DESIGN	FED RD. DIV NO	FEDERAL AID			
ES	6	STP 2B24(162)VRU			
GRAPHICS	STATE	CONT	SECT	JOB	HIGHWAY NO.
JR	TEXAS	0047	07	243, ETC	US 75, ETC
CHECK	CHECK	DIST	COUNTY		SHEET NO
JC	ES	DAL	DALLAS, ETC		1

FINAL PLANS

NAME OF CONTRACTOR: _____

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED: _____

DATE WORK ACCEPTED: _____

SUMMARY OF CHANGE ORDERS:

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT
CSJ: 0047-07-243, ETC.

DESIGN SPEEDS = VARIES

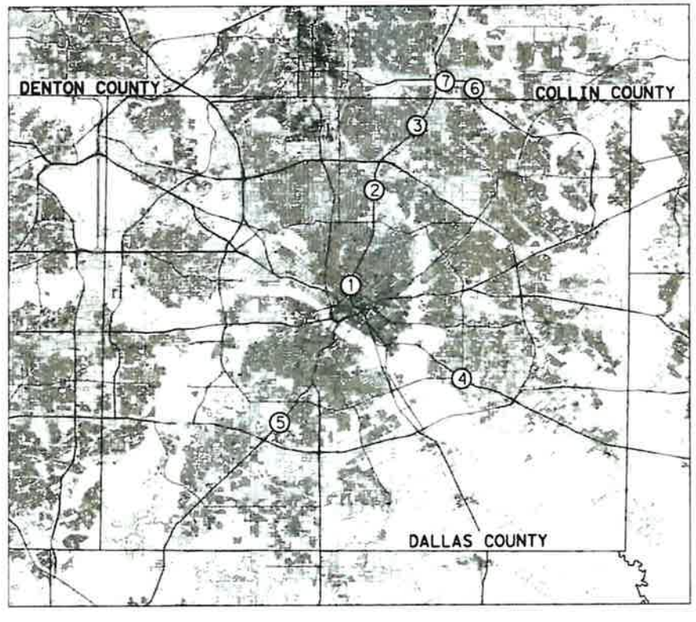
CITY OF DALLAS
PROJECT SITES
① CSJ 0047-07-243
US 75 AT LEMMON AVE
STP 2B24(162)VRU
② CSJ 0047-07-244
US 75 AT ROYAL LN
STP 2B24(162)VRU

CITY OF DALLAS
PROJECT SITES
④ CSJ 0197-02-134
US 175 AT SL 12
STP 2B24(162)VRU
⑤ CSJ 0261-03-069
US 67 AT RED BIRD LN
STP 2B24(162)VRU

CITY OF RICHARDSON
PROJECT SITES
③ CSJ 0047-07-247
US 75 AT ARAPAHO RD
STP 2B24(165)VRU
⑥ CSJ 2964-05-032
SH 190 AT RENNER RD
STP 2B24(165)VRU
⑦ CSJ 2964-05-033
SH 190 AT PLANO RD
STP 2B24(165)VRU

US 75, VARIOUS
COLLIN & DALLAS COUNTIES

FOR THE CONSTRUCTION OF SAFETY IMPROVEMENT PROJECTS
CONSISTING OF TRAFFIC SIGNALS INSTALLATIONS



N
0 1 4
1" = 8 MILES
DALLAS DISTRICT

EQUATIONS: NONE
EXCEPTIONS: NONE
RAILROAD CROSSINGS: NONE

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. TABS2024015385

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/24/2024

CITY OF DALLAS

CONCURRENCE: 04-24-2024
G. A. Hicks, P. E.
DIRECTOR OF DALLAS DEPARTMENT OF TRANSPORTATION

CONCURRENCE: 4-24-24
ASST. DIRECTOR OF DALLAS DEPARTMENT OF TRANSPORTATION

CITY OF RICHARDSON

CONCURRENCE: 4-25-2024
DIRECTOR OF TRANSPORTATION AND MOBILITY CITY OF RICHARDSON

CONCURRENCE: 4/25/24
ASST. DIRECTOR OF TRANSPORTATION AND MOBILITY CITY TRAFFIC ENGINEER OF RICHARDSON

TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED FOR LETTING
DocuSigned by: 4/29/2024
Eyad Fanous, P.E.
TRAFFIC DESIGN SUPERVISOR
7C074158193848D...

APPROVED FOR LETTING
DocuSigned by: 4/29/2024
Christopher D. Blain, P.E.
DIRECTOR OF OPERATIONS
5E35BC5C7...

WORK WAS COMPLETED ACCORDING TO THE PLANS AND CONTRACT

_____
Signature of Registrant & Date

DATE: 4/24/2024

DocuSign

Certificate Of Completion

Envelope Id: 3FCD6E6DDA7B4C9EB13E17E850881A23
Status: Completed
Subject: Complete with DocuSign: 001 Title Sheet.pdf 0624 0047-07-243 Dallas
Source Envelope:
Document Pages: 1
Signatures: 2
Envelope Originator:
Certificate Pages: 2
Initials: 0
Annie Bryant
AutoNav: Enabled
125 E. 11th Street
EnvelopeId Stamping: Enabled
Austin, TX 78701
Time Zone: (UTC-06:00) Central Time (US & Canada)
Annie.Bryant@txdot.gov
IP Address: 204.64.21.251

Record Tracking

Status: Original
4/28/2024 9:22:39 PM
Holder: Annie Bryant
Annie.Bryant@txdot.gov
Location: DocuSign
Security Appliance Status: Connected
Pool: StateLocal
Storage Appliance Status: Connected
Pool: Texas Department of Transportation
Location: DocuSign

Signer Events	Signature	Timestamp
Christopher D. Blain, PE Christopher.Blain@txdot.gov DAL - Traffic Projects Engineer TxDOT Security Level: Email, Account Authentication (Optional)	DocuSigned by: Christopher D. Blain, PE 5E35BC5C75194E5... Signature Adoption: Pre-selected Style Using IP Address: 204.64.21.234	Sent: 4/28/2024 9:27:31 PM Viewed: 4/29/2024 8:05:32 AM Signed: 4/29/2024 8:05:54 AM
Electronic Record and Signature Disclosure: Not Offered via DocuSign		
Eyad Fanous, P.E. Eyad.Fanous@txdot.gov Transportation Engineer Supervisor Texas Department of Transportation Security Level: Email, Account Authentication (Optional)	DocuSigned by: Eyad Fanous, P.E. 7C074158193648D... Signature Adoption: Pre-selected Style Using IP Address: 204.64.21.234	Sent: 4/28/2024 9:27:31 PM Viewed: 4/29/2024 5:20:23 AM Signed: 4/29/2024 5:21:44 AM
Electronic Record and Signature Disclosure: Not Offered via DocuSign		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	4/28/2024 9:27:32 PM

Envelope Summary Events	Status	Timestamps
Certified Delivered	Security Checked	4/29/2024 5:20:23 AM
Signing Complete	Security Checked	4/29/2024 5:21:44 AM
Completed	Security Checked	4/29/2024 8:05:54 AM

Payment Events	Status	Timestamps

INDEX OF SHEETS

SHEET DESCRIPTION

I. GENERAL

II. TRAFFIC CONTROL STANDARDS

III. ROADWAY DETAILS

NONE

IV. RETAINING WALL DETAILS

NONE

V. DRAINAGE DETAILS

NONE

VI. UTILITIES

NONE

VII. BRIDGES

NONE

VIII. TRAFFIC ITEMS

SHEET DESCRIPTION

VIII. TRAFFIC ITEMS

SHEET DESCRIPTION

VIII. TRAFFIC STANDARDS

IX. ENVIRONMENTAL ISSUES

X. MISCELLANEOUS ITEMS

NONE

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER

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

Elizabeth Shelton , P.E. 5/1/2024
Signature of Registrant & Date

STATE OF TEXAS
CHARLES R. STEVENS, JR
101286
LICENSED
PROFESSIONAL ENGINEER

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

, P.E. 5/1/2024
Signature of Registrant & Date

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

INDEX OF SHEETS

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
ES	6	(SEE TITLE SHEET)		US 75, ETC.
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
JR	TEXAS	DAL	DALLAS, ETC.	2
CHECK	CONTROL	SECTION	JOB	
JC	0047	07	243, ETC.	
CHECK				
ES				

GENERAL

The co struction, 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 0.1AC (CCSJ 0047-07-243), 0.1AC (CSJ 0047-07-244), 0.1AC (CSJ 0047-07-247), 0.1AC (CSJ 0197-02-134), 0.1AC (CSJ 0261-03-069), 0.1AC (CSJ 2964-05-032), and 0.1AC (CSJ 2964-05-033). 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

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

CSJ: 0047-07-243 **Sheet 3**

County: Dallas, etc.

Highway: US 75, etc.

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.

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.

Ensure a representative of the Prime Contractor is available on the project site at all times when work is being performed by the Prime Contractor or sub-contractor(s) to receive instructions from the Engineer or authorized Department representative.

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 this 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 an original of the TxDOT Construction Material Buy America Certification Form for all items classified as construction materials. This form is not required for materials classified as a manufactured product.

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

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

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

Item 7:

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

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 (5 am on December 31 thru 10:00 pm January 1)
- Easter Holiday weekend (5 am on Friday thru 10:00 pm Sunday)
- Memorial Day weekend (5 am on Friday thru 10:00 pm Monday)
- Independence Day (5 am on July 3 thru 10:00 pm on July 5)
- Labor Day weekend (5 am on Friday thru 10:00 pm Monday)
- Thanksgiving Holiday (5 am on Wednesday thru 10:00 pm Sunday)
- Christmas Holiday (5 am 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.

CSJ: 0047-07-243 Sheet 3

County: Dallas, etc.

Highway: US 75, etc.

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

Item 162:

Install block sod as directed by the Engineer.

Item 168:

Water once a day where sod is installed. Include cost for this work in the unit bid price for this item.

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.

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.

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 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.

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.

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.

Item 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 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.

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 commence work on the road before sunrise. 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.

CSJ: 0047-07-243 **Sheet 3**

County: Dallas, etc.

Highway: US 75, etc.

As approved by the Engineer, provide uniformed off duty police officers and squad cars during lane or ramp closures, night time work or other situations that indicate a need for additional traffic control to protect the traveling public or the construction workforce. Provide documentation such as payroll, log sheets with signatures and badge number, or invoices from the government entity providing the officers for reimbursement. Complete the weekly tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided. Reimbursement will not be made for coordination fees charged by the police department.

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 ¾ 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 ¾ 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 540:

Furnish one type of post throughout the project except as specifically noted in the plans.

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.

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

When holes are drilled through concrete structures, use a coring device. Do not use masonry or concrete drills.

Structurally mount junction boxes as shown on the plans. When used for traffic signal installations, use boxes 12"x12"x8", or as approved.

Use conduit hangers for 3 inch and larger conduit when hanging conduit from structures.

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.

Existing conduit is proposed for reuse in this project. Conduit prep will be paid for under Item 6027 as directed by the Engineer.

When using existing conduit, ensure that all conduits have bushings and are cleaned of mud and debris. Re-strap conduit that is being relocated to new timber poles as if it were a new installation. This work will not be paid for directly, but is subsidiary to this Item.

Communications cable shall be installed in a separate conduit and bored separately.

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

CSJ: 0047-07-243 Sheet 3

County: Dallas, etc.

Highway: US 75, etc.

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.

Item 624:

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

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

Item 627:

Use the timber pole heights, as shown on the plans and in the material summary, for bidding purposes only. Coordinate pole locations, and make field measurements before construction to ensure a vertical clearance of 17 to 19 feet from the highest point on the roadway surface to the span. 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.

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.

Granite concrete service pole embedment depth shall be 10’ and shall be a minimum of 25’ above grade.

Backfill Granite Concrete service poles with a Class A concrete in accordance with Item 421, "Hydraulic Cement Concrete", except consider the concrete subsidiary to Item 628 for payment purposes.

The Meter Base 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.

Bill the electrical service power usage to the City of Dallas and the City of Richardson.

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, 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 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 and City of Richardson 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.

CSJ: 0047-07-243 **Sheet 3**

County: Dallas, etc.

Highway: US 75, etc.

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. Provide submittal literature for all traffic signal equipment before installation.
3. Contact City of Richardson Traffic Engineer at 972-744-4324 prior to commencing and construction work. Signal pole foundation locations shall be approved in the field by the city engineer prior to installation. Contact City of Dallas Traffic Engineer prior to commencing and construction work. Signal pole foundation locations shall be approved in the field by the city engineer prior to installation.
4. Install the controller cabinet in an orientation as directed by the Cities.
5. Connect all field wiring to the controller assembly, including SSR coaxial cable termination into the polyphaser. 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 and City of Richardson. Have a qualified technician on the project site to place the traffic signals in operation.
6. The BBU will be installed with the controller on the concrete pad. If a larger pad is needed to accommodate the BBU, the additional labor and material will be subsidiary to this item.
7. Furnish and install all sign panels for mounting on signal poles, mast arms, and span wires. 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 except for those provided by the Cities.
8. Provide 250W Equivalent LED Fixtures with 120 – 277 volt electronic LED drivers as shown on the Material Producers List.

9. Install the emergency vehicle preemption equipment supplied by the City of Richardson.
10. Have a qualified technician on the project site to place the traffic signal in operation.
11. 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.
12. When 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.
13. Provide a Buck-Boost autotransformer. Use a transformer capable of boosting the incoming line voltage to the controller house by 20 volts maximum with small increments of line voltage boosts also selectable. Mount the transformer in the controller house and connect to the power service feeder as it enters the house from the service pole.
14. 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.
15. Provide an external 1200-baud (minimum) modem for each controller unit as shown in the plans.
16. The concrete foundation for the controller as shown on standard TS-CF is diagrammatic and the dimensions will be adjusted in the field to fit existing conditions.
17. A 3 inch strip of red prismatic conformable 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.
18. Salvage the existing traffic signals as shown on the plans. Salvage poles, cabinets, service poles and equipment, exposed conduit, and any other equipment as directed. The equipment remains the property of the applicable city. Contact the City of Dallas (214) 670-7748 and the City of Richardson at (972) 744-4322 48 hours in advance.
19. 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, and local regulations. Maintain the operation of the existing traffic signal until directed to remove it.
20. Completely remove timber poles not set in concrete without cutting off the pole. Timber poles set in concrete are considered unsalvageable.

CSJ: 0047-07-243 **Sheet 3**

County: Dallas, etc.

Highway: US 75, etc.

Item 681:

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

1. Re-guy signal heads and re-strap the cable after making adjustments to head locations. Accomplish relocation of signal heads for a phase change during the same day.
2. Bottom tether cable for signal heads and signs will be required.
3. Provide submittal literature for all traffic signal equipment before installation.
4. Furnish and install a new controller (eight phase NEMA TS 2 Type 1) and cabinet (NEMA TS 2 Size 6, 16 position load bay), meeting the requirements of Departmental Materials Specifications DMS-11170. Provide detector panel toggle switches that additionally permit the user to disconnect the detector. Provide new MMU with Ethernet port. Provide a pole-mounted cabinet that has three brackets for pole mounting and install a 5' x 5' x 4" Class A concrete pad under the cabinet in accordance to Items 420 and 421.
5. Operate and maintain the temporary signal. Provide a telephone number to the District for trouble calls. Check the signal equipment at least monthly, and within 24 hours in response to complaints, and immediately repair or replace any malfunctioning Contractor-supplied equipment. Notify the Department immediately upon finding malfunctioning Department-supplied equipment or a problem with the signal timing. If the controller is supplied by the Contractor, provide a reliable technical support person and phone number for the manufacturer of the controller
6. Relocate existing emergency vehicle preemption equipment to temporary signals.
7. Install pole-mounted BBU on the opposite side of the pole from the controller cabinet.

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.

For the City of Richardson provide aluminum pedestrian and vehicle signal heads in the following color: Federal Yellow #13538 of Federal Standard 595. Provide non-painted aluminum tubing. Provide back plates, louvers, and the inside of visors with a flat black finish. Provide aluminum vented back plates for all traffic signal heads.

For the City of Dallas provide louvers that have 5 vanes and a flat black finish on the inside surfaces. Securely fasten a hardware cloth screen with 5/8 inch or smaller mesh size to the front face of each louver to prevent entry by birds.

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 retroreflective aluminum non-vented back plates for all traffic signal heads.

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.

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.

CSJ: 0047-07-243 Sheet 3

County: Dallas, etc.

Highway: US 75, etc.

For mast arm poles designated with an ILSN bid code, the ILSN arm, clamps, bolts, and washers will be considered part of the complete pole assembly. The ILSN signs and mounting hardware will be furnished by the applicable City.

The bid price for this item is for a standard galvanized signal pole

Item 687:

The bid price for this item is for a standard galvanized pedestal pole

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.

Contractor shall provide a digital copy of the APS messages to the applicable city for all new APS Units on the project.

APS Units shall operate with hardwired connections for the communications path between the APS Units and the APS controller. Use 2 APS controllers at diamonds and single cables to each APS unit.

Item 6058:

The BBU will be installed with the controller on the concrete pad paid for under Item 680. If a larger pad is needed to accommodate the BBU, the additional labor and material will be subsidiary to this item.

Item 6185:

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

TCP 2 Series	Scenario		Required TMA/TA	
(2-1)-18 / (2-2)-18 / (2-4)-18 / (2-5)-18 / (2-6)-18	All		1	
(2-3)-18	A	B	1	2

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 6292:

All additional items such as poles, conduit, cable, etc. required to achieve the detection specified in the plans will not be paid for separately, but will be considered subsidiary to this item.

Item 6306:

The vehicle detection devices and supporting equipment will be supplied by the City of Richardson and installed by the contractor.

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

This pay item includes install only for radar detectors and radar cables.

If the camera locations shown in the plans do not allow for proper sight of the proposed detection zones, relocate the cameras as needed and as directed. This labor and material cost will not be paid separately, but is subsidiary to this item.

For temporary signals, the Contractor shall retain all removed VIVDS components furnished and installed as part of this project, unless otherwise shown on the plans.

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.

SUBSIDIARY TO ITEM 680

CSJ 0047-07-243: City of Dallas - US 75 AT LEMMON AVE

DESCRIPTION	UNIT	QUANTITY
250W EQ LED Luminaire (240V)	EA	6
Install Controller Cabinet (City Provided)	EA	1
Concrete Controller Foundation	CY	3
Procure and Install Regulatory Sign Panel	EA	26
Procure and Install Street Name Sign Assembly	EA	6

CSJ: 0047-07-243 **Sheet 3**

County: Dallas, etc.

Highway: US 75, etc.

CSJ 0047-07-244: City of Dallas - US 75 AT ROYAL

DESCRIPTION	UNIT	QUANTITY
250W EQ LED Luminaire (240V)	EA	4
Install Controller Cabinet (City Provided)	EA	1
Concrete Controller Foundation	CY	3
Procure and Install Regulatory Sign Panel	EA	22
Procure and Install Street Name Sign Assembly	EA	6

CSJ 0047-07-247: City of Richardson - US 75 AT ARAPAHO

DESCRIPTION	UNIT	QUANTITY
250W EQ LED Luminaire (240V)	EA	4
Install Controller Cabinet (City Provided)	EA	1
Concrete Controller Foundation	CY	0.25
Procure and Install Regulatory Sign Panel	EA	28
Procure and Install Street Name Sign Assembly	EA	6

CSJ 0197-02-134: City of Dallas - US 175 AT SL 12

DESCRIPTION	UNIT	QUANTITY
250W EQ LED Luminaire (240V)	EA	4
Install Controller Cabinet (City Provided)	EA	1
Concrete Controller Foundation	CY	3
Procure and Install Regulatory Sign Panel	EA	20
Procure and Install Street Name Sign Assembly	EA	6

CSJ 0261-03-069: City of Dallas - US 67 AT RED BIRD LN

DESCRIPTION	UNIT	QUANTITY
250W EQ LED Luminaire (240V)	EA	6
Install Controller Cabinet (City Provided)	EA	1
Concrete Controller Foundation	CY	3
Procure and Install Regulatory Sign Panel	EA	22
Procure and Install Street Name Sign Assembly	EA	6

CSJ 2964-05-032: City of Richardson - SH 190 AT RENNER RD

DESCRIPTION	UNIT	QUANTITY
250W EQ LED Luminaire (240V)	EA	5
Install Controller Cabinet (City Provided)	EA	1
Concrete Controller Foundation	CY	0.25
Procure and Install Regulatory Sign Panel	EA	28
Procure and Install Street Name Sign Assembly	EA	6

CSJ 2964-05-033: City of Richardson - SH 190 AT PLANO RD

DESCRIPTION	UNIT	QUANTITY
250W EQ LED Luminaire (240V)	EA	6
Install Controller Cabinet (City Provided)	EA	1
Concrete Controller Foundation	CY	0.25
Procure and Install Regulatory Sign Panel	EA	30
Procure and Install Street Name Sign Assembly	EA	6

LIST OF MATERIAL
FURNISHED BY THE CITY OF DALLAS

CSJ 0047-07-243: City of Dallas - US 75 AT LEMMON AVE

DESCRIPTION	UNIT	QUANTITY
ATC 352i Signal Controller Cabinet	EA	1
Battery Back-Up Unit (BBU)	EA	1
PTZ Camera	EA	1
Ethernet Cable	LF	215
2070 Controller & Ethernet Communication Devices	EA	1
Radar Presence Detector	EA	4
Radar Communication Cable	LF	2075
Radar 4 Port CCU	EA	2

CSJ 0047-07-244: City of Dallas - US 75 AT ROYAL

DESCRIPTION	UNIT	QUANTITY
ATC 352i Signal Controller Cabinet	EA	1
Battery Back-Up Unit (BBU)	EA	1
PTZ Camera	EA	1
Ethernet Cable	LF	205
2070 Controller & Ethernet Communication Devices	EA	1
Radar Presence Detector	EA	4
Radar Communication Cable	LF	1115
Radar 4 Port CCU	EA	2

CSJ: 0047-07-243 **Sheet 3**

County: Dallas, etc.

Highway: US 75, etc.

CSJ 0197-02-134: City of Dallas - US 175 AT SL 12

DESCRIPTION	UNIT	QUANTITY
ATC 352i Signal Controller Cabinet	EA	1
Battery Back-Up Unit (BBU)	EA	1
PTZ Camera	EA	1
Ethernet Cable	LF	290
2070 Controller & Ethernet Communication Devices	EA	1
Radar Presence Detector	EA	6
Radar Advanced Detector	EA	4
Radar Communication Cable	LF	311
Radar 4 Port CCU	EA	2

CSJ 0261-03-069: City of Dallas - US 67 AT RED BIRD LN

DESCRIPTION	UNIT	QUANTITY
ATC 352i Signal Controller Cabinet	EA	1
Battery Back-Up Unit (BBU)	EA	1
PTZ Camera	EA	1
Ethernet Cable	LF	250
2070 Controller & Ethernet Communication Devices	EA	1
Radar Presence Detector	EA	4
Radar Communication Cable	LF	1885
Radar 4 Port CCU	EA	2

LIST OF MATERIAL
FURNISHED BY THE CITY OF RICHARDSON

CSJ 0047-07-247: City of Richardson - US 75 AT ARAPAHO

DESCRIPTION	UNIT	QUANTITY
ATC P44 Signal Controller Cabinet	EA	1
Battery Back-Up Unit (BBU)	EA	1
Q-Free Controller & Ethernet Communication Devices	EA	1
Cellular Modem	EA	1
Hybrid Vehicle Detector	EA	6
Hybrid Vehicle System Controller	EA	1
Vehicle Detector Cable	LF	1260
Opticom	EA	4
Opticom Cable	LF	1260
Enforcement Light	EA	6
Enforcement Light Cable	LF	150

CSJ 2964-05-032: City of Richardson -SH 190 AT RENNER RD

DESCRIPTION	UNIT	QUANTITY
ATC P44 Signal Controller Cabinet	EA	1
Battery Back-Up Unit (BBU)	EA	1
Q-Free Controller & Ethernet Communication Devices	EA	1
Cellular Modem	EA	1
Hybrid Vehicle Detector	EA	4
Hybrid Vehicle System Controller	EA	1
Vehicle Detector Cable	LF	1530
Opticom	EA	4
Opticom Cable	LF	1530
Enforcement Light	EA	6
Enforcement Light Cable	LF	150

CSJ 2964-05-033: City of Richardson - SH 190 AT PLANO RD

DESCRIPTION	UNIT	QUANTITY
ATC P44 Signal Controller Cabinet	EA	1
Battery Back-Up Unit (BBU)	EA	1
Q-Free Controller & Ethernet Communication Devices	EA	1
Cellular Modem	EA	1
Hybrid Vehicle Detector	EA	4
Hybrid Vehicle System Controller	EA	1
Vehicle Detector Cable	LF	1350
Opticom	EA	4
Opticom Cable	LF	1350
Enforcement Light	EA	6
Enforcement Light Cable	LF	200

100% SUBMITTAL

SUMMARY OF QUANTITIES				
ITEM NO.	CODE	DESCRIPTION	UNIT	QTY
104	6001	REMOVING CONC (PAV)	SY	116
110	6001	EXCAVATION (ROADWAY)	CY	144
251	6034	REWORK BS MTL (TY C) (8") (ORD COMP)	SY	134
360	6044	CONC PVMT (CONT REINF)(FAST TRK)(12")	SY	50
416	6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	108
416	6030	DRILL SHAFT (TRF SIG POLE) (24 IN)*	LF	234
416	6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	60
416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	406
416	6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	110
432	6001	RIPRAP (CONC)(4 IN)	CY	96
479	6001	ADJUSTING MANHOLES	EA	1
500	6001	MOBILIZATION	LS	1
502	6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	14
506	6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	700
506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	700
510	6003	ONE-WAY TRAF CONT (PORT TRAF SIG)	MO	8
529	6002	CONC CURB (TY II)	LF	192
529	6008	CONC CURB & GUTTER (TY II)	LF	622
531	6001	CONC SIDEWALKS (4")	SY	856
531	6004	CURB RAMPS (TY 1)	EA	39
531	6005	CURB RAMPS (TY 2)	EA	3
531	6006	CURB RAMPS (TY 3)	EA	2
531	6008	CURB RAMPS (TY 5)	EA	6
531	6009	CURB RAMPS (TY 6)	EA	5
531	6010	CURB RAMPS (TY 7)	EA	25
531	6013	CURB RAMPS (TY 10)	EA	2
531	6015	CURB RAMPS (TY 20)	EA	1
531	6016	CURB RAMPS (TY 21)	EA	14
531	6017	CURB RAMPS (TY 22)	EA	1
610	6162	IN RD IL (TY SA) 30T-8 (250W EQ) LED	EA	6
610	6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	7
618	6046	CONDT (PVC) (SCH 80) (2")	LF	1725
618	6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	1565
618	6053	CONDT (PVC) (SCH 80) (3")	LF	2430
618	6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF	2135
618	6058	CONDT (PVC) (SCH 80) (4")	LF	1355
618	6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	6880
618	6078	CONDT (RM) (4")	LF	350
620	6004	ELEC CONDR (NO.12) INSULATED	LF	3040
620	6008	ELEC CONDR (NO.8) INSULATED	LF	20980
620	6009	ELEC CONDR (NO.6) BARE	LF	13435
620	6010	ELEC CONDR (NO.6) INSULATED	LF	2630
620	6011	ELEC CONDR (NO.4) BARE	LF	295
620	6012	ELEC CONDR (NO.4) INSULATED	LF	590
620	6015	ELEC CONDR (NO.2) BARE	LF	540
620	6016	ELEC CONDR (NO.2) INSULATED	LF	1070
624	6008	GROUND BOX TY C (162911)W/APRON	EA	14
624	6010	GROUND BOX TY D (162922)W/APRON	EA	62
624	6028	REMOVE GROUND BOX	EA	90
628	6187	ELC SRV TY D 120/240 070(NS)SS(E)PS(U)	EA	7
636	6001	ALUMINUM SIGNS (TY A)	SF	272
644	6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	26
644	6070	RELOCATE SM RD SN SUP&AM TY S80	EA	1
644	6076	REMOVE SM RD SN SUP&AM	EA	4
666	6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF	160
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	9625
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	6377
666	6224	PAVEMENT SEALER 4"	LF	1460
666	6225	PAVEMENT SEALER 6"	LF	20509
666	6226	PAVEMENT SEALER 8"	LF	9625
666	6229	PAVEMENT SEALER 18"	LF	176
666	6230	PAVEMENT SEALER 24"	LF	6836
666	6231	PAVEMENT SEALER (ARROW)	EA	112
666	6232	PAVEMENT SEALER (WORD)	EA	67
666	6234	PAVEMENT SEALER (DBL ARROW)	EA	31
666	6236	PAVEMENT SEALER (UTURN ARROW)	EA	7
666	6238	PAVEMENT SEALER (U-L ARROW)	EA	1
666	6243	PAVEMENT SEALER (YLD TRI)	EA	296
666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	1160
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2300
666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	10710
666	6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	7339
668	6075	PREFAB PAV MRK TY C (W) (18") (SLD)	LF	176
668	6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	450
668	6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	112
668	6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	31
668	6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA	7
668	6081	PREFAB PAV MRK TY C (W) (U-LT ARROW)	EA	1
668	6085	PREFAB PAV MRK TY C (W) (WORD)	EA	67
668	6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	296
672	6010	REFL PAV MRKR TY II-C-R	EA	2769
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	6104
677	6002	ELIM EXT PAV MRK & MRKS (6")	LF	14801
677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	7353
677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	4653
677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	2607

