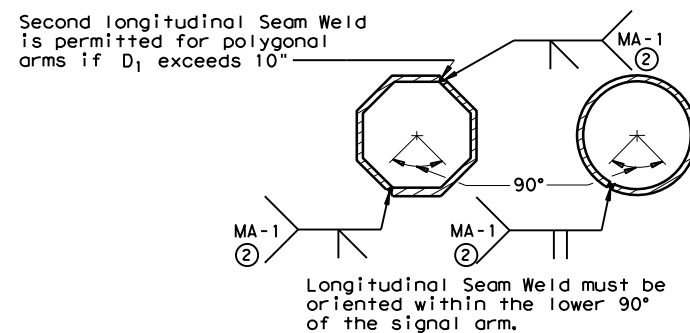
Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights 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.

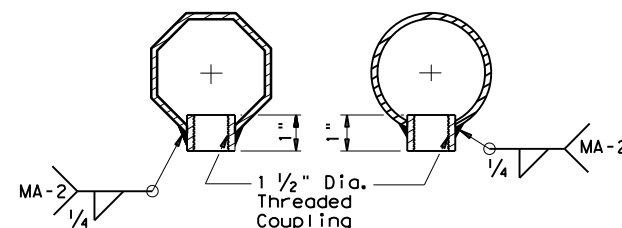
The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backplates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 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.



ARM WELD DETAIL

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



ARM COUPLING DETAILS

REPLACED TENON DETAIL WITH PLATE WELD DETAIL (2/12).

Texas Department of Transportation
 Dallas District Standard
TRAFFIC SIGNAL SUPPORT STRUCTURES
 DUAL MAST ARM ASSEMBLY
 (80 MPH WIND ZONE)
DMA-80 (2) - 12 (DAL)

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REVISIONS					
5-96	1-12	CONT	SECT	JOB	HIGHWAY
		0918	24	267, ETC.	VAR
		DIST		COUNTY	SHEET NO.
		DAL		COL, ETC.	85

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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		
	LF	Lc	See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		See note above plus one small hand hole		
ft.	ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20	2020L-80		2020S-80		2020-80	
24	20	2420L-80		2420S-80		2420-80	
	24	2424L-80		2424S-80		2424-80	
28	20	2820L-80		2820S-80		2820-80	
	24	2824L-80		2824S-80		2824-80	
	28	2828L-80		2828S-80		2828-80	
32	20	3220L-80		3220S-80		3220-80	
	24	3224L-80		3224S-80		3224-80	
	28	3228L-80		3228S-80		3228-80	
	32	3232L-80		3232S-80		3232-80	
36	20	3620L-80		3620S-80		3620-80	
	24	3624L-80		3624S-80		3624-80	
	28	3628L-80		3628S-80		3628-80	
	32	3632L-80		3632S-80		3632-80	
	36	3636L-80		3636S-80		3636-80	
40	20	4020L-80		4020S-80		4020-80	
	24	4024L-80		4024S-80		4024-80	
	28	4028L-80		4028S-80		4028-80	
	32	4032L-80		4032S-80		4032-80	
	36	4036L-80		4036S-80		4036-80	
44	20	4420L-80		4420S-80		4420-80	
	24	4424L-80		4424S-80		4424-80	
	28	4428L-80		4428S-80		4428-80	
	32	4432L-80	1	4432S-80		4432-80	
	36	4436L-80	2	4436S-80		4436-80	

Traffic Signal Arms (Fixed Mount) (1 per pole) Ship each arm w/ the listed equipment attached

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

Traffic Signal Arms (Clamp-On Mount) (1 per pole) Ship each arm w/ the listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 Bracket Assembly and 1 clamp w/bolts and washers		2 Bracket Assemblies and 1 clamp w/bolts and washers		3 Bracket Assemblies and 1 clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80		20II-80			
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	1
36			36II-80		36III-80	2

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	3

ILSN Arm (1 or 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 1/2"	3'-4"	
1 3/4"	3'-10"	
2"	4'-3"	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".

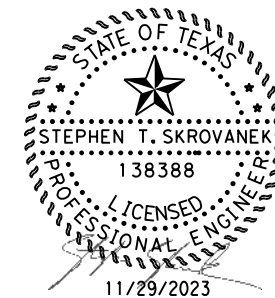
Templates may be removed for shipment.

LF	Lc	ROUND POLES					POLYGONAL POLES					Foundation Type
		D _B	D ₁₉	D ₂₄	D ₃₀	③ thk	D _B	D ₁₉	D ₂₄	D ₃₀	③ thk	
ft.	ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	20	11.5	8.8	8.1	7.3	.179	12.5	9.5	8.7	7.8	.179	30-A
24	20	12.0	9.3	8.6	7.8	.179	13.0	10.0	9.2	8.3	.179	30-A
	24	12.0	9.3	8.6	7.8	.179	13.0	10.0	9.2	8.3	.239	30-A
28	20	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
	28	12.5	9.8	9.1	8.3	.179	12.0	9.0	8.2	7.3	.239	30-A
32	20	13.0	10.3	9.6	8.8	.179	12.5	9.5	8.7	7.8	.239	30-A
	24	13.0	10.3	9.6	8.8	.179	12.5	9.5	8.7	7.8	.239	30-A
	28	12.0	9.3	8.6	7.8	.239	13.0	10.0	9.2	8.3	.239	30-A
	32	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
36	20	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
	24	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
	28	12.5	9.8	9.1	8.3	.239	13.5	10.5	9.7	8.8	.239	36-A
	32	12.5	9.8	9.1	8.3	.239	13.5	10.5	9.7	8.8	.239	36-A
40	36	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
	20	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
	24	12.5	9.8	9.1	8.3	.239	14.0	11.0	10.2	9.3	.239	36-A
	28	13.0	10.3	9.6	8.8	.239	14.0	11.0	10.2	9.3	.239	36-A
44	32	13.0	10.3	9.6	8.8	.239	15.0	12.0	11.2	10.3	.239	36-A
	36	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
	20	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
	24	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
44	28	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
	32	14.0	11.3	10.6	9.8	.239	15.5	12.5	11.7	10.8	.239	36-B
	36	14.0	11.3	10.6	9.8	.239	15.5	12.5	11.7	10.8	.239	36-B

Arm LF or LC	ROUND ARMS					POLYGONAL ARMS				
	L ₁	D ₁	D ₂	③ thk	Rise	L ₁	D ₁	④ D ₂	③ 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"

D_B = Pole Base O.D.
 D₁₉ = Pole Top O.D.
 D₂₄ = Pole Top O.D. with ILSN w/out Luminaire
 D₃₀ = Pole Top O.D. with Luminaire
 D₁ = Arm Base O.D.
 D₂ = Arm End O.D.
 L₁ = Shaft Length
 L_F = Fixed Arm Length
 L_C = Clamp-on Arm Length (36" Max)

- ③ Thickness shown are minimums, thicker materials may be used.
- ④ D₂ may be increased by up to 1.0" for polygonal arms.



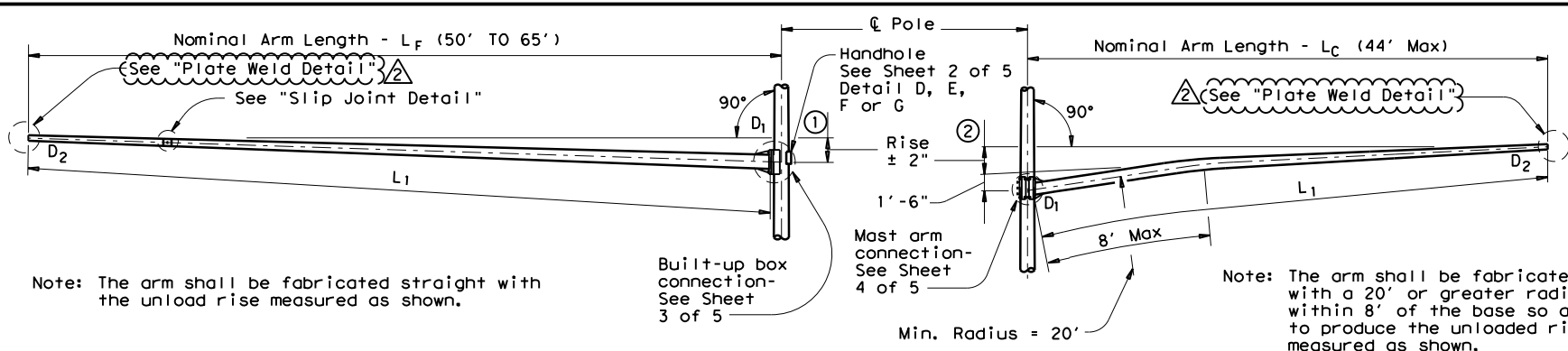
I AM SEALING THIS SHEET ONLY FOR THE SHIPPING PARTS LIST

- Ⓐ REPLACED CGB CONNECTOR WITH BRACKET ASSEMBLY (2/12).
- Ⓙ ADDITIONAL OPTION (2/12).

Texas Department of Transportation
 Dallas District Standard
TRAFFIC SIGNAL SUPPORT STRUCTURES
DUAL MAST ARM ASSEMBLY
 (80 MPH WIND ZONE)
DMA-80 (3) - 12 (DAL)

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5-96	0918 24	267, ETC.		VAR	
1-12	DIST	COUNTY	SHEET NO.		
	DAL	COL, ETC.	86		

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

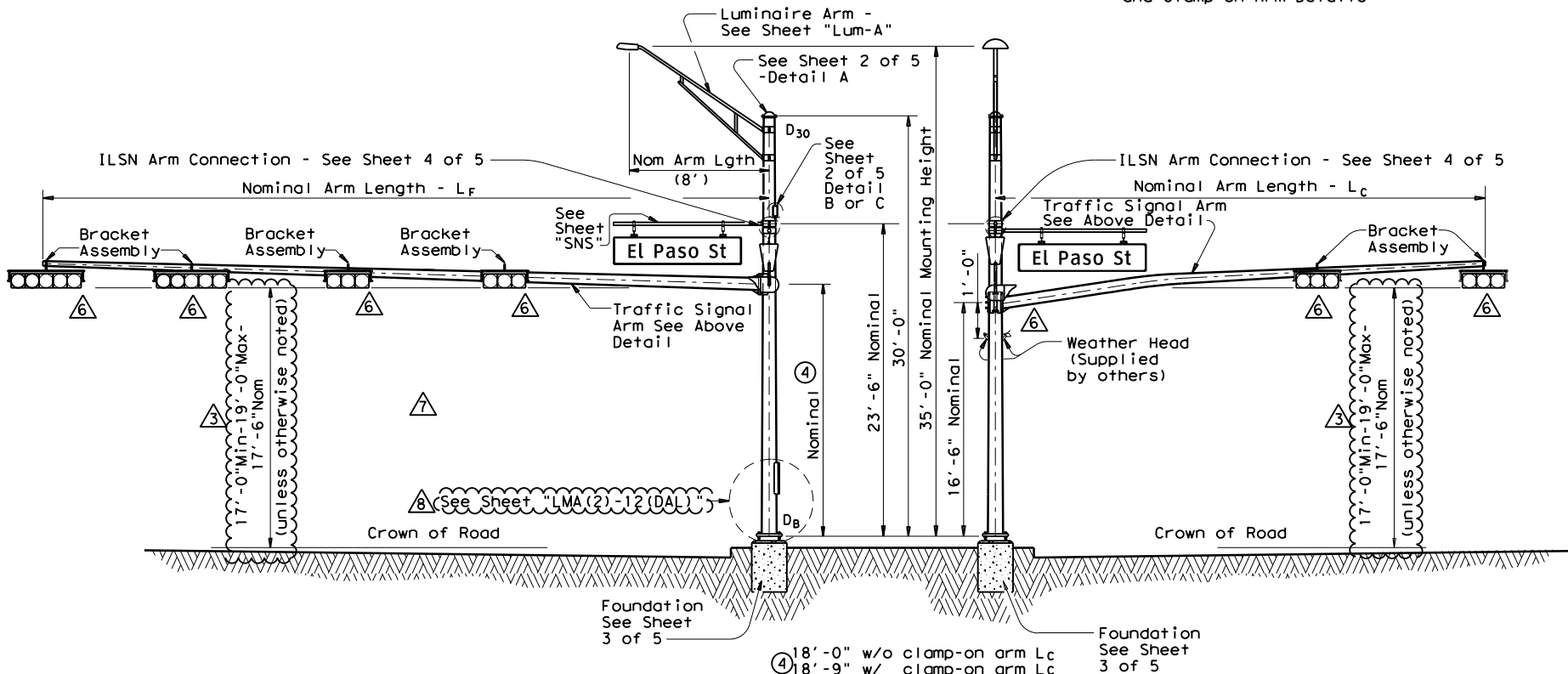
Note: The arm shall be fabricated with a 20' or greater radius within 8' of the base so as to produce the unloaded rise measured as shown.

FIXED MOUNT TRAFFIC SIGNAL ARM

① See Sheet 3 of 5 for Arm Rise

CLAMP-ON TRAFFIC SIGNAL ARM (IF REQUIRED)

② See Sheet 4 of 5 for Arm Rise and Clamp-on Arm Details



ELEVATION

(Showing fixed mount arm)

STRUCTURE ASSEMBLY

ELEVATION

(Showing clamp-on arm)

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 can be either 100 mph or 80 mph plus a 1.3 gust factor. If clamp-on traffic signal is required, designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

Poles are designed to support one 8'-0" luminaire arm, two 9'-0" internally lighted street name (ILSN) signs and two traffic signal arms with limited length combinations.

Each arm with its related attachment is shown below

Arm	Equivalent DL ⑤	WL EPA ⑤⑥
8' Luminaire Arm	Luminaire 60 lbs	1.6 sq ft
9' ILSN Arm	Sign 85 lbs	11.5 sq ft
50' to 65' Fixed Mount Arm	Signal Loads 310 lbs	52 sq ft
Up to 44' Clamp-on Arm	Signal Loads 180 lbs	32.4 sq ft

⑤ Equivalent dead load plus horizontal wind load applied at the end of arm except ILSN arm, which applied 4.5' from the centerline of the pole.

⑥ Effective projected area (actual area times drag coefficient) for the application of horizontal wind load.

△ Except as noted in Sheet 1 thru 5 of 5, other details not covered shall refer to Standard Sheet "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.

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. Material, fabrication tolerances, and shipping practices shall also 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.

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

Installation of damping plate for the long mast arm is not recommended.

Provision of the bracket assembly used to support the traffic signal heads shall be under the direction of the Engineer for approval.

Design also conforms to NCHRP Report 412 for fatigue resistance except that there are no stiffeners at the base plate. TxDOT is conducting tests to determine if stiffeners at the base plate will or will not result in optimal performance; depending upon the results of the tests, poles may need a retrofit to ensure optimal fatigue performance.

MODIFICATIONS:

- ① NOT USED
- ② REPLACED TENON DETAIL WITH PLATE WELD DETAIL. (2/12)
- ③ REVISED MINIMUM SIGNAL HEIGHT. (3/12)
- ④ REMOVED "MA-D" REFERENCE. (2/12)
- ⑤ REMOVED TABLE OF DIMENSIONS "A". (2/12)
- ⑥ REMOVED CGB CONNECTORS. (2/12)
- ⑦ REMOVED THREADED COUPLING FOR CGB CONNECTOR. (2/12)
- ⑧ REVISED THE ELEVATION OF ACCESS COMPARTMENT. (3/12)

NOTE:

Pole manufacturer shall drill 1/2" hole in bottom of mast arm at end plate. (for hot-dip galvanizing)

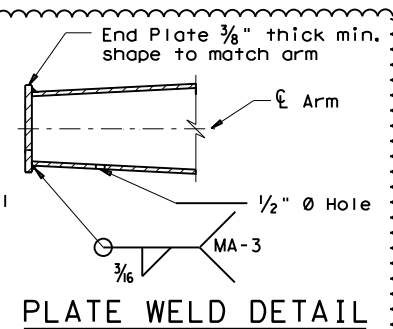
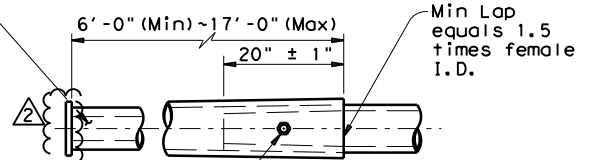


PLATE WELD DETAIL

.239" thickness is permissible for Tip Section



Note: A slip joint is permissible for arms 50' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

SLIP JOINT DETAIL (FIXED MOUNT ARM)

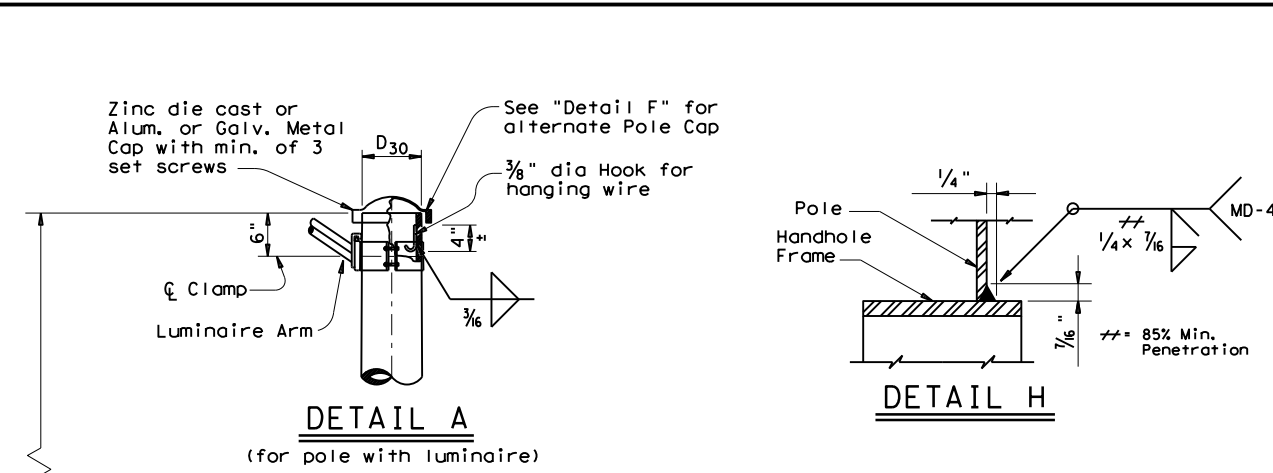
**TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY
(50 TO 65 FT)
(80 AND 100 MPH WIND ZONE)
LMA(1)-12(DAL)**

Sheet 1 of 5

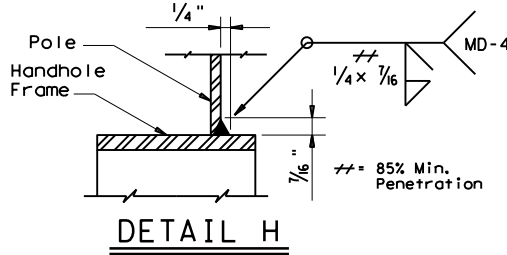
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1-12		DIST	COUNTY	SHEET NO.	
		DAL	COL, ETC.	87	

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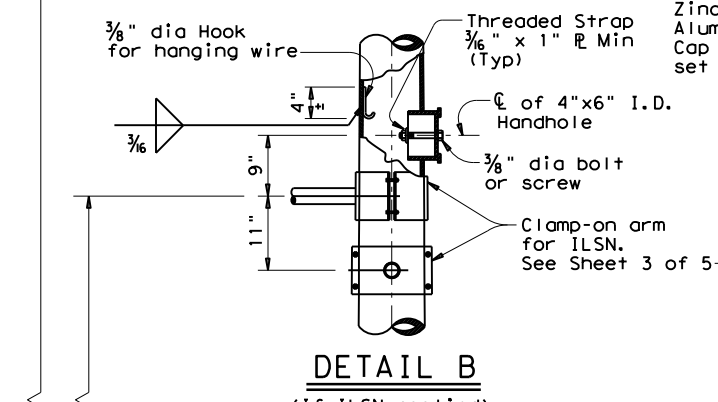
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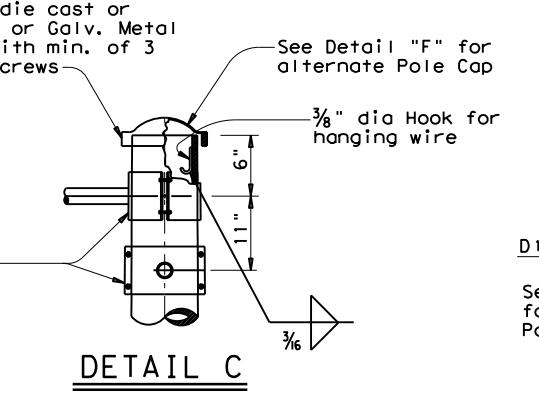
DETAIL A
 (for pole with luminaire)



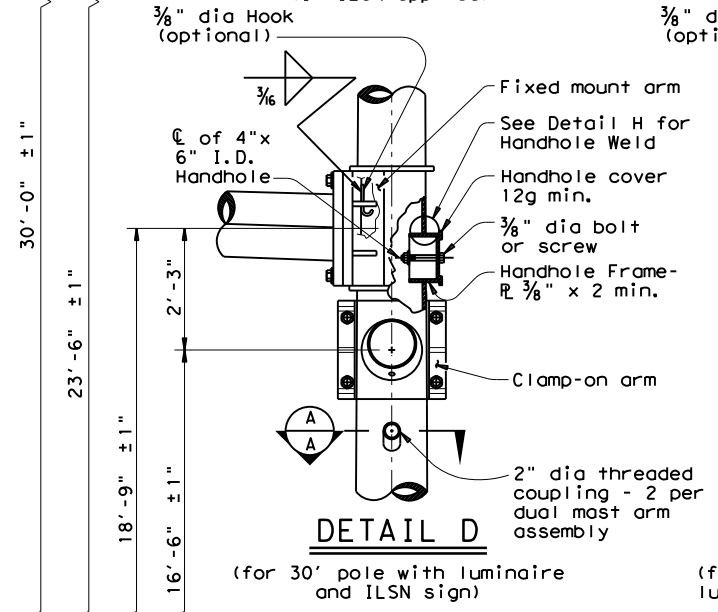
DETAIL H



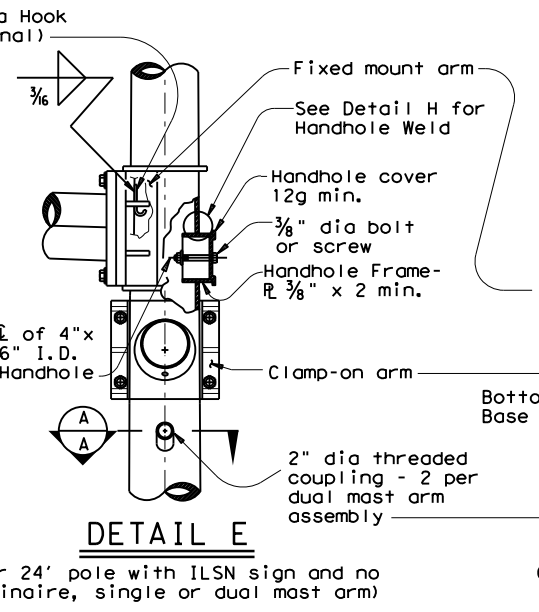
DETAIL B
 (If ILSN applied)



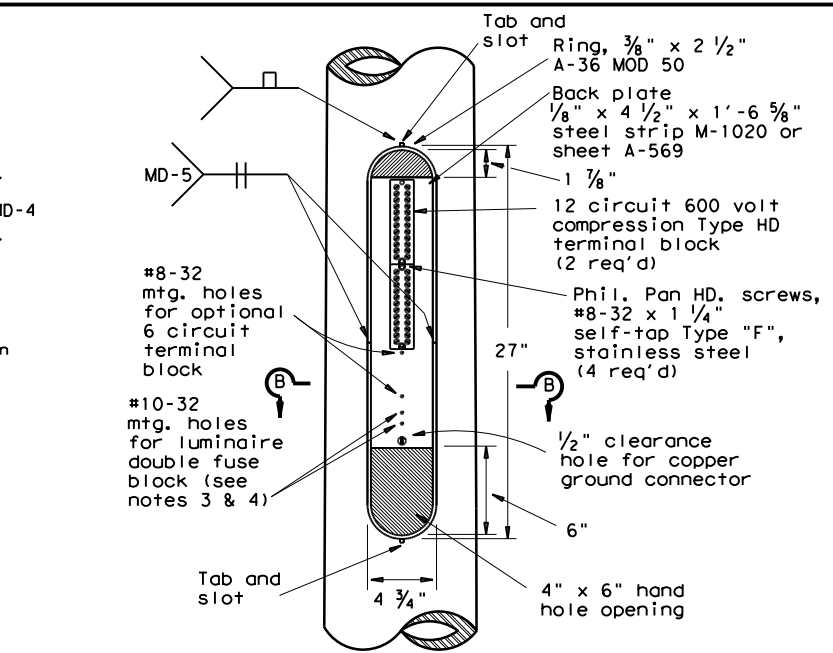
DETAIL C



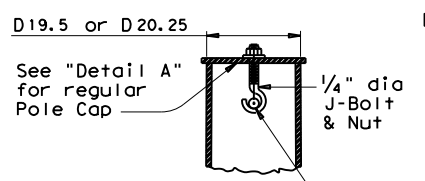
DETAIL D
 (for 30' pole with luminaire and ILSN sign)



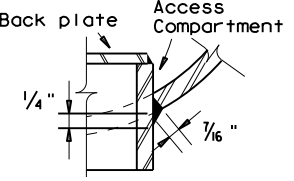
DETAIL E
 (for 24' pole with ILSN sign and no luminaire, single or dual mast arm)



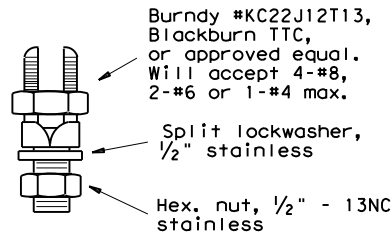
ACCESS COMPARTMENT



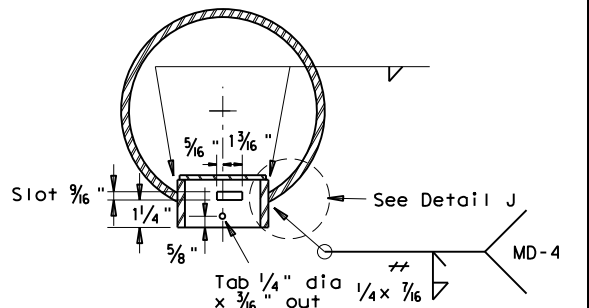
SECTION Y-Y



DETAIL J



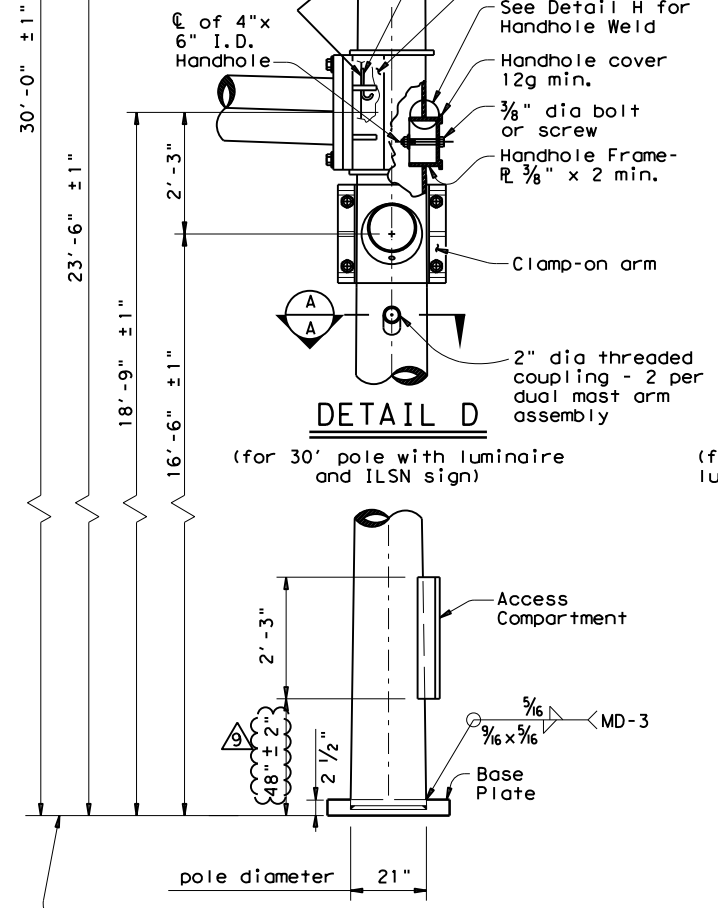
COPPER GROUND CONNECTOR



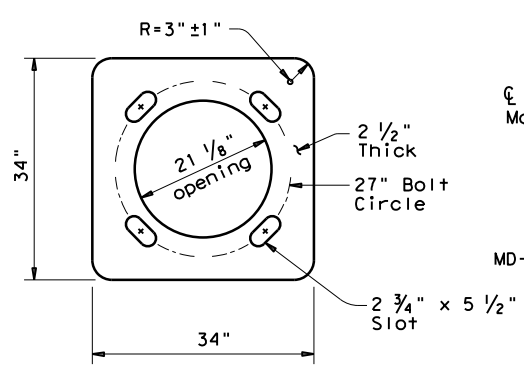
SECTION B-B

ACCESS COMPARTMENT NOTES:

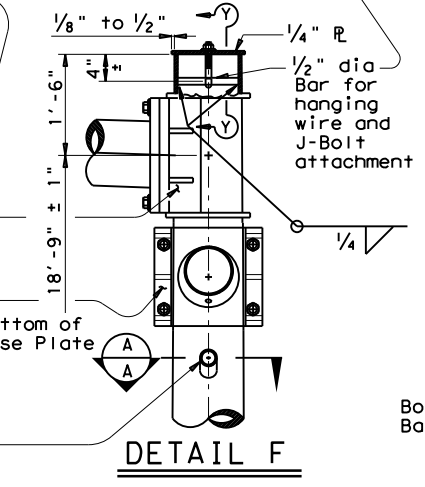
- The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
- 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 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilco SSS-5). The traffic signal contractor shall install the kit items in the field.
- 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.
- Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.



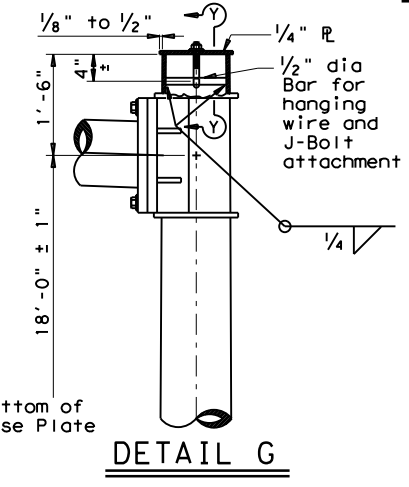
POLE ELEVATION



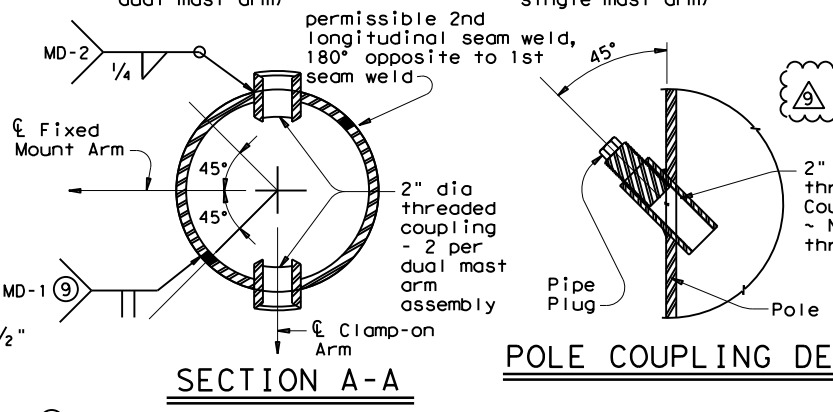
BASE PLATE



DETAIL F
 (for 20.25' pole with no ILSN sign and no luminaire, dual mast arm)



DETAIL G
 (for 19.5' pole with no ILSN sign and no luminaire, single mast arm)



SECTION A-A

POLE COUPLING DETAIL

⑨ Longitudinal seam weld must be oriented within 90° (45° rotation each side) along the fixed mount arm. 60% min penetration required, 100% penetration within 6" of circumferential base weld.

MATERIALS	
Round Shafts or Polygonal Shafts ⑦	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 ⑧
Plates ⑦	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325, or A449 except where noted
Pin Bolts	ASTM A325
Pipe ⑦	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

- ⑦ 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.
- ⑧ ASTM A1011 SS Gr.50 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.

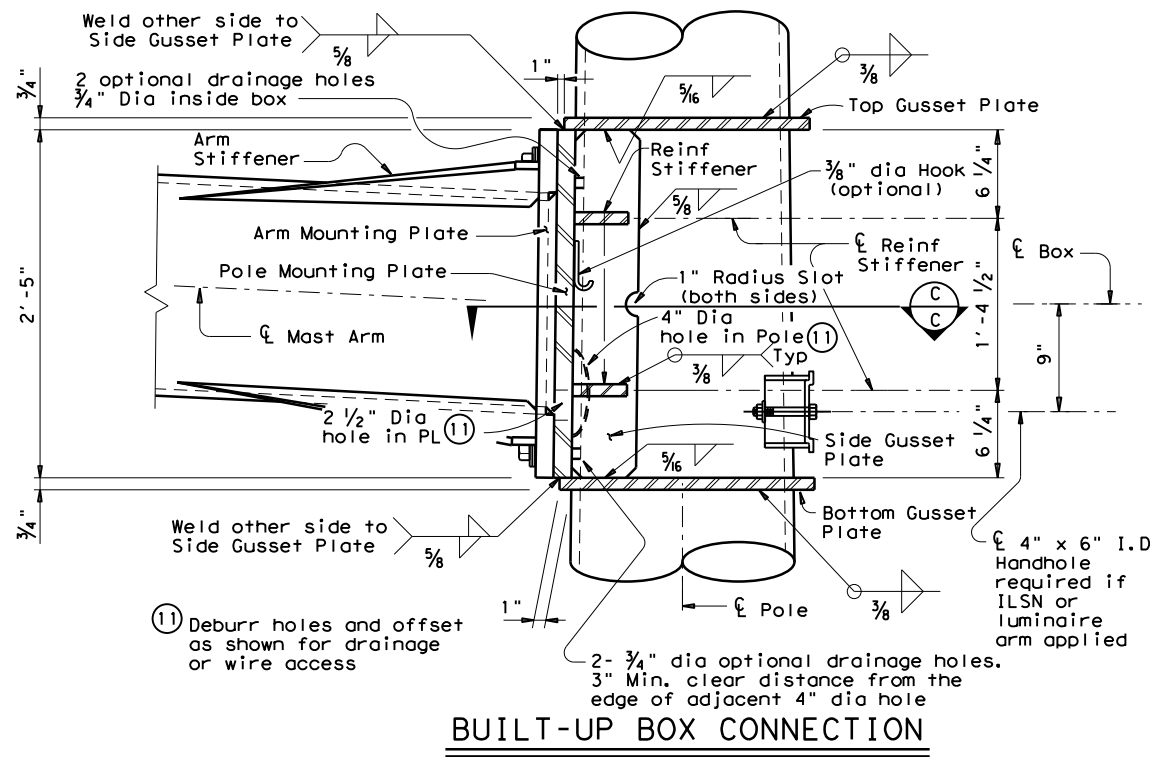
Texas Department of Transportation
 Dallas District Standard

TRAFFIC SIGNAL SUPPORT STRUCTURES
 LONG MAST ARM ASSEMBLY
 (50 TO 65 FT)
 (80 AND 100 MPH WIND ZONE)
 LMA(2)-12(DAL)

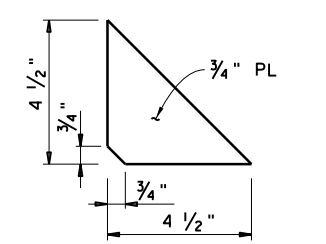
Sheet 2 of 5

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		DAL	COL, ETC.		88

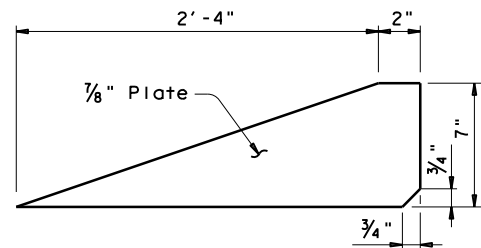
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BUILT-UP BOX CONNECTION



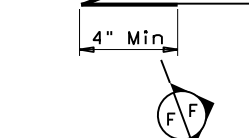
REINFORCING STIFFENER



ARM STIFFENER

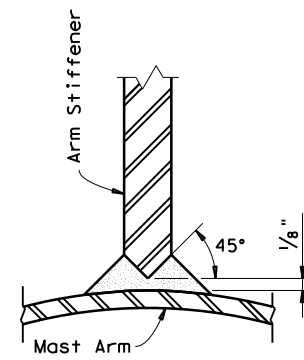
(Cut to match arm inclination and taper)

Provide Detail shown in SECTION F-F or equivalent 100% complete joint penetration weld from both sides.

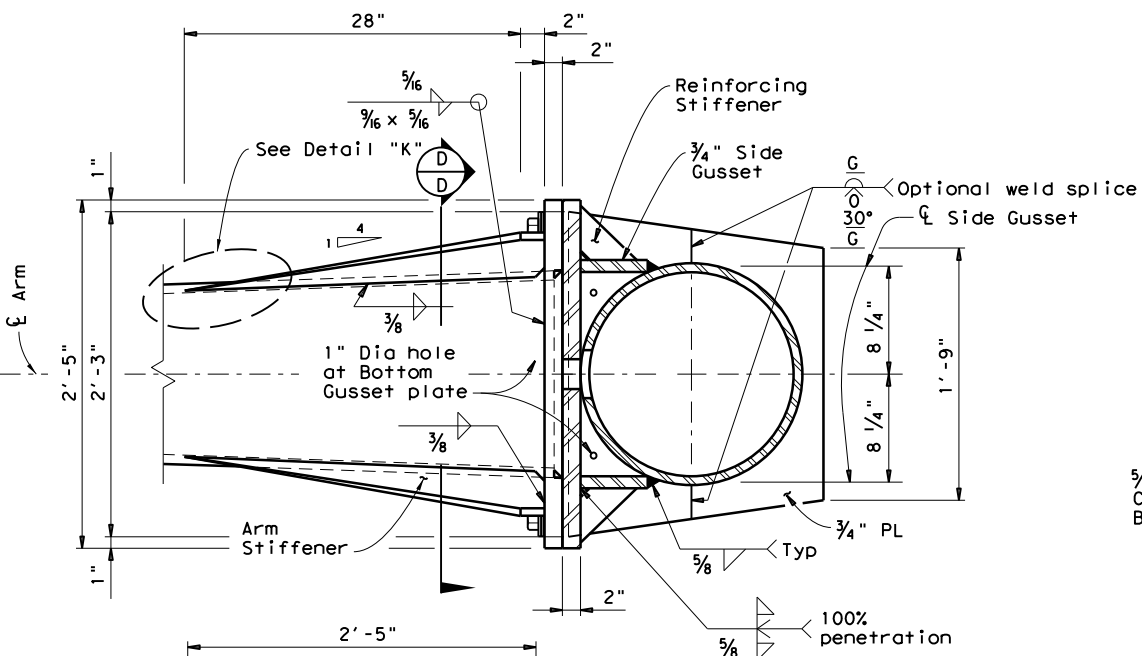


DETAIL "K"

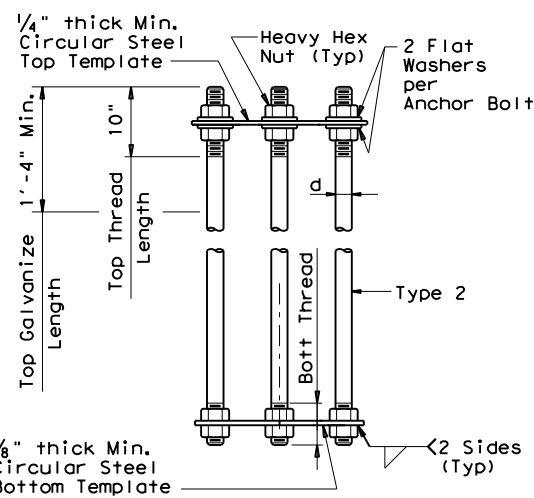
Only 4" length at tip of Arm Stiffener requires a complete joint penetration weld. Smooth weld radius to connect Stiffener. Only a fillet weld is required for the remaining weld length.



SECTION F-F



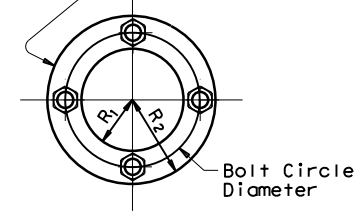
SECTION C-C



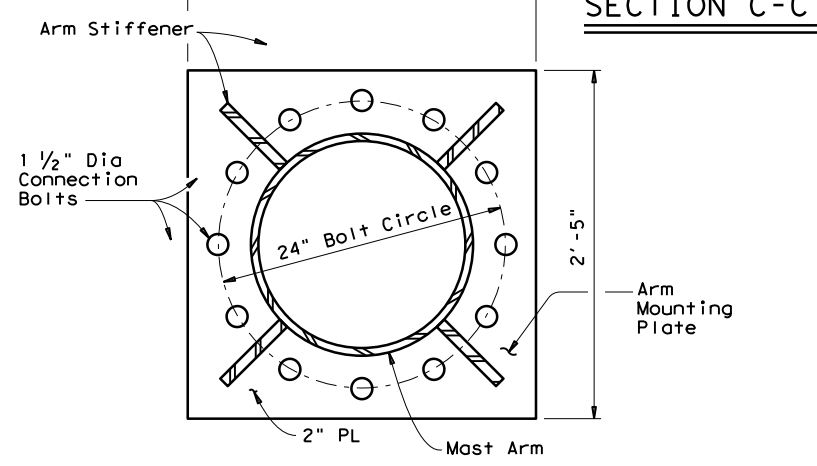
NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

Steel Template with holes 1/16" greater than bolt diameter



TEMPLATE DETAIL



SECTION D-D

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft (16), (17), (18)			ANCHOR BOLT DESIGN (14)			FOUNDATION DESIGN LOAD (15)		TYPICAL APPLICATION	
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft		SHEAR Kips
				10	15	40							
48-A	48"	20 #9	#4 at 6"	21.9	19.5	14.7	2 1/2"	55	27"	2	490	10	50' to 65' Mast arm assembly.

SEE SHEET "TS-FD" FOR ADDITIONAL DETAILS.

- (14) Anchor bolt design develops the foundation capacity given under Foundation Design Loads.
- (15) Foundation Design Loads are the allowable moments and shears at the base of the structure.
- (16) Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.
- (17) If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.
- (18) Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Fixed Mount Arm L F	ROUND POLES (13)					Foundation Type
	D _B	D _{19.5}	D _{20.25}	D ₂₄	D ₃₀	
ft.	in.	in.	in.	in.	(12)thk in.	
50', 55', 60', 65'	21.0	18.2	17.6	16.8	.3125	48-A

Fixed Mount Arm L F	ROUND ARMS (13)				
	L ₁	D ₁	D ₂	(12)thk in.	Rise
ft.	ft.	in.	in.	in.	
50	49	18.5	11.7	.3125	3'- 3"
55	54	18.5	11.0	.3125	3'- 7"
60	59	18.5	10.3	.3125	3'- 11"
65	64	18.5	9.6	.3125	4'- 4"

- D_B = Pole Base O.D.
- D_{19.5} = Pole Top O.D. with no Luminaire and no ILSN (single mast arm)
- D_{20.25} = Pole Top O.D. with no Luminaire and no ILSN (dual mast arm)
- D₂₄ = Pole Top O.D. with ILSN w/out Luminaire
- D₃₀ = Pole Top O.D. with Luminaire
- D₁ = Arm Base O.D.
- D₂ = Arm End O.D.
- L₁ = Shaft Length
- L_F = Fixed Arm Length

- (12) Thickness shown is minimum, thicker materials may be used.
- (13) Shaft profile 16-sided or 18-sided is considered to be equivalent to round section.

GENERAL NOTES:

Built-up Box Connection: For the welded arm-to-pole connection as a built-up box configuration illustrated here is an example only, fabricators are required to submit a shop drawing of box connection for approval. The drawing shall specify the details of each box element, welds of arm-to-pole connection, arm-to-plate socket connection, and arm rise creation. Specify the proper location of drain holes along the pole. 2 1/2" dia hole in the pole mounting plate and 4" dia hole in the pole need to be aligned for wiring access or drainage. Arm stiffeners cut to match arm inclination and taper shall also be included.

The deviation from flat for either arm or pole mounting plate shall not exceed 1/32 in., which is measured along the center of mounting plate to a radial distance of 13.5 in. The deformed-from-flat connection between arm and pole mounting plates shall not be allowed if the center of both mounting plates cannot contact directly.

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

ANCHOR BOLT & TEMPLATE SIZE						
Bolt Dia in.	Length #	Top Thread	Bottom Thread	Bolt Circle	R ₂	R ₁
2 1/2"	5'-2"	10"	6 1/2"	27"	16"	11"

*Min dimension given, longer bolts are acceptable.

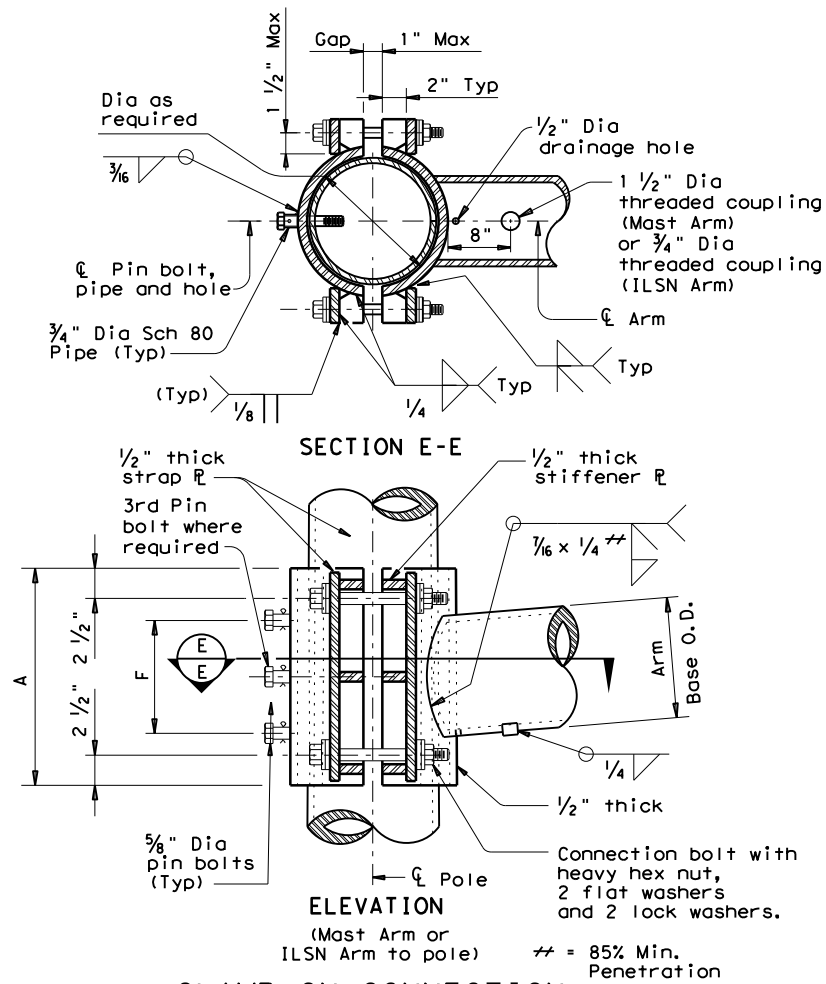


TRAFFIC SIGNAL SUPPORT STRUCTURES
 LONG MAST ARM ASSEMBLY
 (50 TO 65 FT)
 (80 AND 100 MPH WIND ZONE)
 Sheet 3 of 5 LMA (3) - 12

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4-20-01 1-12	REVISIONS		CONT	SECT	JOB	HIGHWAY
			0918	24	267, ETC.	VAR
			DIST	COUNTY	SHEET NO.	
		DAL	COL, ETC.	89		

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CLAMP-ON CONNECTION

80 MPH WIND										
Clamp-on Arm LC	ROUND ARMS					POLYGONAL ARMS				
	L ₁	D ₁	D ₂	thk (12)	Rise	L ₁	D ₁	D ₂	thk (12)	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'-0"	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"

100 MPH WIND										
Clamp-on Arm LC	ROUND ARMS					POLYGONAL ARMS				
	L ₁	D ₁	D ₂	thk (12)	Rise	L ₁	D ₁	D ₂	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

D₁ = Arm Base O.D.
 D₂ = Arm End O.D.
 L₁ = Shaft Length
 LC = Clamp-on Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

CLAMP-ON ARM CONNECTION					
ILSN Arm Size		A	F	4 Conn. Bolts	5/8" Dia. Pin Bolts
Sch 40 pipe Dia	Thick				
in.	in.	in.	in.	in.	ea
3	.216	10	4	3/4	2

Mast Arm Size					
Mast Arm Size		A	F	4 Conn. Bolts	5/8" Dia. Pin Bolts
Base Dia	Thick				
in.	in.	in.	in.	in.	ea
6.5	.179	12	6	1	2
7.5	.179	14	8	1	2
8.0	.179	14	8	1	2
9.0	.179	16	10	1	2
9.5	.179	18	12	1 1/4	3
9.5	.239	18	12	1 1/4	3
10.0	.239	18	12	1 1/4	3
10.5	.239	18	12	1 1/4	3
11.0	.239	18	12	1 1/4	3
11.5	.239	18	12	1 1/4	3

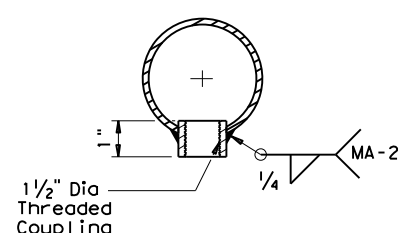
GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies or ILSN arm support. For a clamp-on mast arm, a maximum 1 1/2" wide vertical slotted hole may 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". For an ILSN arm, a 1 1/2" diameter hole shall be cut in the front clamp plate for wire access. A matched hole shall be field drilled through the pole to provide wire access after arm is oriented. Deburr both holes.

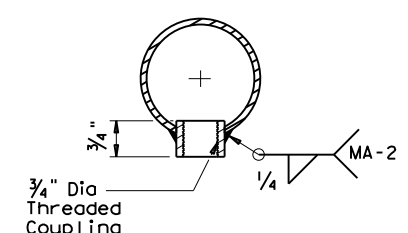
Where duplicate parts occur on a detail, welds shown for part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces. Pin bolts shall be ASTM A325 with threads excluded from the shear plane. Pin bolt and 3/4" diameter pipe shall have 3/16" diameter holes for a 1/8" diameter galvanized cotter pin. Back clamp plate shall be furnished with a 3/4" diameter hole for each pin bolt. An 1/16" diameter hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

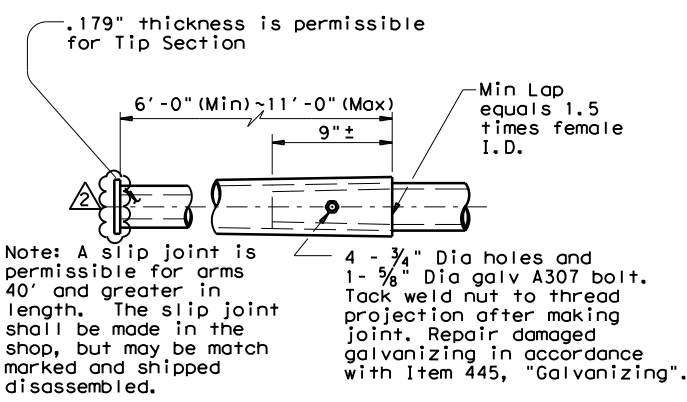
REPLACED TENON DETAIL WITH PLATE WELD DETAIL (2/12).



ARM COUPLING DETAIL



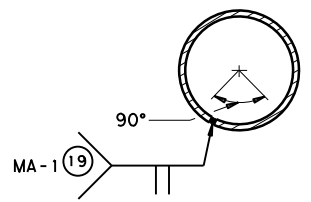
ILSN ARM COUPLING DETAIL



SLIP JOINT DETAIL (CLAMP-ON ARM)

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 1/2" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

(19) Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm. 60% Min penetration 100% penetration within 6" of circumferential base welds.

Texas Department of Transportation
 Dallas District Standard

TRAFFIC SIGNAL SUPPORT STRUCTURES
 LONG MAST ARM ASSEMBLY
 (50 TO 65 FT)
 (80 AND 100 MPH WIND ZONE)

Sheet 4 of 5 LMA(4)-12(DAL)

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		DIST	COUNTY		SHEET NO.
		DAL	COL, ETC.		90

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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		19.50' (Single Mast Arm) 20.25' (Dual Mast Arm) Poles with no Luminaire and no ILSN See note above		
	See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		See note above plus one small hand hole				
Single Mast Arm							
Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity	
50	50L	1	50S		50		
55	55L		55S		55		
60	60L		60S		60		
65	65L	3	65S		65	1	
Dual Mast Arm							
Lf ft.	Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	20	5020L		5020S		5020	
	24	5024L		5024S		5024	
	28	5028L		5028S		5028	
	32	5032L		5032S		5032	
	36	5036L		5036S		5036	
	40	5040L		5040S		5040	
55	20	5520L		5520S		5520	
	24	5524L		5524S		5524	
	28	5528L		5528S		5528	
	32	5532L		5532S		5532	
	36	5536L		5536S		5536	
	40	5540L		5540S		5540	
60	20	6020L		6020S		6020	
	24	6024L		6024S		6024	
	28	6028L		6028S		6028	
	32	6032L		6032S		6032	
	36	6036L		6036S		6036	
	40	6040L		6040S		6040	
65	20	6520L	1	6520S		6520	
	24	6524L		6524S		6524	
	28	6528L		6528S		6528	
	32	6532L		6532S		6532	
	36	6536L		6536S		6536	
	40	6540L		6540S		6540	
	44	6544L		6544S		6544	

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft ***
			Length (feet)
			48-A
HARRY HINES AT WALNUT HILL	10	4	22
SPRING VALLEY AT HILLCREST	10	1	22
DALLAS PKWY AT FRANKFORD	10	1	22
Total Drill Shaft Length			132

Notes

- ** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
- *** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

REPLACED CGB CONNECTOR WITH BRACKET ASSEMBLY (2/12).

Shipping Parts List							
Traffic Signal Arms (Fixed Mount) (1 per pole) Ship each arm with listed equipment attached							
Nominal Arm Length	Type IV Arm (4 Signals)		Luminaire Arms (1 per 30' pole)				
	4 Bracket Assemblies		Nominal Arm Length	Quantity			
8' Arm				5			
	ft.		Designation		ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers		
50			Quantity		Nominal Arm Length		
55			1		Quantity		
60					7' Arm		
65					9' Arm		
Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached							
Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)		
	1 Bracket Assembly and 1 clamp w/bolts and washers		2 Bracket Assemblies and 1 clamp w/bolts and washers		3 Bracket Assemblies and 1 clamp w/bolts and washers		
ft.	Designation		Quantity		Designation		Quantity
20	20I-80						
24	24I-80				24II-80		
28	28I-80				28II-80		
32					32II-80		32III-80
36					36II-80		36III-80
40							40III-80
44							44III-80 1
Traffic Signal Arms (100 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached							
Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)		
	1 Bracket Assembly and 1 clamp w/bolts and washers		2 Bracket Assemblies and 1 clamp w/bolts and washers		3 Bracket Assemblies and 1 clamp w/bolts and washers		
ft.	Designation		Quantity		Designation		Quantity
20	20I-100						
24	24I-100				24II-100		
28	28I-100				28II-100		
32					32II-100		32III-100
36					36II-100		36III-100
40							40III-100
44							44III-100
Anchor Bolt Assemblies (1 per pole) 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.							
Anchor Bolt Diameter	Anchor Bolt Length	Quantity					
2 1/2 "	5' - 3"	6					

Abbreviations

- Lf= Fixed Arm Length
- Lc= Clamp-on Arm Length (44' Max.)



I AM SEALING THIS SHEET ONLY FOR THE SHIPPING PARTS LIST

Texas Department of Transportation
Dallas District Standard

LONG MAST ARM ASSEMBLY PARTS LIST
LMA (5) - 12 (DAL)

Sheet 5 of 5

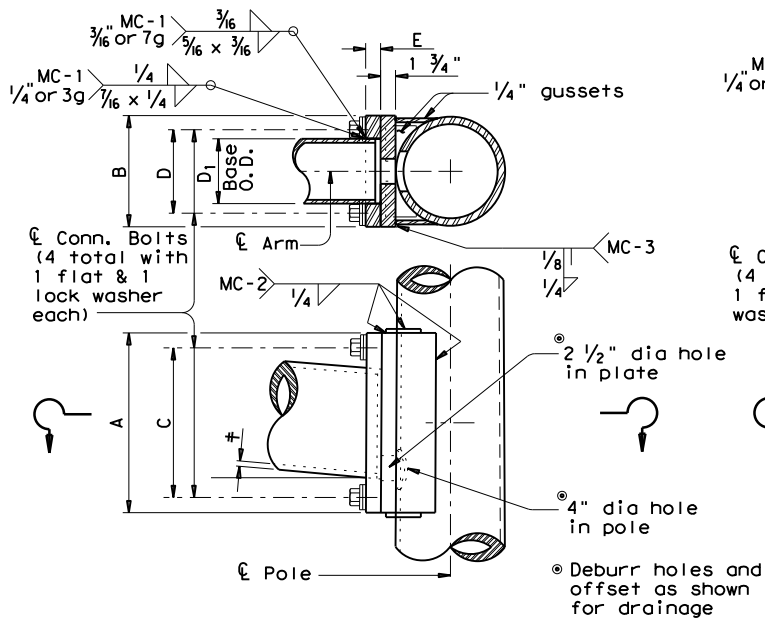
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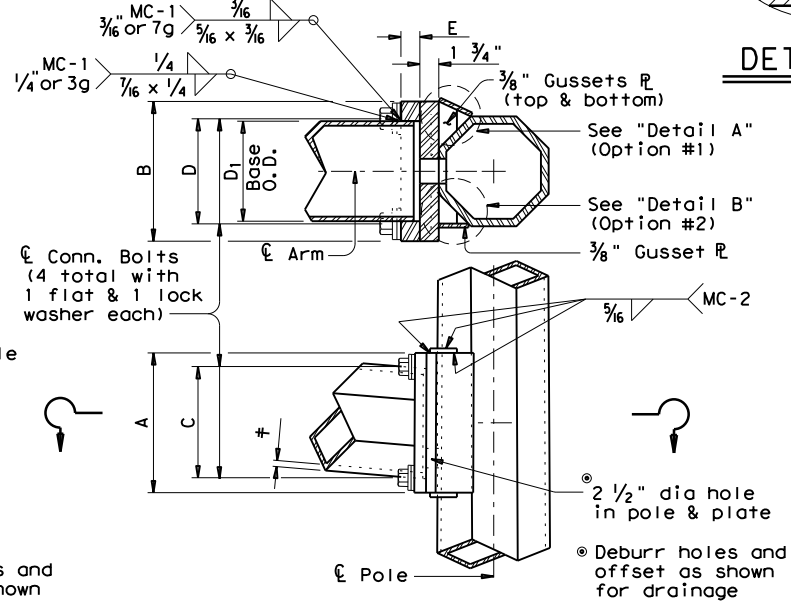
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ARM SIZE		A	B	C	D	E	CONN BOLT DIA
D ₁	φ	in.	in.	in.	in.	in.	in.
6.5	.179	12	9	9	6	1 3/4	1
7.5	.179	13	9	10	6	1 3/4	1
8.0	.179	14	10	11	7	2	1 1/4
9.0	.179	16	11	13	8	2	1 1/4
9.5	.179	17	12	14	9	2	1 1/4
9.5	.239	18	12	15	9	2	1 1/4
10.0	.239	18	12	15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

ARM SIZE		A	B	C	D	E	CONN BOLT DIA
D ₁	φ	in.	in.	in.	in.	in.	in.
7.0	.179	11	11	8	8	1 3/4	1 1/4
7.5	.179	11	11	8	8	1 3/4	1 1/4
8.0	.179	11	11	8	8	2	1 1/4
9.0	.179	13	13	10	10	2	1 1/4
10.0	.179	13	13	10	10	2	1 1/4
9.5	.239	13	13	10	10	2	1 1/4
10.0	.239	14	14	11	11	2	1 1/2
11.0	.239	14	14	11	11	3	1 1/2
11.5	.239	14	14	11	11	3	1 1/2



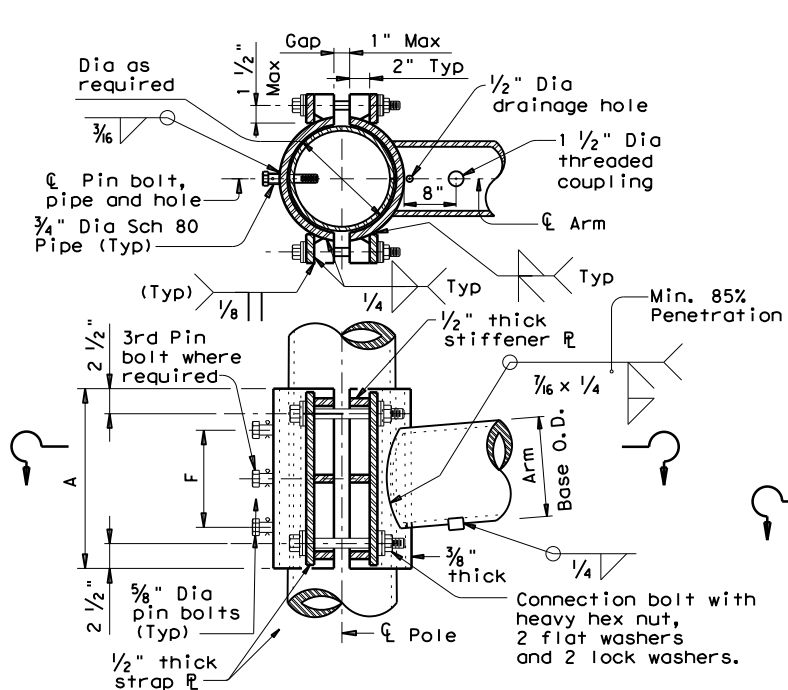
FIXED MOUNT DETAIL 1



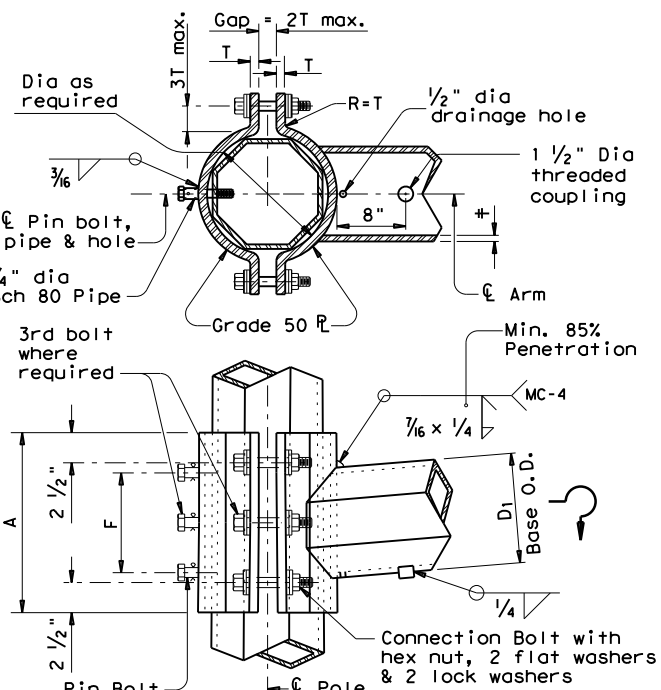
FIXED MOUNT DETAIL 2

ARM SIZE		A	F	CONN. BOLTS		PIN BOLTS	
D ₁	φ	in.	in.	No.	Dia	No.	Dia
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

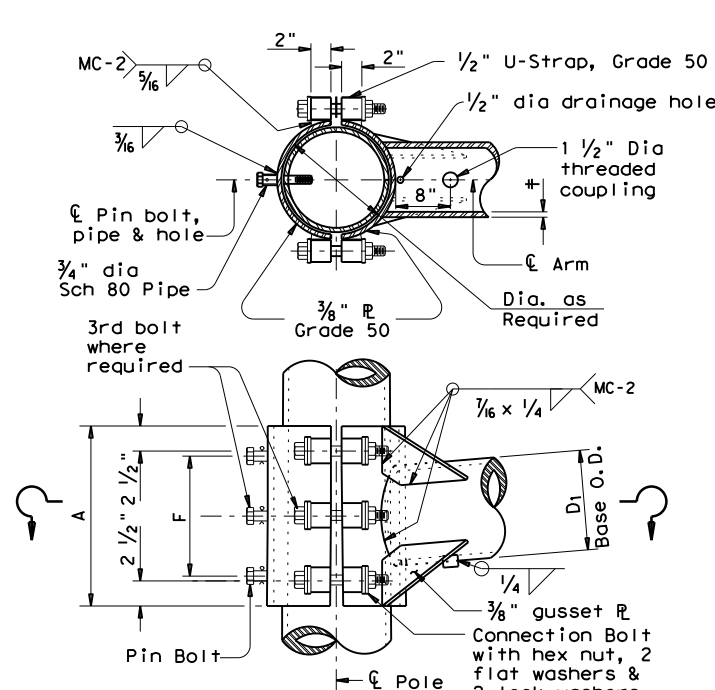
ARM SIZE		A	F	T	CONN. BOLTS		PIN BOLTS	
D ₁	φ	in.	in.	in.	No.	Dia	No.	Dia
7.0	.179	12	6	3/4	4	3/4	2	5/8
7.5	.179	14	8	3/4	4	3/4	2	5/8
8.0	.179	14	8	3/4	4	3/4	2	5/8
9.0	.179	16	10	7/8	4	1	2	5/8
10.0	.179	18	10	7/8	4	1	2	5/8
9.5	.239	18	10	1	6	1	3	5/8
10.0	.239	18	10	1	6	1	3	5/8



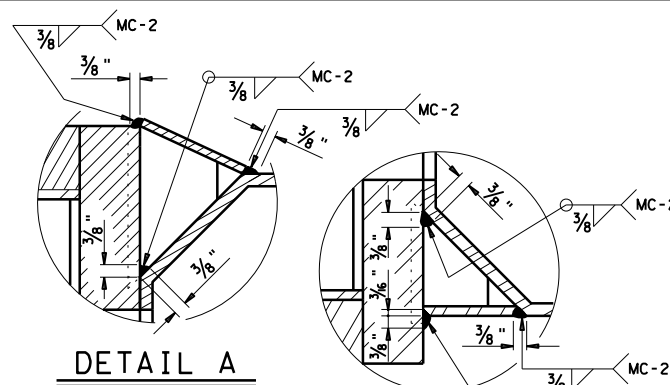
CLAMP-ON DETAIL 1



CLAMP-ON DETAIL 2

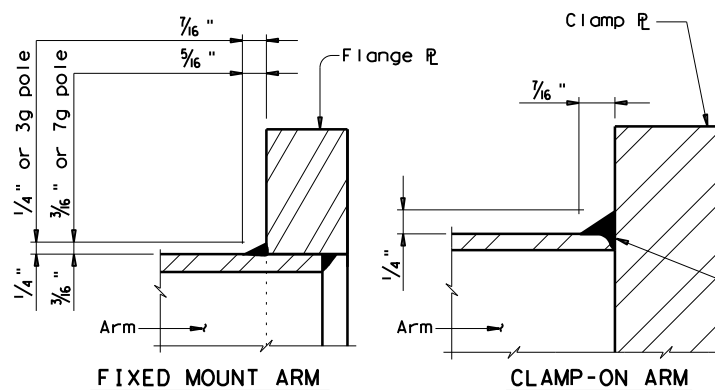


CLAMP-ON DETAIL 3



DETAIL A

DETAIL B



FIXED MOUNT ARM

CLAMP-ON ARM

ARM BASE WELD DETAILS

ARM SIZE		A	F	CONN. BOLTS		PIN BOLTS	
D ₁	φ	in.	in.	No.	Dia	No.	Dia
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

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 1/16" 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

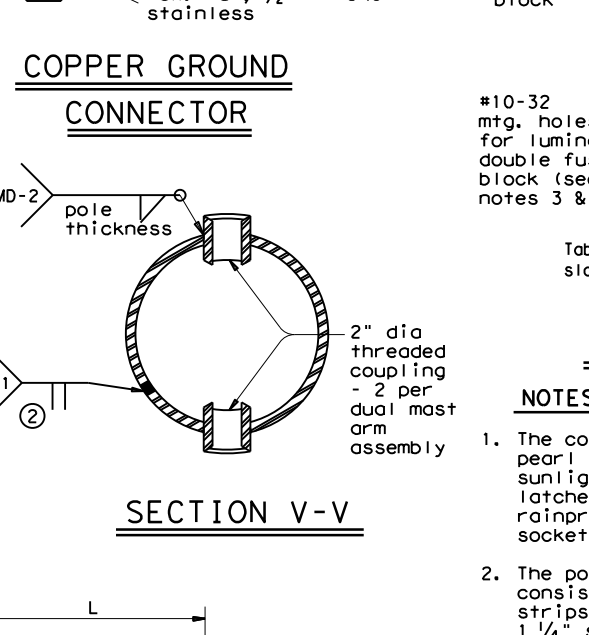
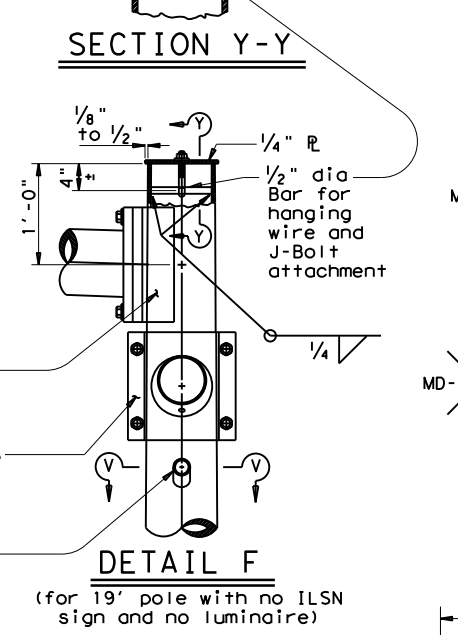
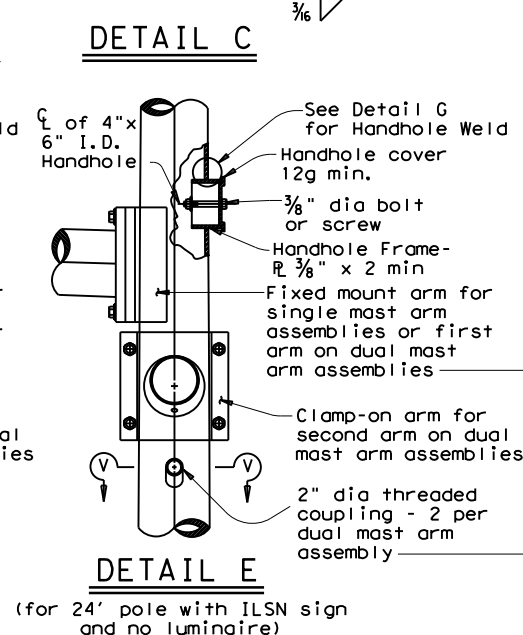
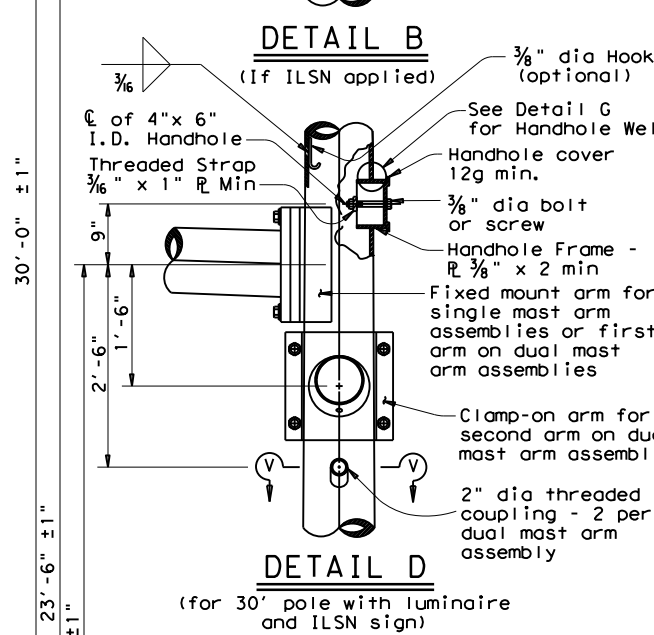
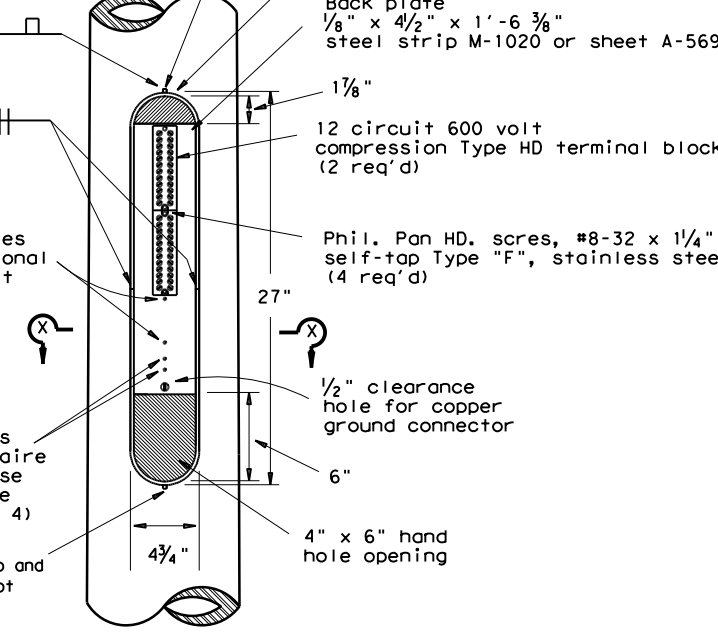
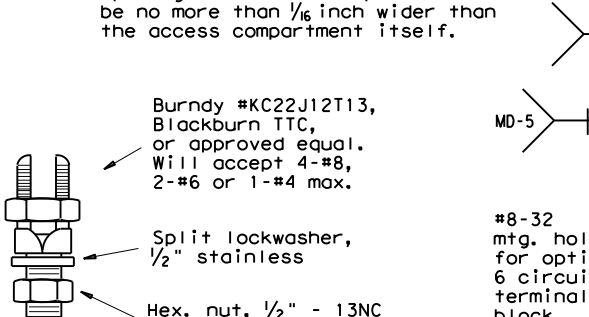
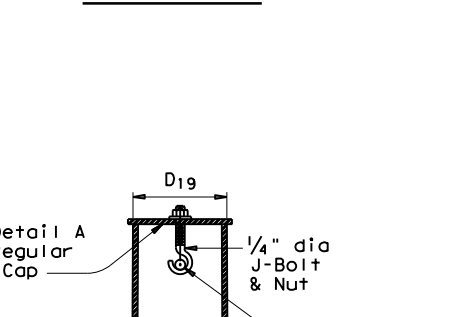
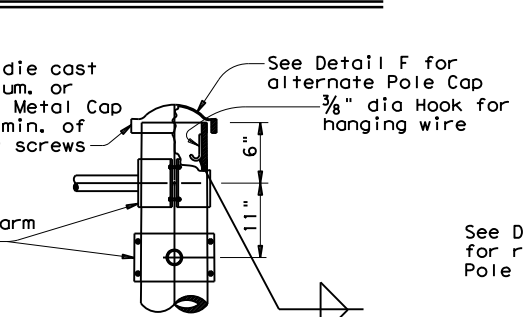
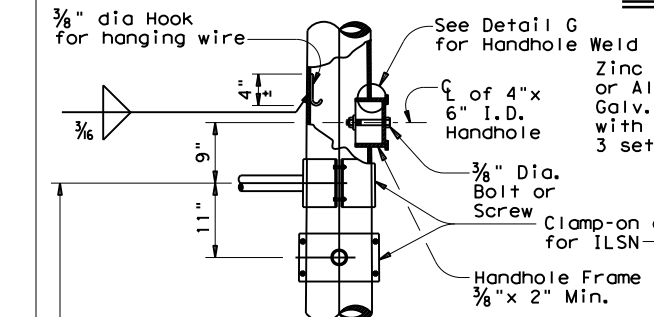
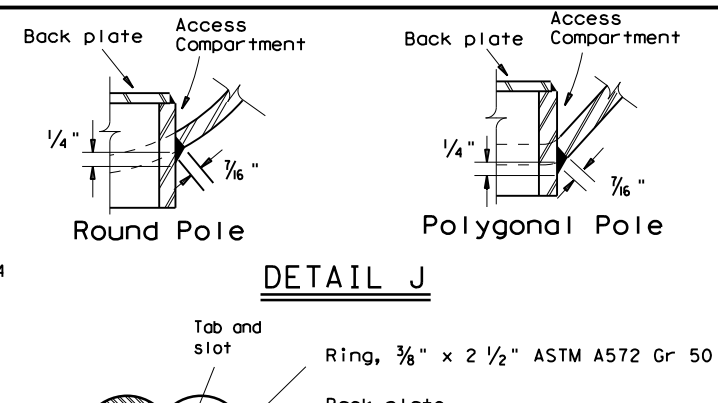
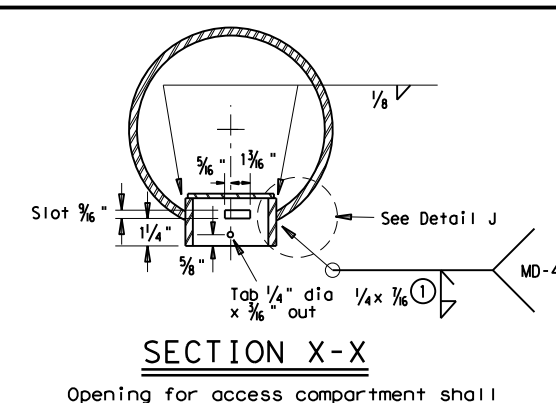
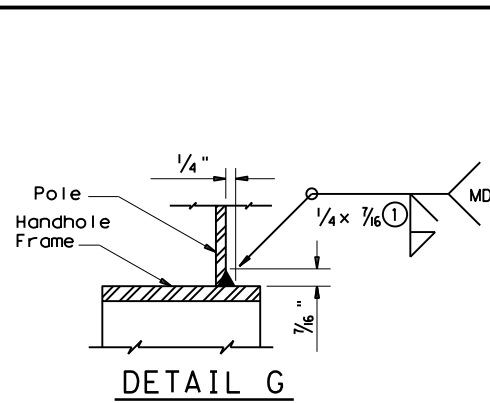
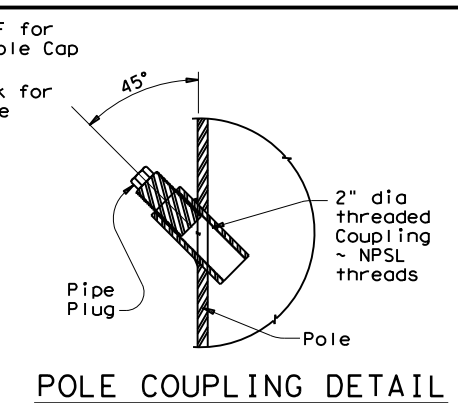
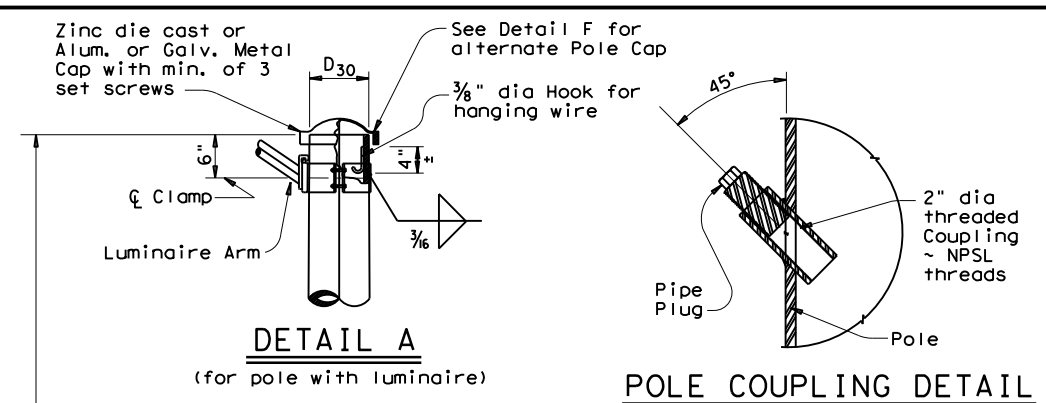
MAST ARM CONNECTIONS

MA-C-12

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REVISIONS		CONT	SECT	JOB	HIGHWAY
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1-12		DAL	COL, ETC.		92

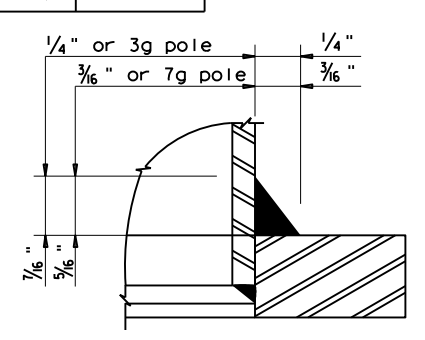
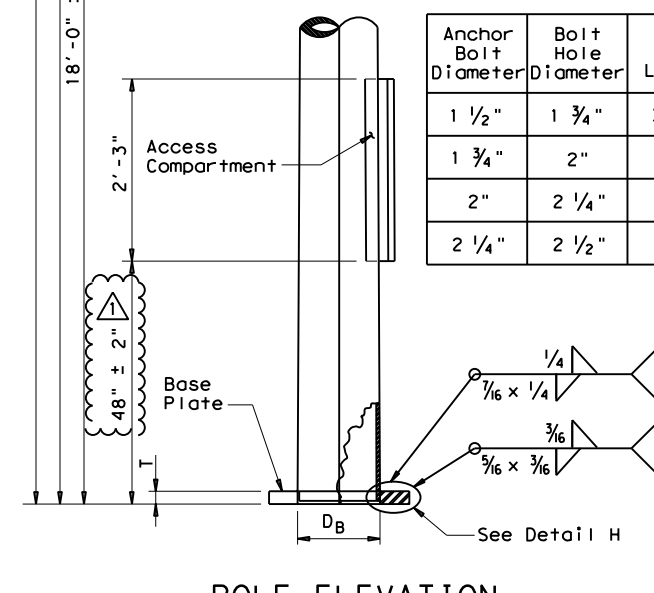
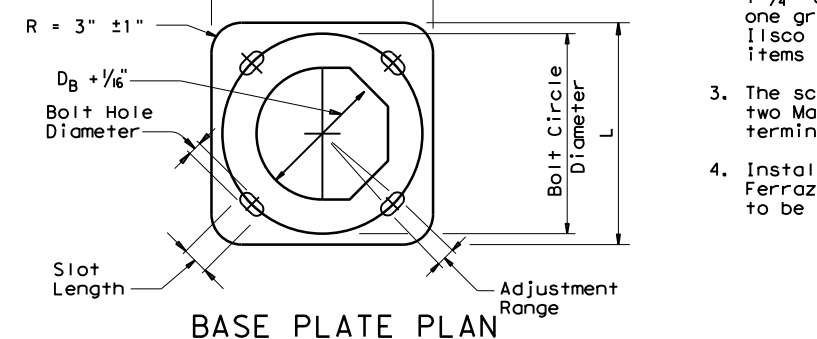
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- NOTES:**
- The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
 - 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 1/4" 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.
 - 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.
 - Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

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



- ① 85% Min. penetration
 ② 60% Min. penetration 100% penetration within 6" of circumferential base welds.
- REVISOR: REVISED THE ELEVATION OF ACCESS COMPARTMENT (2/12).