SUMMARY OF QUANTITIES				
ITEM NO.	CODE	DESCRIPTION	UNIT	QTY
677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	89
677	6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	23
677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	67
677	6019	ELIM EXT PAV MRK & MRKS (36")(YLD TRI)	EA	14
677	6036	ELIM EXT PAV MRK & MRKS (UTURN ARROW)	EA	7
678	6001	PAV SURF PREP FOR MRK (4")	LF	1460
678	6002	PAV SURF PREP FOR MRK (6")	LF	20509
678	6004	PAV SURF PREP FOR MRK (8")	LF	9625
678	6007	PAV SURF PREP FOR MRK (18")	LF	176
678	6008	PAV SURF PREP FOR MRK (24")	LF	6836
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	112
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	31
678	6012	PAV SURF PREP FOR MRK (UTURN ARR)	EA	7
678	6013	PAV SURF PREP FOR MRK (U/LT ARROW)	EA	1
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	67
678	6022	PAV SURF PREP FOR MRK (18")(YLD TRI)	EA	296
678	6033	PAV SURF PREP FOR MRK (RPM)	EA	2772
680	6005	INS HY TRF SIG (DPT SUP CNT & CAB)(ISO)	EA	7
680	6012	REMOVING TRAFFIC SIGNALS (DIAMOND)	EA	7
682	6001	VEH SIG SEC (12")LED(GRN)	EA	117
682	6002	VEH SIG SEC (12")LED(GRN ARW)	EA	53
682	6003	VEH SIG SEC (12")LED(YEL)	EA	142
682	6004	VEH SIG SEC (12")LED(YEL ARW)	EA	38
682	6005	VEH SIG SEC (12")LED(RED)	EA	146
682	6006	VEH SIG SEC (12")LED(RED ARW)	EA	29
682	6018	PED SIG SEC (LED)(COUNTDOWN)	EA	80
682	6051	BACKPLATE W/REFL BRDR(3 SEC)ALUM	EA	138
682	6052	BACKPLATE W/REFL BRDR(4 SEC)ALUM	EA	4
682	6053	BACKPLATE W/REFL BRDR(5 SEC)ALUM	EA	19
684	6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	6602
684	6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	2910
684	6036	TRF SIG CBL (TY A)(14 AWG)(10 CONDR)	LF	8875
684	6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	14520
684	6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF	31425
686	6029	INS TRF SIG PL AM (S)1 ARM(28')	EA	1
686	6031	INS TRF SIG PL AM(S)1 ARM(28')LUM	EA	1
686	6035	INS TRF SIG PL AM(S)1 ARM(32')LUM	EA	3
686	6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA	2
686	6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	EA	1
686	6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA	13
686	6049	INS TRF SIG PL AM(S)1 ARM(48')	EA	3
686	6051	INS TRF SIG PL AM(S)1 ARM(48')LUM	EA	12
686	6057	INS TRF SIG PL AM(S)1 ARM(55')	EA	1
686	6061	INS TRF SIG PL AM(S)1 ARM(60')	EA	1
686	6063	INS TRF SIG PL AM(S)1 ARM(60')LUM	EA	1
686	6067	INS TRF SIG PL AM(S)1 ARM(65')LUM	EA	1
686	6251	INS TRF SIG PL AM(S)2 ARM(60-44')LUM	EA	1
687	6001	PED POLE ASSEMBLY	EA	42
688	6001	PED DETECT PUSH BUTTON (APS)	EA	88
688	6003	PED DETECTOR CONTROLLER UNIT	EA	14
6010	6011	CCTV FIELD EQUIP (DIGITAL) (INSTL ONLY)	EA	4
6027	6003	CONDUIT (PREPARE)	LF	1475
6027	6008	GROUND BOX (PREPARE)	EA	4
6186	6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA	8
6292	6004	RVDS(PRESENCE DET ONLY)(INSTALL ONLY)	EA	18
6292	6005	RVDS(ADVANCE DET ONLY)(INSTALL ONLY)	EA	4

Texas Department of Transportation

DIAMOND SIGNALS

ESTIMATE OF QUANTITIES

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		4
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0047-07-243 **DISTRICT** Dallas **COUNTY** Collin, Dallas
HIGHWAY SH 190, US 175, US 67, US 75

			CONTROL SECTION JOB	**0047-07-243**		**0047-07-244**		**0047-07-247**		**0197-02-134**		**0261-03-069**		**2964-05-032**	
			PROJECT ID	**A00177561**		**A00177562**		**A00184740**		**A00177560**		**A00177563**		**A00184773**	
			COUNTY	**Dallas**		**Dallas**		**Dallas**		**Dallas**		**Dallas**		**Collin**	
			HIGHWAY	**US 75**		**US 75**		**US 75**		**US 175**		**US 67**		**SH 190**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	104-6001	REMOVING CONC (PAV)	SY	28.000											
	110-6001	EXCAVATION (ROADWAY)	CY	70.000											
	162-6002	BLOCK SODDING	SY	50.000		50.000		50.000		50.000		50.000		50.000	
	168-6001	VEGETATIVE WATERING	MG	1.000		1.000		1.000		1.000		1.000		2.000	
	251-6034	REWORK BS MTL (TY C) (8") (ORD COMP)	SY	112.000											
	360-6044	CONC PVMT (CONT REINF)(FAST TRK)(12")	SY	28.000											
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF												
	416-6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	24.000		16.000		16.000		48.000		20.000		16.000	
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	28.000		42.000		68.000		28.000		84.000		84.000	
	416-6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	44.000		44.000		22.000							
	432-6001	RIPRAP (CONC)(4 IN)	CY	25.300		19.100		18.900		3.000		3.500		14.200	
	479-6001	ADJUSTING MANHOLES	EA			1.000									
	500-6001	MOBILIZATION	LS	0.143		0.143		0.143		0.143		0.143		0.143	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	2.000		2.000		2.000		2.000		2.000		2.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (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	
	510-6003	ONE-WAY TRAF CONT (PORT TRAF SIG)	MO	8.000											
	529-6002	CONC CURB (TY II)	LF			25.000				35.000		132.000			
	529-6008	CONC CURB & GUTTER (TY II)	LF	150.000		274.000		31.000				48.000		15.000	
	531-6001	CONC SIDEWALKS (4")	SY	111.600		157.300		142.100				100.000		35.000	
	531-6004	CURB RAMPS (TY 1)	EA	2.000		5.000		3.000		17.000				4.000	
	531-6005	CURB RAMPS (TY 2)	EA	3.000											
	531-6006	CURB RAMPS (TY 3)	EA	2.000											
	531-6008	CURB RAMPS (TY 5)	EA			4.000						2.000			
	531-6009	CURB RAMPS (TY 6)	EA	3.000				2.000							
	531-6010	CURB RAMPS (TY 7)	EA	3.000		1.000		10.000						11.000	
	531-6013	CURB RAMPS (TY 10)	EA									2.000			
	531-6015	CURB RAMPS (TY 20)	EA							1.000					
	531-6016	CURB RAMPS (TY 21)	EA	2.000		2.000				2.000		3.000			
	531-6017	CURB RAMPS (TY 22)	EA	1.000											
	610-6162	IN RD IL (TY SA) 30T-8 (250W EQ) LED	EA					2.000						2.000	
	610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	3.000		2.000						2.000			
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	270.000		40.000		340.000		650.000		50.000		265.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	565.000		260.000				515.000					
	618-6053	CONDT (PVC) (SCH 80) (3")	LF	370.000		175.000		200.000		600.000		240.000		185.000	
	618-6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF	540.000		1,030.000						565.000			
	618-6058	CONDT (PVC) (SCH 80) (4")	LF	190.000				30.000		90.000		55.000		475.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0047-07-243 **DISTRICT** Dallas **COUNTY** Collin, Dallas
HIGHWAY SH 190, US 175, US 67, US 75

			CONTROL SECTION JOB		**0047-07-243**		**0047-07-244**		**0047-07-247**		**0197-02-134**		**0261-03-069**		**2964-05-032**	
			PROJECT ID		**A00177561**		**A00177562**		**A00184740**		**A00177560**		**A00177563**		**A00184773**	
			COUNTY		**Dallas**		**Dallas**		**Dallas**		**Dallas**		**Dallas**		**Collin**	
			HIGHWAY		**US 75**		**US 75**		**US 75**		**US 175**		**US 67**		**SH 190**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	618-6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	1,445.000		1,210.000		1,345.000		305.000		545.000		1,325.000	
	618-6078	CONDT (RM) (4")	LF									350.000			
	620-6004	ELEC CONDR (NO.12) INSULATED	LF	480.000		340.000		320.000		320.000		660.000		480.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	5,530.000		1,820.000		2,510.000		1,780.000		2,850.000		3,460.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	2,625.000		1,565.000		1,600.000		1,420.000		2,045.000		2,460.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF					690.000		750.000		70.000		470.000	
	620-6011	ELEC CONDR (NO.4) BARE	LF			295.000									
	620-6012	ELEC CONDR (NO.4) INSULATED	LF			590.000									
	620-6015	ELEC CONDR (NO.2) BARE	LF	540.000											
	620-6016	ELEC CONDR (NO.2) INSULATED	LF	1,070.000											
	624-6008	GROUND BOX TY C (162911)W/APRON	EA							14.000					
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	12.000		9.000		10.000				9.000		11.000	
	624-6028	REMOVE GROUND BOX	EA	9.000		17.000		10.000		13.000		11.000		17.000	
	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	
	636-6001	ALUMINUM SIGNS (TY A)	SF	32.000				32.000		72.000		40.000		32.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	4.000				4.000		1.000		5.000		4.000	
	644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA			1.000									
	644-6076	REMOVE SM RD SN SUP&AM	EA							2.000					
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF							160.000					
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1,490.000		1,430.000		2,430.000		475.000		290.000		2,080.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	1,308.000		1,200.000		905.000				804.000		1,185.000	
	666-6224	PAVEMENT SEALER 4"	LF	630.000		230.000						600.000			
	666-6225	PAVEMENT SEALER 6"	LF	4,165.000		3,915.000		1,960.000		2,069.000		2,160.000		4,010.000	
	666-6226	PAVEMENT SEALER 8"	LF	1,490.000		1,430.000		2,430.000		475.000		290.000		2,080.000	
	666-6229	PAVEMENT SEALER 18"	LF							176.000					
	666-6230	PAVEMENT SEALER 24"	LF	1,308.000		1,200.000		905.000		459.000		804.000		1,185.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	22.000		22.000		18.000		6.000		8.000		18.000	
	666-6232	PAVEMENT SEALER (WORD)	EA					20.000		4.000				23.000	
	666-6234	PAVEMENT SEALER (DBL ARROW)	EA	4.000		10.000		6.000		4.000		3.000		2.000	
	666-6236	PAVEMENT SEALER (UTURN ARROW)	EA			4.000								1.000	
	666-6238	PAVEMENT SEALER (U-L ARROW)	EA											1.000	
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	84.000		30.000		38.000				28.000		43.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	630.000		230.000						300.000			
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	580.000		360.000		420.000		180.000		160.000		450.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	2,460.000		2,660.000		260.000		970.000		1,400.000		1,960.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	1,125.000		895.000		1,280.000		759.000		600.000		1,600.000	
	668-6075	PREFAB PAV MRK TY C (W) (18") (SLD)	LF							176.000					

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0047-07-243 **DISTRICT** Dallas **COUNTY** Collin, Dallas
HIGHWAY SH 190, US 175, US 67, US 75

				0047-07-243		0047-07-244		0047-07-247		0197-02-134		0261-03-069		2964-05-032	
CONTROL SECTION JOB															
PROJECT ID				**A00177561**		**A00177562**		**A00184740**		**A00177560**		**A00177563**		**A00184773**	
COUNTY				**Dallas**		**Dallas**		**Dallas**		**Dallas**		**Dallas**		**Collin**	
HIGHWAY				**US 75**		**US 75**		**US 75**		**US 175**		**US 67**		**SH 190**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF							450.000					
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	22.000		22.000		18.000		6.000		8.000		18.000	
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	4.000		10.000		6.000		4.000		3.000		2.000	
	668-6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA			4.000								1.000	
	668-6081	PREFAB PAV MRK TY C (W) (U-LT ARROW)	EA											1.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA					20.000		4.000				23.000	
	668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	84.000		30.000		38.000				28.000		43.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	196.000		131.000		888.000		65.000		61.000		789.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	725.000		590.000		790.000		2,256.000		500.000		753.000	
	677-6002	ELIM EXT PAV MRK & MRKS (6")	LF	3,112.000		2,640.000		825.000				1,665.000		4,406.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	1,060.000		995.000		1,109.000		264.000		150.000		1,750.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	1,218.000				930.000		373.000		386.000		986.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	372.000		893.000		302.000		172.000		258.000		328.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	22.000		27.000		11.000		2.000		2.000		15.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	4.000		10.000		5.000						2.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	12.000		15.000		13.000		2.000		2.000		15.000	
	677-6019	ELIM EXT PAV MRK & MRKS (36")(YLD TRI)	EA											14.000	
	677-6036	ELIM EXT PAV MRK & MRKS (UTURN ARROW)	EA			4.000		2.000						1.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF	630.000		230.000						600.000			
	678-6002	PAV SURF PREP FOR MRK (6")	LF	4,165.000		3,915.000		1,960.000		2,069.000		2,160.000		4,010.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	1,490.000		1,430.000		2,430.000		475.000		290.000		2,080.000	
	678-6007	PAV SURF PREP FOR MRK (18")	LF							176.000					
	678-6008	PAV SURF PREP FOR MRK (24")	LF	1,308.000		1,200.000		905.000		459.000		804.000		1,185.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	22.000		22.000		18.000		6.000		8.000		18.000	
	678-6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	4.000		10.000		6.000		4.000		3.000		2.000	
	678-6012	PAV SURF PREP FOR MRK (UTURN ARR)	EA			4.000								1.000	
	678-6013	PAV SURF PREP FOR MRK (U/LT ARROW)	EA											1.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA					20.000		4.000				23.000	
	678-6022	PAV SURF PREP FOR MRK (18")(YLD TRI)	EA	84.000		30.000		38.000				28.000		43.000	
	678-6033	PAV SURF PREP FOR MRK (RPM)	EA	196.000		131.000		888.000		68.000		61.000		789.000	
	680-6005	INS HY TRF SIG (DPT SUP CNT & CAB)(ISO)	EA	1.000		1.000		1.000		1.000		1.000		1.000	
	680-6012	REMOVING TRAFFIC SIGNALS (DIAMOND)	EA	1.000		1.000		1.000		1.000		1.000		1.000	
	681-6001	TEMP TRAF SIGNALS	EA	1.000											
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	21.000		19.000		17.000		17.000		14.000		15.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	8.000		6.000		8.000		2.000		6.000		13.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	25.000		23.000		22.000		17.000		18.000		19.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	6.000		4.000		5.000		4.000		4.000		9.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0047-07-243 **DISTRICT** Dallas **COUNTY** Collin, Dallas
HIGHWAY SH 190, US 175, US 67, US 75

				0047-07-243		0047-07-244		0047-07-247		0197-02-134		0261-03-069		2964-05-032	
		CONTROL SECTION JOB													
		PROJECT ID		A00177561		A00177562		A00184740		A00177560		A00177563		A00184773	
		COUNTY		Dallas		Dallas		Dallas		Dallas		Dallas		Collin	
		HIGHWAY		US 75		US 75		US 75		US 175		US 67		SH 190	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	682-6005	VEH SIG SEC (12")LED(RED)	EA	25.000		23.000		21.000		17.000		18.000		22.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	4.000		4.000		5.000		4.000		4.000		4.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	12.000		12.000		12.000		12.000		16.000		24.000	
	682-6051	BACKPLATE W/REFL BRDR(3 SEC)ALUM	EA	23.000		23.000				17.000		18.000			
	682-6053	BACKPLATE W/REFL BRDR(5 SEC)ALUM	EA	4.000		2.000				2.000		2.000			
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA					21.000						18.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA											2.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA					3.000						4.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	1,185.000		760.000		975.000		596.000		891.000		965.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	210.000		145.000		545.000		135.000		130.000		1,335.000	
	684-6036	TRF SIG CBL (TY A)(14 AWG)(10 CONDR)	LF	3,955.000		1,445.000				1,070.000		2,405.000			
	684-6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	2,830.000		1,905.000		1,725.000		1,240.000		2,980.000		2,280.000	
	684-6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF	6,900.000		4,540.000		3,635.000		3,065.000		4,085.000		5,500.000	
	686-6029	INS TRF SIG PL AM (S)1 ARM(28')	EA							1.000					
	686-6031	INS TRF SIG PL AM(S)1 ARM(28')LUM	EA							1.000					
	686-6035	INS TRF SIG PL AM(S)1 ARM(32')LUM	EA					1.000		2.000					
	686-6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA												
	686-6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	EA									1.000			
	686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA	3.000				2.000		1.000		1.000		3.000	
	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	1.000		3.000		1.000				4.000		2.000	
	686-6057	INS TRF SIG PL AM(S)1 ARM(55')	EA			1.000									
	686-6061	INS TRF SIG PL AM(S)1 ARM(60')	EA					1.000							
	686-6063	INS TRF SIG PL AM(S)1 ARM(60')LUM	EA	1.000											
	686-6067	INS TRF SIG PL AM(S)1 ARM(65')LUM	EA	1.000											
	686-6251	INS TRF SIG PL AM(S)2 ARM(60-44')LUM	EA			1.000									
	687-6001	PED POLE ASSEMBLY	EA	5.000		6.000		6.000		11.000		6.000		6.000	
	688-6001	PED DETECT PUSH BUTTON (APS)	EA	14.000		14.000		12.000		14.000		10.000		12.000	
	688-6003	PED DETECTOR CONTROLLER UNIT	EA	2.000		2.000		2.000		2.000		2.000		2.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	12.000		12.000		12.000		12.000		12.000		12.000	
	6010-6011	CCTV FIELD EQUIP (DIGITAL) (INSTL ONLY)	EA	1.000		1.000				1.000		1.000			
	6027-6003	CONDUIT (PREPARE)	LF	640.000								670.000		165.000	
	6027-6008	GROUND BOX (PREPARE)	EA	4.000											
	6185-6002	TMA (STATIONARY)	DAY	40.000		40.000		40.000		40.000		40.000		40.000	
	6186-6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA	4.000		2.000				1.000		1.000			
	6292-6004	RVDS(PRESENCE DET ONLY)(INSTALL ONLY)	EA	4.000		4.000				6.000		4.000			
	6292-6005	RVDS(ADVANCE DET ONLY)(INSTALL ONLY)	EA							4.000					

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0047-07-243 **DISTRICT** Dallas **COUNTY** Collin, Dallas
HIGHWAY SH 190, US 175, US 67, US 75

			CONTROL SECTION JOB	**0047-07-243**		**0047-07-244**		**0047-07-247**		**0197-02-134**		**0261-03-069**		**2964-05-032**	
			PROJECT ID	**A00177561**		**A00177562**		**A00184740**		**A00177560**		**A00177563**		**A00184773**	
			COUNTY	**Dallas**		**Dallas**		**Dallas**		**Dallas**		**Dallas**		**Collin**	
			HIGHWAY	**US 75**		**US 75**		**US 75**		**US 175**		**US 67**		**SH 190**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	6306-6009	VIVDS PROSR SYS (INSTALL ONLY)	EA					1.000						1.000	
	6306-6010	VIVDS CAM ASSY (INSTALL ONLY)	EA					6.000						6.000	
	6306-6012	VIVDS CABLING (INSTALL ONLY)	LF					1,500.000						2,000.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000		1.000		1.000		1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000		1.000		1.000		1.000		1.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0047-07-243 **DISTRICT** Dallas **COUNTY** Collin, Dallas
HIGHWAY SH 190, US 175, US 67, US 75

							TOTAL EST.	TOTAL FINAL
			CONTROL SECTION JOB		**2964-05-033**			
			PROJECT ID		**A00184774**			
			COUNTY		**Collin**			
			HIGHWAY		**SH 190**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL		
	104-6001	REMOVING CONC (PAV)		SY	88.000		116.000	
	110-6001	EXCAVATION (ROADWAY)		CY	74.000		144.000	
	162-6002	BLOCK SODDING		SY	50.000		350.000	
	168-6001	VEGETATIVE WATERING		MG	1.000		8.000	
	251-6034	REWORK BS MTL (TY C) (8") (ORD COMP)		SY	22.000		134.000	
	360-6044	CONC PVMT (CONT REINF)(FAST TRK)(12")		SY	22.000		50.000	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)		LF	16.000		16.000	
	416-6031	DRILL SHAFT (TRF SIG POLE) (30 IN)		LF	38.000		178.000	
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)		LF	84.000		418.000	
	416-6034	DRILL SHAFT (TRF SIG POLE) (48 IN)		LF			110.000	
	432-6001	RIPRAP (CONC)(4 IN)		CY	12.000		96.000	
	479-6001	ADJUSTING MANHOLES		EA			1.000	
	500-6001	MOBILIZATION		LS	0.143		1.001	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING		MO	2.000		14.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")		LF	100.000		700.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)		LF	100.000		700.000	
	510-6003	ONE-WAY TRAF CONT (PORT TRAF SIG)		MO			8.000	
	529-6002	CONC CURB (TY II)		LF			192.000	
	529-6008	CONC CURB & GUTTER (TY II)		LF	104.000		622.000	
	531-6001	CONC SIDEWALKS (4")		SY	310.000		856.000	
	531-6004	CURB RAMPS (TY 1)		EA	8.000		39.000	
	531-6005	CURB RAMPS (TY 2)		EA			3.000	
	531-6006	CURB RAMPS (TY 3)		EA			2.000	
	531-6008	CURB RAMPS (TY 5)		EA			6.000	
	531-6009	CURB RAMPS (TY 6)		EA			5.000	
	531-6010	CURB RAMPS (TY 7)		EA			25.000	
	531-6013	CURB RAMPS (TY 10)		EA			2.000	
	531-6015	CURB RAMPS (TY 20)		EA			1.000	
	531-6016	CURB RAMPS (TY 21)		EA	5.000		14.000	
	531-6017	CURB RAMPS (TY 22)		EA			1.000	
	610-6162	IN RD IL (TY SA) 30T-8 (250W EQ) LED		EA			4.000	
	610-6214	IN RD IL (TY SA) 40T-8 (250W EQ) LED		EA	2.000		9.000	
	618-6046	CONDT (PVC) (SCH 80) (2")		LF	110.000		1,725.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)		LF	225.000		1,565.000	
	618-6053	CONDT (PVC) (SCH 80) (3")		LF	140.000		1,910.000	
	618-6054	CONDT (PVC) (SCH 80) (3") (BORE)		LF			2,135.000	
	618-6058	CONDT (PVC) (SCH 80) (4")		LF	515.000		1,355.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0047-07-243 **DISTRICT** Dallas **COUNTY** Collin, Dallas
HIGHWAY SH 190, US 175, US 67, US 75

			CONTROL SECTION JOB		**2964-05-033**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00184774**		
			COUNTY		**Collin**		
			HIGHWAY		**SH 190**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	618-6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	705.000		6,880.000	
	618-6078	CONDT (RM) (4")	LF			350.000	
	620-6004	ELEC CONDR (NO.12) INSULATED	LF	440.000		3,040.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	3,030.000		20,980.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	1,720.000		13,435.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	650.000		2,630.000	
	620-6011	ELEC CONDR (NO.4) BARE	LF			295.000	
	620-6012	ELEC CONDR (NO.4) INSULATED	LF			590.000	
	620-6015	ELEC CONDR (NO.2) BARE	LF			540.000	
	620-6016	ELEC CONDR (NO.2) INSULATED	LF			1,070.000	
	624-6008	GROUND BOX TY C (162911)W/APRON	EA			14.000	
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	11.000		62.000	
	624-6028	REMOVE GROUND BOX	EA	13.000		90.000	
	628-6187	ELC SRV TY D 120/240 070(NS)SS(E)PS(U)	EA	1.000		7.000	
	636-6001	ALUMINUM SIGNS (TY A)	SF	64.000		272.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA			18.000	
	644-6070	RELOCATE SM RD SN SUP&AM TY S80	EA			1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	2.000		4.000	
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF			160.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1,430.000		9,625.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	975.000		6,377.000	
	666-6224	PAVEMENT SEALER 4"	LF			1,460.000	
	666-6225	PAVEMENT SEALER 6"	LF	2,230.000		20,509.000	
	666-6226	PAVEMENT SEALER 8"	LF	1,430.000		9,625.000	
	666-6229	PAVEMENT SEALER 18"	LF			176.000	
	666-6230	PAVEMENT SEALER 24"	LF	975.000		6,836.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	18.000		112.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	20.000		67.000	
	666-6234	PAVEMENT SEALER (DBL ARROW)	EA	2.000		31.000	
	666-6236	PAVEMENT SEALER (UTURN ARROW)	EA	2.000		7.000	
	666-6238	PAVEMENT SEALER (U-L ARROW)	EA			1.000	
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	73.000		296.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF			1,160.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	150.000		2,300.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	1,000.000		10,710.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	1,080.000		7,339.000	
	668-6075	PREFAB PAV MRK TY C (W) (18") (SLD)	LF			176.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0047-07-243 **DISTRICT** Dallas **COUNTY** Collin, Dallas
HIGHWAY SH 190, US 175, US 67, US 75

			CONTROL SECTION JOB		**2964-05-033**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00184774**		
			COUNTY		**Collin**		
			HIGHWAY		**SH 190**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF			450.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	18.000		112.000	
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	2.000		31.000	
	668-6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA	2.000		7.000	
	668-6081	PREFAB PAV MRK TY C (W) (U-LT ARROW)	EA			1.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	20.000		67.000	
	668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	73.000		296.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	639.000		2,769.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	490.000		6,104.000	
	677-6002	ELIM EXT PAV MRK & MRKS (6")	LF	2,153.000		14,801.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	2,025.000		7,353.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	760.000		4,653.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	282.000		2,607.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	10.000		89.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	2.000		23.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	8.000		67.000	
	677-6019	ELIM EXT PAV MRK & MRKS (36")(YLD TRI)	EA			14.000	
	677-6036	ELIM EXT PAV MRK & MRKS (UTURN ARROW)	EA			7.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF			1,460.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF			18,279.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF			8,195.000	
	678-6007	PAV SURF PREP FOR MRK (18")	LF			176.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF			5,861.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA			94.000	
	678-6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA			29.000	
	678-6012	PAV SURF PREP FOR MRK (UTURN ARR)	EA			5.000	
	678-6013	PAV SURF PREP FOR MRK (U/LT ARROW)	EA			1.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA			47.000	
	678-6022	PAV SURF PREP FOR MRK (18")(YLD TRI)	EA			223.000	
	678-6033	PAV SURF PREP FOR MRK (RPM)	EA			2,133.000	
	680-6005	INS HY TRF SIG (DPT SUP CNT & CAB)(ISO)	EA	1.000		7.000	
	680-6012	REMOVING TRAFFIC SIGNALS (DIAMOND)	EA	1.000		7.000	
	681-6001	TEMP TRAF SIGNALS	EA			1.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	14.000		117.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	10.000		53.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	18.000		142.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	6.000		38.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0047-07-243 **DISTRICT** Dallas **COUNTY** Collin, Dallas
HIGHWAY SH 190, US 175, US 67, US 75

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**2964-05-033**			
		PROJECT ID		**A00184774**			
		COUNTY		**Collin**			
		HIGHWAY		**SH 190**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	682-6005	VEH SIG SEC (12")LED(RED)	EA	20.000		146.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	4.000		29.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	24.000		112.000	
	682-6051	BACKPLATE W/REFL BRDR(3 SEC)ALUM	EA			81.000	
	682-6053	BACKPLATE W/REFL BRDR(5 SEC)ALUM	EA			10.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	18.000		57.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	2.000		4.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA	2.000		9.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	1,230.000		6,602.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	410.000		2,910.000	
	684-6036	TRF SIG CBL (TY A)(14 AWG)(10 CONDR)	LF			8,875.000	
	684-6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	1,560.000		14,520.000	
	684-6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF	3,700.000		31,425.000	
	686-6029	INS TRF SIG PL AM (S)1 ARM(28')	EA			1.000	
	686-6031	INS TRF SIG PL AM(S)1 ARM(28')LUM	EA			1.000	
	686-6035	INS TRF SIG PL AM(S)1 ARM(32')LUM	EA	2.000		5.000	
	686-6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA	2.000		2.000	
	686-6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	EA			1.000	
	686-6047	INS TRF SIG PL AM(S)1 ARM(44')LUM	EA	3.000		13.000	
	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	1.000		12.000	
	686-6057	INS TRF SIG PL AM(S)1 ARM(55')	EA			1.000	
	686-6061	INS TRF SIG PL AM(S)1 ARM(60')	EA			1.000	
	686-6063	INS TRF SIG PL AM(S)1 ARM(60')LUM	EA			1.000	
	686-6067	INS TRF SIG PL AM(S)1 ARM(65')LUM	EA			1.000	
	686-6251	INS TRF SIG PL AM(S)2 ARM(60-44')LUM	EA			1.000	
	687-6001	PED POLE ASSEMBLY	EA	2.000		42.000	
	688-6001	PED DETECT PUSH BUTTON (APS)	EA	22.000		98.000	
	688-6003	PED DETECTOR CONTROLLER UNIT	EA	1.000		13.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	12.000		84.000	
	6010-6011	CCTV FIELD EQUIP (DIGITAL) (INSTL ONLY)	EA			4.000	
	6027-6003	CONDUIT (PREPARE)	LF			1,475.000	
	6027-6008	GROUND BOX (PREPARE)	EA			4.000	
	6185-6002	TMA (STATIONARY)	DAY	40.000		280.000	
	6186-6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA			8.000	
	6292-6004	RVDS(PRESENCE DET ONLY)(INSTALL ONLY)	EA			18.000	
	6292-6005	RVDS(ADVANCE DET ONLY)(INSTALL ONLY)	EA			4.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0047-07-243 **DISTRICT** Dallas **COUNTY** Collin, Dallas
HIGHWAY SH 190, US 175, US 67, US 75

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**2964-05-033**			
		PROJECT ID		**A00184774**			
		COUNTY		**Collin**			
		HIGHWAY		**SH 190**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	6306-6009	VIVDS PROSR SYS (INSTALL ONLY)	EA	1.000		3.000	
	6306-6010	VIVDS CAM ASSY (INSTALL ONLY)	EA	6.000		18.000	
	6306-6012	VIVDS CABLING (INSTALL ONLY)	LF	1,600.000		5,100.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		7.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		7.000	

100% SUBMITTAL

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION	500 6001 MOBILIZATION	502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING	506 6042 BIODEG EROSN CONT LOGS (INSTL)(18")	506 6043 BIODEG EROSN CONT LOGS (REMOVE)	510 6003 ONE-WAY TRAF CONT (PORT TRAF SIG)	681 6001 TEMP TRAF SIGNALS	6001 6001 PORTABLE CHANGEABLE MESSAGE SIGN	6185 6002 TMA (STATIONARY)
	LS	MO	LF	LF	MO	EA	DAY	DAY
CSJ 0047-07-243 US 75 AT LEMMON AVE	0.143	2	100	100	8	1	12	40
CSJ 0047-07-244 US 75 AT ROYAL LN	0.143	2	100	100			12	40
CSJ 0047-07-247 US 75 AT ARAPAHO RD	0.143	2	100	100			12	40
CSJ 0197-02-134 US 175 AT SL 12	0.143	2	100	100			12	40
CSJ 0261-03-069 US 67 AT RED BIRD LN	0.143	2	100	100			12	40
CSJ 2964-05-032 SH 190 AT RENNER RD	0.143	2	100	100			12	40
CSJ 2964-05-033 SH 190 AT PLANO RD	0.142	2	100	100			12	40
PROJECT TOTALS	**1**	**14**	**700**	**700**	**8**	**1**	**84**	**280**

SUMMARY OF ROADWAY ITEMS

LOCATION	251 6034 REWORK BS MTL (TY C)(8") (ORD COMP)	360 6044 CONC PVMT (CONT REINF)(FAST TRK)(12")	432 6001 RIPRAP (CONC)(4 IN)	479 6001 ADJUSTING MANHOLES	529 6002 CONC CURB (TY II)	529 6008 CONC CURB & GUTTER (TY II)	531 6001 CONC SIDEWALKS (4")	531 6004 CURB RAMPS (TY 1)	531 6005 CURB RAMPS (TY 2)	531 6006 CURB RAMPS (TY 3)	531 6008 CURB RAMPS (TY 5)	531 6009 CURB RAMPS (TY 6)	531 6010 CURB RAMPS (TY 7)	531 6013 CURB RAMPS (TY 10)	531 6015 CURB RAMPS (TY 20)	531 6016 CURB RAMPS (TY 21)	531 6017 CURB RAMPS (TY 22)	644 6070 RELOCATE SM RD SN SUP&AM TY S80
	SY	SY	CY	EA	LF	LF	SY	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
CSJ 0047-07-243 US 75 AT LEMMON AVE	112	28	25.3			150	111.6	2	3	2		3	3			2	1	
CSJ 0047-07-244 US 75 AT ROYAL LN			19.1	1	25	274	157.3	5			4		1			2		1
CSJ 0047-07-247 US 75 AT ARAPAHO RD			18.9			31	142.1	3				2	10					
CSJ 0197-02-134 US 175 AT SL 12			3		35			17							1	2		
CSJ 0261-03-069 US 67 AT RED BIRD LN			3.5		132	48	100				2			2		3		
CSJ 2964-05-032 SH 190 AT RENNER RD			14.2			15	35	4					11					
CSJ 2964-05-033 SH 190 AT PLANO RD	22	22	12			104	310	8								5		
PROJECT TOTALS	**134**	**50**	**96**	**1**	**192**	**622**	**856**	**39**	**3**	**2**	**6**	**5**	**25**	**2**	**1**	**14**	**1**	**1**

SUMMARY OF REMOVAL ITEMS

LOCATION	104 6001 REMOVING CONC (PAV)	110 6001 EXCAVATION (ROADWAY)	624 6028 REMOVE GROUND BOX	644 6076 REMOVE SM RD SN SUP&AM	677 6001 ELIM EXT PAV MRK & MRKS (4")	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)	677 6019 ELIM EXT PAV MRK & MRKS (36")(YLD TRI)	677 6036 ELIM EXT PAV MRK & MRKS (UTURN ARROW)	680 6012 REMOVING TRAFFIC SIGNALS (DIAMOND)
	SY	CY	EA	EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA
CSJ 0047-07-243 US 75 AT LEMMON AVE	28	70	9		725	3112	1060	1218	372	22	4	12			1
CSJ 0047-07-244 US 75 AT ROYAL LN			17		590	2640	995		893	27	10	15		4	1
CSJ 0047-07-247 US 75 AT ARAPAHO RD			10		790	825	1109	930	302	11	5	13		2	1
CSJ 0197-02-134 US 175 AT SL 12			13	2	2256		264	373	172	2		2			1
CSJ 0261-03-069 US 67 AT RED BIRD LN			11		500	1665	150	386	258	2		2			1
CSJ 2964-05-032 SH 190 AT RENNER RD			17		753	4406	1750	986	328	15	2	15	14	1	1
CSJ 2964-05-033 SH 190 AT PLANO RD	88	74	13	2	490	2153	2025	760	282	10	2	8			1
PROJECT TOTALS	**116**	**144**	**90**	**4**	**6104**	**14801**	**7353**	**4653**	**2607**	**89**	**23**	**67**	**14**	**7**	**7**

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

SUMMARY OF QUANTITIES

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		5
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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SUMMARY OF TRAFFIC SIGNAL ITEMS

LOCATION	416 6029	416 6031	416 6032	416 6034	610 6162	610 6214	618 6046	618 6047	618 6053	618 6054	618 6058	618 6059	618 6078	620 6004	620 6008	620 6009	620 6010	620 6011	620 6012	620 6015	620 6016	624 6008	624 6010
	DRILL SHAFT (RDWY ILL POLE) (30 IN)	DRILL SHAFT (TRF SIG POLE) (30 IN)	DRILL SHAFT (TRF SIG POLE) (36 IN)	DRILL SHAFT (TRF SIG POLE) (48 IN)	IN RD IL (TY SA) 30T-8 (250W EQ) LED	IN RD IL (TY SA) 40T-8 (250W EQ) LED	CONDT (PVC) (SCH 80) (2")	CONDT (PVC) (SCH 80) (2") (BORE)	CONDT (PVC) (SCH 80) (3")	CONDT (PVC) (SCH 80) (3") (BORE)	CONDT (PVC) (SCH 80) (4")	CONDT (PVC) (SCH 80) (4") (BORE)	CONDT (RM) (4")	ELEC CONDR (NO. 12) INSULATED	ELEC CONDR (NO. 8) INSULATED	ELEC CONDR (NO. 6) BARE	ELEC CONDR (NO. 6) INSULATED	ELEC CONDR (NO. 4) BARE	ELEC CONDR (NO. 4) INSULATED	ELEC CONDR (NO. 2) BARE	ELEC CONDR (NO. 2) INSULATED	GROUND BOX TY C (162911)W /APRON	GROUND BOX TY D (162922)W /APRON
	LF	LF	LF	LF	EA	EA	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA
CSJ 0047-07-243 US 75 AT LEMMON AVE	24		28	44		3	270	565	890	540	190	1445		480	5530	2625				540	1070		12
CSJ 0047-07-244 US 75 AT ROYAL LN	16		42	44		2	40	260	175	1030		1210		340	1820	1565		295	590				9
CSJ 0047-07-247 US 75 AT ARAPAHO RD	16	12	56	22	2		340		200		30	1345		320	2510	1600	690						10
CSJ 0197-02-134 US 175 AT SL 12		48	28				650	515	600		90	305		320	1780	1420	750					14	
CSJ 0261-03-069 US 67 AT RED BIRD LN	20		84			2	50		240	565	55	545	350	660	2850	2045	70						9
CSJ 2964-05-032 SH 190 AT RENNER RD	16		84		2		265		185		475	1325		480	3460	2460	470						11
CSJ 2964-05-033 SH 190 AT PLANO RD	16		84		2		110	225	140		515	705		440	3030	1720	650						11
PROJECT TOTALS	**108**	**60**	**406**	**110**	**6**	**7**	**1725**	**1565**	**2430**	**2135**	**1355**	**6880**	**350**	**3040**	**20980**	**13435**	**2630**	**295**	**590**	**540**	**1070**	**14**	**62**

SUMMARY OF TRAFFIC SIGNAL ITEMS

LOCATION	628 6187	636 6001	644 6004	680 6005	682 6001	682 6002	682 6003	682 6004	682 6005	682 6006	682 6018	682 6051	682 6052	682 6053	684 6031	684 6033	684 6036	684 6046	684 6079	686 6029	686 6031	686 6035	686 6039	686 6043
	ELC SRV TY D 120/240 070(NS)SS (E)PS(U)	ALUMINUM SIGNS (TY A)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	INS HY TRF SIG (DPT SUP CNT & CAB)(ISD)	VEH SIG SEC (12")LED (GRN)	VEH SIG SEC (12")LED (GRN ARW)	VEH SIG SEC (12")LED (YEL)	VEH SIG SEC (12")LED (YEL ARW)	VEH SIG SEC (12")LED (RED)	VEH SIG SEC (12")LED (RED ARW)	PED SIG SEC (LED)(COUNT DOWN)	BACKPLATE W/REFL BRDR(3 SEC)ALUM	BACKPLATE W/REFL BRDR(4 SEC)ALUM	BACKPLATE W/REFL BRDR(5 SEC)ALUM	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	TRF SIG CBL (TY A)(14 AWG)(10 CONDR)	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	INS TRF SIG PL AM(S)1 ARM(28')	INS TRF SIG PL AM(S)1 ARM(28')LUM	INS TRF SIG PL AM(S)1 ARM(32')LUM	INS TRF SIG PL AM(S)1 ARM(36')LUM	INS TRF SIG PL AM(S)1 ARM(40')LUM
	EA	SF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA
CSJ 0047-07-243 US 75 AT LEMMON AVE	1	32	4	1	21	8	25	6	25	4	12	23		4	1185	210	3955	2830	6900					
CSJ 0047-07-244 US 75 AT ROYAL LN	1			1	19	6	23	4	23	4	12	23		2	760	145	1445	1905	4540					
CSJ 0047-07-247 US 75 AT ARAPAHO RD	1	32	4	1	17	8	22	5	21	5	12	21		3	975	545		1725	3635			1		
CSJ 0197-02-134 US 175 AT SL 12	1	72	1	1	17	2	17	4	17	4	12	17		2	596	135	1070	1240	3065	1	1	2		
CSJ 0261-03-069 US 67 AT RED BIRD LN	1	40	5	1	14	6	18	4	18	4	8	18		2	891	130	2405	2980	4085					1
CSJ 2964-05-032 SH 190 AT RENNER RD	1	32	4	1	15	13	19	9	22	4	12	18	2	4	965	1335		2280	5500					
CSJ 2964-05-033 SH 190 AT PLANO RD	1	64	8	1	14	10	18	6	20	4	12	18	2	2	1230	410		1560	3700				2	
PROJECT TOTALS	**7**	**272**	**26**	**7**	**117**	**53**	**142**	**38**	**146**	**29**	**80**	**138**	**4**	**19**	**6602**	**2910**	**8875**	**14520**	**31425**	**1**	**1**	**3**	**2**	**1**

SUMMARY OF TRAFFIC SIGNAL ITEMS

LOCATION	686 6047	686 6049	686 6051	686 6057	686 6061	686 6063	686 6067	686 6251	687 6001	688 6001	688 6003	6010 6011	6027 6003	6027 6008	6186 6002	6292 6004	6292 6005
	INS TRF SIG PL AM(S)1 ARM(44')LUM	INS TRF SIG PL AM(S)1 ARM(48')	INS TRF SIG PL AM(S)1 ARM(48')LUM	INS TRF SIG PL AM(S)1 ARM(55')	INS TRF SIG PL AM(S)1 ARM(60')	INS TRF SIG PL AM(S)1 ARM(60')LUM	INS TRF SIG PL AM(S)1 ARM(65')LUM	INS TRF SIG PL AM(S)2 ARM(60-44') LUM	PED POLE ASSEMBLY	PED DETECT PUSH BUTTON (APS)	PED DETECTOR CONTROLLER UNIT	CCTV FIELD EQUIP (DIGITAL) (INSTL ONLY)	CONDUIT (PREPARE)	GROUND BOX (PREPARE)	ITS GND BOX (PCAST) TY 1 (243636)W/ APRN	RVDS (PRESENCE DET ONLY) (INSTALL ONLY)	RVDS (ADVANCE DET ONLY) (INSTALL ONLY)
	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF	EA	EA	EA	EA
CSJ 0047-07-243 US 75 AT LEMMON AVE	3		1			1	1		5	14	2	1	640	4	4	4	
CSJ 0047-07-244 US 75 AT ROYAL LN			3	1				1	6	14	2	1			2	4	
CSJ 0047-07-247 US 75 AT ARAPAHO RD	2	1	1		1				6	12	2						
CSJ 0197-02-134 US 175 AT SL 12	1	1							11	14	2	1			1	6	4
CSJ 0261-03-069 US 67 AT RED BIRD LN	1		4						6	10	2	1	670		1	4	
CSJ 2964-05-032 SH 190 AT RENNER RD	3	1	2						6	12	2		165				
CSJ 2964-05-033 SH 190 AT PLANO RD	3		1						2	12	2						
PROJECT TOTALS	**13**	**3**	**12**	**1**	**1**	**1**	**1**	**1**	**42**	**88**	**14**	**4**	**1475**	**4**	**8**	**18**	**4**

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

SUMMARY OF QUANTITIES

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		6
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

100% SUBMITTAL

SUMMARY OF PAVEMENT MARKING ITEMS

LOCATION	666 6018	666 6036	666 6048	666 6224	666 6225	666 6226	666 6229	666 6230	666 6231	666 6232	666 6234	666 6236	666 6238	666 6243	666 6300	666 6306	666 6309	666 6321	668 6075	668 6076	668 6077	668 6078	668 6080
	REFL PAV MRK TY I (W)6"(DOT) (100MIL)	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	PAVEMENT SEALER 4"	PAVEMENT SEALER 6"	PAVEMENT SEALER 8"	PAVEMENT SEALER 18"	PAVEMENT SEALER 24"	PAVEMENT SEALER (ARROW)	PAVEMENT SEALER (WORD)	PAVEMENT SEALER (DBL ARROW)	PAVEMENT SEALER (UTURN ARROW)	PAVEMENT SEALER (U-L ARROW)	PAVEMENT SEALER (YLD TRI)	RE PM W/RET REQ TY I (W)4"(BRK) (100MIL)	RE PM W/RET REQ TY I (W)6"(BRK) (100MIL)	RE PM W/RET REQ TY I (W)6"(SLD) (100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	PREFAB PAV MRK TY C (W)(18") (SLD)	PREFAB PAV MRK TY C (W)(24") (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W)(DBL ARROW)	PREFAB PAV MRK TY C (W)(UTURN ARROW)
	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF	LF	LF	EA	EA	EA
CSJ 0047-07-243 US 75 AT LEMMON AVE		1490	1308	630	4165	1490		1308	22		4			84	630	580	2460	1125			22	4	
CSJ 0047-07-244 US 75 AT ROYAL LN		1430	1200	230	3915	1430		1200	22		10	4		30	230	360	2660	895			22	10	4
CSJ 0047-07-247 US 75 AT ARAPAHO RD		2430	905		1960	2430		905	18	20	6			38		420	260	1280			18	6	
CSJ 0197-02-134 US 175 AT SL 12	160	475			2069	475	176	459	6	4	4					180	970	759	176	450	6	4	
CSJ 0261-03-069 US 67 AT RED BIRD LN		290	804	600	2160	290		804	8		3			28	300	160	1400	600			8	3	
CSJ 2964-05-032 SH 190 AT RENNER RD		2080	1185		4010	2080		1185	18	23	2	1	1	43		450	1960	1600			18	2	1
CSJ 2964-05-033 SH 190 AT PLANO RD		1430	975		2230	1430		975	18	20	2	2		73		150	1000	1080			18	2	2
PROJECT TOTALS	**160**	**9625**	**6377**	**1460**	**20509**	**9625**	**176**	**6836**	**112**	**67**	**31**	**7**	**1**	**296**	**1160**	**2300**	**10710**	**7339**	**176**	**450**	**112**	**31**	**7**

SUMMARY OF PAVEMENT MARKING ITEMS

LOCATION	668 6081	668 6085	668 6091	672 6010	678 6001	678 6002	678 6004	678 6007	678 6008	678 6009	678 6010	678 6012	678 6013	678 6016	678 6022	678 6033
	PREFAB PAV MRK TY C (W)(U-LT ARROW)	PREFAB PAV MRK TY C (W)(WORD)	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	REFL PAV MRKR TY II-C-R	PAV SURF PREP FOR MRK (4")	PAV SURF PREP FOR MRK (6")	PAV SURF PREP FOR MRK (8")	PAV SURF PREP FOR MRK (18")	PAV SURF PREP FOR MRK (24")	PAV SURF PREP FOR MRK (ARROW)	PAV SURF PREP FOR MRK (DBL ARROW)	PAV SURF PREP FOR MRK (UTURN ARR)	PAV SURF PREP FOR MRK (U/LT ARROW)	PAV SURF PREP FOR MRK (WORD)	PAV SURF PREP FOR MRK (18")(YLD TRI)	PAV SURF PREP FOR MRK (RPM)
	EA	EA	EA	EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA
CSJ 0047-07-243 US 75 AT LEMMON AVE			84	196	630	4165	1490		1308	22	4				84	196
CSJ 0047-07-244 US 75 AT ROYAL LN			30	131	230	3915	1430		1200	22	10	4			30	131
CSJ 0047-07-247 US 75 AT ARAPAHO RD		20	38	888		1960	2430		905	18	6			20	38	888
CSJ 0197-02-134 US 175AT SL 12		4		65		2069	475	176	459	6	4			4		68
CSJ 0261-03-069 US 67 AT RED BIRDLN			28	61	600	2160	290		804	8	3				28	61
CSJ 2964-05-032 SH 190AT RENNER RD	1	23	43	789		4010	2080		1185	18	2	1	1	23	43	789
CSJ 2964-05-033 SH 190AT PLANO RD		20	73	639		2230	1430		975	18	2	2		20	73	639
PROJECT TOTALS	**1**	**67**	**296**	**2769**	**1460**	**20509**	**9625**	**176**	**6836**	**112**	**31**	**7**	**1**	**67**	**296**	**2772**

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DIAMOND SIGNALS

SUMMARY OF QUANTITIES

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	7
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

SHEET 1 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		8

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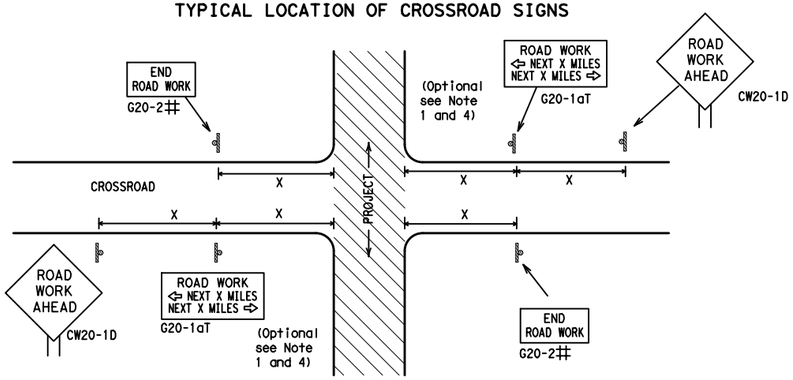
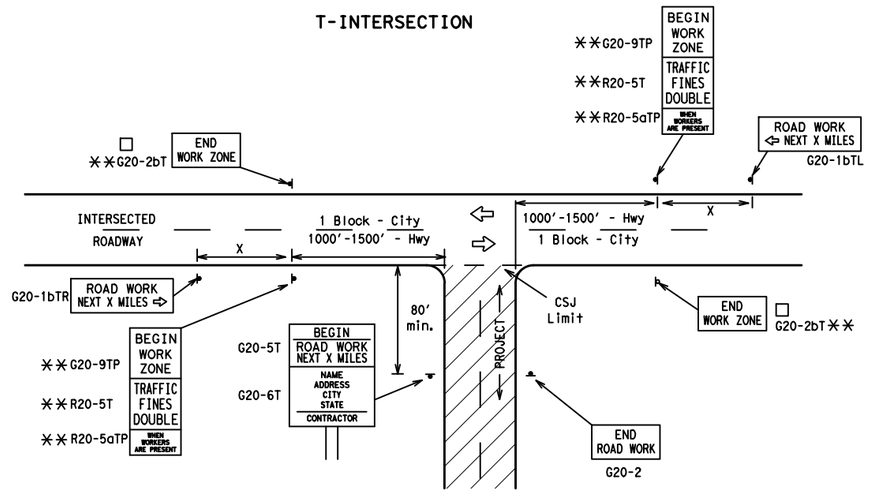
TYPICAL LOCATION OF CROSSROAD SIGNS



May be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D)sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TMUTCD Part 5. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1aT)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
2. If construction closes the road at a T-intersection, the Contractor shall place the "CONTRACTOR NAME"(G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow(G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR)" signs shall be replaced by the detour signing called for in the plans.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE

Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING

Posted Speed	Sign △ Spacing "X"
MPH	Feet (Apprx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
✳	✳[3]

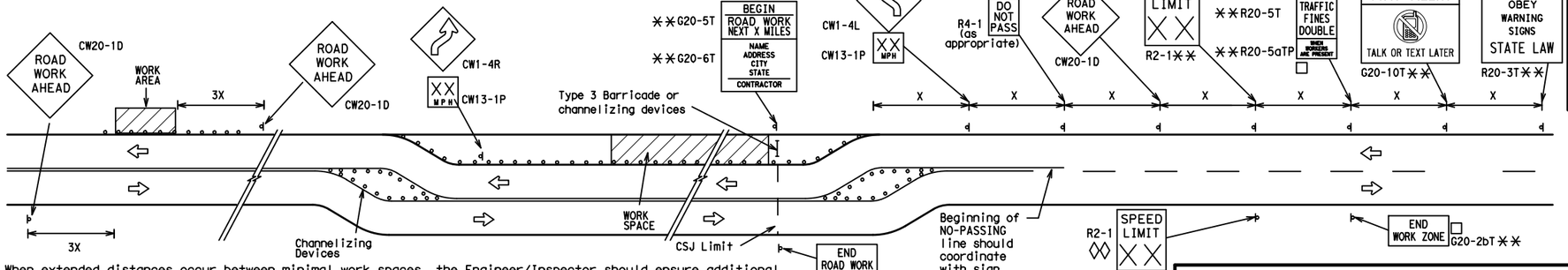
✳ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

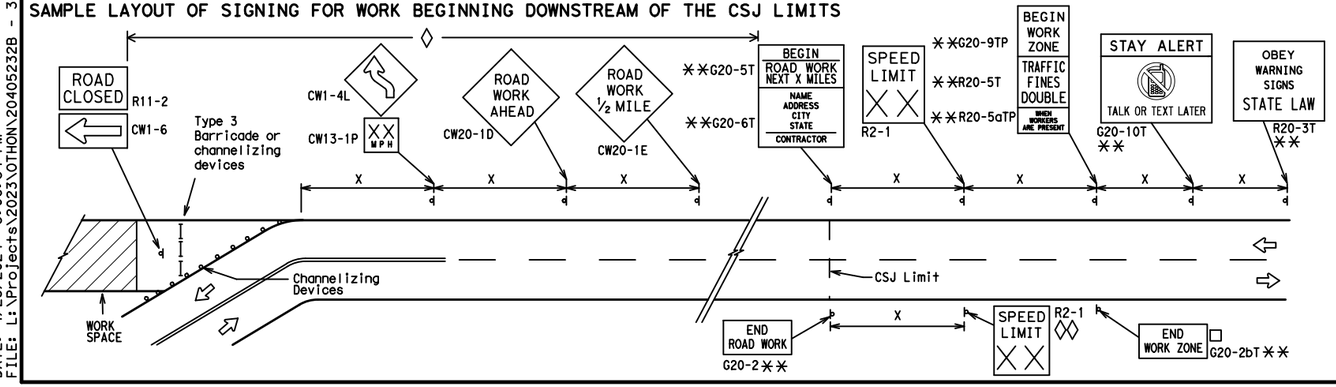
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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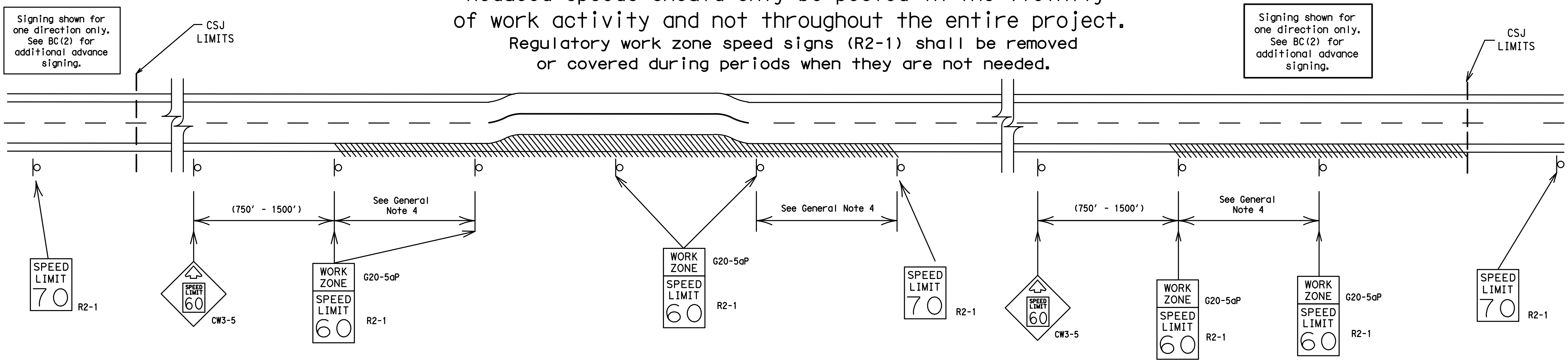
REVISIONS	0047	07	243, ETC.	US 75, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	DAL	DALLAS, ETC.		9