Texas Department of Transportation
 Dallas District Standard

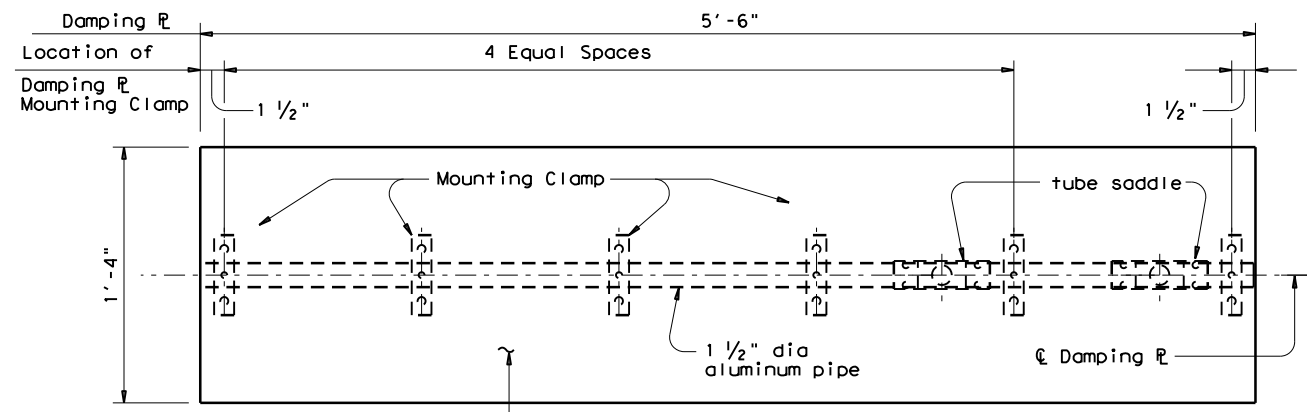
TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

MA-D-12 (DAL)

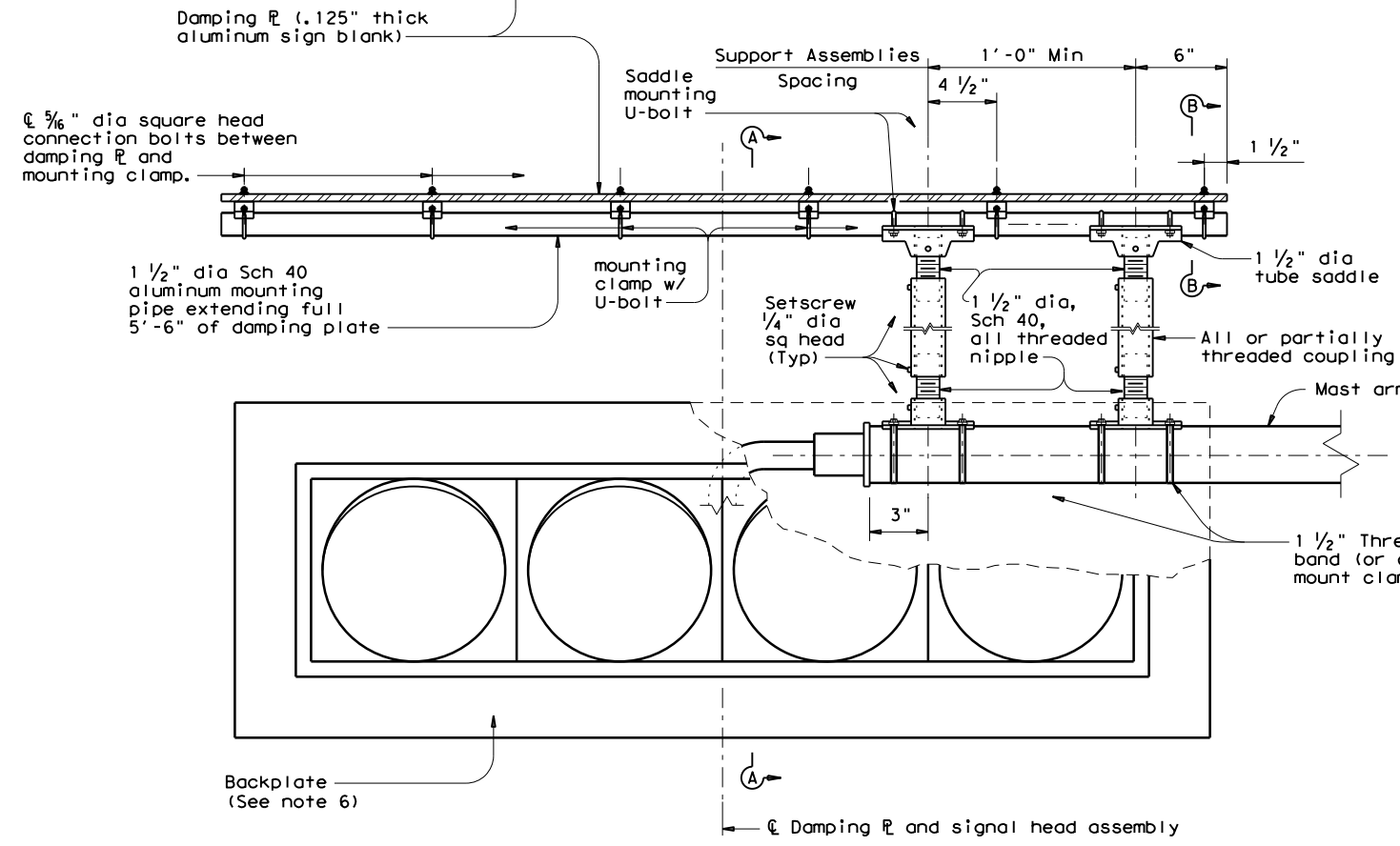
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0918	24	267, ETC.		VAR	
DIST	COUNTY	SHEET NO.			
DAL	COL, ETC.	93			

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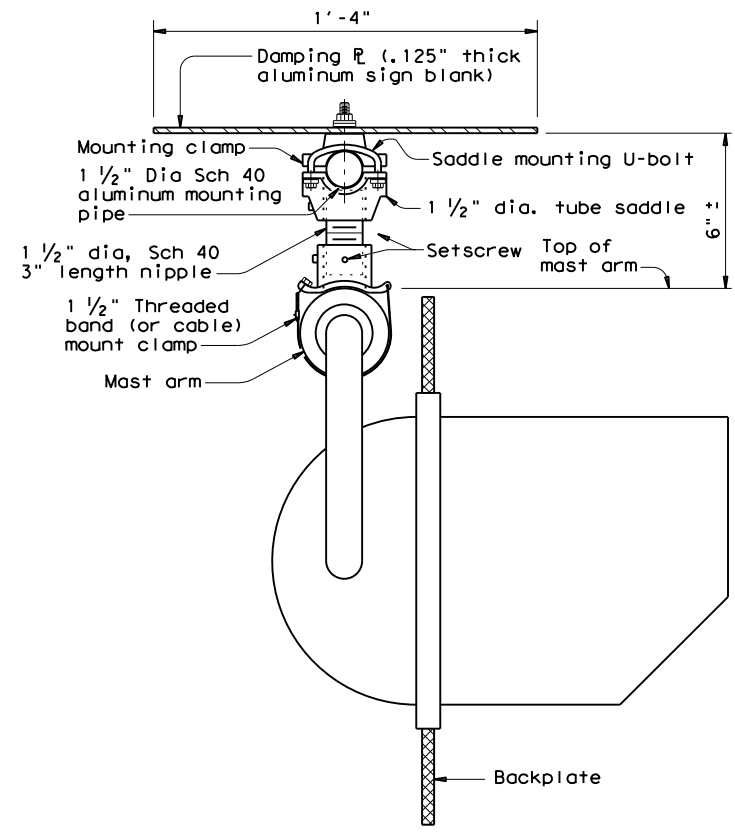


PLAN



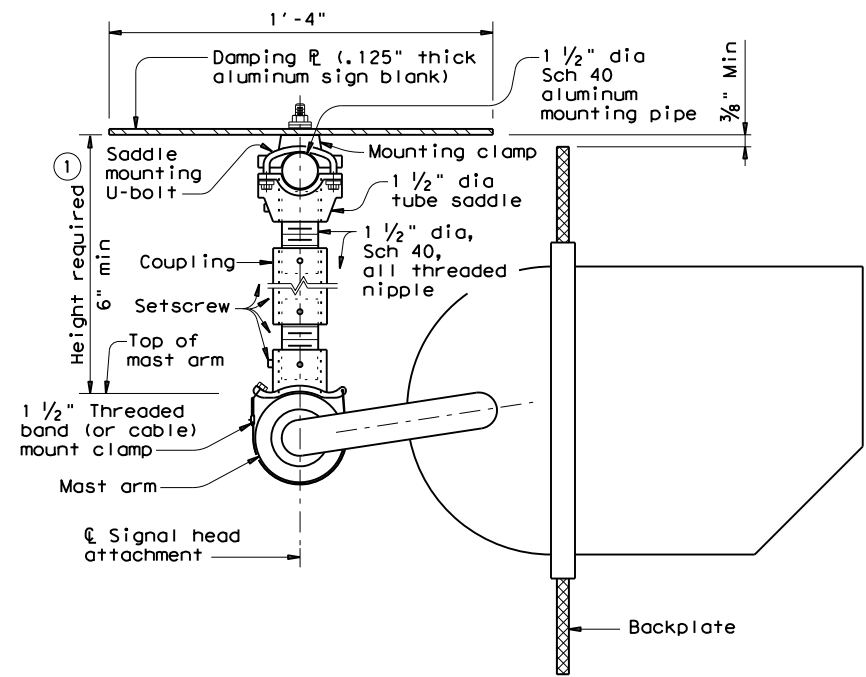
ELEVATION

DAMPING PLATE MOUNTING DETAILS
 (Showing alternate placement of signal head)



SECTION A-A

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



SECTION A-A

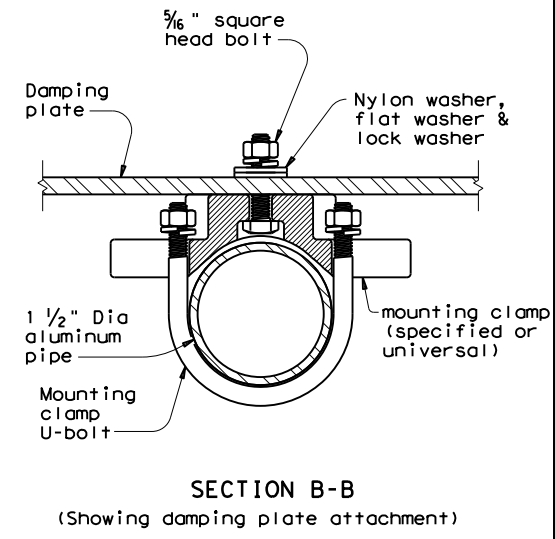
(Showing alternate placement of signal head)
 (Mounting clamp U-bolt is not shown for clarity)

① Recommended supporting assemblies to achieve required height for horizontal section heads

Height required	One nipple each length	Two nipples each length plus One coupling each length	
6"-6 3/4"	3"	-	-
7"-8 1/2"	4"	-	-
9"-10 1/2"	6"	-	-
11"-15 1/2"	-	4"	5"
16"-24"	-	6"	10"

GENERAL NOTES:

- 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.
- 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.
- 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.
- Unless stipulated by the manufacturers, all steel parts will be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".
- Contractor will verify applicable field dimensions before the installation.
- Backplates are optional for traffic signals. When backplates are used, Backplates will have a 2-inch fluorescent yellow AASHTO Type BFL or CFL retroreflective border conforming to TxDOT DMS-8300 "Sign Face Materials." See Sheet TS-BP-20 for backplate details.



SECTION B-B

(Showing damping plate attachment)

Texas Department of Transportation
 Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

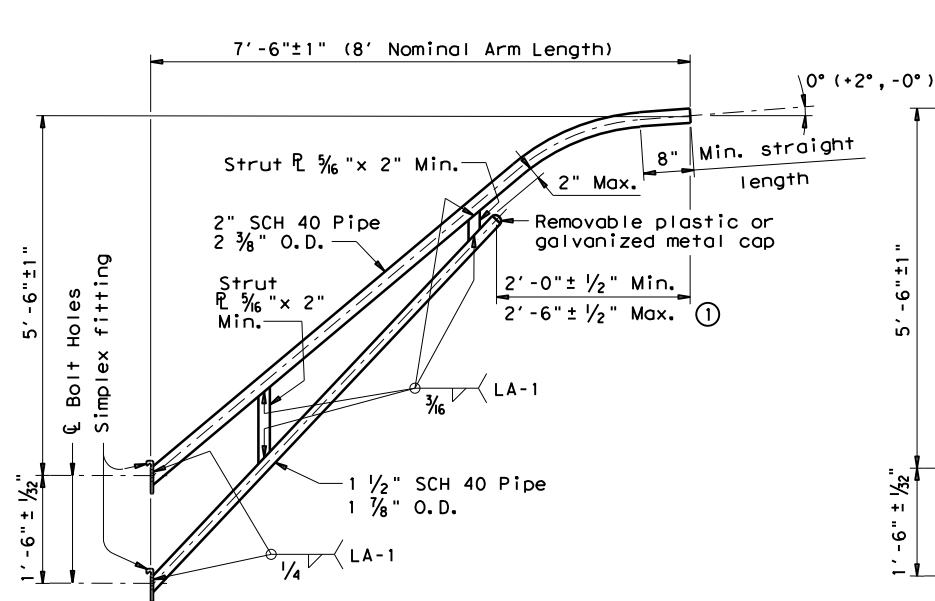
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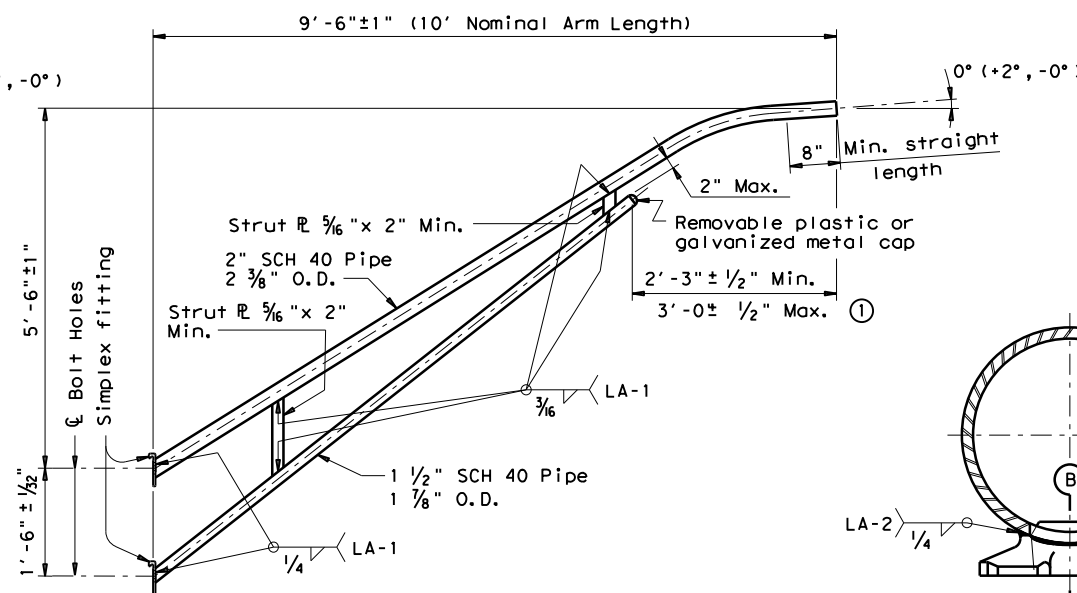
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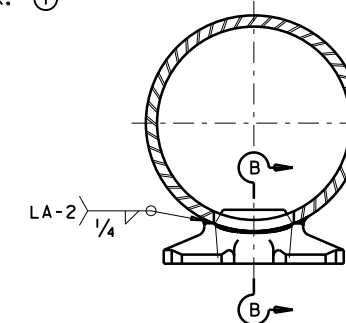
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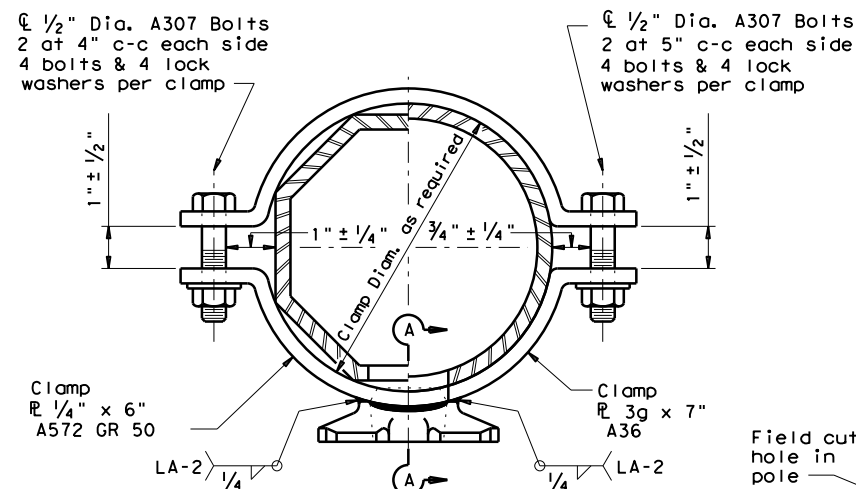
8-FOOT LUMINAIRE ARM



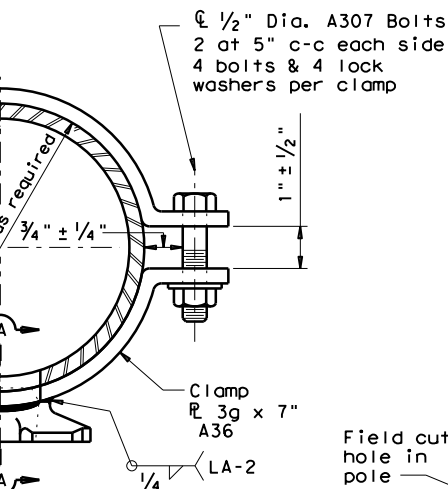
10-FOOT LUMINAIRE ARM



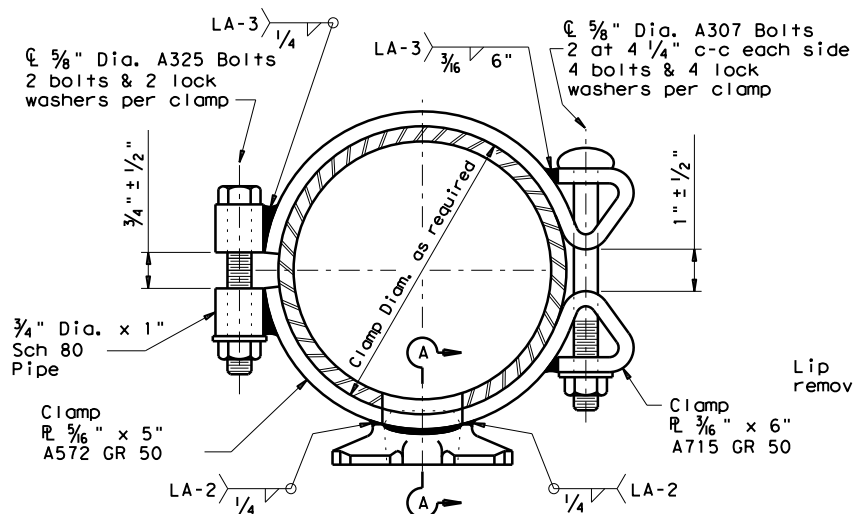
DIRECT ATTACHMENT DETAIL



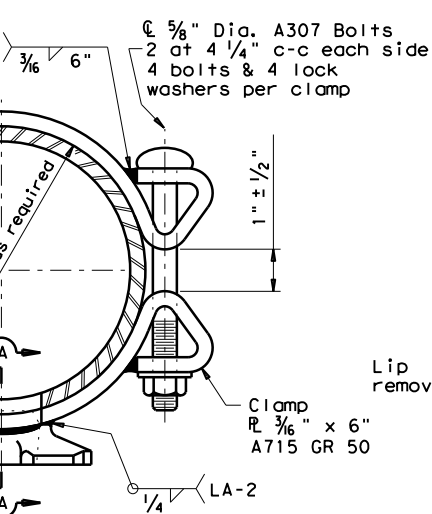
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)



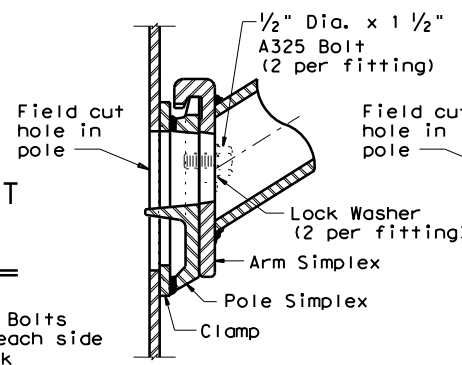
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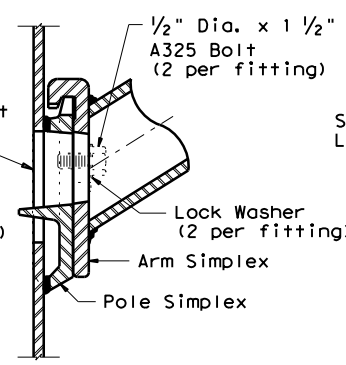
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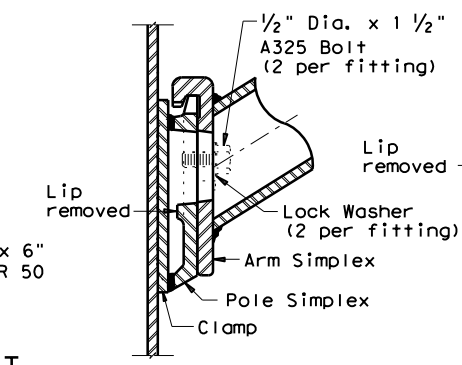
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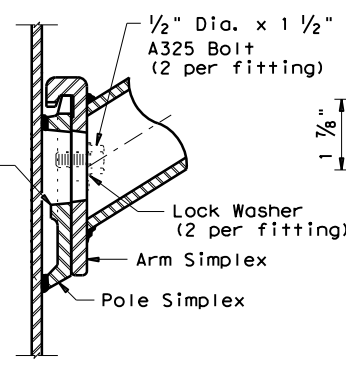
UPPER SIMPLEX FITTING



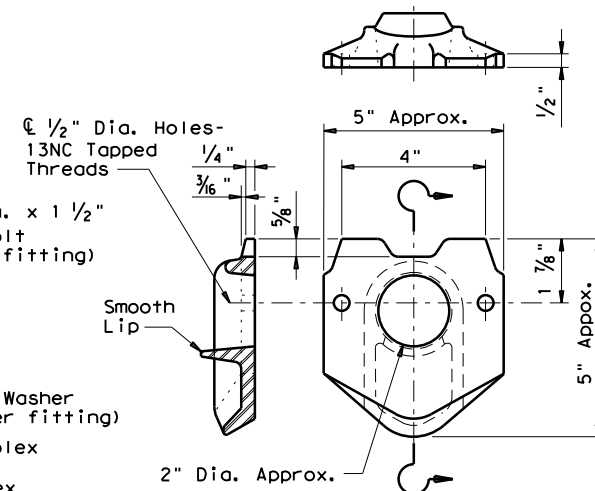
UPPER SIMPLEX FITTING



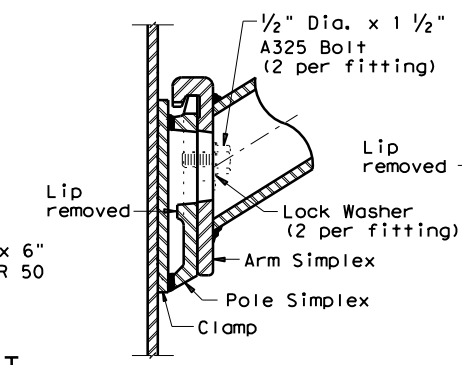
LOWER SIMPLEX FITTING



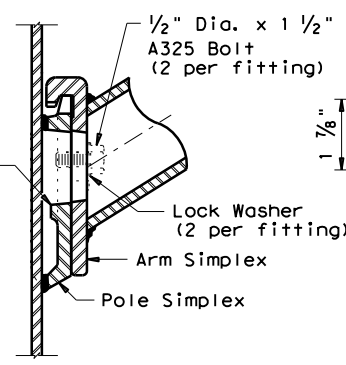
LOWER SIMPLEX FITTING



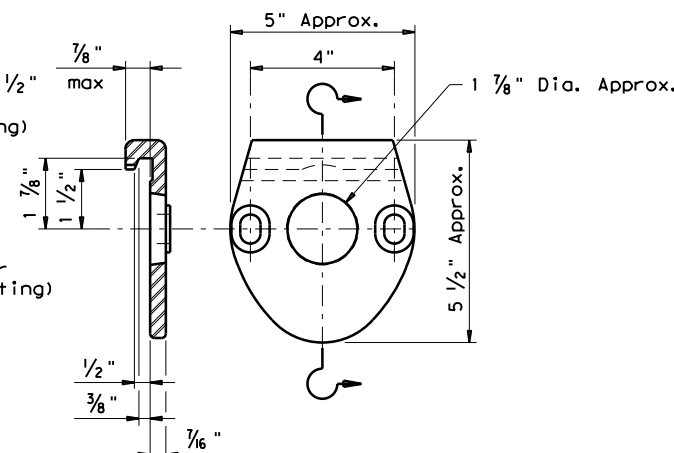
POLE SIMPLEX DETAIL



SECTION A-A



SECTION B-B



ARM SIMPLEX 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

- 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.
- Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.
- 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.
- 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 absence of specified Fabricator 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.

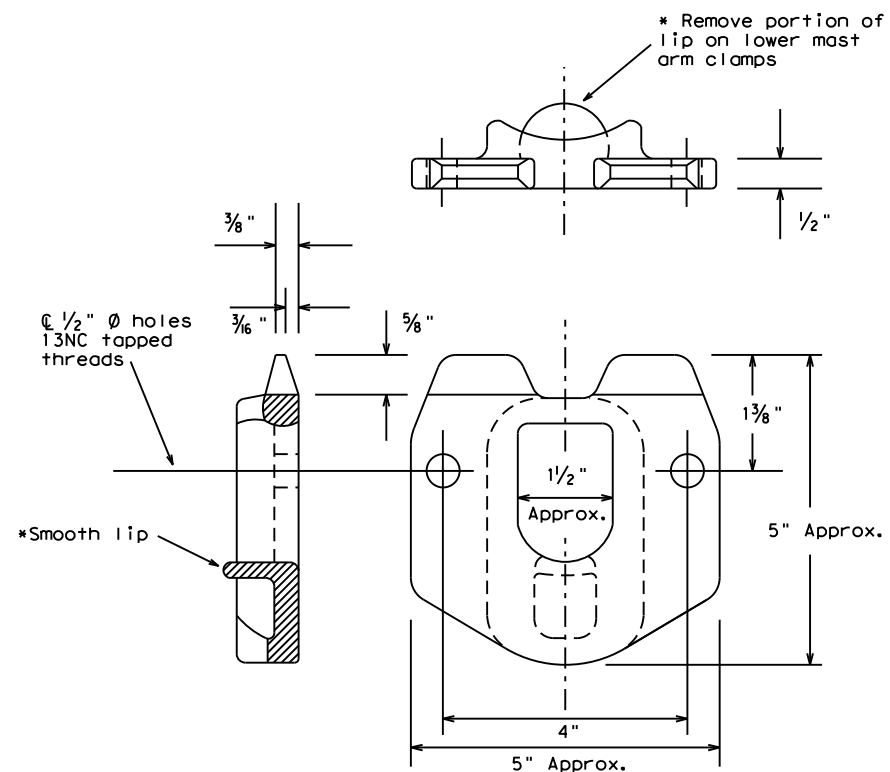
If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.

Texas Department of Transportation
 Traffic Operations Division
STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES
 ARM DETAILS
LUM-A-12

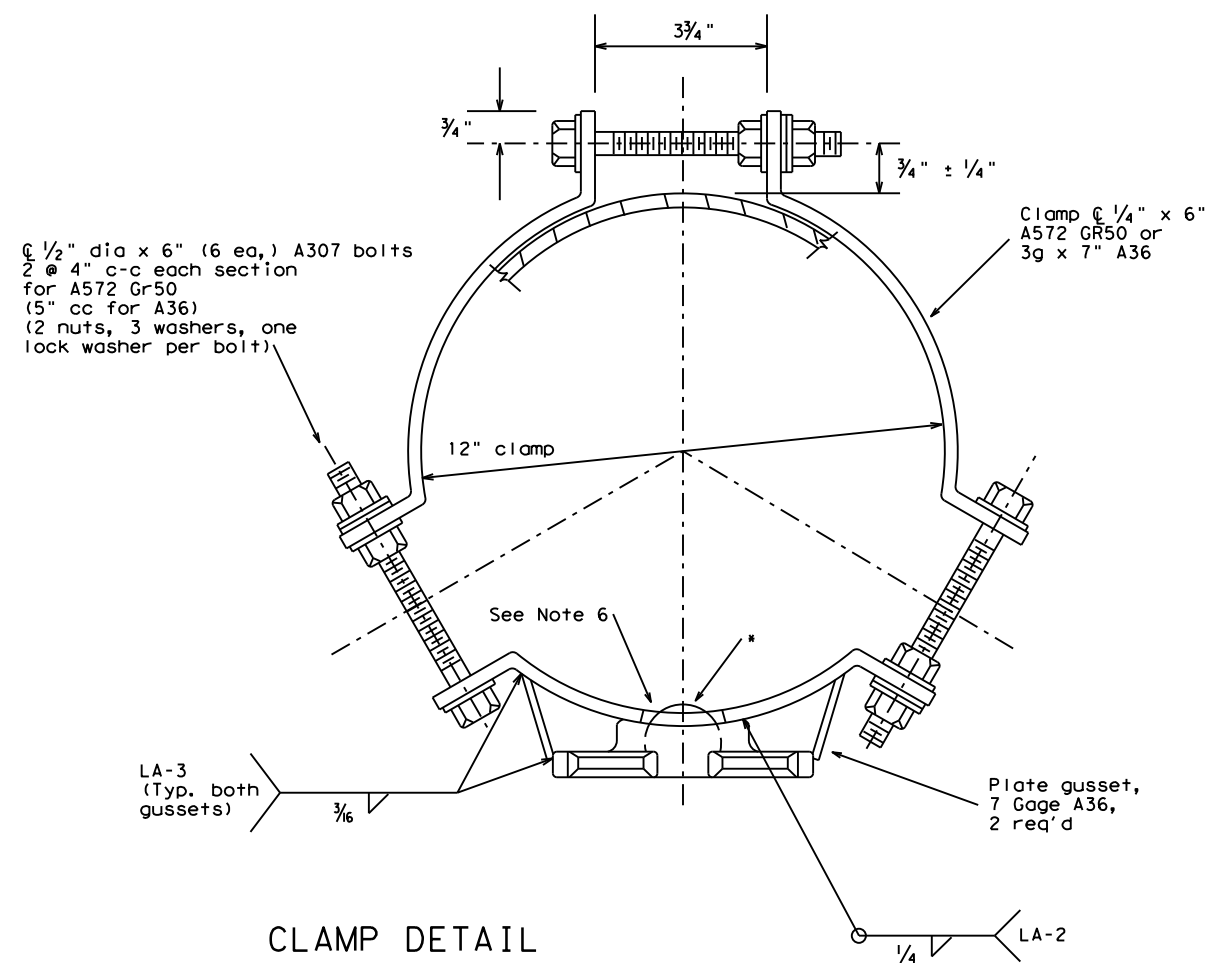
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		DAL	COL, ETC.		95

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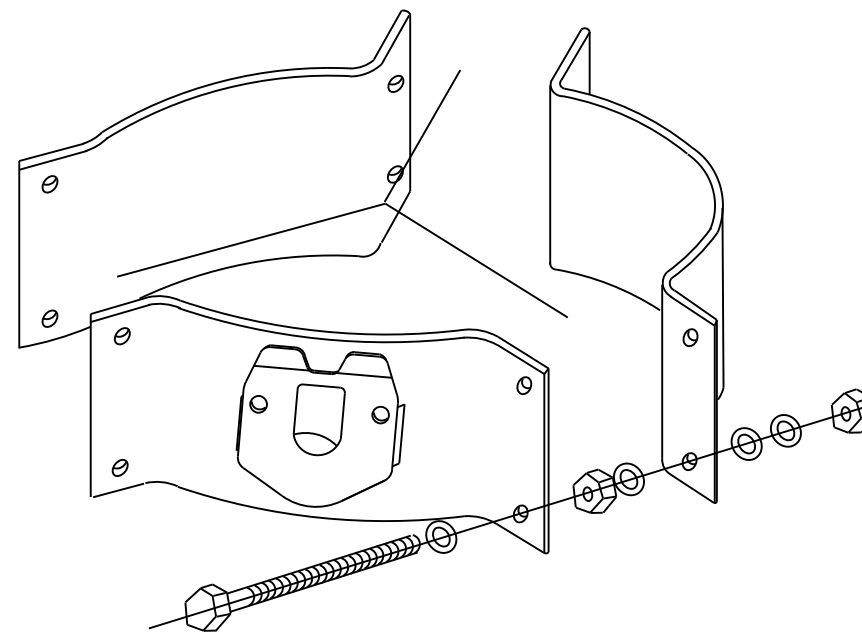
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POLE SIMPLEX DETAILS



CLAMP DETAIL



PROJECTION

For 8.9 - 12 inch diameter Signal Poles
 (Two req'd for each mast arm)

OTHER MATERIALS:

1. Pole simplex shall be ASTM A27 GR65-35 or A148 GR80-50 or A576 GR1021. ASTM A576 must be suitable for forging and also meet minimum tensile of 65ksi, minimum yield of 35ksi, and a minimum elongation of 22 percent in 2 inches.
2. Welded tabs and backplates shall be ASTM A-36 steel or better.
3. Nylon insert locknuts shall conform to ASTM A563.

GENERAL NOTES:

1. Materials and fabrication shall be in accordance with Standard Sheet "MA-C" 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 absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
2. All parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing". The throat of the Simplex shall be made free of all rough or sharp edges resulting from the galvanizing process.
3. Each simplex fitting shall be supplied with 2 ASTM A325 bolts, 1/2 in. x 1 1/2 in. and 2 lock washers. The bolts and lock washers shall be secured to the clamp with the other hardware items. The Fabricator shall ship clamp assembly together in a single package, including all bolts, nuts, and washers required for the clamp and simplex fitting.
4. 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 80 mph plus a 1.3 gust factor. Clamps are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft., 12 ft. maximum arm length.
5. Each assembly shall consist of one upper piece simplex fitting having a smooth lip and one lower piece simplex fitting with the lip removed.
6. Approximately 2 in. diameter hole in upper mast arm clamp.

Texas Department of Transportation
 Traffic Operations Division

CLAMP ON
 FITTING ASSEMBLY FOR
 LUMINAIRE MAST ARM

CFA-12

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REVISIONS		CONT	SECT	JOB	HIGHWAY
11-99		0918	24	267, ETC.	VAR
1-12		DIST	COUNTY		SHEET NO.
		DAL	COL, ETC.		96

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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			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft		SHEAR Kips
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	3/4"	36	12 3/4"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 1/2"	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 3/4"	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 1/4"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

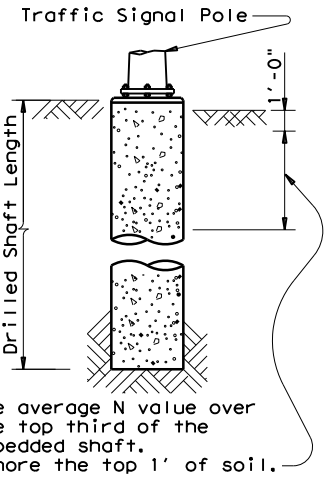
- Anchor bolt design develops the foundation capacity given under Foundation Design Loads.
- Foundation Design Loads are the allowable moments and shears at the base of the structure.
- Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
- Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.
- If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.
- 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	30-ILL
HARRY HINES AT WALNUT HILL	10	24-A	4	6				
	10	30-ILL	3					8
MIDWAY AT ROYAL	10	24-A	7	6				
	10	36-A	4			14		
SPRING VALLEY AT HILLCREST	10	24-A	5	6				
	10	36-A	4			14		
DALLAS PKWY AT FRANKFORD	10	24-A	10	6				
	10	36-A	2			14		
PGBT AT MIDWAY	10	24-A	7	6				
	10	36-A	2			14		
PARK AT SHADY BROOK	10	24-A	2	6				
	10	30-A	1			12		
		36-A	2			14		
TOTAL DRILLED SHAFT LENGTHS				210	12	196	48	32

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

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

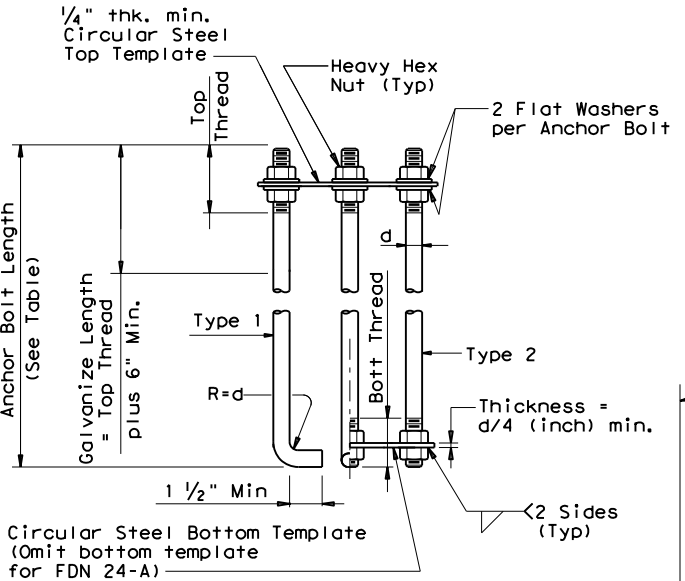


ANCHOR BOLT & TEMPLATE SIZES

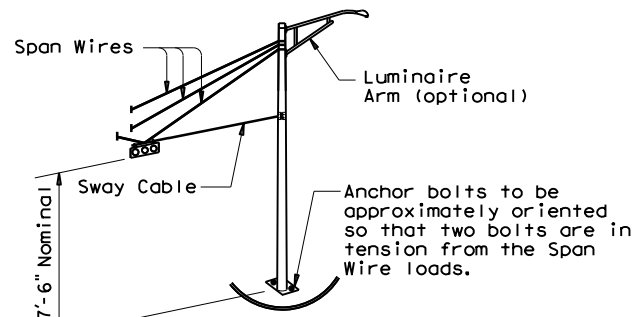
BOLT DIA IN.	BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
3/4"	1'-6"	3"	—	12 3/4"	7 1/8"	5 5/8"
1 1/2"	3'-4"	6"	4"	17"	10"	7"
1 3/4"	3'-10"	7"	4 1/2"	19"	11 1/4"	7 3/4"
2"	4'-3"	8"	5"	21"	12 1/2"	8 1/2"
2 1/4"	4'-9"	9"	5 1/2"	23"	13 3/4"	9 1/4"

Min dimensions given, longer bolts are acceptable.

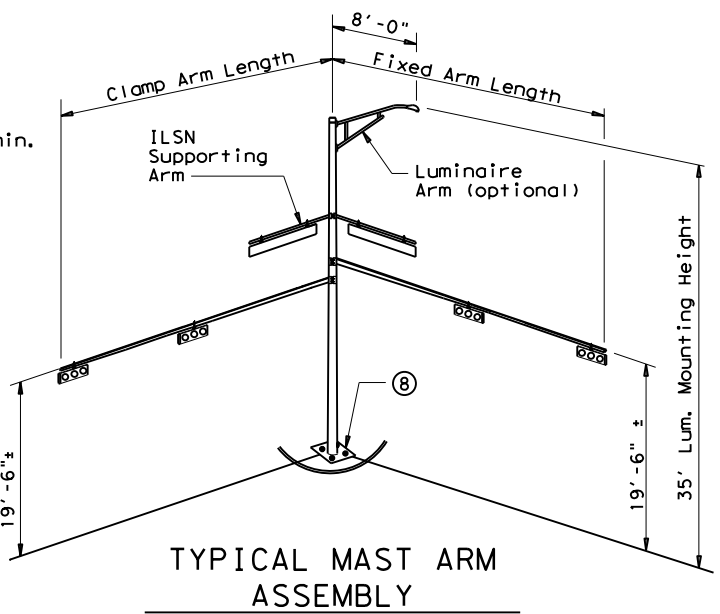
- EXAMPLE:**
- For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
 - For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



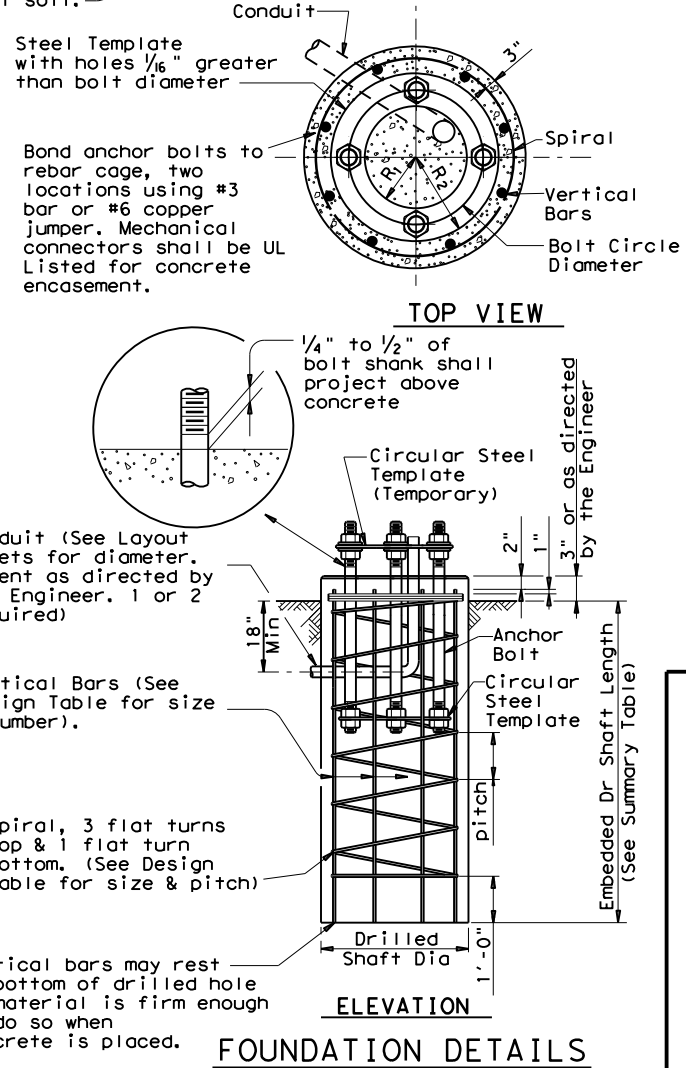
ANCHOR BOLT ASSEMBLY



TYPICAL STRAIN POLE ASSEMBLY



TYPICAL MAST ARM ASSEMBLY



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.

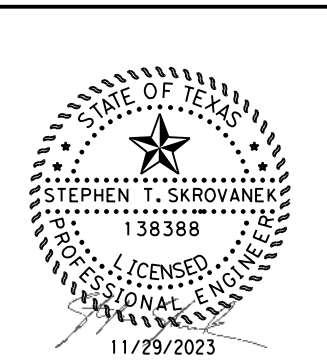
Reinforcing steel shall conform to Item 440, "Reinforcing Steel".

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".



Texas Department of Transportation
 Traffic Operations Division

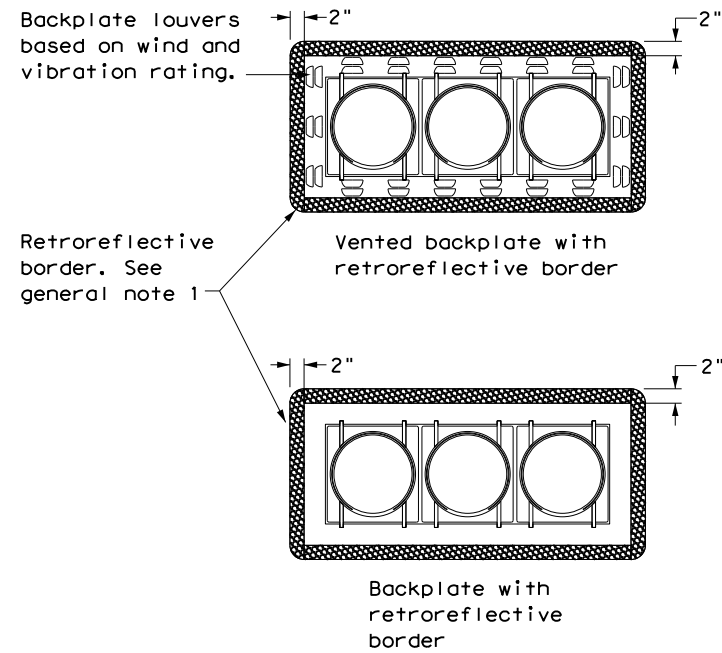
TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

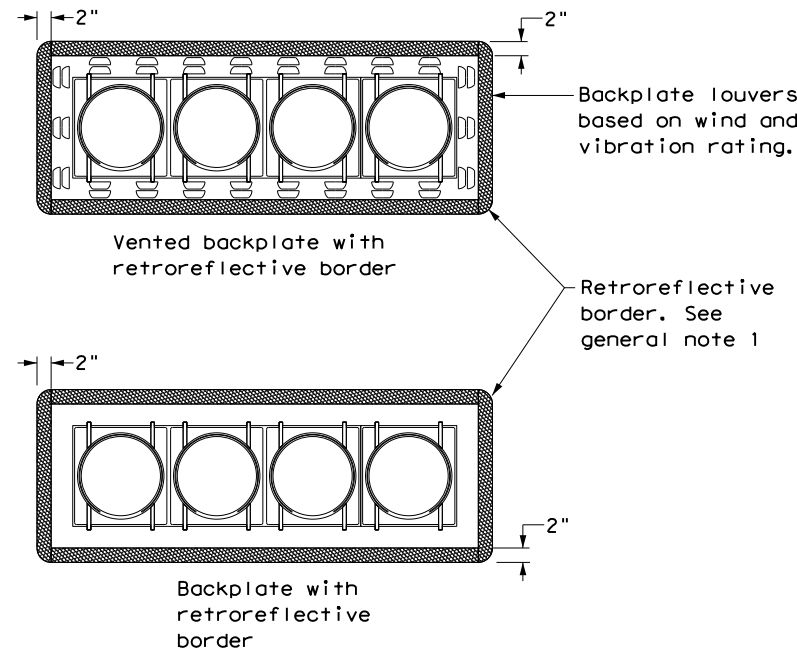
© TxDOT August 1995		DN: MS	CK: JSY	DW: MAQ/MMF	CK: JSY/TEB
REVISONS	CON	SECT	JOB	HIGHWAY	
0918 24			267, ETC.	VAR	
DIST	COUNTY			SHEET NO.	
DAL	COL, ETC.			97	

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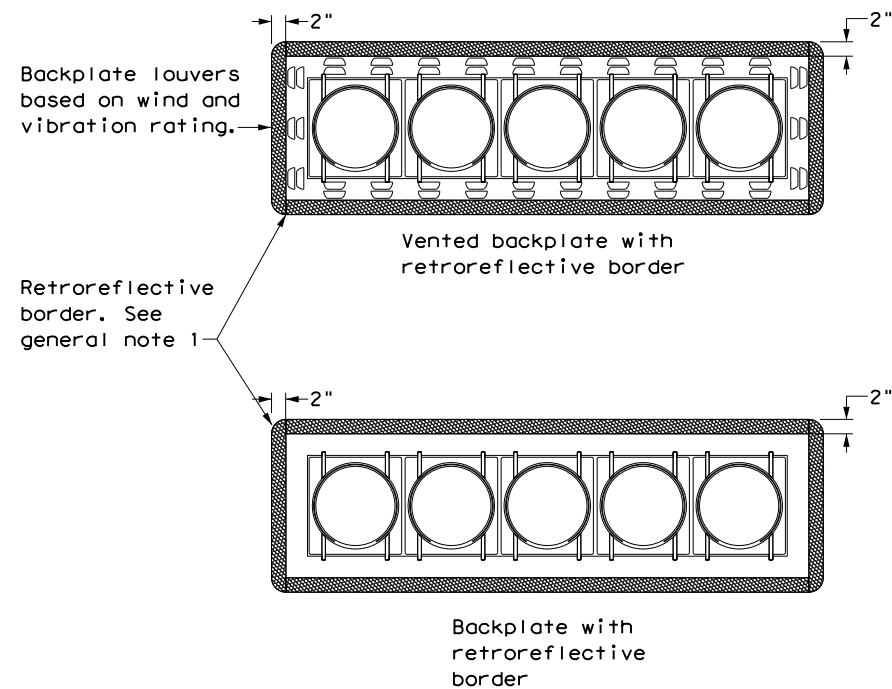
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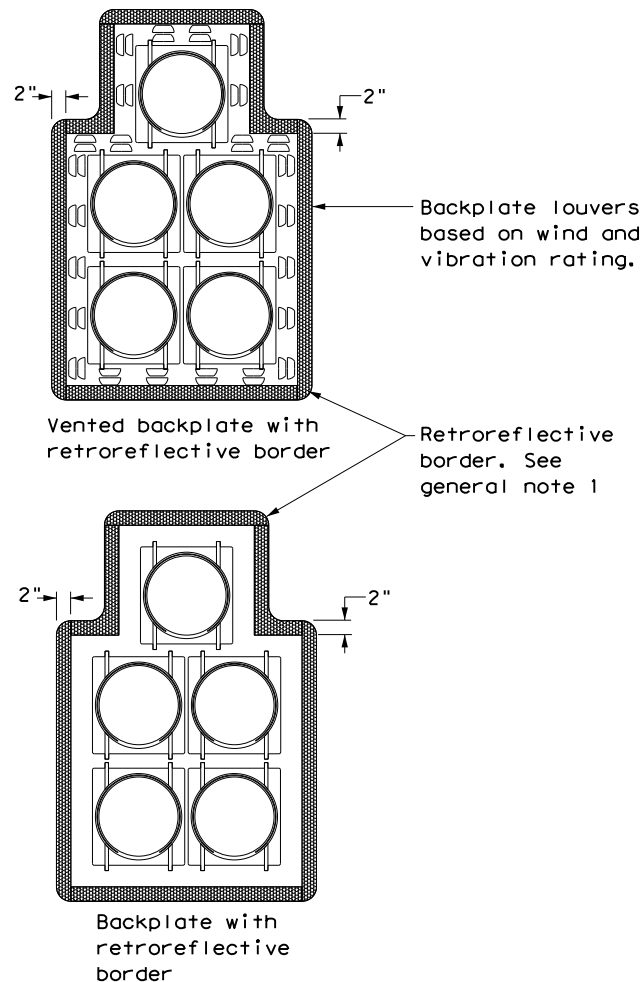
THREE-SECTION HEAD
 HORIZONTAL OR VERTICAL



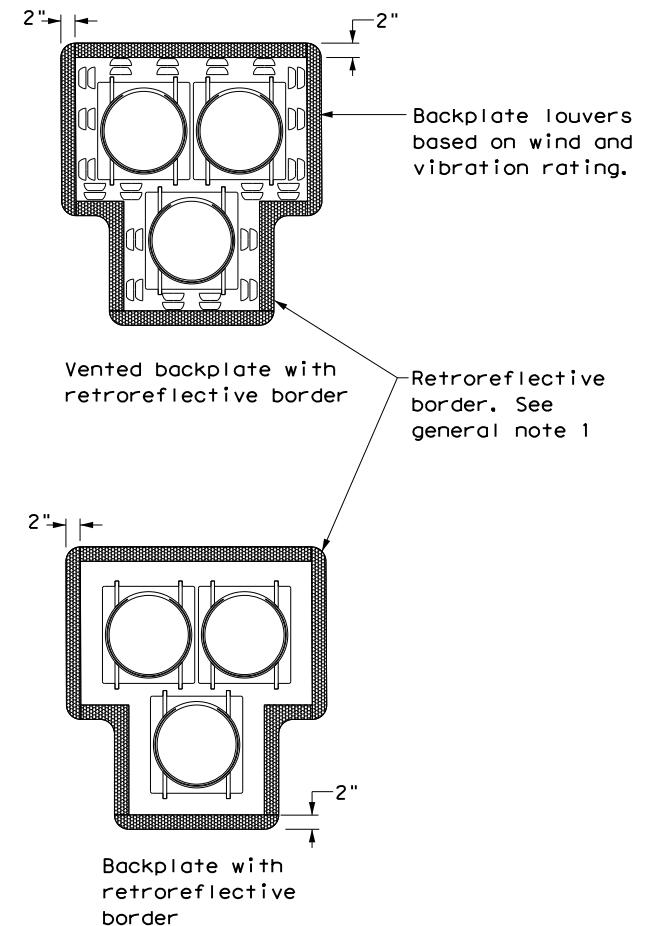
FOUR-SECTION HEAD
 HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
 HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
 CLUSTER

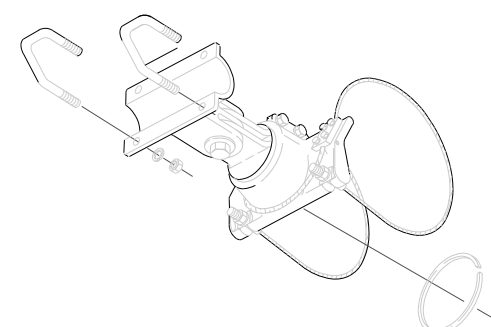
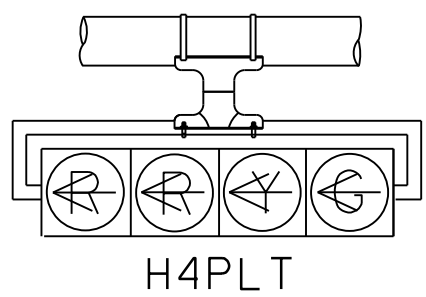
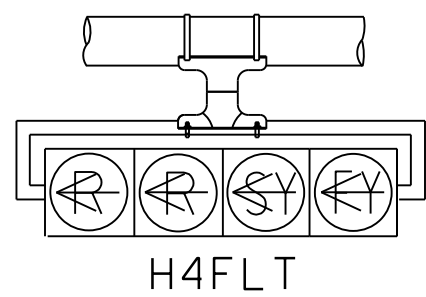
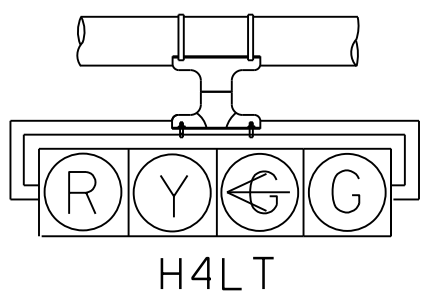
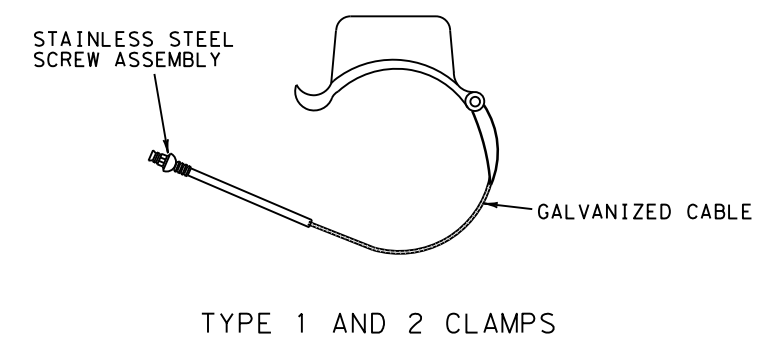
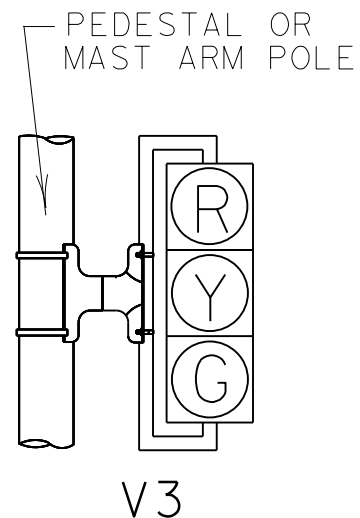
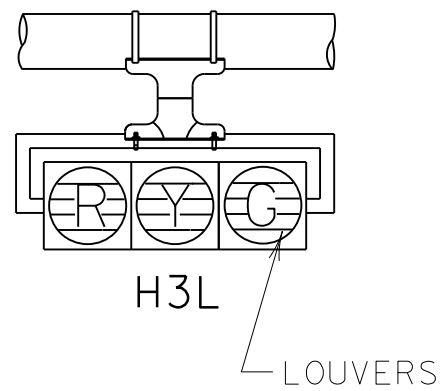
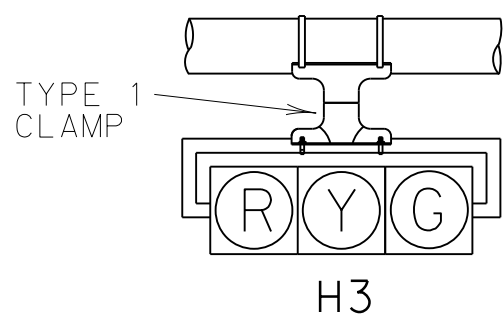


PEDESTRIAN HYBRID
 BEACON

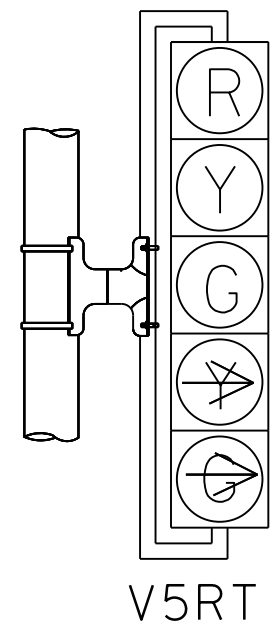
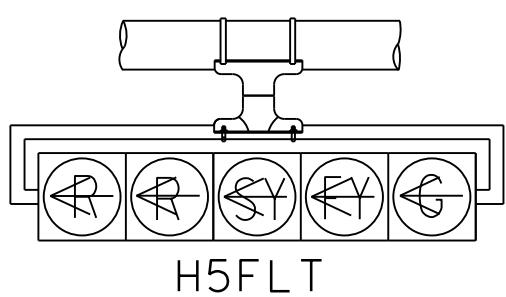
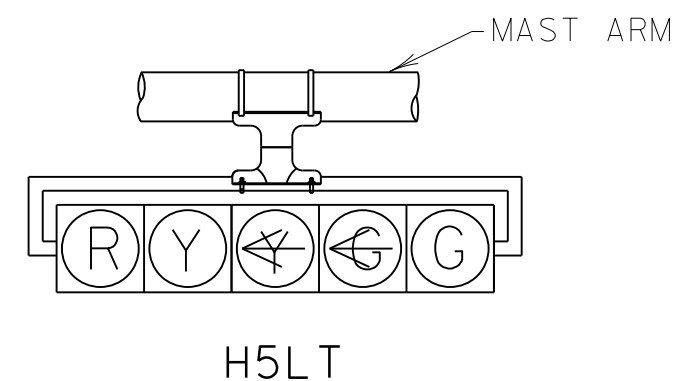
GENERAL NOTES:

1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatibility 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 <i>Traffic Safety Division Standard</i>	
TRAFFIC SIGNAL HEAD WITH BACKPLATE TS-BP-20					
FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT	
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	DIST	COUNTY	SHEET NO.		
	DAL	COL, ETC.	98		



SHALL BE INSTALLED WHEN ROTATION ABOUT THE HORIZONTAL AND VERTICAL AXES ARE NEEDED.

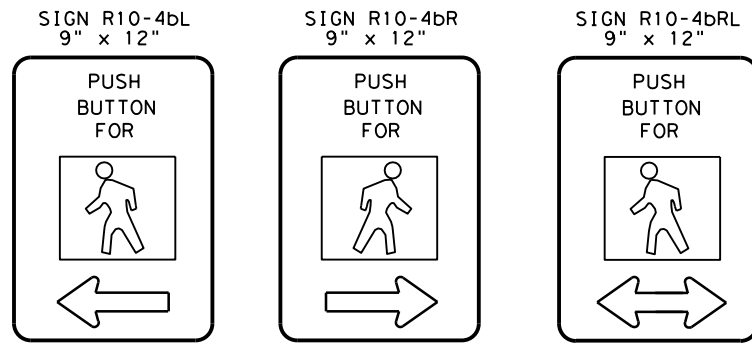


- NOTES:
1. VEHICLE SIGNAL HEADS SHALL BE MOUNTED WITH TYPE 1 CLAMP AND APPROPRIATE TUBING.
 2. ALL POLE MOUNTED VEHICLE HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
 3. THE SIGNAL HEADS SHOWN ARE NOT MEANT TO REFLECT ALL POSSIBLE SIGNAL HEADS, BUT ARE REPRESENTATIVE OF SIGNAL HEADS COMMONLY IN USE. SEE THE TRAFFIC SIGNAL LAYOUT FOR REQUIRED SIGNAL HEADS, AND THE NUMBER AND ORIENTATION OF LOUVERS.

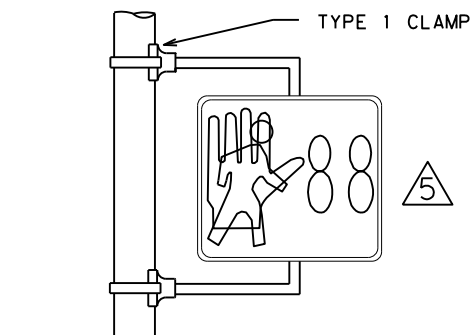
TRAFFIC SIGNAL HEAD DETAILS (DAL)

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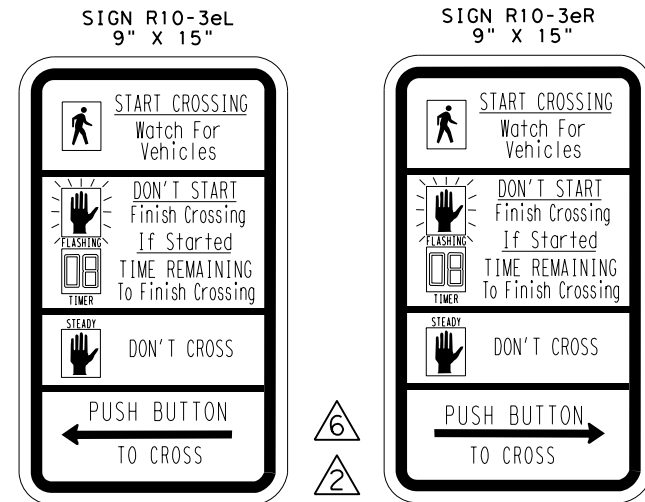
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	99
STATE	STATE DIST.	COUNTY
TEXAS	DALLAS	COL., ETC.
CONT.	SECT.	JOB HIGHWAY NO.
0918	24	267, ETC. VAR



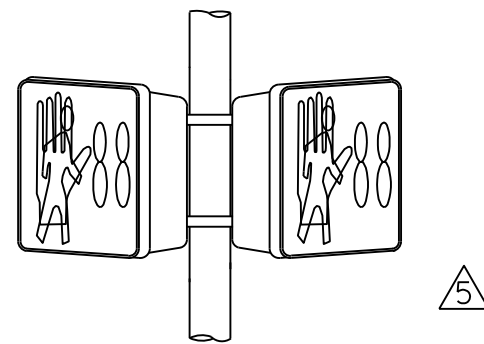
PEDESTRIAN PUSHBUTTON SIGN DETAILS



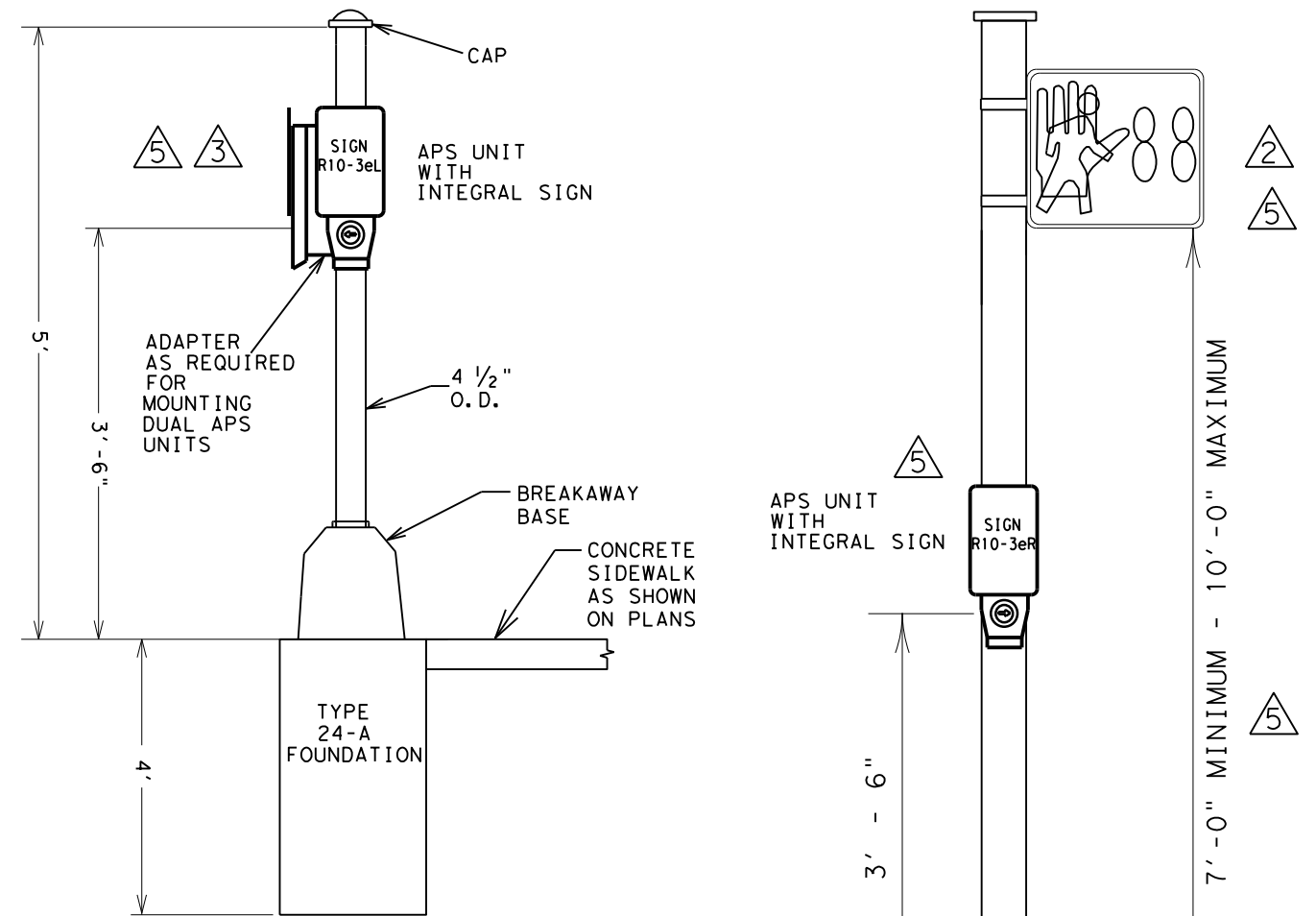
PEDESTRIAN SIGNAL HEAD MOUNTING FOR ONE PEDESTRIAN SIGNAL HEAD 152A



COUNTDOWN PEDESTRIAN PUSHBUTTON SIGN DETAILS



PEDESTRIAN SIGNAL HEAD MOUNTING FOR TWO PEDESTRIAN SIGNAL HEADS 143C

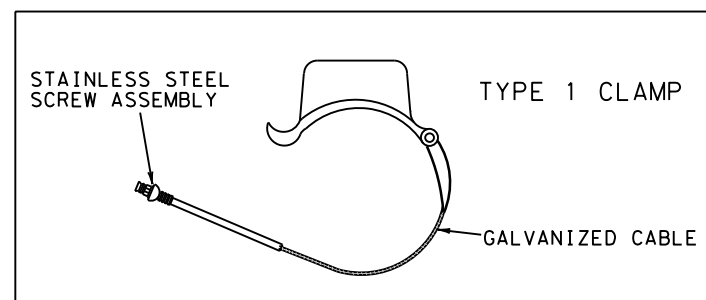


PEDESTRIAN PUSH BUTTON POLE

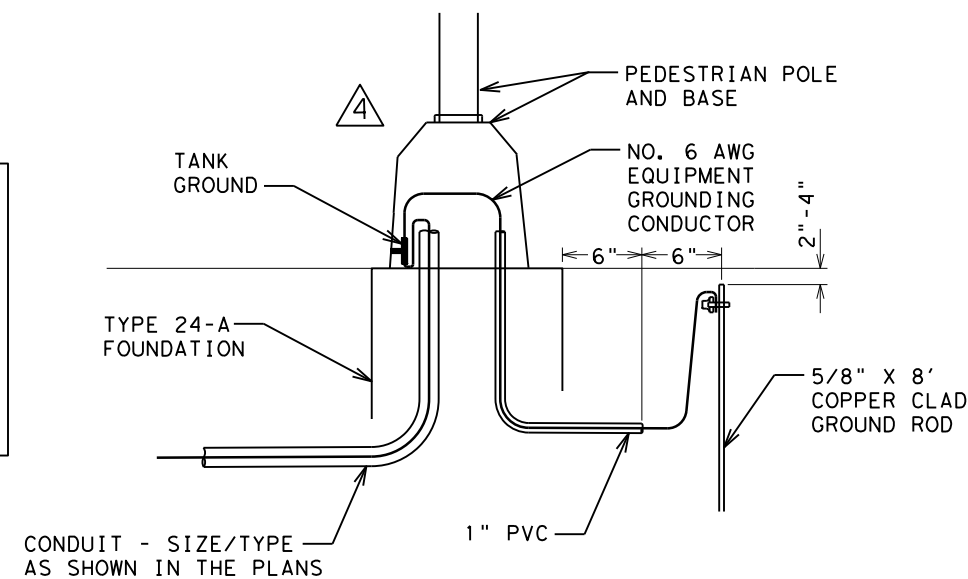
PEDESTAL POLE

NOTE: EITHER TYPE 1 CLAMPS OR CLAM SHELL MOUNTING HARDWARE MAY BE USED AS APPROVED BY THE ENGINEER. FOR CLAM SHELLS, USE ICC P/N 4805 OR McCAIN QUICKMOUNT OR APPROVED EQUAL.

- 1 ALTERNATIVE MOUNTING METHOD revised 12-92
- 2 ALTERNATIVE PEDESTRIAN SIGNAL HEAD AND SIGNING revised 10-08
- 3 PEDESTRIAN PUSH BUTTON POLE revised 01-11
- 4 PEDESTRIAN PUSH BUTTON POLE GROUNDING DETAILS revised 09-15
- 5 APS UNIT ADDED "SYMBOLS ONLY" PEDESTRIAN SIGNAL HEAD REMOVED MOUNTING HARDWARE NOTES REVISED MOUNTING HEIGHT REVISED revised 06-17
- 6 APS SIGN REVISED revised 11-20



- NOTES:
1. ALL PEDESTRIAN SIGNAL HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
 2. ALL WIRING FOR PEDESTRIAN SIGNALS SHALL BE TOTALLY ENCLOSED WITHIN THE SIGNAL MOUNTING HARDWARE.
 3. ALL PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON SIGNS SHALL DISPLAY THE SYMBOLIZED MESSAGES SHOWN ABOVE.



PEDESTRIAN PUSH BUTTON POLE GROUNDING DETAILS

NOTE: THE POLES ON THIS DRAWING ARE SHOWN AS AN EXAMPLE ONLY. POLES OF SIMILAR DESIGN FOR ANY CROSS SECTION WHICH MEET THE SPECIFICATIONS AND REQUIREMENTS SHOWN ON THESE DRAWINGS AND ARE APPROVED BY THE ENGINEER WILL BE DEEMED ACCEPTABLE.

PEDESTRIAN SIGNAL HEAD DETAILS (DAL)

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6	(SEE TITLE SHEET)	100
STATE	STATE DIST.	COUNTY
TEXAS	18	COL., ETC.
CONT.	SECT.	JOB HIGHWAY NO.
0918	24	267, ETC. VAR

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GENERAL NOTES FOR ALL ELECTRICAL WORK

- The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.
- 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.
- Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is 1/2 in. or less in diameter.
- 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.
- 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.
- 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

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

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

- 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.
- 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.
- 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

- 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.
- 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.
- Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.
- 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.
- 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."
- Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.
- 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.
- 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.
- 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.
- 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.
- At all electrical services, install a 6 AWG solid copper grounding electrode conductor.
- 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).
- 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.
- 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.

		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS CONDUITS & NOTES</h2>			
<h3>ED(1) - 14</h3>			
FILE:	ed1-14.dgn	DWG:	CK:
© TxDOT	October 2014	CONT	SECT
REVISIONS		0918 24	267, ETC.
DIST	COUNTY	SHEET NO.	
DAL	COL, ETC.	101	

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS) 11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.
2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.
3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.
4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.
2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.
3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight seal. 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.

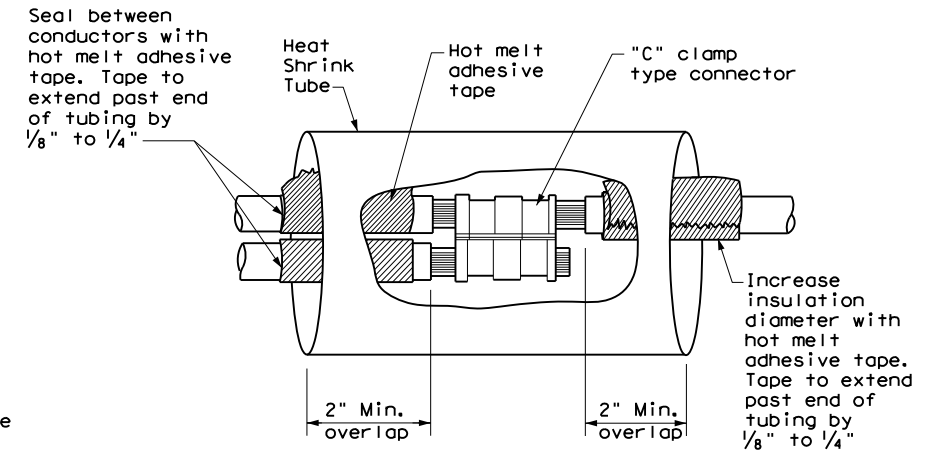
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

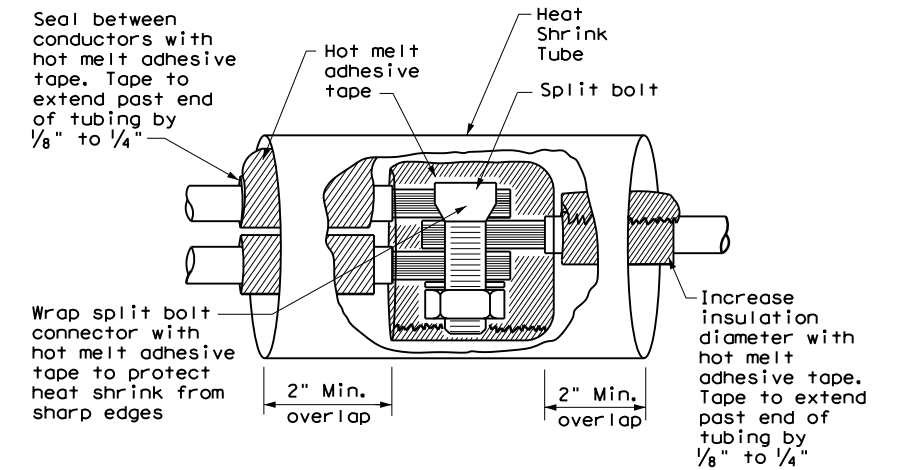
1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in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

B. CONSTRUCTION METHODS

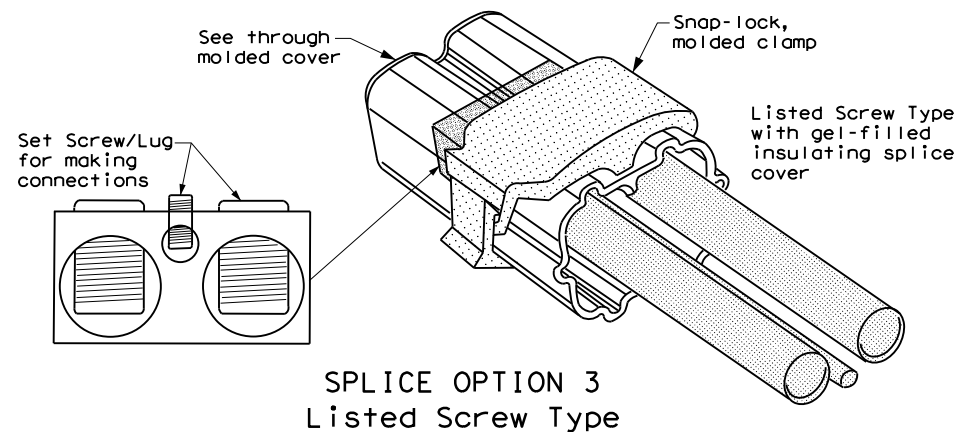
1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil,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



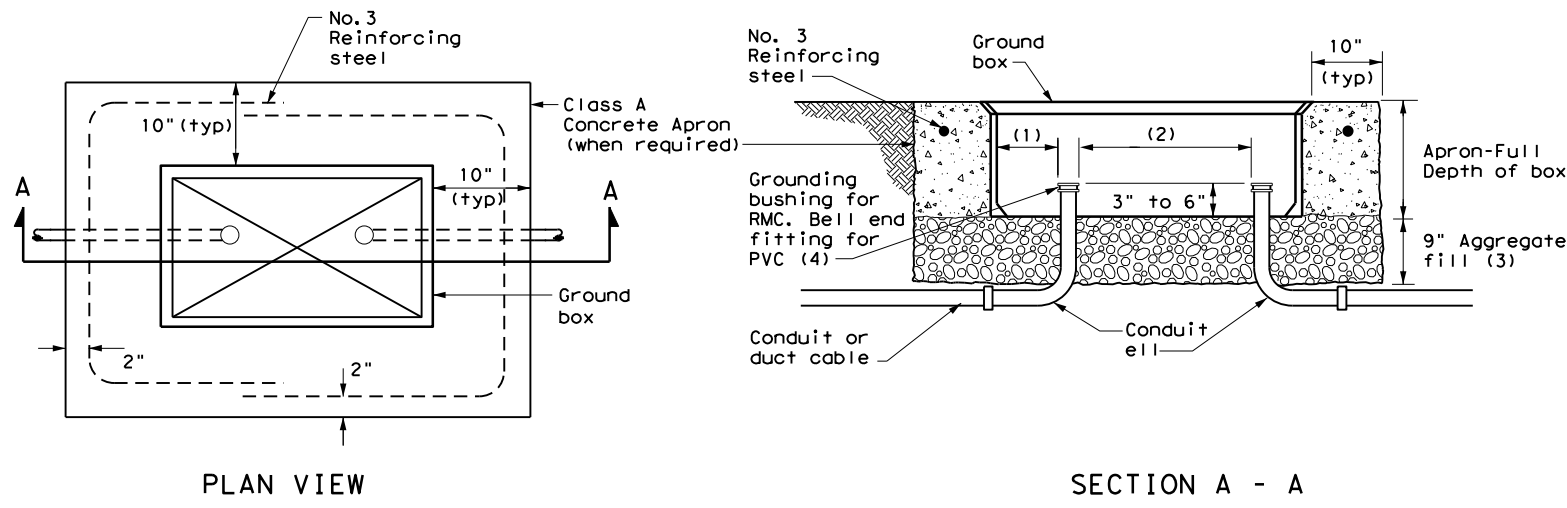
SPLICE OPTION 3
Listed Screw Type

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				Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS CONDUCTORS</h2> <h3>ED(3)-14</h3>					
FILE:	ed3-14.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2014	CONT:	SECT:	JOB:	HIGHWAY
REVISIONS		0918	24	267, ETC.	VAR
DIST:	COUNTY:	SHEET NO.			
DAL	COL, ETC.	102			

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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 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

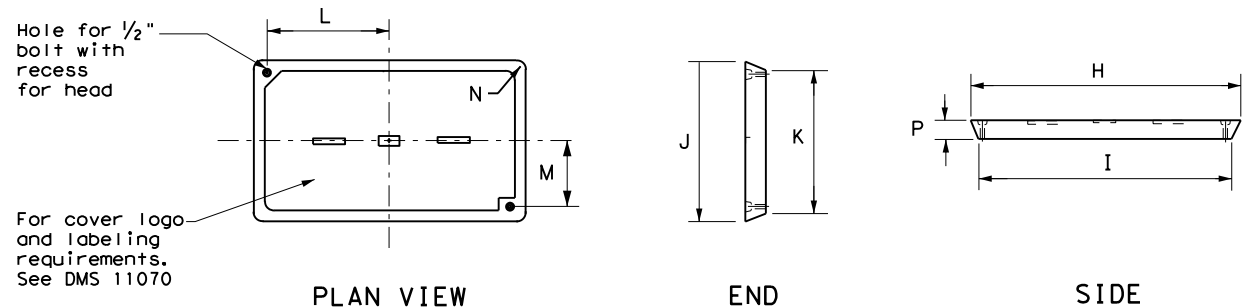
1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the 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.

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



GROUND BOX COVER

				Traffic Operations Division Standard	
ELECTRICAL DETAILS GROUND BOXES					
ED(4) - 14					
FILE:	ed4-14.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS		0918	24	267, ETC.	VAR
DIST	COUNTY	SHEET NO.			
DAL	COL, ETC.	103			

ELECTRICAL SERVICES NOTES

- 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.
- 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.
- Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.
- 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.
- 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.
- 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.
- When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.
- 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.
- 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.
- Provide rigid metal conduit (RMC) for all conduits on service, except for the 1/2 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.
- 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.
- Ensure all mounting hardware and installation details of services conform to utility company specifications.
- 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 1/2 in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.
- 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 1/2 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.
- 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

- Provide threaded hub for all conduit entries into the top of enclosure.
- 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 photoceII or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.
- 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.
- 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

- Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.
- 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

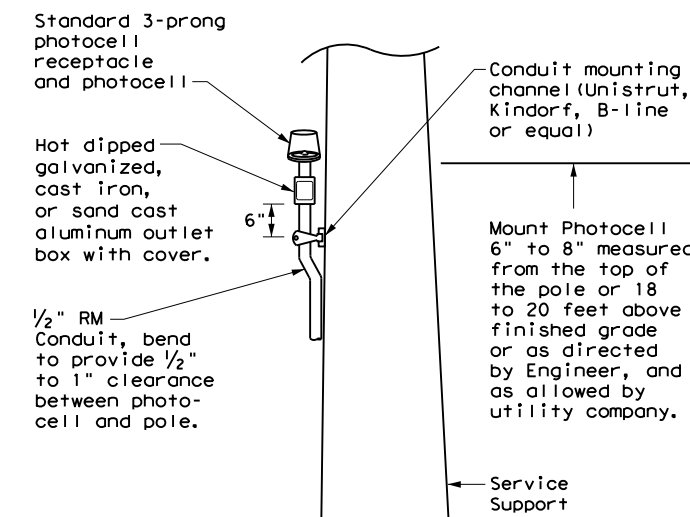
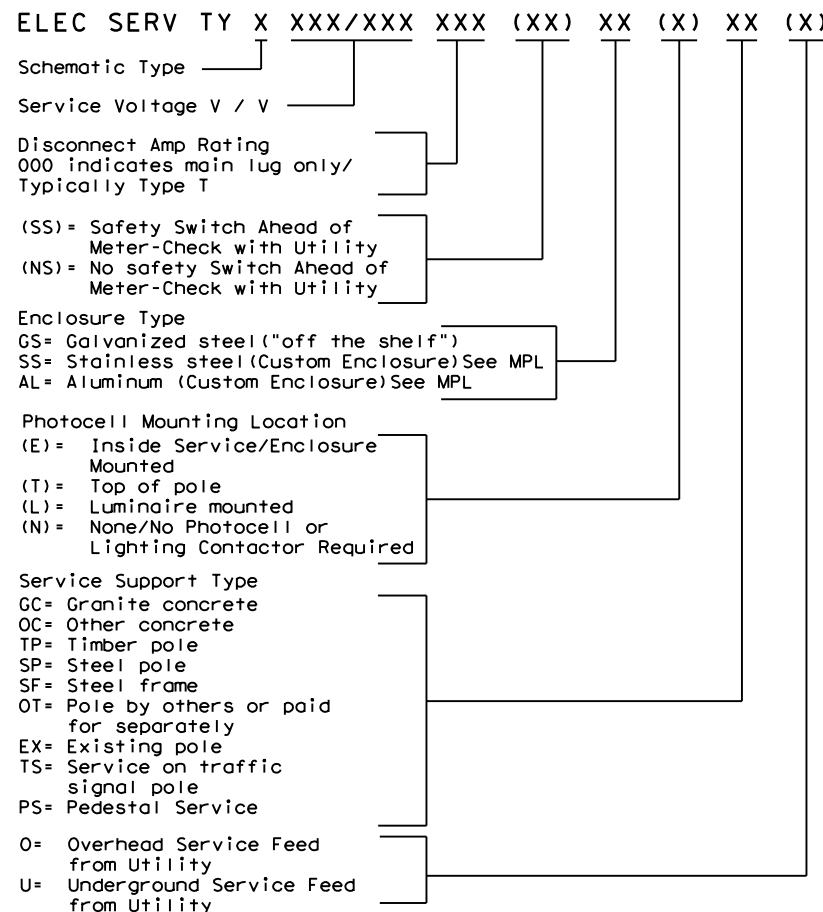
- Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA												
Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit *xSize	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 1/4"	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 1/4"	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



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

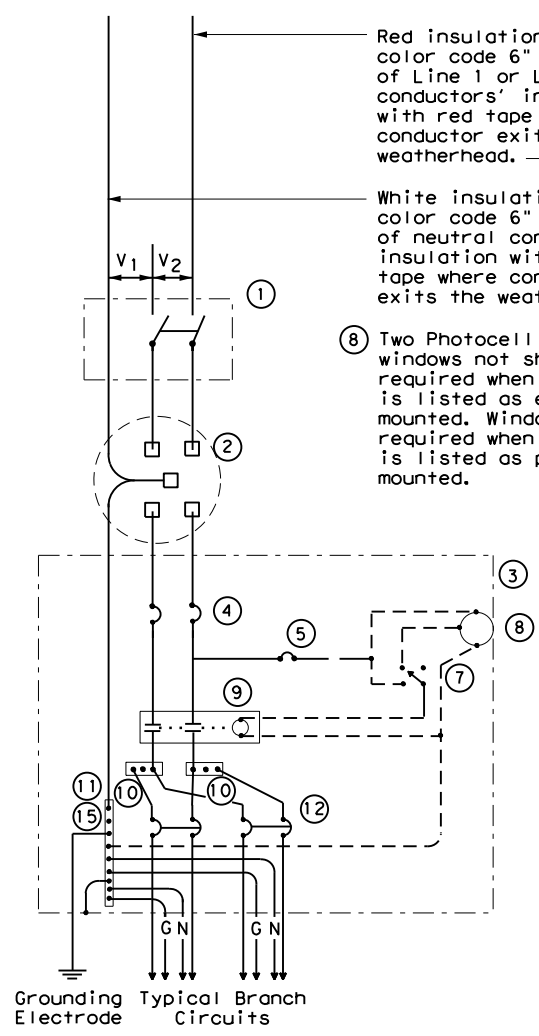
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<h3>ED(5) - 14</h3>			
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© TxDOT October 2014	CONT	SECT	JOB
REVISIONS	0918 24	267, ETC.	
DIST	COUNTY		SHEET NO.
DAL	COL, ETC.		104

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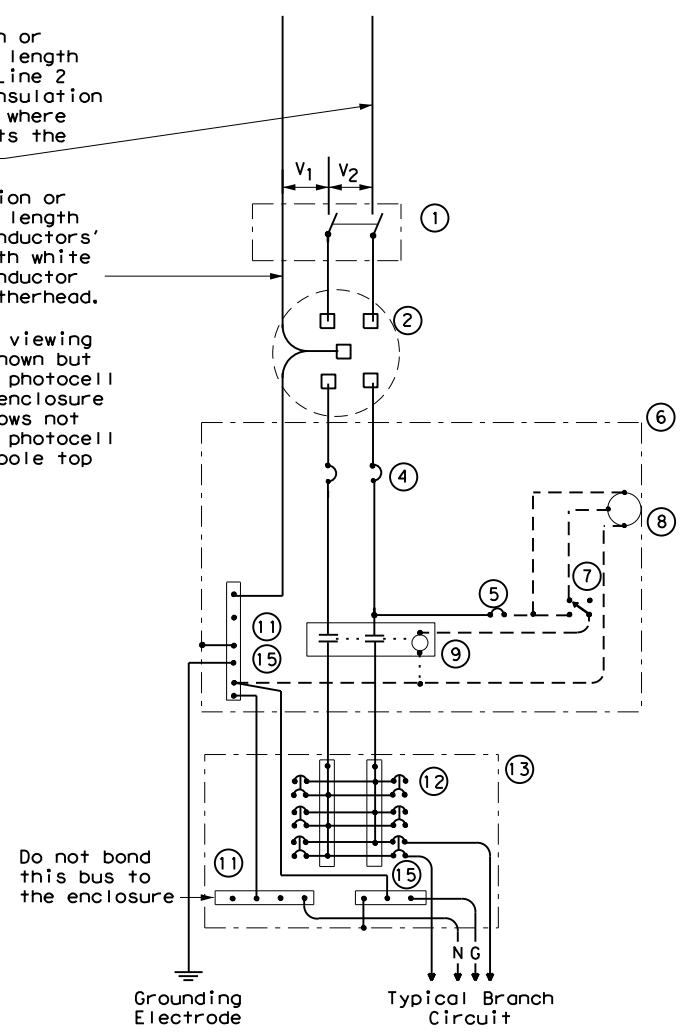
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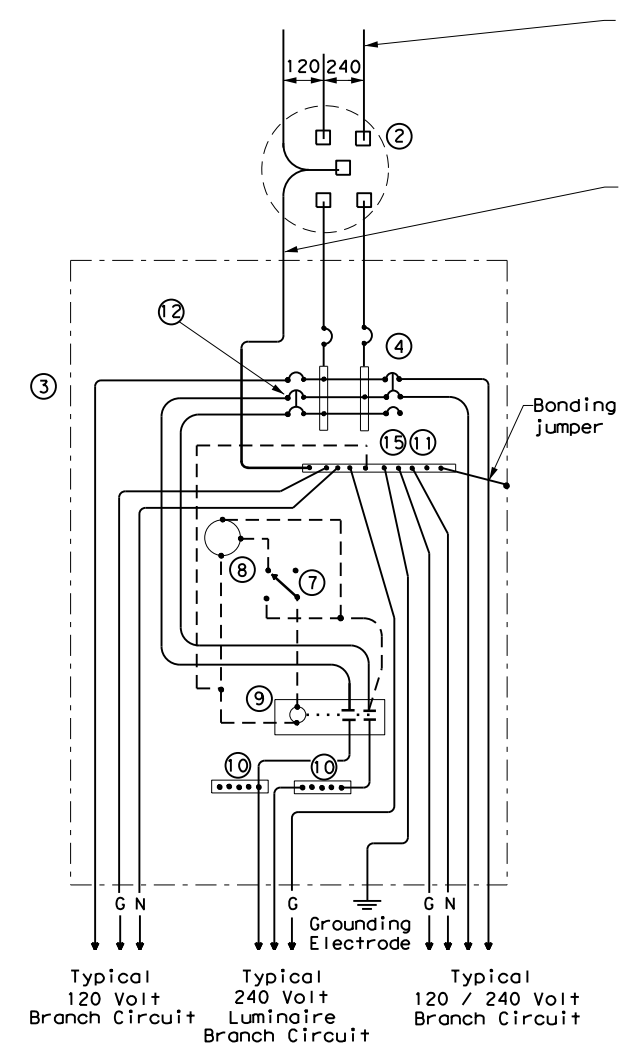
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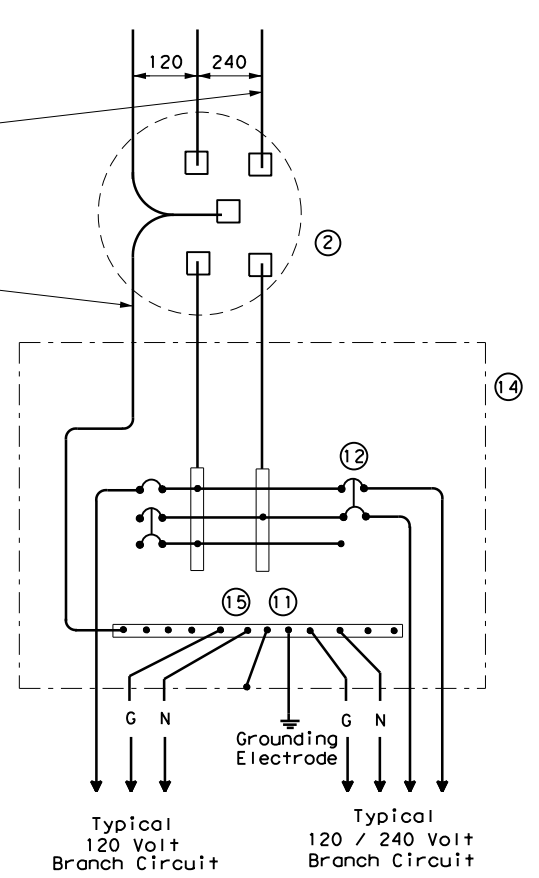
SCHEMATIC TYPE A
THREE WIRE



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

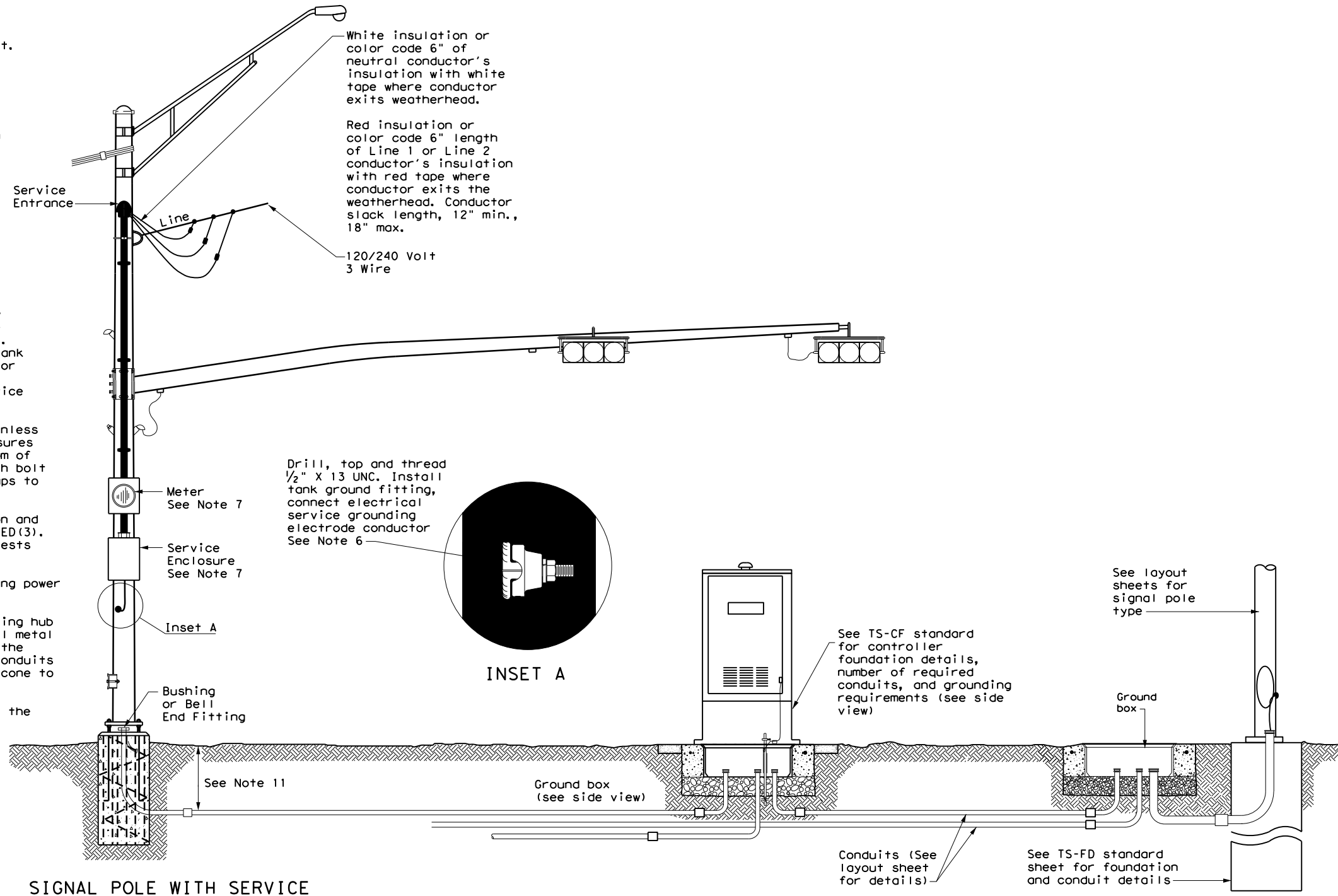
				Traffic Operations Division Standard	
ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES					
ED(6) - 14					
FILE:	ed6-14.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2014	CONT:	0918	SECT:	24
REVISIONS		JOB		HIGHWAY	
		267, ETC.		VAR	
DIST:	DAL	COUNTY:	COL, ETC.	SHEET NO.:	105

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TRAFFIC SIGNAL NOTES

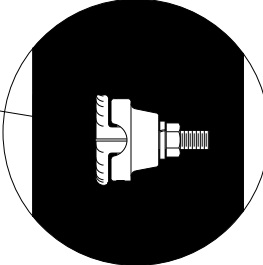
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TxDOT standard TS-FD for further details.
6. Drill and tap signal poles for 1/2 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 3/4 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".



White insulation or color code 6" of neutral conductor's insulation with white tape where conductor exits weatherhead.

Red insulation or color code 6" length of Line 1 or Line 2 conductor's insulation with red tape where conductor exits the weatherhead. Conductor slack length, 12" min., 18" max.

Drill, top and thread 1/2" X 13 UNC. Install tank ground fitting, connect electrical service grounding electrode conductor See Note 6



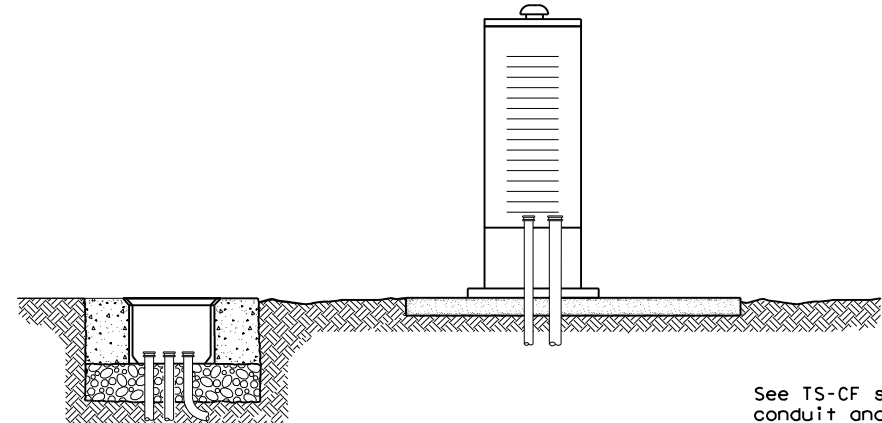
INSET A

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.

**ELECTRICAL DETAILS
 TYPICAL TRAFFIC SIGNAL
 SYSTEM DETAILS
 ED(8) - 14**

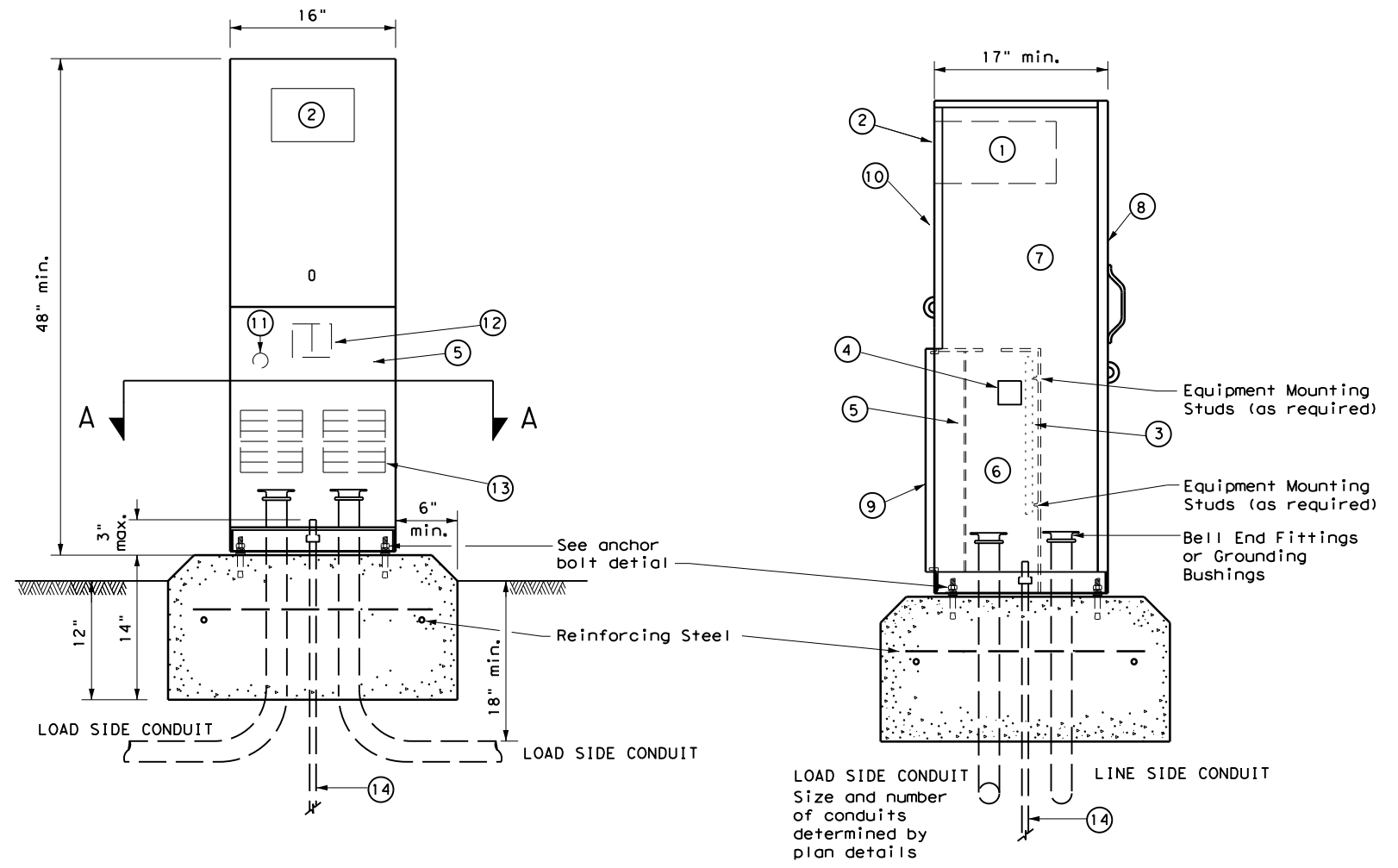
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© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918 24	267, ETC.	VAR	
DIST	COUNTY	SHEET NO.		
DAL	COL, ETC.	106		

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PEDESTAL SERVICE NOTES

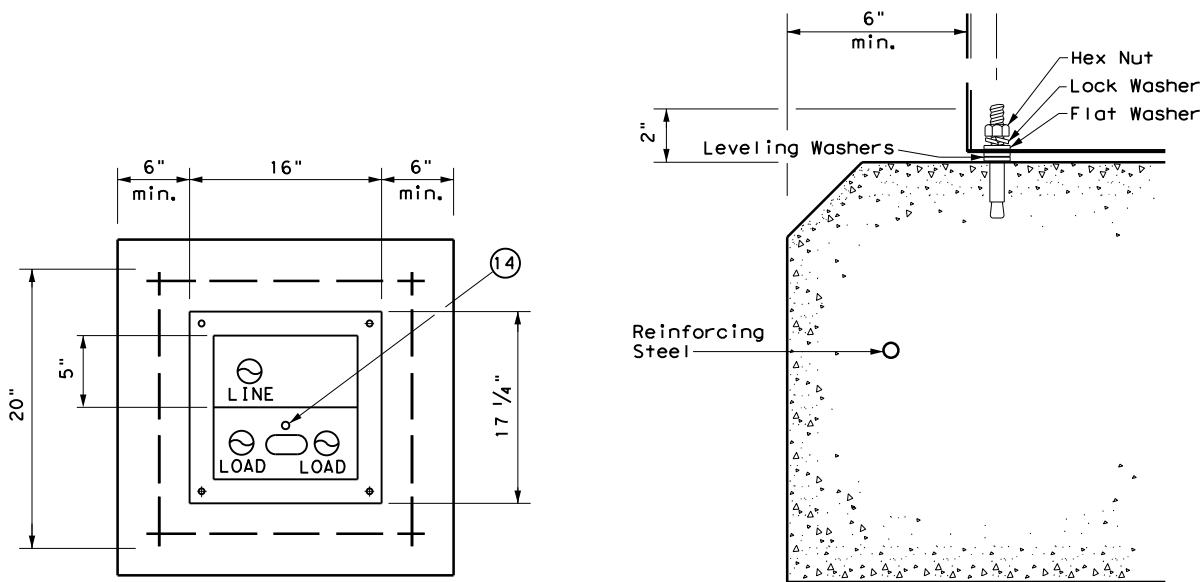
1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS) 11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services." Provide pedestal electrical services as listed on the Material Producers List (MPL) on the 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 1/2 in. X 2 1/16 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 1/2 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 1/8 in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of 1/8 in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within 1/4 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

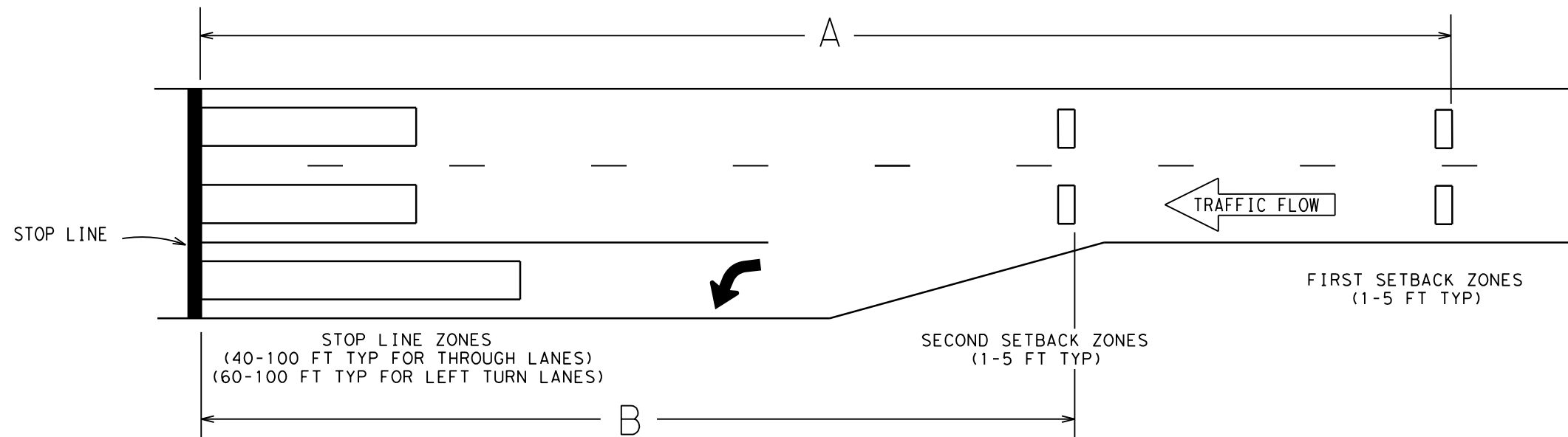
ANCHOR BOLT DETAIL

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'

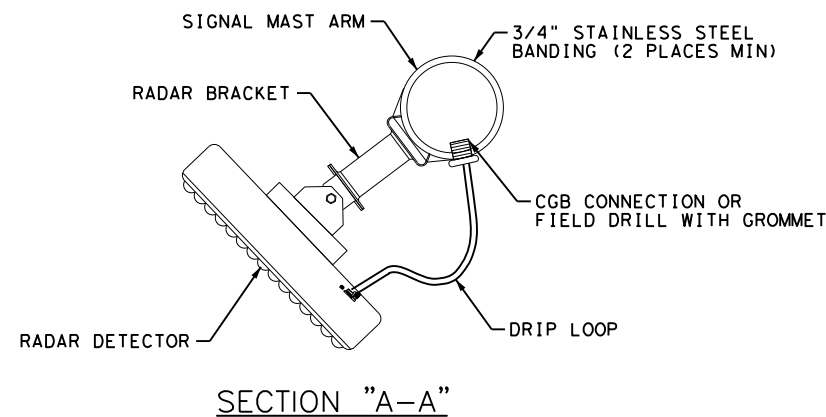
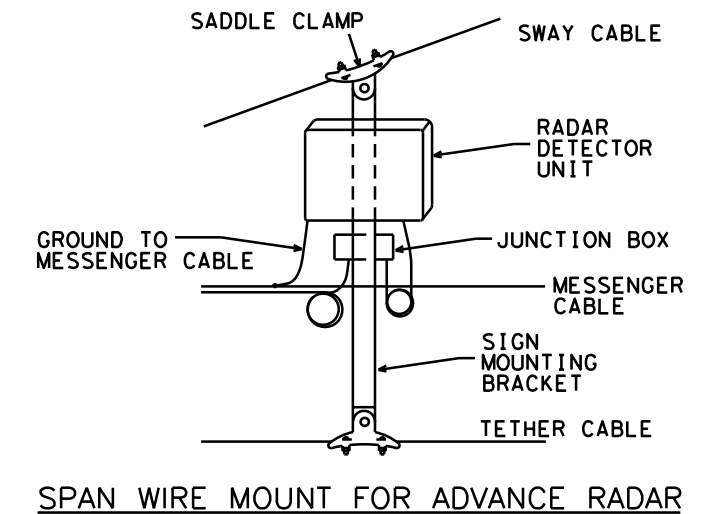
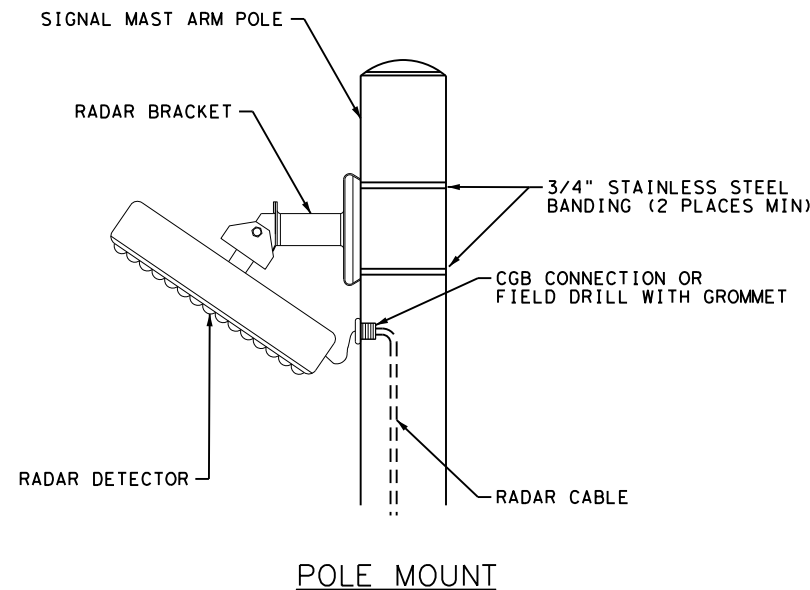
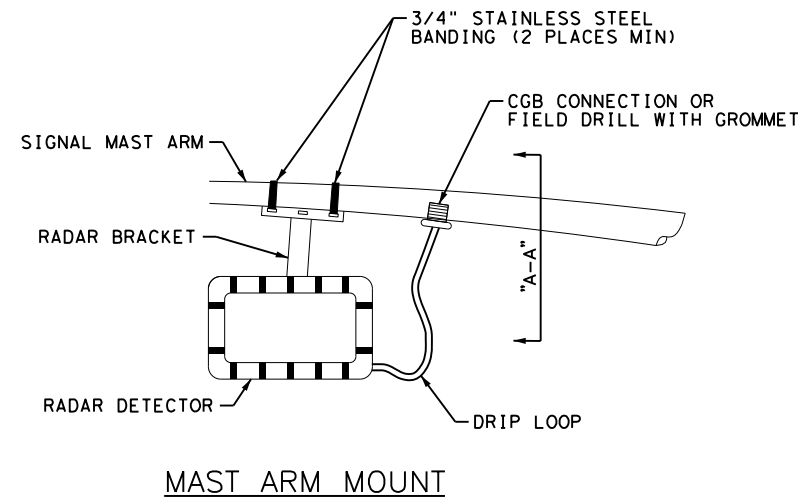
				Traffic Operations Division Standard	
ELECTRICAL DETAILS ELECTRICAL SERVICE SUPPORT PEDESTAL SERVICE TYPE PS					
ED(9) - 14					
FILE:	ed9-14.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2014	CONT:	SECT:	JOB:	HIGHWAY:
REVISIONS		0918	24	267, ETC.	VAR
DIST:	COUNTY:	SHEET NO.			
DAL	COL, ETC.	107			

RADAR DETECTION ZONE LOCATIONS



APPROACH SPEED LIMIT (MPH)	DISTANCE A (FT)	DISTANCE B (FT)	MINIMUM RANGE OF DETECTION (LF)
45	360	245	400
50	405	300	440
55	445	325	490
60	485	355	530
65	525	380	575
70	565	410	620

RADAR DETECTION INSTALLATION DETAILS



NOTES:

1. THE RADAR SENSOR MOUNTING BRACKET MUST BE ADJUSTABLE TO TILT UP, DOWN, LEFT, RIGHT, AND TO ROTATE.
2. THE RADAR DETECTOR UNITS SHOWN ARE NOT INTENDED TO REPRESENT ANY SPECIFIC BRAND OR PRODUCT, AND ALTERNATE MOUNTING METHODS MAY BE SUBMITTED FOR APPROVAL.

DALLAS DISTRICT STANDARD

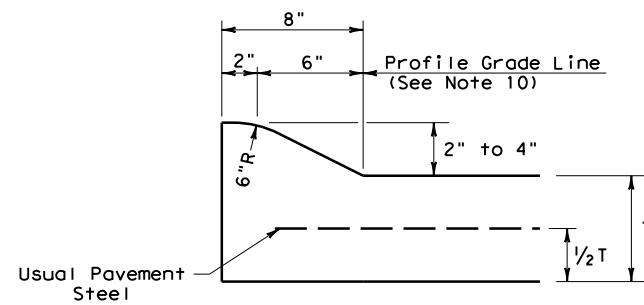


RADAR VEHICLE DETECTION SYSTEM RVDS-18 (DAL)

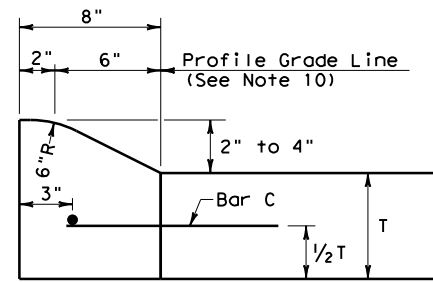
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	6	(SEE TITLE SHEET)	VAR
	STATE	DISTRICT	COUNTY
	TEXAS	DAL	COL, ETC.
	CONTROL	SECTION	JOB
	0918	24	267, ETC.

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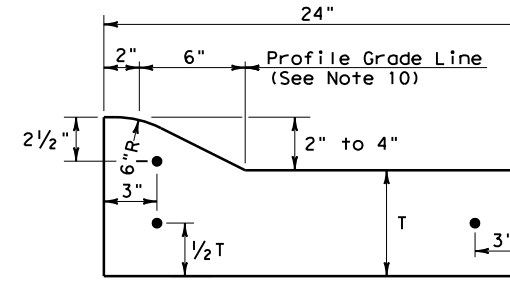
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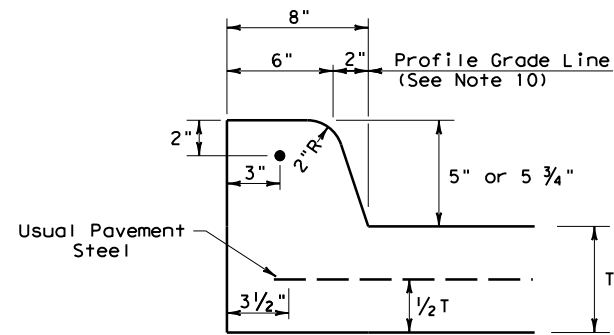
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



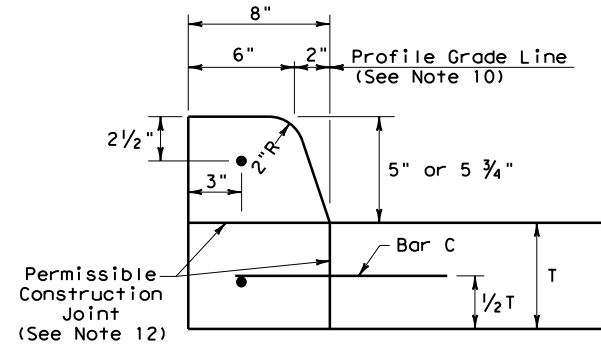
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2" - 4" HEIGHT



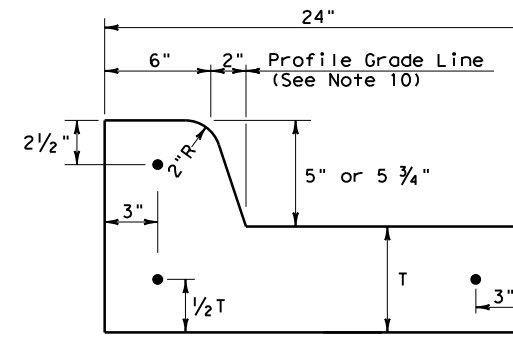
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



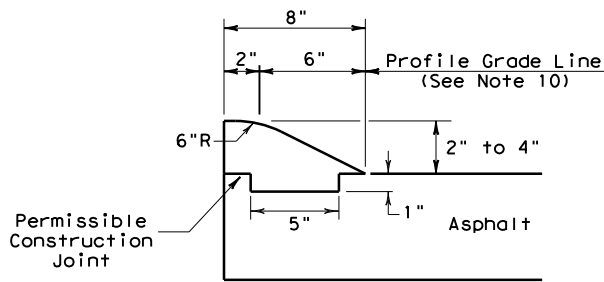
TYPE II CURB (MONOLITHIC)
5" - 5 3/4" HEIGHT



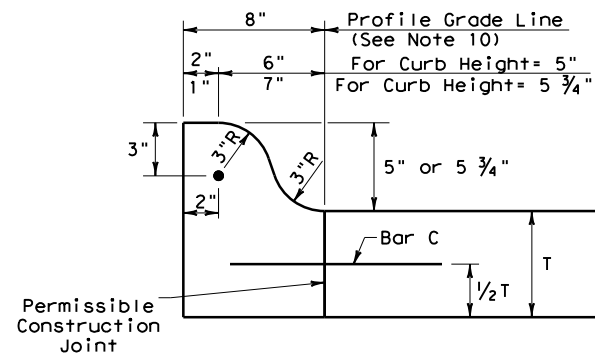
TYPE II CURB
5" - 5 3/4" HEIGHT



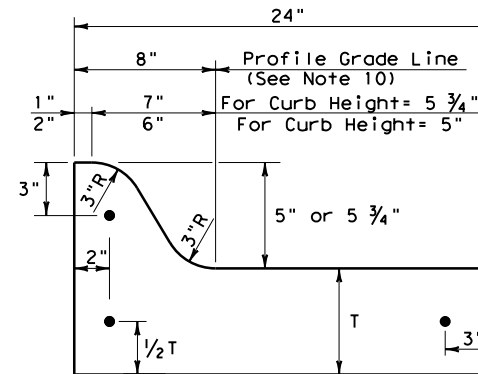
TYPE II CURB AND GUTTER
5" - 5 3/4" HEIGHT



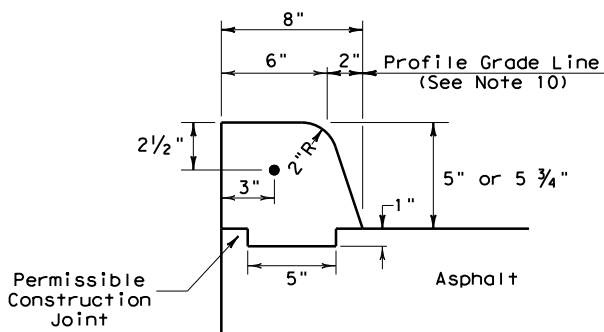
TYPE III CURB (KEYED)
2" - 4" HEIGHT



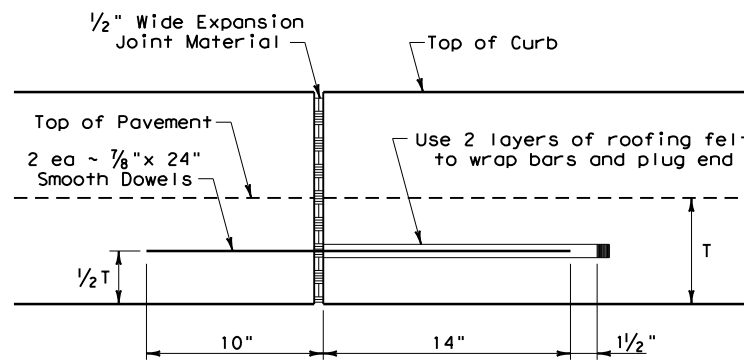
TYPE IIa CURB
5" - 5 3/4" HEIGHT



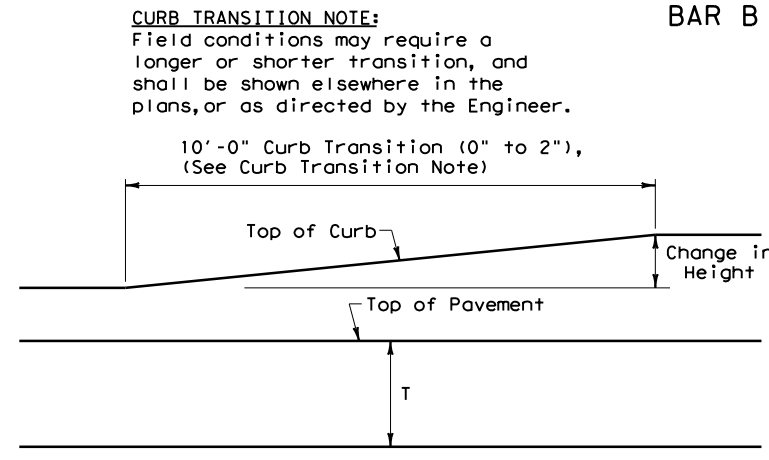
TYPE IIa CURB AND GUTTER
5" - 5 3/4" HEIGHT



TYPE IV CURB (KEYED)
5" - 5 3/4" HEIGHT



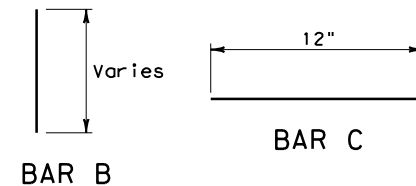
EXPANSION JOINT DETAIL



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

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



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

				Design Division Standard
<h2>CONCRETE CURB AND CURB AND GUTTER</h2> <h3>CCCG-21</h3>				
FILE: cccg21.dgn	DN: TxDOT	CK: AN	DW: SS	CK: KM
© TxDOT: FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918	24	267, ETC.	VAR
DIST	COUNTY	SHEET NO.		
DAL	COL, ETC.	109		

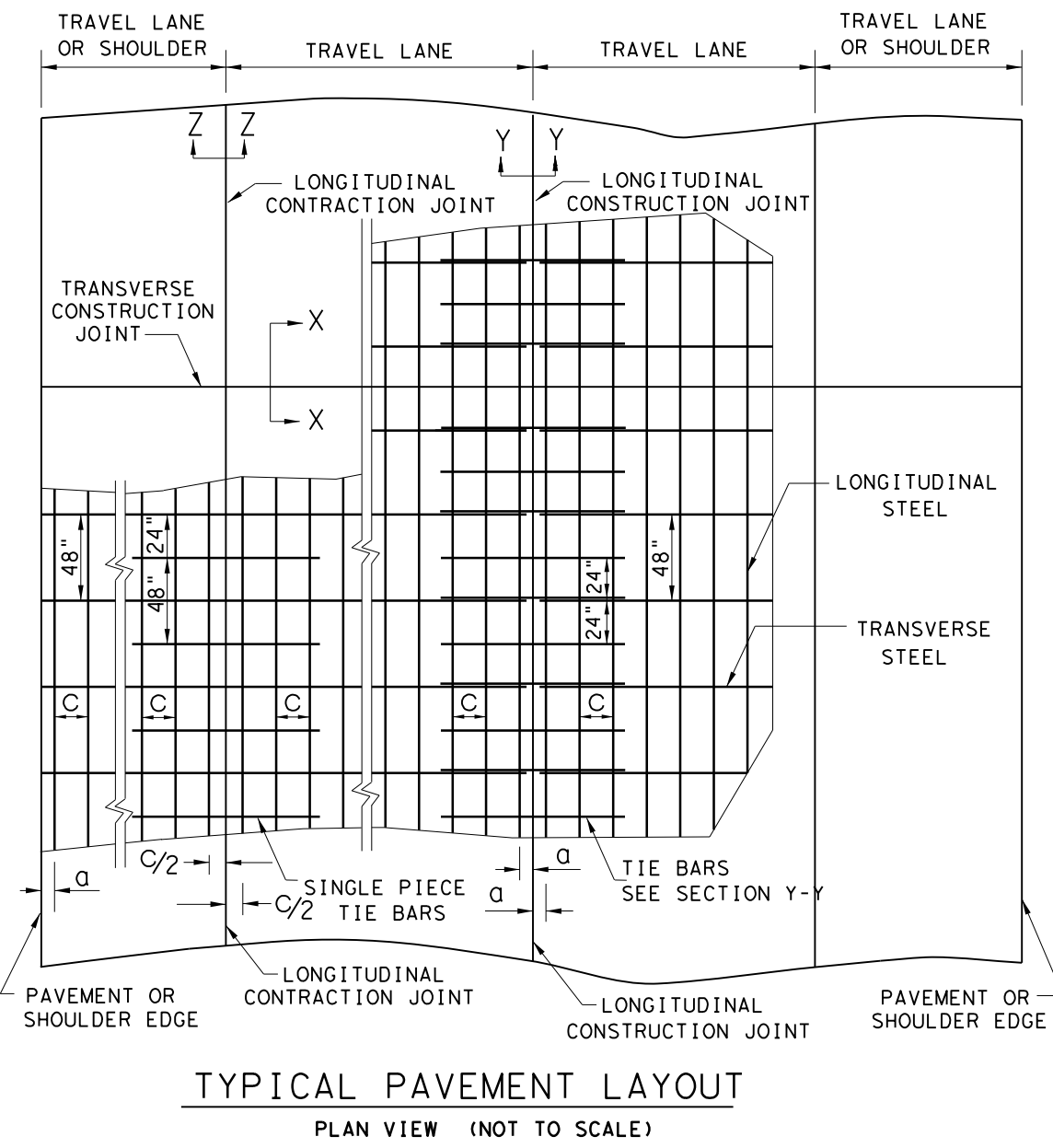
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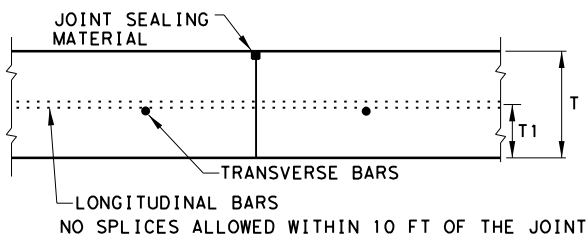
SLAB THICKNESS AND BAR SIZE		LONGITUDINAL STEEL BARS	FIRST SPACING AT EDGE OR JOINT	LONG. STEEL VERTICAL POSITION FROM BOTTOM OF PAVEMENT
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING ϕ (IN.)	T1 (IN.)
7.0	#5	6.5	3 TO 4	3.5
7.5	#5	6.0	3 TO 4	3.75
8.0	#6	9.0	3 TO 4	4.0
8.5	#6	8.5	3 TO 4	4.25
9.0	#6	8.0	3 TO 4	4.5
9.5	#6	7.5	3 TO 4	4.75
10.0	#6	7.0	3 TO 4	5.0
10.5	#6	6.75	3 TO 4	5.5
11.0	#6	6.5	3 TO 4	6.0
11.5	#6	6.25	3 TO 4	6.5
12.0	#6	6.0	3 TO 4	7.0
12.5	#6	5.75	3 TO 4	7.5
13.0	#6	5.5	3 TO 4	8.0

SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONTRACTION 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

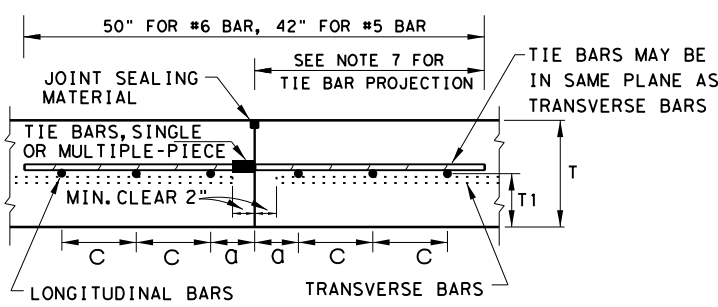
*CONTRACTOR MAY USE #6 REINFORCING STEEL INSTEAD OF #5 REINFORCING STEEL OR COMBINATION OF EACH SIZE



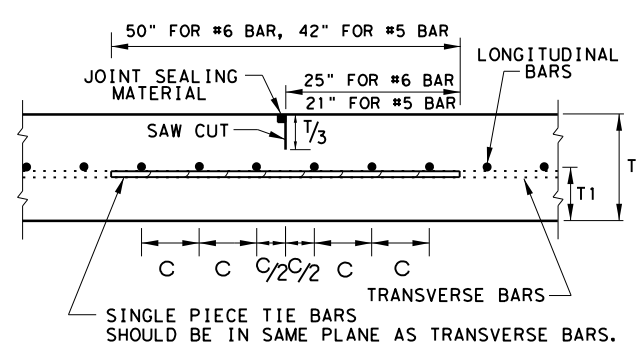
- GENERAL NOTES**
1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. FOR PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT, ADDITIONAL DETAIL MAY BE SHOWN ELSEWHERE IN THE PLANS.
 2. USE COARSE AGGREGATES WITH A RATED COEFFICIENT OF THERMAL EXPANSION (COTE) OF NOT MORE THAN 5.5×10^{-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. ADJUST REINFORCING STEEL VERTICALLY USING SHIMS OR OTHER METHODS, AS APPROVED, TO MEET VERTICAL TOLERANCES PRIOR TO CONCRETE PLACEMENT.
 6. 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.
 7. THE MINIMUM PROJECTION OF TIE BARS INTO THE ADJACENT PLACEMENT IS 22.5 IN. FOR #6 BARS AND 18.5 IN. FOR #5 BARS.
 8. SEE STANDARD SHEET "CONCRETE CURB AND CURB AND GUTTER," FOR DETAILS WHEN TYING CONCRETE CURB OR CURB GUTTER AT A LONGITUDINAL JOINT.
 9. 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.
 10. 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.
 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

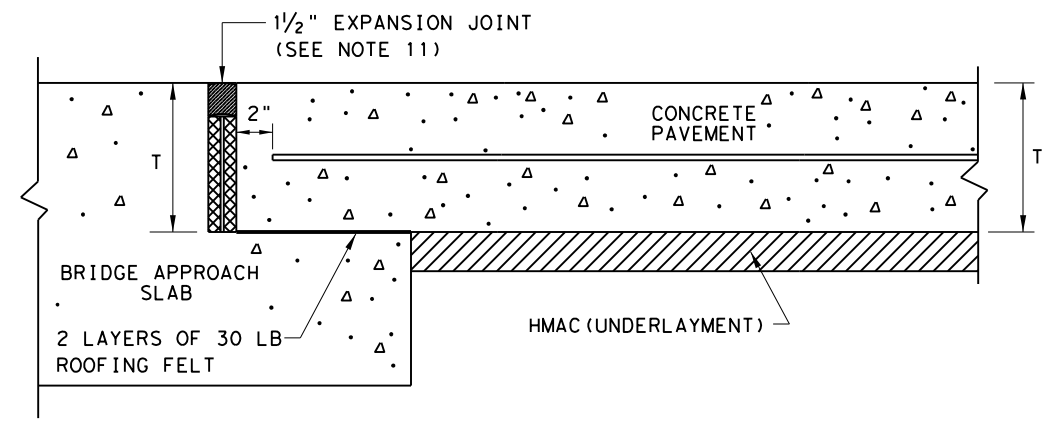


LONGITUDINAL CONTRACTION JOINT
SECTION Z - Z

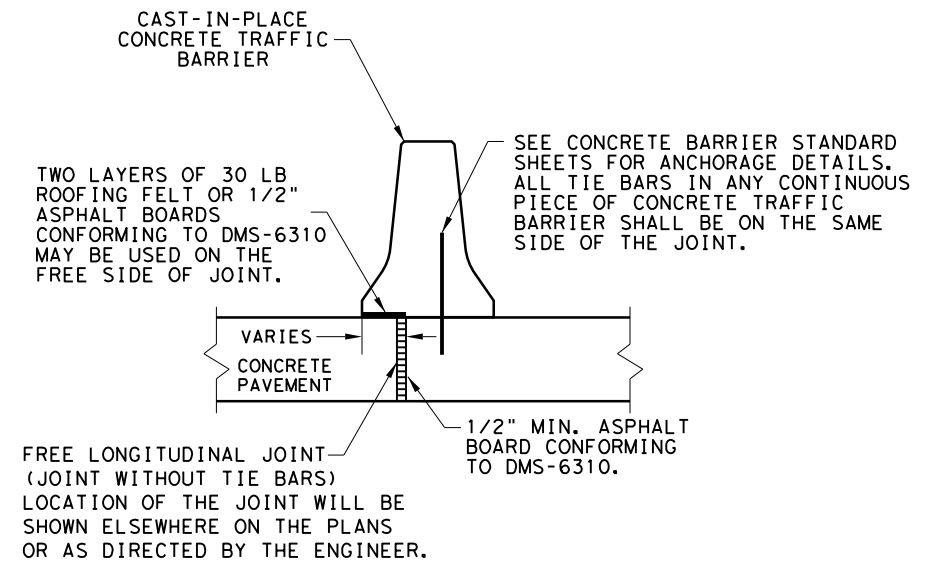
		Design Division Standard	
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT ONE LAYER STEEL BAR PLACEMENT T - 7 TO 13 INCHES CRCP (1) - 23			
FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES
© TxDOT: APRIL 2023	CONT	SECT	JOB
APRIL 2023	0918	24	267, ETC.
REVISOR: LONG. STEEL VERTICAL LOCATION	DIST	COUNTY	SHEET NO.
REVISOR: TIE BAR AT TRANSVERSE	DAL	COL, ETC.	110

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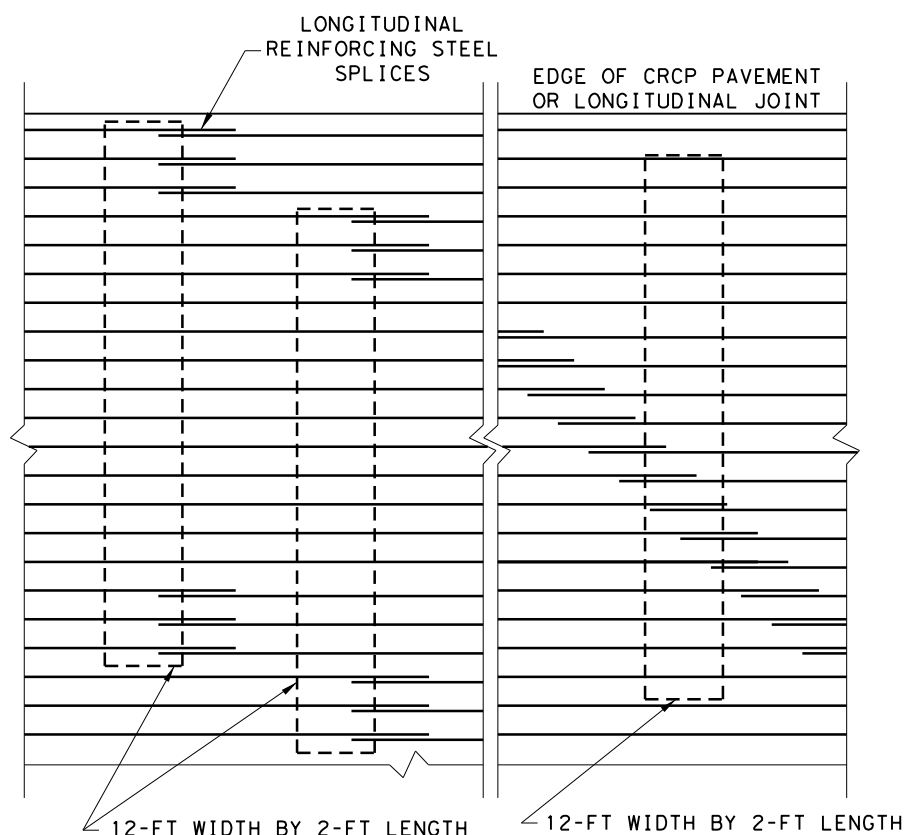
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**TRANSVERSE EXPANSION JOINT DETAIL
 AT BRIDGE APPROACH**

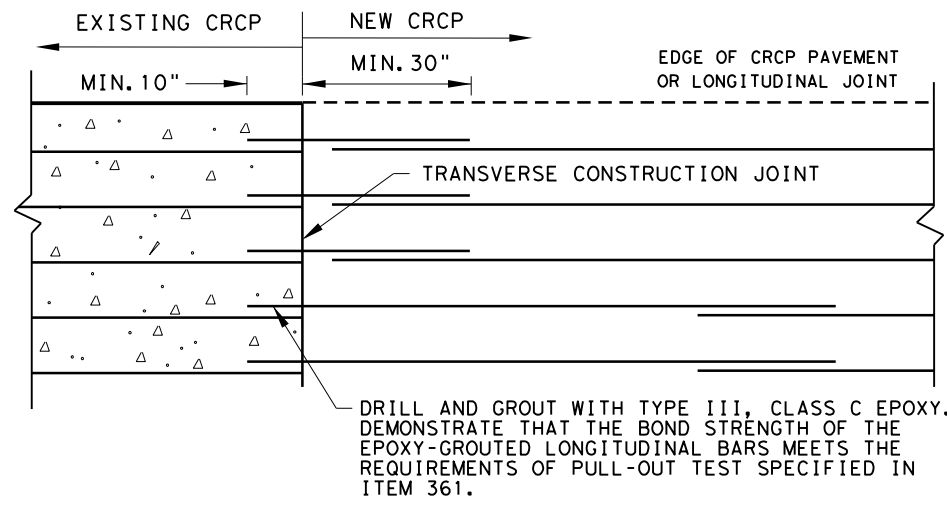


CENTERLINE FREE LONGITUDINAL JOINT DETAIL

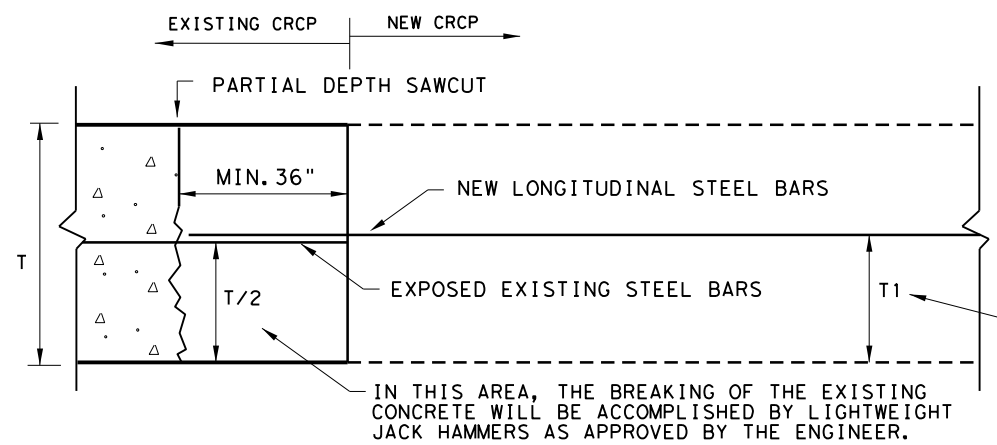


STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT. ANY OTHER LAP CONFIGURATION MEETING THIS REQUIREMENT WILL BE ALLOWED.