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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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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REVISIONS 9-07 8-14 7-13 5-21	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		10

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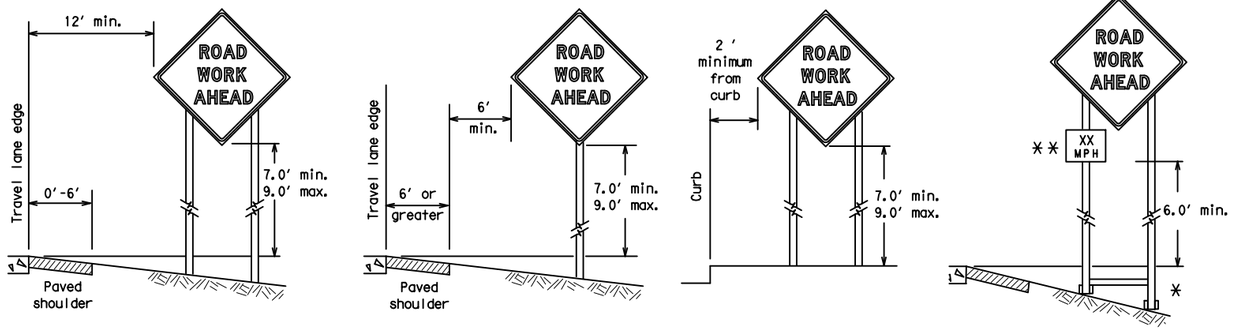
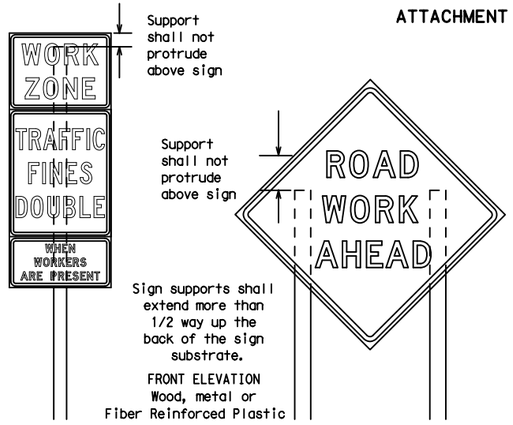
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

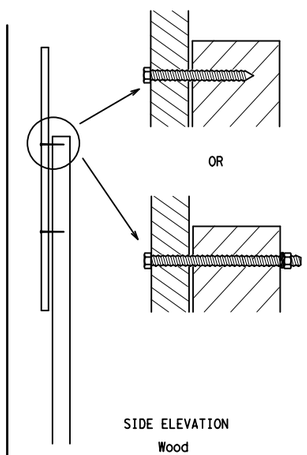


⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





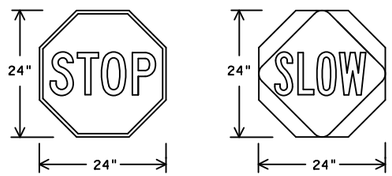
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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7-13 5-21	DAL	DALLAS, ETC.		11

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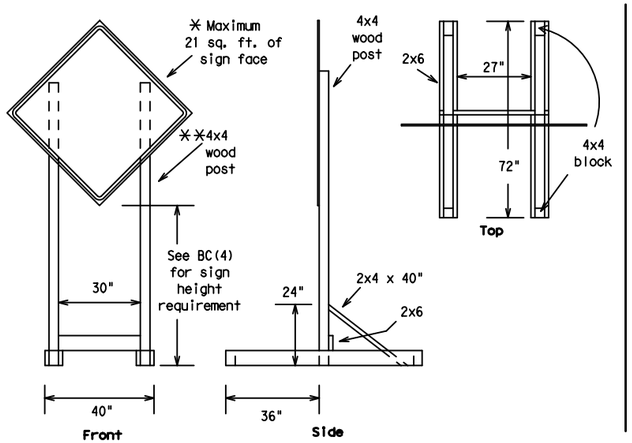
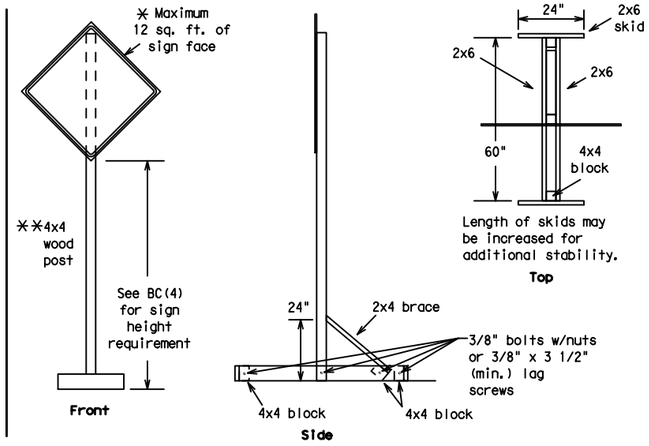
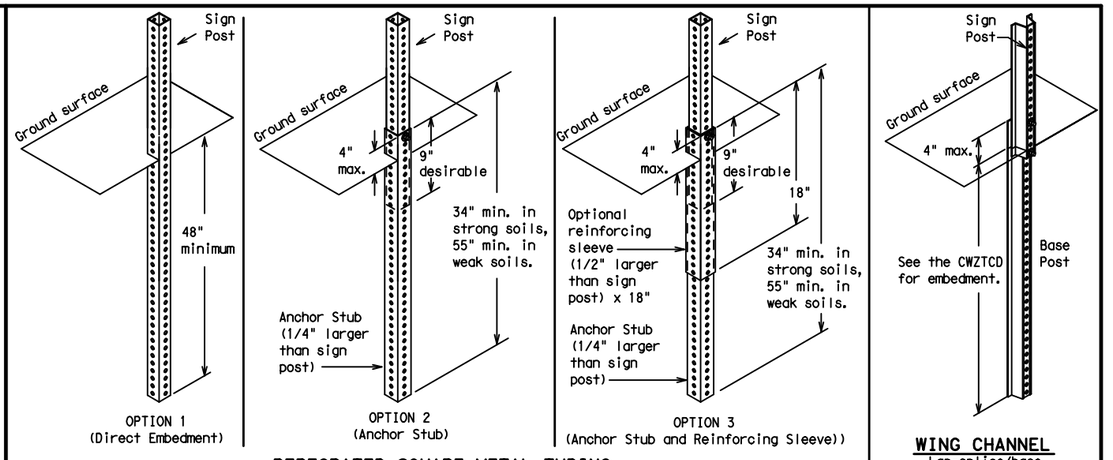




SKID MOUNTED WOOD SIGN SUPPORTS

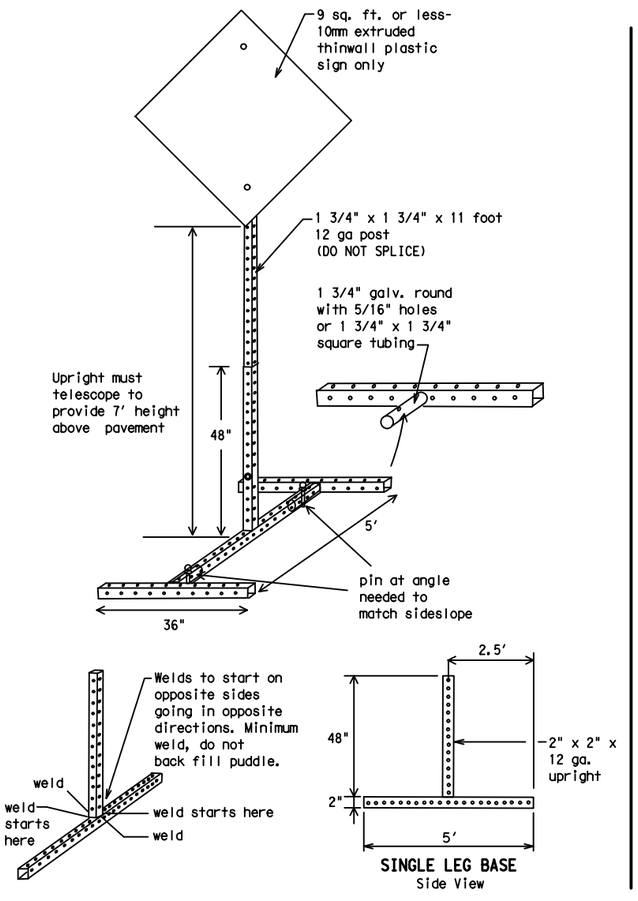
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

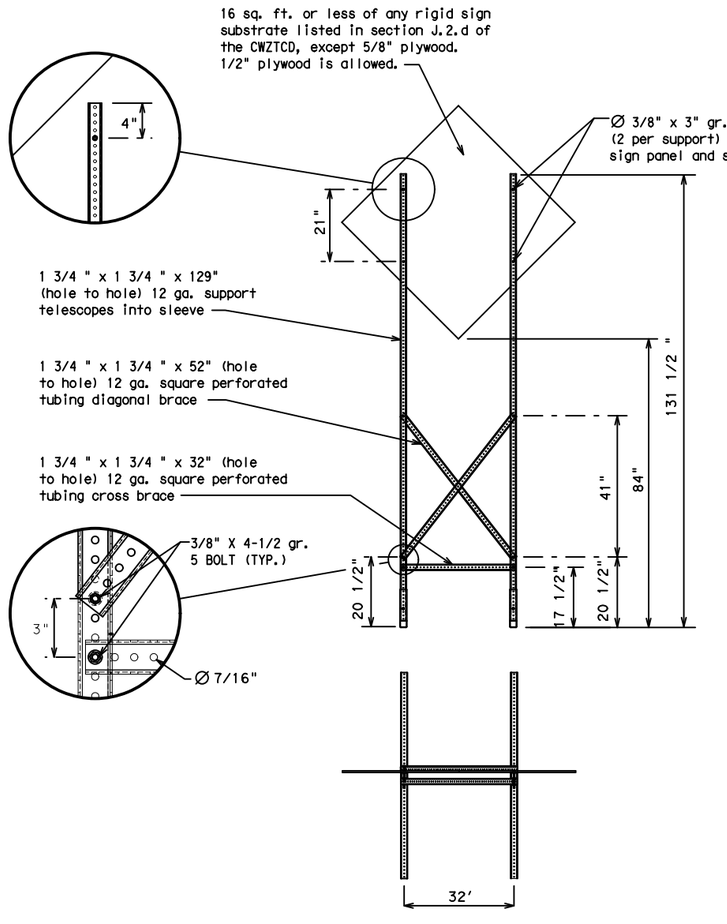


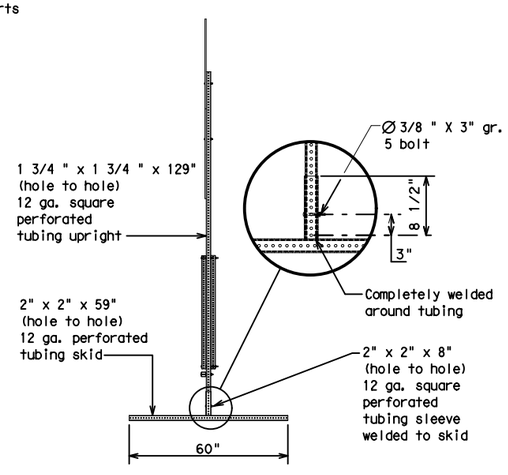
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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7-13 5-21	DAL	DALLAS, ETC.		12

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	DAL	DALLAS, ETC.		13

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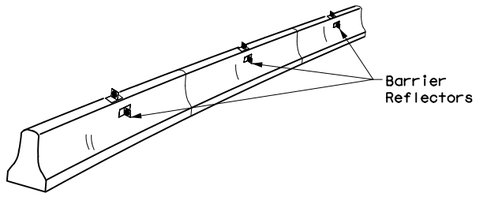
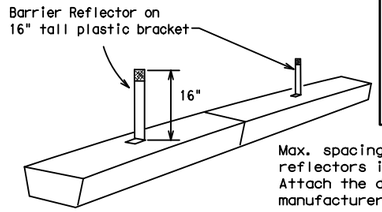
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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

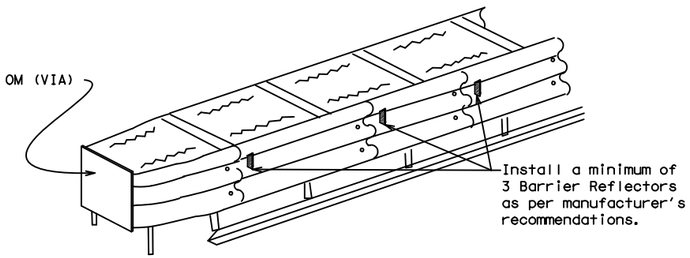


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

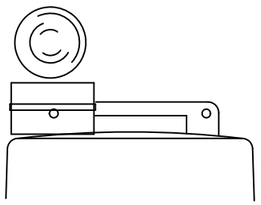


DELINEATION OF END TREATMENTS

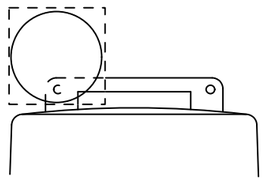
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

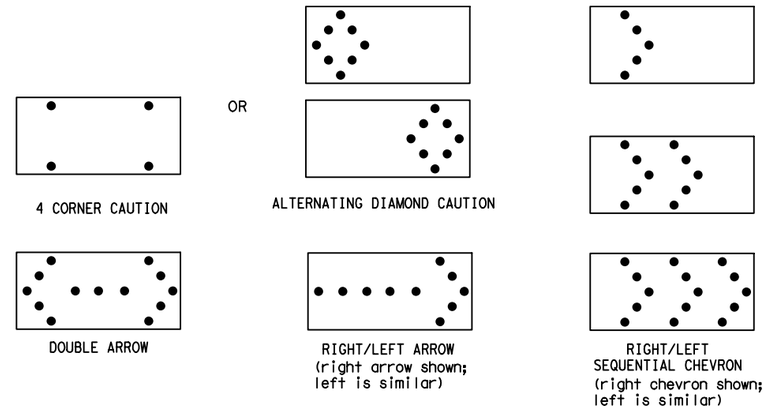
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	DAL	DALLAS, ETC.		14

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

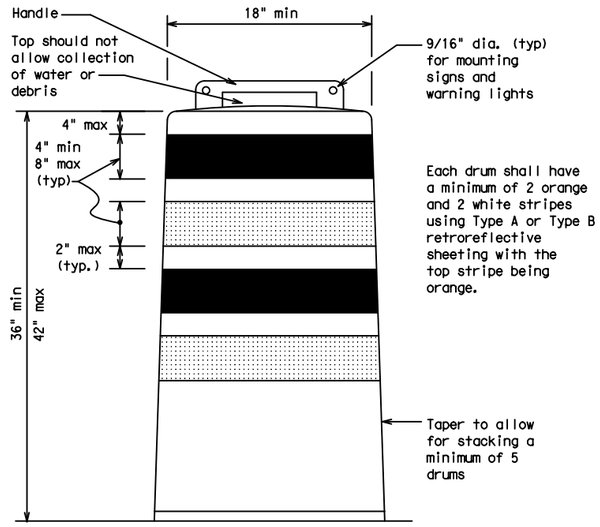
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

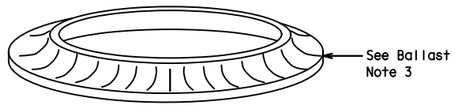
RETROREFLECTIVE SHEETING

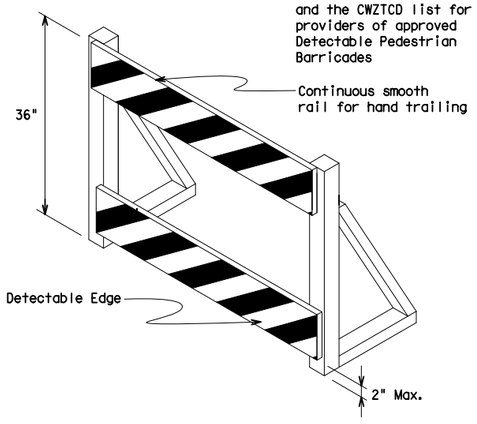
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

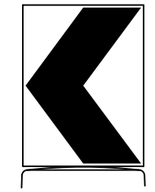




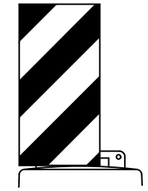


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	DAL	DALLAS, ETC.		15
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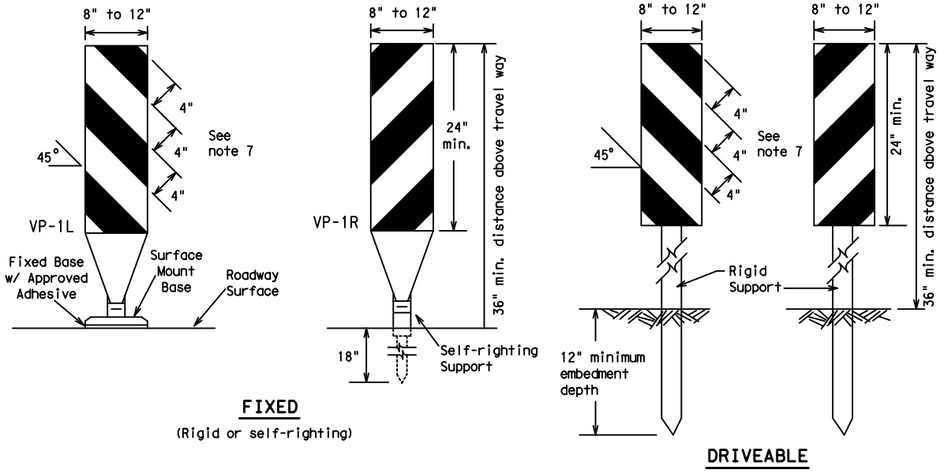
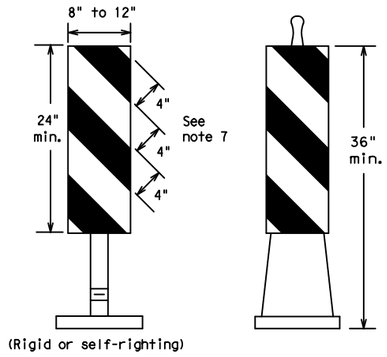


FIXED
(Rigid or self-righting)

DRIVEABLE

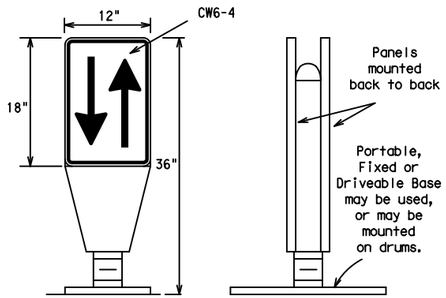


(Rigid or self-righting)

PORTABLE

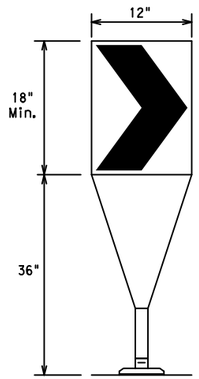
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



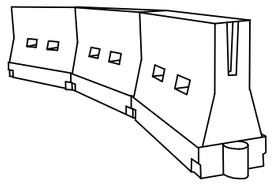
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	DAL	DALLAS, ETC.		16

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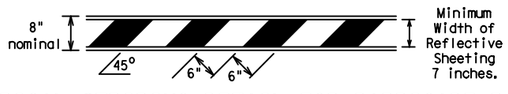
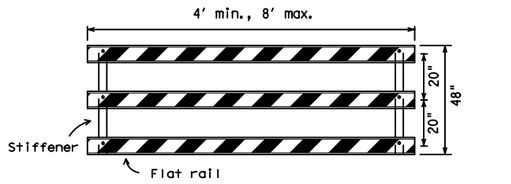
TYPE 3 BARRICADES

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.



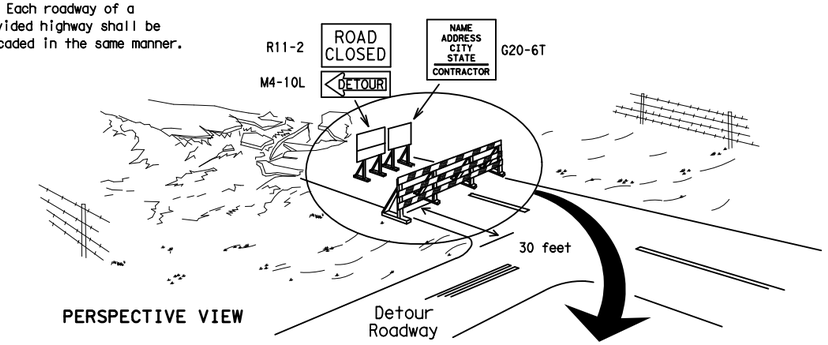
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

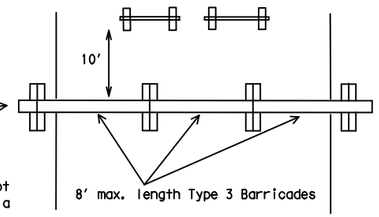
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

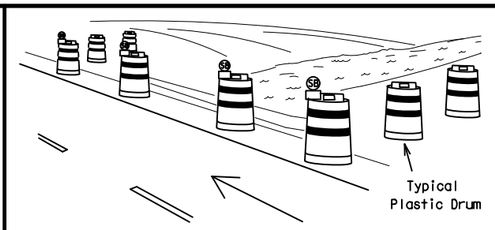
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

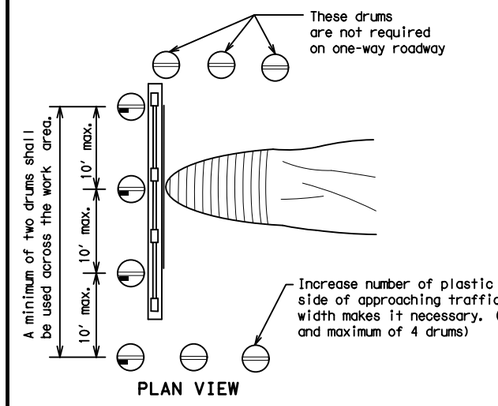
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

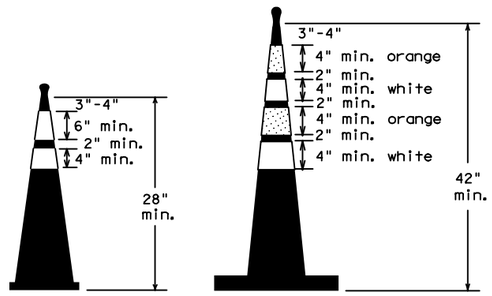
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

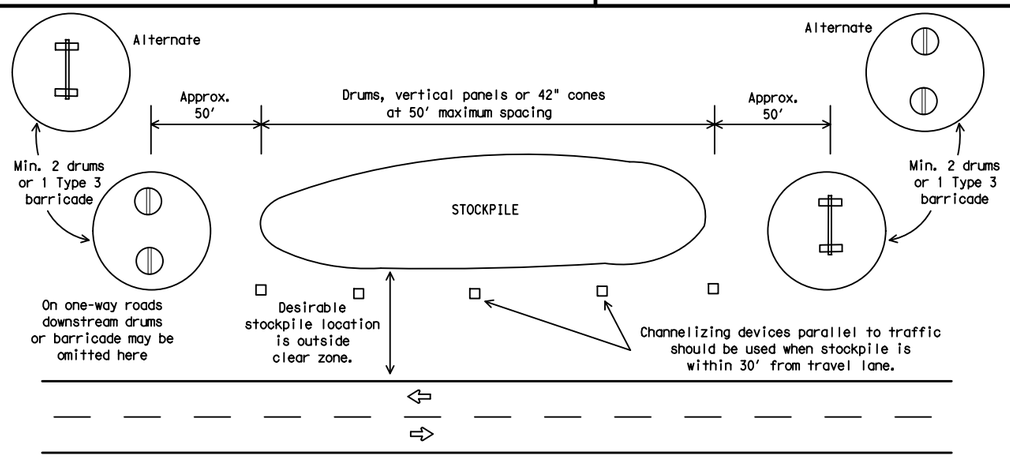
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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7-13 5-21	DAL	DALLAS, ETC.		17

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

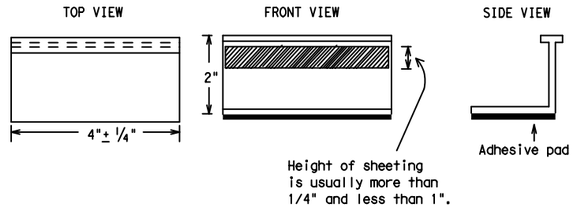
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		18

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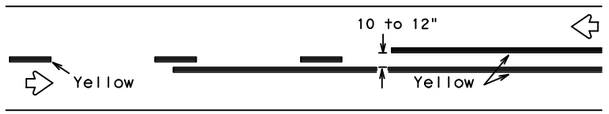
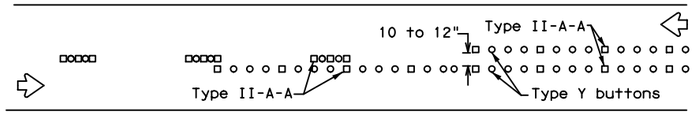
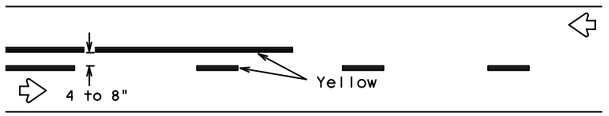
PAVEMENT MARKING PATTERNS



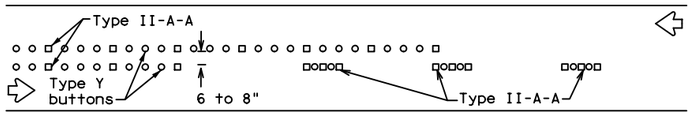
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



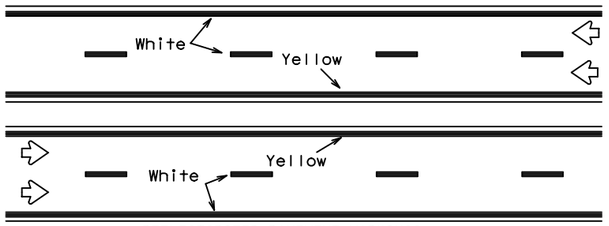
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



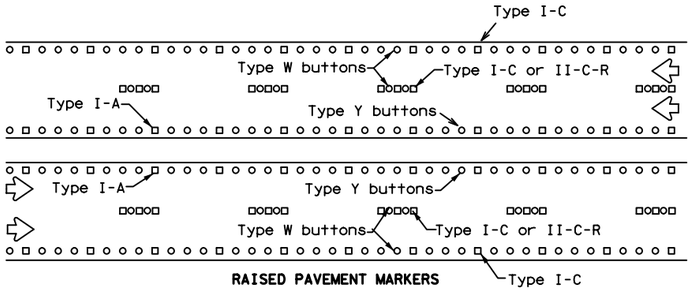
RAISED PAVEMENT MARKERS - PATTERN B

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

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



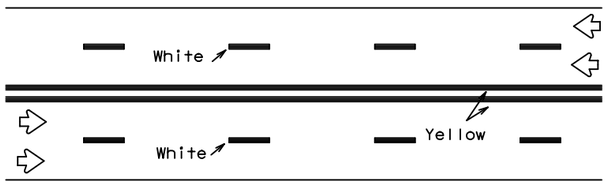
REFLECTORIZED PAVEMENT MARKINGS



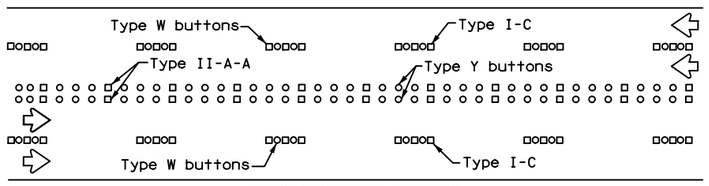
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



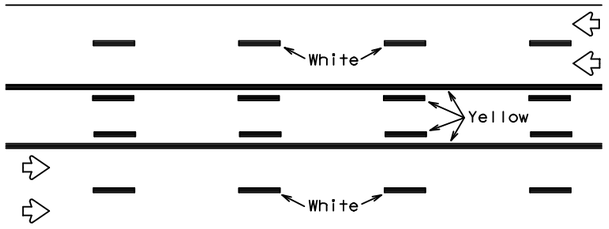
REFLECTORIZED PAVEMENT MARKINGS



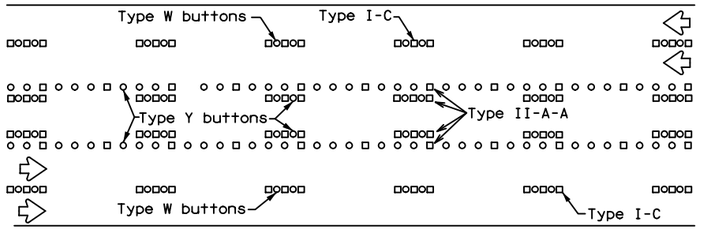
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

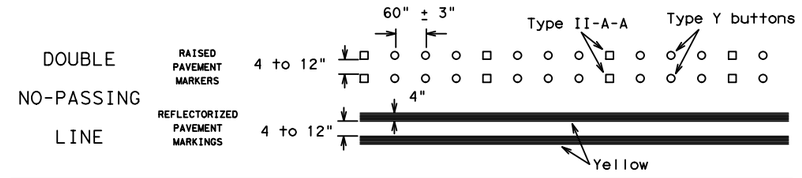
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

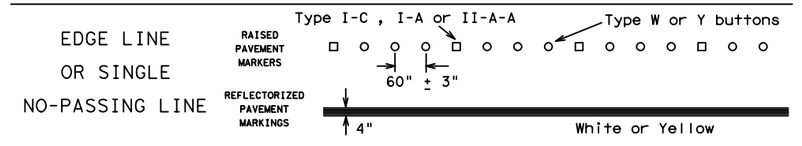
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

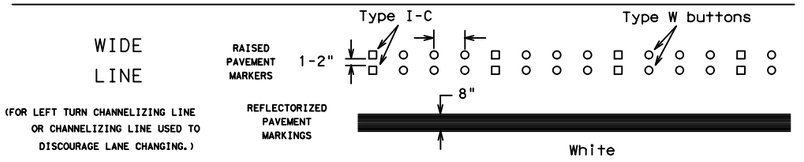


EDGE LINE OR SINGLE NO-PASSING LINE



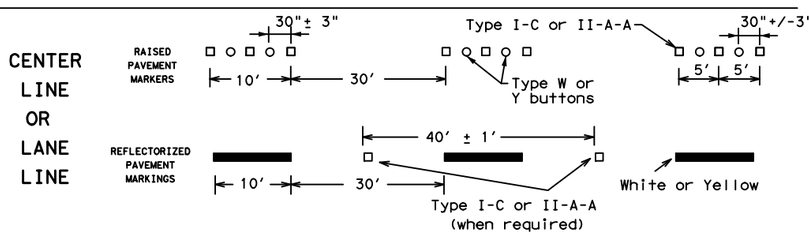
WIDE LINE

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

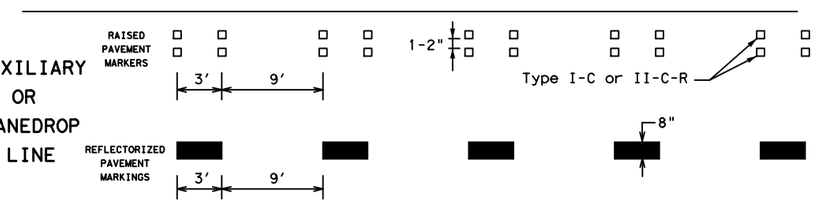


BROKEN LINES

CENTER LINE OR LANE LINE

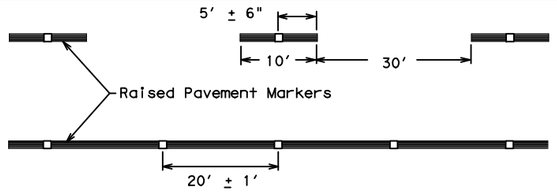


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		19

106

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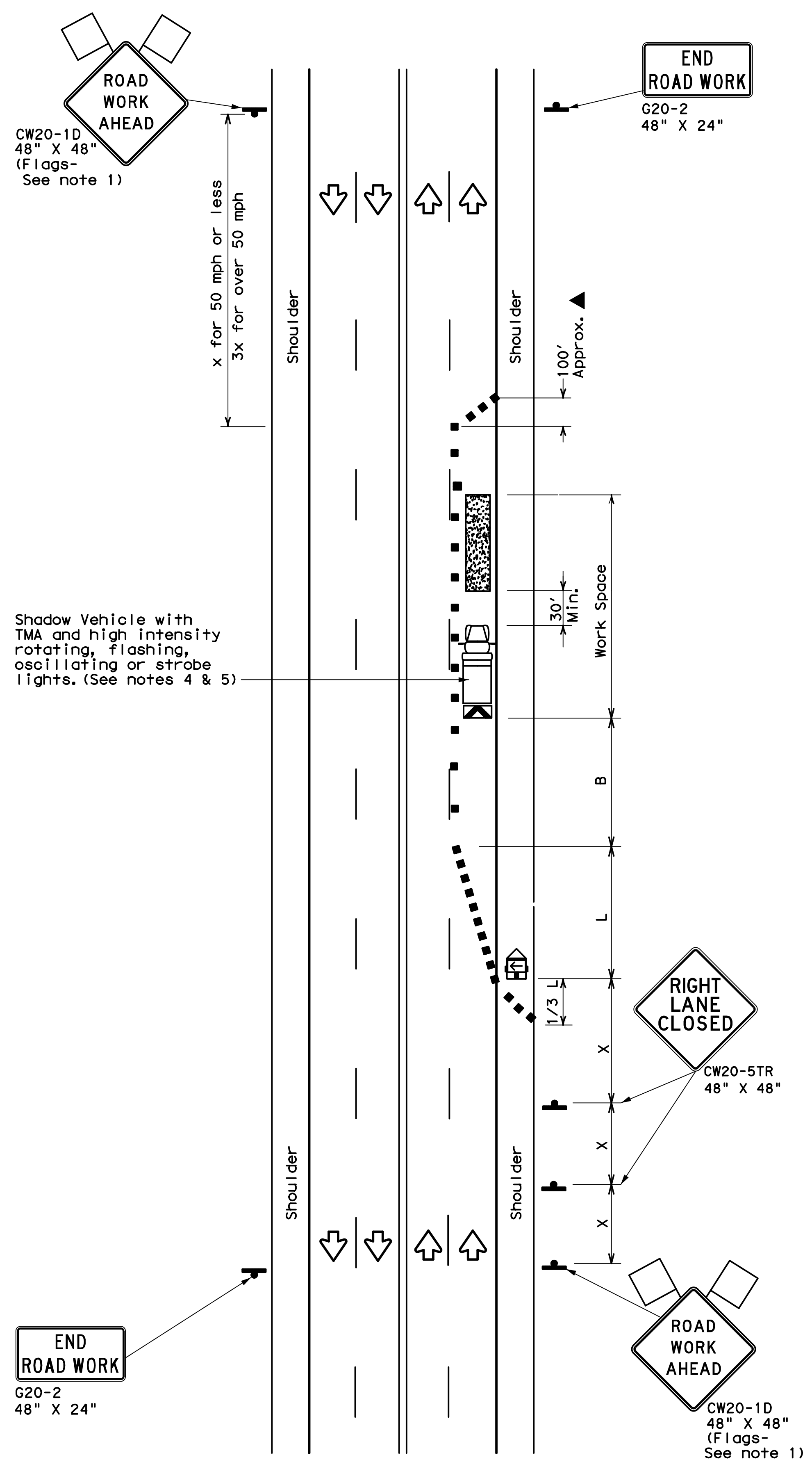
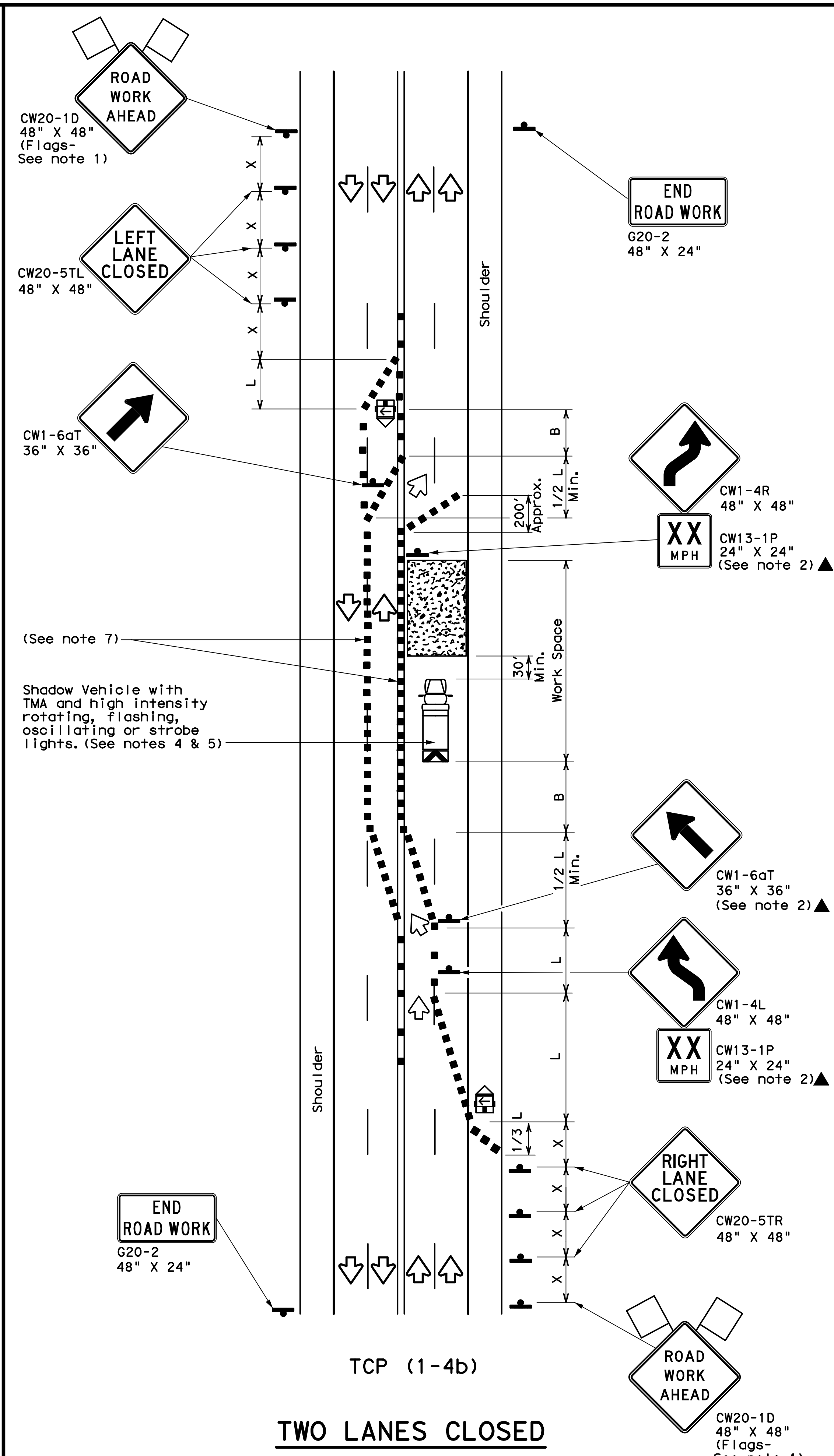


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (1-4a)

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

TCP (1-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT 0047	SECT 07	JOB 243, ETC.	HIGHWAY US 75, ETC.
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	DIST DAL		COUNTY DALLAS, ETC.	SHEET NO. 20

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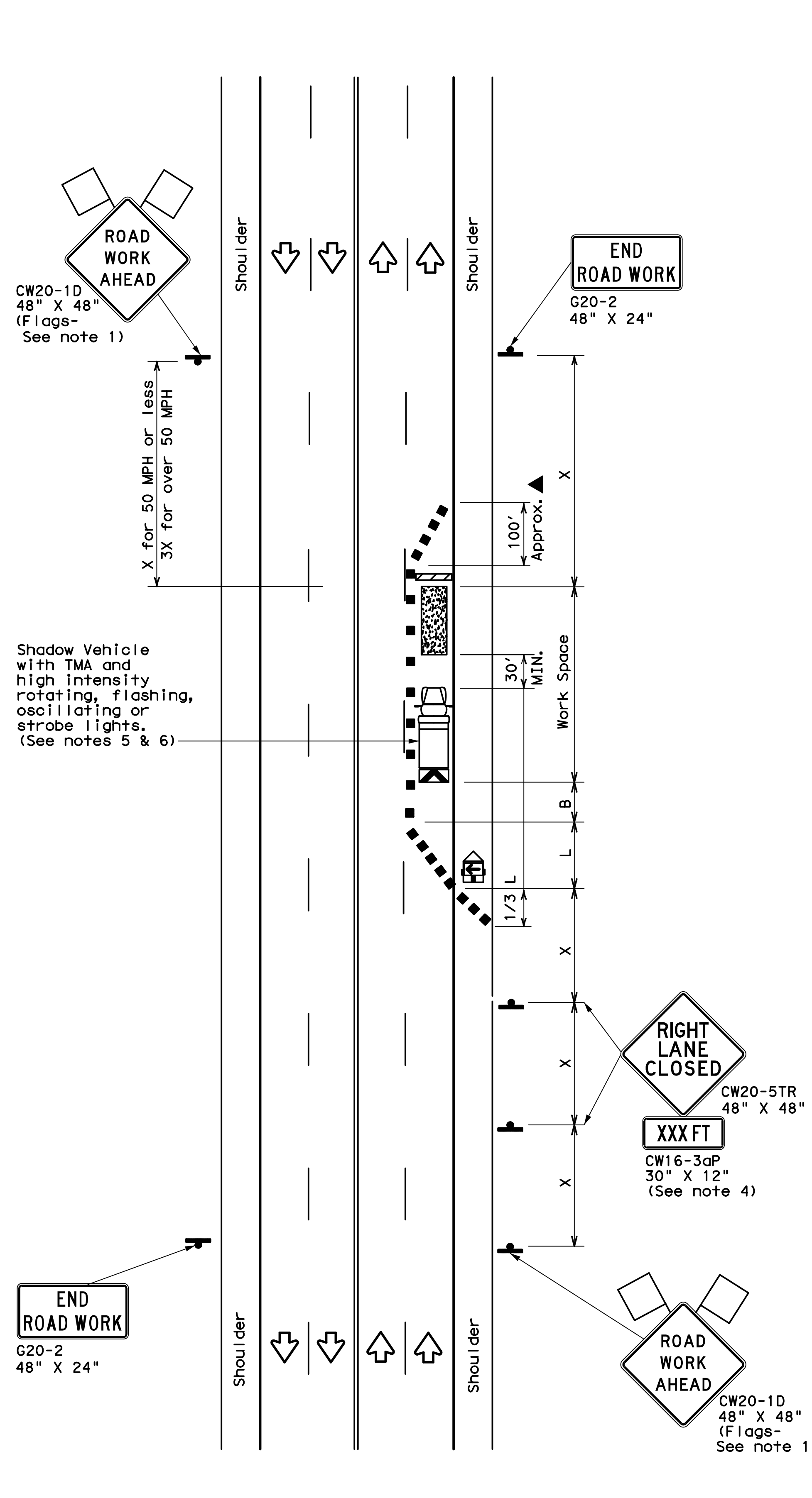
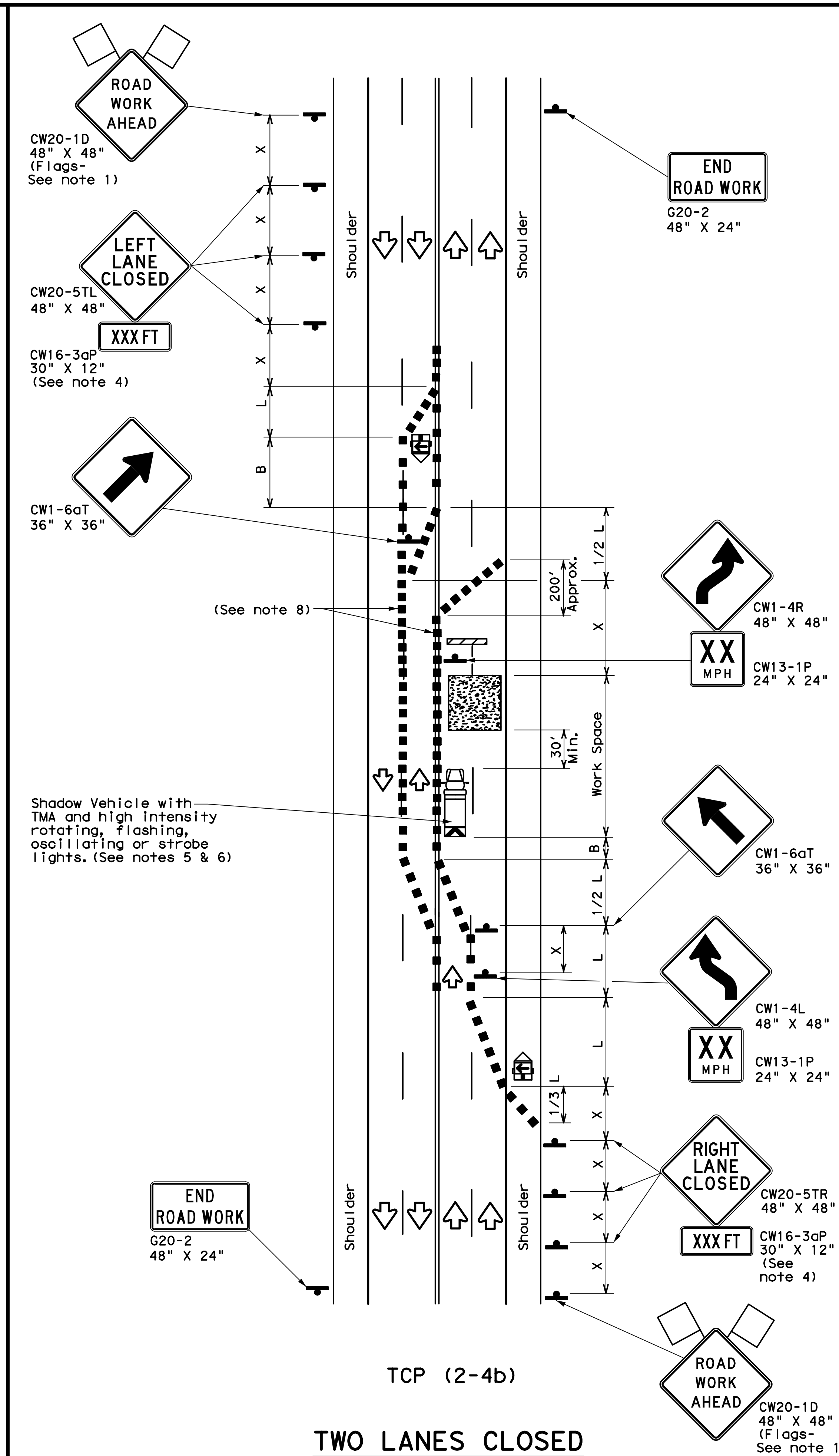


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

LEGEND

Symbol	Description	Symbol	Description
	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)

TYPICAL USAGE

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		21

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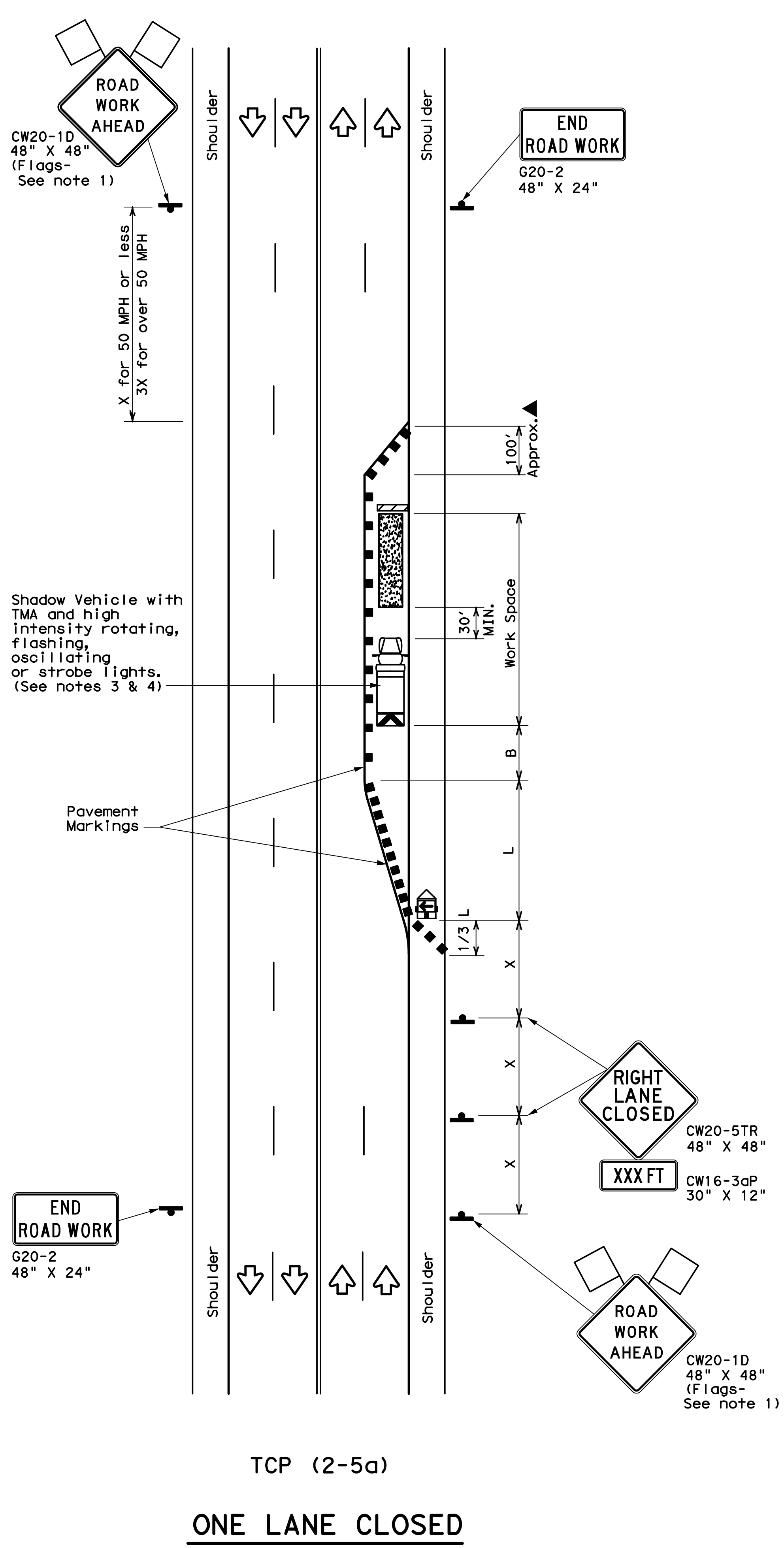
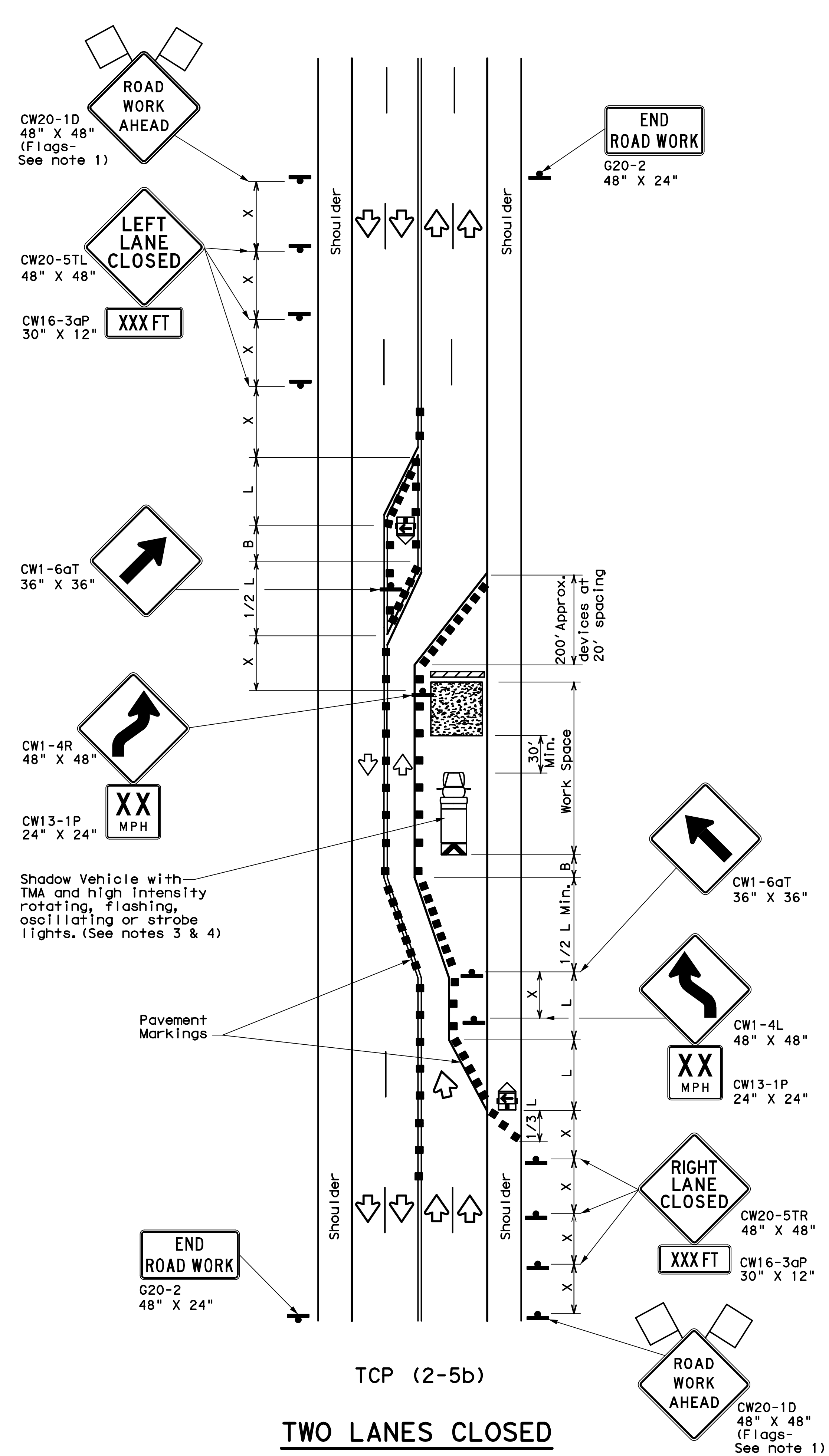


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

LEGEND

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

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

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

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

GENERAL NOTES

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

TCP (2-5a)

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

TCP (2-5b)

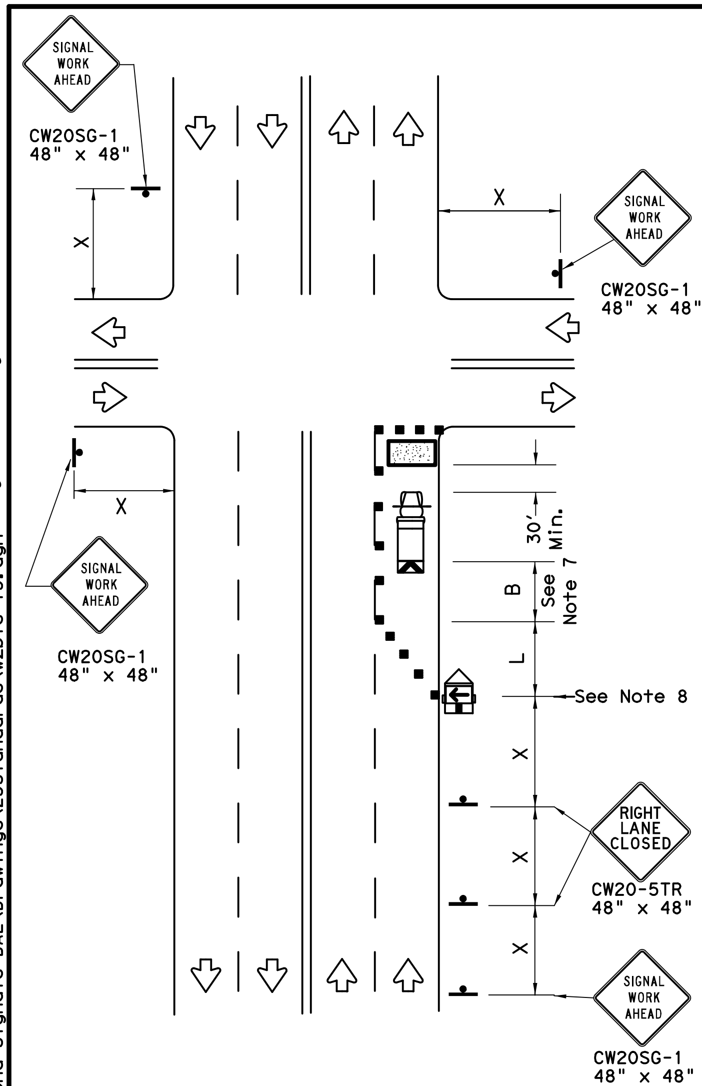
7. Conflicting pavement markings shall be removed for long-term projects.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