**EXAMPLES OF LAP CONFIGURATION
 PLAN VIEW (NOT TO SCALE)**

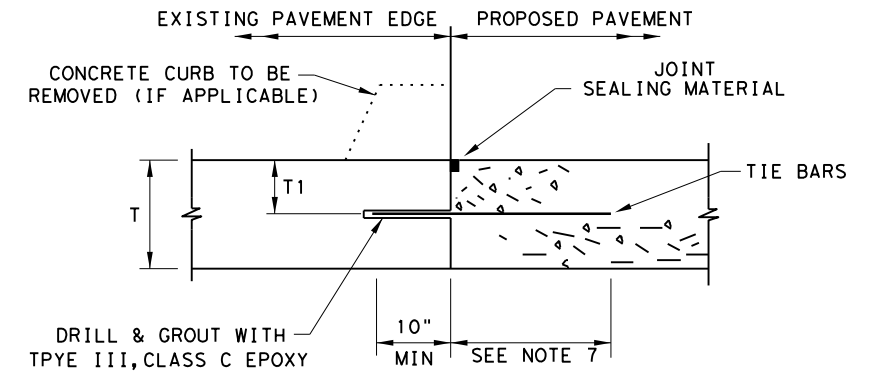


**OPTION A: DRILL AND EPOXY
 PLAN VIEW (NOT TO SCALE)**



OPTION B: BREAKBACK AND LAP

**TRANSVERSE TIE JOINT DETAIL
 NEW CRCP TO EXISTING CRCP**



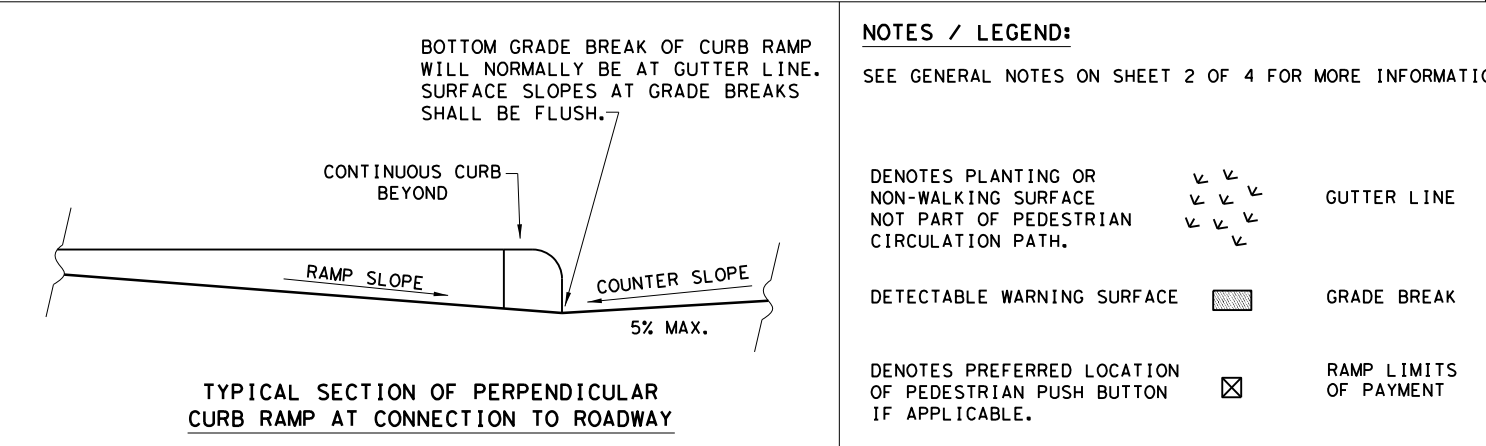
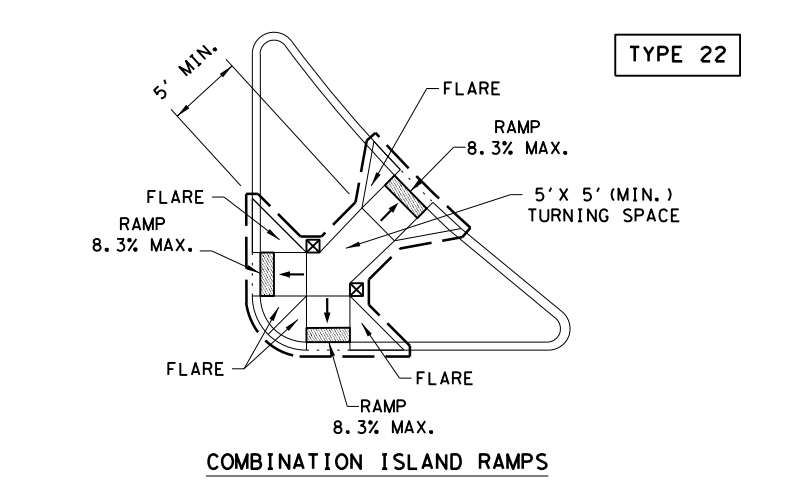
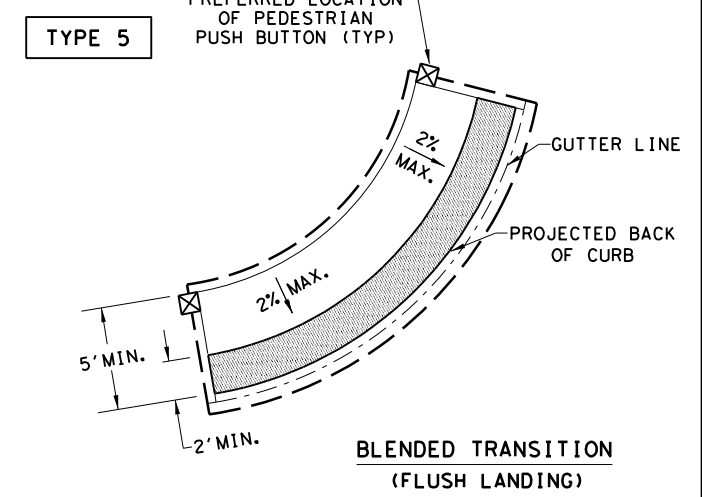
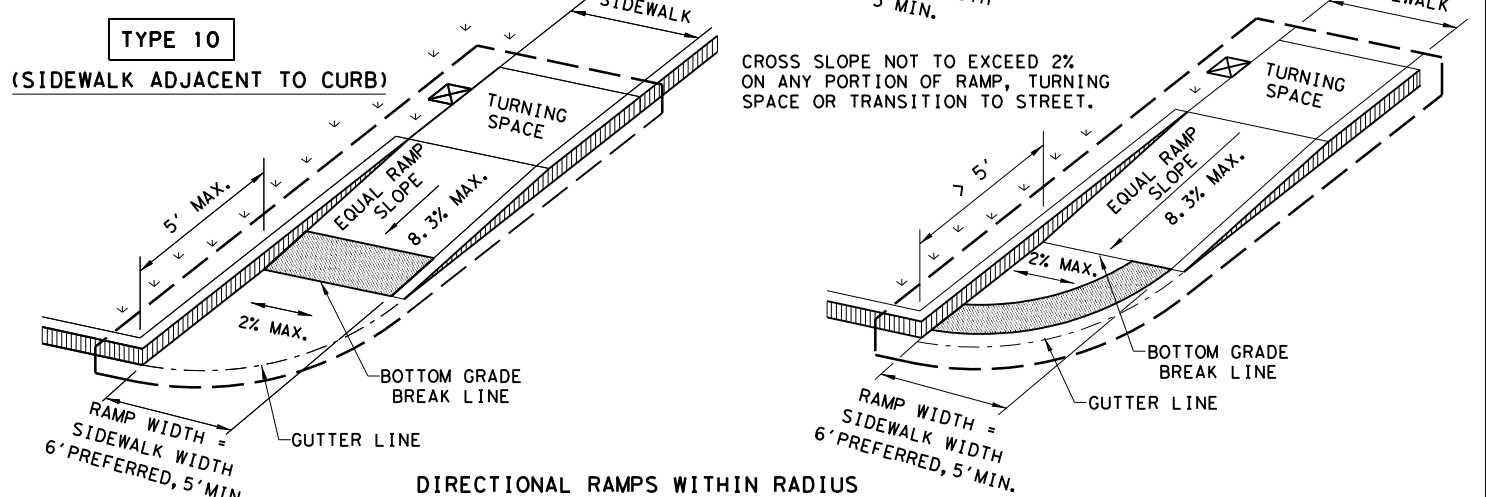
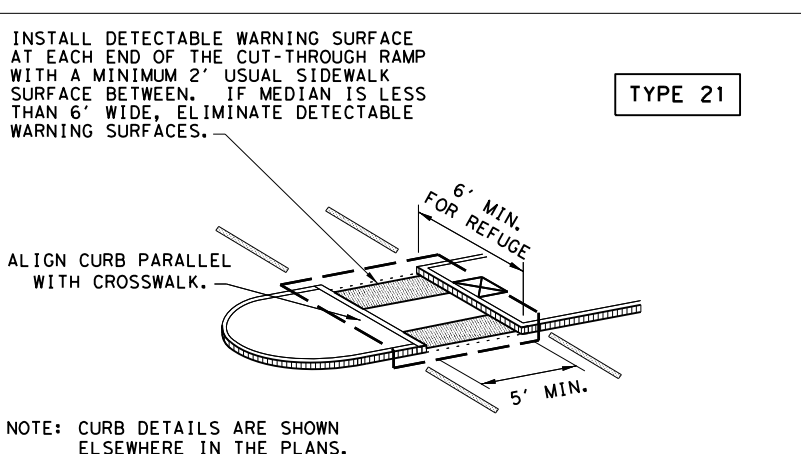
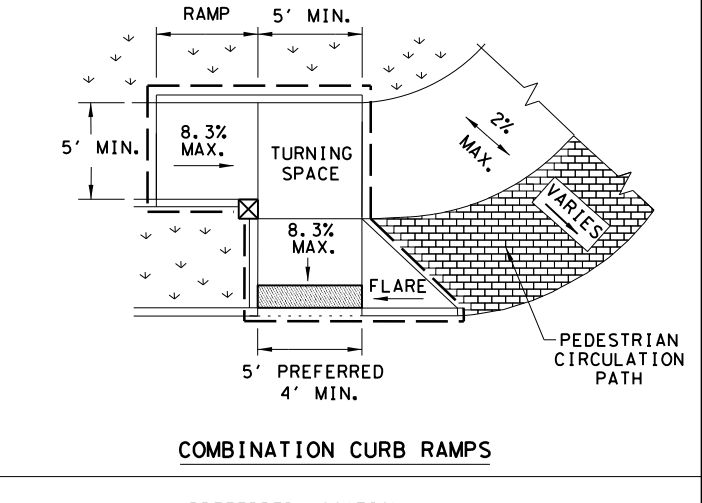
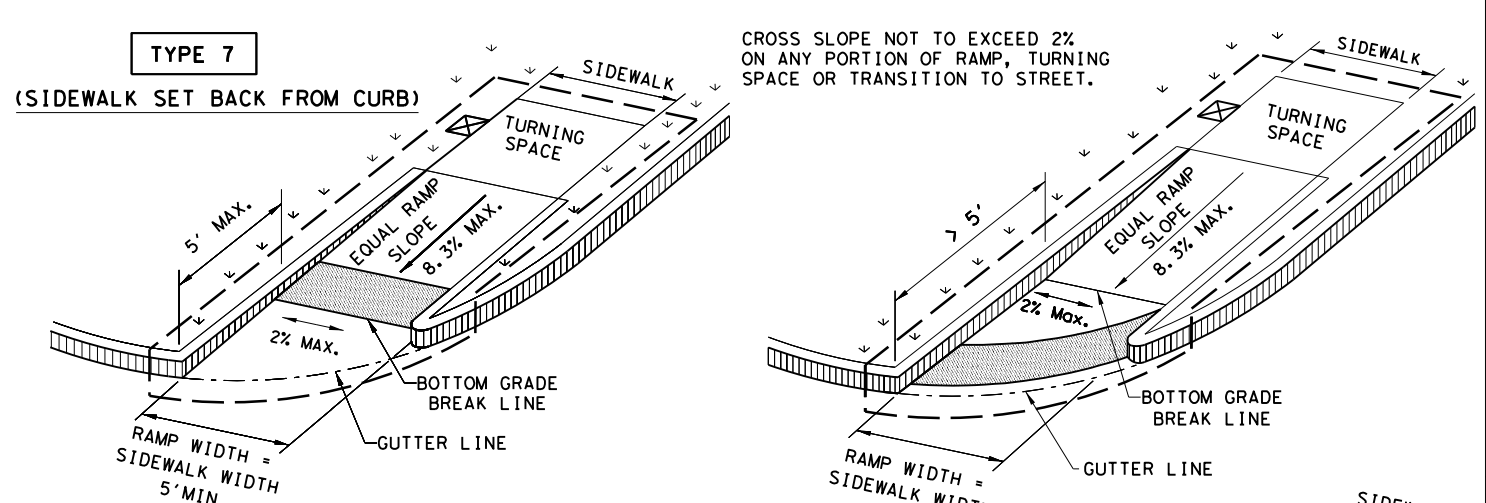
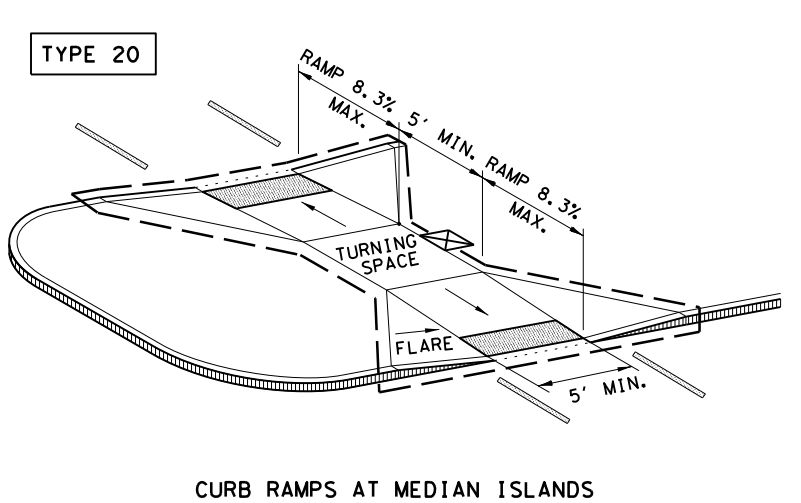
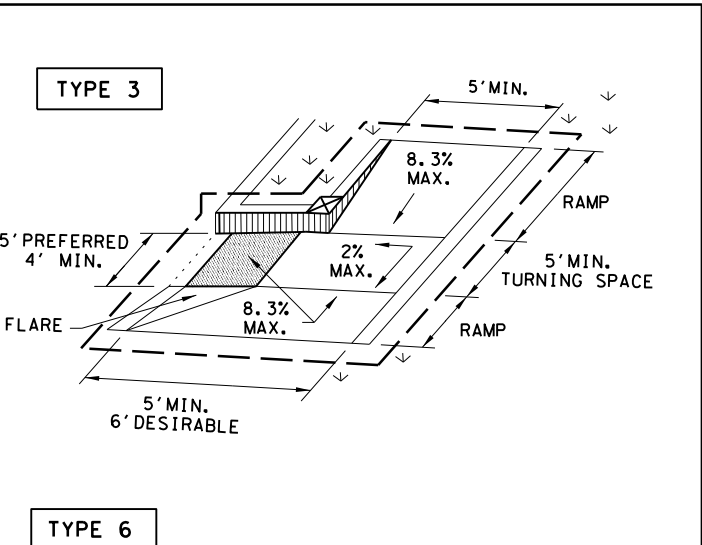
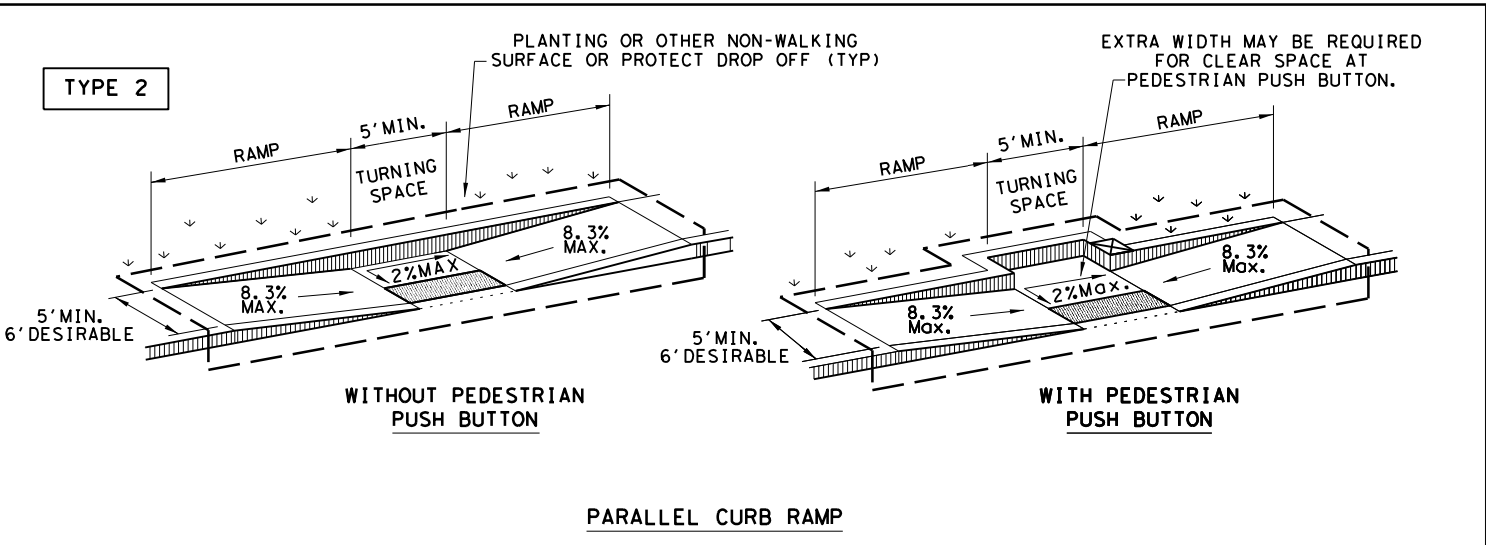
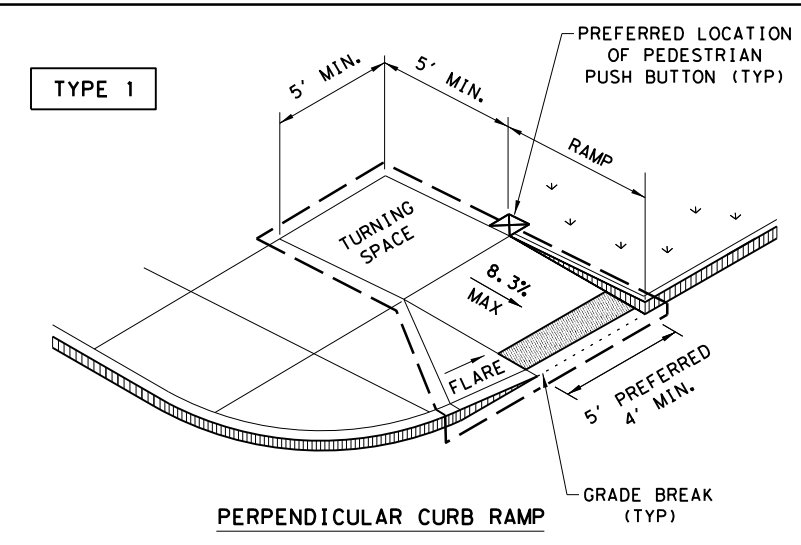
LONGITUDINAL WIDENING JOINT DETAIL

- BEFORE CONCRETE PLACEMENT, PERFORM PULL-OUT TESTS ON EPOXY-GROUTED TIE BARS IN ACCORDANCE WITH ITEM 360.
- SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER PAVEMENTS, USE #5 TIE BARS FOR LESS THAN 8" THICK PAVEMENTS.

SHEET 2 OF 2

		<i>Design Division Standard</i>	
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT ONE LAYER STEEL BAR PLACEMENT T - 7 TO 13 INCHES CRCP (1) - 23			
FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES
© TxDOT: APRIL 2023	CONT	SECT	JOB
APRIL 2023 MODIFIED EXPANSION JOINT DETAIL AT BRIDGE APPROACH	0918	24	267, ETC.
DIST	COUNTY	SHEET NO.	
DAL	COL, ETC.	111	

DATE: 11/29/2023
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- 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.
 - DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.
 - GUTTER LINE
 - GRADE BREAK
 - RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

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
REVISED 08, 2005	REVISIONS		0918 24	267, ETC.
REVISED 06, 2012	DIST	COUNTY	SHEET NO.	
REVISED 01, 2018	DAL	COL, ETC.	112	

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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 applicable standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

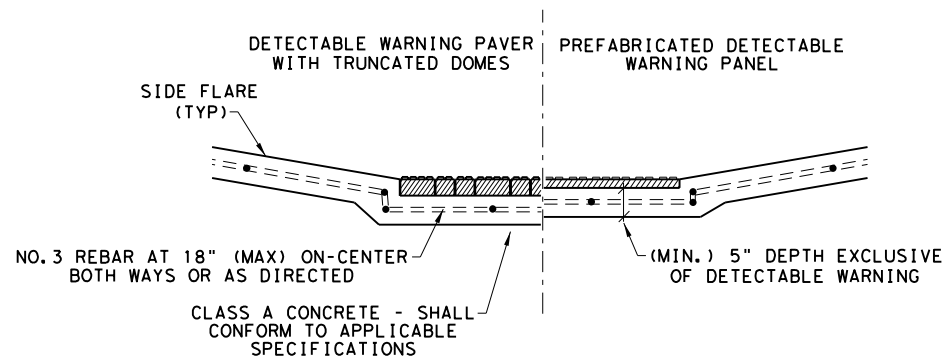
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material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

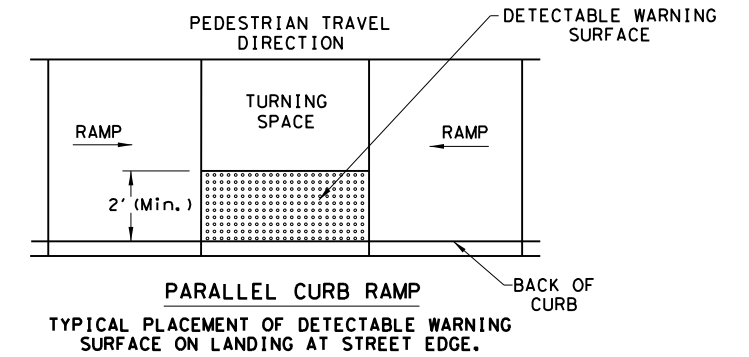
SIDEWALKS

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.

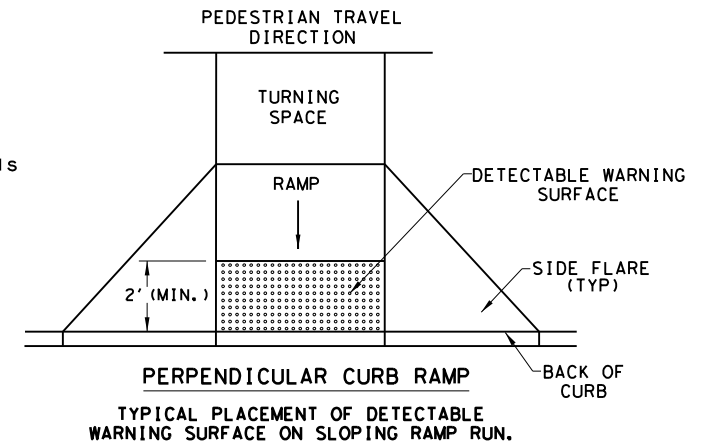


**SECTION VIEW DETAIL
 CURB RAMP AT DETECTIBLE WARNINGS**

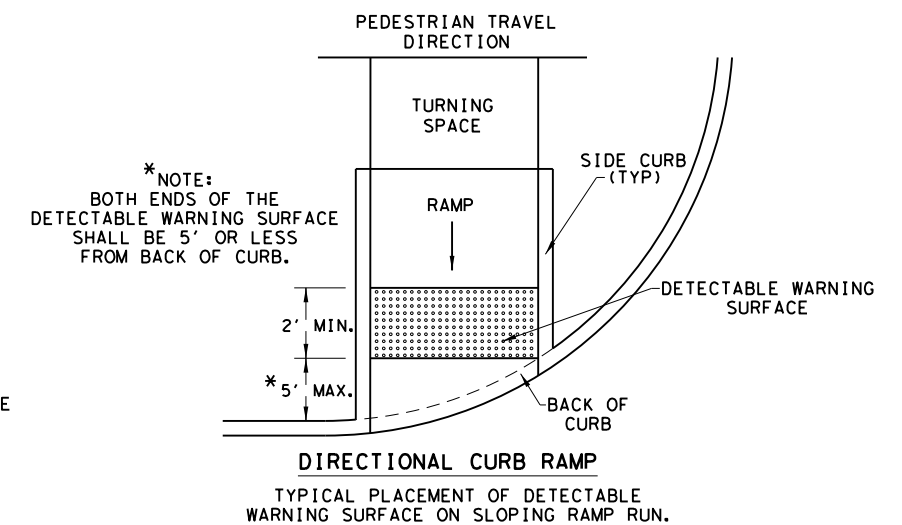
DETECTABLE WARNING SURFACE DETAILS



**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.**

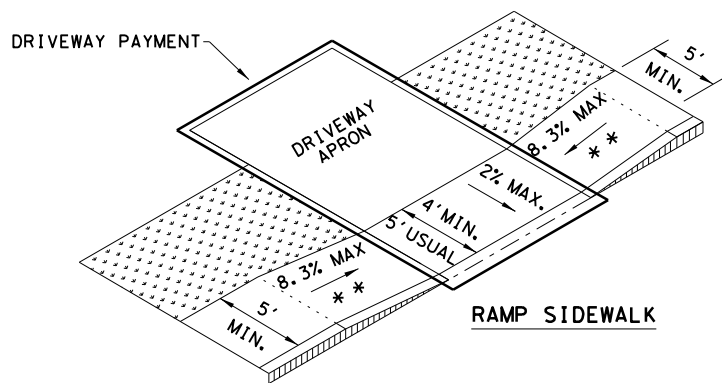
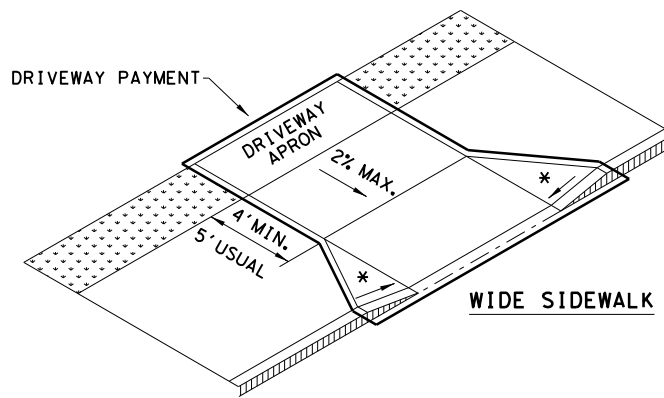
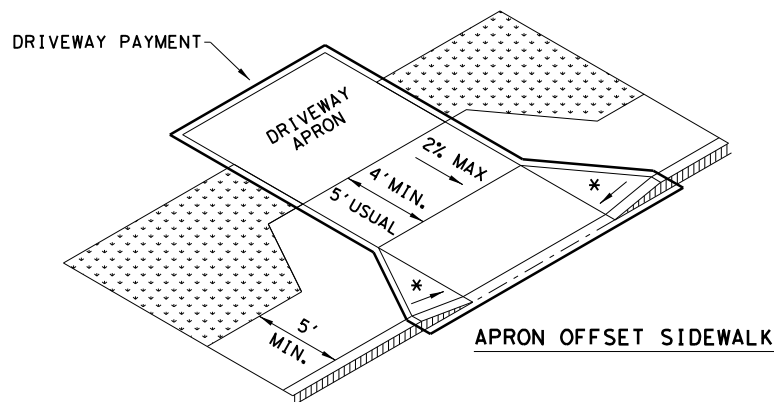
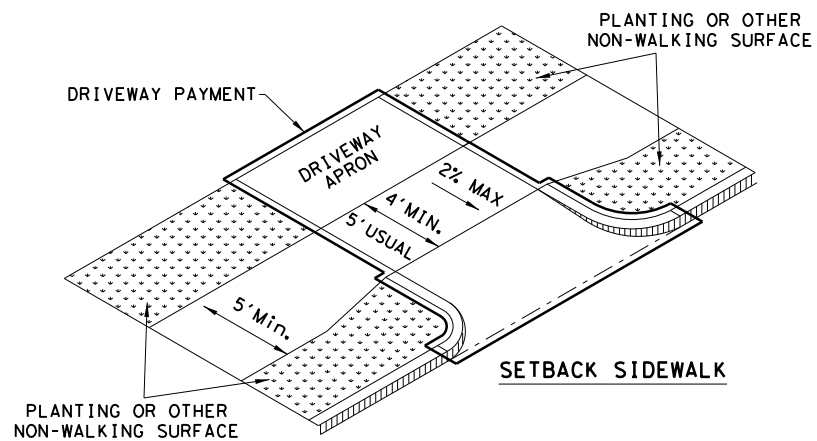
SHEET 2 OF 4

		Design Division Standard	
<h1>PEDESTRIAN FACILITIES</h1> <h2>CURB RAMPS</h2> <h3>PED-18</h3>			
FILE: ped18	DN: TxDOT	DW: VP	CK: KM
© TxDOT: MARCH, 2002	CONT	SECT	JOB
REVISIONS	0918 24	267, ETC.	VAR
REVISOR	DIST	COUNTY	SHEET NO.
REVISOR 08, 2005	DAL	COL, ETC.	113
REVISOR 06, 2012			
REVISOR 01, 2018			

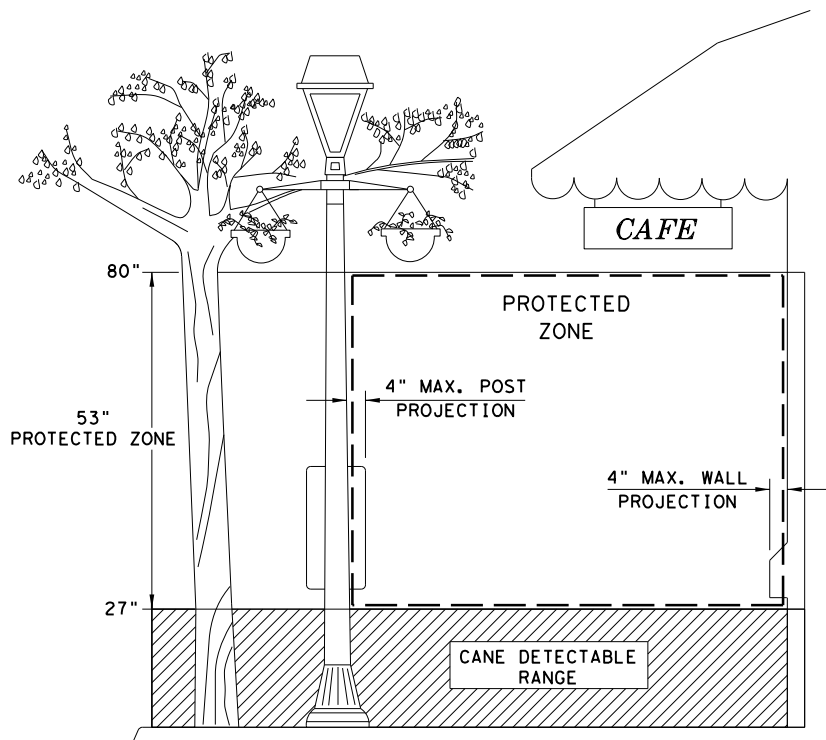
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SIDEWALK TREATMENT AT DRIVEWAYS

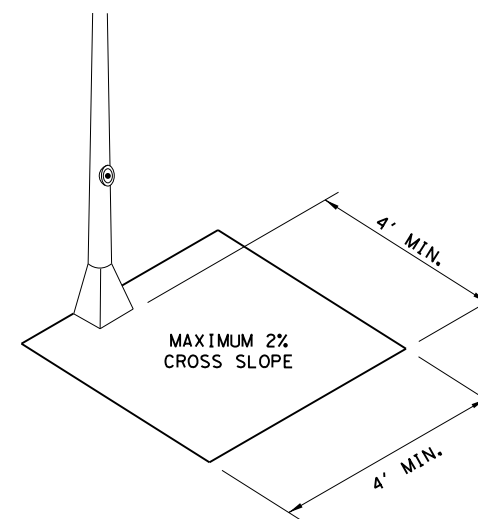


NOTES:
 * WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.
 * * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.

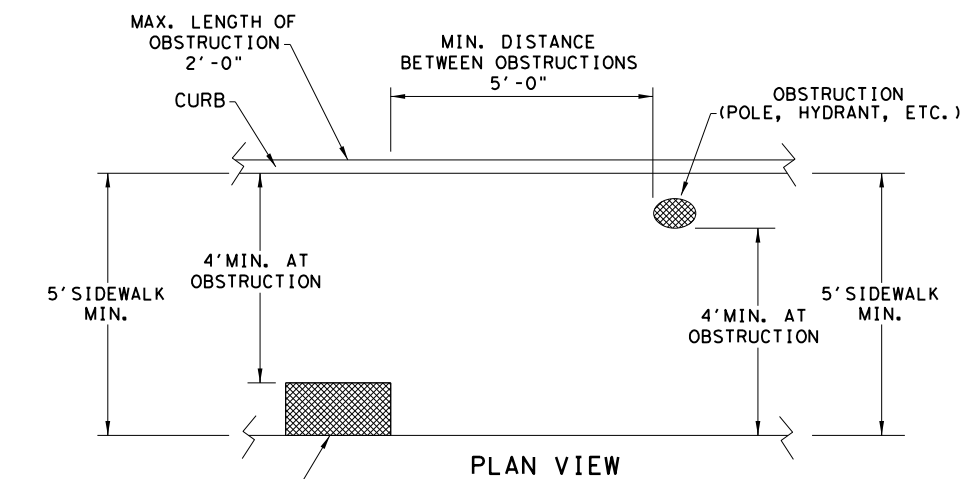


PROTECTED ZONE

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

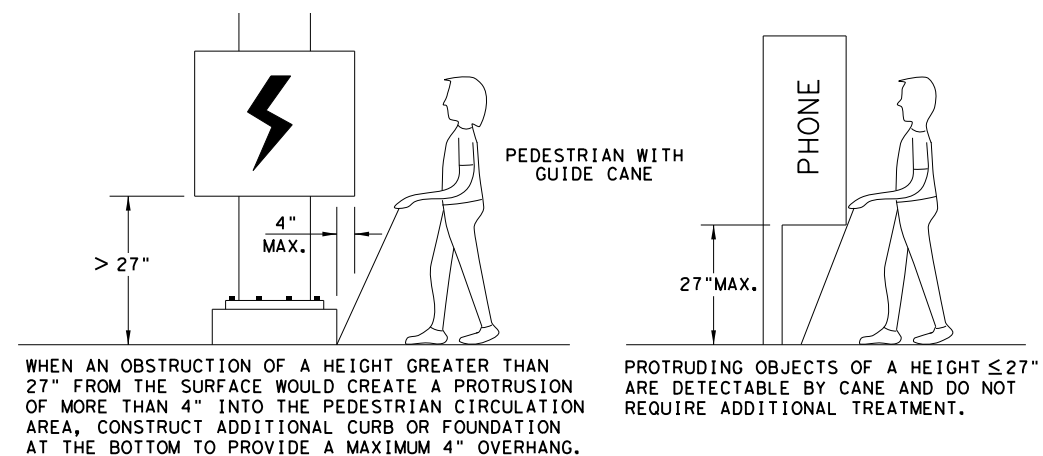


CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



**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.



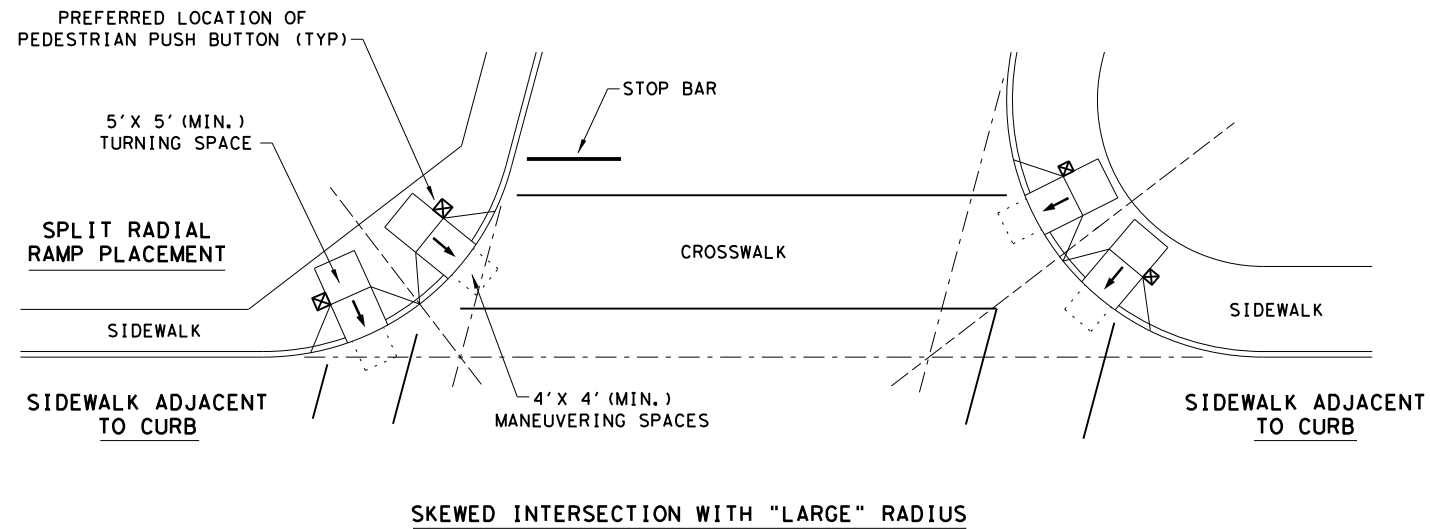
DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

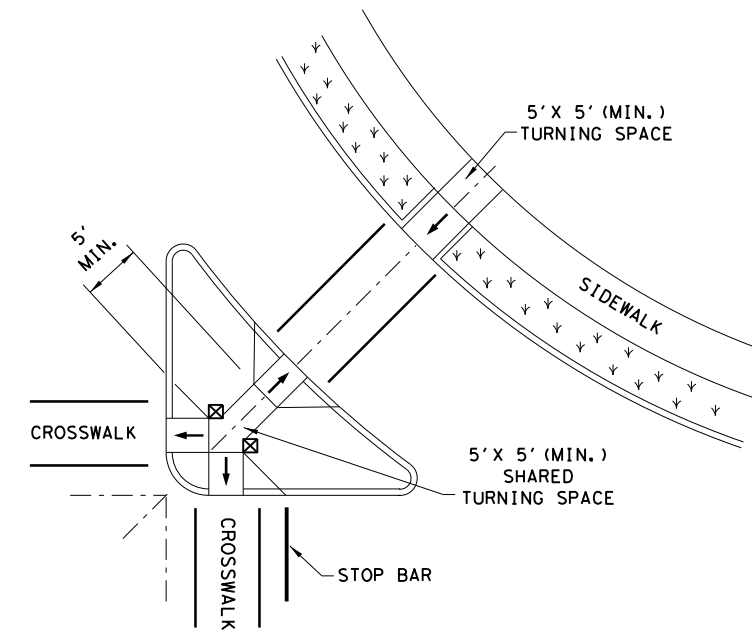
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PEDESTRIAN FACILITIES CURB RAMPS			
PED-18			
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© TxDOT: MARCH, 2002	CONT	SECT	JOB
REVISIONS	0918	24	267, ETC.
REVISED 08, 2005	DIST	COUNTY	SHEET NO.
REVISED 06, 2012	DAL	COL, ETC.	114
REVISED 01, 2018			

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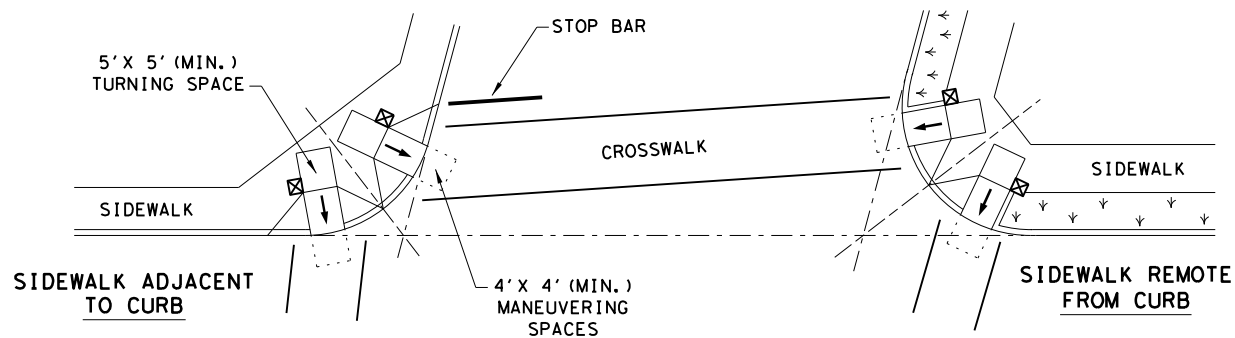
TYPICAL CROSSING LAYOUTS
 SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



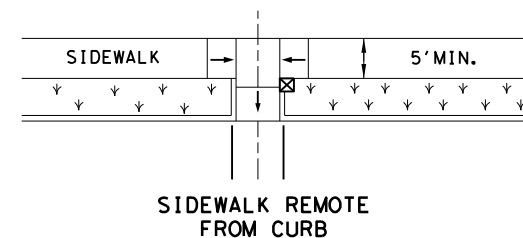
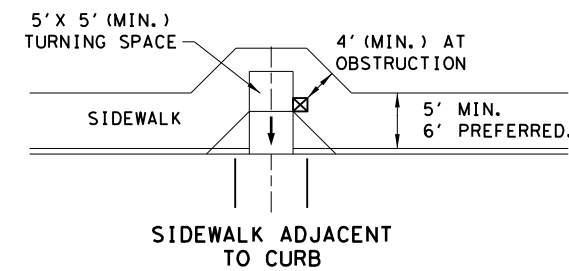
SKewed INTERSECTION WITH "LARGE" RADIUS



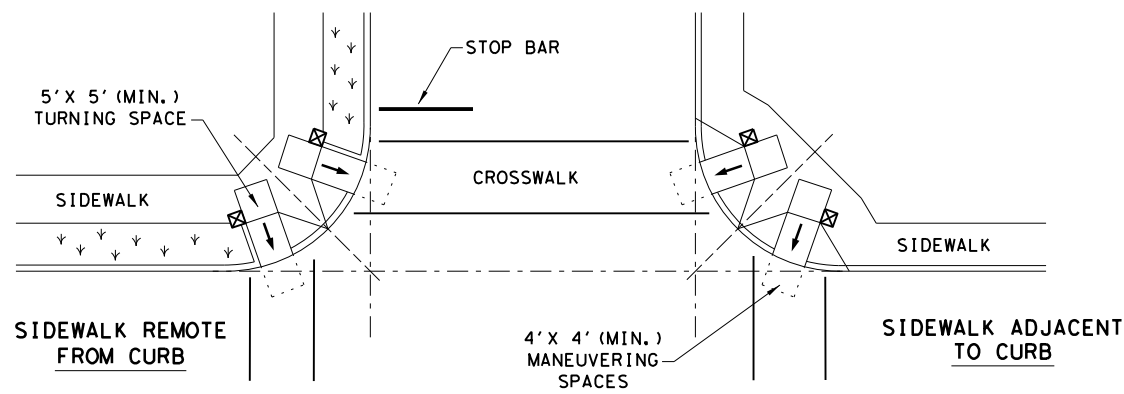
AT INTERSECTION
 W/FREE RIGHT TURN & ISLAND



SKewed INTERSECTION WITH "SMALL" RADIUS



MID-BLOCK PLACEMENT
 PERPENDICULAR RAMPS



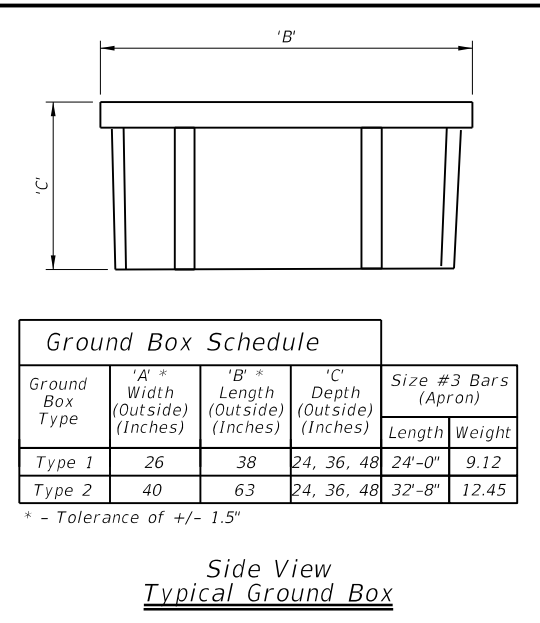
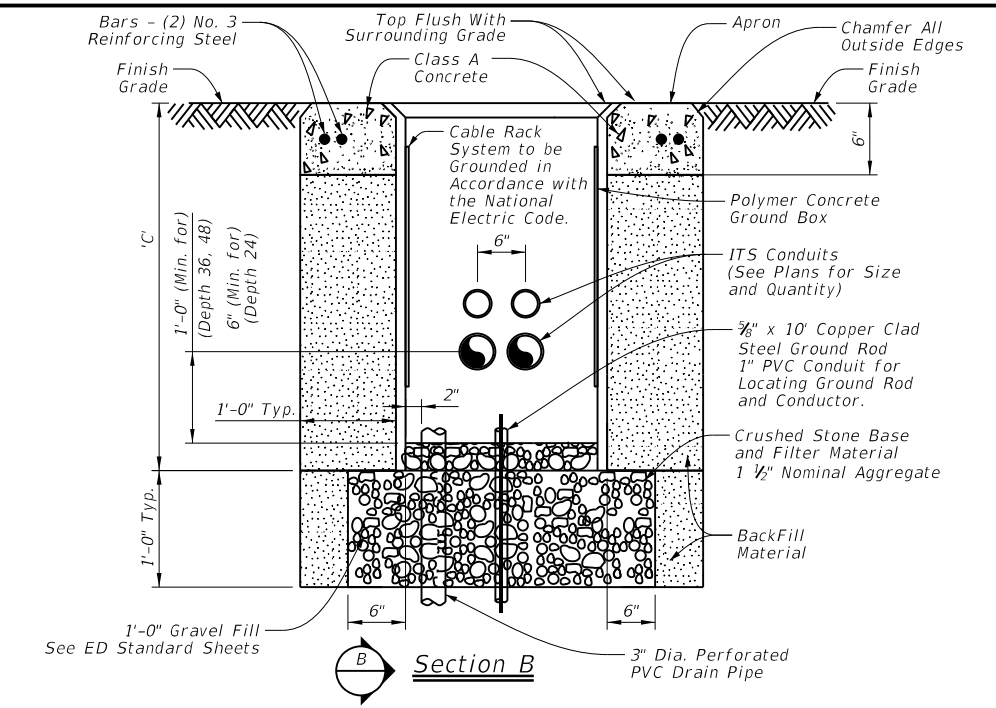
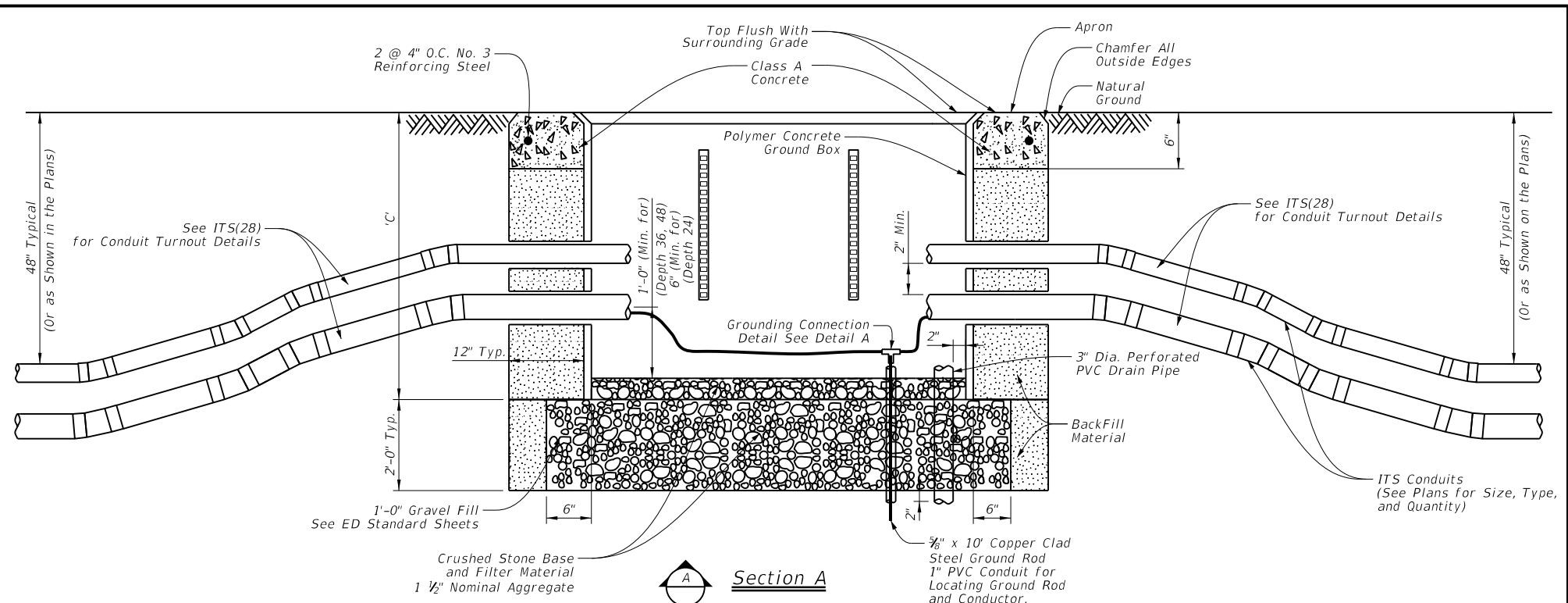
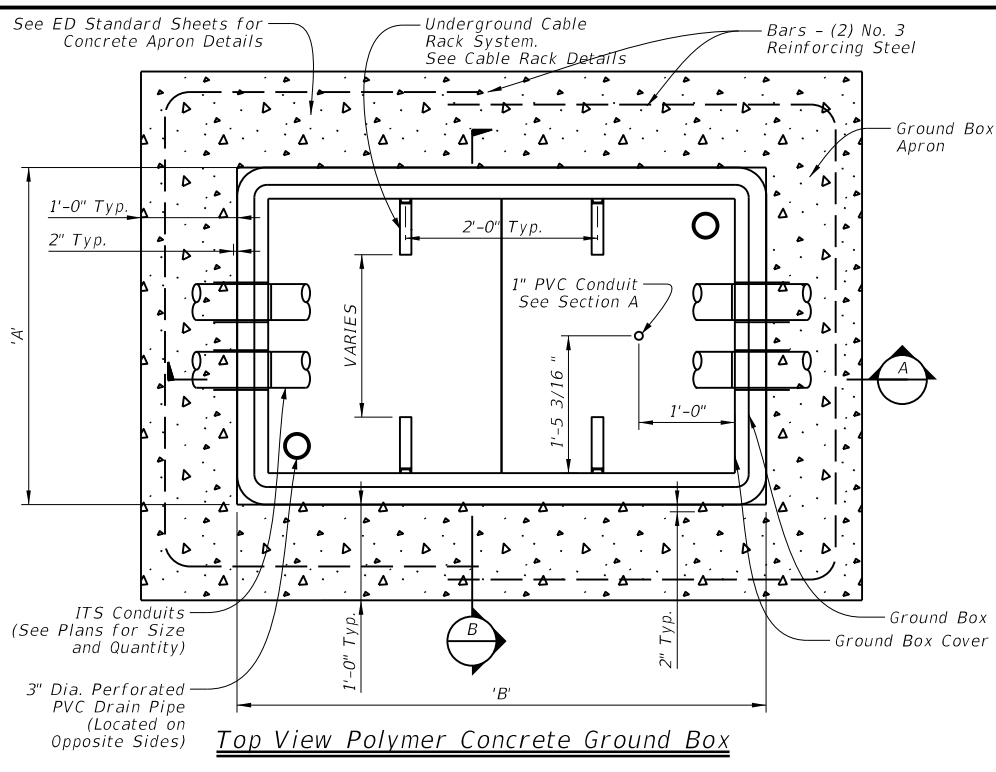
NORMAL INTERSECTION WITH "SMALL" RADIUS

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. ↙ ↘ ↗ ↖

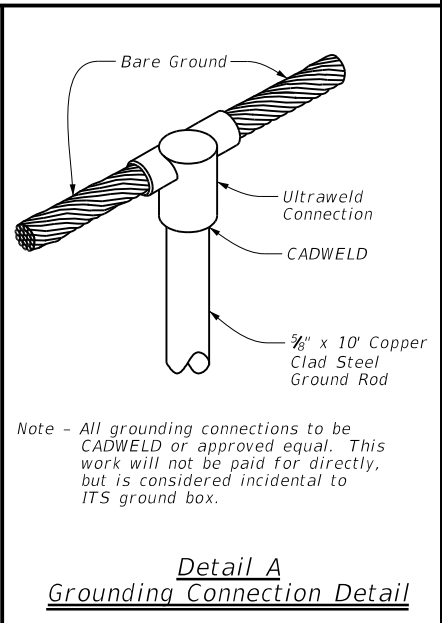
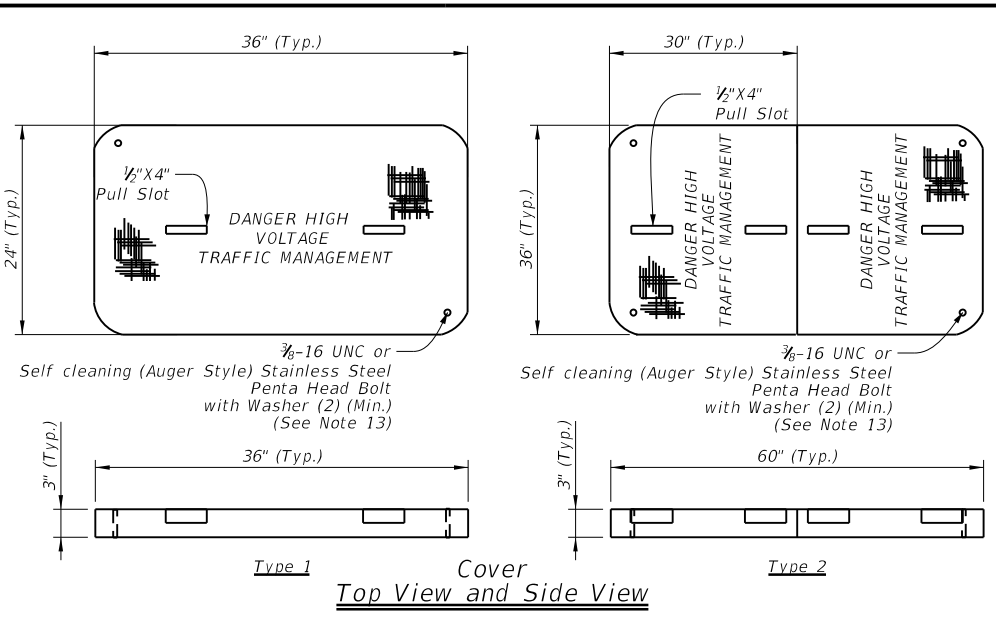
		Design Division Standard	
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© TxDOT: MARCH, 2002	CONT	SECT	JOB
REVISIONS	0918	24	267, ETC.
REVISED 08, 2005	DIST	COUNTY	SHEET NO.
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REVISED 01, 2018			

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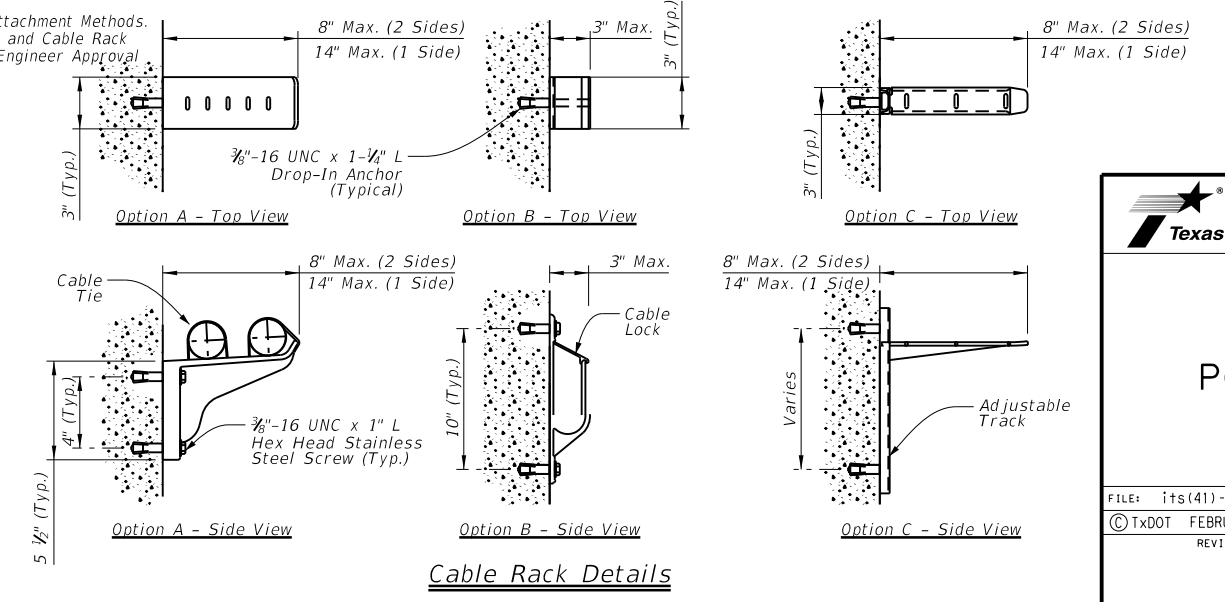
Ground Box Type	'A' * Width (Outside) (Inches)	'B' * Length (Outside) (Inches)	'C' Depth (Outside) (Inches)	Size #3 Bars (Apron)	
				Length	Weight
Type 1	26	38	24, 36, 48	24'-0"	9.12
Type 2	40	63	24, 36, 48	32'-8"	12.45

* - Tolerance of +/- 1.5"



General Notes:

- Conduit shown is for example only. Additional conduits may be required as shown on the plans.
- Provide polymer concrete ground box and cover.
- Provide Type "2" ground boxes when splice enclosure is required, as shown on the plans.
- Terminate conduits through the side of the ground box.
- Provide terminators for conduits cast in the walls and placed symmetrically about the centerline of the box at the depths shown, unless otherwise noted, for the number of conduits identified on the plans to enter the box.
- Provide terminators appropriately sized for the conduits indicated on the plans. Provide terminators with an air tight and water tight connection.
- Provide ground box with open bottom. Provide two 3" Dia. perforated PVC drain pipes on opposite corners and extend 2" below bottom of gravel bed to optimize water drainage.
- Install ground box on a 12-inch base of crushed stone which extends 6 inches in all directions from the perimeter of the box. Crushed stone will be subsidiary to special specification, "ITS Ground Box."
- When additional conduit entry points are needed to accommodate existing conduit, core drill conduit knockouts in the field of the appropriate number and size of conduit at each location, as directed by the Engineer.
- Provide a bell fitting on the end of each conduit to ensure a flush fit inside the ground box.
- Concrete grout around the knockout (inside and out) and around the conduit and bell fitting to ensure a neat watertight fit after the conduit and bell fitting have been placed in a knockout. Ensure all openings in the ground box are sealed prior to grouting operations.
- Label top of cover with the words "DANGER HIGH VOLTAGE TRAFFIC MANAGEMENT."
- Equip all covers with a bolting system that will positively secure the cover in place.
- Backfill in accordance with Item 400, "Excavation and Backfill for Structures."
- Provide p
- Provide steel (ASTM A-153), glass reinforced nylon, or equivalent cable rack assemblies designed to support the amount of cable storage slack and splice enclosures identified in the plans. Locate cable rack system on any side but allow for sufficient access to the inside of the ground box. Cable racks may be installed at the factory or in the field. When mounting cable racks in the field, seal all penetrations to the side wall to prevent moisture penetration. Ground metallic cable rack systems to grounding system inside ground box in accordance with the National Electrical Code.



Sheet Details
Not to Scale

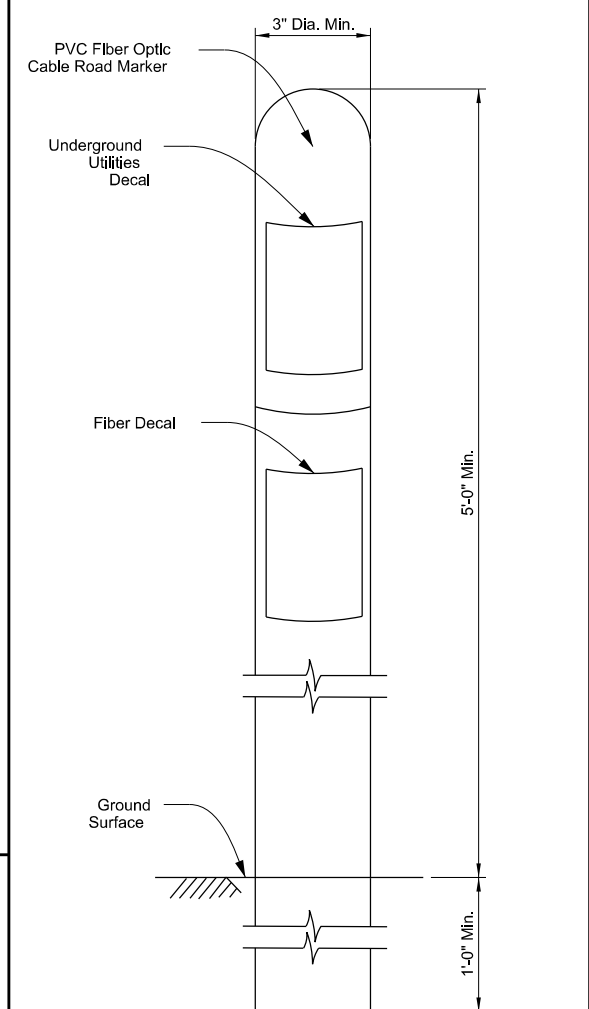
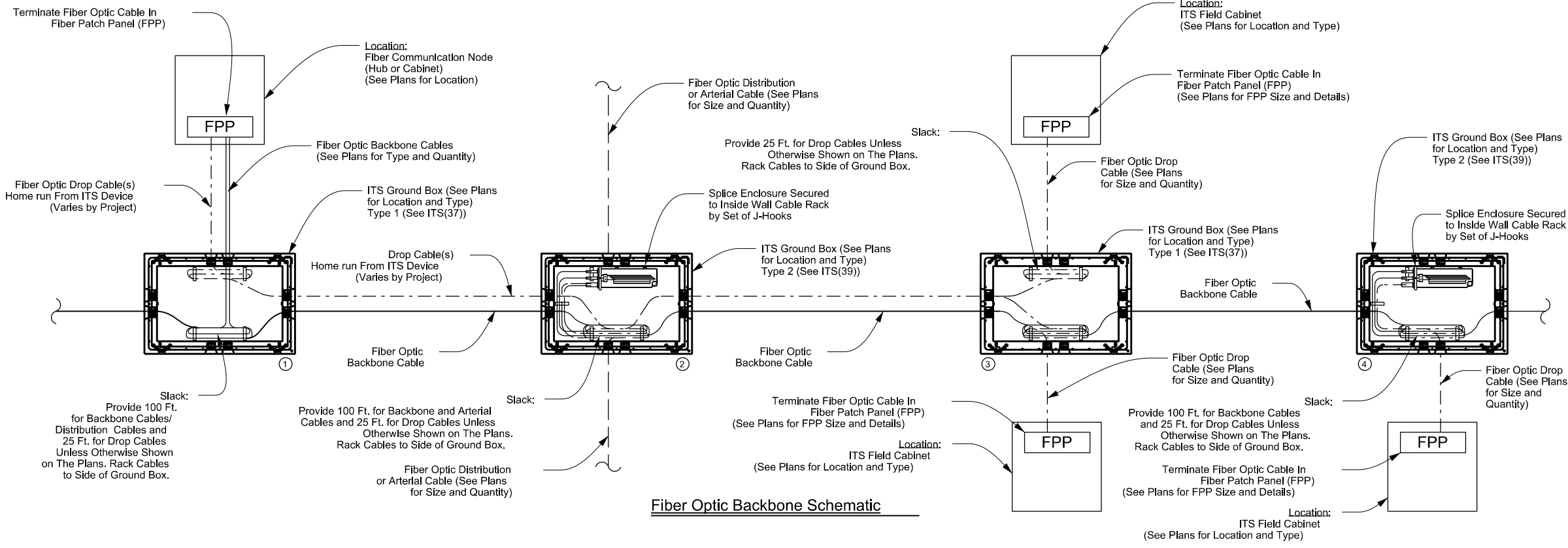
Texas Department of Transportation
Traffic Operations Division Standard

**ITS GROUND BOX
POLYMER CONCRETE**

ITS(41)-16

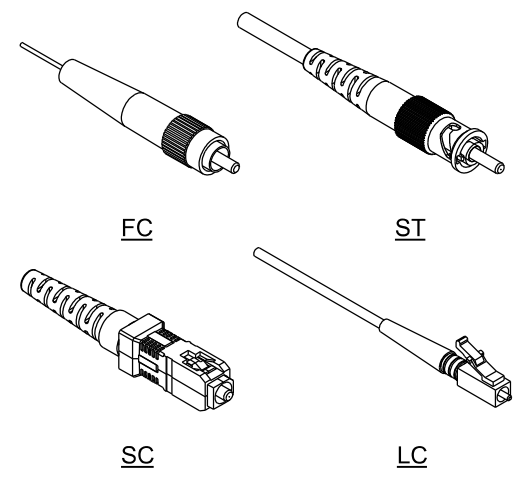
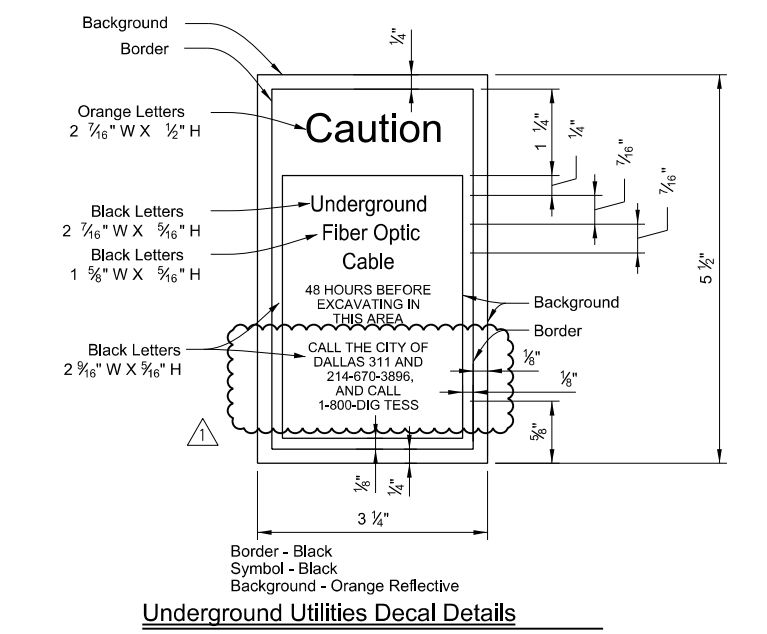
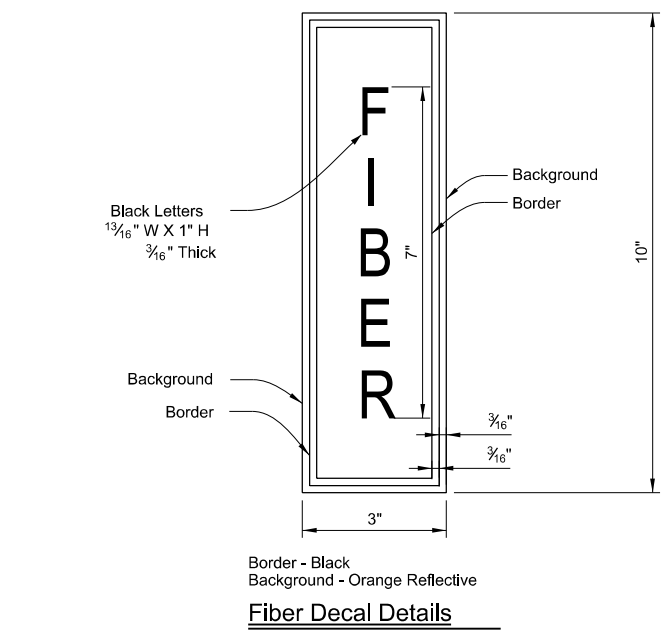
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© TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918 24	267, ETC.	VAR	
	DIST	COUNTY	SHEET NO.	
	DAL	COL, ETC.	116	

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- Notes:
1. Space fiber optic cable road markers at maximum 1000' intervals or at significant changes in direction such as a 90 degree turn.
 2. Provide all orange fiber optic cable road markers for non-splice locations.
 3. Provide orange fiber optic cable road markers with white dome for splice locations.
 4. Locate marker within concrete apron of fiber ground box.

Fiber Optic Cable Road Markers



Fiber Optic Connectors

Note - Details are diagrammatic and may vary by manufacturer.

General Notes:

1. The fiber optic backbone schematic shown is diagrammatic only and intended to represent the various fiber optic communication architectures seen across the state and may not show all configurations seen. Connection of ITS field equipment to ITS communication nodes or hubs is achieved through home run drop cables or spliced to the backbone in a splice enclosure. Refer to fiber communication schematic details and fiber termination information shown on the plans for further information.
2. Install a flat pull cord in all empty conduits and inner-ducts identified for communication use. The pull cord must have a tensile strength of 1,250 lbs minimum and have foot markings to determine length installed. Furnish and installation of pull cord will be subsidiary to special specification "ITS Fiber Optic Cable".
3. Color code each type of fiber optic cable to identify the cable as a "backbone" (green or blue), "distribution" (red), or "drop" (orange or yellow).
4. Terminate fibers at fiber patch panel (FPP), also referred to as patch panel, with SC connectors for new installations. When connecting to existing FPP, terminate with FC or ST connectors as shown on the plans. Provide connector adaptors as required to accommodate existing equipment if information is not provided in the plans.
5. Provide a list showing cable number assignments and highway or facility that the cable services.
6. Provide a single 1/C #14 insulated wire in conduit runs which have been identified in the plans to carry fiber optic cable. Provide UL listed solid copper wire with orange color low density polyethylene insulation suitable for conduit installation rated for temperature range -20 C to 60 C and a voltage rating of 600V. This wire will serve as a tracer, or locate, wire for locating underground conduit containing fiber optic cabling and will be paid for under Item 620, "Electrical Conductors."
7. Ensure each cable is marked on the outer jacket with a label detailing the manufacturer's name, the date of manufacturer (month/year), the fiber count (Example: 48F SM or 48 SMF), and sequential length markings at maximum 3 FT increments.