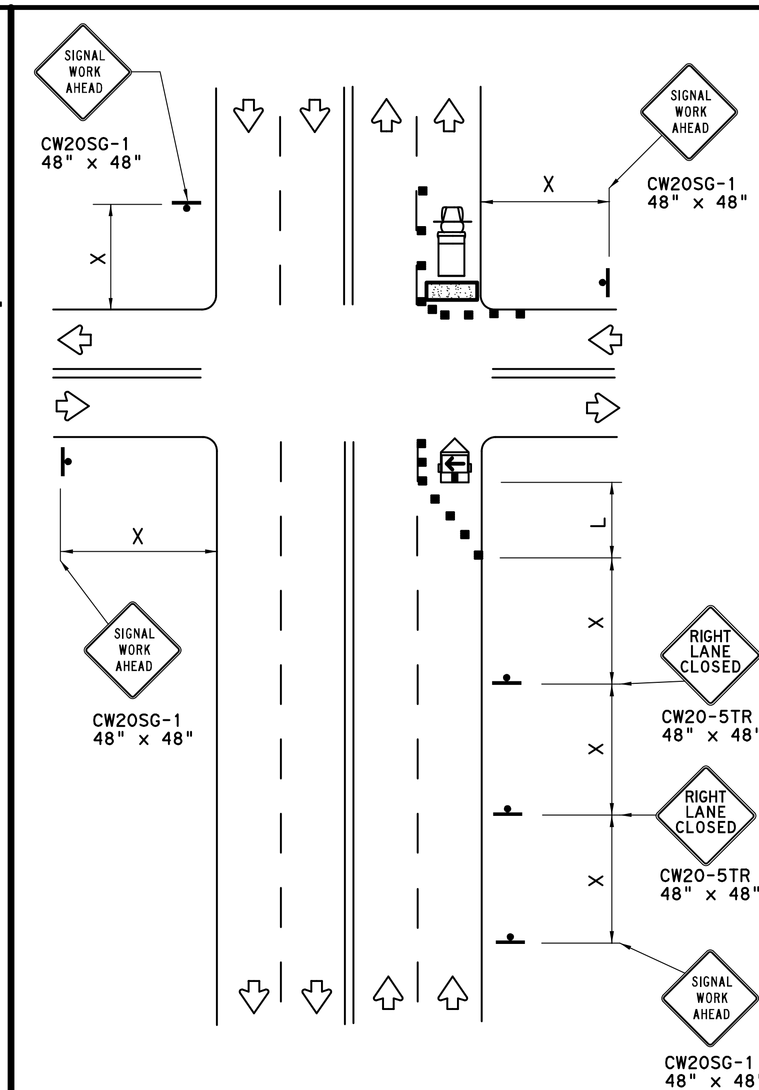
TCP(2-5)-18

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12 / 1-97 3-03 / 4-98 2-18	0047	07	243, ETC.	US 75, ETC.
	DIST		COUNTY	SHEET NO.
	DAL		DALLAS, ETC.	22



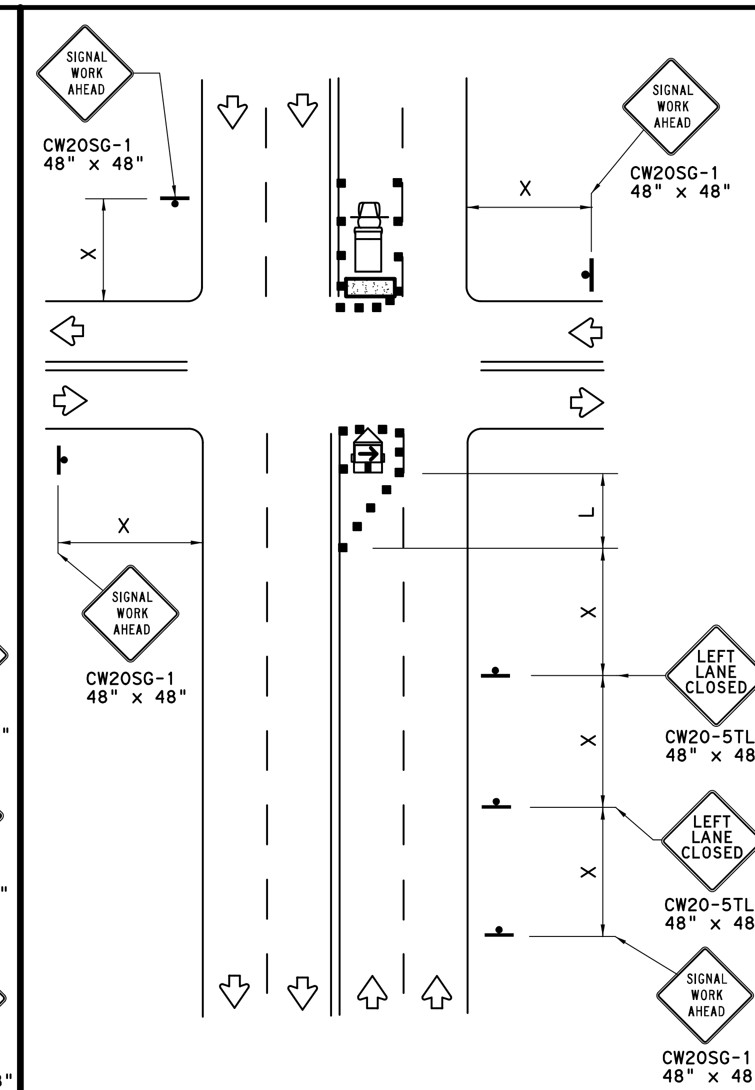
NEAR SIDE LANE CLOSURE

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

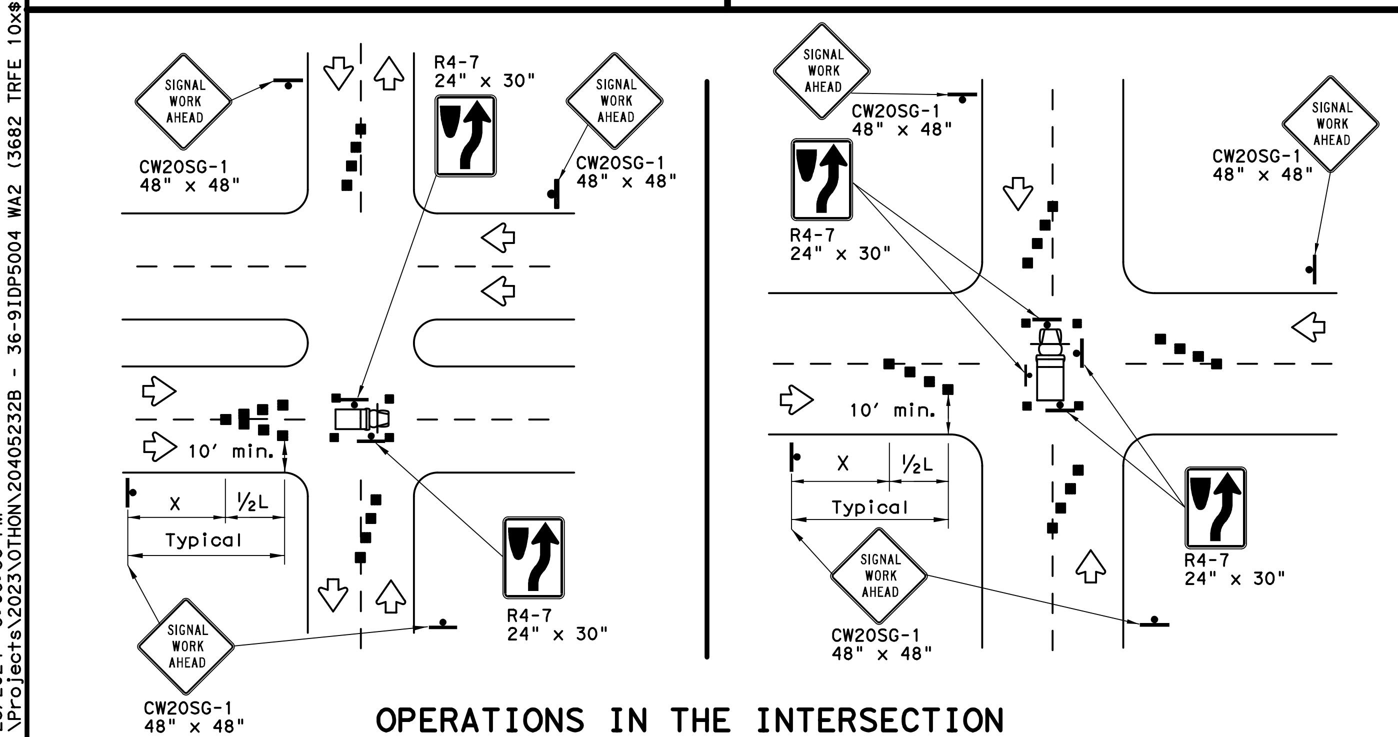
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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

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

SHEET 1 OF 2

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
2-98 10-99 7-13 4-98 3-03	DIST		COUNTY	SHEET NO.
	DAL		DALLAS, ETC.	23

114

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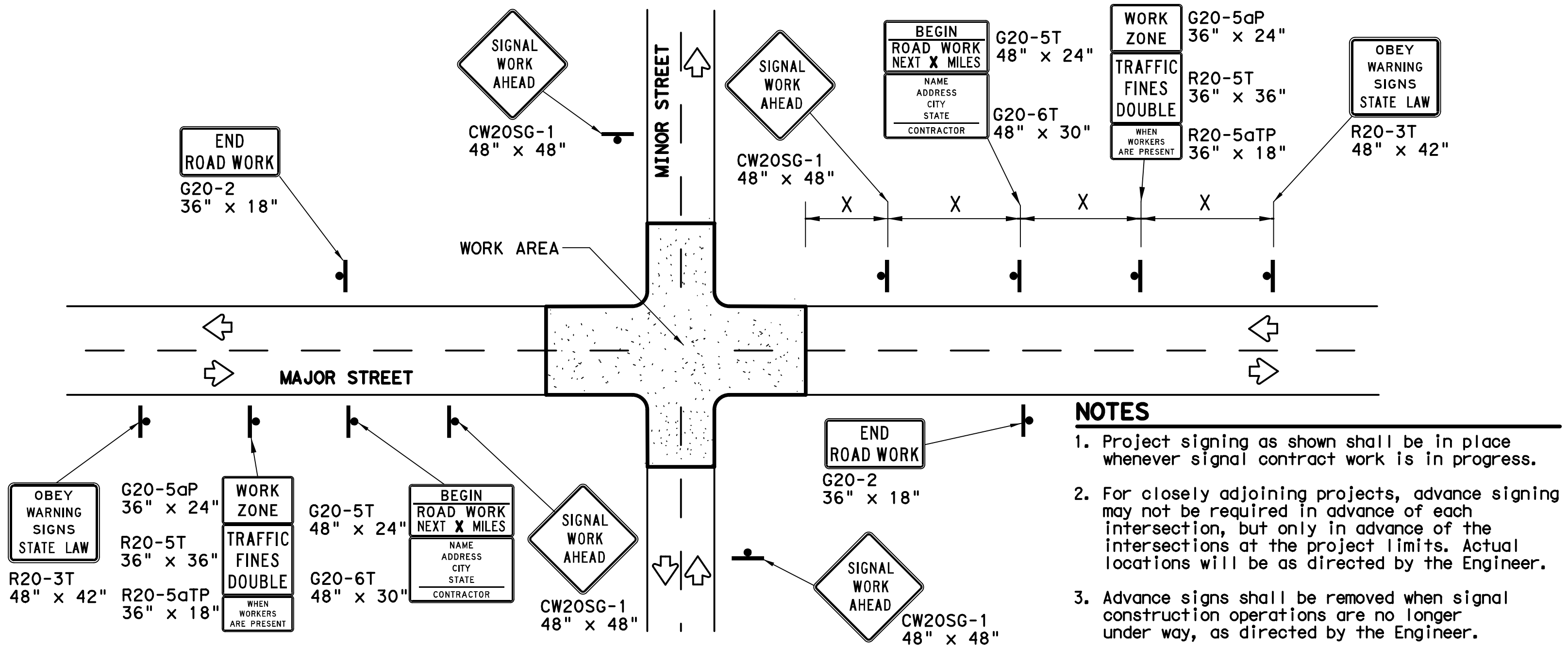
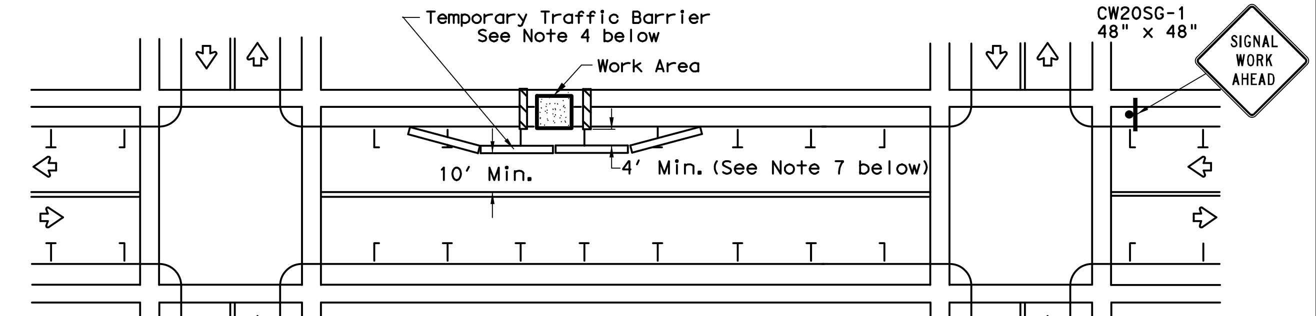


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

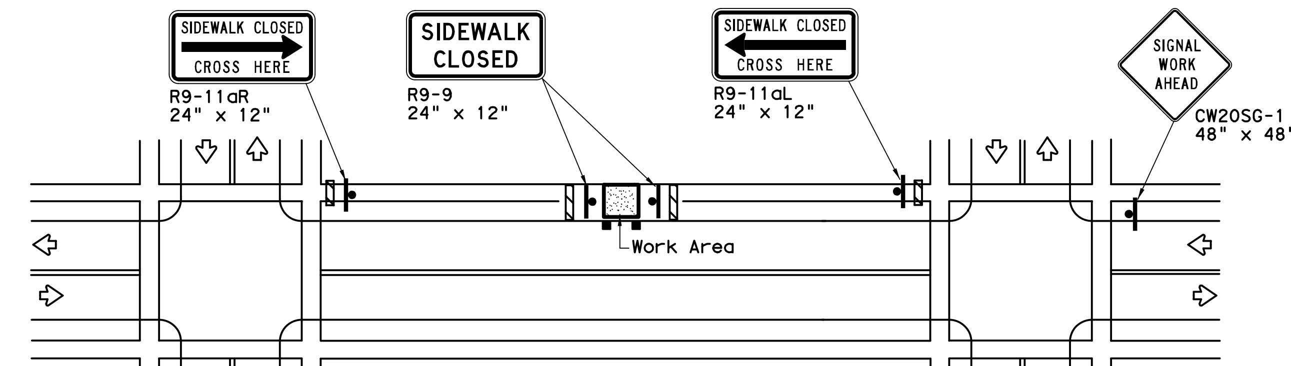
FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

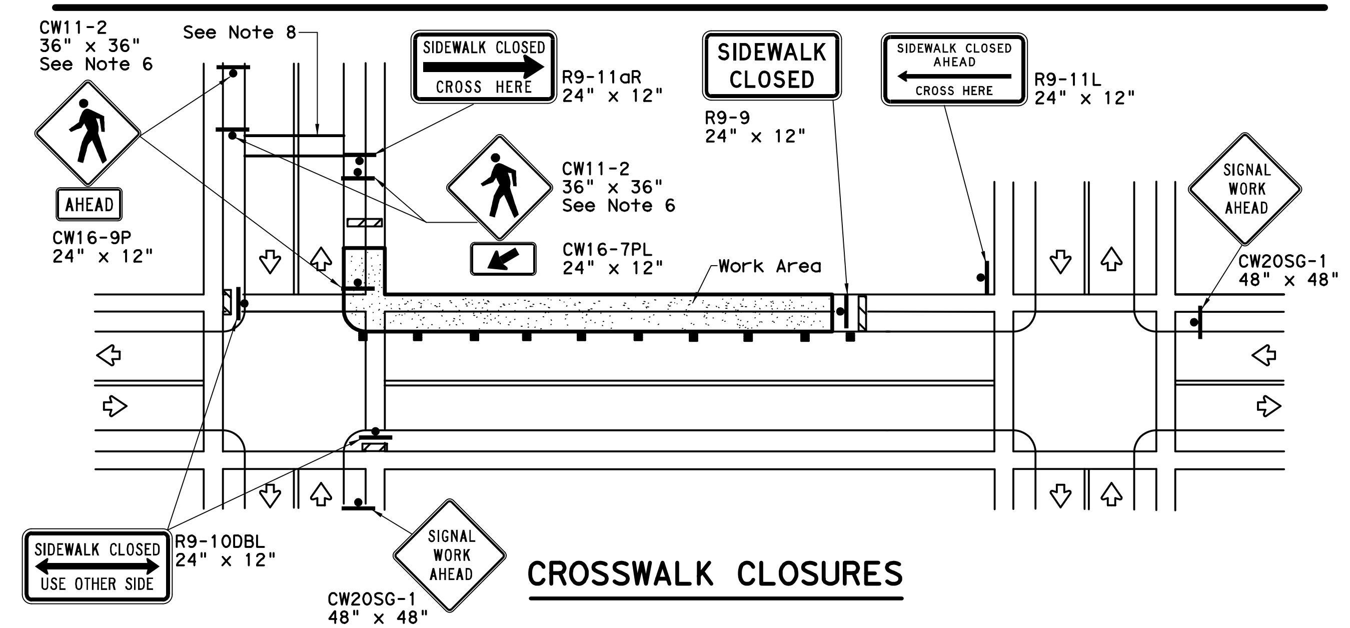
1. Project signing as shown shall be in place whenever signal contract work is in progress.
2. For closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. Actual locations will be as directed by the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



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

GENERAL NOTES FOR WORK ZONE SIGNS

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

DURATION OF WORK

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

SIGN MOUNTING HEIGHT

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

REMOVING OR COVERING

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

REFLECTIVE SHEETING

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

SIGN SUPPORT WEIGHTS

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

LEGEND	
(symbol)	Sign
(symbol)	Channelizing Devices
(symbol)	Type 3 Barricade

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

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

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

PEDESTRIAN CONTROL

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

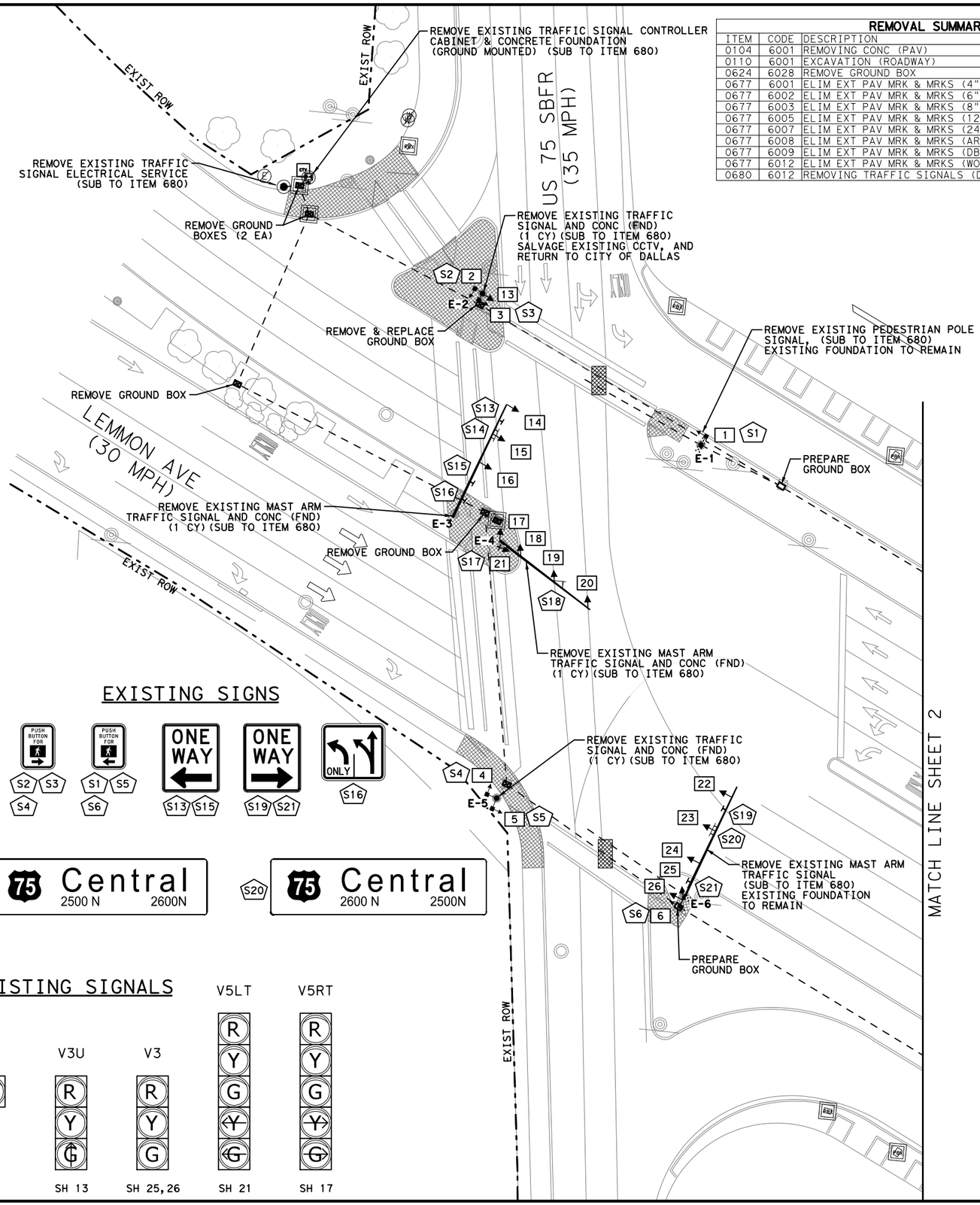
WZ(BTS-2)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
2-98 10-99 7-13	DIST		COUNTY	SHEET NO.
4-98 3-03	DAL		DALLAS, ETC.	24

100% SUBMITTAL

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
3. CONTRACTOR SHALL MAINTAIN THE EXISTING SIGNAL INSTALLATION AND OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED SIGNAL IS OPERATIONAL.
4. THE CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AFTER PROPOSED SIGNAL IS OPERATIONAL. EXISTING FOUNDATIONS AND GROUND BOXES SHALL BE REMOVED, WITH POLE FOUNDATIONS REMOVED TO A MINIMUM OF 2' BELOW EXISTING GROUND, AND BACK FILLED WITH SIMILAR MATERIALS IN THE SURROUNDING AREA. EXISTING CONDUITS SHALL BE ABANDONED IN PLACE. SEE GENERAL NOTES AND SPECIFICATIONS FOR MORE INFORMATION.
5. ELIMINATE ALL EXISTING PAVEMENT MARKINGS WITHIN THE INTERSECTION AND ALONG 200' IN EACH DIRECTION FROM STOP BAR. REFER TO PAVEMENT MARKING SHEET FOR ADDITIONAL INFORMATION.
6. EXISTING SIGNS S1-S30 SHALL BE REMOVED WITH TRAFFIC SIGNAL EQUIPMENT.
7. PAVING REMOVAL (CURB, RAMP, PAVERS AND SIDEWALK) SHALL BE SUBSIDIARY TO THE INSTALLATION OF NEW CURB, RAMP, RIPRAP OR CONCRETE SIDEWALK (SEE ITEMS 421 & 531 QTYS AND PROPOSED PEDESTRIAN RAMP AND SIDEWALK LAYOUT).
8. ALL GROUND MOUNTED SIGNS SHALL REMAIN AS INSTALLED UNLESS OTHERWISE NOTED.



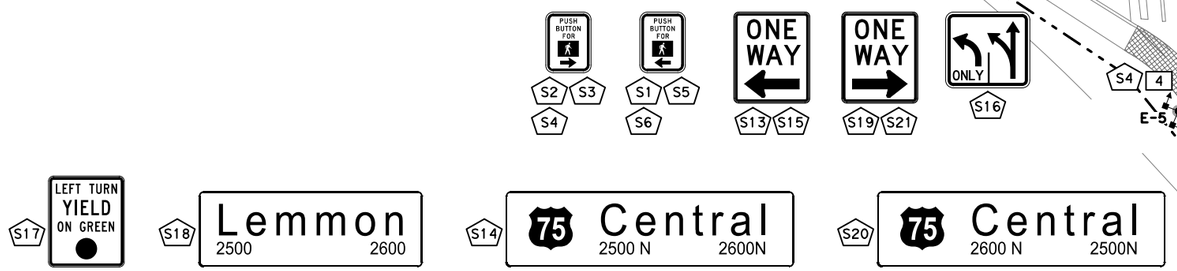
REMOVAL SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0104	6001	REMOVING CONC (PAV)	SY	28
0110	6001	EXCAVATION (ROADWAY)	CY	70
0624	6028	REMOVE GROUND BOX	EA	9
0677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	725
0677	6002	ELIM EXT PAV MRK & MRKS (6")	LF	3112
0677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	1060
0677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	1218
0677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	372
0677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	22
0677	6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	4
0677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	12
0680	6012	REMOVING TRAFFIC SIGNALS (DIAMOND)	EA	1

N

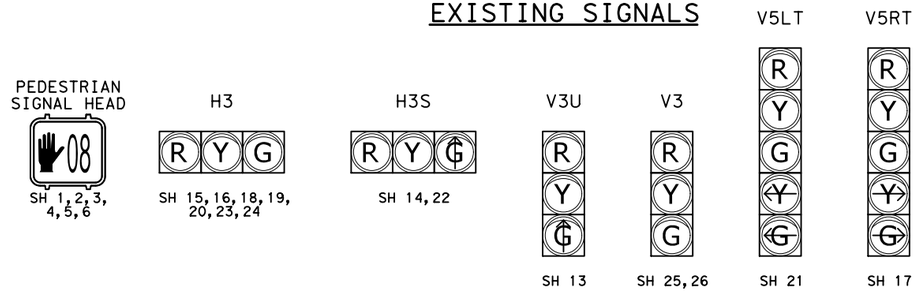
EXISTING SIGNAL LEGEND

- MAST ARM POLE
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LUMINAIRE
- VEHICLE DETECTOR
- OPTICOM
- CCTV
- EXISTING SIGNAL CONTROLLER CABINET
- EXISTING GROUND BOX
- 1 — SIGNAL HEAD NUMBER
- S1 — SIGN LABEL
- EXISTING ELECTRICAL SERVICE
- E-# — EXISTING SIGNAL POLE NUMBER
- PAVING REMOVAL

EXISTING SIGNS



EXISTING SIGNALS



STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

EXISTING CONDITIONS AND REMOVALS US 75 AT LEMMON AVE

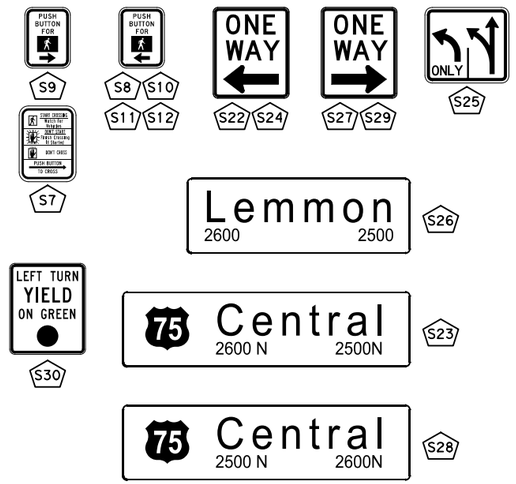
SCALE: 1" = 40' SHEET 1 OF 2

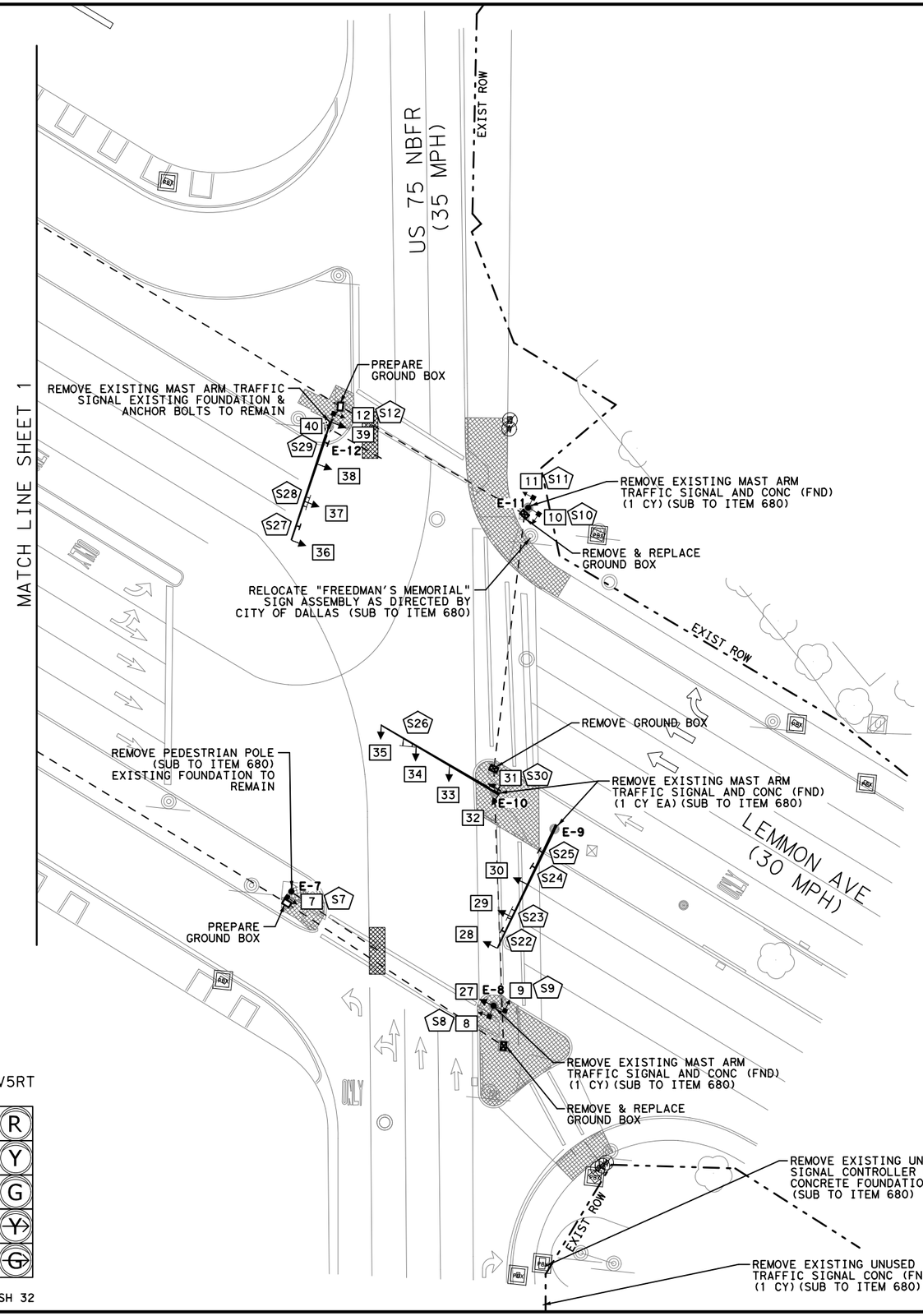
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	25
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

4/25/2024 3:56:37 PM L:\Projects\2023\OTHON\204052328 - 36-910P5004 WA2 (3682 TRFE 10x83) 7 Diamond Signals DAL\Drawings\10TRF\1. US 75 at Lemmon\Dallas District Signals - Existing Layout 1.dgn

100% SUBMITTAL

EXISTING SIGNS

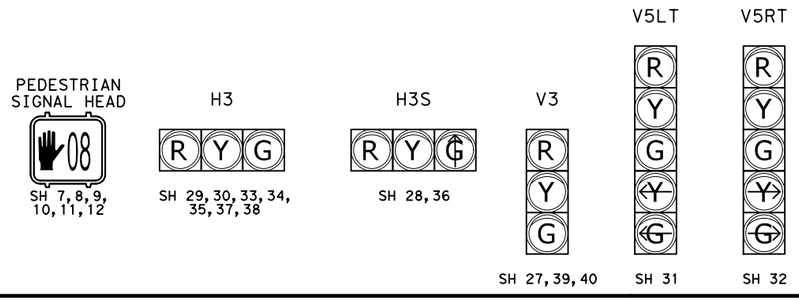




EXISTING SIGNAL LEGEND

- MAST ARM POLE
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LUMINAIRE
- VEHICLE DETECTOR
- OPTICOM
- CCTV
- EXISTING SIGNAL CONTROLLER CABINET
- EXISTING GROUND BOX
- SIGNAL HEAD NUMBER
- SIGN LABEL
- EXISTING ELECTRICAL SERVICE
- E-# EXISTING SIGNAL POLE NUMBER
- PAVING REMOVAL

EXISTING SIGNALS



STATE OF TEXAS
ELIZABETH SHELTON
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4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

EXISTING CONDITIONS AND REMOVALS US 75 AT LEMMON AVE

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	26

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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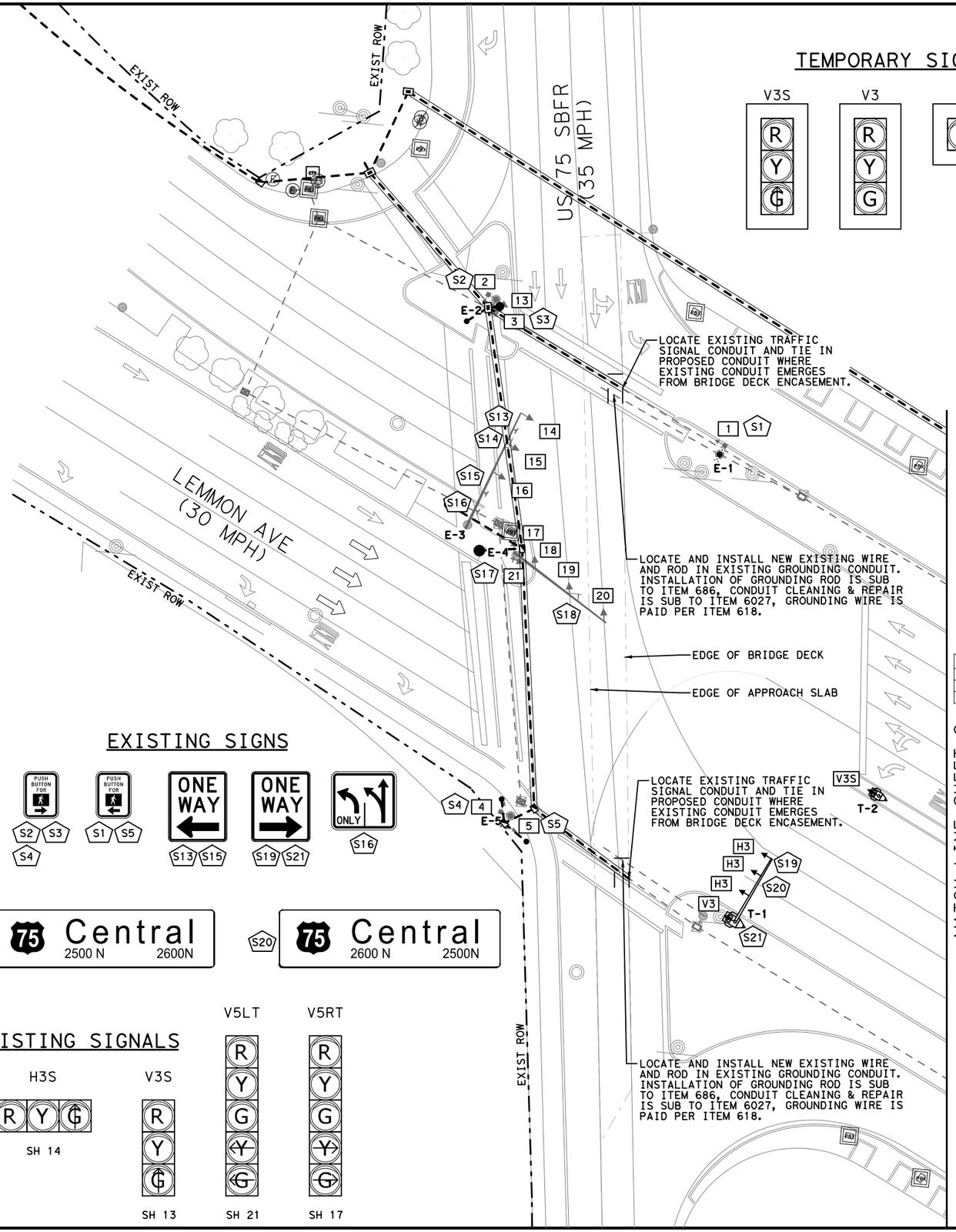
NOTES:
1. CONTRACTOR SHALL MAINTAIN ONE CROSSWALK IN EACH DIRECTION DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTINUED OPERATION OF THE TEMPORARY SIGNAL, INCLUDING IMPLEMENTATION OF ALL TIMING AND PHASING THROUGHOUT CONSTRUCTION.
3. THE CONTRACTOR SHALL MAINTAIN TMUTCD COMPLIANT TRAFFIC CONTROL VIA PORTABLE TRAFFIC SIGNALS OR OTHER TXDOT APPROVED MEANS.
4. TCP SHALL BE PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH THE TxDOT TCP STANDARDS.
5. CONTRACTOR SHALL SUPPLY 5' OF SLACK AT EACH GROUND BOX FOR ALL NEW TEMPORARY CABLES.

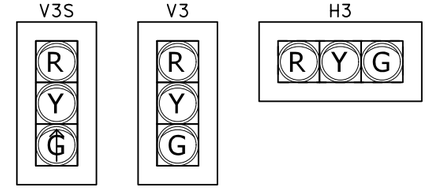
PHASE 1 NOTES:
1. EXISTING TRAFFIC SIGNAL WIRING SHALL BE ADJUSTED TO UTILIZE ONLY THE EXISTING BRIDGE ENCASED TRAFFIC SIGNAL CONDUITS ON THE NORTH SIDE (WB) OF LEMMON AVE. NEW SIGNAL & ELECTRICAL WIRING SHALL BE PAID SUBSIDIARY TO ITEM 681.
2. EXISTING SIGNAL CONDUCTORS ON THE SOUTH SIDE OF LEMMON AVE. (EB) SHALL BE REMOVED.
3. EXISTING BRIDGE MOUNTED CONDUIT ON THE SOUTH SIDE OF LEMMON SHALL BE CLEANED & REPAIRED, PER ITEM 6027.
4. EXISTING BRIDGE MOUNTED GROUND BOXES SHALL BE REPAIRED AND LIDS REPLACED AS REQUIRED TO PROVIDE A SECURED SEAL AND LIMIT DEBRIS INGRESS, PER ITEM 6027.
5. NEW CONDUIT SHALL BE INSTALLED FROM THE EDGE OF THE BRIDGE DECK TO THE TRAFFIC SIGNAL CONTROLLER ACCORDING TO THE PROPOSED CONDITIONS.
6. INSTALLATION OF THE SOUTH SIDE TRAFFIC SIGNAL ELEMENTS CAN COMMENCE FOLLOWING THE INSTALLATION OF THE SUPPORT INFRASTRUCTURE.

PHASE 2 NOTES:
1. EXISTING TRAFFIC SIGNAL WIRING SHALL BE ADJUSTED TO UTILIZE ONLY THE EXISTING BRIDGE ENCASED TRAFFIC SIGNAL CONDUITS ON THE SOUTH SIDE (EB) OF LEMMON AVE. NEW SIGNAL & ELECTRICAL WIRING SHALL BE PAID SUBSIDIARY TO ITEM 681.
2. EXISTING SIGNAL CONDUCTORS ON THE NORTH SIDE OF LEMMON AVE. (WB) SHALL BE REMOVED.
3. EXISTING BRIDGE MOUNTED CONDUIT ON THE NORTH SIDE OF LEMMON SHALL BE CLEANED & REPAIRED, PER ITEM 6027.
4. EXISTING BRIDGE MOUNTED GROUND BOXES SHALL BE REPAIRED AND LIDS REPLACED AS REQUIRED TO PROVIDE A SECURED SEAL AND LIMIT DEBRIS INGRESS, PER ITEM 6027.
5. NEW CONDUIT SHALL BE INSTALLED FROM THE EDGE OF THE BRIDGE DECK TO THE TRAFFIC SIGNAL CONTROLLER ACCORDING TO THE PROPOSED CONDITIONS.
6. INSTALLATION OF THE NORTH SIDE TRAFFIC SIGNAL ELEMENTS CAN COMMENCE FOLLOWING THE INSTALLATION OF THE SUPPORT INFRASTRUCTURE.

ALTERNATIVE CONSTRUCTION PHASING MAY BE UTILIZED AS APPROVED BY TXDOT & THE CITY OF DALLAS.



TEMPORARY SIGNALS



TEMPORARY SIGNAL LEGEND

- MAST ARM POLE*
- SIGNAL HEAD*
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)*
- SIGNAL MOUNTED SIGNS*
- LUMINAIRE*
- EXIST SIGNAL CONTROLLER * CABINET
- EXIST GROUND BOX*
- EXISTING ELECTRICAL SERVICE*
- CONDUIT*
- 1 SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- E-* EXISTING SIGNAL POLE NUMBER
- T-* TEMPORARY SIGNAL POLE NUMBER
- TEMPORARY PORTABLE SIGNAL

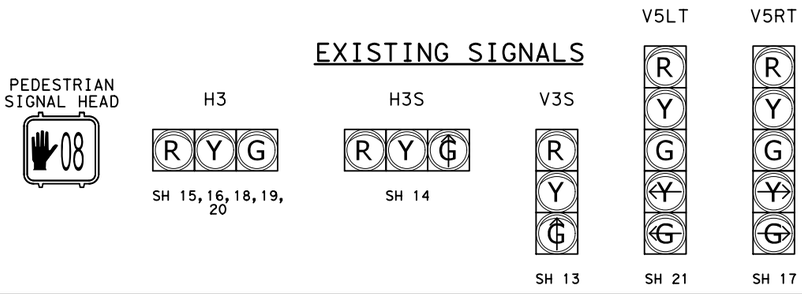
*PROPOSED EQUIPMENT IS SHOWN IN BLACK & EXISTING SHOWN IN GREY

TEMPORARY TRAFFIC SIGNAL

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
510	6003	ONE-WAY TRAF CONT (PORT TRAF SIG)	MO	8
0681	6001	TEMP TRAF SIGNALS	EA	1

EXISTING SIGNS

EXISTING SIGNALS



MATCH LINE SHEET 2

ELIZABETH SHELTON
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LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

TEMPORARY CONDITIONS US 75 AT LEMMON AVE

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	27

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

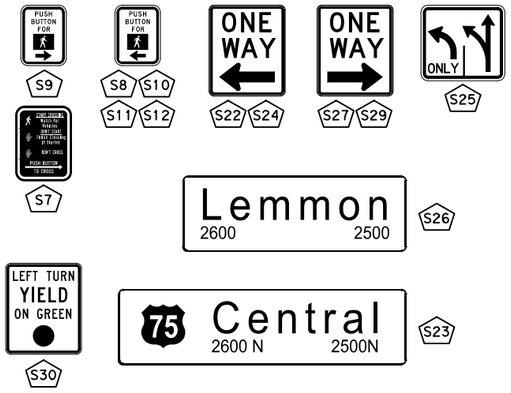
4/25/2024 3:06:45 PM L:\Projects\2023\OTHON\20405238 - 36-910P5004 WA2 (3682 TRFE 10x83) 7 Diamond Signals DAL\Drawings\10TRF\1. US 75 at Lemmon\Dallas District Signals - TEMP Layout 1.dgn

100% SUBMITTAL

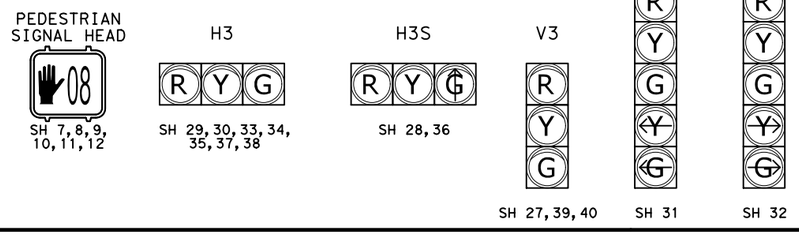
NOTES:
1. SEE NOTES ON SHEET 1 OF 1.

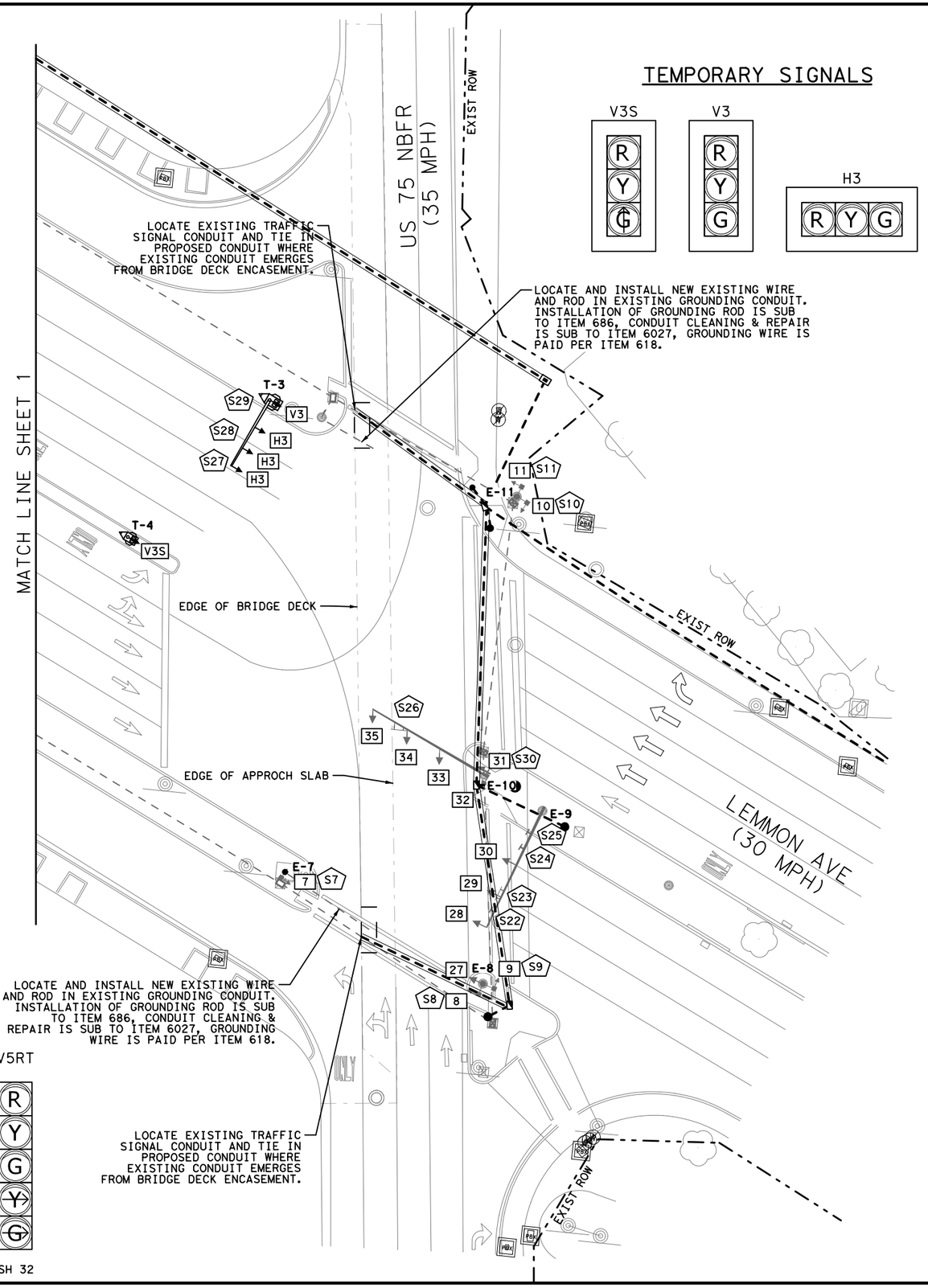
TEMPORARY TRAFFIC SIGNAL				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
510	6003	ONE-WAY TRAF CONT (PORT TRAF SIG)	MO	8
0681	6001	TEMP TRAF SIGNALS	EA	1

EXISTING SIGNS



EXISTING SIGNALS





TEMPORARY SIGNALS

TEMPORARY SIGNAL LEGEND

- MAST ARM POLE*
- SIGNAL HEAD*
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)*
- SIGNAL MOUNTED SIGNS*
- LUMINAIRE*
- EXIST SIGNAL CONTROLLER * CABINET
- EXIST GROUND BOX*
- EXISTING ELECTRICAL SERVICE*
- CONDUIT*
- 1 SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- E-# EXISTING SIGNAL POLE NUMBER
- T-# TEMPORARY SIGNAL POLE NUMBER
- TEMPORARY PORTABLE SIGNAL

*PROPOSED EQUIPMENT IS SHOWN IN BLACK & EXISTING SHOWN IN GREY

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024
Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

TEMPORARY CONDITIONS
US 75 AT LEMMON AVE

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		28
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

4/25/2024 3:06:47 PM L:\Projects\2023\OTHON\20405232B - 36-910P5004 WA2 (368) TRE (10x43) 7 Diamond Signals DAL\Drawings\10TRF\1. US 75 at Lemmon\Dallas District Signals - TEMP Layout 2.dgn

100% SUBMITTAL

INSTALL ELECTRICAL SERVICE ES-01
TY D (120/240)070(NS)(SS)(E)PS(U)
(SEE NOTE 4)
ADDRESS:
TBD
DALLAS, TX 75204.

ONCOR POINT OF DELIVERY
(SEE NOTE 4) (ONCOR
POLE 3983146 3608608)

EXIST ROW

US 75 SBFR
(35 MPH)

LEMMON AVE
(30 MPH)

Ø8

Ø6

Ø5

OL A

P-1 P-2 P-3 P-4 P-5 P-6 P-7 P-8

D1 D2

PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINAIRE (250W EQ)
- RADAR VEHICLE DETECTOR (DALLAS)
- VIDEO VEHICLE DETECTOR (RICHARDSON)
- OPTICOM (RICHARDSON)
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE D GROUND BOX
- TYPE 1 ITS GROUND BOX
- ELECTRICAL SERVICE
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- CONDUIT (RMC)
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- (S1) SIGN LABEL
- (D1) VEHICLE DETECTOR LABEL
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

PROPOSED SIGNS

R10-3EL 9"x15" — S1 S3 S5 S6
R10-3ER 9"x15" — S2 S4
R10-3ELR 9"x15" — S39
R6-2L 30"x36" ONE WAY — S17 S19
R6-2R 30"x36" ONE WAY — S22 S23
R3-8LM 36"x30" ONLY — S18 S21
R9-3 18"x18" — S13 S25
R1-2 48"x48"x48" YIELD — S14 S15

S20 Lemmon 2500 2600
S24 75 Central 2600 N 2500N
S16 75 Central 2500 N 2600N

PROPOSED SIGNALS

H3 — SH 14, 15, 17, 18, 19, 22, 23
H3S — SH 13, 21
H5LT — SH 20
COUNTDOWN PEDESTRIAN SIGNAL HEAD — SH 1, 2, 3, 4, 5, 6
V5FYA — SH 16
V3 — SH 24, 25

MATCH LINE SHEET 2

ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED CONDITIONS
US 75 AT LEMMON AVE

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	29

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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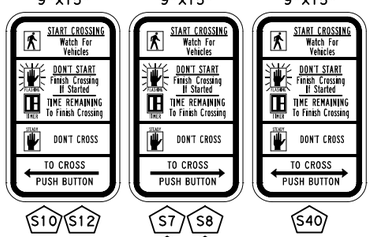
NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF DALLAS TRAFFIC MANAGEMENT CENTER AT (214-670-3095) 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, RADAR DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
4. CONTRACTOR SHALL COORDINATE WITH ONCOR CONCERNING TRAFFIC SIGNAL ELECTRICAL SERVICE. CONTACT ONCOR (ANTHONY F MADRIGAL AT ANTHONY.MADRIGAL2@ONCOR.COM) REGARDING POINT OF DELIVERY AND DISTRIBUTION TO ELECTRICAL PEDESTAL SERVICE. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. THE FOLLOWING ITEMS WILL BE FURNISHED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR: SIGNAL CABINET AND INTERNAL HARDWARE, RADAR AND RADAR CABLE. CONTACT MR. ALFRED LEMON AT 214-670-4812 TO SCHEDULE PICK-UP OF MATERIALS.
6. INSTALL BASE MOUNTED CONTROLLER CABINET (TYPE 332I CABINET) AND FOUNDATION.
7. SIGNAL POLES SHALL BE SHALL BE POWDER COATED TRAFFIC BLACK (RAL 9017).
8. SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BLACK POWDERCOATED ALUMINUM VISORS AND BACK PLATES.
9. RADAR DETECTION ZONES TO BE PROGRAMMED BY THE CITY OF DALLAS. CONTACT SRINIVASA VEERAMALLU, PE. AT 214-670-5892 WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.
10. ALL SIGNAL CABLES SHALL BE WIRED IN ACCORDANCE WITH THE CABINET PREPARATION NOTES SUPPLIED BY THE CITY OF DALLAS.
11. CONTRACTOR SHALL COORDINATE THE TRAFFIC SIGNAL POLE FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED FIRST, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER SO A FIELD MEETING CAN BE SCHEDULED TO DETERMINE IF FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL POLE FOUNDATIONS ARE INSTALLED FIRST, THE CURB RAMPS AND SIDEWALKS SHALL BE MODIFIED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS ARE 10" OR LESS.
12. PROPOSED APS UNITS SHALL BE PLACED ADJACENT TO A LEVEL LANDING AREA (2% MAX IN ANY DIRECTION). IF THE DISTANCE FROM THE PUSH BUTTON TO THE EDGE OF ACCESSIBLE PATH EXCEEDS 10", THE CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON EXTENDER TO MAKE THE REACH 10" OR LESS. MEASUREMENT AND PAYMENT SHALL BE CONSIDERED SUBSIDIARY TO THE INSTALLATION OF THE TRAFFIC SIGNAL EQUIPMENT.
13. 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.
14. PROPOSED CURB RAMP LANDING SHALL BE POURED UP TO THE SIGNAL FOUNDATION LEAVING NO GAPS.
15. CONTRACTOR TO MAINTAIN FULL ACCESS TO A MINIMUM OF TWO PEDESTRIAN CROSSINGS AT ALL TIMES DURING CONSTRUCTION.
16. CCTV AND CABLING SHALL BE PROVIDED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR. INSTALLATION SHALL BE PAID UNDER ITEM 680.
17. THE CONTRACTOR SHALL VERIFY LOCATIONS OF THE DRILL SHAFT PLACED ALONG US-75 BETWEEN THE MAIN LANES AND THE FRONTAGE ROAD. THE BORE MUST BE 8' BELOW THE MAIN LANES OF US-75
18. CONNECT RUN 40 TO NEAREST GROUND BOX AT THE LEMMON AVE AT WASHINGTON AVE INTERSECTION. CONTRACTOR TO CONFIRM ANY UTILITY CONFLICTS PRIOR TO INSTALLATION.