MODIFICATIONS:

REPLACED TxDOT WITH CITY OF DALLAS CONTACT INFORMATION



Digitally signed by Christopher Pierce
Date: 2023.11.29 09:56:09-06'00'

CHRISTOPHER J. PIERCE, P.E.
LEE ENGINEERING, L.L.C., REGISTRATION NO. F-450

Sheet Details
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SHEET 1 OF 2



ITS FIBER OPTIC CABLE MISCELLANEOUS DETAILS

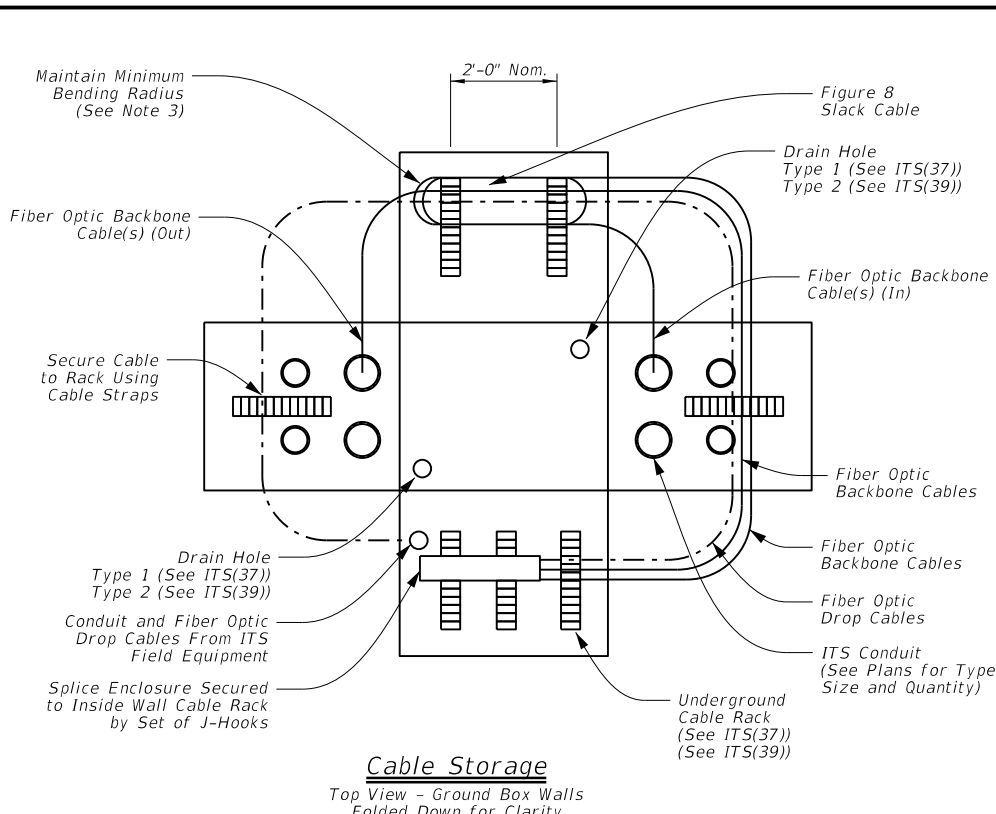
ITS(42)-16 (MOD)

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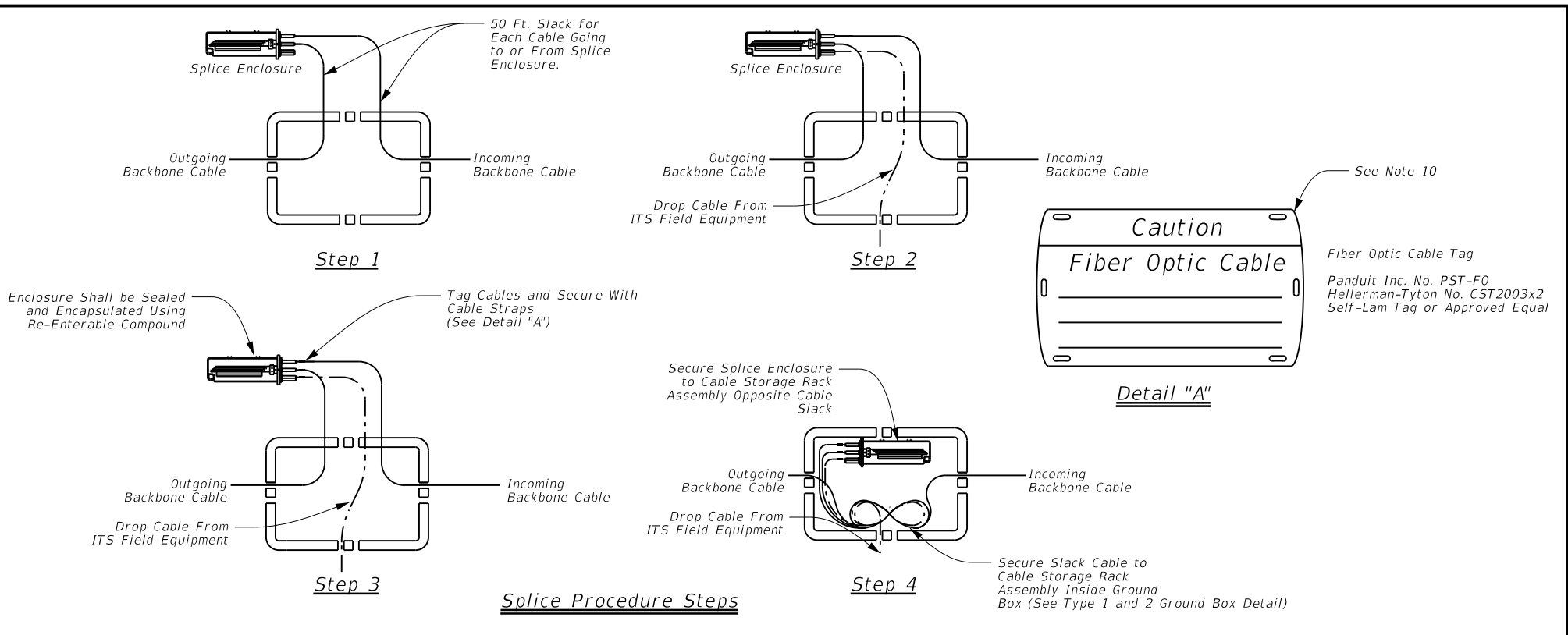
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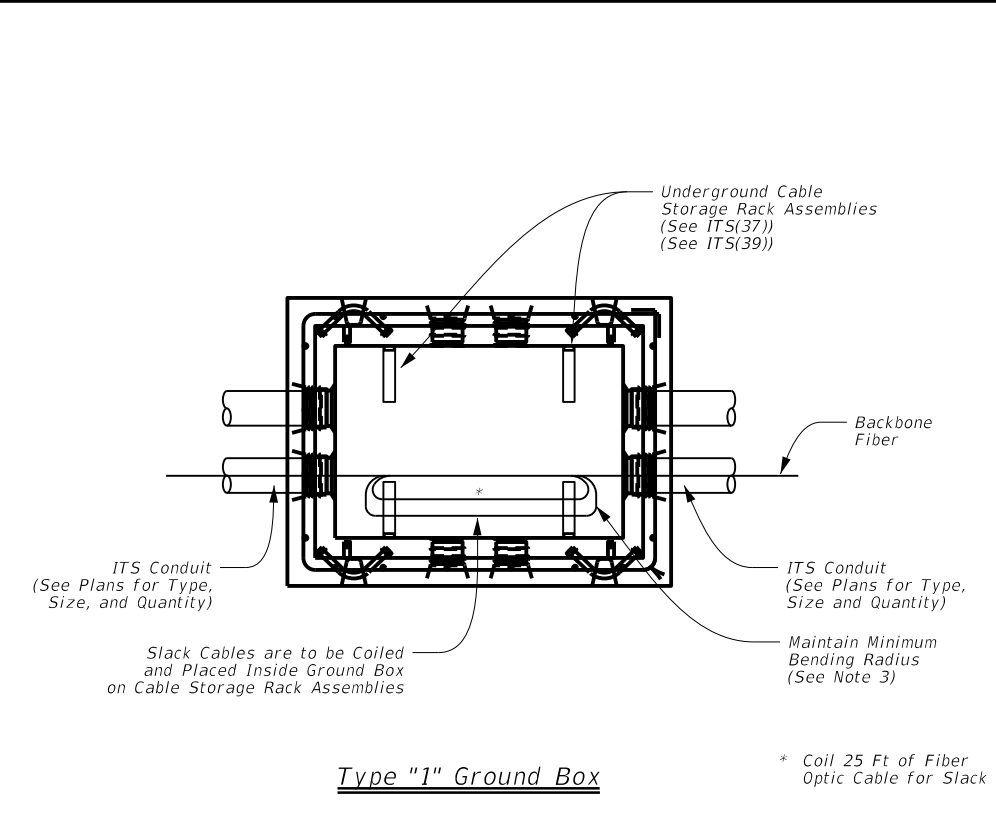
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Cable Storage
 Top View - Ground Box Walls
 Folded Down for Clarity

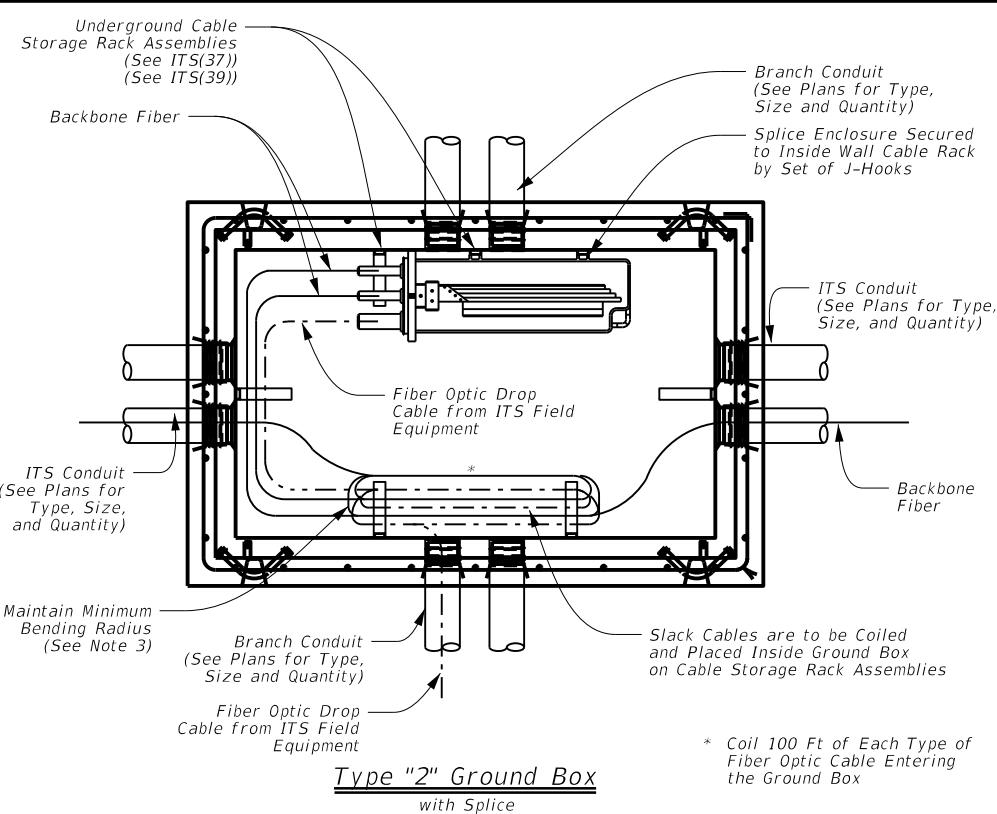


Splice Procedure Steps



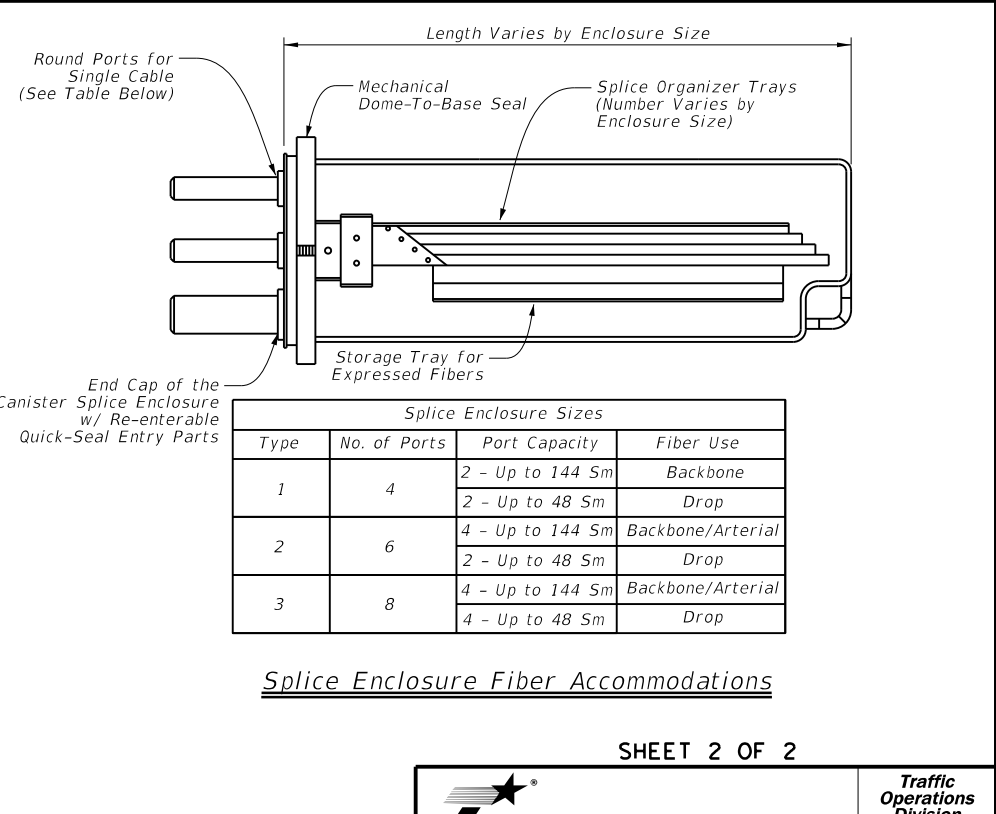
Type "1" Ground Box

* Coil 25 Ft of Fiber Optic Cable for Slack



Type "2" Ground Box with Splice

* Coil 100 Ft of Each Type of Fiber Optic Cable Entering the Ground Box



Splice Enclosure Fiber Accommodations

General Notes:

1. Conduit entry points to the Type 1 and Type 2 ground boxes are diagrammatic. Refer to ITS ground box standards, ITS(37) and ITS(39), for more information. Additional conduits may be required as shown on the plans.
2. Type 2 ground boxes are to be used, as shown on the plans, when splice enclosures are required.
3. Maintain a minimum bend radius of 20 times the fiber optic cable diameter during installation, relocation, and removal and a minimum of 10 times the fiber optic cable diameter when in operation.
4. Caulk all conduit around the top of the cable ducts with an engineer approved caulking compound to seal clearance between the cables and ducts. Place conduit plugs in all vacant conduits or inner-ducts.
5. Provide cable straps that will withstand ultra-violet exposure and do not damage cables when tightening.
6. All incidental equipment necessary for the cable installation and mounting of splice enclosure within the ground box will be incidental to Special Specification, "ITS Fiber Optic Cable."
7. Submit all splice locations to the field engineer for approval before beginning work.

8. Provide splice enclosures designed to seal, bond, anchor, and protect fiber optic cable splices. Provide splice enclosures designed to handle mechanical and fusion type splices. Provide splice enclosures with port configurations for the sizes detailed above.
9. Provide splice enclosures designed for underground placement with a sealing system preventing water penetration when submerged under 10 ft. of water.
10. Furnish, install, and secure fiber optic cable tags for each fiber optic cable entering a ground box, ITS field equipment cabinet (ground and pole), and hub building or communication node as detailed above. Provide information including fiber optic type, count, origin, and destination on the cable tag. Use UV resistant tie-wraps for securing the tag to the cable. Provide tie-wraps that do not damage fiber when securing to cable.

Sheet Details
 Not to Scale

SHEET 2 OF 2

Texas Department of Transportation
 Traffic Operations Division Standard

ITS FIBER OPTIC CABLE MISCELLANEOUS DETAILS

ITS(43)-16

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ROADWAY ILLUMINATION ASSEMBLY NOTES

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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.

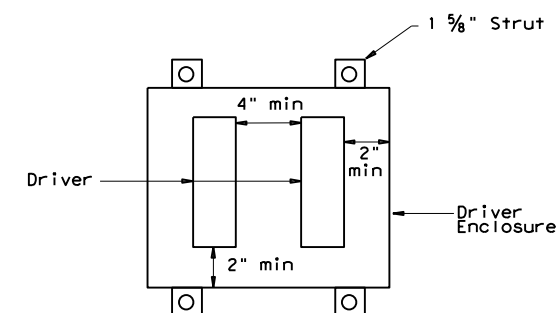
- ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."
 - iii. Tighten each nut to 150 ft-lb. using a torque wrench.
- c. Level and Plumb
- i. Ensure 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:

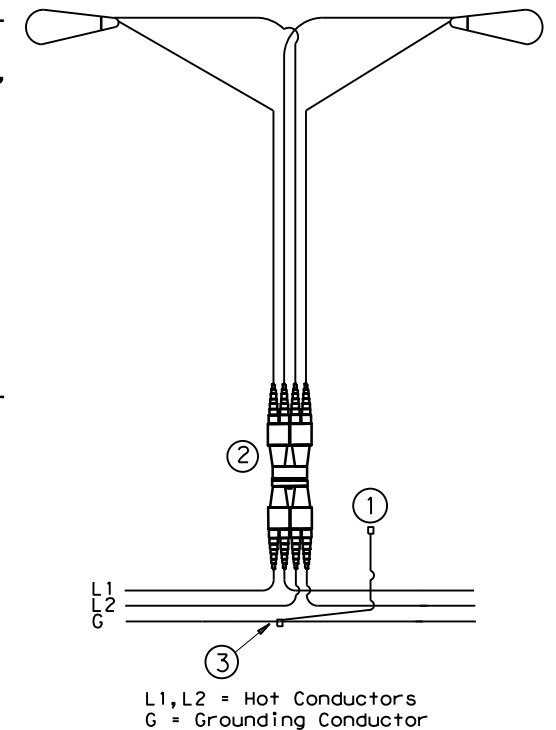
- ① Use 1/2 in. -13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.
- ② Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.
- ③ Split Bolt or other connector.

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



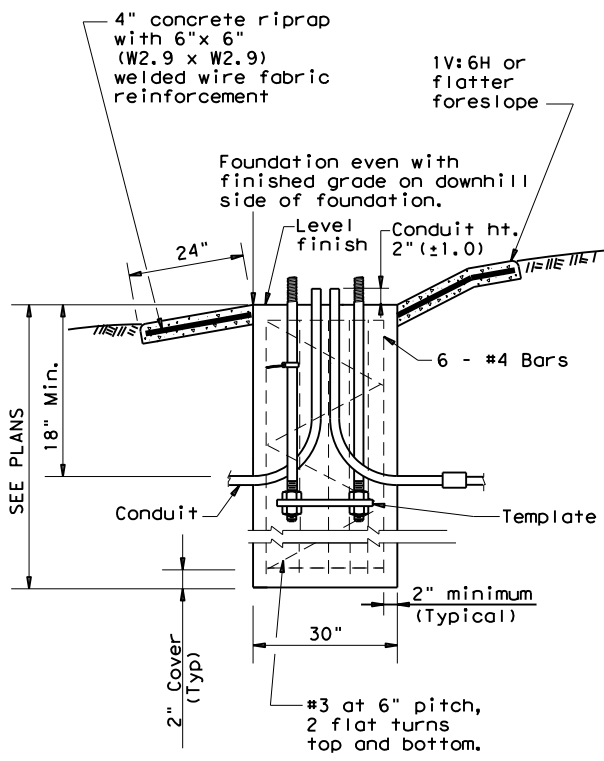
TYPICAL WIRING DIAGRAM

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

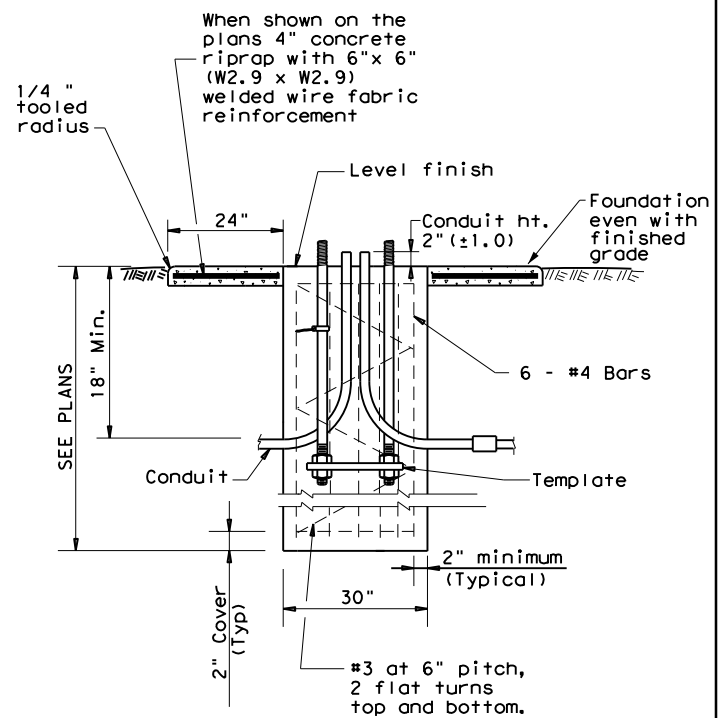
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7-17		DIST	COUNTY
12-20		DAL	COL, ETC.
			SHEET NO.
			119

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SECTION A-A
SHOWING SLOPED GRADE



SECTION A-A
SHOWING CONSTANT GRADE

TABLE 1
ANCHOR BOLTS

POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1 in. x 30 in.
40-50 ft.	15 in.	17 1/4 in.	1 1/4 in. x 30 in.

TABLE 2
RECOMMENDED FOUNDATION LENGTHS (See note 1)

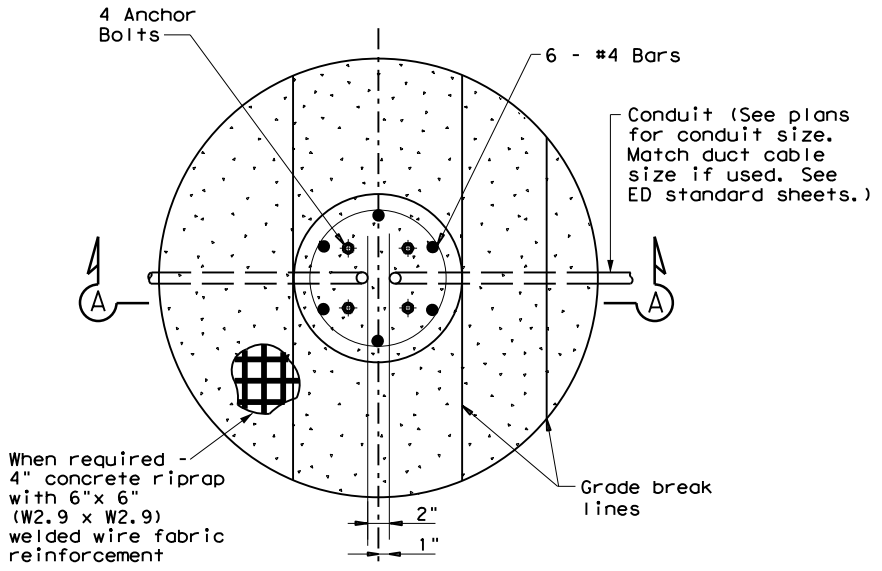
MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
≤20 ft.	6'	6'	6'
>20 ft. to 30 ft.	8'	6'	6'
>30 ft. to 40 ft.	8'	8'	6'
>40 ft. to 50 ft.	10'	8'	6'

TABLE 3
PAY QUANTITY OF RIPRAP PER FOUNDATION (Install only when shown on the plans)

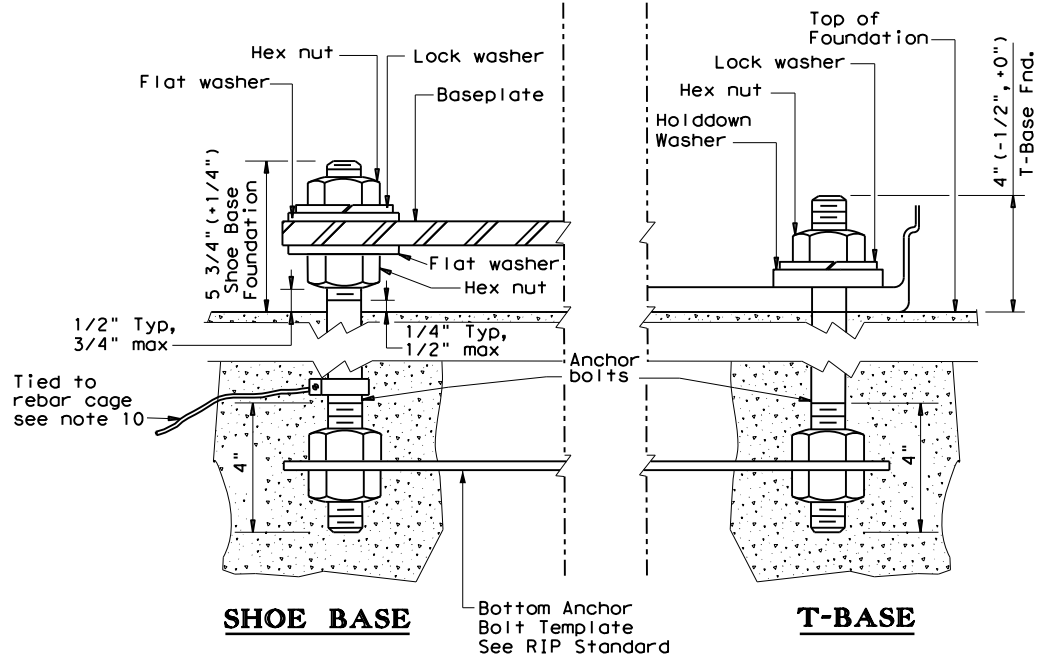
Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

GENERAL NOTES:

- "Recommended Foundation Lengths" table is for information purposes only. Foundation lengths shall be as shown on the plans, or as directed by the Engineer. Foundations will be paid for under Item 416, "Drilled Shaft Foundations," unless otherwise shown on the plans.
- Erect roadway illumination assembly poles plumb and true. Form and level the top 6" of the foundation so the pole will be plumb. Use leveling nuts to plumb shoe base poles. Do not use shims or leveling nuts under transformer bases. Do not grout between baseplate and the foundation.
- Ensure Class 2A and 2B fit for anchor bolts and nuts. Tap and chase nuts after galvanizing. Anchor bolt body with rolled threads need not be full size.
- Use appropriate class of concrete as specified in Items 416 and 432. Concrete for riprap may be upgraded to Class C at no extra cost to the Department.
- Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
- Locate breakaway roadway illumination assemblies as shown in the placement table, unless otherwise dimensioned on the plans. Protect non-breakaway illumination assemblies from vehicular impact (i.e. 2.5 ft. behind guard rail or mounted on traffic barrier), or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less. See Roadway Design Manual for further information.
- Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
- Install a minimum of 2 conduits in each foundation. See lighting layout sheets for locations of foundations with more than 2 conduits. Cap unused conduits in foundations on both ends.
- Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
- Bond anchor bolt to rebar cage with #6 bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. The bonded steel in the foundation creates a concrete encased grounding electrode which replaces the ground rod.
- Grade earthwork around T-base foundations even with the finished grade as shown in Section A-A to ensure proper function of the breakaway device. Use riprap on T-base foundations that are located on sloped grades, and as shown on the plans for level grades.



FOUNDATION DETAIL



ANCHOR BOLT DETAIL

TABLE 4
BREAKAWAY POLE PLACEMENT (See note 6)

ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

* or as close to ROW line as is practical
 ** provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.

Texas Department of Transportation
 Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS (RDWY ILLUM FOUNDATIONS)
 RID(2)-20

FILE: rid2-20.dgn	DN:	CK:	DW:	CK:
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1-11	DIST	COUNTY	SHEET NO.	
7-17	DAL	COL, ETC.	120	
12-20				

SHIPPING PARTS LIST - POLES AND LUMINAIRE ARMS

Nominal Mounting Ht. (ft)	Shoe Base					T-Base					CSB/SSCB Mounted				
	Designation				Quantity	Designation				Quantity	Designation				Quantity
	Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire	
20	(Type SA 20 S - 4)			(150W EQ) LED		(Type SA 20 T - 4)			(150W EQ) LED						
	(Type SA 20 S - 4 - 4)			(150W EQ) LED		(Type SA 20 T - 4 - 4)			(150W EQ) LED						
30	(Type SA 30 S - 4)			(250W EQ) LED		(Type SA 30 T - 4)			(250W EQ) LED			(Type SP 28 S - 4)	(250W EQ) LED		
	(Type SA 30 S - 4 - 4)			(250W EQ) LED		(Type SA 30 T - 4 - 4)			(250W EQ) LED			(Type SP 28 S - 4 - 4)	(250W EQ) LED		
40	(Type SA 30 S - 8)			(250W EQ) LED		(Type SA 30 T - 8)			(250W EQ) LED	2		(Type SP 28 S - 8)	(250W EQ) LED		
	(Type SA 30 S - 8 - 8)			(250W EQ) LED		(Type SA 30 T - 8 - 8)			(250W EQ) LED			(Type SP 28 S - 8 - 8)	(250W EQ) LED		
	(Type SA 40 S - 4)			(250W EQ) LED		(Type SA 40 T - 4)			(250W EQ) LED			(Type SP 38 S - 4)	(250W EQ) LED		
	(Type SA 40 S - 4 - 4)			(250W EQ) LED		(Type SA 40 T - 4 - 4)			(250W EQ) LED			(Type SP 38 S - 4 - 4)	(250W EQ) LED		
	(Type SA 40 S - 8)			(250W EQ) LED		(Type SA 40 T - 8)			(250W EQ) LED			(Type SP 38 S - 8)	(250W EQ) LED		
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	(Type SA 40 S - 10)			(250W EQ) LED		(Type SA 40 T - 10)			(250W EQ) LED			(Type SP 38 S - 10)	(250W EQ) LED		
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50	(Type SA 50 S - 4)			(400W EQ) LED		(Type SA 50 T - 4)			(400W EQ) LED			(Type SP 48 S - 4)	(400W EQ) LED		
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	(Type SA 50 S - 8)			(400W EQ) LED		(Type SA 50 T - 8)			(400W EQ) LED			(Type SP 48 S - 8)	(400W EQ) LED		
	(Type SA 50 S - 8 - 8)			(400W EQ) LED		(Type SA 50 T - 8 - 8)			(400W EQ) LED			(Type SP 48 S - 8 - 8)	(400W EQ) LED		
	(Type SA 50 S - 10)			(400W EQ) LED		(Type SA 50 T - 10)			(400W EQ) LED			(Type SP 48 S - 10)	(400W EQ) LED		
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	(Type SA 50 S - 12)			(400W EQ) LED		(Type SA 50 T - 12)			(400W EQ) LED			(Type SP 48 S - 12)	(400W EQ) LED		
	(Type SA 50 S - 12 - 12)			(400W EQ) LED		(Type SA 50 T - 12 - 12)			(400W EQ) LED			(Type SP 48 S - 12 - 12)	(400W EQ) LED		

OTHER				
Designation				Quantity
Pole	A1	A2	Luminaire	
(Type SA 20 T - 4)			(150W EQ) LED	2

GENERAL NOTES:

- All work, materials and services not shown on the plans which may be necessary for complete and proper construction shall be performed, furnished and installed by the Contractor. Faulty fabrication or poor workmanship in any material, equipment or installation will be considered justification for rejection. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the Department such warranties or guarantees.
- The location of poles and fixtures are diagrammatic only and 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.
- Standard Steel Pole Designs. Steel poles fabricated in accordance with the details and dimensions shown herein, shall be considered standard designs. Submission of shop drawings and design calculations for standard designs is not required.
- Optional Steel Pole Designs. Multi-sided steel poles may be allowed as optional designs, if steel poles are permitted or required, pending approval by the Department as outlined below.
 - Shop Drawings. Optional designs require submission of shop drawings and design calculations bearing the seal of an engineer licensed in the State of Texas, in accordance with Item 441, "Steel Structures." The Department may elect to pre-approve some shop drawings for optionally designed poles. Submission of shop drawings and design calculations is not required for structures fabricated in accordance with the details of shop drawings on the pre-approved list maintained by the TxDOT Traffic Operations Division. Any deviation from the pre-approved shop drawings will require submission of shop drawings of the complete assembly and design calculations as described above.
 - Structural Support Design for Luminaires. Lighting support structures shall be designed for a 25 year design life in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto. All poles shall be designed for 110 mph 3-second gust wind speeds. The Gust Factor, G, and Wind Importance Factor, Ir, shall be applied as per the AASHTO Specifications assuming a 25-year design life. The design wind pressure for hurricane wind velocities greater than 100 mph shall not be less than the design wind pressure using 100 mph with the non-hurricane Wind Importance Factor, Ir, value. For transformer base poles, fabricator shall include transformer base and connecting hardware in design calculations and shop drawing submittals. All transformer bases shall have been structurally tested to resist the theoretical plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with the shop drawings. Shop drawings shall show breakaway base model number, and manufacturer's name and logo. Manufacturer's shop drawings shall include the ASTM designations for all materials to be used.
 - Mast Arm Attachments. All poles and attachments shall be structurally designed to support two 12-foot mast arms and luminaires. Poles shall be supplied with mast arm combinations as shown in the plans. All mast arms shall be designed for a 60-pound luminaire having an effective projected area of 1.6 square feet.
 - Anchor Bolt Assembly. Anchor bolt assemblies for optionally designed poles shall be the same as those shown herein.
- Aluminum Pole Designs. Aluminum pole designs may be allowed, if aluminum poles are permitted or required, pending approval by the Department as outlined below.
 - Meet all of the requirements stated above for optional steel pole designs and the following:
 - Aluminum poles shall be fabricated in accordance with "Structural Welding Code-Aluminum" AWS D1.2.
 - Aluminum pole designs shall use the same anchor bolt assembly and be subject to the same geometric restraints and other requirements for steel poles specified herein.
 - Aluminum poles shall be equipped with vibration mitigation devices, as approved by the engineer.
 - Pole components shall be constructed using the following material:
 - Shaft: ASTM B221 or B241 Alloy 6063-T6, ASTM B209 Alloy 5086-H34, ASTM B221 Alloy 6005-T5.
 - Base Flange: ASTM B26 Alloy 356.0-T6 or ASTM B108 Alloy 356.0-T6 (Yield strength test required).
 - Mast Arm Fitting: ASTM B209 Alloy 6061-T6 or ASTM B221 Alloy 6005-T5.
 - Mast Arms: ASTM B241 Alloy 6061-T6 or Alloy 6063-T6.
 - Pole Cap: ASTM B209 Alloy 5086-H32 or ASTM B108 or B26 Alloy 356.0-T6.
 - Bolts: Stainless Steel AISI 300 series. Bolts threading into aluminum threads shall be treated with anti-seize compound, Never-Seez Compound, Permatex 133K or equal.
- Special Designs. Poles with architectural treatments shall meet the requirements shown elsewhere in the plans.
- Luminaire Mounting Height. Actual luminaire mounting height shall be the nominal mounting height given on RIP(2) for all pole-arm combinations except for poles with 4 ft. luminaire arms, which shall be 3'-0" lower than the nominal height, unless otherwise shown or directed.

EXPLANATION OF ROADWAY ILLUMINATION ASSEMBLY DESIGNATIONS

(TYPE SA 50 T - X - X) (400W EQ) LED

SA: Pole and mast arm may be steel or aluminum.
 ST: Pole and mast arm must be steel.
 AL: Pole and mast arm must be aluminum.
 SP: Special (ovalized) steel or aluminum pole for installing on CSB or SSCB. See standard sheet CSB (4), or SSCB (4).

Two numerical digits denote nominal mounting height in feet.

Next letter denotes type of base, (S-Shoe Base, T-Transformer Base, or B-Bridge/Ret.Wall Mount)

First number denotes length of mast arm in feet.

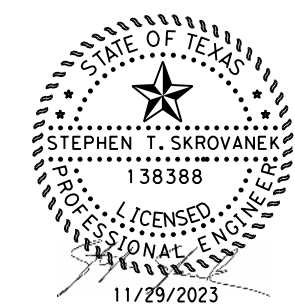
Use of second mast arm is indicated by second dashed number which denotes length in feet.

Luminaire rating in watts (i.e. 400W). Equivalent wattage LED fixtures will include EQ (i.e. 400W EQ)

Last letters indicate light source (S - High Pressure Sodium; LED - LED luminaire)

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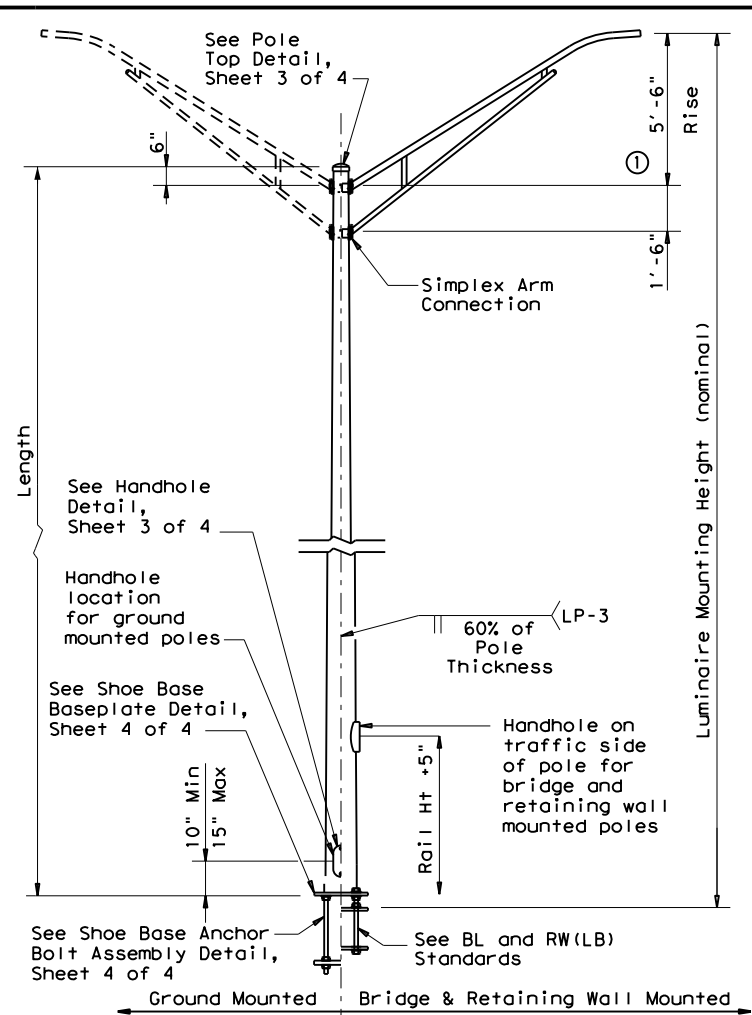
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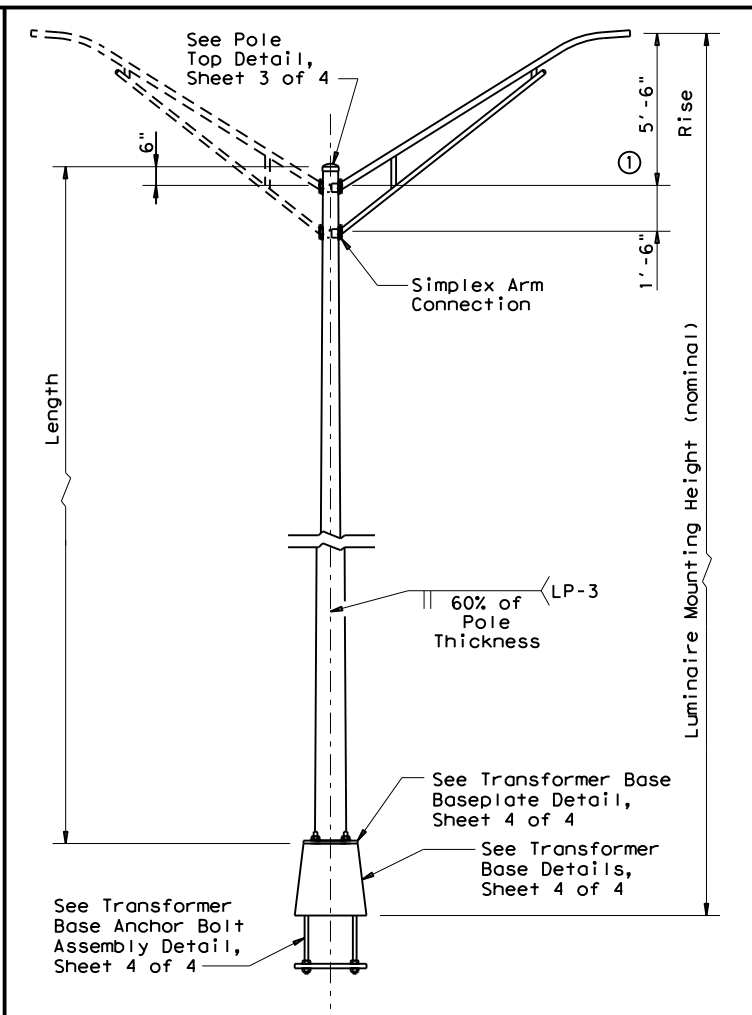
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© TxDOT January 2007	CONT	SECT	JOB
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7-17	DIST	COUNTY	SHEET NO.
12-19	DAL	COL, ETC.	121

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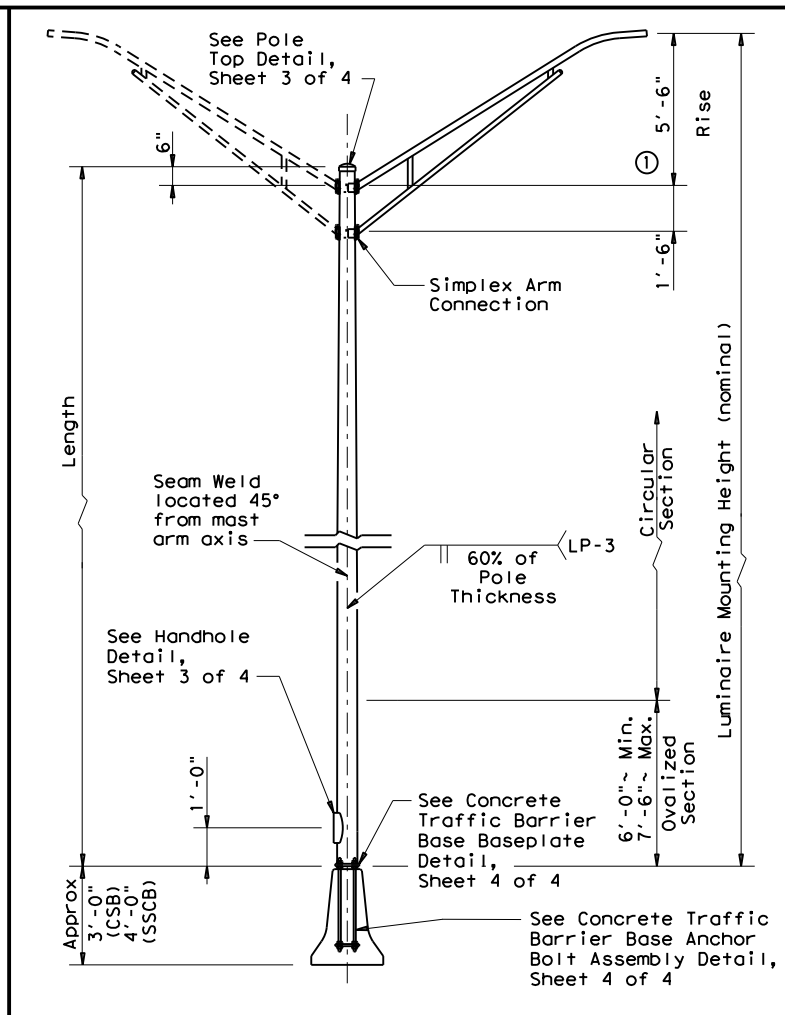
SHOE BASE POLE

SHOE BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	4.90	15.00	0.1196	7.1
30.00	7.50	4.00	25.00	0.1196	13.2
31.00-39.00	8.00	4.36-3.24	26.00-34.00	0.1196	20.7
40.00	8.50	3.60	35.00	0.1196	20.7
50.00	10.50	4.20	45.00	0.1196	30.3



TRANSFORMER BASE POLE

TRANSFORMER BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	5.11	13.50	0.1196	7.1
30.00	7.50	4.21	23.50	0.1196	13.2
31.00-39.00	8.00	4.57-3.45	24.50-32.50	0.1196	20.7
40.00	8.50	3.81	33.50	0.1196	20.7
50.00	10.00	3.91	43.50	0.1196	30.3



CONCRETE TRAFFIC BARRIER BASE POLE

CONCRETE TRAFFIC BARRIER BASE POLE (CSB/SSCB)						
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)	
					About C of Rail	Perp. to Rail
28.00	9.00	5.78	23.00	0.1196	10.3	13.2
38.00	9.00	4.38	33.00	0.1196	16.6	20.8
48.00	10.50	4.48	43.00	0.1345	25.1	30.5

GENERAL NOTES:

- Designs conform to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto. Design 3-Second Gust Wind Speed equals 110 mph with a 1.14 gust factor. A wind importance factor of 0.80 is applied to adjust the wind speed to a 25 year recurrence interval. Design moments listed in tables assume base of pole is 25' above natural ground level.
- Structures are designed to support two 12' luminaire mast arms and luminaires. Mast arms are designed to support a 60-pound luminaire having an effective projected area of 1.6 square feet.
- Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Do not submit shop drawings for roadway illumination pole assemblies fabricated in accordance 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 these sheets and the Specifications. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
- For mounting heights between values shown in the tables, use base diameter and thickness values for the larger height.
- Unless otherwise noted, all steel parts shall be galvanized in accordance with Item 445, "Galvanizing."
- Steel poles shall be fabricated in accordance with Item 441, "Steel Structures." Longitudinal seam welds for pole sections shall have 60% minimum penetration. All welding shall be in accordance with AWS D1.1, Structural Welding Code-Steel.
- Two-section poles joined by circumferential welds will not be permitted, unless otherwise shown on the plans. Poles may be fabricated in two sections and field-assembled by the lap-joint method. The two sections shall telescope together with a lap length of not less than 1-1/2 times the shaft diameter at the lap joint.
- Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
- Lubricate and tighten anchor bolts, when erecting shoe base poles and concrete traffic barrier base poles, in accordance with Item 449, "Anchor Bolts."
- All poles, except Transformer Base Poles, shall have hand holes with reinforcing frames and covers. For ground mounted shoe base poles, hand holes shall be placed 90 degrees to mast arm unless otherwise noted on the plans. For poles mounted on a concrete traffic barrier with one luminaire arm, hand holes shall be located 180 degrees from luminaire arm. For poles mounted on a concrete traffic barrier with two luminaire arms, all hand holes shall be on the same side of the barrier. For poles mounted on a bridge lighting bracket or a retaining wall lighting bracket, hand hole shall be on traffic side of the pole, at a height that will clear the barrier.
- The finished pole shall have a smooth, uniform finish free of pits, blisters, or other defects. Scratched, chipped, and other damaged galvanized areas on poles and mast arms shall be repaired in accordance with Item 445, "Galvanizing."
- Pole length is based on a 5'-6" luminaire arm rise. 4 ft. luminaire arms have a 2'-6" rise. A pole with 4 ft. luminaire arms will have an actual mounting height 3'-0" less than the nominal mounting height. Increasing the pole length to meet the nominal mounting height is allowed, but unnecessary unless otherwise directed by the engineer.
- Erect transformer base poles in accordance with sheet RID(1).

MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)
Pole Shaft (0.14"/ft. Taper)	A572 Gr 50, A595 Gr A, A1011 HSLAS Gr 50 CI 2 (3), or A1008 HSLAS Gr 50 CI 2	50
Base Plate and Handhole Frame	A572 Gr.50, or A36	36
T-Base Connecting Bolts	F3125 Gr A325	92
Anchor Bolts	F1554 Gr 55, A193-B7 or A321	55 105
Anchor Bolt Templates	A36	36
Heavy Hex (H.H.) Nuts	A194 Gr 2H, or A563 Gr DH	
Flat Washers	F436	

NOTES:

- 2'-6" rise for 4 ft. luminaire arms.
- Before ovalized as shown on Concrete Traffic Barrier Base Baseplate details, Sheet 4 of 4.
- A1011 SS Gr 50 may be used instead of HSLAS, provided the material meets the elongation requirements for HSLAS.

POLE ASSEMBLY FABRICATION TOLERANCES TABLE

DIMENSION	TOLERANCE
Shaft length	+1"
I.D. of outside piece of slip fitting pieces	+1/8", -1/16"
O.D. of inside piece of slip fitting pieces	+1/32", -1/8"
Shaft diameter: other	+3/16"
Out of "round"	1/4"
Straightness of shaft	±1/4" in 10 ft
Twist in multi-sided shaft	4° in 50 ft
Perpendicular to baseplate	1/8" in 24"
Pole centered on baseplate	±1/4"
Location of Attachments	±1/4"
Bolt hole spacing	±1/16"

SHEET 2 OF 4

Texas Department of Transportation

 Traffic Safety Division Standard

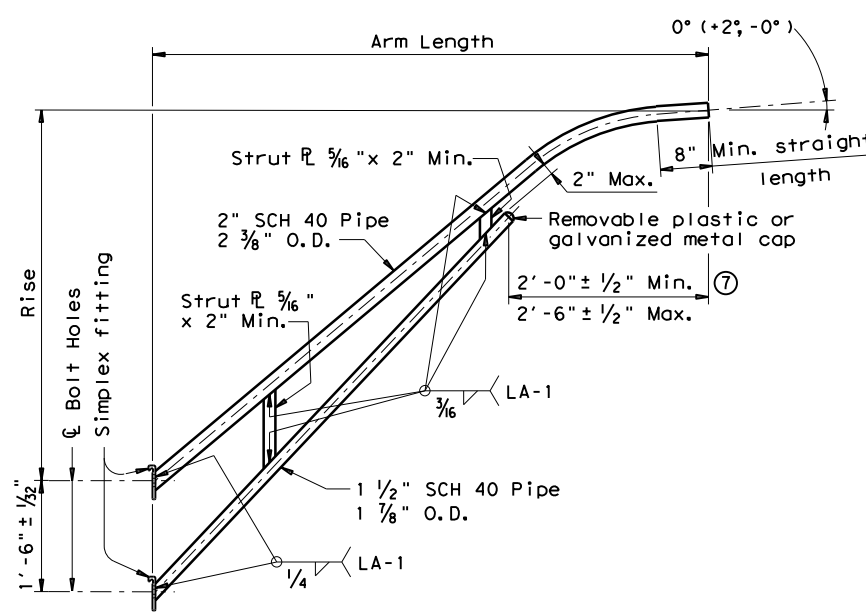
ROADWAY ILLUMINATION POLES

RIP(2) - 19

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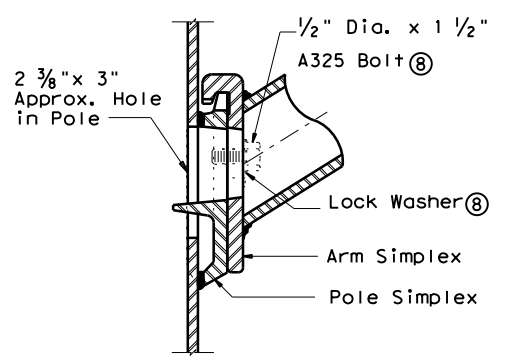
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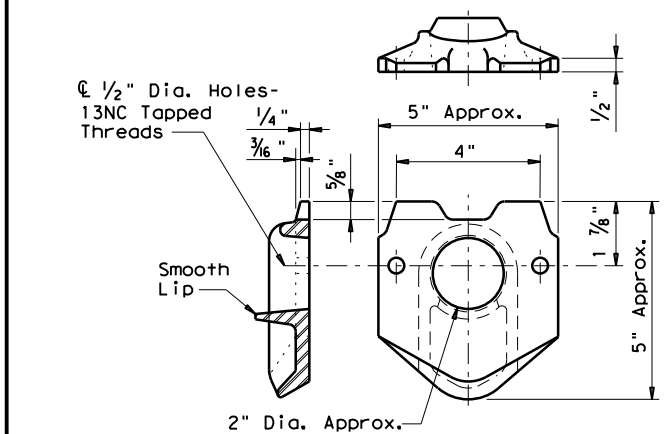
LUMINAIRE ARM

LUMINAIRE ARM DIMENSIONS		
Nominal Arm Length	Arm Length	Rise
4'-0"	3'-6"	2'-6"
6'-0"	5'-6"	5'-6"
8'-0"	7'-6"	5'-6"
10'-0"	9'-6"	5'-6"
12'-0"	11'-6"	5'-6"

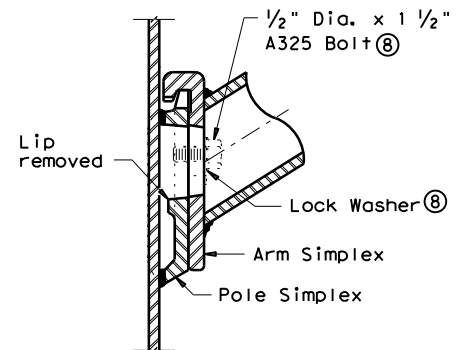
ARM ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Arm Length	±1"
Arm Rise	±1"
Deviation from flat	1/8" in 12"
Spacing between holes	±1/32"



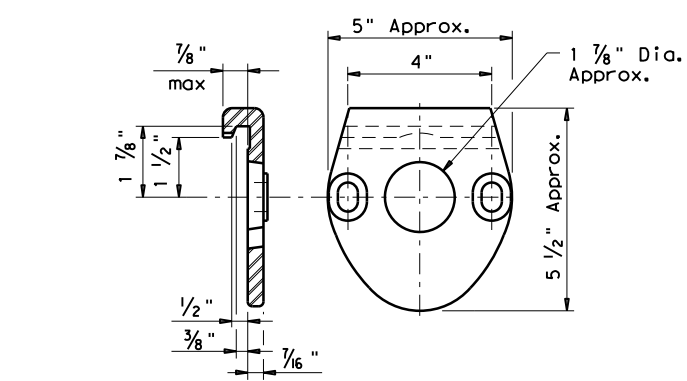
UPPER SIMPLEX FITTING
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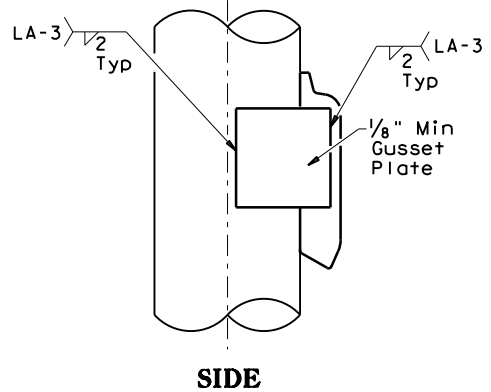
POLE SIMPLEX DETAIL



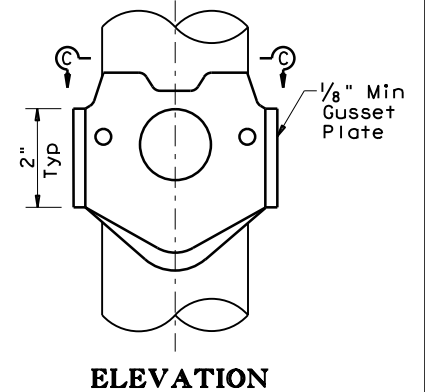
LOWER SIMPLEX FITTING
(Gusset not shown for clarity)



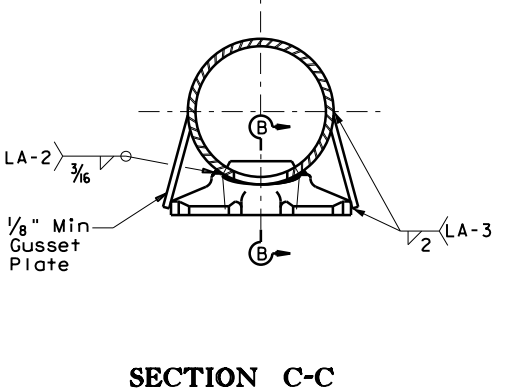
ARM SIMPLEX DETAIL



SIDE

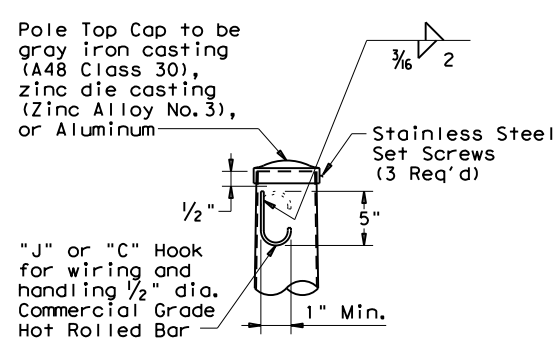


ELEVATION

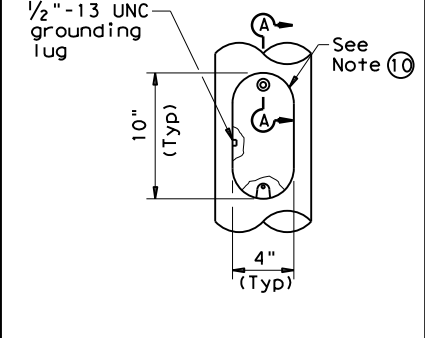


SECTION C-C

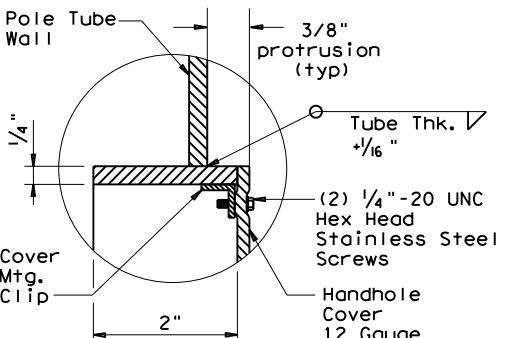
SIMPLEX ATTACHMENT DETAIL



POLE TOP



ELEVATION



SECTION A-A

HANDHOLE

NOTES:

- ④ Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.
- ⑤ 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.
- ⑥ A572, A1008 HSLAS-F, and A1011 HSLAS-F materials may have higher yield strengths but shall not have less elongation than the grade indicated.
- ⑦ 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.
- ⑧ Each pole simplex fitting shall be supplied with 2 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.
- ⑨ Proposed deviations in arm simplex dimensions or materials must be submitted to the Department for approval.
- ⑩ A welded handhole frame is permissible. Maximum of two (2) CJP weld splices is allowed.

MATERIALS

Pole or Arm Simplex	ASTM A27 Gr 65-35 or Gr 70-36, A148 Gr 80-50, A576 Gr 1021 ⑤, or A36 (Arm only)
Arm Pipes	ASTM A53 Gr A or B, A500 Gr B, A501, A 1008 HSLAS-F Gr 50 ⑥, or A1011 HSLAS-F Gr 50 ⑥
Arm Struts and Gusset Plates ④	ASTM A36, A572 Gr 50 ⑥, or A588
Misc.	ASTM designations as noted

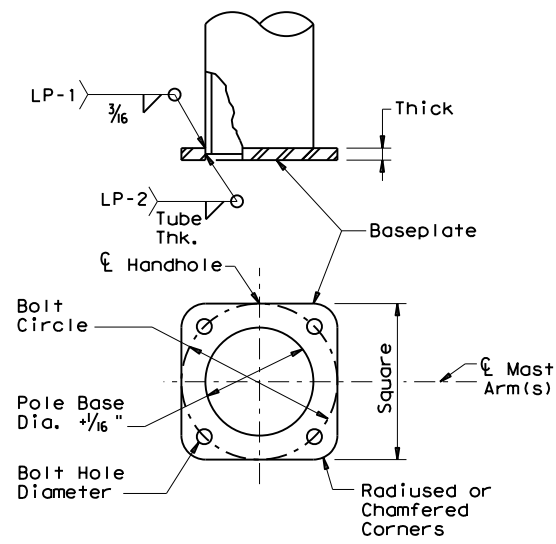
SHEET 3 OF 4



ROADWAY ILLUMINATION POLES
RIP(3)-19

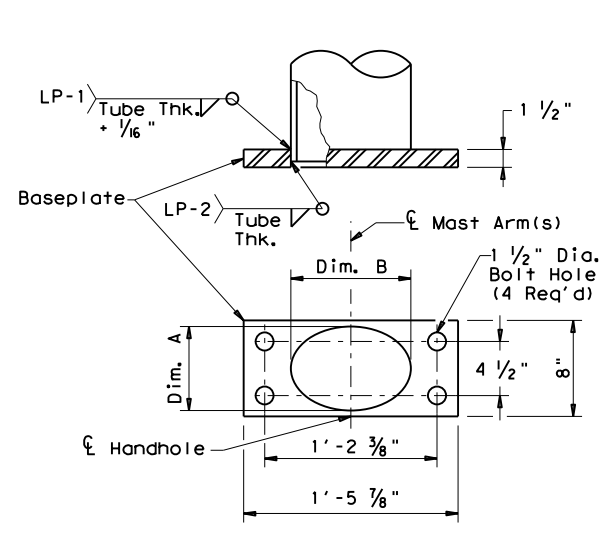
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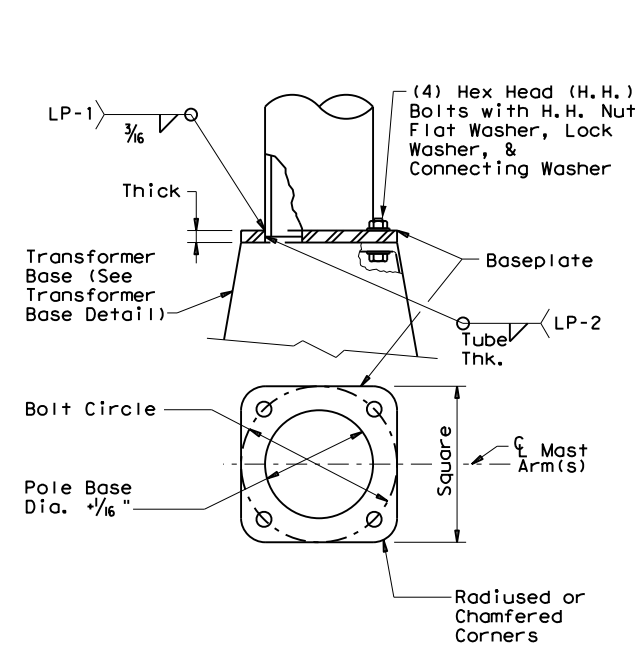
SHOE BASE BASEPLATE

SHOE BASE BASEPLATE TABLE				
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	BOLT HOLE DIAMETER
20' - 39'	13"	13"	1 1/4"	1 1/4"
40'	15"	15"	1 1/4"	1 1/2"
50'	15"	15"	1 1/2"	1 1/2"



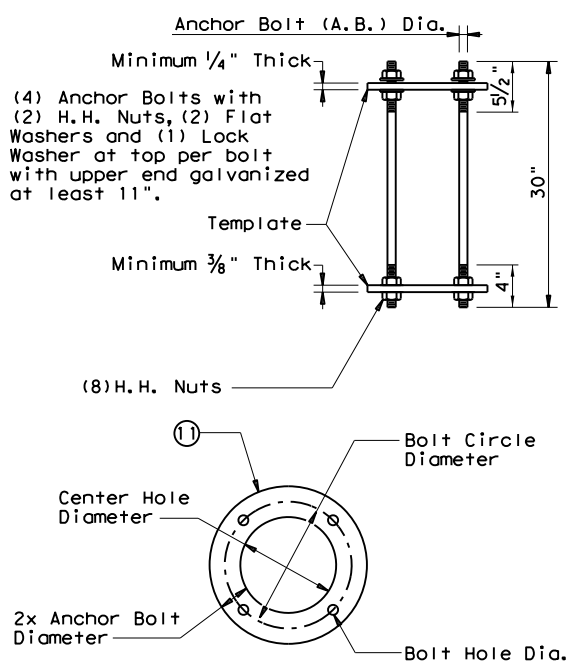
CONCRETE TRAFFIC BARRIER BASE BASEPLATE

CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA. (1)	DIM. A	DIM. B
28' - 38'	9"	7" ± 1/4"	10" ± 1/4"
48'	10 1/2"	7" ± 1/4"	13" ± 1/4"



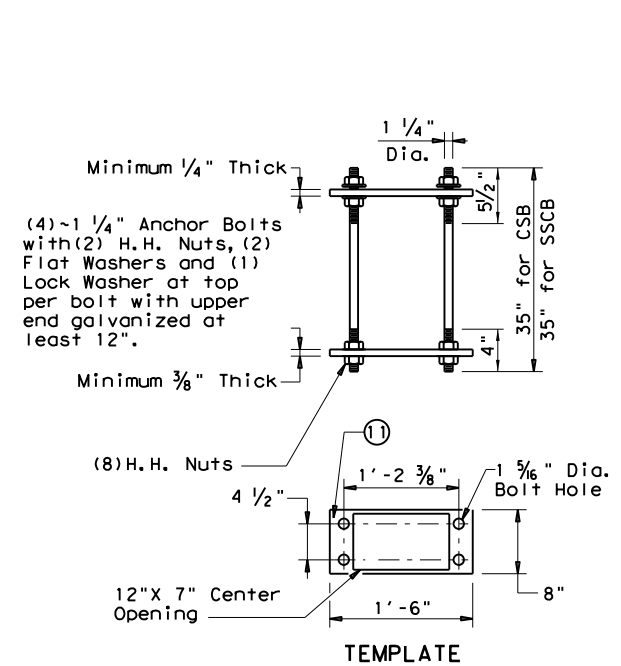
TRANSFORMER BASE BASEPLATE

TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFORMER BASE TYPE
20' - 39'	13"	13"	1 1/4"	1"	1 1/4"	A
40'	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50'	15"	15"	1 1/2"	1 1/4"	1 1/2"	B



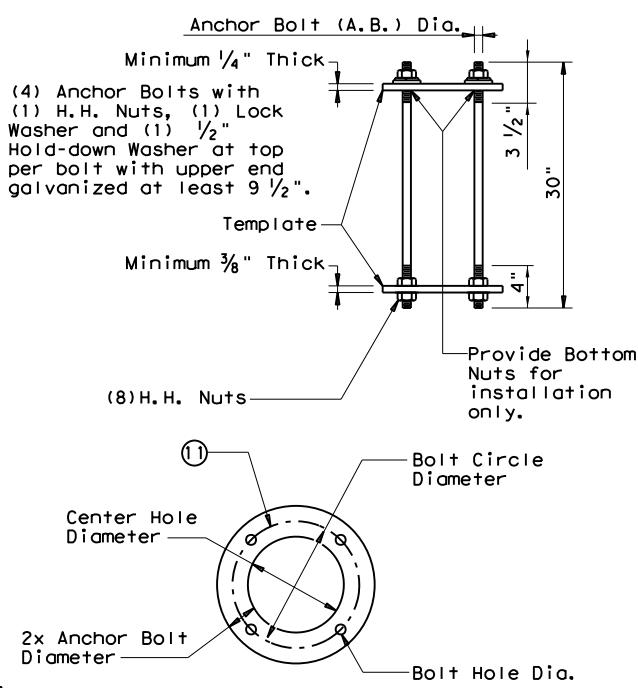
SHOE BASE ANCHOR BOLT ASSEMBLY

SHOE BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20' - 39'	1"	13"	11"	1 1/16"
40' - 50'	1 1/4"	15"	12 1/2"	1 5/16"



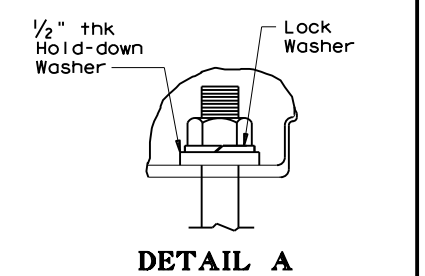
CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

TRANSFORMER BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20' - 39'	1"	14"	12"	1 1/16"
40' - 50'	1 1/4"	17 1/4"	14 3/4"	1 5/16"

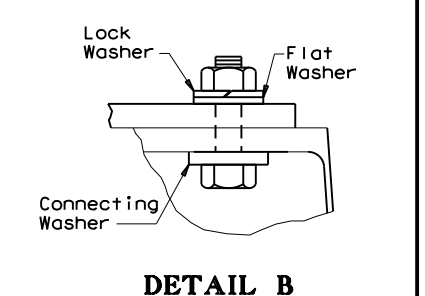


TRANSFORMER BASE ANCHOR BOLT ASSEMBLY

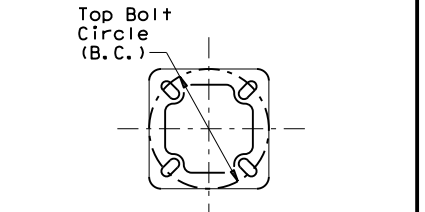
TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



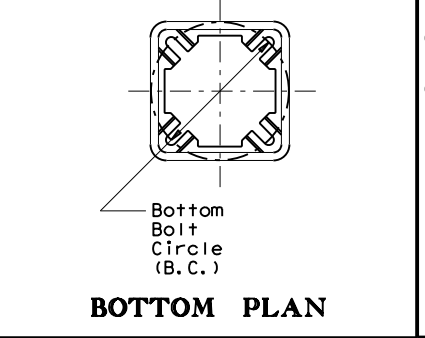
DETAIL A



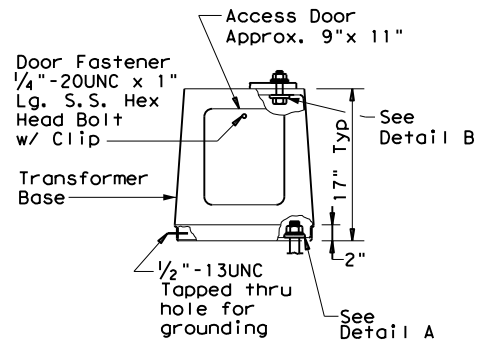
DETAIL B



TOP PLAN



BOTTOM PLAN



ELEVATION

TRANSFORMER BASE DETAILS

GENERAL NOTES:

- For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
- All breakaway bases shall meet the breakaway requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to resist 150% of the design moment.
- Transformer bases shall be cast from aluminum, ASTM B108 or B26 Alloy 356.0-T6, or other material approved by the Engineer. Four Hex Head (H.H.) bolts with four H.H. nuts, four lock washers, four flat washers, and connecting and hold-down washers as recommended by the manufacturer, galvanized to ASTM A153 Class C or D, or B695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A563 grade DH galvanized.
- Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
- Doors for transformer bases shall be made of plastic, fiberglass or other non-metallic material approved by the Engineer and shall be attached with stainless steel screws or bolts. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.

NOTES:

- Anchor Bolt Templates do not need to be galvanized.
- Pole diameter before ovalized.

ANCHOR BOLT FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"

SHEET 4 OF 4

Texas Department of Transportation

Traffic Safety Division Standard

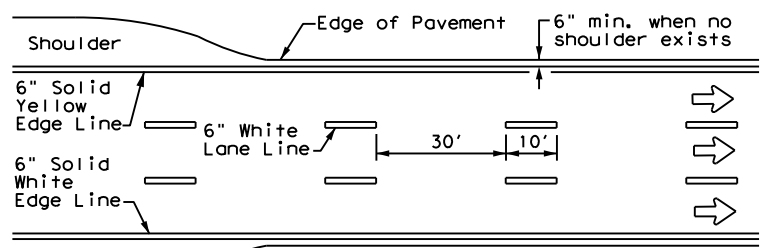
ROADWAY ILLUMINATION POLES

RIP(4) - 19

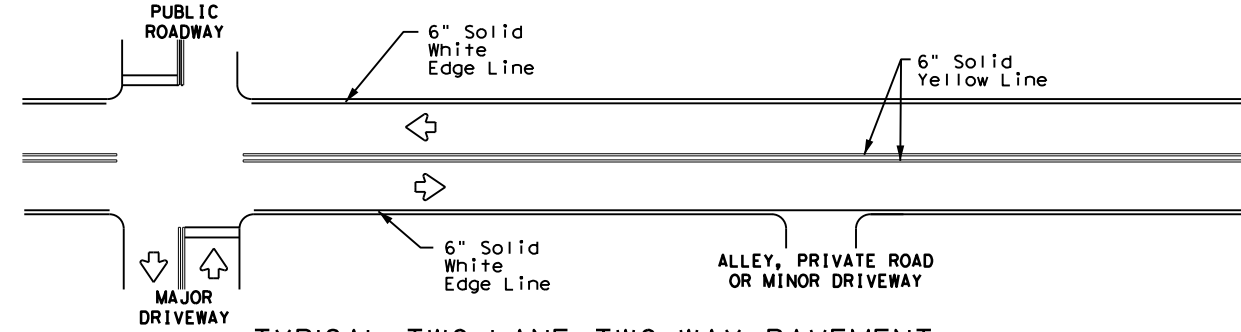
FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918 24	267, ETC.	VAR	
7-17	DIST	COUNTY	SHEET NO.	
12-19	DAL	COL, ETC.	124	

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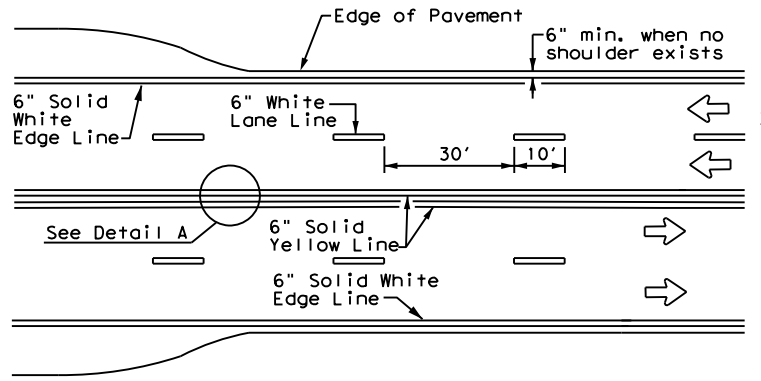
DATE: FILE:



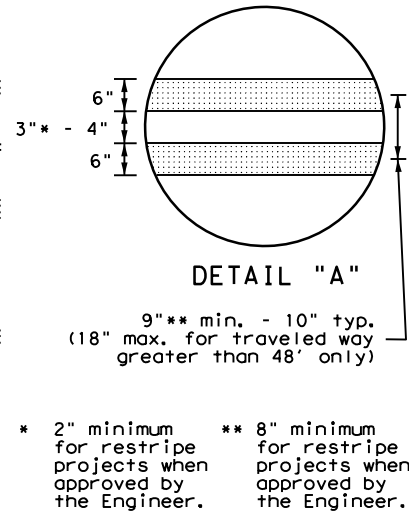
EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



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

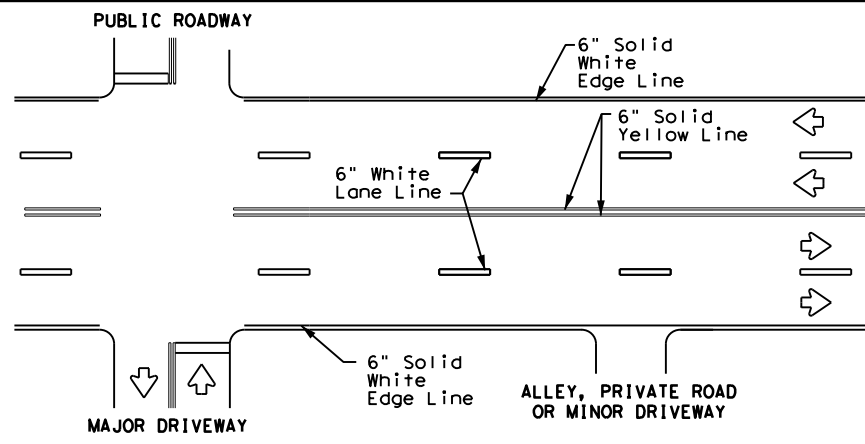


CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

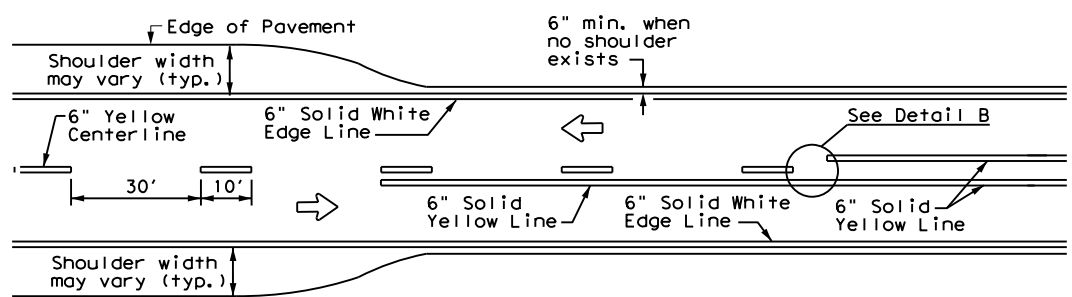


DETAIL "A"
9" min. - 10" typ.
(18" max. for traveled way greater than 48' only)

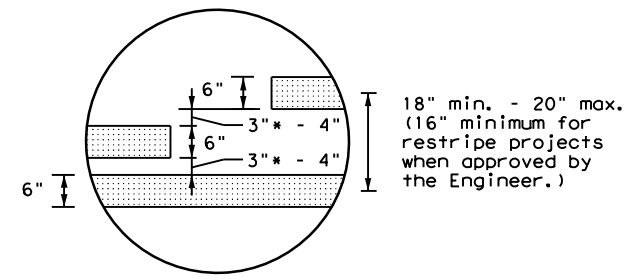
* 2" minimum for restripe projects when approved by the Engineer.
** 8" minimum for restripe projects when approved by the Engineer.



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

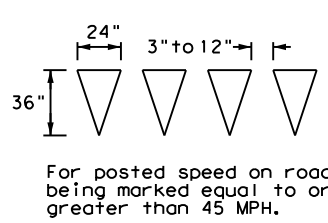


TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



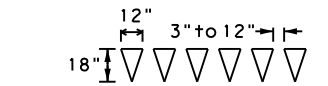
DETAIL "B"
18" min. - 20" max.
(16" minimum for restripe projects when approved by the Engineer.)

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



YIELD LINES

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



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

NOTES

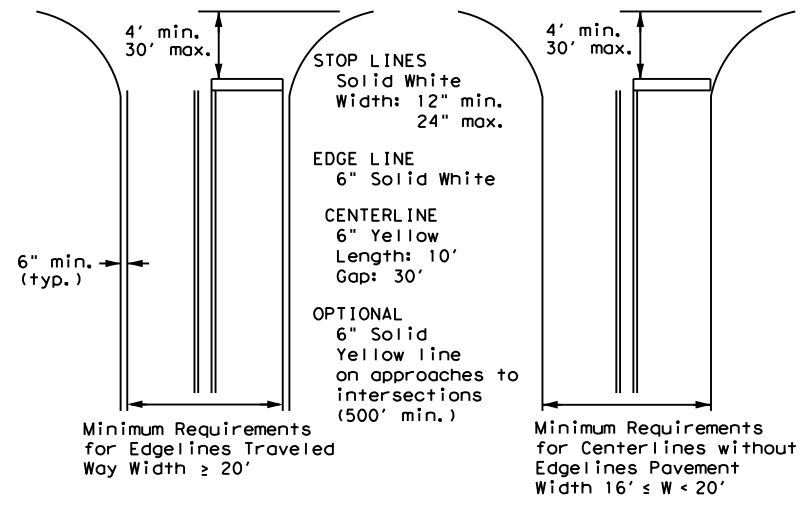
- Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling 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.
- 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.
- 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

- 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.
- 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.

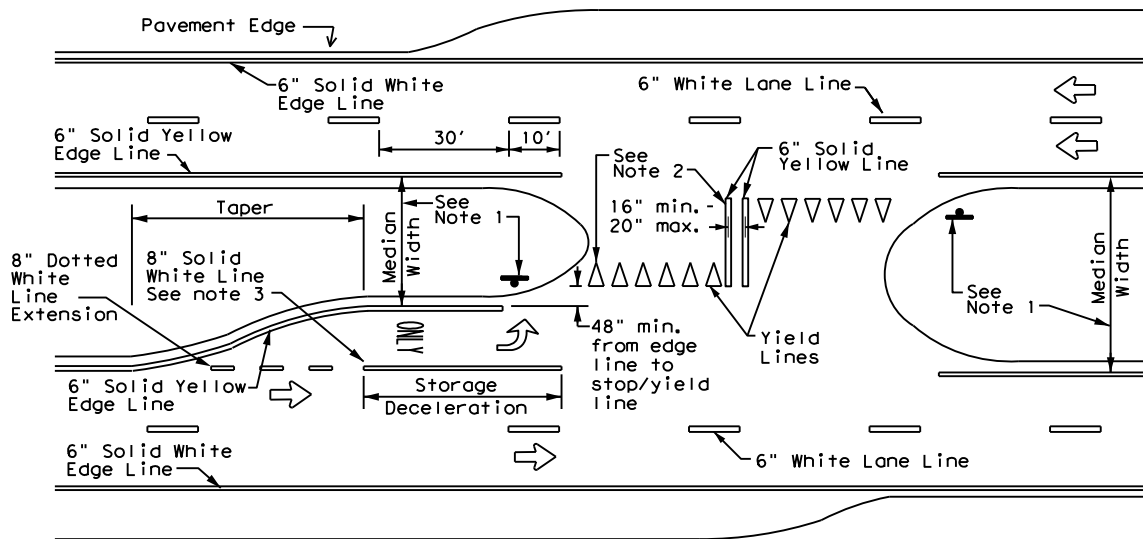
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

Texas Department of Transportation
 Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

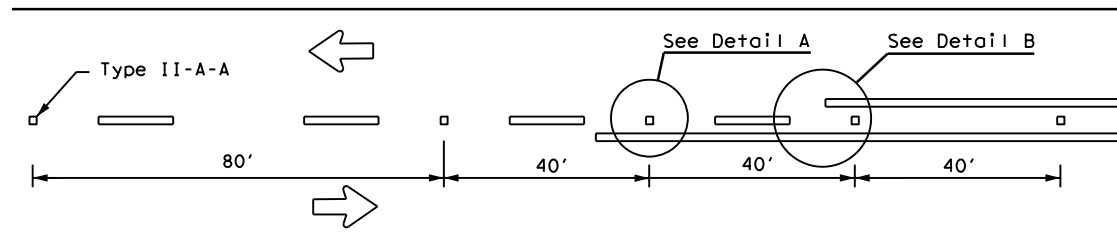
PM(1) - 22

FILE: pm1-22.dgn	DN: []	CK: []	DW: []	CK: []
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918	24	267, ETC.	VAR
11-78 8-00 6-20	DIST	COUNTY	SHEET NO.	
8-95 3-03 12-22	DAL	COL, ETC.	125	
5-00 2-12				

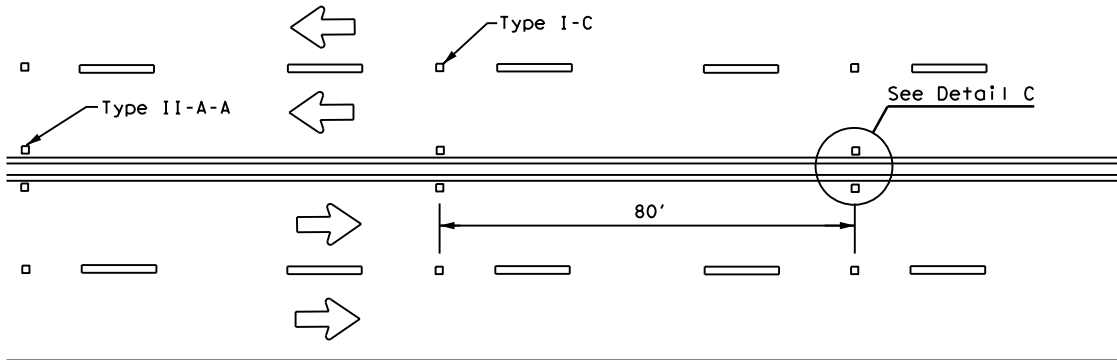
22A

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

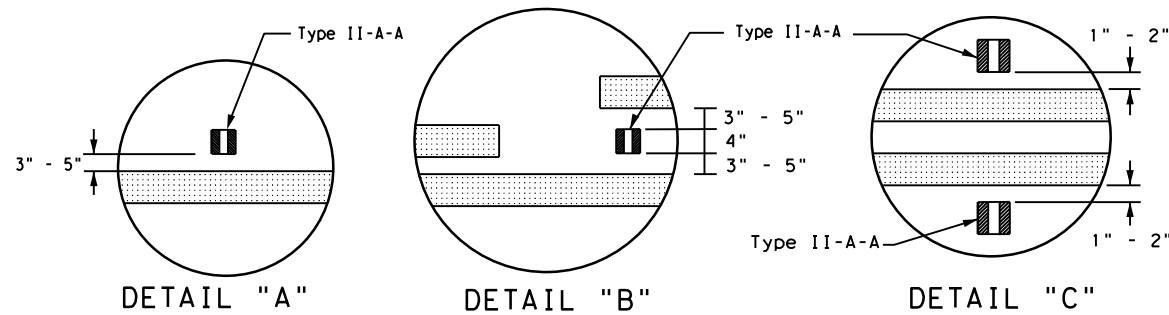
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CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS



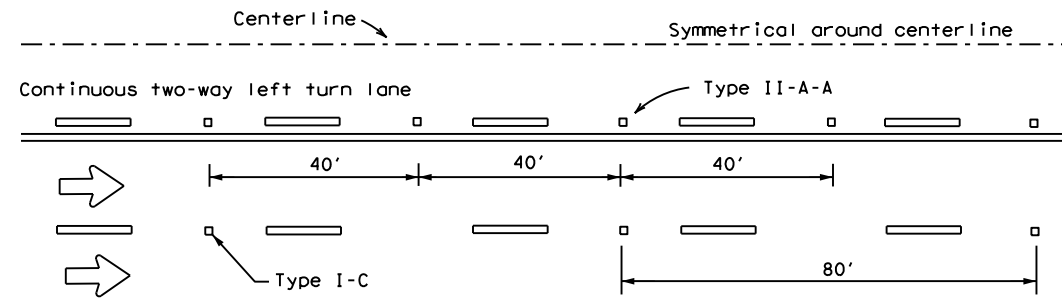
CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY ROADWAYS



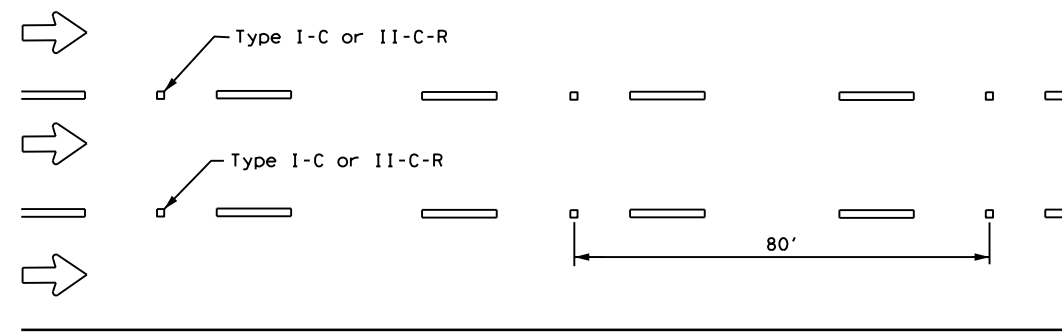
DETAIL "A"

DETAIL "B"

DETAIL "C"



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

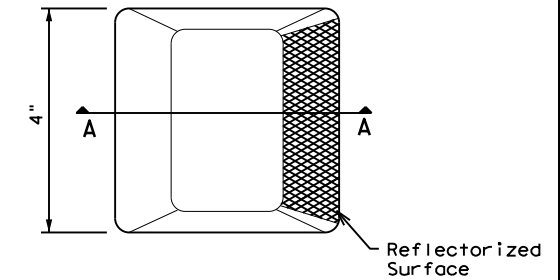


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

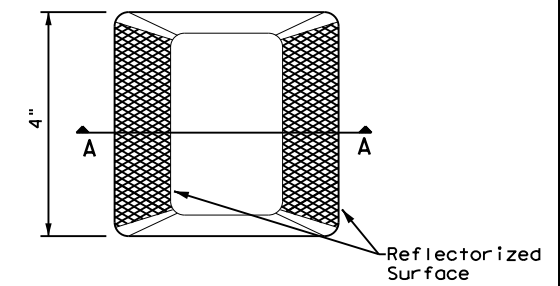
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.
See Note 3.

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

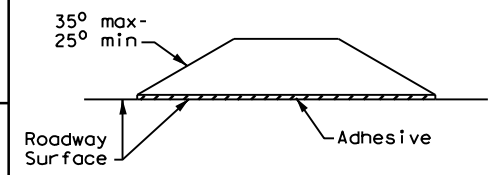
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



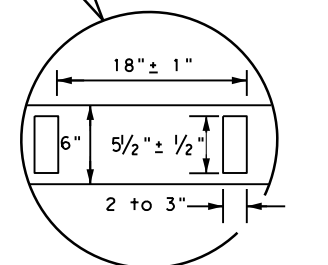
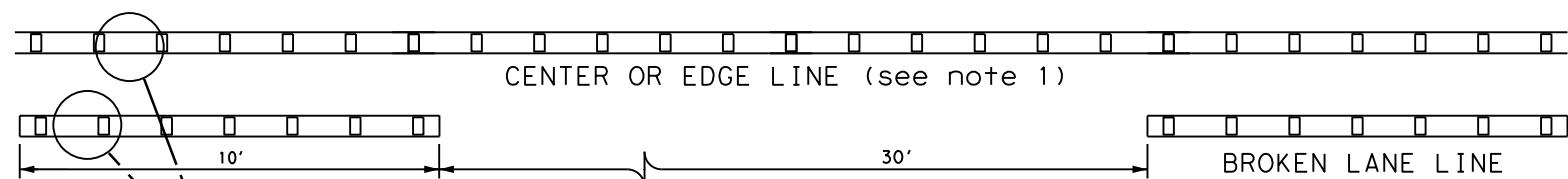
SECTION A

RAISED PAVEMENT MARKERS



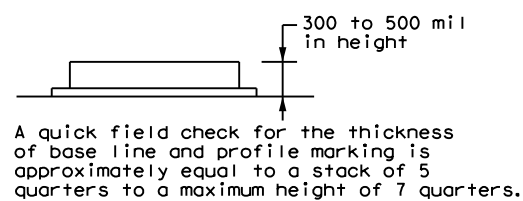
POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2) - 22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918 24	267, ETC.	VAR	
4-77 8-00 6-20	DIST	COUNTY	SHEET NO.	
4-92 2-10 12-22	DAL	COL, ETC.	126	
5-00 2-12				



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

- Edge lines should typically be 6" wide and the materials shall be specified in the plans.
- Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

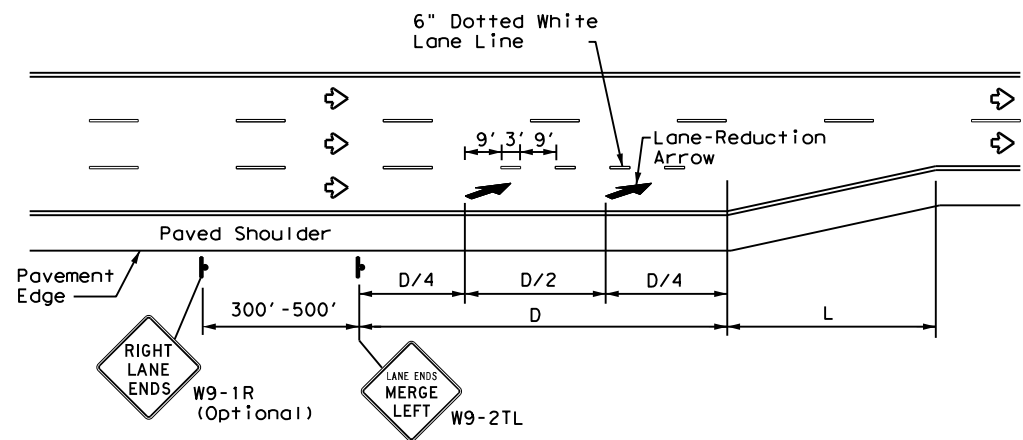
GENERAL NOTES

- All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
- 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.

DATE:
FILE:

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DATE: FILE:



LANE REDUCTION

NOTES

- 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.
- 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.
- 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.
- For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

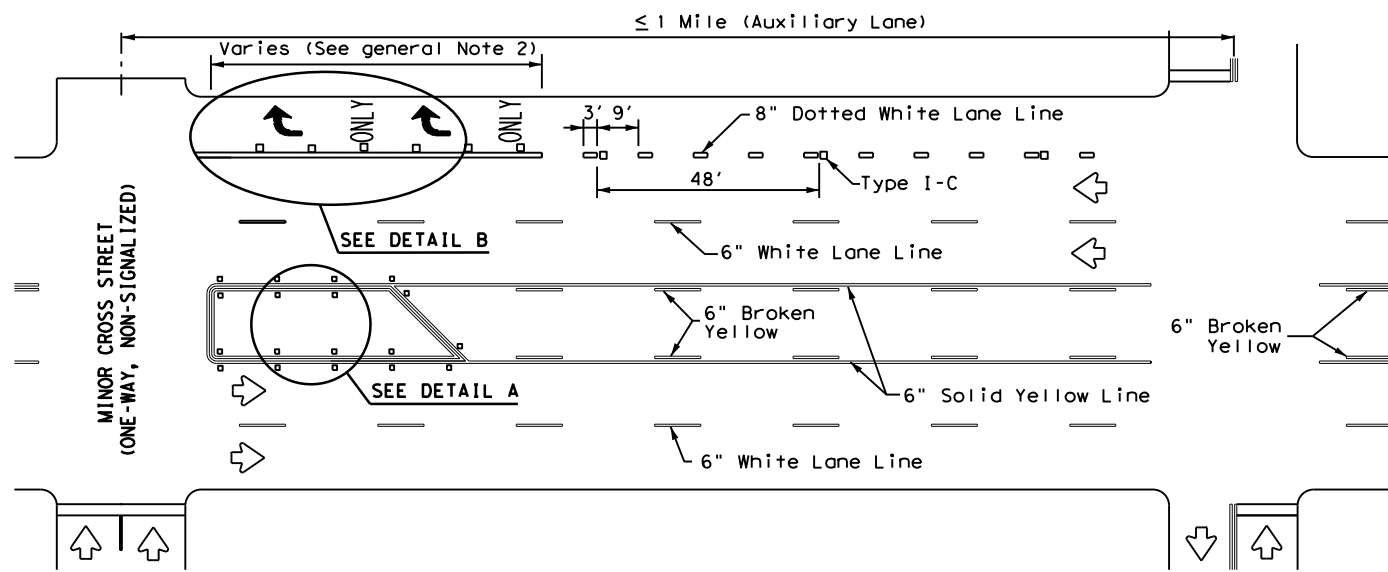
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L = \frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

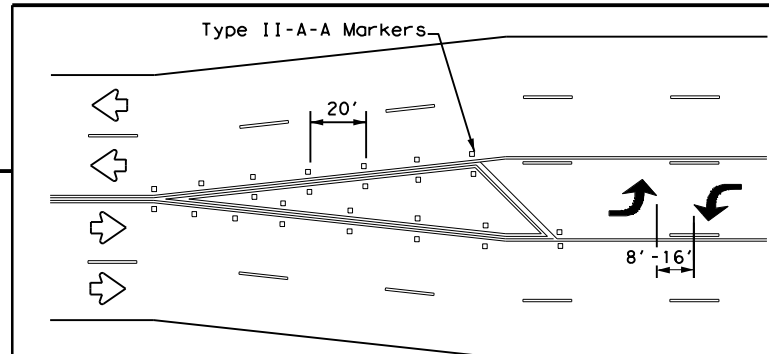
- Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
- 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.
- 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.
- 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.

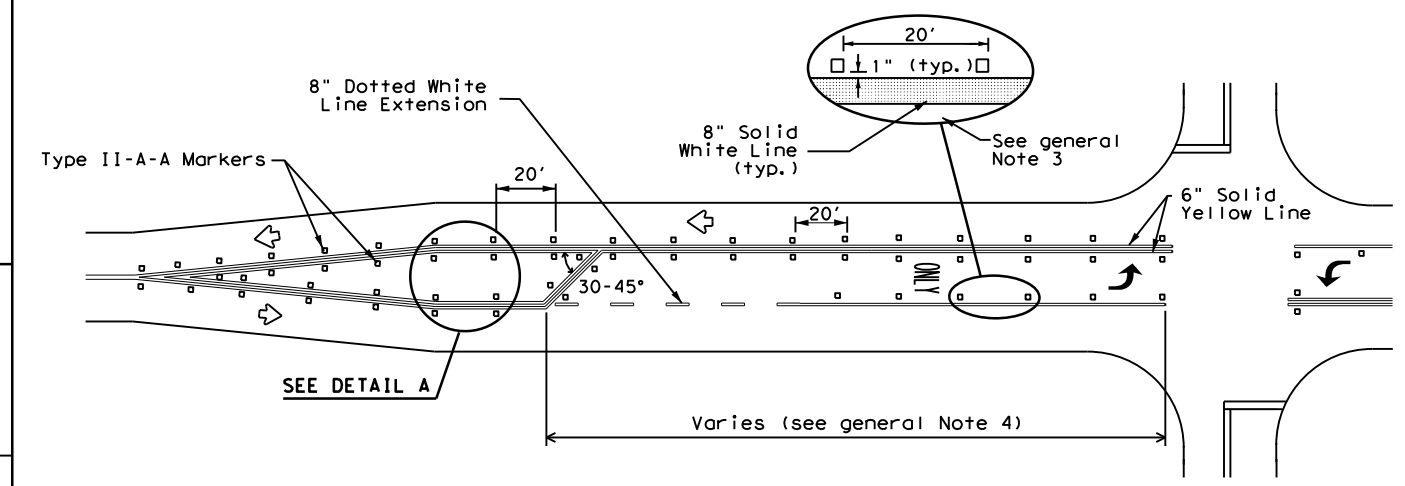


TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE

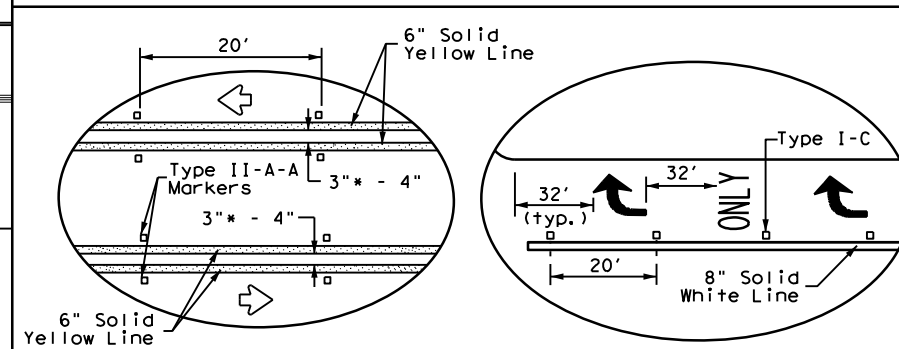


A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



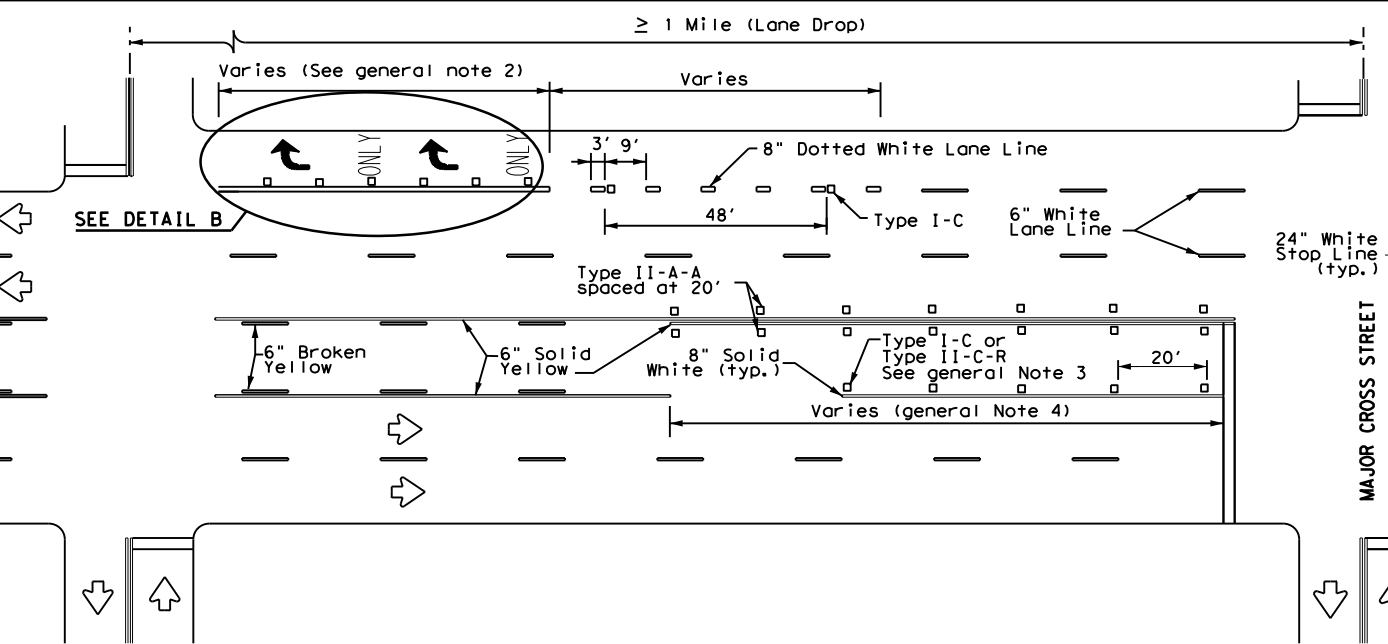
TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A

DETAIL B

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



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP

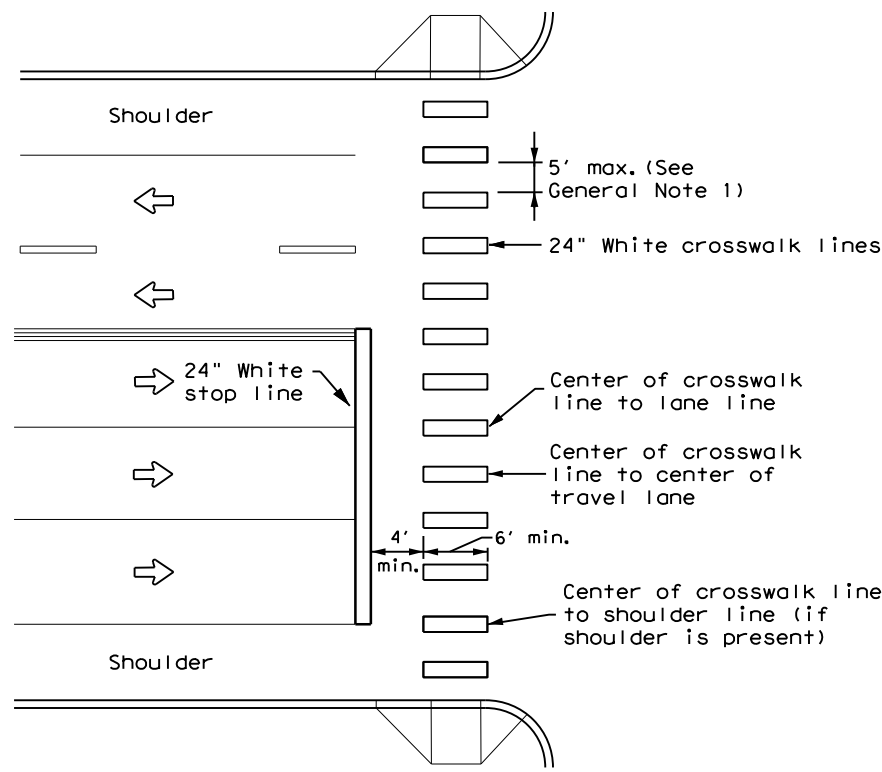
Texas Department of Transportation
Traffic Safety Division Standard

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	0918	24	267, ETC.	VAR
4-98 3-03 6-20	DIST	COUNTY	SHEET NO.	
5-00 2-10 12-22	DAL	COL, ETC.	127	
8-00 2-12				

22C

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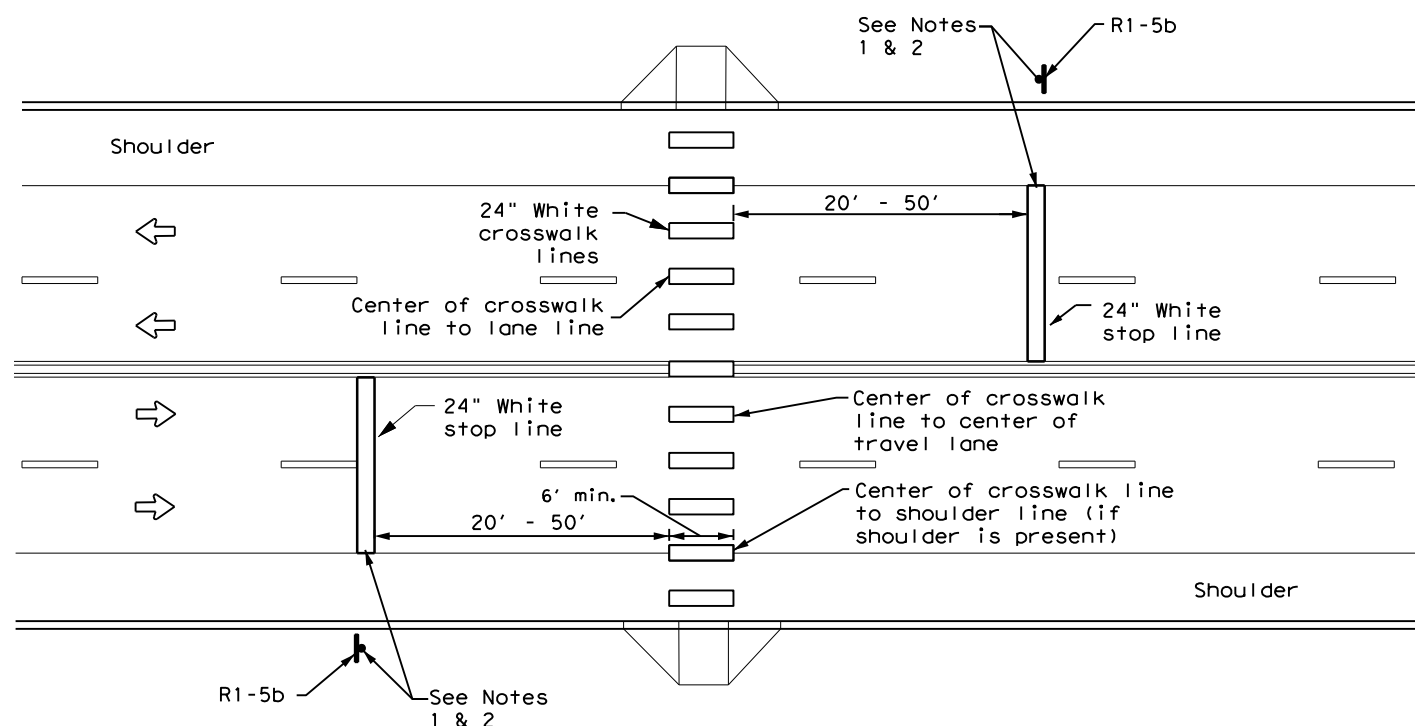
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

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

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



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock crosswalks.
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.

DATE:
FILE:

<h2>CROSSWALK PAVEMENT MARKINGS</h2> <h3>PM(4) - 22A</h3>			
FILE: pm4-22a.dgn	DN:	CK:	DW:
© TxDOT December 2022	CONT	SECT	JOB
REVISIONS		0918 24	267, ETC.
6-20		DIST	COUNTY
6-22		DAL	COL, ETC.
12-22			SHEET NO.
			128

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

- FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
- TWT = Thin-Walled Tubing (see SMD(TWT))
- 10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
- S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

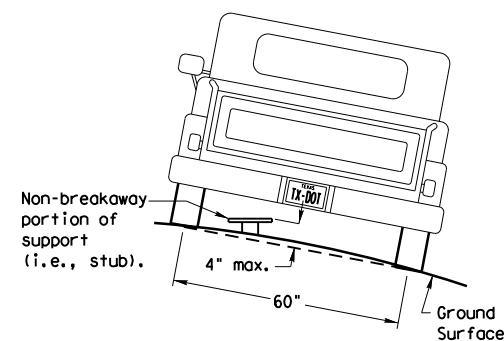
Anchor Type

- UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
- UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
- WS = Wedge Anchor Steel - (see SMD(TWT))
- WP = Wedge Anchor Plastic (see SMD(TWT))
- SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
- SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

- P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
- T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
- U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
- IF REQUIRED
- 1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
- BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
- WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
- EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

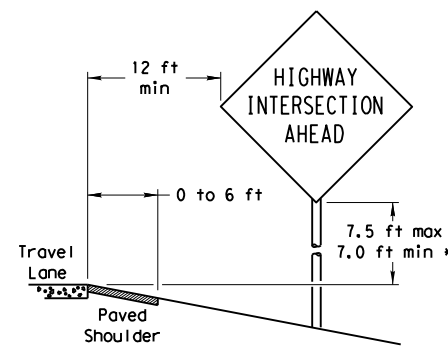
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

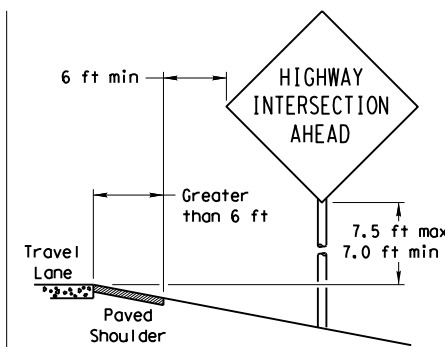
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

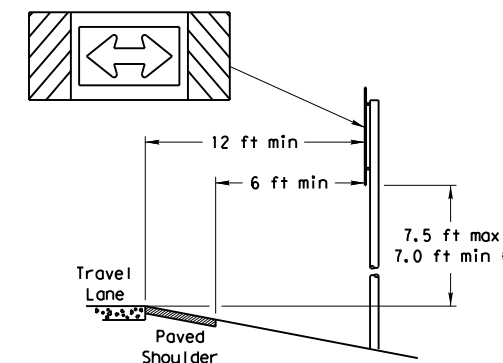
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

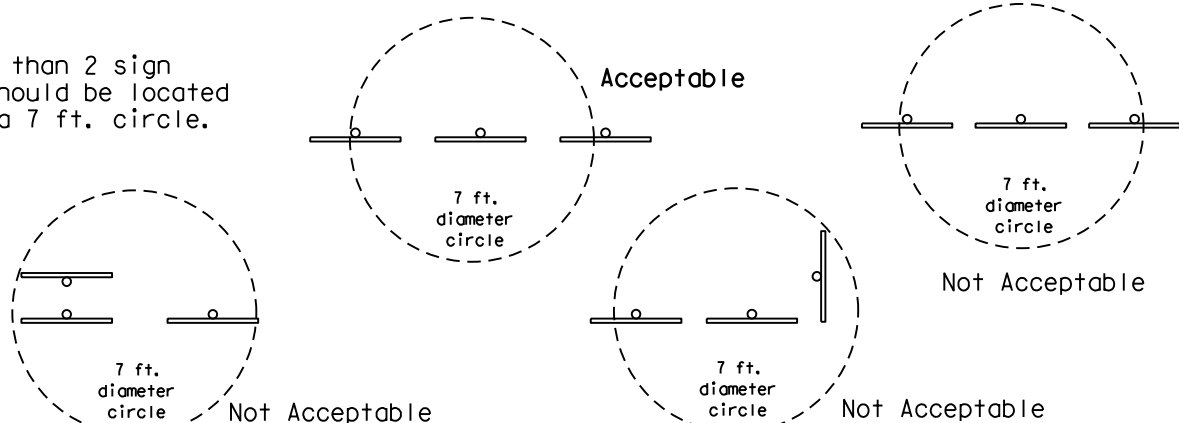
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

T-INTERSECTION

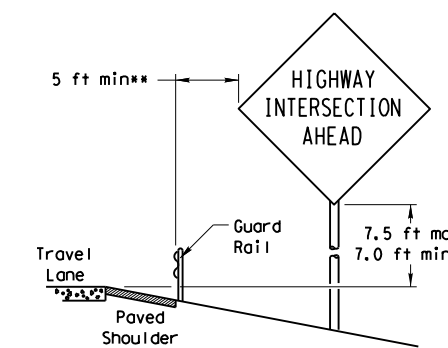


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

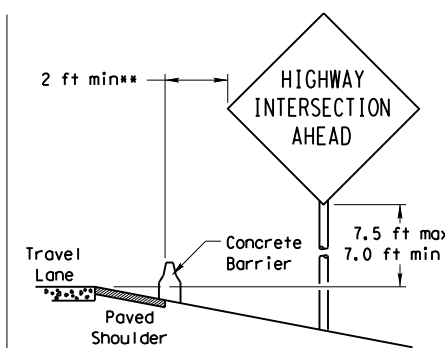
No more than 2 sign posts should be located within a 7 ft. circle.



BEHIND BARRIER



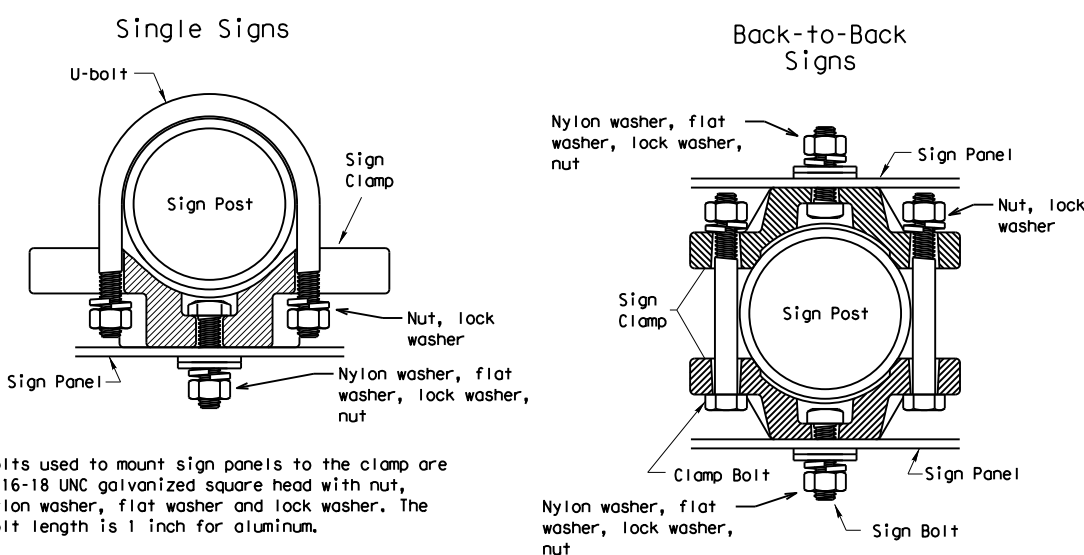
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

TYPICAL SIGN ATTACHMENT DETAIL



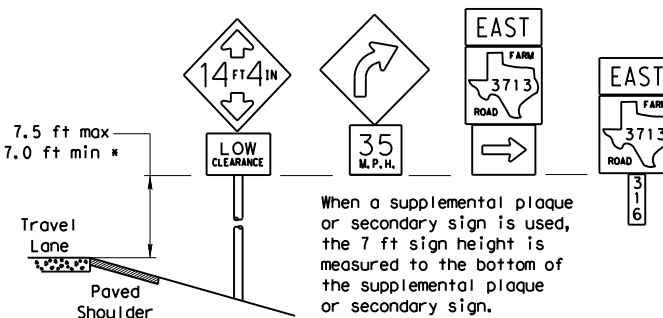
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

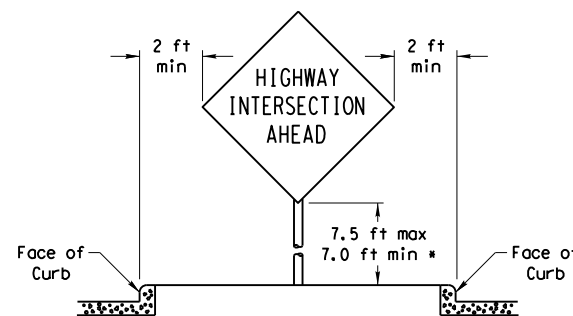
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

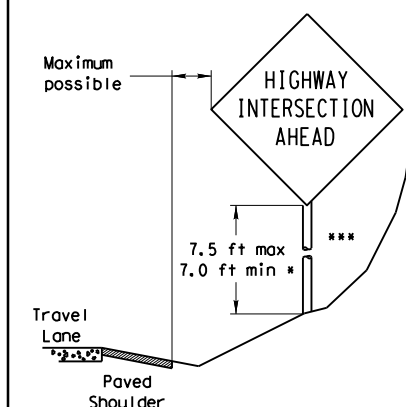


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY (When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

- (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
- (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
<http://www.txdot.gov/publications/traffic.htm>

Texas Department of Transportation
Traffic Operations Division

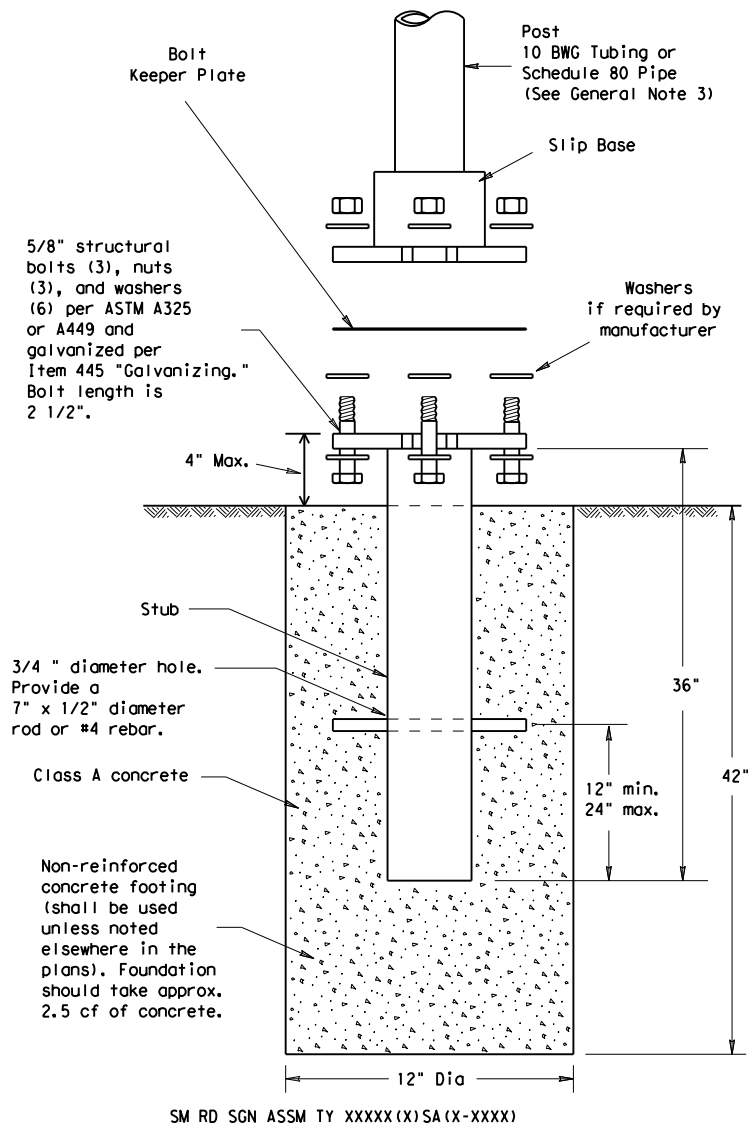
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

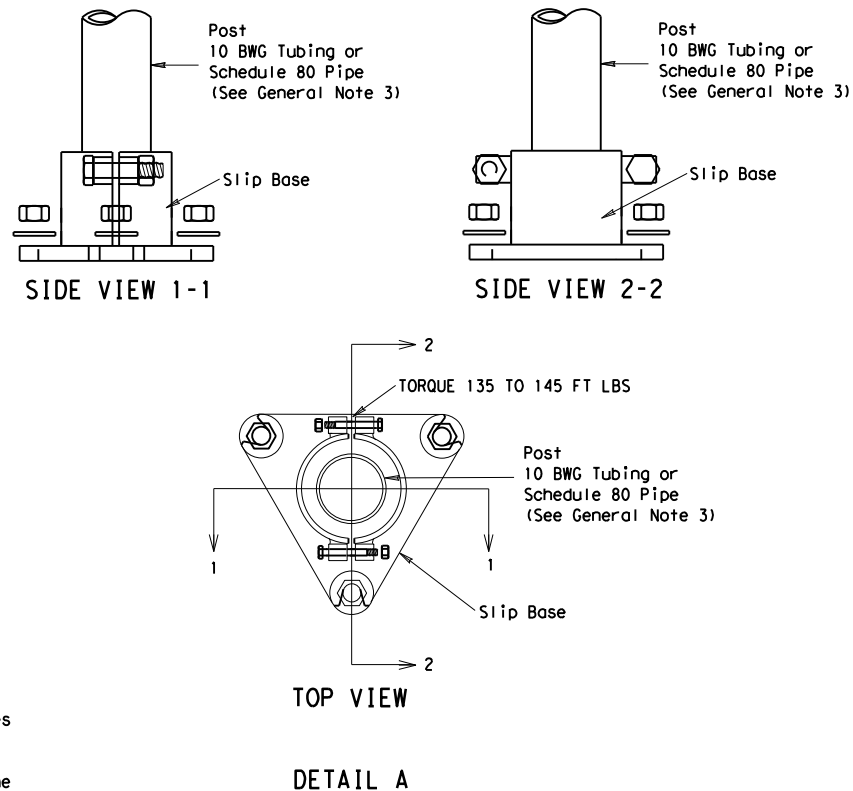
© TxDOT July 2002	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	REVISIONS	CONTRACT NO. 0918 24	JOB NO. 267, ETC.	HIGHWAY VAR
		DIST. COUNTY	SHEET NO.	
		DAL COL, ETC.	129	

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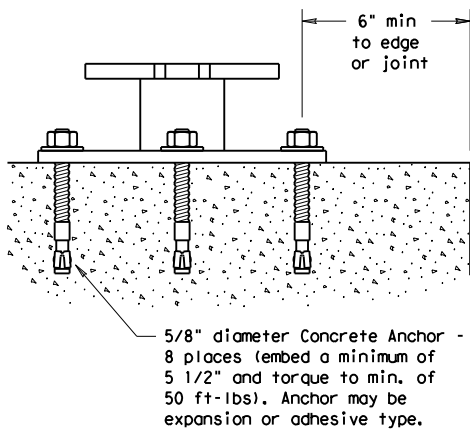
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



NOTE
The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.



CONCRETE ANCHOR



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, "Epoxyes 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.

GENERAL NOTES:

- 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.
- 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
- 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>
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

- Foundation**
- 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.
 - 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.
 - 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.
 - Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
 - The triangular slipbase system is multidirectional and is designed to release when struck from any direction.
- Support**
- 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.
 - 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.

DATE:
FILE:

ADDED DETAIL A FOR CLAMP BASE
10-2010

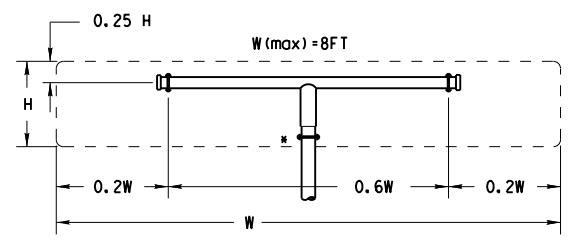
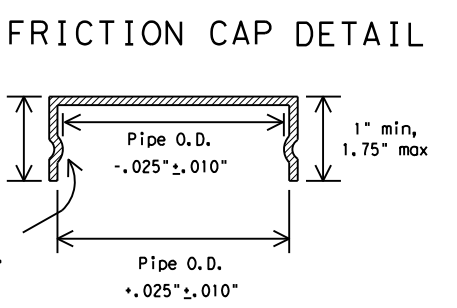
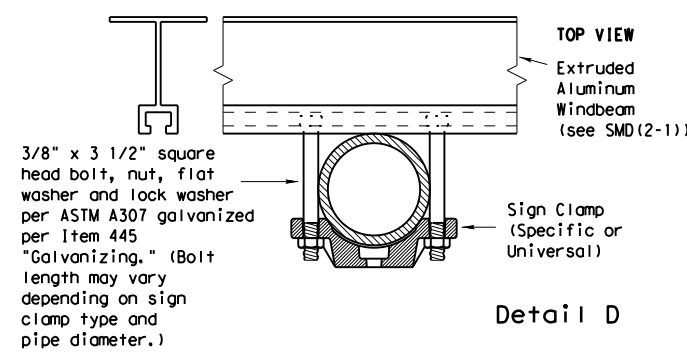
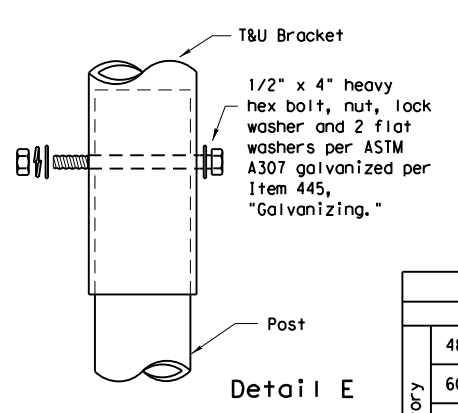
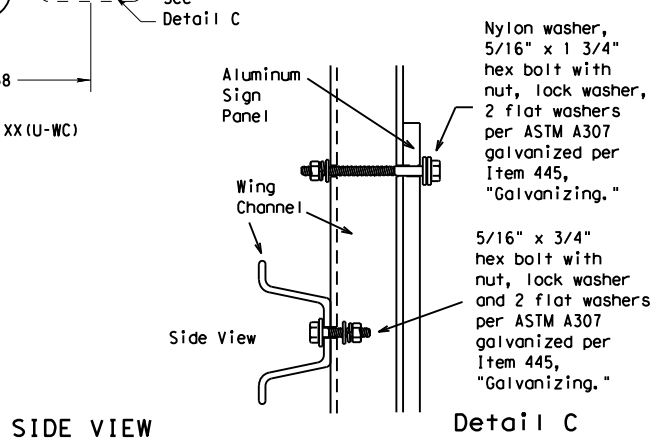
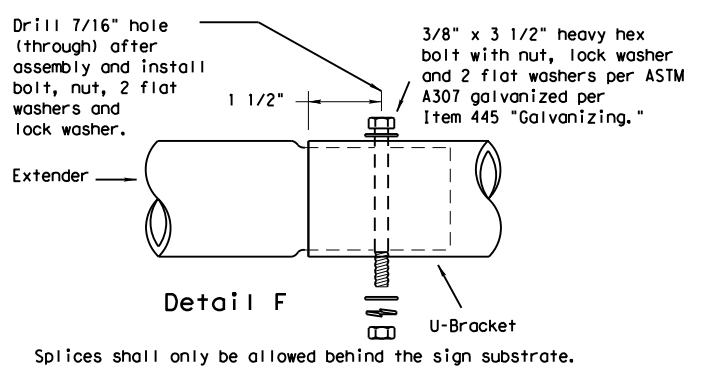
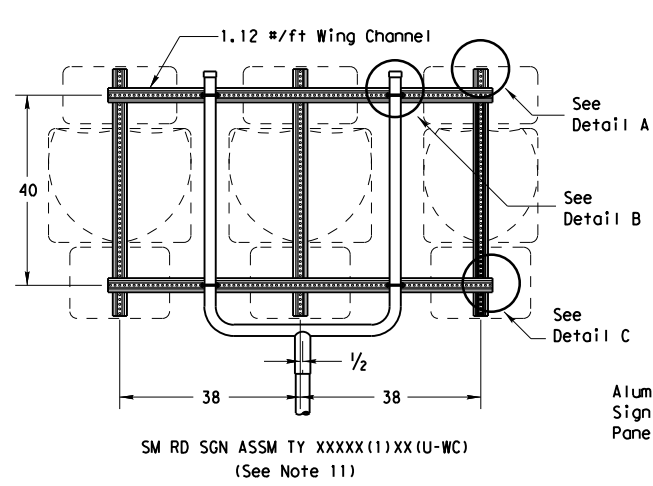
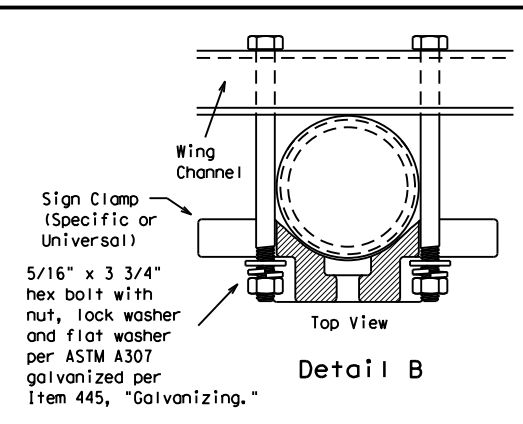
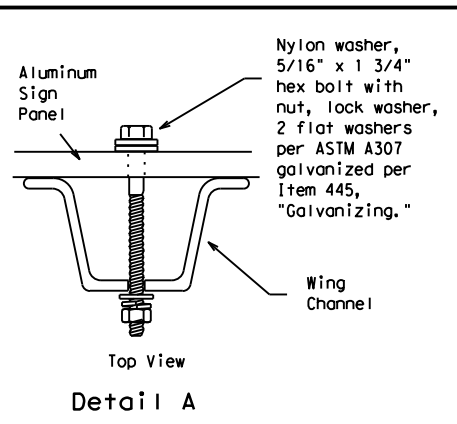
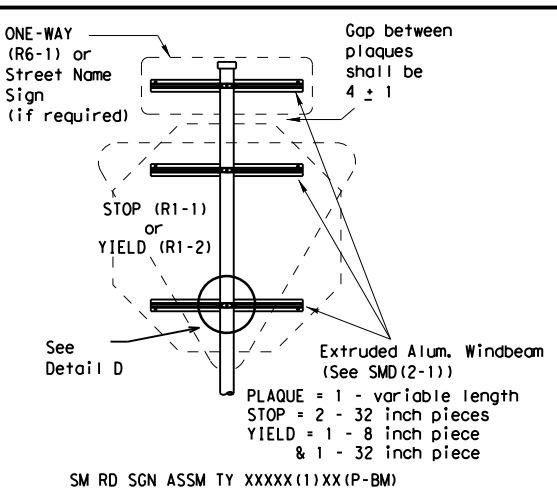
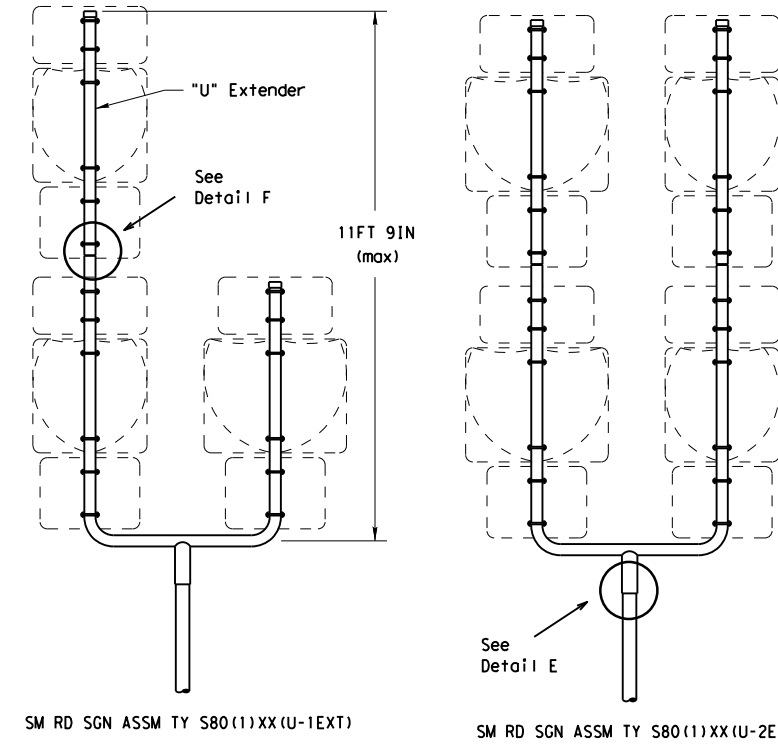
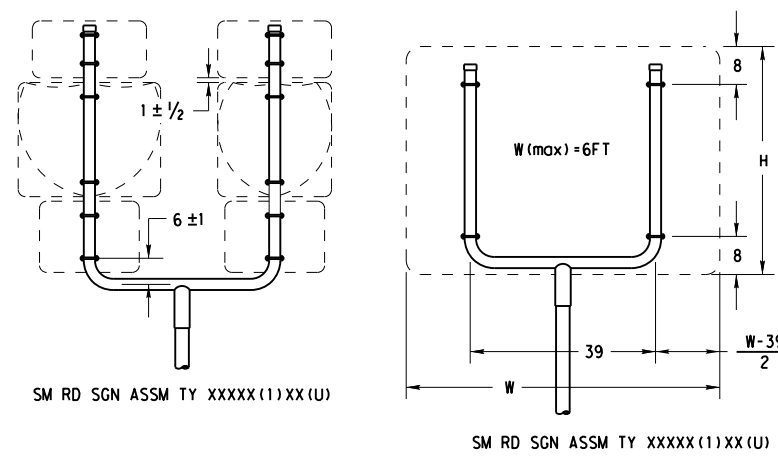
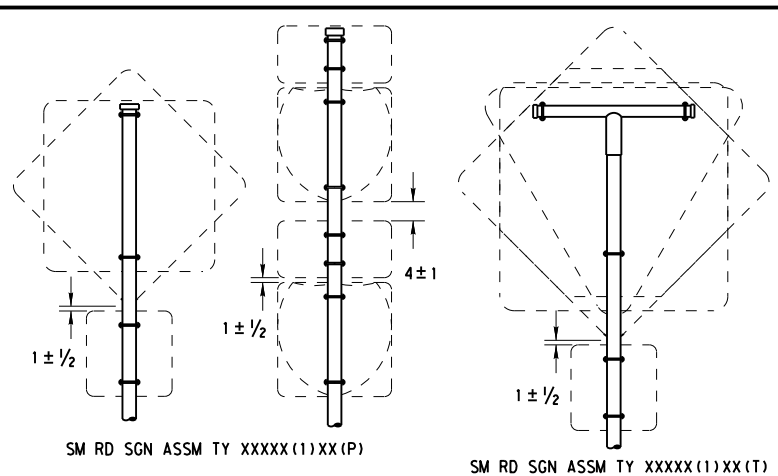


SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM SMD(SLIP-1)-08(DAL)

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
12-10 (DISTRICT)		0918	24	267, ETC.	VAR
ADDED CLAMP BASE DETAIL FOR SLIP BASE INSTALLATION		DIST	COUNTY	SHEET NO.	
		DAL	COL, ETC.	130	

26B

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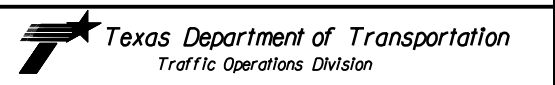
All dimensions are in english unless detailed otherwise.

GENERAL NOTES:

1. SIGN SUPPORT # OF POSTS MAX. SIGN AREA

10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT		
SIGN DESCRIPTION	SUPPORT	
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY S80(1)XX(T)
	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)	



SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-2) - 08

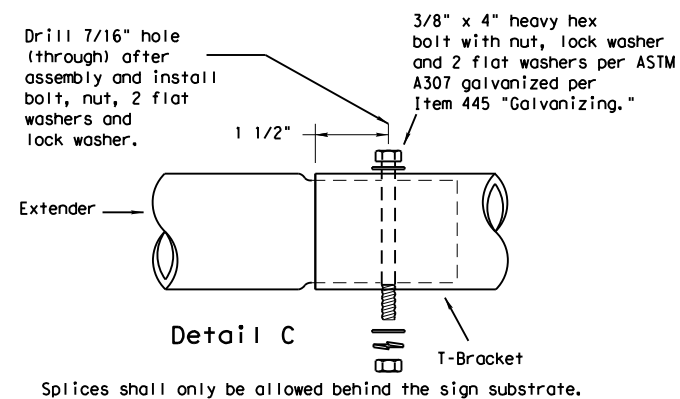
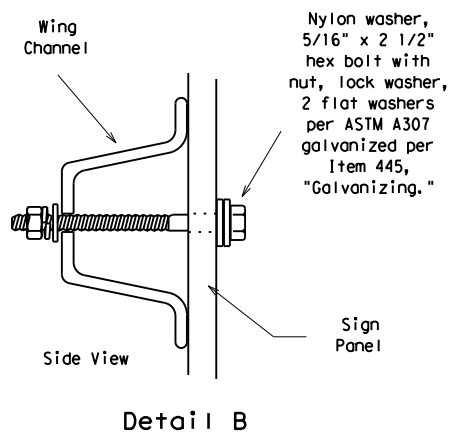
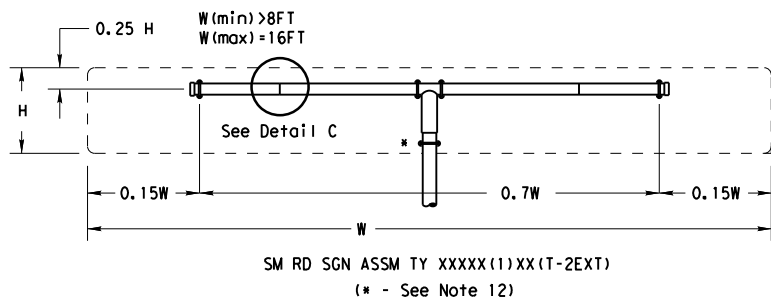
Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes. The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no 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.

DATE:
FILE:

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0918	24	267, ETC.	VAR
		DIST	COUNTY	SHEET NO.	
		DAL	COL, ETC.	131	

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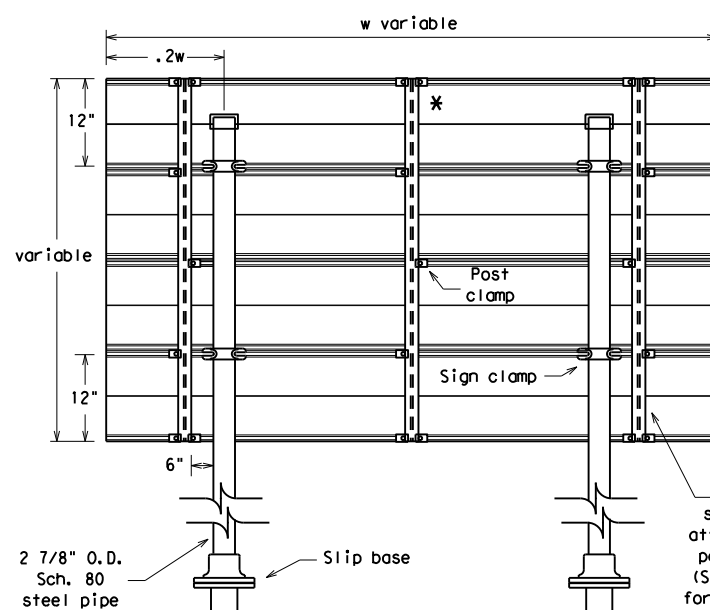
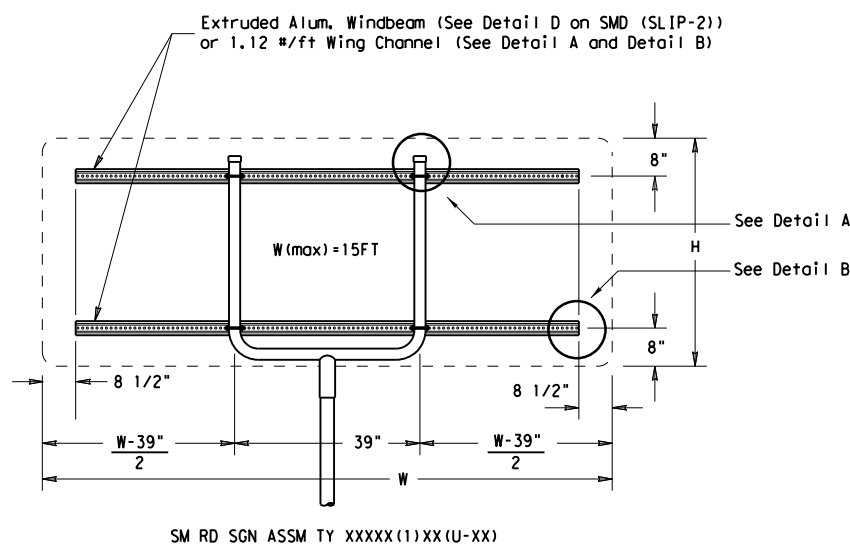
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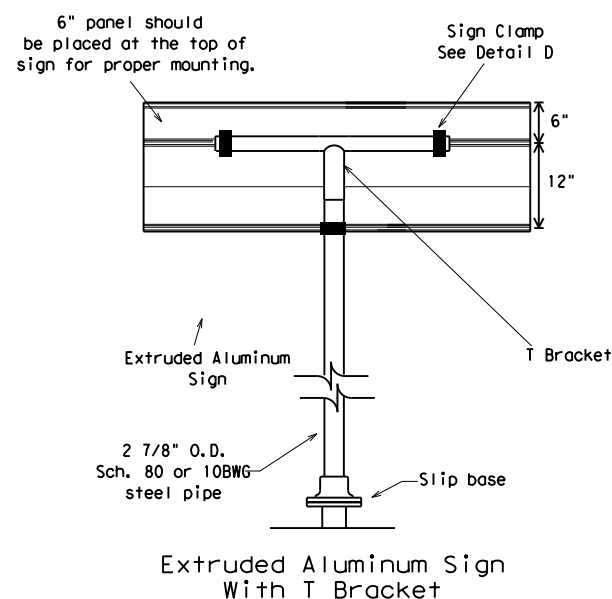
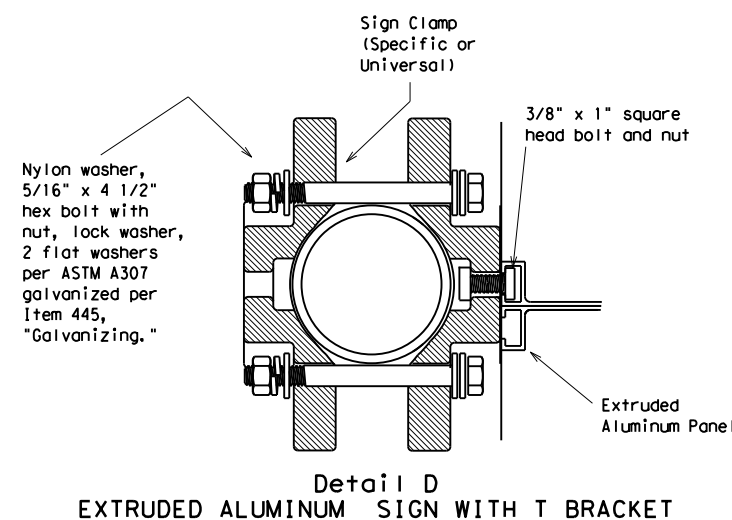
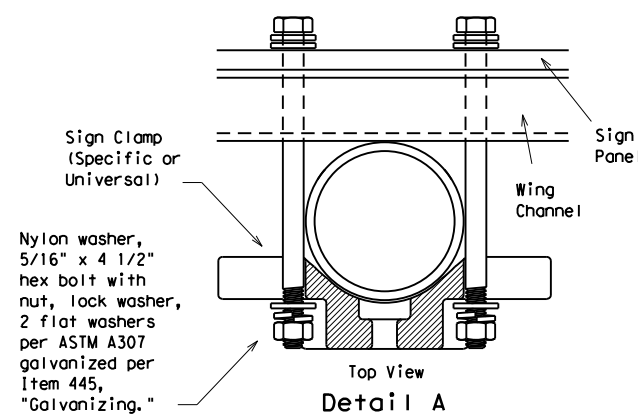
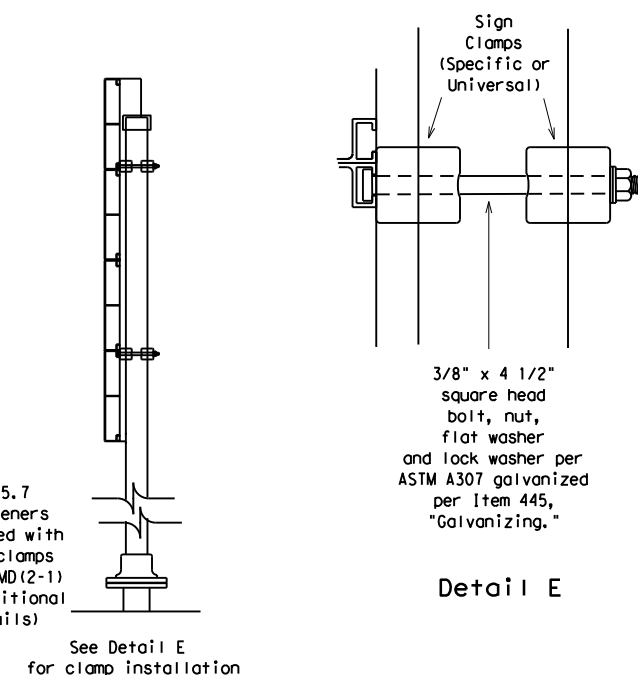
Splices shall only be allowed behind the sign substrate.

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 |
- 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.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- 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.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- 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.
- 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.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- 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."
- Sign blanks shall be the sizes and shapes shown on the plans.
- 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.
- Post open ends shall be fitted with Friction Caps.



* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



Use Extruded Alum. Windbeam as stiffeners See SMD (2-1) for additional details
See Detail E for clamp installation

		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)	

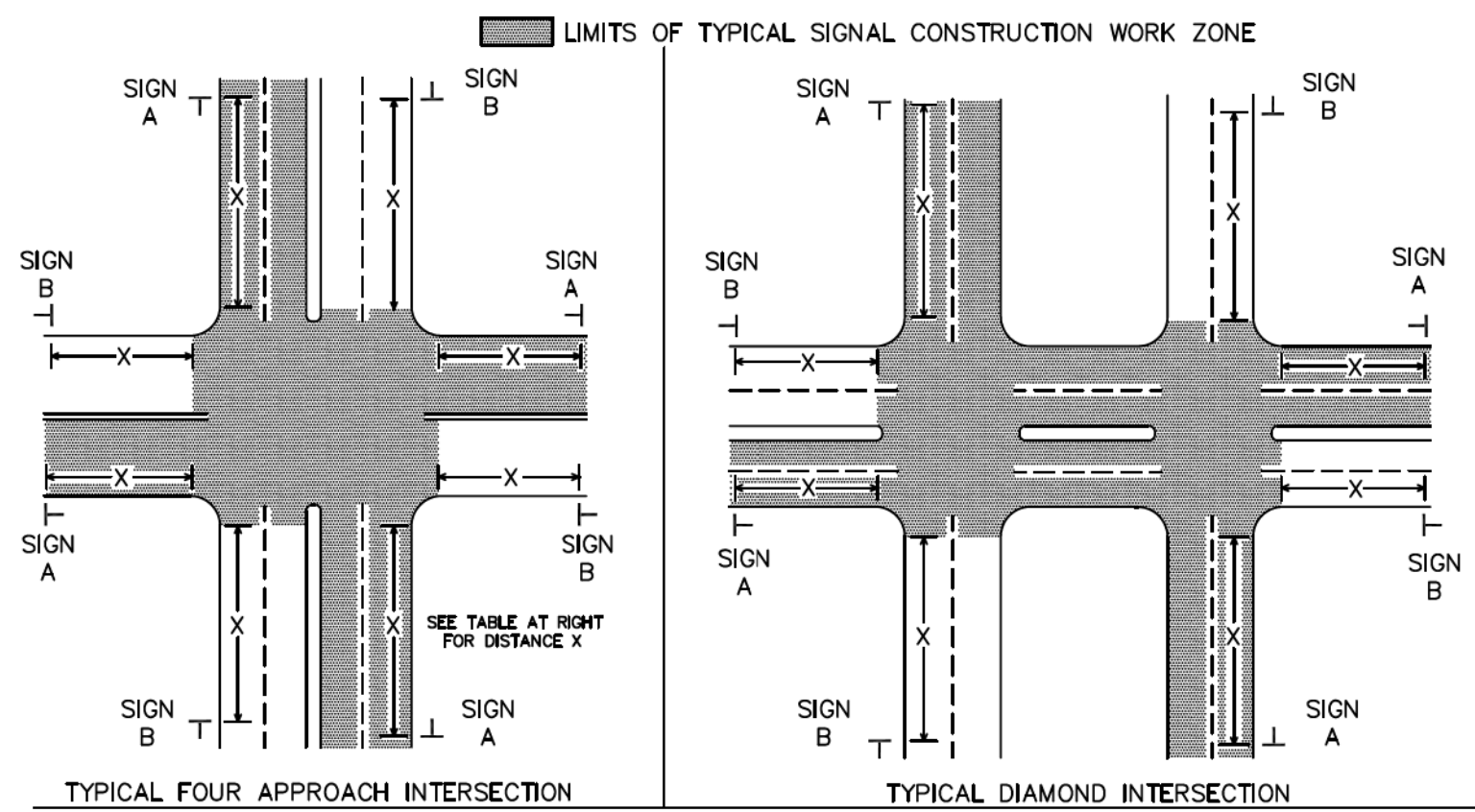
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-3) -08

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9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0918	24	267, ETC.	VAR
		DIST	COUNTY	SHEET NO.	
		DAL	COL, ETC.	132	

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DETAILS FOR PLACEMENT OF SIGNAL CONSTRUCTION SIGNS

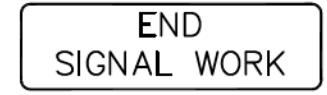


SIGN A
(PROVIDED BY VENDOR)



48" x 48"

SIGN B
(PROVIDED BY VENDOR)



60" x 24"

SIGN C
(PROVIDED BY CITY)



48" x 48"

POSTED SPEED OR 85% SPEED (MPH)	X MIN. DISTANCE (FEET)
30 OR LESS	80
35	120
40	160
45	240

GENERAL NOTES

1. ALL SIGNS SHALL REMAIN POSTED DURING THE ENTIRE CONSTRUCTION PERIOD AT THE INTERSECTION.
2. SIGNS A AND B SHALL BE PROCURED AND INSTALLED BY THE VENDOR.
3. SIGNS A AND B SHALL HAVE BLACK LETTERS AND BORDERS ON A REFLECTIVE ORANGE BACKGROUND. SIGN LEGENDS SHALL CONFORM TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. SIGN LEGENDS SHALL NOT BE HAND-PAINTED OR MADE WITH TAPE.
4. SIGNS A AND B SHALL BE MOUNTED ON A WHITE WOOD FRAME. IF WEIGHTS ARE REQUIRED FOR STABILIZATION, SANDBAGS SHOULD BE USED. PIECES OF CONCRETE, ROCKS, IRON, STEEL OR OTHER SOLID OBJECTS SHALL NOT BE USED AS WEIGHTS.
5. SIGN C WILL BE FABRICATED BY THE CITY AND INSTALLED BY THE VENDOR IN THE FIELD.
6. SIGN C SHALL BE MOUNTED WITH HARDWARE PROVIDED BY THE CITY AND SHALL NOT BE ATTACHED TO THE HARDWARE USED TO SUPPORT SIGN A.
7. SIGN C SHALL BE PLACED IN A PROMINENT POSITION AT THE INTERSECTION PREFERRABLY NEAR THE SITE OF THE SIGNAL CONTROLLER CABINET.
8. BOTTOM OF SIGNS SHALL BE A MINIMUM OF 3 FT. FROM GROUND LEVEL.
9. SIGNS SHALL BE LOCATED WITHIN 10 FT. OF THE CURB AND BE UNOBSTRUCTED FROM MOTORISTS' VIEW.

CITY OF DALLAS
 DEPARTMENT OF TRANSPORTATION
 TRANSPORTATION OPERATIONS
 2018 TRAFFIC SIGNAL
 CONSTRUCTION SPECIFICATION
 EXHIBIT A



BGE, Inc.
 2595 Dallas Parkway, Suite 101, Frisco, TX 75034
 Tel: 972-464-4800 • www.bgeinc.com
 TBPE Registration No. F-1046 Copyright 2023

CITY OF DALLAS
 DEPARTMENT
 OF TRANSPORTATION

Texas Department of Transportation

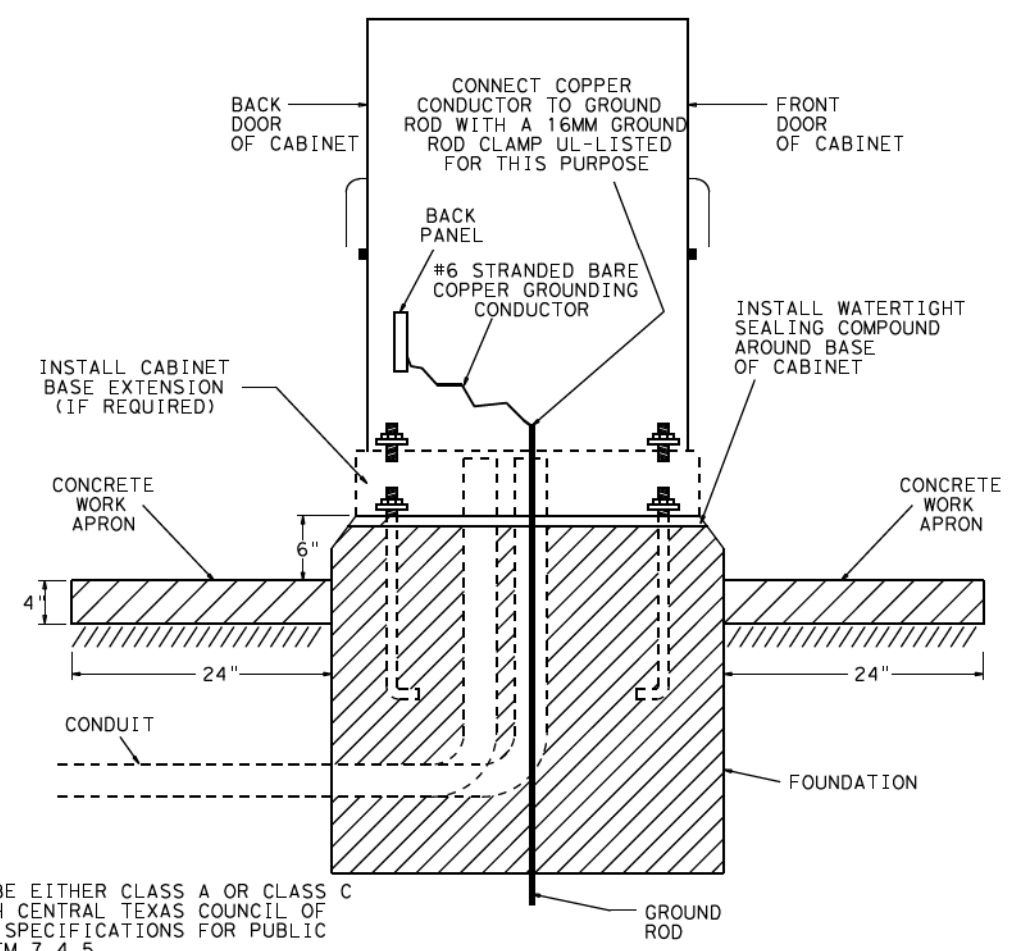
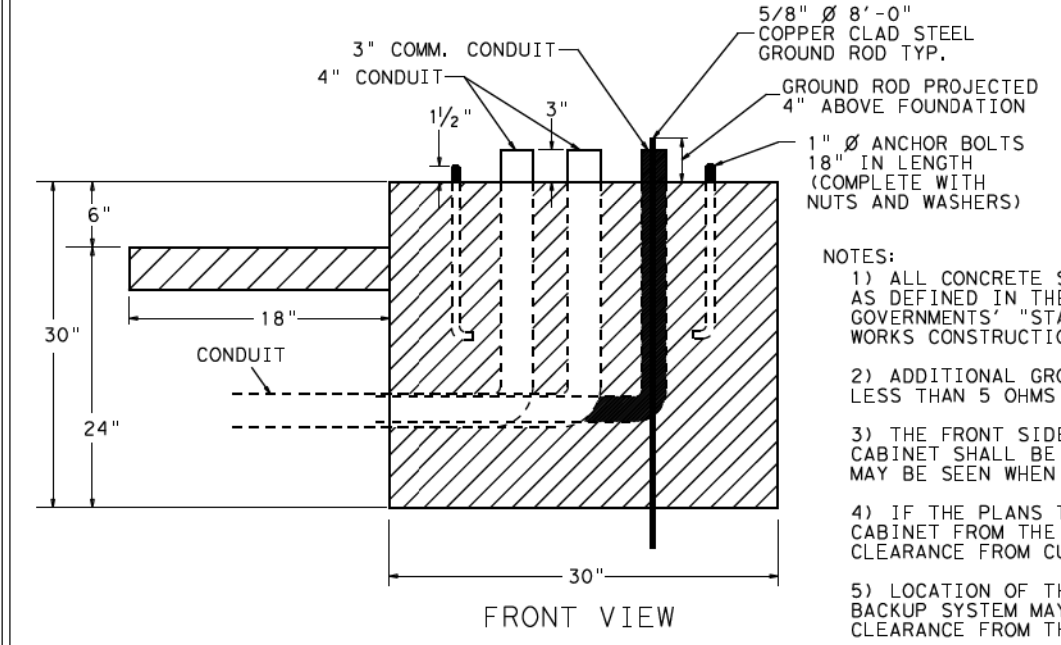
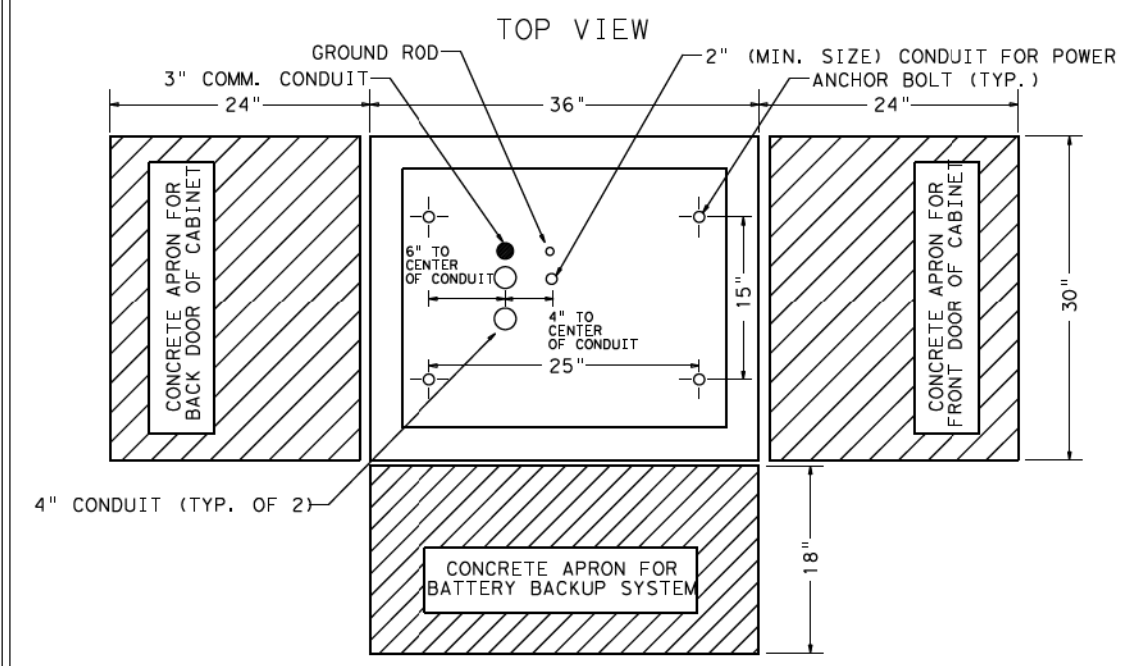
TRAFFIC SIGNAL CONSTRUCTION SIGNS PLACEMENT DETAILS

SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	133

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BASE MOUNTED CONTROLLER CABINET FOUNDATION DETAILS (FOR TYPE 332, 352i CONTROLLER CABINETS)



- NOTES:
- 1) ALL CONCRETE SHALL BE EITHER CLASS A OR CLASS C AS DEFINED IN THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS' "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" ITEM 7.4.5
 - 2) ADDITIONAL GROUND RODS MAY BE NEEDED TO ACHIEVE LESS THAN 5 OHMS RESISTANCE TO GROUND.
 - 3) THE FRONT SIDE OF THE TRAFFIC SIGNAL CONTROLLER CABINET SHALL BE ORIENTED SUCH THAT THE INTERSECTION MAY BE SEEN WHEN VIEWING THE CONTROLLER FRONT PANEL.
 - 4) IF THE PLANS TO NOT INDICATE SPACING OF THE CABINET FROM THE CURB, PROVIDE FOR A 48" MINIMUM CLEARANCE FROM CURB.
 - 5) LOCATION OF THE CONCRETE APRON FOR THE BATTERY BACKUP SYSTEM MAY NEED TO BE ADJUSTED BASED ON CLEARANCE FROM THE CURB AND AVAILABLE RIGHT-OF-WAY.

VERSION 1.3

CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

CITY OF DALLAS
2022 TRAFFIC SIGNAL CONSTRUCTION
DESIGN SPECIFICATIONS



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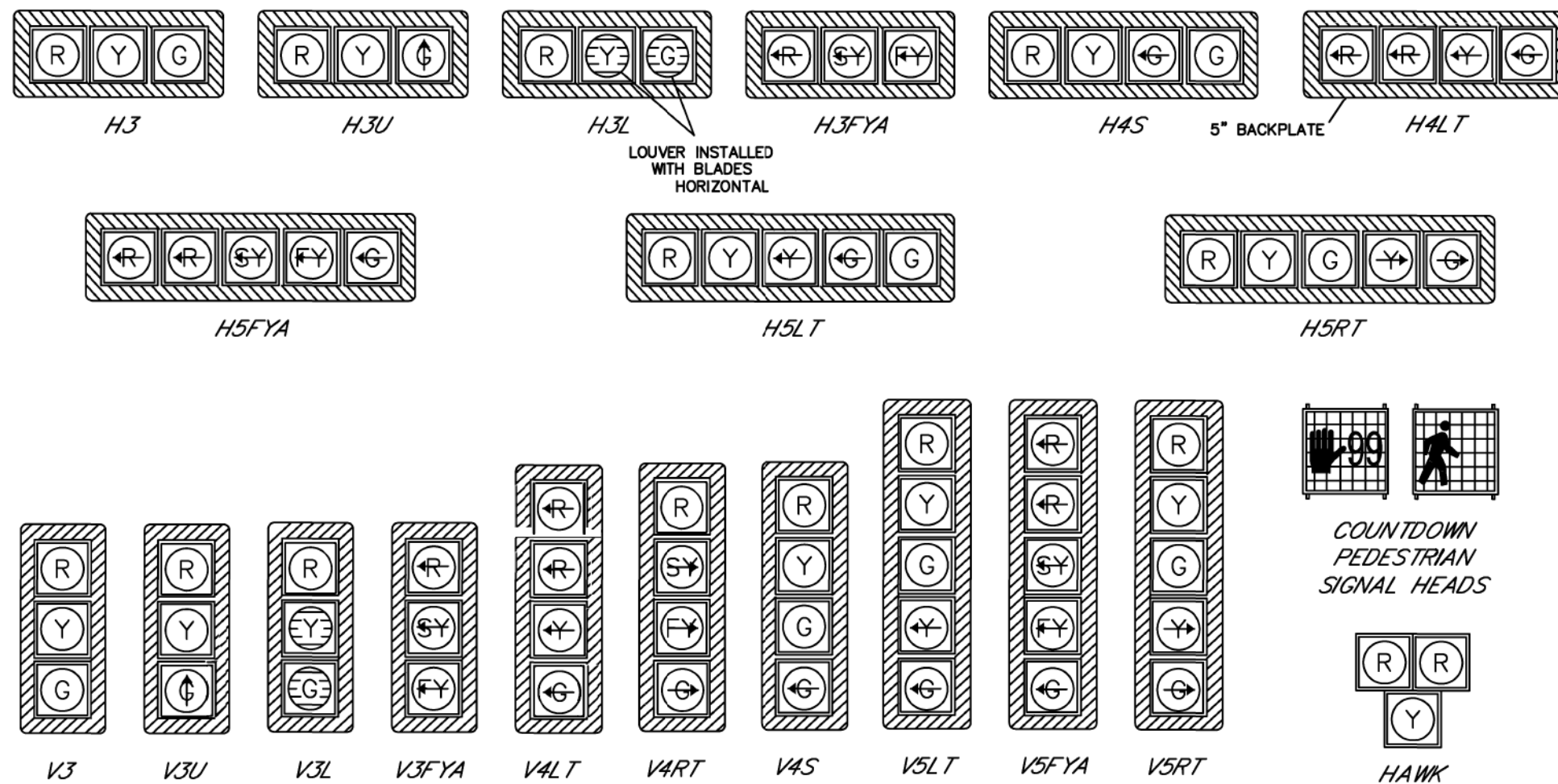
BASE-MOUNTED CONTROLLER CABINET FOUNDATION DETAILS

SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLLIN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	134

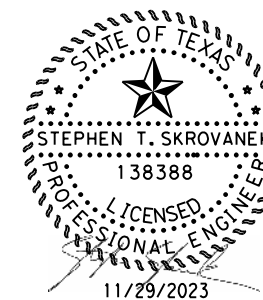
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TRAFFIC SIGNAL HEAD IDENTIFICATION CHART



NOTE: ALL SIGNAL HEAD LENSES SHALL BE 12" IN DIAMETER.

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 2018 TRAFFIC SIGNAL
 CONSTRUCTION SPECIFICATION
 EXHIBIT D



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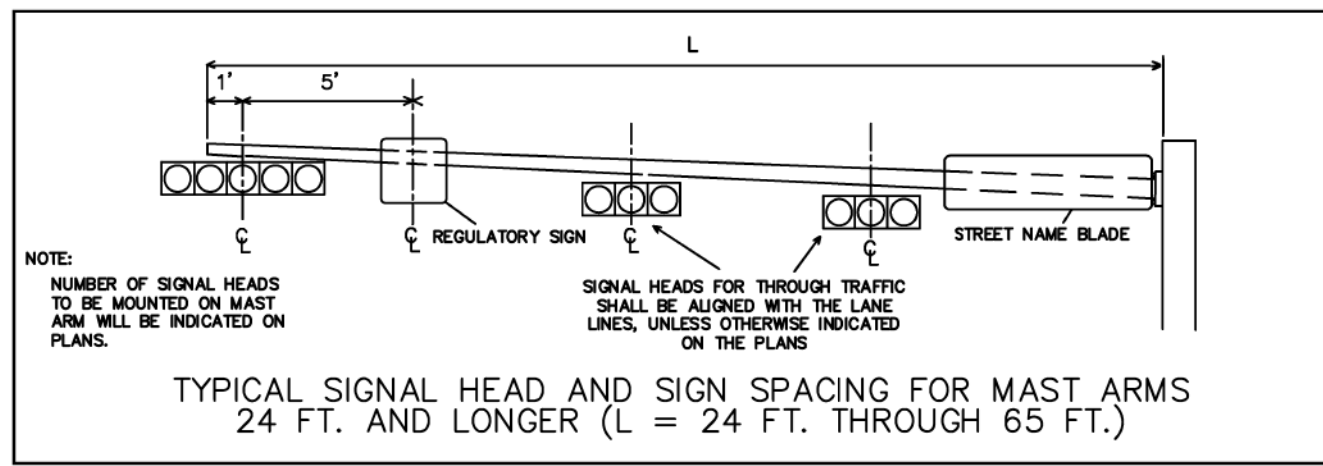
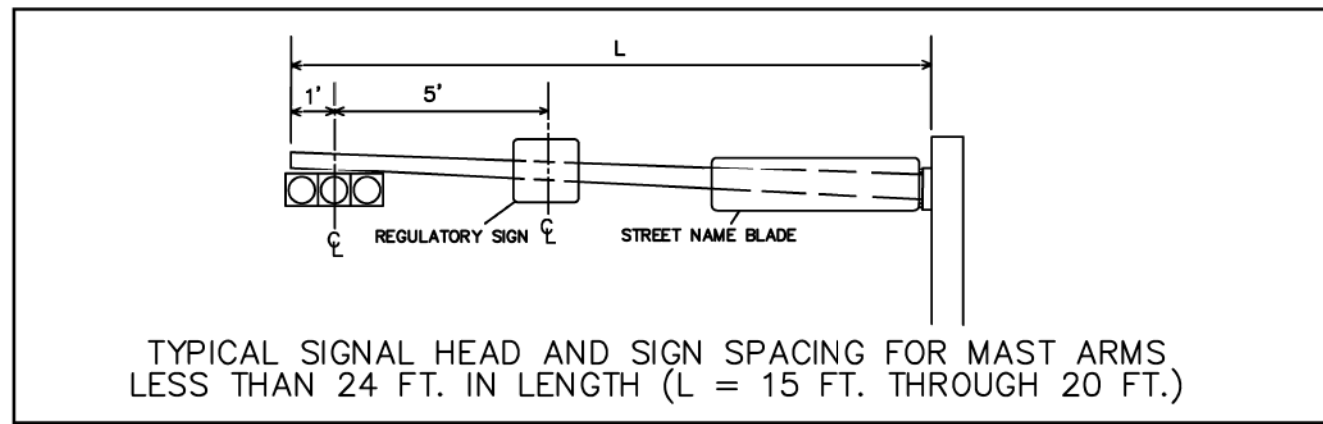
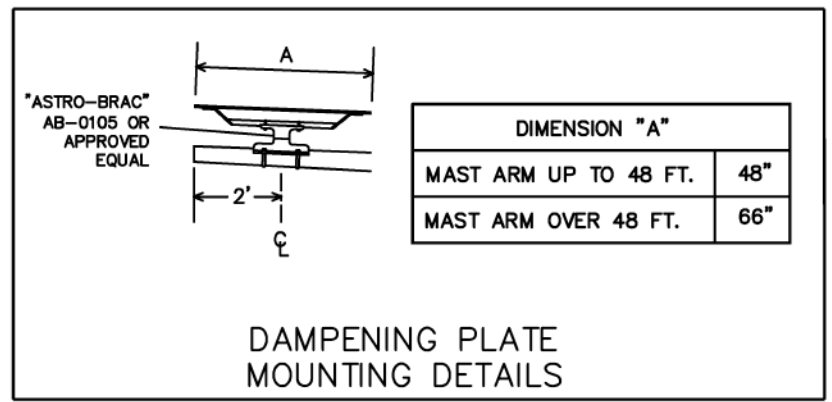
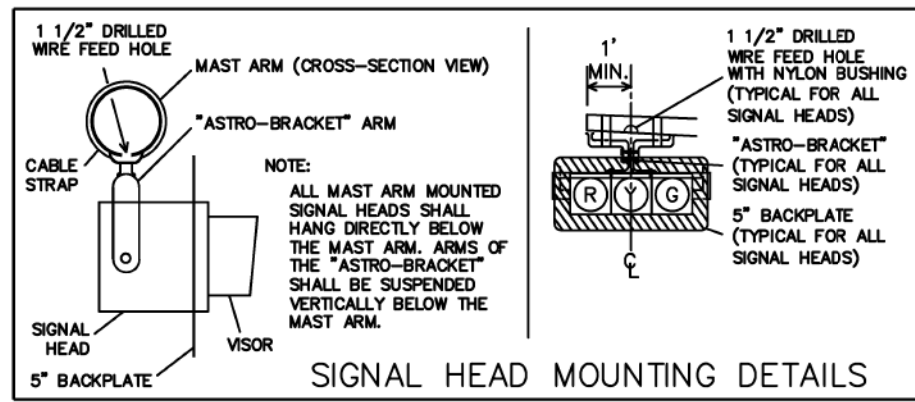
TRAFFIC SIGNAL HEAD IDENTIFICATION CHART

SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	135

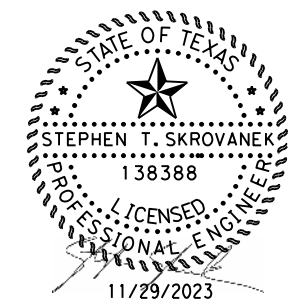
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DETAILS FOR MOUNTING SIGNAL AND SIGN HARDWARE ON MAST ARMS



1. ALL WIRE FEED HOLES SHALL BE DRILLED IN THE FIELD BY THE VENDOR. TORCHING WILL NOT BE PERMITTED. DRILLED HOLES SHALL BE TOUCHED UP WITH ONE COAT OF COLD GALVANIZING COMPOUND, ALLOWING ADEQUATE DRYING TIME BEFORE MOUNTING ANY SIGNAL OR SIGN HARDWARE.
 2. SIGNAL AND SIGN HARDWARE SHALL BE MOUNTED AT THE LOCATIONS SHOWN ON THE DIAGRAMS ABOVE UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER.
 3. IF THE VEHICLE SIGNAL HEAD IS SKEWED WITH RESPECT TO THE MAST ARM, THE VENDOR MAYBE REQUIRED TO PROVIDE EXTENDED (12") "ASTRO-BRACKET" ARMS SO THAT THE BACKPLATE CLEARS THE MAST ARM.
 4. 1 1/2" DIAMETER HOLES SHALL BE DRILLED ON THE BOTTOM FACE OF NEW GALVANIZED MAST ARMS WHEN MOUNTING HORIZONTAL SIGNAL HEADS. (WHEN MOUNTING VERTICAL SIGNAL HEADS ON THE MAST ARM, THE HOLES SHALL BE DRILLED ON THE FRONT FACE OF THE ARM.)
 5. NYLON BUSHINGS SHALL BE INSTALLED IN ALL WIRE FEED HOLES TO PROTECT THE WIRE INSULATION.
- GENERAL NOTES**

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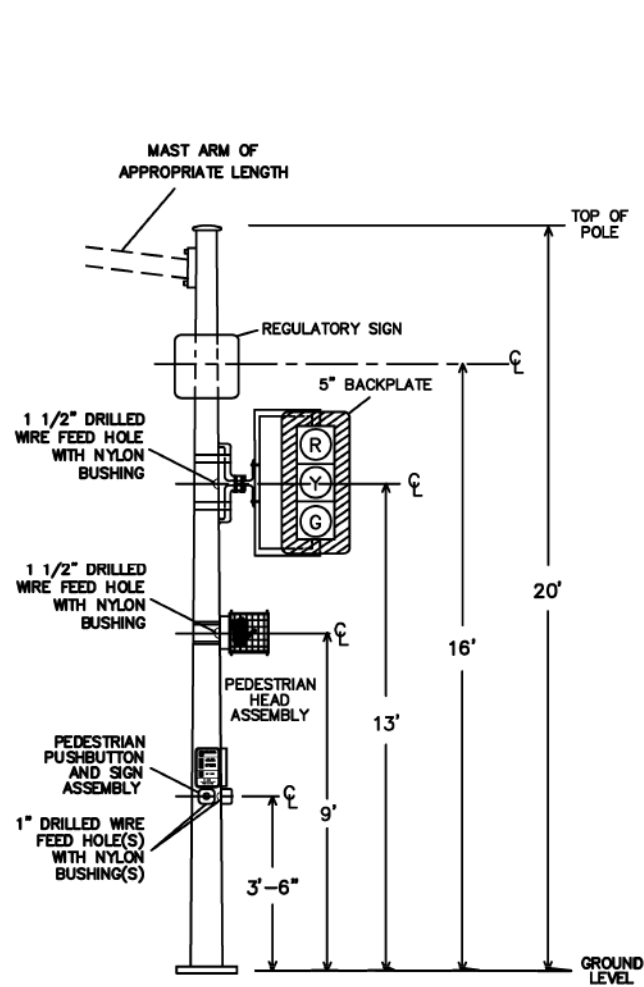
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SIGNAL & SIGN HARDWARE
MAST ARM-MOUNTING DETAILS
 SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	136

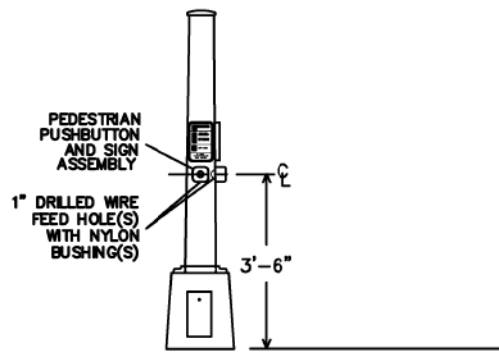
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DETAILS FOR MOUNTING SIGNAL AND SIGN HARDWARE ON POLES

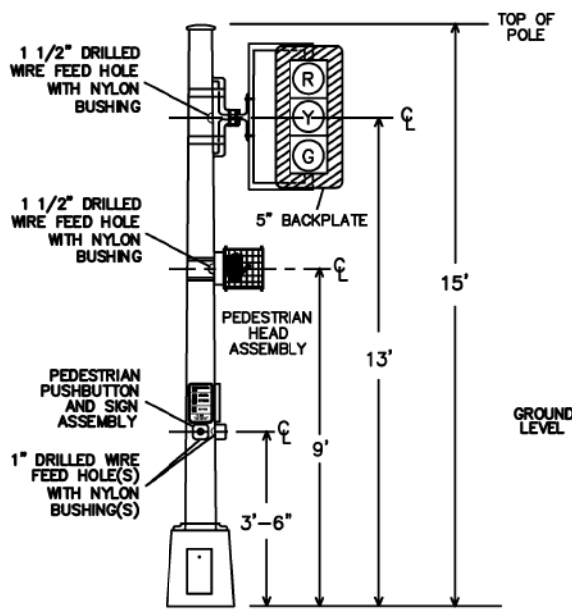


MAST ARM POLE

NOTE:
SIGNS, VEHICLE SIGNAL HEADS, PEDESTRIAN SIGNAL HEADS AND PEDESTRIAN PUSHBUTTONS SHALL BE INSTALLED ON STRAIN POLES AT HEIGHTS SHOWN ABOVE.

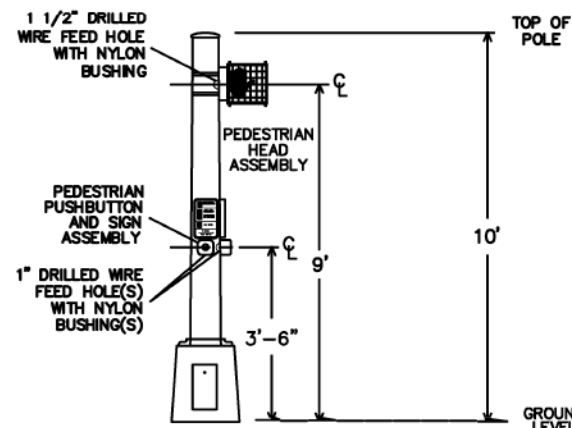


5' PEDESTAL POLE (TYPE III)



15' PEDESTAL POLE (TYPE I)

1. ALL HOLES SHALL BE DRILLED IN THE FIELD BY THE VENDOR. TORCHING WILL NOT BE PERMITTED. DRILLED HOLES SHALL BE TOUCHED UP WITH ONE COAT OF COLD GALVANIZING COMPOUND, ALLOWING ADEQUATE DRYING TIME BEFORE MOUNTING ANY SIGNAL OR SIGN HARDWARE.
2. NYLON BUSHINGS SHALL BE INSTALLED IN ALL WIRE FEED HOLES TO PROTECT THE WIRE INSULATION.
3. ALL SIGNAL AND SIGN HARDWARE SHALL BE MOUNTED AT THE DISTANCES SHOWN ON THE DIAGRAMS BELOW UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER.
4. IF THE DISTANCE BETWEEN THE SIDE MOUNT VEHICLE SIGNAL HEAD AND THE MAST ARM POLE IS NOT SUFFICIENT TO INSTALL A BACK PLATE THE CONTRACTOR MAY BE REQUIRED TO PROVIDE EXTENDED (12") "ASTRO-BRACKET" ARMS.
5. A TWO-WAY UNIVERSAL MOUNTING BRACKET SHALL BE USED WHENEVER TWO PEDESTRIAN SIGNAL HEADS ARE TO BE INSTALLED ON THE SAME POLE, AND A ONE-WAY UNIVERSAL MOUNTING BRACKET SHALL BE USED WHENEVER A SINGLE PEDESTRIAN HEAD IS MOUNTED ON A POLE.
6. ALL PEDESTRIAN PUSHBUTTON SIGNS SHALL DISPLAY THE MESSAGE SHOWN BELOW (WITH ARROW POINTING IN APPROPRIATE DIRECTION).



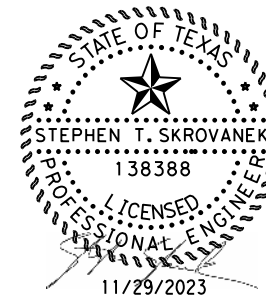
10' PEDESTAL POLE (TYPE II)



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2018 TRAFFIC SIGNAL
CONSTRUCTION SPECIFICATION

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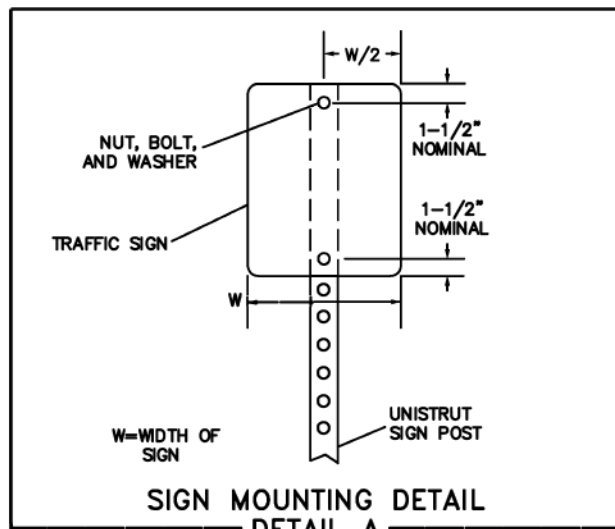
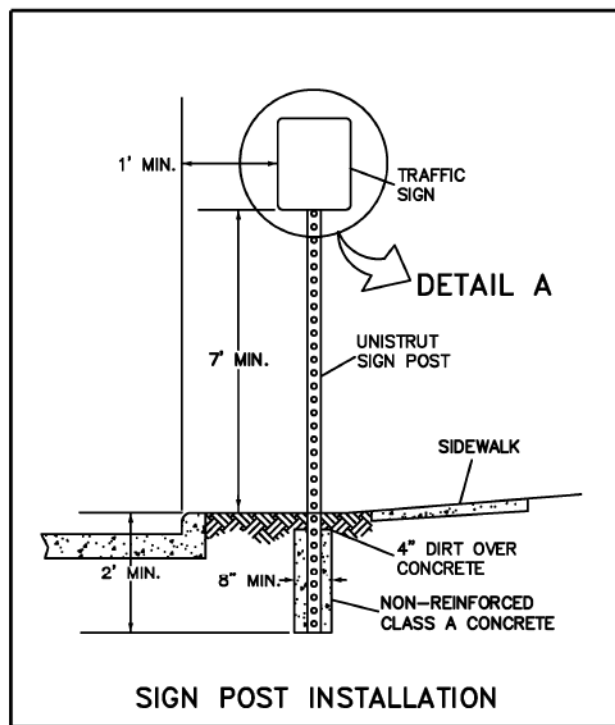

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**SIGNAL & SIGN
HARDWARE
POLE-MOUNTING DETAILS**

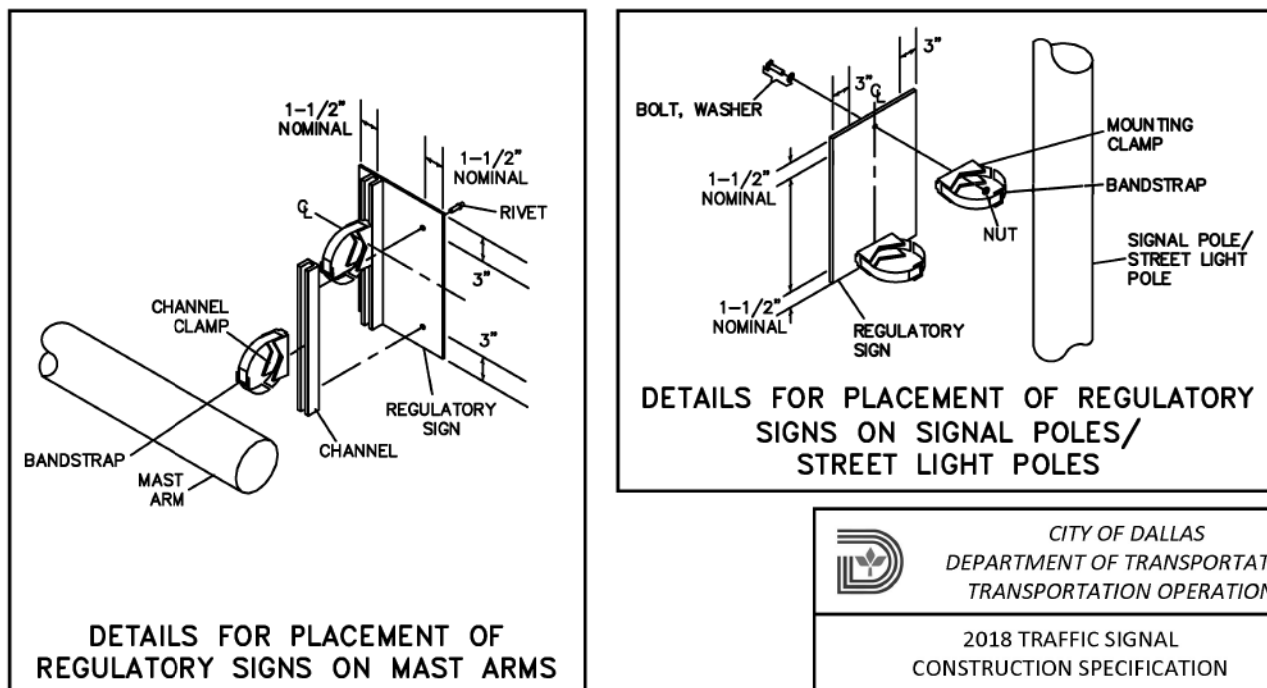
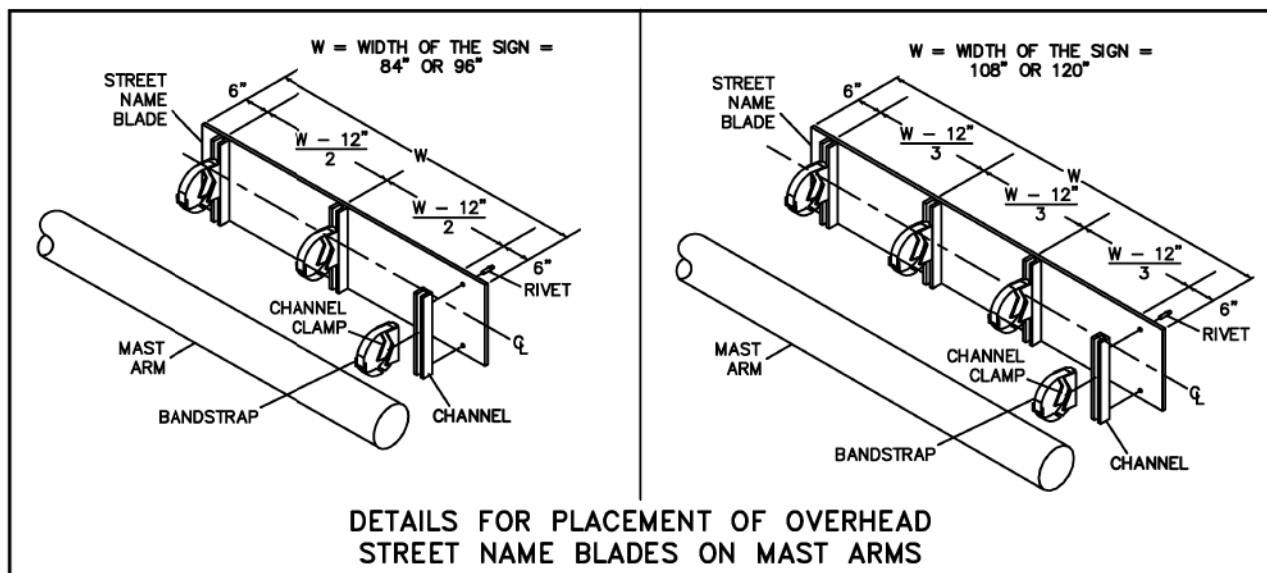
SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLLIN, ETC.	0918	24
		267, ETC.	137

DETAILS FOR MOUNTING TRAFFIC SIGNS ON SIGN POSTS



DETAILS FOR MOUNTING TRAFFIC SIGNS ON SIGNAL MAST ARMS AND POLES



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TRANSPORTATION OPERATIONS

2018 TRAFFIC SIGNAL
CONSTRUCTION SPECIFICATION

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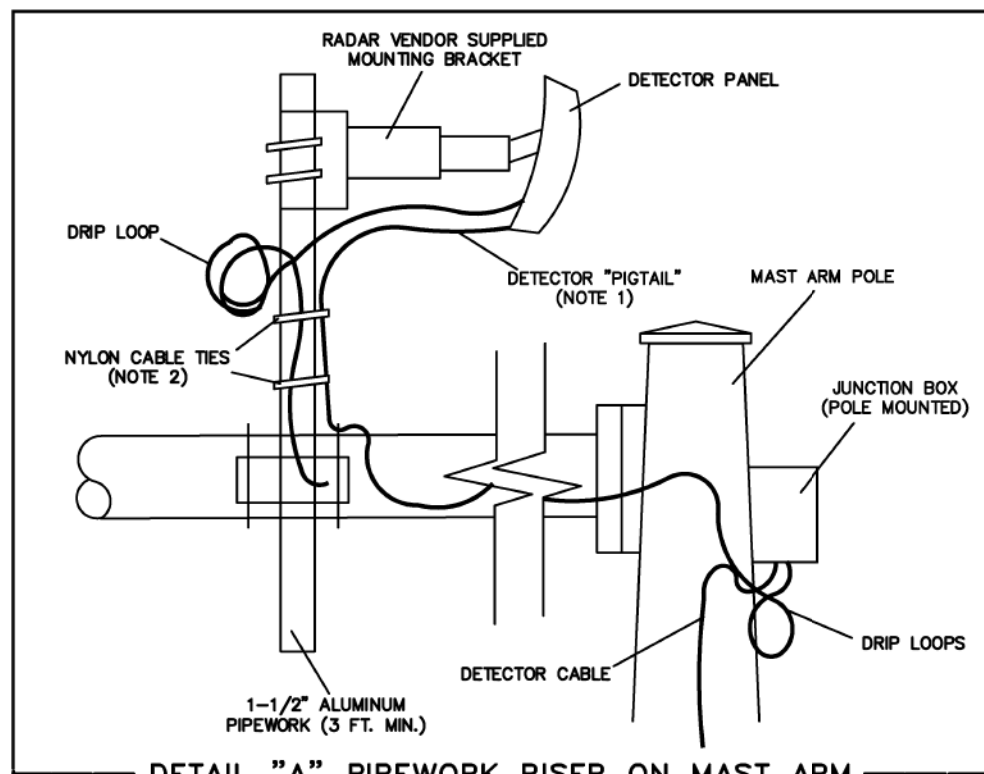
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**TRAFFIC SIGN
MOUNTING DETAILS**

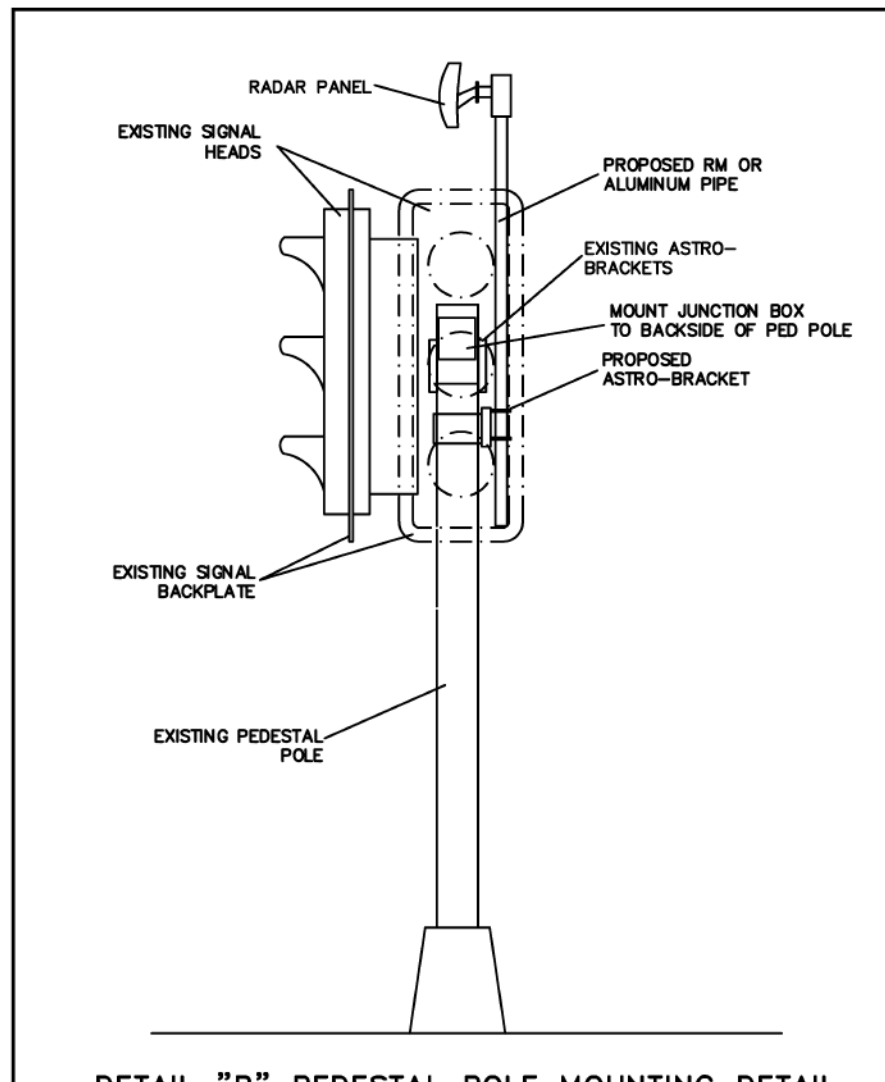
SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	138

DETAILS FOR MOUNTING RADAR VEHICLE DETECTOR PANELS



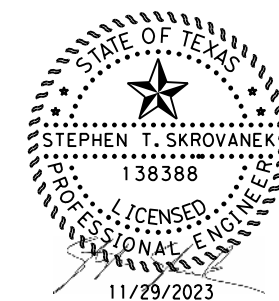
DETAIL "A" PIPEWORK RISER ON MAST ARM




DETAIL "B" PEDESTAL POLE MOUNTING DETAIL

NOTES:

1. DETECTOR PIGTAIL SHALL RUN CONTINUOUSLY FROM DETECTOR PANEL, FORMED INTO A 3-LOOP DRIP LOOP, ROUTED INTO THE 1-1/2" PIPE, THROUGH THE ASTRO-BRACKET, THROUGH THE MAST ARM OR POLE, AND THROUGH A HOLE DRILLED BELOW THE JUNCTION BOX MOUNTING POINT ON THE POLE. A DRIP LOOP SHALL BE PROVIDED FOR BOTH THE PIGTAIL AND DETECTOR CABLE BELOW THE JUNCTION BOX.
2. GROUND CONDUCTOR FOR RADAR PANEL SHALL BE NEATLY STRAPPED TO THE EXTERIOR OF THE PIPEWORK WITH NYLON CABLE TIES ATTACHED TO THE SIGNAL POLE/ARM NEAR THE ASTRO-BRACKET WITH A SELF-TAPPING STAINLESS STEEL SCREW.







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CONSTRUCTION SPECIFICATION

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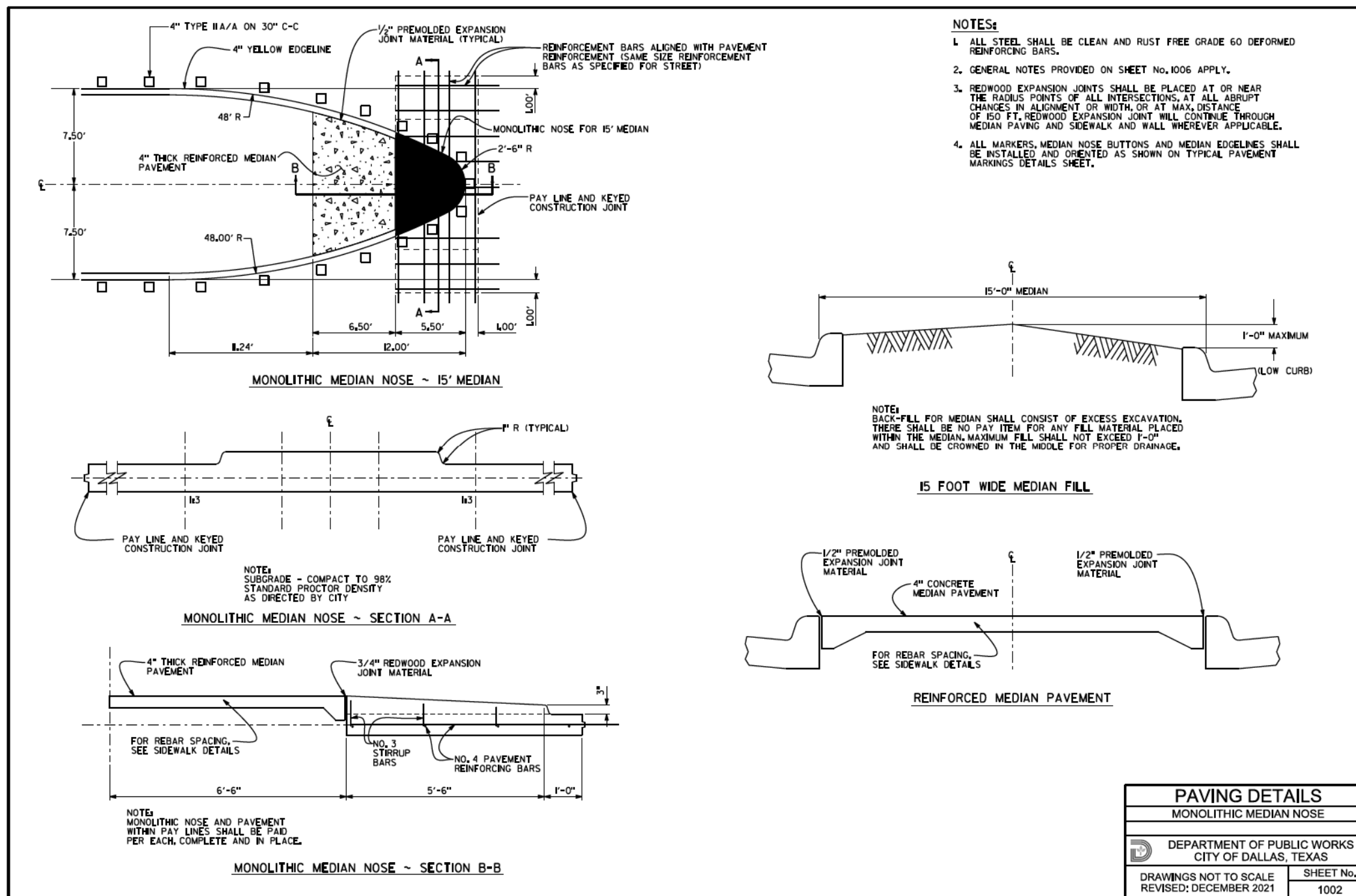
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RADAR VEHICLE DETECTOR PANELS MOUNTING DETAILS

SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	139

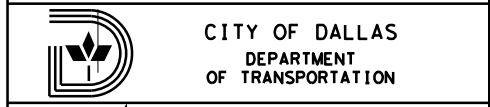
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PAVING DETAILS	
MONOLITHIC MEDIAN NOSE	
DEPARTMENT OF PUBLIC WORKS CITY OF DALLAS, TEXAS	
DRAWINGS NOT TO SCALE REVISED: DECEMBER 2021	SHEET No. 1002



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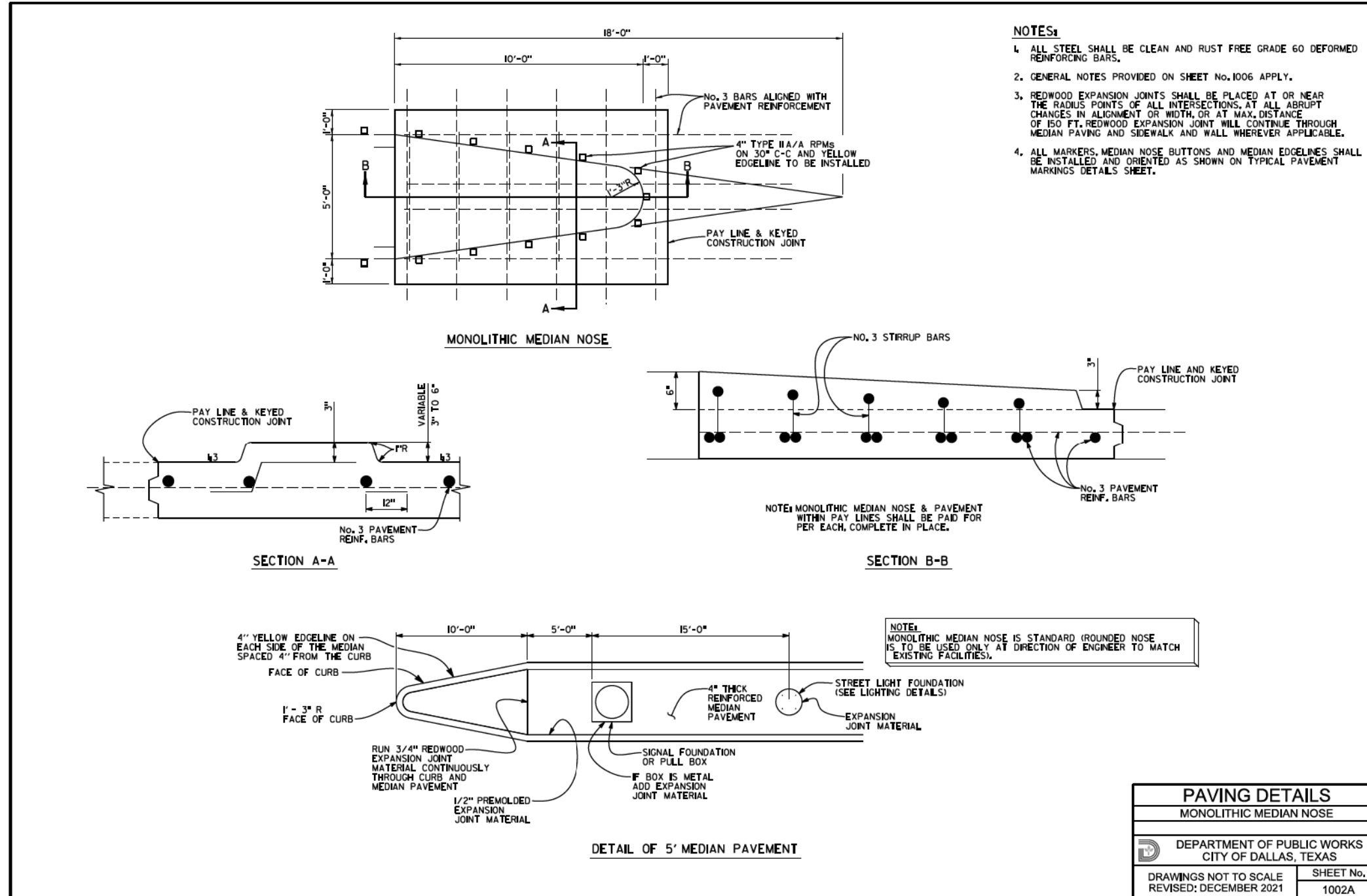


Texas Department of Transportation

MONOLITHIC MEDIAN NOSE

SHEET 1 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	140



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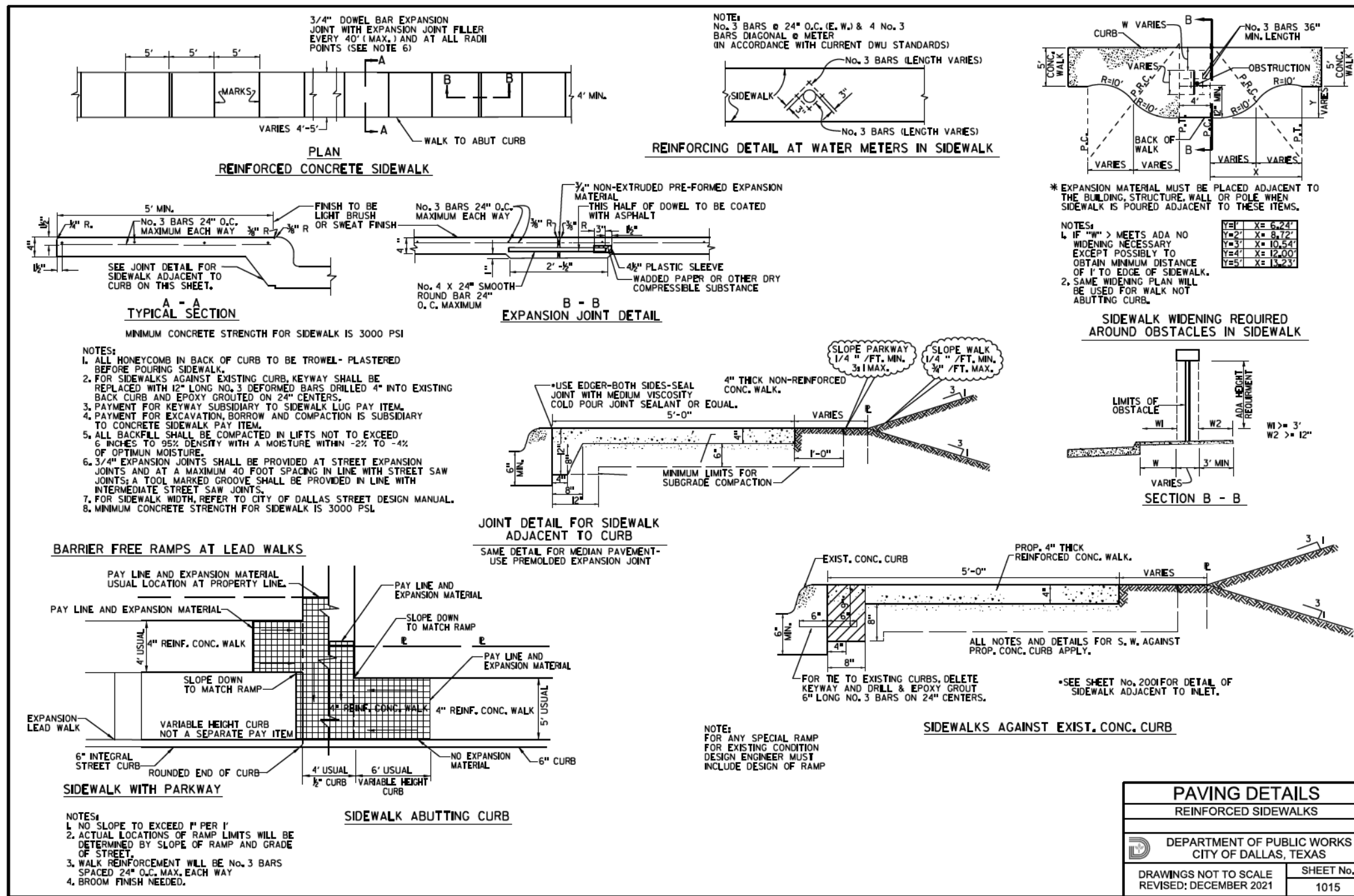
MONOLITHIC MEDIAN NOSE

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DEPARTMENT OF PUBLIC WORKS CITY OF DALLAS, TEXAS	
DRAWINGS NOT TO SCALE REVISED: DECEMBER 2021	SHEET No. 1002A

SHEET 2 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	141

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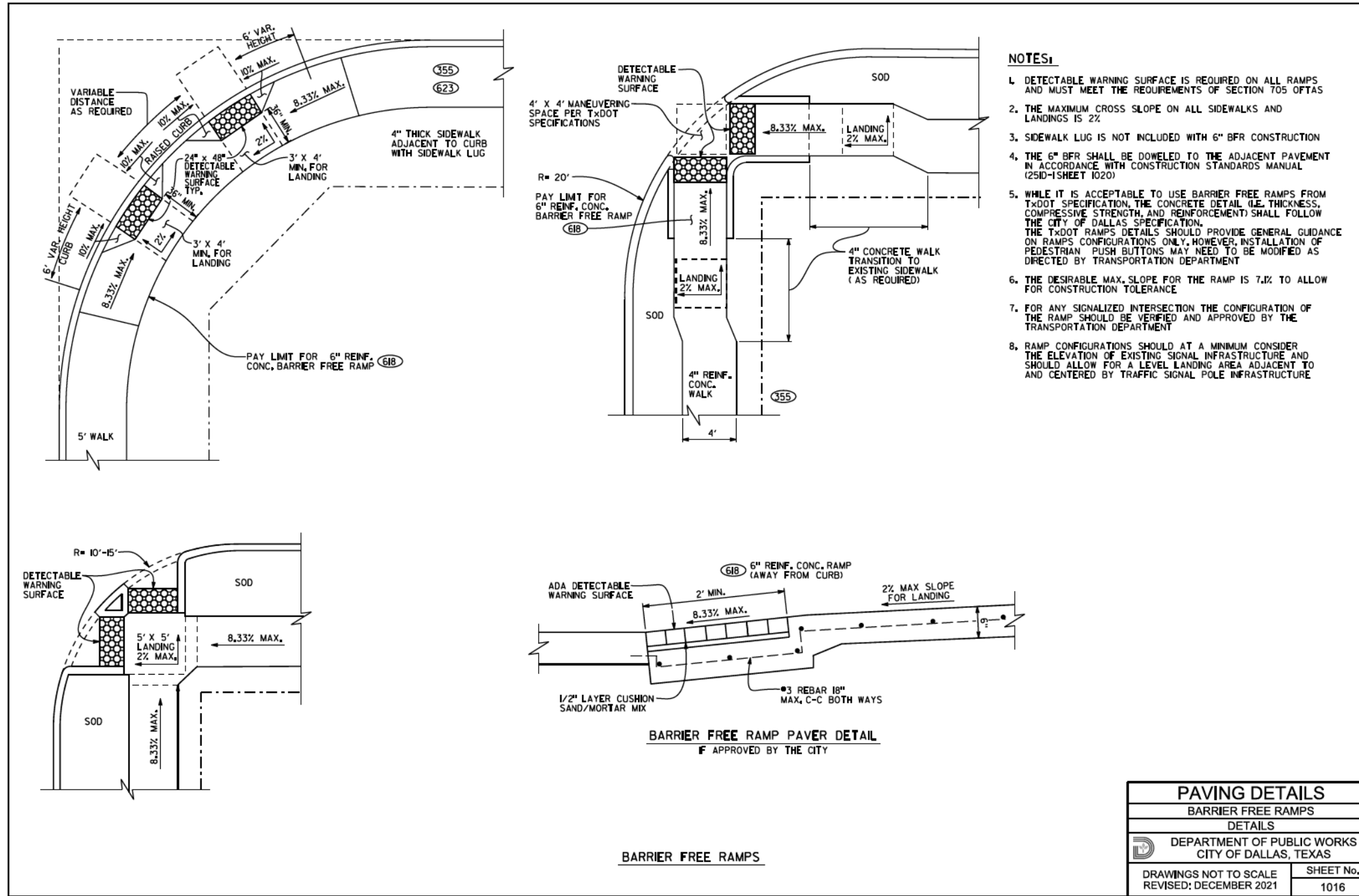
REINFORCED SIDEWALKS

PAVING DETAILS	
REINFORCED SIDEWALKS	
DEPARTMENT OF PUBLIC WORKS CITY OF DALLAS, TEXAS	
DRAWINGS NOT TO SCALE REVISED: DECEMBER 2021	SHEET No. 1015

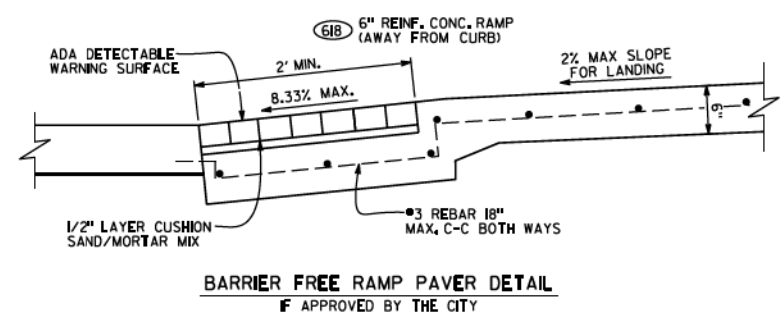
SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
			JOB NO.
			267, ETC.
			SHEET NO.
			142

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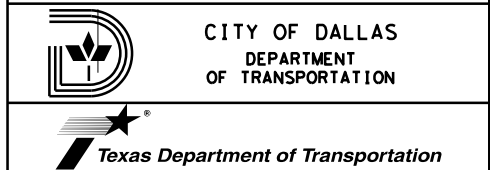


- NOTES:**
1. DETECTABLE WARNING SURFACE IS REQUIRED ON ALL RAMPS AND MUST MEET THE REQUIREMENTS OF SECTION 705 OF T&S
 2. THE MAXIMUM CROSS SLOPE ON ALL SIDEWALKS AND LANDINGS IS 2%
 3. SIDEWALK LUG IS NOT INCLUDED WITH 6" BFR CONSTRUCTION
 4. THE 6" BFR SHALL BE DOWELED TO THE ADJACENT PAVEMENT IN ACCORDANCE WITH CONSTRUCTION STANDARDS MANUAL (25D-1SHEET 1020)
 5. WHILE IT IS ACCEPTABLE TO USE BARRIER FREE RAMPS FROM T&S SPECIFICATION, THE CONCRETE DETAIL (I.E. THICKNESS, COMPRESSIVE STRENGTH, AND REINFORCEMENT) SHALL FOLLOW THE CITY OF DALLAS SPECIFICATION. THE T&S RAMP DETAILS SHOULD PROVIDE GENERAL GUIDANCE ON RAMP CONFIGURATIONS ONLY, HOWEVER, INSTALLATION OF PEDESTRIAN PUSH BUTTONS MAY NEED TO BE MODIFIED AS DIRECTED BY TRANSPORTATION DEPARTMENT
 6. THE DESIRABLE MAX. SLOPE FOR THE RAMP IS 7.0% TO ALLOW FOR CONSTRUCTION TOLERANCE
 7. FOR ANY SIGNALIZED INTERSECTION THE CONFIGURATION OF THE RAMP SHOULD BE VERIFIED AND APPROVED BY THE TRANSPORTATION DEPARTMENT
 8. RAMP CONFIGURATIONS SHOULD AT A MINIMUM CONSIDER THE ELEVATION OF EXISTING SIGNAL INFRASTRUCTURE AND SHOULD ALLOW FOR A LEVEL LANDING AREA ADJACENT TO AND CENTERED BY TRAFFIC SIGNAL POLE INFRASTRUCTURE



PAVING DETAILS	
BARRIER FREE RAMPS	
DETAILS	
DEPARTMENT OF PUBLIC WORKS CITY OF DALLAS, TEXAS	
DRAWINGS NOT TO SCALE REVISED: DECEMBER 2021	SHEET No. 1016

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BARRIER FREE RAMP DETAILS

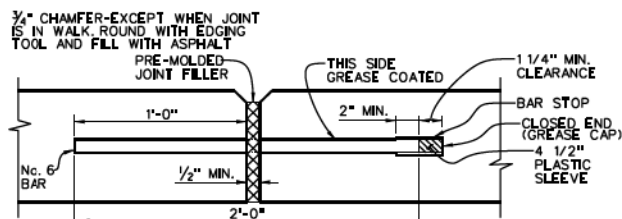
SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	143

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GENERAL NOTES FOR RETAINING WALLS, ALL TYPES (U.N.O.)

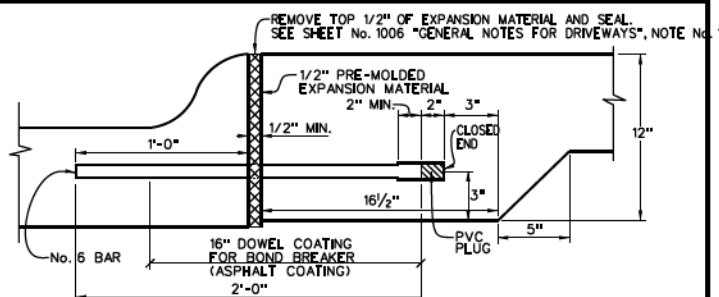
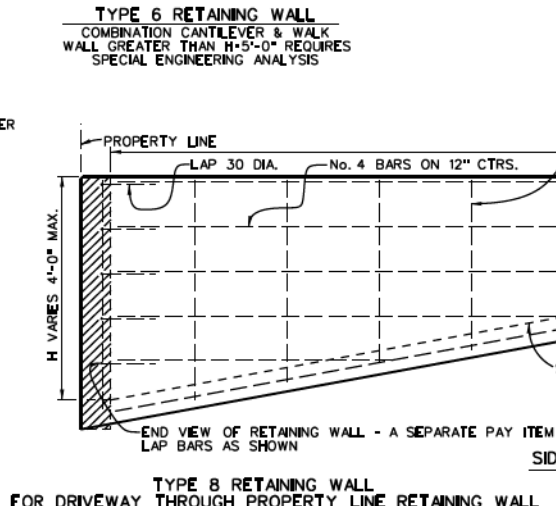
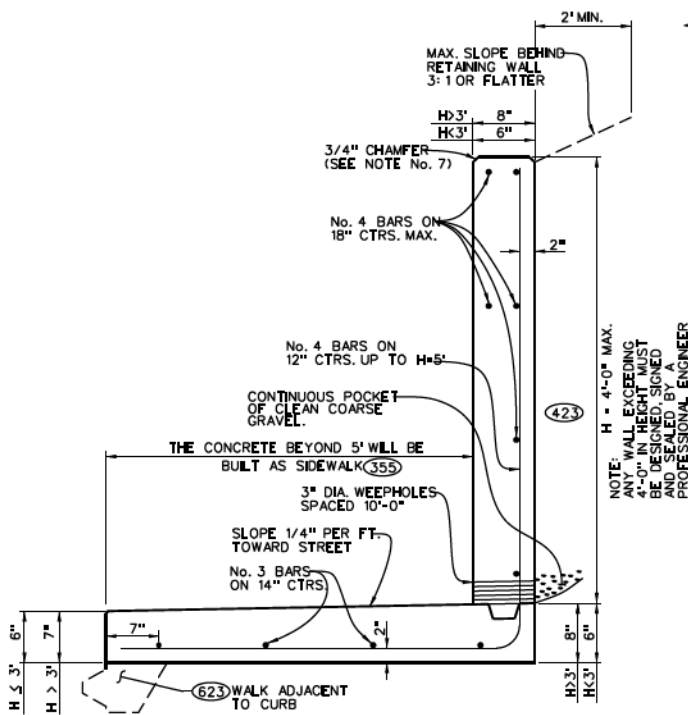
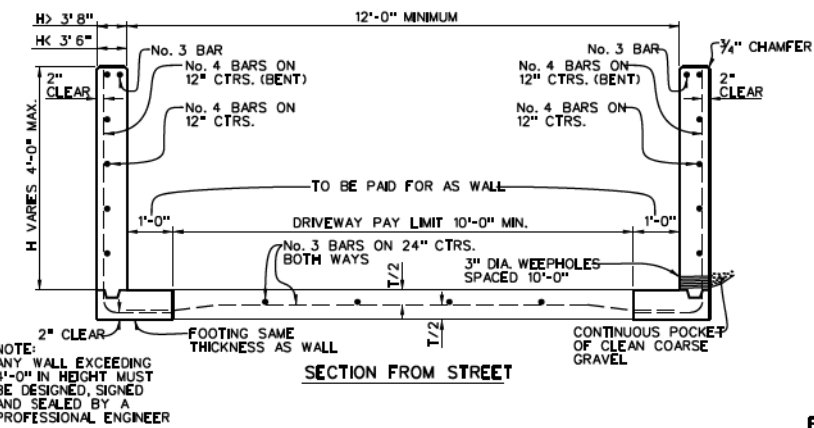
1. RETAINING WALLS SHALL BE BUILT WITH PERFORATED DRAIN SYSTEM INSTEAD OF WEEP HOLES WHENEVER FEASIBLE.
2. ALL CONCRETE SHALL BE CLASS "C". ALL REINFORCING SHALL BE GRADE 60.
3. BAR LAPS SHALL BE 30 TIMES THE DIAMETER OF THE BAR.
4. ALL EXPOSED SURFACES EXCEPT DRIVEWAY AND WALK SHALL RECEIVE A CARBORUNDUM OR APPROVED PAINTED FINISH.
5. DRIVEWAY AND WALK SHALL RECEIVE A HORSE HAIR OR FINE BROOM FINISH.
6. EXPOSED EDGES AND CORNERS TO BE ROUNDED OR CHAMFERED AS INDICATED HEREIN. (CHAMFER ON BACK OF WALL MAY BE ELIMINATED TO PERMIT MOWING)
7. WEEP HOLES SHALL BE FORMED BY PVC 3" O.D.
8. FOR WALL TYPES 6 & 7, THE WALKWAY WIDTH MAY BE INCREASED WHEN SPECIFIED ON THE PLANS, BUT SHALL NOT BE DECREASED UNLESS A SPECIAL DETAILED DESIGN IS PROVIDED IN THE PLANS AND SPECIFICATIONS.
9. WEEP HOLES OR PERFORATED DRAIN SYSTEM MAY BE DELETED FOR RETAINING WALLS NOT EXCEEDING 3' IN HEIGHT WHEN APPROVED BY THE ENGINEER.
10. EXPANSION JOINTS SHALL BE CONSTRUCTED BETWEEN STREET CURB AND RETAINING WALL FOOTINGS, ABUTTING BACK OF CURBS WHEN RETAINING WALL HEIGHT EXCEEDS 5' FOR WALLS LESS THAN OR EQUAL TO 5' IN HEIGHT, SIDEWALK LUGS SHALL BE CONSTRUCTED AT BACK OF CURB INTEGRAL WITH THE RETAINING WALL FOOTING (NO EXPANSION MATERIAL).
11. ADD FABRIC INSIDE OF WALL TO PREVENT CLUGGING.



THE DOWELS SHALL BE SPACED 1'-0" MAXIMUM BEGINNING 1'-0" ABOVE FOOTING. A MINIMUM OF 2 DOWELS TO BE USED IN EACH JOINT. THE SLEEVE FOR DOWEL SHALL HAVE AN INSIDE DIAMETER OF 7/8" AND BE OF A QUALITY AND DESIGN TO PROVIDE FREE MOVEMENT OF THE DOWEL. THE ENTIRE DOWEL AND SLEEVE ASSEMBLY SHALL BE SECURED IN POSITION PRIOR TO POURING OPERATIONS.

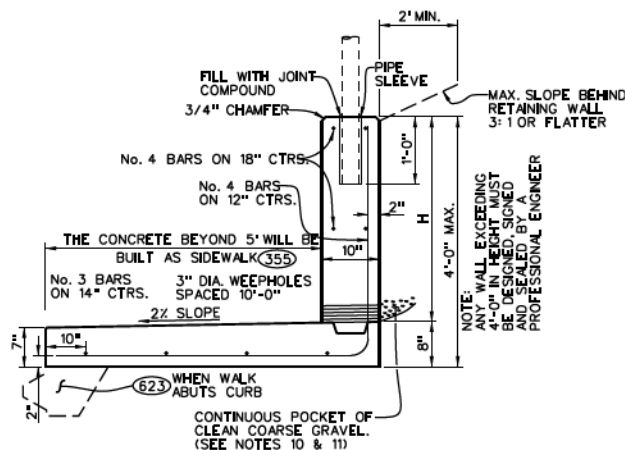
THE EXPANSION JOINT SHALL EXTEND THROUGHOUT THE STEM AND WALK SECTION IN CONTINUOUS VERTICAL PLANE. ALL OTHER DETAILS TO BE AS ABOVE.

SPACING OF JOINTS SHALL BE 45' MAXIMUM FOR TYPES 6 THRU 8.
EXPANSION JOINT DETAIL IN WALL



1. DOWELS SHALL BE COATED WITH BOND BREAKER ON WALL FOOTING SIDE AS SHOWN.
2. SPACING SHALL BE 12" ON CENTER, No. 6 DOWEL BARS.
3. THE SLEEVE FOR DOWEL SHALL HAVE AN INSIDE DIAMETER OF 7/8" AND BE OF A QUALITY AND DESIGN TO PROVIDE FREE MOVEMENT OF THE DOWEL.
4. ENTIRE DOWEL AND SLEEVE ASSEMBLY WITH JOINT FILLER MATERIAL SHALL BE SECURED IN POSITION PARALLEL WITH THE FOOTING SURFACE BY A METHOD APPROVED BY THE ENGINEER PRIOR TO POURING OPERATION.

EXPANSION JOINT DETAIL AGAINST CURB
(FOR WALLS OVER 5 FEET IN HEIGHT WITH FOOTING ABUTTING BACK OF CURB.)

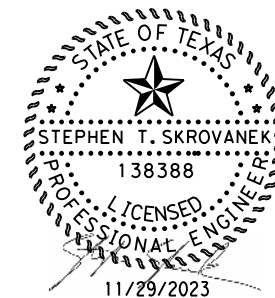


STANDARD RETAINING WALL
TYPES 6-8

DEPARTMENT OF PUBLIC WORKS
CITY OF DALLAS, TEXAS

DRAWINGS NOT TO SCALE
REVISED: SEPTEMBER 2022

SHEET No.
3001



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STANDARD RETAINING WALL DETAILS

SHEET 1 OF 1

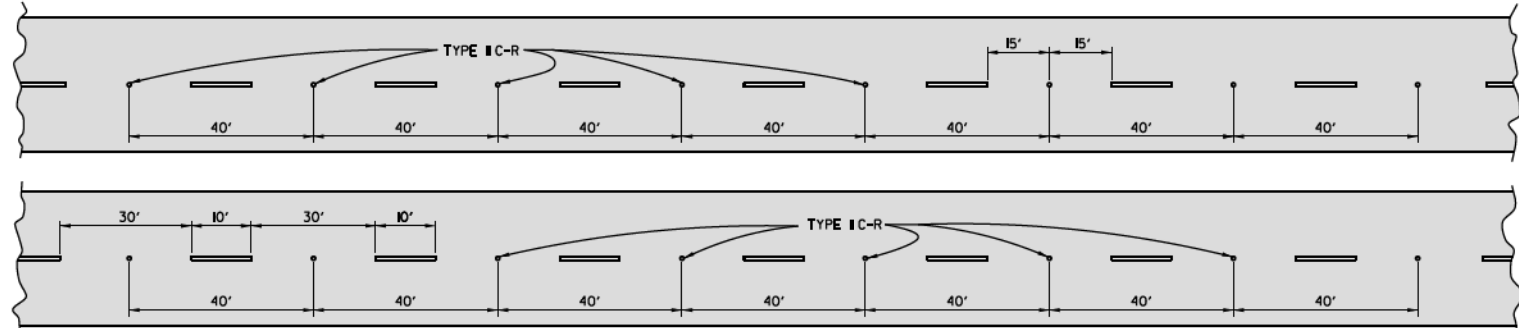
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	144

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DESCRIPTION AND APPLICATION OF PAVEMENT MARKING LINES				
LINE SERIES	COLOR	DESCRIPTION	WIDTH INCHES	TYPICAL APPLICATIONS
	WHITE	BROKEN (10' STRIPE WITH 30' GAP)	4"	LANE LINES BETWEEN TRAVEL LANES IN THE SAME DIRECTION WHEN CHANGING OF LANES IS PERMITTED.
	WHITE	SOLID	4"	EDGE LINES TO DELINEATE THE RIGHT EDGE OF THE ROADWAY.
			6"	LEFT EDGE OF BICYCLE LANE AND LANE LINES BETWEEN TRAVEL LANES IN THE SAME DIRECTION WHERE CHANGING OF LANES IS DISCOURAGED.
			6", 24"	PERPENDICULAR CROSSWALK LINES.
			18"	STOP BARS AT INTERSECTIONS (SIGNALIZED AND UNSIGNALIZED).
		12", 24"	6" DIAGONAL HATCHING USED IN GORES BETWEEN SAME DIRECTION OF TRAVEL LANES.	
	WHITE	GUIDE (2' STRIPE WITH 6' GAP)	6"	GUIDE LINES THROUGH INTERSECTIONS, TAPER LINES FOR TURN LANES, GUIDE LINES FOR BICYCLE LANES.
	YELLOW	SOLID	4"	EDGE LINES TO DELINEATE THE LEFT EDGE OF A DIVIDE ROADWAY OR A ONE-WAY ROAD.
			12", 24"	6" DIAGONAL HATCHING USED IN GORES BETWEEN OPPOSING DIRECTION OF TRAVEL LANES.
	YELLOW	DOUBLE SOLID	4" - (4") - 4" (GAP)	CENTERLINE THAT SEPARATES OPPOSING TRAVEL LANES AND DELINEATION OF MEDIAN ISLANDS.
	YELLOW	DOUBLE BROKEN	4" - (4") - 4" (GAP)	DEFINES THE EDGES OF CENTER REVERSIBLE LANES THAT ARE USE AS TWILTS DURING INTERMITTENT PERIODS.
	YELLOW	BROKEN (10' STRIPE WITH 30' GAP)	4"	SEPARATES TRAVEL LANES IN OPPOSITE DIRECTIONS WHERE PASSING IS PERMITTED IN BOTH DIRECTIONS OF TRAVEL.
YIELD LINE	WHITE	TRIANGLE	12" X 18" 24" X 36"	IN DESIGNATED AREAS

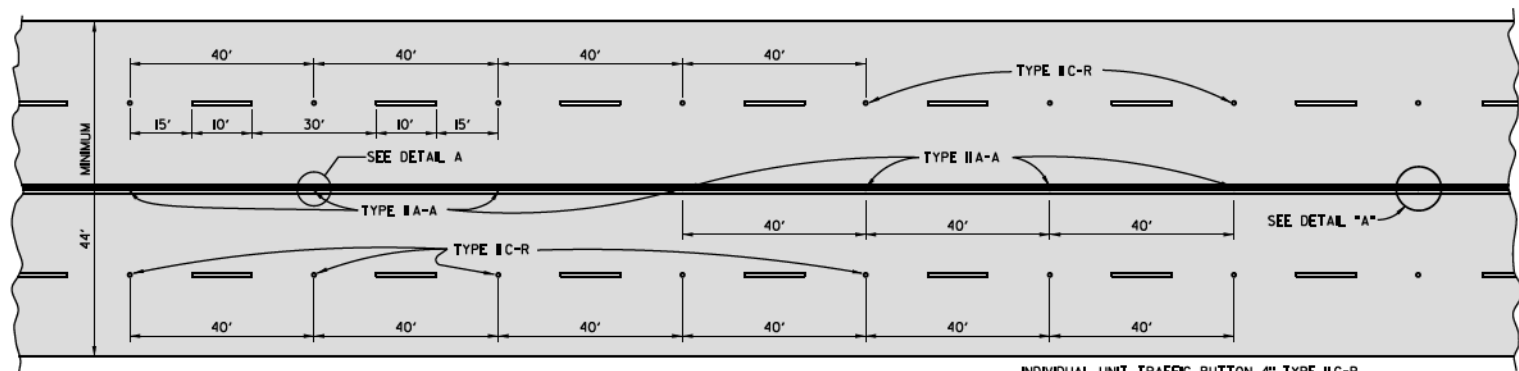
- NOTES:**
- ALL LINES ARE 125 MIL THICK THERMOPLASTIC OR 3M 380 TAPE.
 - ALL THERMOPLASTIC LINES AND PAVEMENT LEGENDS ARE 125 MIL THICK UNLESS OTHERWISE SHOWN.
 - ALL HOT APPLIED THERMOPLASTIC MUST MEET TXDOT SPECIFICATION DMS-8220
 - CROSSWALKS WITHIN TXDOT ROW SHALL FOLLOW TXDOT STANDARDS, COORDINATE WITH THE CITY OF DALLAS TRANSPORTATION FIELD OPERATIONS DEPARTMENT.

- GENERAL NOTES:**
- ALL MATERIAL AND WORK SHALL CONFORM TO THE LATEST EDITION OF CITY OF DALLAS STANDARDS 251D-1AS AMENDED, CITY OF DALLAS DEPARTMENT OF TRANSPORTATION (DDOT) TRAFFIC SIGNS STANDARDS AND TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) STANDARD PLANS UNLESS OTHERWISE APPROVED BY THE CITY.
 - ALL TRAFFIC STRIPES, PAVEMENT MARKINGS, AND SIGNS SHALL BE REFLECTORIZED AND IN STANDARD SIZE AS ACCORDING TO TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
 - THE CONTRACTOR SHALL REMOVE ALL CONFLICTING STRIPES, PAVEMENT MARKINGS, AND RAISED PAVEMENT MARKERS IN ACCORDANCE WITH THE PLANS AND AS DIRECTED BY THE ENGINEER. WORD OR SYMBOL PAVEMENT MARKINGS SHALL BE REMOVED BY SANDBLASTING OR GRINDING A RECTANGULAR AREA COVERING THE WHOLE MARKING.
 - THE CONTRACTOR SHALL FURNISH AND INSTALL ALL TRAFFIC STRIPES, RAISED PAVEMENT MARKERS (RPMs), CERAMIC BUTTONS, PAVEMENT MARKINGS, TRAFFIC CALMING DEVICES AND SIGNS IN ACCORDANCE WITH THE PLANS AND AS DIRECTED BY THE ENGINEER.
 - ALL PAVEMENT MARKINGS INCLUDING CROSSWALKS, LIMIT LINES, AND STOP BARS SHALL BE APPLIED WITH THERMOPLASTIC MATERIAL.
 - ALL RPMs AND CERAMIC BUTTONS SHALL BE INSTALLED WITHIN SEVEN WORKING DAYS OF ROADWAY STRIPING. ALL EXISTING RPMs AND CERAMIC BUTTONS WITHIN THE PROJECT AREA SHALL BE REPLACED IN KIND OR REMOVED IN ACCORDANCE WITH THE PLANS, OR AS DIRECTED BY THE ENGINEER. ALL EXISTING CAST IRON BUTTONS SHALL BE REMOVED AND NOT REPLACED.
 - THE CONTRACTOR SHALL REPLACE ALL SIGNING WITHIN PROJECT LIMITS DAMAGED OR ALTERED BY THE PROJECT, AS DETERMINED BY THE DDOT PAVEMENT MARKING SECTION REPRESENTATIVE.



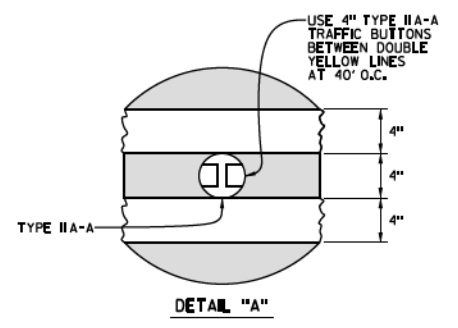
LANE LINES FOR DIVIDED THOROUGHFARE

INDIVIDUAL UNIT TRAFFIC BUTTON TYPE II-C-R RED FACE TOWARD WRONG WAY TRAFFIC SHALL BE SPACED ON 40' CENTERS.

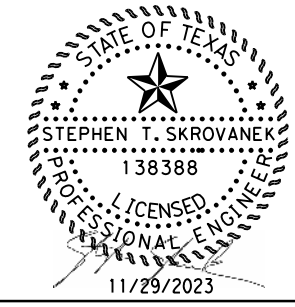


LANE LINES AND CENTER LINES FOR UNDIVIDED MINOR ARTERIALS (44' OR MORE IN WIDTH)

INDIVIDUAL UNIT TRAFFIC BUTTON 4" TYPE II-C-R TOWARD NORMAL TRAFFIC SHALL BE PLACED ON 40' CENTERS.



TYPICAL PAVEMENT MARKINGS	
LANE LINES AND CENTER LINES FOR CITY STREETS	
DEPARTMENT OF PUBLIC WORKS CITY OF DALLAS, TEXAS	
DRAWINGS NOT TO SCALE REVISED: DECEMBER 2021	SHEET No. 5001



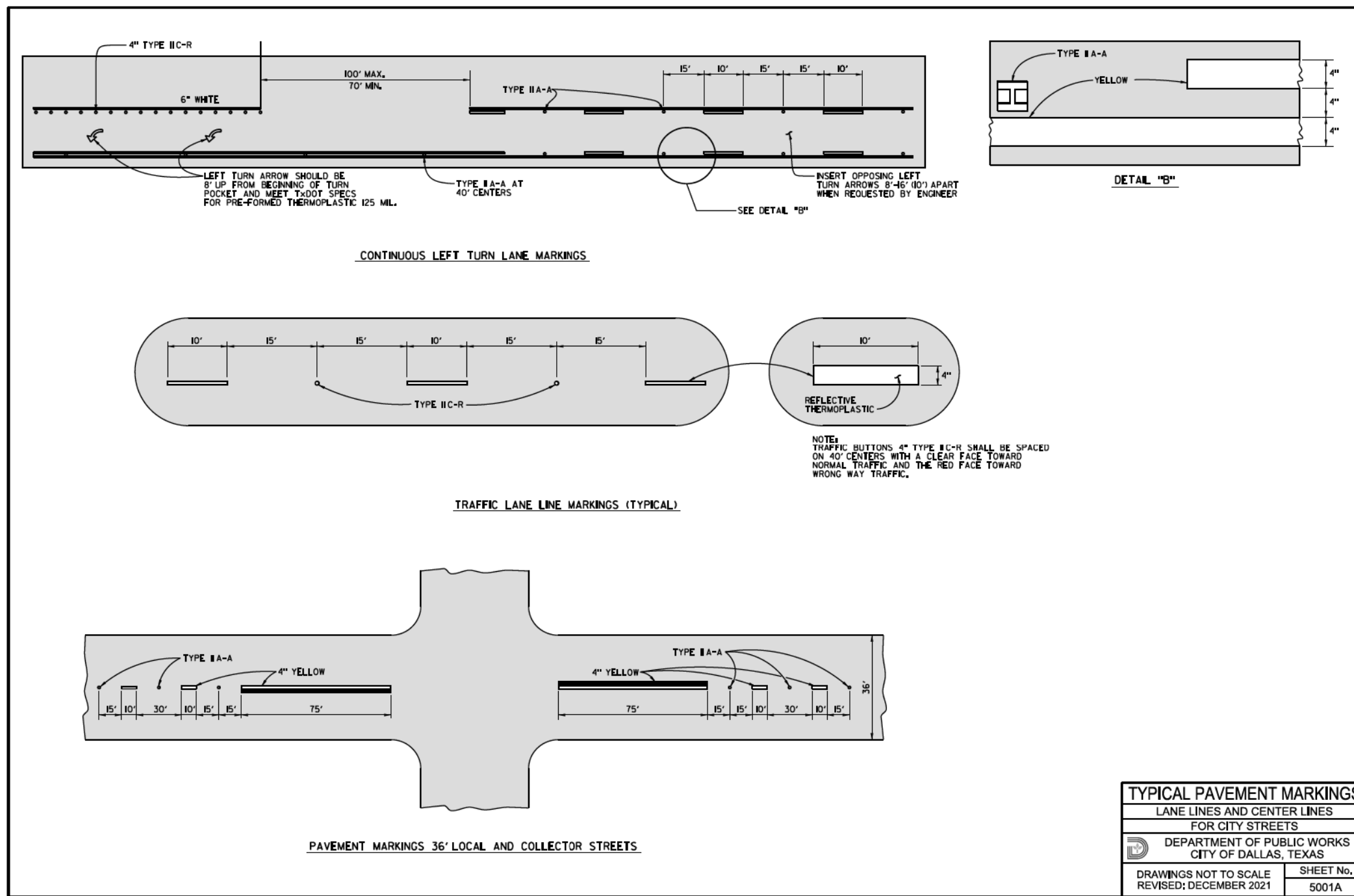
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PAVEMENT MARKINGS
DETAILS
LANE LINES AND CENTER LINES
SHEET 1 OF 2

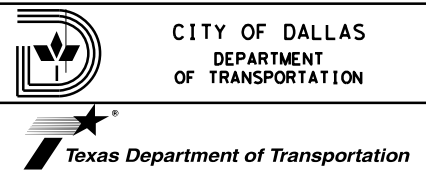
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET	VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.
DAL	COLL IN, ETC.	0918	24
		JOB NO.	SHEET NO.
		267, ETC.	145



TYPICAL PAVEMENT MARKINGS	
LANE LINES AND CENTER LINES FOR CITY STREETS	
DEPARTMENT OF PUBLIC WORKS CITY OF DALLAS, TEXAS	
DRAWINGS NOT TO SCALE REVISED: DECEMBER 2021	SHEET No. 5001A



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**PAVEMENT MARKINGS
DETAILS
LANE LINES AND CENTER LINES**

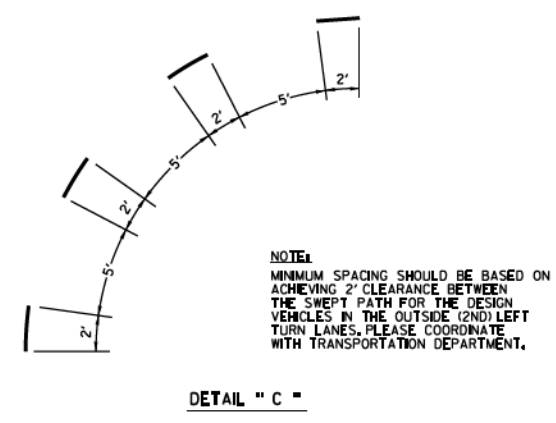
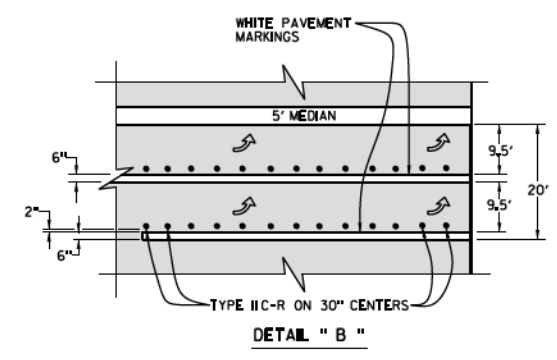
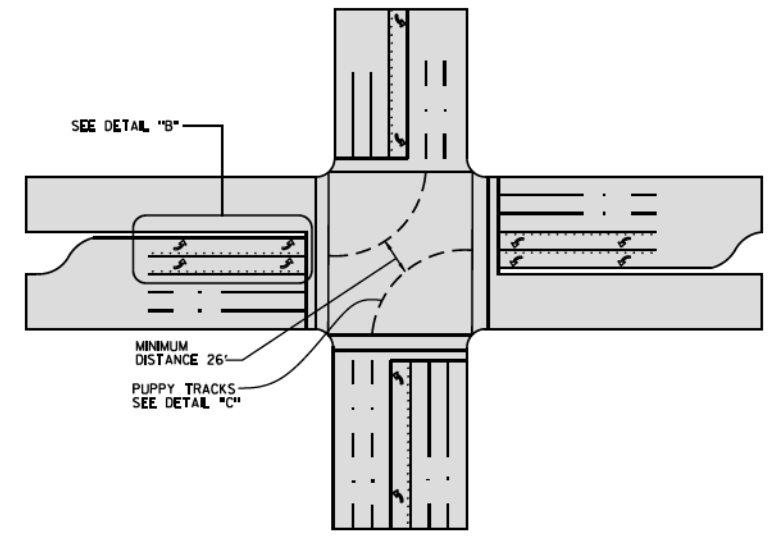
SHEET 2 OF 2

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	146

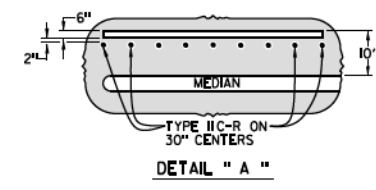
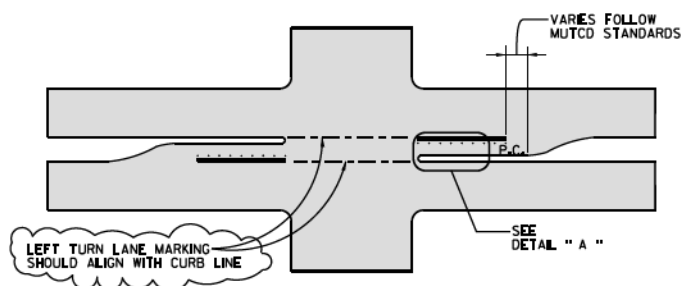
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NOTES:

1. ALL ARROWS IN A TURN POCKET ARE 8' UP FROM BEGINNING OF A TURN POCKET. WHEN THERE ARE TWO ARROWS IN A TURN POCKET THEN ONE IS 8' FROM BEGINNING OF TURN POCKET AND THE SECOND IS 8' BACK FROM THE END OF THE TURN POCKET. A TURN POCKET WITH 80' OR LESS ONE LEFT ARROW. A TURN POCKET WITH 100' PLUS TWO ARROWS AND ADD ONE ARROW EVERY 100'.
2. LEFT TURN ARROW PLACEMENTS ARE SUBJECT TO DISCRETION OF THE ENGINEER.

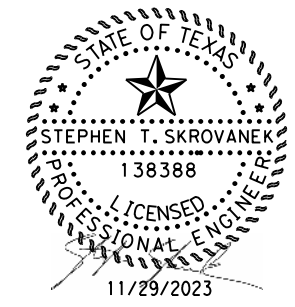


TYPICAL "PUPPY TRACK" PAVEMENT MARKING LAYOUT



STANDARD LEFT TURN LANE MARKINGS

TYPICAL PAVEMENT MARKINGS	
LEFT TURN LANES	
DEPARTMENT OF PUBLIC WORKS CITY OF DALLAS, TEXAS	
DRAWINGS NOT TO SCALE REVISED: DECEMBER 2021	SHEET No. 5002



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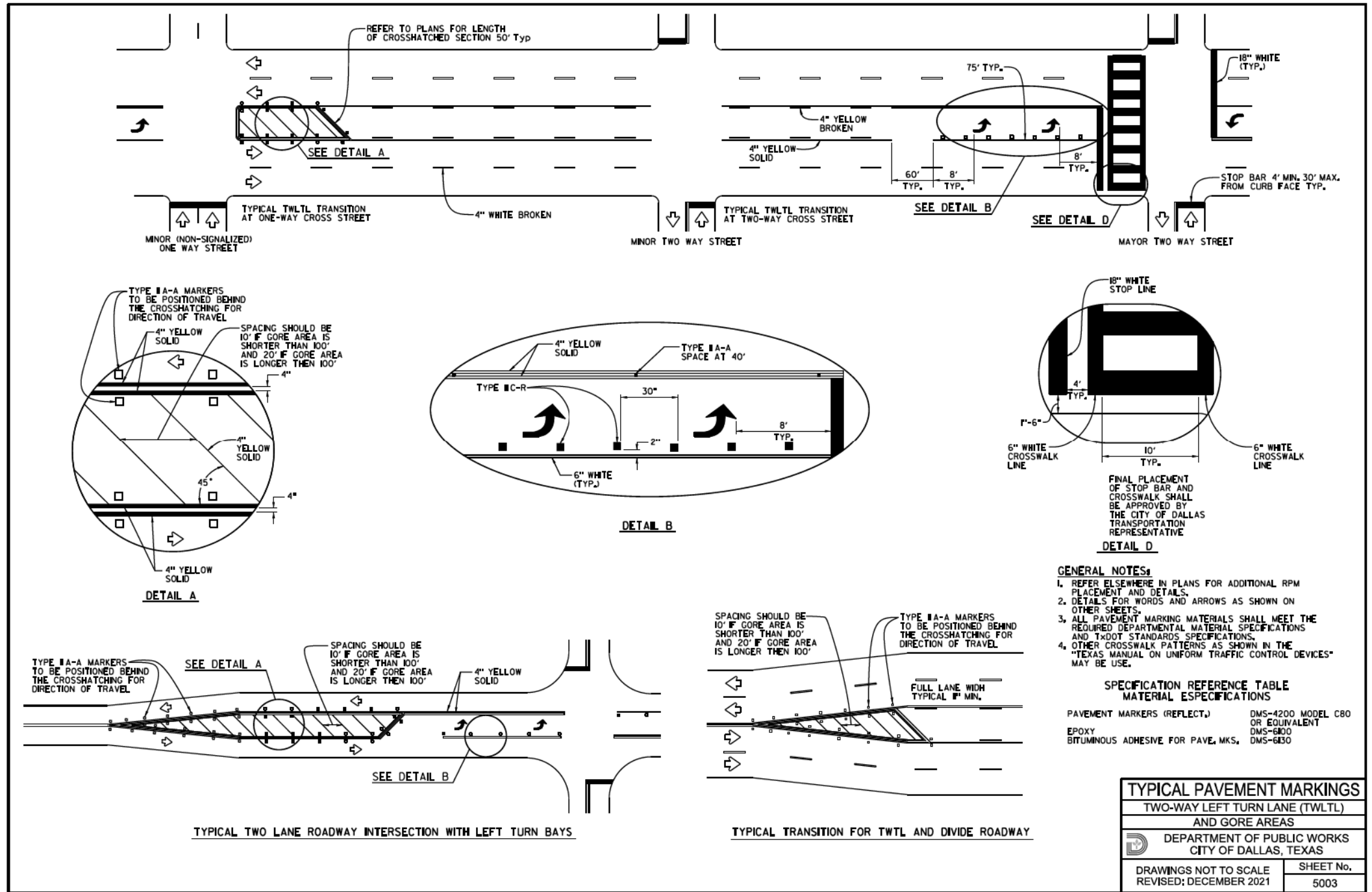
Texas Department of Transportation

PAVEMENT MARKINGS
DETAILS
LEFT TURN LANES

SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	147

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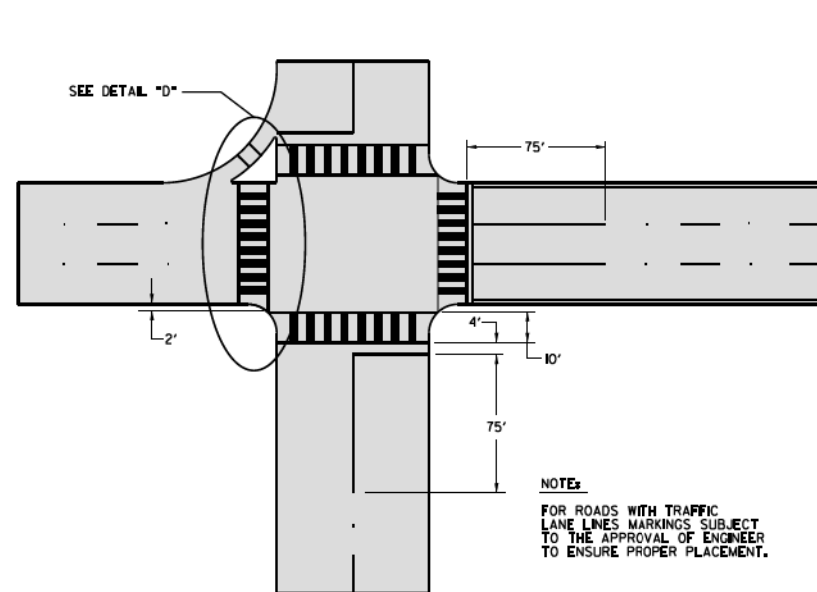
PAVEMENT MARKINGS
DETAILS
TWLTLs AND GORE AREAS

SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT	HIGHWAY NO.		
6	TEXAS	SEE TITLE SHEET	VAR		
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	148

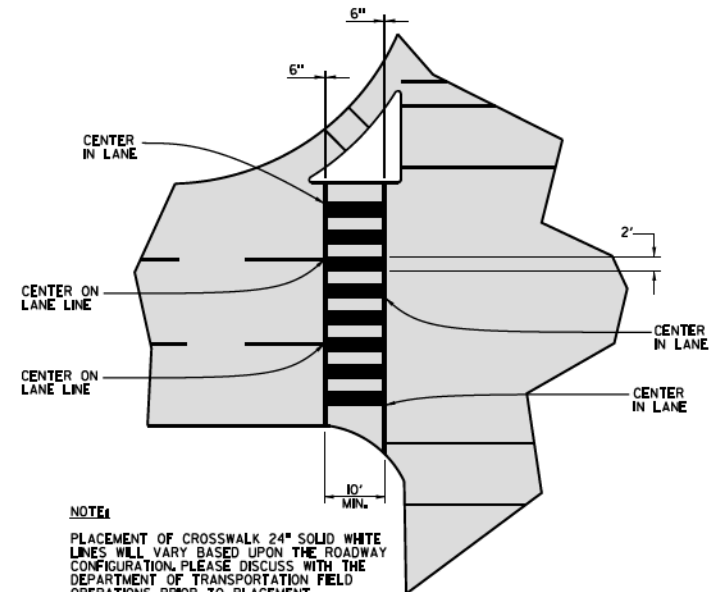
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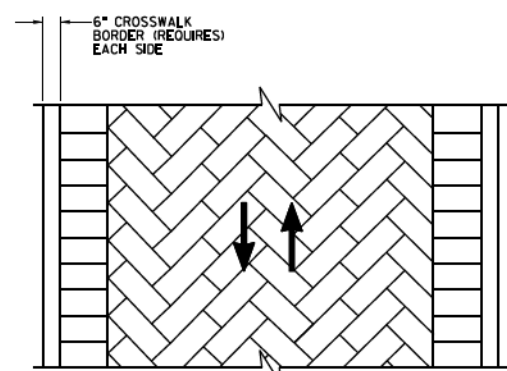
TYPICAL CROSSWALK LAYOUT

NOTE:
FOR ROADS WITH TRAFFIC LANE LINES MARKINGS SUBJECT TO THE APPROVAL OF ENGINEER TO ENSURE PROPER PLACEMENT.



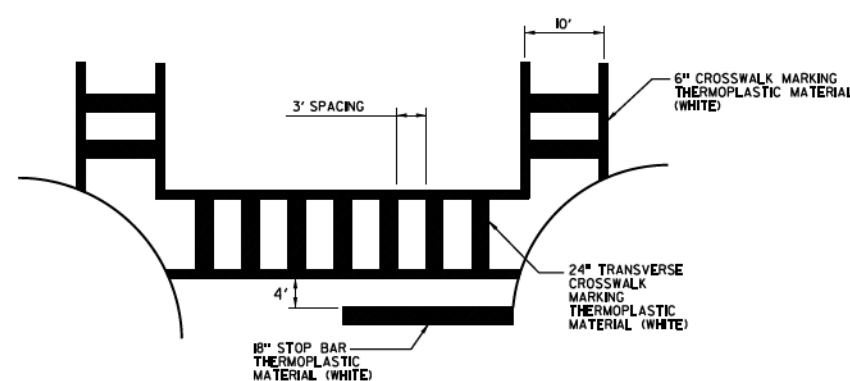
DETAIL D

NOTE:
PLACEMENT OF CROSSWALK 24" SOLID WHITE LINES WILL VARY BASED UPON THE ROADWAY CONFIGURATION. PLEASE DISCUSS WITH THE DEPARTMENT OF TRANSPORTATION FIELD OPERATIONS PRIOR TO PLACEMENT.



DECORATIVE CROSSWALK

NOTE:
DECORATIVE CROSSWALK COLOR AND PATTERNS SHALL BE APPROVED BY THE DEPARTMENT OF TRANSPORTATION PRIOR TO INSTALLATION.



CROSSWALK DETAIL

NOTE:
FOR ROADS WITHOUT TRAFFIC LANE LINES MARKINGS.

TYPICAL PAVEMENT MARKINGS	
CROSSWALK DETAILS	
DEPARTMENT OF PUBLIC WORKS CITY OF DALLAS, TEXAS	
DRAWINGS NOT TO SCALE REVISED: DECEMBER 2021	SHEET No. 5004



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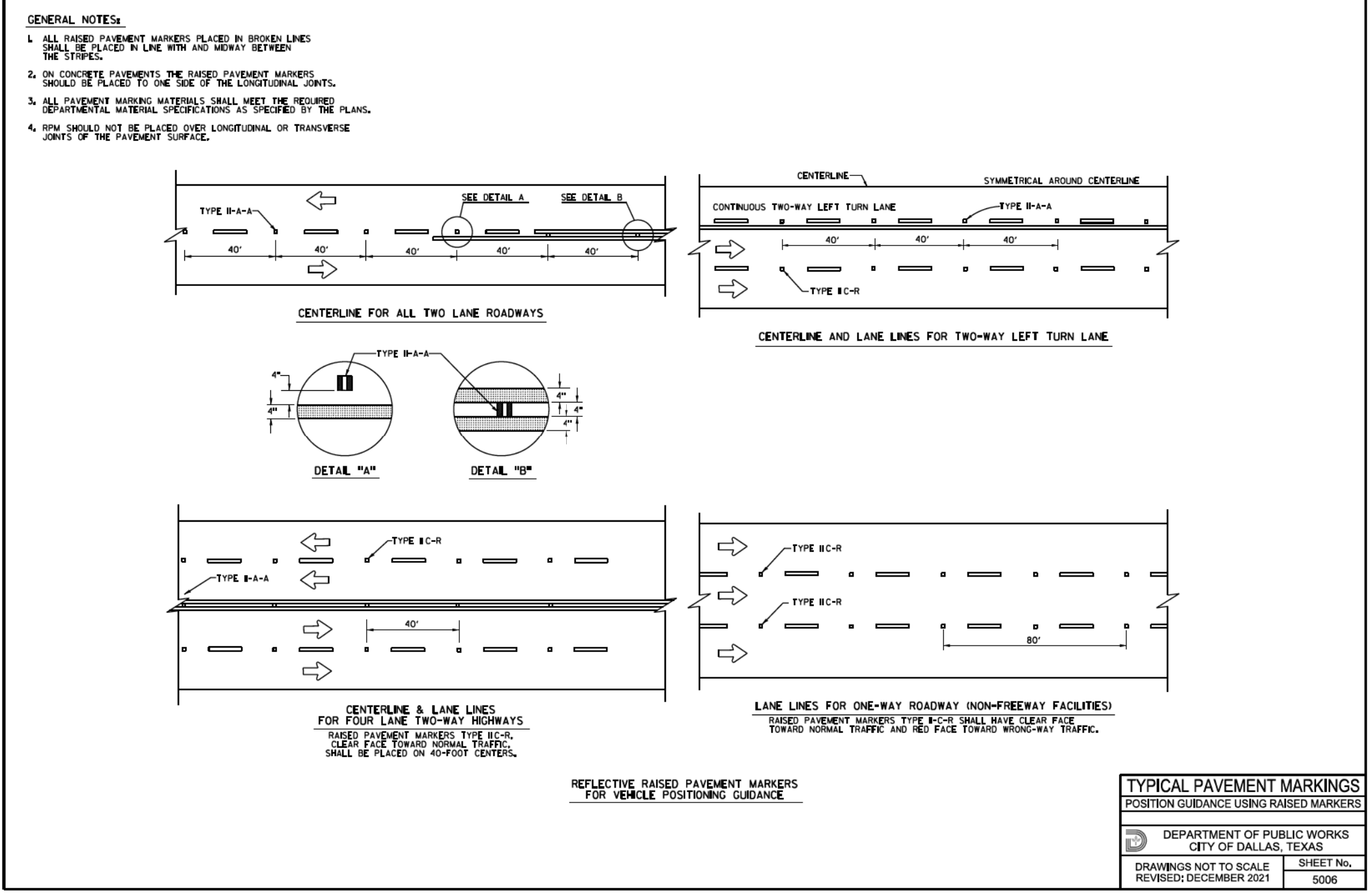
CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

Texas Department of Transportation

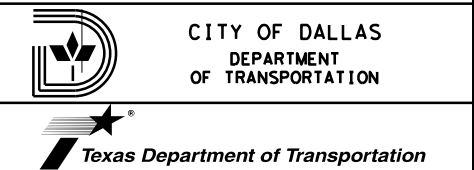
**PAVEMENT MARKINGS
DETAILS
CROSSWALK DETAILS**

SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLL IN, ETC.	0918	24	267, ETC.	149



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**PAVEMENT MARKINGS
DETAILS
RAISED MARKER POSITIONING**

SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT		HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET		VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.
				SHEET NO.
				150

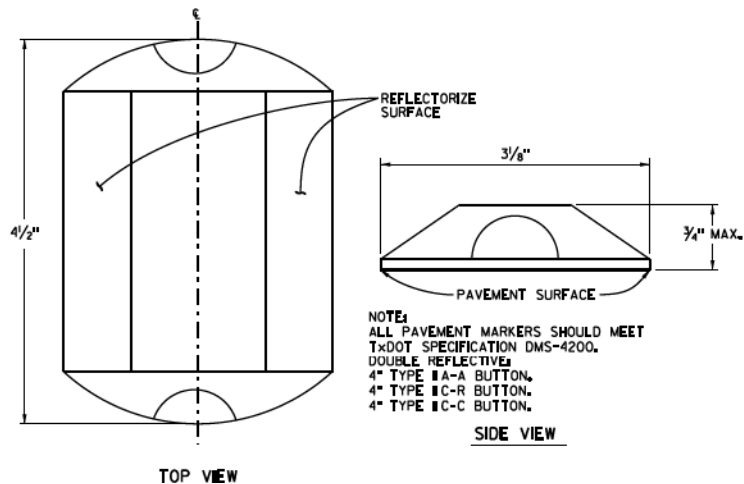
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GENERAL NOTES:

1. THE PAVEMENT UPON WHICH THE LANE AND CHANNEL MARKERS, TILE ARE TO BE PLACED SHALL BE PREPARED SUBJECT TO THE APPROVAL OF THE ENGINEER TO INSURE PROPER CLEANING OF THE PAVEMENT SURFACE.
2. RPM'S SHALL BE BONDED TO THE ROADWAY SURFACE WITH TWO PART EPOXY OR FLEXIBLE BITUMEN. BITUMEN SHOULD MEET TXDOT SPECIFICATIONS DMS-6100.
3. MARKERS SHOWN ARE FOR ILLUSTRATION PURPOSES ONLY. THEY ARE NOT INTENDED TO SPECIFY ANY PARTICULAR PRODUCT.
4. THE CITY OF DALLAS REQUIRES MARKERS TO BE MODEL C80 OR 3M SERIES 290.
5. DETAILS FOR MARKERS PLACEMENT FOR MEDIAN NOSES CAN BE FOUND ON SHEET No. 1002 AND No. 1002A

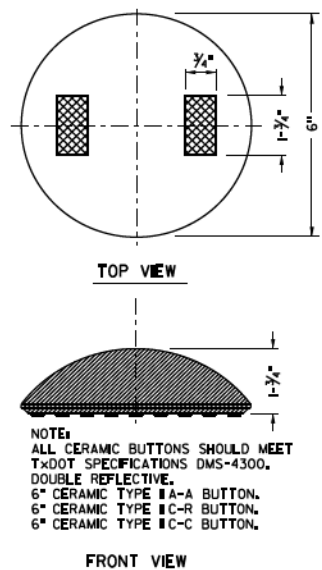
DESCRIPTION AND APPLICATION OF REFLECTIVE RAISED PAVEMENT MARKERS (RPM-4")

RRPM TYPES	COLOR	TYPE	DESCRIPTION
C-C	CLEAR & CLEAR	TYPE IIC-C	APPROACH FACE THAT REFLECTS WHITE LIGHT, AND THE OTHER SIDE DOES NOT REFLECT.
C-R	CLEAR & RED	TYPE IIC-R	APPROACH FACE THAT REFLECTS WHITE LIGHT, AND THE OTHER SIDE REFLECTS RED LIGHT.
A-A	AMBER & AMBER	TYPE IIA-A	APPROACH FACE AND THE OTHER SIDE BOTH REFLECT AMBER LIGHT.

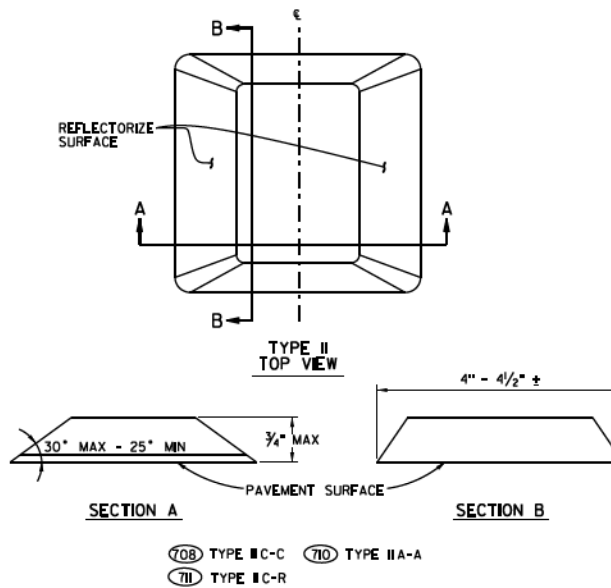


DESCRIPTION OF MARKERS:
 DOUBLE REFLECTIVE:
 4" TYPE IIA-A BUTTON - YELLOW / YELLOW REFLECTORS,
 4" TYPE IIC-R BUTTON - WHITE / RED REFLECTORS,
 4" TYPE IIC-C BUTTON - WHITE / WHITE REFLECTORS.

PAVEMENT LANE MARKERS (REFLECTORIZED)



6" CERAMIC CHANNEL MARKERS



708 TYPE IIC-C 710 TYPE IIA-A
 711 TYPE IIC-R

PAVEMENT LANE MARKERS (REFLECTORIZED)

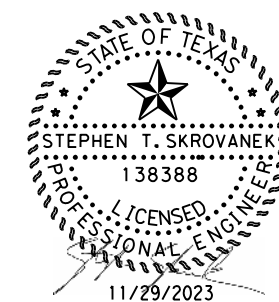
TYPICAL PAVEMENT MARKINGS

INDIVIDUAL UNIT PAVEMENT MARKINGS
 REFLECTIVE PAVEMENT MARKERS,
 CERAMIC TRAFFIC BUTTONS

DEPARTMENT OF PUBLIC WORKS
 CITY OF DALLAS, TEXAS

DRAWINGS NOT TO SCALE
 REVISED: DECEMBER 2021

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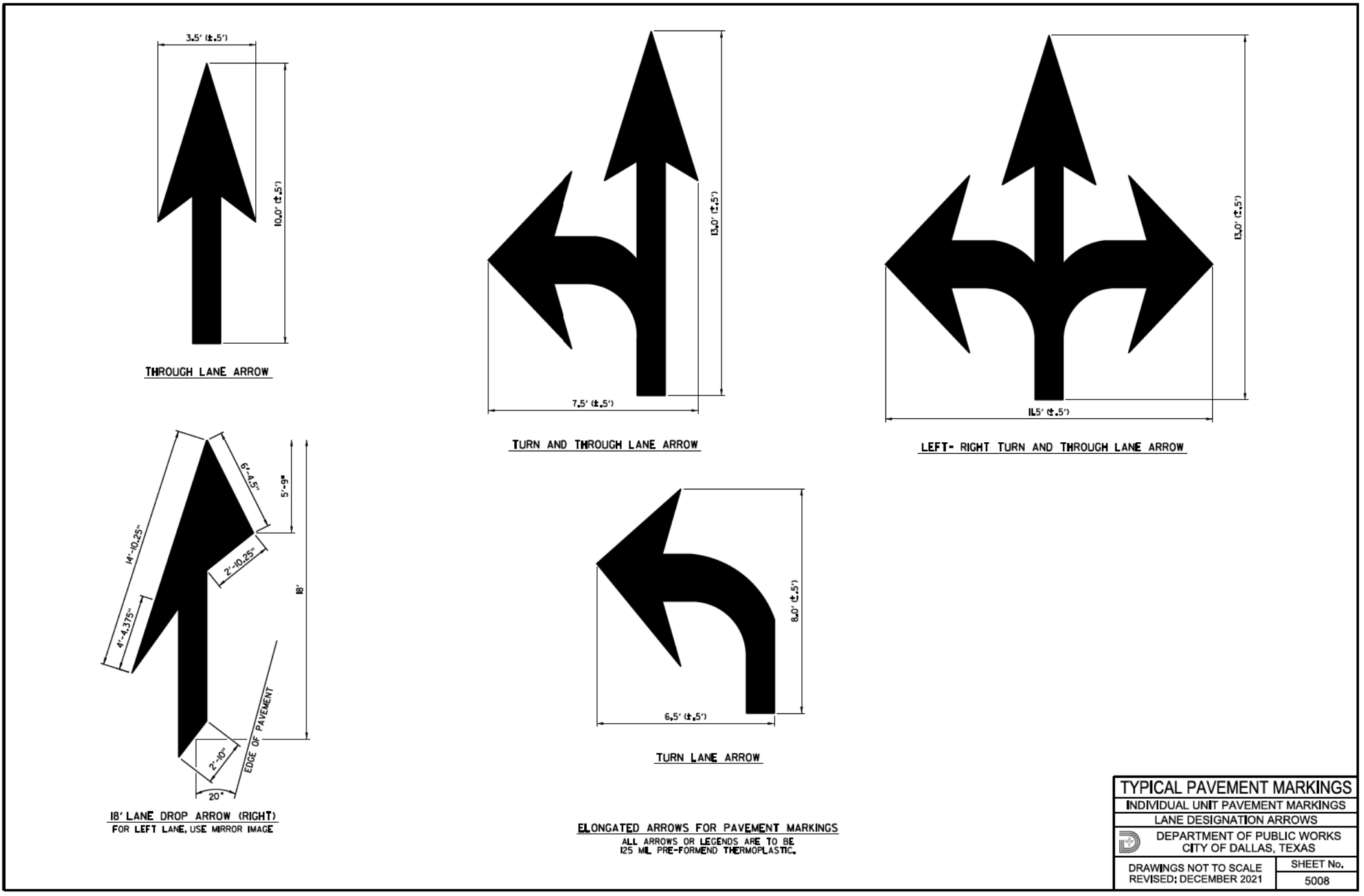
Texas Department of Transportation

**PAVEMENT MARKINGS
 DETAILS
 RAISED MARKER DETAILS**

SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	151

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ELONGATED ARROWS FOR PAVEMENT MARKINGS
 ALL ARROWS OR LEGENDS ARE TO BE
 125 MIL. PRE-FORMED THERMOPLASTIC.

TYPICAL PAVEMENT MARKINGS	
INDIVIDUAL UNIT PAVEMENT MARKINGS	
LANE DESIGNATION ARROWS	
DEPARTMENT OF PUBLIC WORKS CITY OF DALLAS, TEXAS	
DRAWINGS NOT TO SCALE REVISED: DECEMBER 2021	SHEET No. 5008



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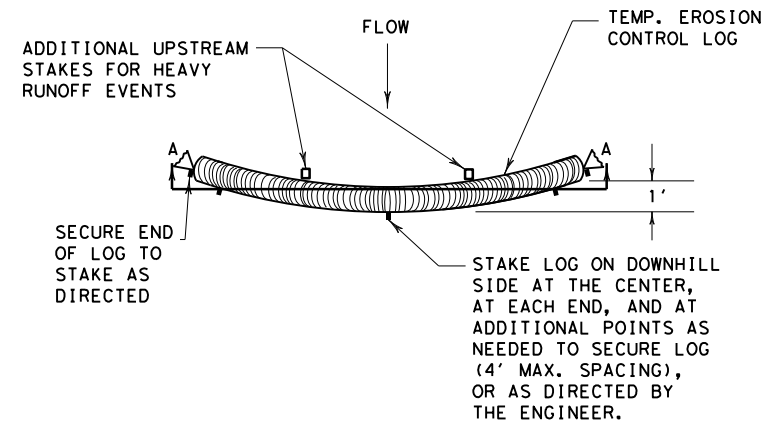
**PAVEMENT MARKINGS
 DETAILS
 LANE DESIGNATION ARROWS**

SHEET 1 OF 1

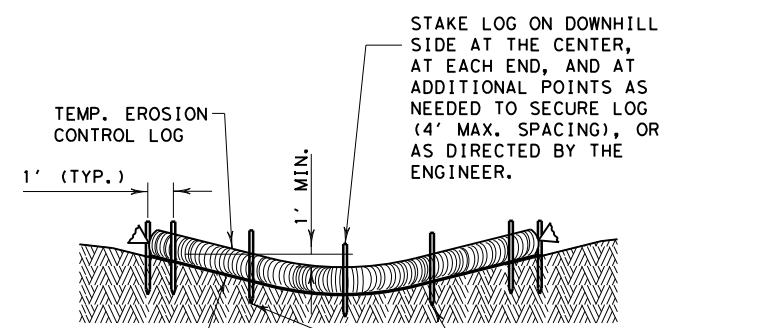
FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT			HIGHWAY NO.
6	TEXAS	SEE TITLE SHEET			VAR
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
DAL	COLLIN, ETC.	0918	24	267, ETC.	152

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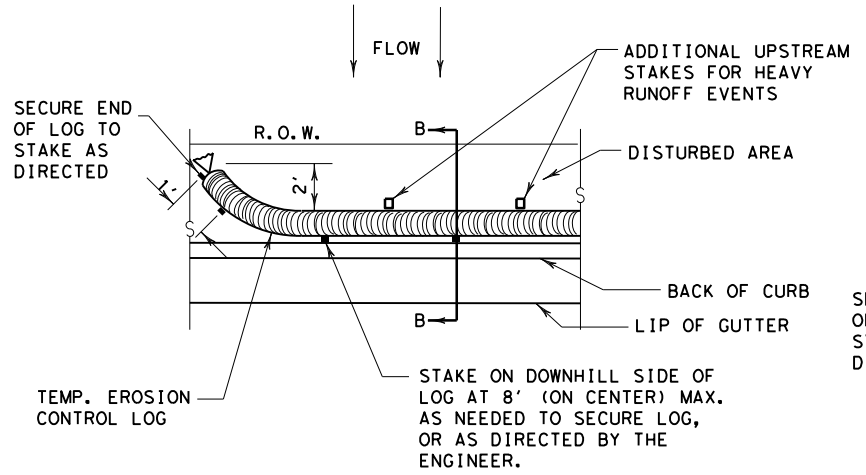
PLAN VIEW



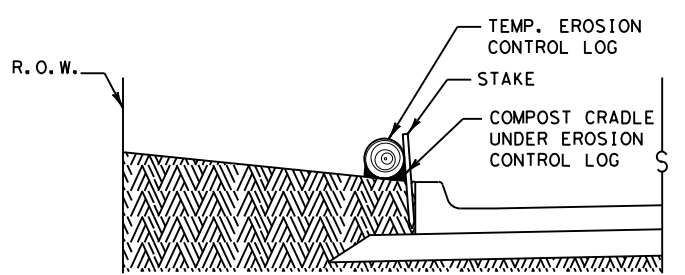
SECTION A-A
EROSION CONTROL LOG DAM

LEGEND

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

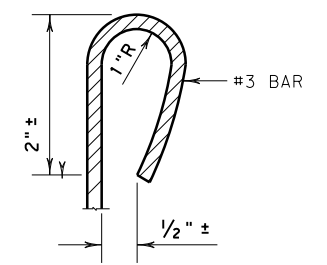


PLAN VIEW

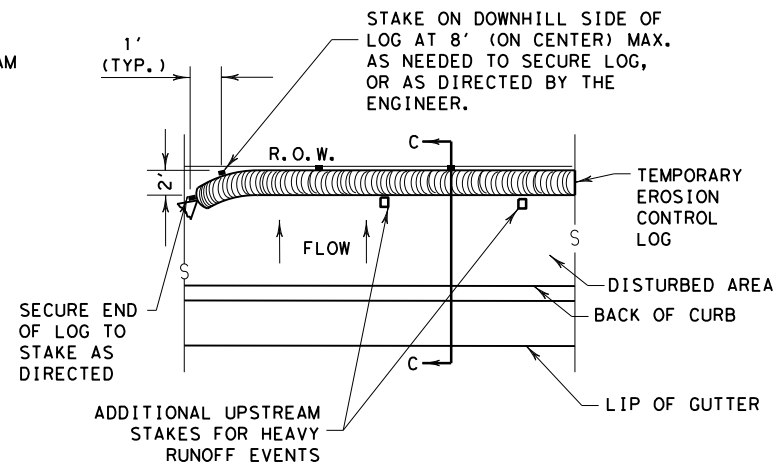


SECTION B-B
EROSION CONTROL LOG AT BACK OF CURB

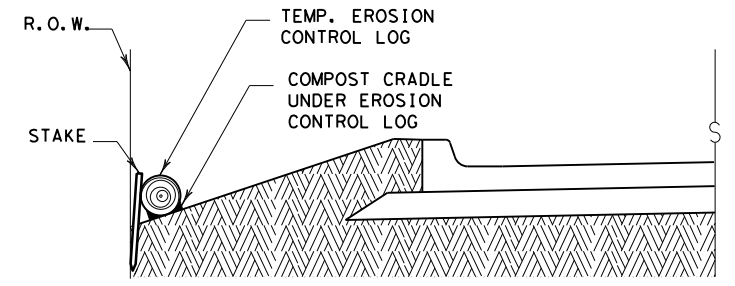
CL-BOC



REBAR STAKE DETAIL



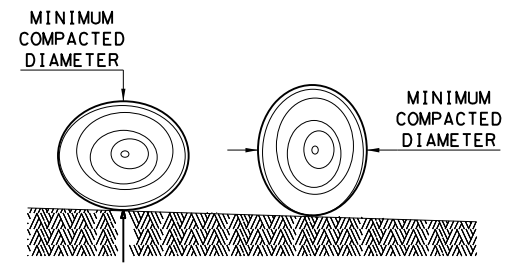
PLAN VIEW



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

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

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

Control logs should be placed in the following locations:

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

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

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

GENERAL NOTES:

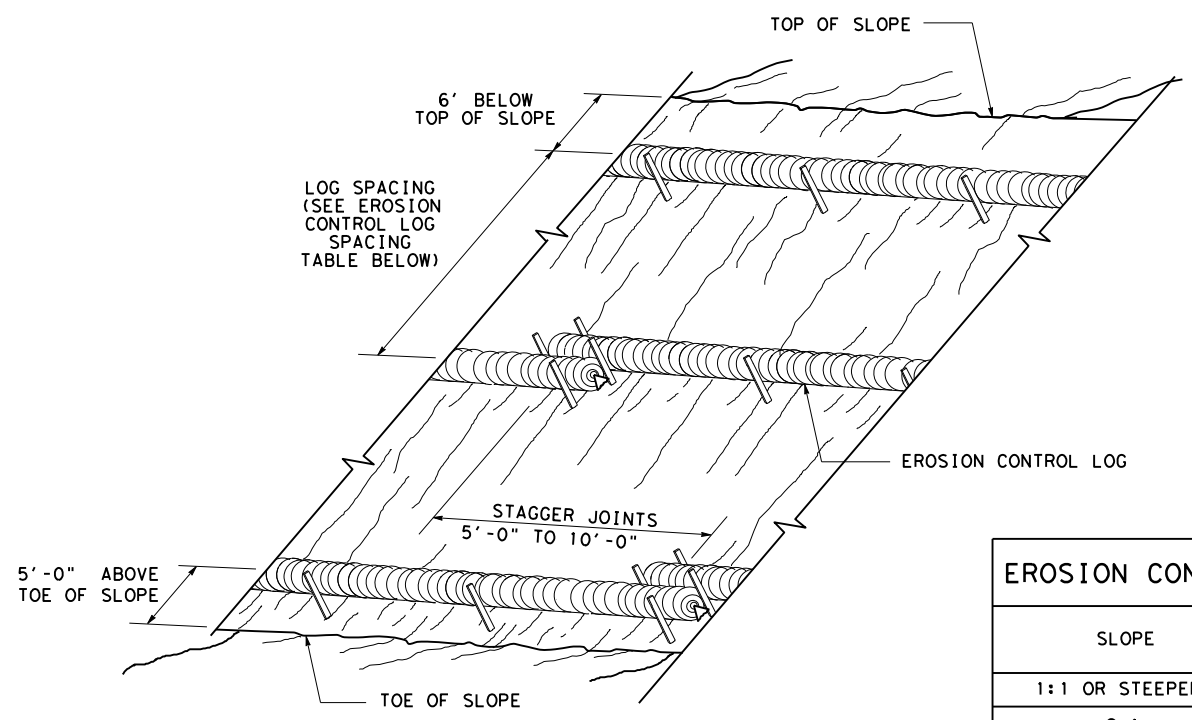
1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE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

SHEET 1 OF 3

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES			
EROSION CONTROL LOG			
EC (9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0918 24	267, ETC.	HIGHWAY
DIST	COUNTY	SHEET NO.	
DAL	COL, ETC.	153	

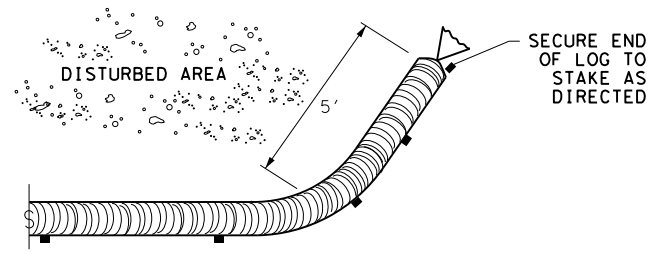
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EROSION CONTROL LOGS ON SLOPES
 STAKE AND TRENCHING ANCHORING

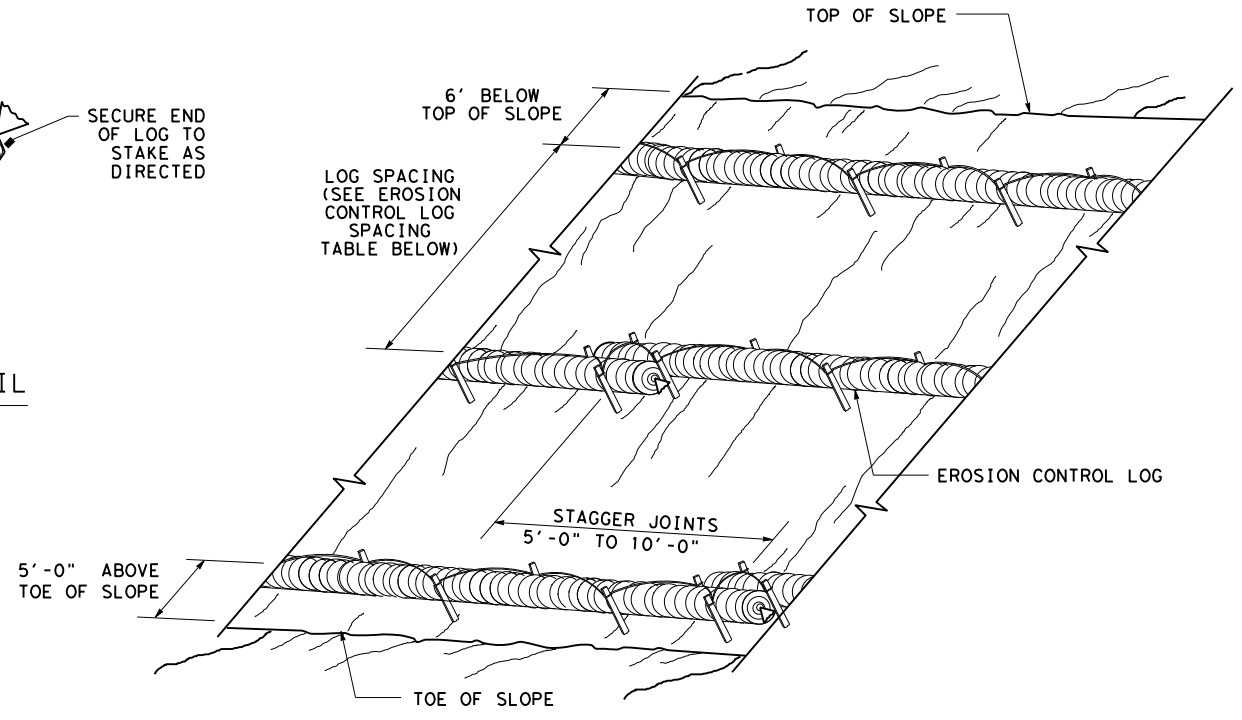
CL-SST



END SECTION RAP DETAIL

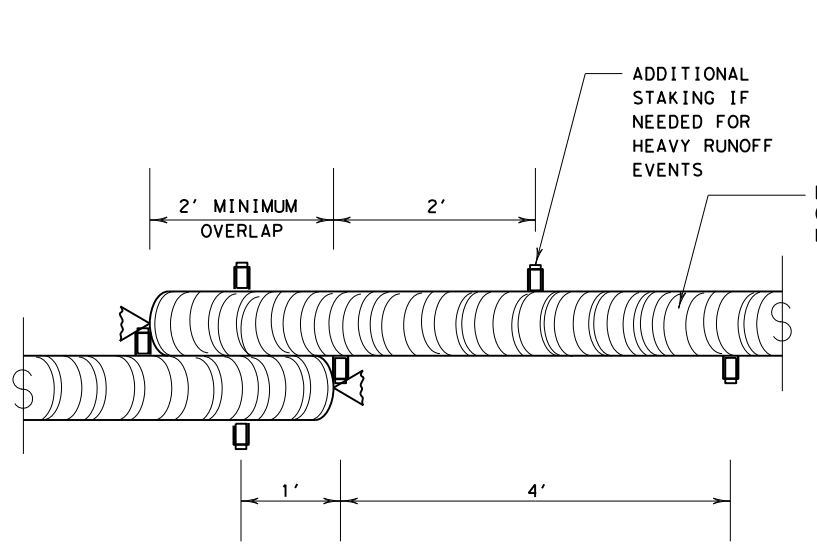
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

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



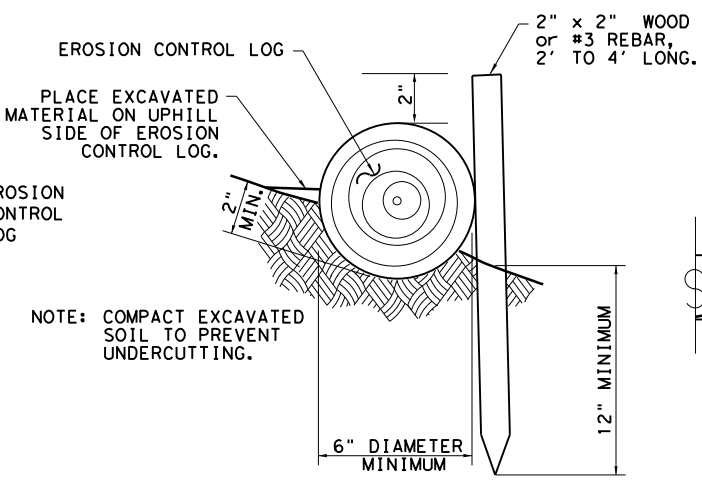
EROSION CONTROL LOGS ON SLOPES
 STAKE AND LASHING ANCHORING

CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

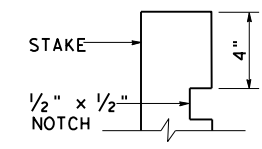
CL-SST



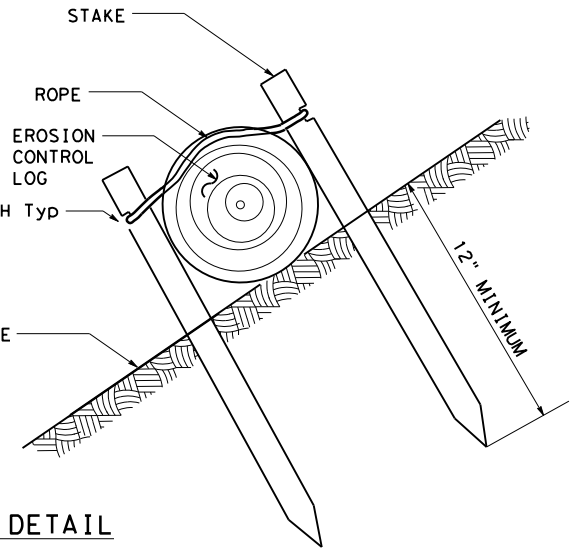
STAKE AND LASHING ANCHORING DETAIL

CL-SSL

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



STAKE NOTCH DETAIL



SHEET 2 OF 3

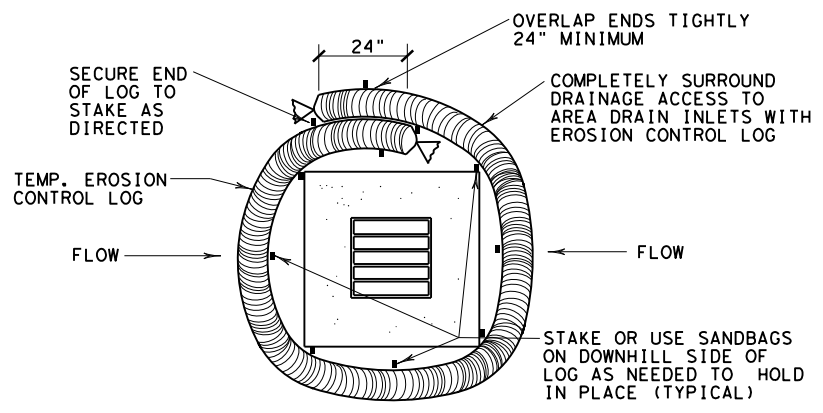
Texas Department of Transportation
Design Division Standard

**TEMPORARY EROSION,
 SEDIMENT AND WATER
 POLLUTION CONTROL MEASURES
 EROSION CONTROL LOG
 EC (9) - 16**

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0918	24	267, ETC.	VAR
DIST	COUNTY	SHEET NO.		
DAL	COL, ETC.	154		

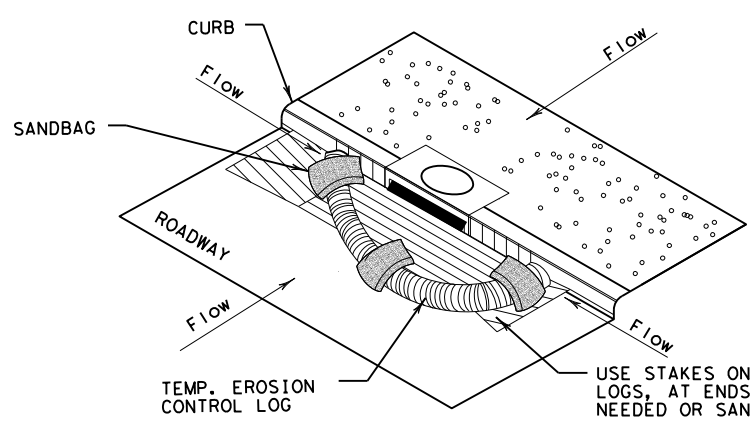
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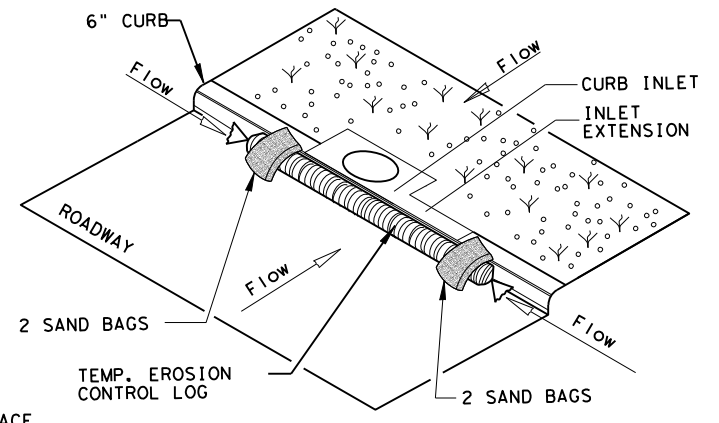
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

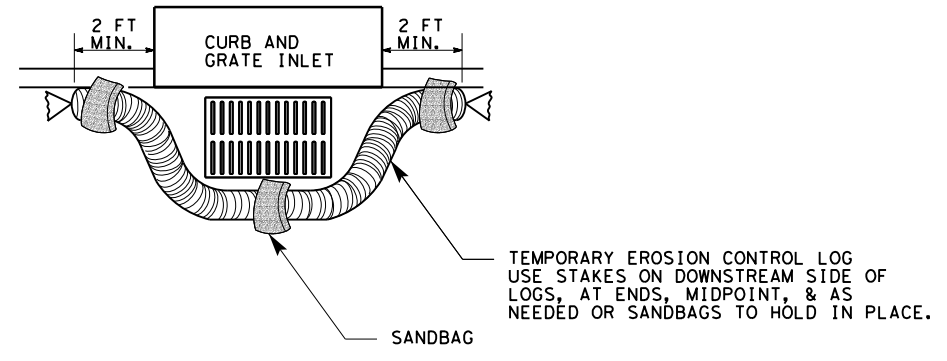
CL-CI



EROSION CONTROL LOG AT CURB INLET

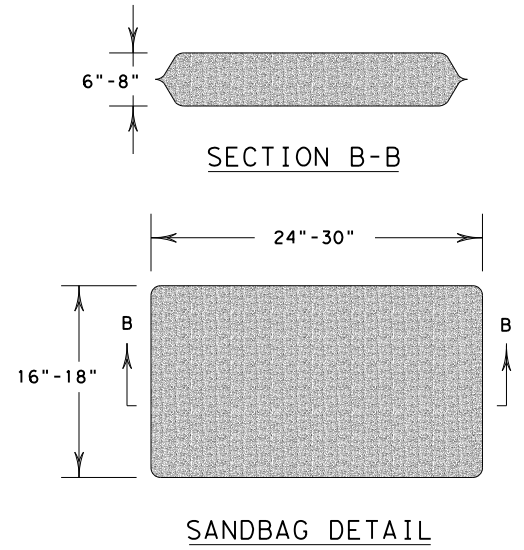
CL-CI

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



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SANDBAG DETAIL

SHEET 3 OF 3

		<i>Design Division Standard</i>	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0918	24	267, ETC.
	DIST	COUNTY	SHEET NO.
	DAL	COL, ETC.	155

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Notes To Designer:
1. Do not alter Sheet Design or Font style, size or weight - match text attributes.
2. If additional space is needed for a numbered section, fence and adjust sections up or down as needed for proportioning and readability but do not relocate from its relative position.
3. All areas should be addressed thoroughly and verify the necessary pay items are set up to support actions needed.
Filled Out: XX.XX.XXXX
Prepared By: Name/Section

I. STORMWATER POLLUTION PREVENTION PLAN-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 adjacent MS 4 Operator(s) that receive discharges from this project. They need to be notified prior to construction activities.
(Note: Leave blank only if no adjacent MS 4 Operator(s) are affected.)

- CITY OF DALLAS - Phase I MS4 - Contact Kevin Hurley
- No Action Required Required Action

Action Number:

- Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
- Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
- Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
- 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. No equipment is allowed in any stream channel below the ordinary High Water Mark except on approved temporary stream crossings or drill pads.

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# 3(a)

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.

-
-
-

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 for applicable 401 General Conditions:
(Note: If CORP Permit not required, do not check boxes.)

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

-
-

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 Number:

-
-

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS TREATY ACT.

- No Action Required Required Action

Action Number:

Special Notes:

- Avoid harming all wildlife species if encountered and allow them to safely leave the project site. Due diligence should be used to avoid killing or harming any wildlife species in the implementation of transportation projects.
- If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediated area, and contact the Engineer immediately.
- The Migratory Bird Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade or transport any migratory bird, nest, young, feather or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. The contractor would remove all old migratory bird nests from any structure or trees where work would be done from October 1 to February 15. In addition, the contractor would be prepared to prevent migratory birds from building nest(s) between February 15 to October 1. In the event that migratory birds are encountered on-site during project construction, efforts to avoid adverse impacts on protected birds, active nests, eggs and/or young would be observed.

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 Corp 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 Safety Data Sheets (SDS) 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 SDS. In the event of a spill, take actions to mitigate the spill as indicated in the SDS, 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, canisters, barrels, etc.
 * Undesirable smells or odors
 * Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation(s) or replacement(s) (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 Number:

VII. OTHER ENVIRONMENTAL ISSUES

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

- No Action Required Required Action

Action Number:

-

GENERAL NOTE:

Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities, as additional environmental clearance may be required.

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Dallas District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	VA
STATE	DISTRICT	COUNTY
TEXAS	DALLAS	DALLAS
CONTROL	SECTION	JOB
0918	24	267, etc.
		SHEET NO.
		156

STORMWATER POLLUTION PREVENTION 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):

0918-24-267,ETC

1.2 PROJECT LIMITS:

VARIOUS INTERSECTIONS WITHIN DALLAS, COLLIN, AND DENTON COUNTY

1.3 PROJECT COORDINATES:

1.4 TOTAL PROJECT AREA (Acres): 0.48

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.48

1.6 NATURE OF CONSTRUCTION ACTIVITY:

Construction of safety improvements and traffic control devices consisting of installation of traffic signals.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
UNKOWN	

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:

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

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

Other: TRAFFIC SIGNAL INSTALLATION-EXCAVATION OF SOIL FOR CONDUIT,GROUND BOXES,DRILLED SHAFTS

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: N/A

Other: _____

Other: _____

1.11 RECEIVING WATERS:

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

Tributaries	Classified Waterbody
N/A	

* 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: _____

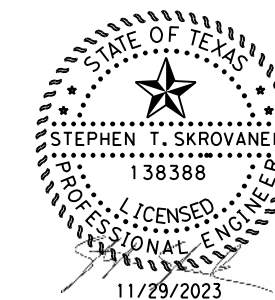
Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- Day To Day Operational Control
- Maintain schedule of major construction activities
- Install, maintain and modify BMPs

Other: _____

Other: _____



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

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6	SEE TITLE SHEET			157
STATE	STATE DIST.	COUNTY		
TEXAS	DAL	COL,ETC.		
CONT.	SECT.	JOB	HIGHWAY NO.	
0918	24	267,ETC.	VAR	

STORMWATER POLLUTION PREVENTION 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
NONE		

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: N/A

- Other: _____
- Other: _____
- Other: _____

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

2.5 POLLUTION PREVENTION MEASURES:

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities
- Other: N/A
- 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
NONE		

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)

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		158
STATE	STATE DIST.	COUNTY	
TEXAS	DAL	COL, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
0918	24	267, ETC.	VAR