PROPOSED SIGNS

R10-3EL 9"x15" — R10-3ER 9"x15" — R10-3ELR 9"x15"



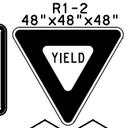
S10 S12 — S7 S8 S9 S11 — S40

R6-2L 30"x36" — R6-2R 30"x36"

S27 S28 — S32 S33

R9-3 18"x18" — S35 S36

R1-2 48"x48"x48"



S37 S38

R3-8LM 36"x30" — S29 S31

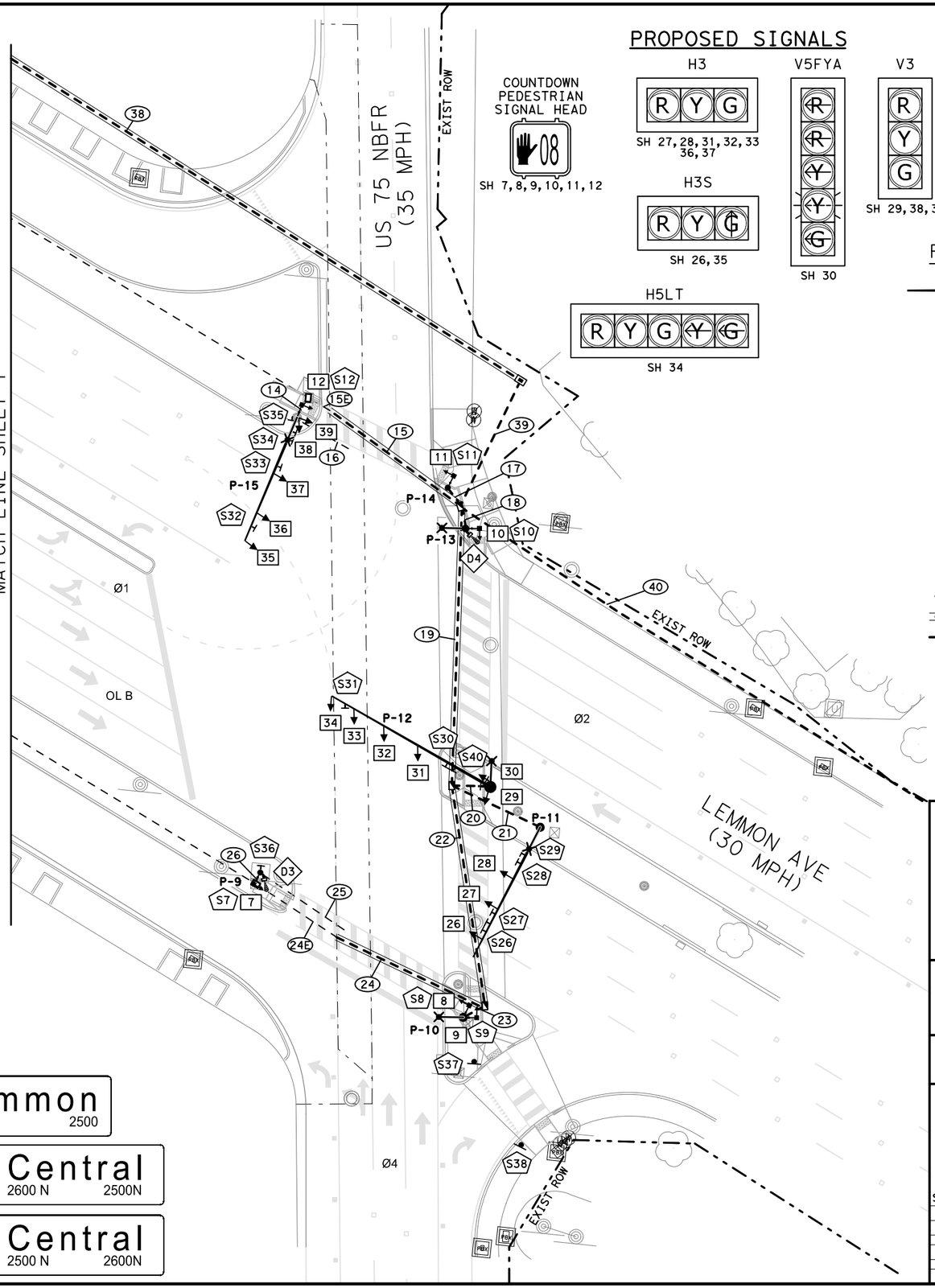
R3-8LM 36"x30"

S34

S30 Lemmon 2600 2500

S26 75 Central 2600 N 2500N

S34 75 Central 2500 N 2600N



PROPOSED SIGNALS

COUNTDOWN PEDESTRIAN SIGNAL HEAD — SH 7, 8, 9, 10, 11, 12

H3 — SH 27, 28, 31, 32, 33, 36, 37

H3S — SH 26, 35

H5LT — SH 34

V5FYA — SH 30

V3 — SH 29, 38, 39

N

PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINAIRE (250W EQ)
- RADAR VEHICLE DETECTOR (DALLAS)
- VIDEO VEHICLE DETECTOR (RICHARDSON)
- OPTICOM (RICHARDSON)
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE D GROUND BOX
- TYPE 1 ITS GROUND BOX
- ELECTRICAL SERVICE
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- CONDUIT (RMC)
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- D1 VEHICLE DETECTOR LABEL
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED CONDITIONS
US 75 AT LEMMON AVE

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	30

STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.

CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT: ITEM 618 2" PVC (RISER) QTY	2" PVC (RISER) LF	2" PVC (TRENCH) QTY	2" PVC (TRENCH) LF	2" PVC (BORED) QTY	2" PVC (BORED) LF	3" PVC (TRENCH) QTY	3" PVC (TRENCH) LF	3" PVC (BORED) QTY	3" PVC (BORED) LF	4" PVC (TRENCH) QTY	4" PVC (TRENCH) LEN	4" PVC (BORED) QTY	4" PVC (BORED) LF	ITEM 6027 PREPARE (CONDUIT) QTY	ITEM 6027 PREPARE (CONDUIT) LEN	CABLE STATUS	CONDUCTORS: ITEM 620 ELECTRICAL CONDUCTORS NO. 2 XHHW WIRE QTY	NO. 2 XHHW WIRE LEN	NO. 2 BARE WIRE QTY	NO. 2 BARE WIRE LF	NO. 6 BARE WIRE QTY	NO. 6 BARE WIRE LF	NO. 8 XHHW WIRE QTY	NO. 8 XHHW WIRE LF	NO. 12 XHHW WIRE QTY	NO. 12 XHHW WIRE LF	ITEM 684 TRAFFIC SIGNAL CABLES TY C 2 CNDR NO. 12 QTY	TY C 2 CNDR NO. 12 LF	TY A 5 CNDR NO. 14 QTY	TY A 5 CNDR NO. 14 LF	TY A 7 CNDR NO. 14 QTY	TY A 7 CNDR NO. 14 LF	TY A 10 CNDR NO. 14 QTY	TY A 10 CNDR NO. 14 LF	TY A 20 CNDR NO. 14 QTY	TY A 20 CNDR NO. 14 LF	CITY PROVIDED EQUIPMENT CCTV** QTY	CCTV** LF	RADAR COMM CABLE** QTY	RADAR COMM CABLE** LF	TOTAL LENGTH OF RUN	RUN NO
O*	I	1	10	1	10													I	ELECTRICAL CONDUCTORS TO BE INSTALLED BY ONCOR FROM THE POINT OF DELIVERY TO THE METER																										20	O*
1	I			1	20													I	2	40	1	25	1	20	4	80																						20	1
2	I			1	55													I	2	120	1	60	1	60	4	240																						55	2
3	I					1	80											I	2	170	1	85	1	85	4	340																						80	3
4	I					1	175											I	2	360	1	180	1	180	4	720																						175	4
5	I			1	125													I	2	260	1	130	1	130	4	520																						125	5
	I							1	125									I	FUTURE COMMUNICATION CONDUIT																										125	
6	I			1	40													I	2	90	1	45	1	45	4	180																						40	6
	I							1	40									I	FUTURE COMMUNICATION CONDUIT																										40	
7	I											1	10					I					1	15														6	90	1	15	4	60	10	7
	I											1	10					I					1	15					14	210					9	135							10	
	I							2	20									I	FUTURE COMMUNICATION CONDUIT																										10	
	I			1	10													I	2	30	1	15	1	15																						10	
8	I															1	65	I					1	70														3	210	1	70	2	140	65	8
	I															1	65	I					1	70	4	280			7	490					5	350							65	
	I									2	130							I	FUTURE COMMUNICATION CONDUIT																										65	
9	I							1	10									I					1	15	4	60			1	15					1	15							10	9
10	I							1	10									I					1	15					1	15					1	15							10	10
11	I					2	110											I					1	60					1	60					1	60					1	60	55	11
11E	I															2	250	I					1	130					1	130					1	130					1	130	125	11E
12	I															1	50	I					1	55																			50	12
13	I															1	35	I					1	40					1	40					1	40					1	40	35	13
14	I															1	10	I					1	15	4	60			1	15							1	15					10	14
15E	I															2	30	I					1	20	4	80			1	20							1	20					15	15E
15	I									1	55							I					1	60	4	240			1	60							1	60					55	15
16	I															1	25	I					1	30																			25	16
17	I							1	10									I					1	15					1	15					1	15							10	17
18	I							1	10									I					1	15	4	60			1	15											1	15	10	18
19	I															1	95	I					1	100	2	200			4	400					2	200	1	100			1	100	95	19
	I									1	95							I	FUTURE COMMUNICATION CONDUIT																										95	
20	I							1	15									I					1	20	4	80			1	20							1	20					15	20
21	I							1	35									I					1	40	4	160											1	40					35	21
22	I															1	75	I					1	80	2	160			3	240					2	160					1	80	75	22
	I									1	75							I	FUTURE COMMUNICATION CONDUIT																										75	
23	I							1	10									I					1	15	4	60			2	30					1	15							10	23
24	I					2	110											I					1	60					1	60					1	60					1	60	55	24
24E	I															2	70	I					1	40					1	40					1	40					1	40	35	24E
25	I															1	35	I					1	40																			35	25
26	I															1	10	I					1	15					1	15					1	15					1	15	10	26
27	I															1	10	I					1	15	4	60			1	15							1	15					10	27
28	I					2	90											I					1	50	2	100			1	50							1	50					45	28
28E	I															2	70	I					1	40	2	80			1	40							1	40					35	28E
29	I															1	45	I					1	50																			45	29
30	I							1	20									I					1	25					2	50					2	40							20	30
31	I							1	10									I					1	15					1	15					1	10							10	31
32	I							1	10									I					1	15					1	15					1	10							10	32
33	I													1	100			I					1	105	2	210			3	315					2	200	1	105					100	33
	I									1	100							I	FUTURE COMMUNICATION CONDUIT																										100	
34	I							1	15									I					1	20	4	80			1	20							1	20	1	20	1	20	15	34
35	I							1	30									I					1	35	4	140													1	35			30	35
36	I															1	85	I					1	90	2	180			4	360					2	170	3	270	1	90	1	90	85	36
	I									1	85							I	FUTURE COMMUNICATION CONDUIT																										85	
37	I											1	35					I					1	40	2	80			7	280					4	140	3	120			2	80	35	37
	I											1	35					I	FUTURE COMMUNICATION CONDUIT																										35	
38	I															1	480	I					1	485	2	970			7	3395					4	1920	3	1455			2	970	480	38
	I															1	480	I	FUTURE COMMUNICATION CONDUIT																										480	
39	I											1	50					I					1	55	2	110			7	385					4	200	3	165			2	110	50	39
	I											1	50					I	FUTURE COMMUNICATION CONDUIT																										50	
40	I							1	520									I	FUTURE COMMUNICATION CONDUIT																										520	40
SUBTOTAL		10		260		565		890		540		190		1445		640			1070		540		2625		5530				6830					3955		2830		195		2010			
P-1	P																	P												5		10									15		P-1
P-2	P																	P												5		10											P-2
P-3	P																	P												5		10											P-3
P-4	P																	P											80		150												P-4
P-5	P																	P											80	5	180	105						20		60			P-5
P-6	P																	P												5	10												P-6
P-7	P																	P												5	10												P-7
P-8	P																	P											80	5	195												P-8
P-9	P																	P												5	10										15		P-9
P-10	P																	P												10	20												P-10
P-11	P																	P											80		155												P-11
P-12	P																	P											80	5	200	105											P-12
P-13	P																	P												5	10										15		P-13
P-14	P																	P												5	10												P-14
P-15	P																	P											80	5	205												P-15
SUBTOTAL																													480	70	1185	210						20		105			
TOTAL		10		260		565		890		540		190		1445		640			1070		540		2625		5530				480	6900	1185	210		3955		2830		215		2115			

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

P-# - REFERS TO THE WIRING INSIDE THE SIGNAL POLE AND MAST ARM.

*- THE CONTRACTOR SHALL INSTALL A 2" PVC CONDUIT FROM THE POINT OF DELIVERY TO THE PEDESTAL METER.

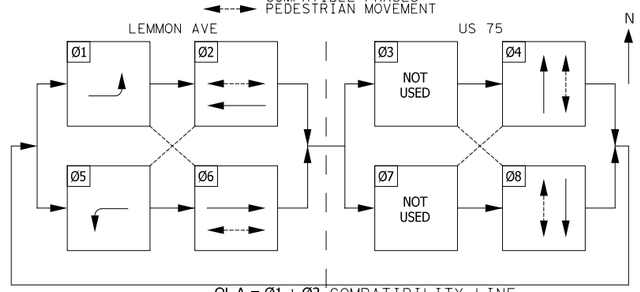
**- CABLE PROVIDED BY THE CITY AND INSTALLED BY THE CONTRACTOR

ELECTRICAL SERVICE DATA

ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED(5)-14)	SERVICE CONDUIT SIZE (PVC)**	SERVICE CONDUCTORS NO. / SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE / AMP	TWO-POLE CONTACTOR AMPS	PANELBD. / LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE / AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-1	TY D (120/240) 070 (NS) SS (E) PS (U)	2"	3 / #4	N/A	2P / 70	30	100	T.S.	1P / 30	24	<7.1
								LIGHTING	2P / 15	4	
								LIGHTING	2P / 15	4	

** - VERIFY SERVICE CONDUIT SIZE WITH UTILITY. SIZE MAY CHANGE DUE TO THE UTILITY METER REQUIREMENTS. ENSURE CONDUIT SIZE MEETS THE NATIONAL ELECTRICAL CODE.

PHASE SEQUENCE



STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

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DIAMOND SIGNALS

PROPOSED TABLES US 75 AT LEMMON AVE

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	31

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

L:\Projects\2023\OTHON\204052328 - 36-91DP5004 MA2 (3682 TRFE 10x#3) 7 Diamond Signals DAL\Drawings\10TRF\1, US 75 at Lemmon\Dallas District Signals - Proposed Tables 1.dgn

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CABLE TERMINATION CHART

CNDR. NO.	CONDUCTOR COLOR	CABLE 1 10 CNDR. FROM P-1 TO CNTRL.	CABLE 2 10 CNDR. FROM P-2 TO CNTRL.	CABLE 3 10 CNDR. FROM P-3 TO CNTRL.	CABLE 4 20 CNDR. FROM P-4 TO CNTRL.	CABLE 5 20 CNDR. FROM P-5 TO CNTRL.	CABLE 6 10 CNDR. FROM P-6 TO CNTRL.	CABLE 7 10 CNDR. FROM P-7 TO CNTRL.	CABLE 8 20 CNDR. FROM P-8 TO CNTRL.	CABLE 9 10 CNDR. FROM P-9 TO CNTRL.	CABLE 10 10 CNDR. FROM P-10 TO CNTRL.	CABLE 11 20 CNDR. FROM P-11 TO CNTRL.	CABLE 12 20 CNDR. FROM P-12 TO CNTRL.	CABLE 9 10 CNDR. FROM P-13 TO CNTRL.	CABLE 10 10 CNDR. FROM P-14 TO CNTRL.	CABLE 12 20 CNDR. FROM P-15 TO CNTRL.
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON
3	RED	SPARE	SPARE	SPARE	SH 13,14,15 OLA R	SH 17,18,19,20 PH 8 R	SPARE	SPARE	SH 21,22,23,25 PH 6 R	SPARE	SPARE	SH 26,27,28 OLB R	SH 29,31,32,33,34 PH 4 R	SPARE	SPARE	SH 35,36,37,39 PH 2 R
4	GREEN	SPARE	SPARE	SPARE	SH 13,14,15 OLA G	SH 17,18,19,20 PH 8 G + G (LT ARW)	SPARE	SPARE	SH 21,22,23,25 PH 6 G	SPARE	SPARE	SH 26,27,28 OLB G	SH 29,31,32,33,34 PH 4 G + G (LT ARW)	SPARE	SPARE	SH 35,36,37,39 PH 2 G
5	ORANGE	SPARE	SPARE	SPARE	SH 13,14,15 OLA Y	SH 17,18,19,20 PH 8 Y + Y (LT ARW)	SPARE	SPARE	SH 21,22,23,25 PH 6 Y	SPARE	SPARE	SH 26,27,28 OLB Y	SH 29,31,32,33,34 PH 4 Y + Y (LT ARW)	SPARE	SPARE	SH 35,36,37,39 PH 2 Y
6	BLUE	SH 1 OLA DW	SH 2 PH 6 DW	SH 3 PH 8 DW	SPARE	SPARE	SH 4 PH 8 DW	SH 5 PH 6 DW	SH 6 PH 6 DW	SH 7 OLB DW	SH 8 OLB DW	SPARE	SPARE	SH 10 PH 4 DW	SH 11 PH 2 DW	SPARE
7	WHITE/BLACK	SH 1 OLA W	SH 2 PH 6 W	SH 3 PH 8 W	SPARE	SPARE	SH 4 PH 8 W	SH 5 PH 6 W	SH 6 PH 6 W	SH 7 OLB W	SH 8 OLB W	SPARE	SPARE	SH 10 PH 4 W	SH 11 PH 2 W	SPARE
8	RED/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
9	GREEN/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SH 9 PH 4 DW	SPARE	SPARE	SPARE	SPARE	SPARE
10	ORANGE/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SH 9 PH 4 W	SPARE	SPARE	SPARE	SPARE	SPARE
11	BLUE/BLACK				SPARE	SPARE			SH 24 PH 8 R			SPARE	SPARE			SH 38 PH 4 R
12	BLACK/WHITE				SPARE	SPARE			SH 24 PH 8 G			SPARE	SPARE			SH 38 PH 4 G
13	RED/WHITE				SPARE	SH 16 PH 5 R (LT ARW)			SH 24 PH 8 Y			SPARE	SH 30 PH 1 R (LT ARW)			SH 38 PH 4 Y
14	GREEN/WHITE				SPARE	SH 16 PH 5 G (LT ARW)			SPARE			SPARE	SH 30 PH 1 G (LT ARW)			SPARE
15	BLUE/WHITE				SPARE	SH 16 PH 5 Y (LT ARW)			SPARE			SPARE	SH 30 PH 1 Y (LT ARW)			SPARE
16	BLACK/RED				SPARE	SPARE			SPARE			SPARE	SPARE			SPARE
17	WHITE/RED				SPARE	SPARE			SPARE			SPARE	SPARE			SPARE
18	ORANGE/RED				SPARE	SPARE			SPARE			SPARE	SPARE			SPARE
19	BLUE/RED				SPARE	SH 16 PH 5 FY (LT ARW)			SPARE			SPARE	SH 30 PH 1 FY (LT ARW)			SPARE
20	RED/GREEN				SPARE	SPARE			SPARE			SPARE	SPARE			SPARE

NOTE: HOME RUN 2 CNDR TO ALL POLES WITH APS BUTTONS

ITEM 6292 RADAR DETECTION ZONE DETAILS

RADAR PANEL NUMBER	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATIONS	ZONES (S)	SETBACK DISTANCE
D1	P-1	18'	STOP BAR	SB	N/A
D2	P-5	18'	STOP BAR	EB	N/A
D3	P-9	18'	STOP BAR	NB	N/A
D4	P-13	18'	STOP BAR	WB	N/A

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
P-1	OL-A	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT LEMMON AVE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-2	OL-A	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT LEMMON AVE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-7	Phase 6	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT LEMMON AVE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-8	Phase 6	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT LEMMON AVE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	WAIT
P-3	Phase 8	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS LEMMON AVE AT US-75 SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-6	Phase 8	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS LEMMON AVE AT US-75 SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
P-14	Phase 2	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 NBFR AT LEMMON AVE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-15	Phase 2	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 NBFR AT LEMMON AVE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-10	Phase 4	BUTTON PUSH ON DW	WAIT TO CROSS LEMMON AVE AT US-75 NBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS LEMMON AVE AT US-75 NBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	LEMMON AVE, WALK SIGN IS ON TO CROSS LEMMON AVE
P-13	Phase 4	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS LEMMON AVE AT US-75 NBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-9	OL-B	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 NBFR AT LEMMON AVE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-10	OL-B	BUTTON PUSH ON DW	WAIT TO CROSS US-75 NBFR AT LEMMON AVE
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 NBFR AT LEMMON AVE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	US-75 NBFR, WALK SIGN IS ON TO CROSS US-75 NBFR

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED TABLES
US 75 AT LEMMON AVE

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	32

STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.

CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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SIGNS SUMMARY

SIGN *	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R10-3EL	APS PUSH BUTTON	I	P-1	9" x 15"
S2	R10-3ER	APS PUSH BUTTON	I	P-2	9" x 15"
S3	R10-3EL	APS PUSH BUTTON	I	P-3	9" x 15"
S4	R10-3ER	APS PUSH BUTTON	I	P-6	9" x 15"
S5	R10-3EL	APS PUSH BUTTON	I	P-7	9" x 15"
S6	R10-3EL	APS PUSH BUTTON	I	P-8	9" x 15"
S7	R10-3ER	APS PUSH BUTTON	I	P-9	9" x 15"
S8	R10-3ER	APS PUSH BUTTON	I	P-10	9" x 15"
S9	R10-3ER	APS PUSH BUTTON	I	P-10	9" x 15"
S10	R10-3EL	APS PUSH BUTTON	I	P-13	9" x 15"
S11	R10-3ER	APS PUSH BUTTON	I	P-14	9" x 15"
S12	R10-3EL	APS PUSH BUTTON	I	P-15	9" x 15"
S13	R9-3	NO PEDESTRIAN CROSSINGS	I	P-1	18" x 18"
S14	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S15	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S16	D3-1	STREET NAME	I	P-4	24" x VARIES
S17	R6-2L	ONE WAY	I	P-4	30" x 36"
S18	R3-8LM	LANE ASSIGNMENT	I	P-4	36" x 30"
S19	R6-2L	ONE WAY	I	P-4	30" x 36"
S20	D3-1	STREET NAME	I	P-5	24" x VARIES
S21	R3-8LM	LANE ASSIGNMENT	I	P-5	36" x 30"
S22	R6-2R	ONE WAY	I	P-8	30" x 36"
S23	R6-2R	ONE WAY	I	P-8	30" x 36"
S24	D3-1	STREET NAME	I	P-8	24" x VARIES
S25	R9-3	NO PEDESTRIAN CROSSINGS	I	P-8	18" x 18"
S26	D3-1	STREET NAME	I	P-11	24" x VARIES
S27	R6-2L	ONE WAY	I	P-11	30" x 36"
S28	R6-2L	ONE WAY	I	P-11	30" x 36"
S29	R3-8LM	LANE ASSIGNMENT	I	P-11	36" x 30"
S30	D3-1	STREET NAME	I	P-12	24" x VARIES
S31	R3-8LM	LANE ASSIGNMENT	I	P-12	36" x 30"
S32	R6-2R	ONE WAY	I	P-15	30" x 36"
S33	R6-2R	ONE WAY	I	P-15	30" x 36"
S34	D3-1	STREET NAME	I	P-15	24" x VARIES
S35	R9-3	NO PEDESTRIAN CROSSINGS	I	P-15	18" x 18"
S36	R9-3	NO PEDESTRIAN CROSSINGS	I	P-9	18" x 18"
S37	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S38	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S39	R10-3ELR	APS PUSH BUTTON	I	P-5	9" x 15"
S40	R10-3ELR	APS PUSH BUTTON	I	P-12	9" x 15"

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

ITEM 0682 SIGNAL HEADS

SIGNAL HEAD NUMBER	SIGNAL HEAD TYPE	STATUS	12-INCH SIGNAL HEAD UNITS								PED SIG SEC (LED) (COUNTDOWN)
			BACKPLATES		LED SIGNAL LAMPS						
			3 SEC	5 SEC	G	<- G	Y	<- Y	R	<- R	
			EA	EA	EA	EA	EA	EA	EA	EA	EA
1	PED	I									1
2	PED	I									1
3	PED	I									1
4	PED	I									1
5	PED	I									1
6	PED	I									1
7	PED	I									1
8	PED	I									1
9	PED	I									1
10	PED	I									1
11	PED	I									1
12	PED	I									1
13	H3S	I	1			1	1		1		
14	H3	I	1		1		1		1		
15	H3	I	1		1		1		1		
16	V5FYA	I		1		1		2		2	
17	H3	I	1		1		1		1		
18	H3	I	1		1		1		1		
19	H3	I	1		1		1		1		
20	H5LT	I		1	1	1	1	1	1		
21	H3S	I	1			1	1		1		
22	H3	I	1		1		1		1		
23	H3	I	1		1		1		1		
24	V3	I	1		1		1		1		
25	V3	I	1		1		1		1		
26	H3S	I	1			1	1		1		
27	H3	I	1		1		1		1		
28	H3	I	1		1		1		1		
29	V3	I	1		1		1		1		
30	V5FYA	I		1		1		2		2	
31	H3	I	1		1		1		1		
32	H3	I	1		1		1		1		
33	H3	I	1		1		1		1		
34	H5LT	I		1	1	1	1	1	1		
35	H3S	I	1			1	1		1		
36	H3	I	1		1		1		1		
37	H3	I	1		1		1		1		
38	V3	I	1		1		1		1		
39	V3	I	1		1		1		1		
TOTAL (NEW)			23	4	21	8	25	6	25	4	12

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

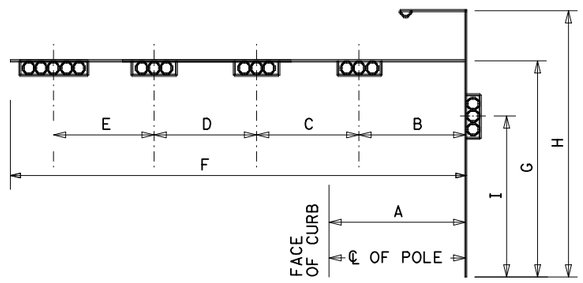
GROUND BOX SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QTY.
624	6010	GROUND BOX TY D (162922)W/APRON	EA	12
6027	6008	GROUND BOX (PREPARE)	EA	4
6186	6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA	4

SIGNAL HEAD AND POLE PLACEMENT (FT)

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	I (FT)	NO. OF HEADS (EA)*	LUM	CITY PROVIDED EQUIPMENT		DRILLED SHAFT LENGTH (LF)				FDN. TYPE WIND ZONE 80 MPH
													CCTV**	RADAR DET.** (EA)	24" DIA SUB TO ITEM	30" DIA ITEM 416	36" DIA TYPE A ITEM 416	48" DIA TYPE A	
P-1	I	EXIST	PEDESTRIAN SIGNAL POLE					15						1					EXIST
P-2	I	5	LUMINAIRE POLE W/ APS						40			Y				8			N/A
P-3	I	5	PEDESTRIAN SIGNAL POLE					15							6				24A
P-4	I	6	18	11	12		44	19	30		3	Y					14		36A
P-5	I	20	28	14	14	9	65	19	30	13	4	Y	1	1				22	48A
P-6	I	9	PEDESTRIAN SIGNAL POLE					15							6				24A
P-7	I	9	PEDESTRIAN SIGNAL POLE					15							6				24A
P-8	I	EXIST	20	11	13		44	19	30	13	3	Y							EXIST
P-9	I	EXIST	PEDESTRIAN SIGNAL POLE					15						1					EXIST
P-10	I	6	LUMINAIRE POLE W/ APS						40			Y				8			N/A
P-11	I	7	19	11	11		48	19	30		3	Y					14		36A
P-12	I	19	27	13	11	9	60	19	30	13	4	Y						22	48A
P-13	I	4	LUMINAIRE POLE W/ APS						40			Y		1		8			N/A
P-14	I	3	PEDESTRIAN SIGNAL POLE					15							6				24A
P-15	I	EXIST	19	15	10		44	19	30	13	3	Y							EXIST
											TOTAL:		1	4	24	24	28	44	

SIGNAL POLE STATUS: I=INSTALL; E=EXISTING; REM=REMOVE; F=INSTALL IN FUTURE PHASE
*- DOES NOT INCLUDE VERTICAL SIDEMOUNT SIGNAL HEADS OR PEDESTRIAN SIGNAL HEADS
**- EQUIPMENT TO BE PROVIDED BY THE CITY AND INSTALLED BY THE CONTRACTOR



STATE OF TEXAS
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OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED TABLES
US 75 AT LEMMON AVE

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		33
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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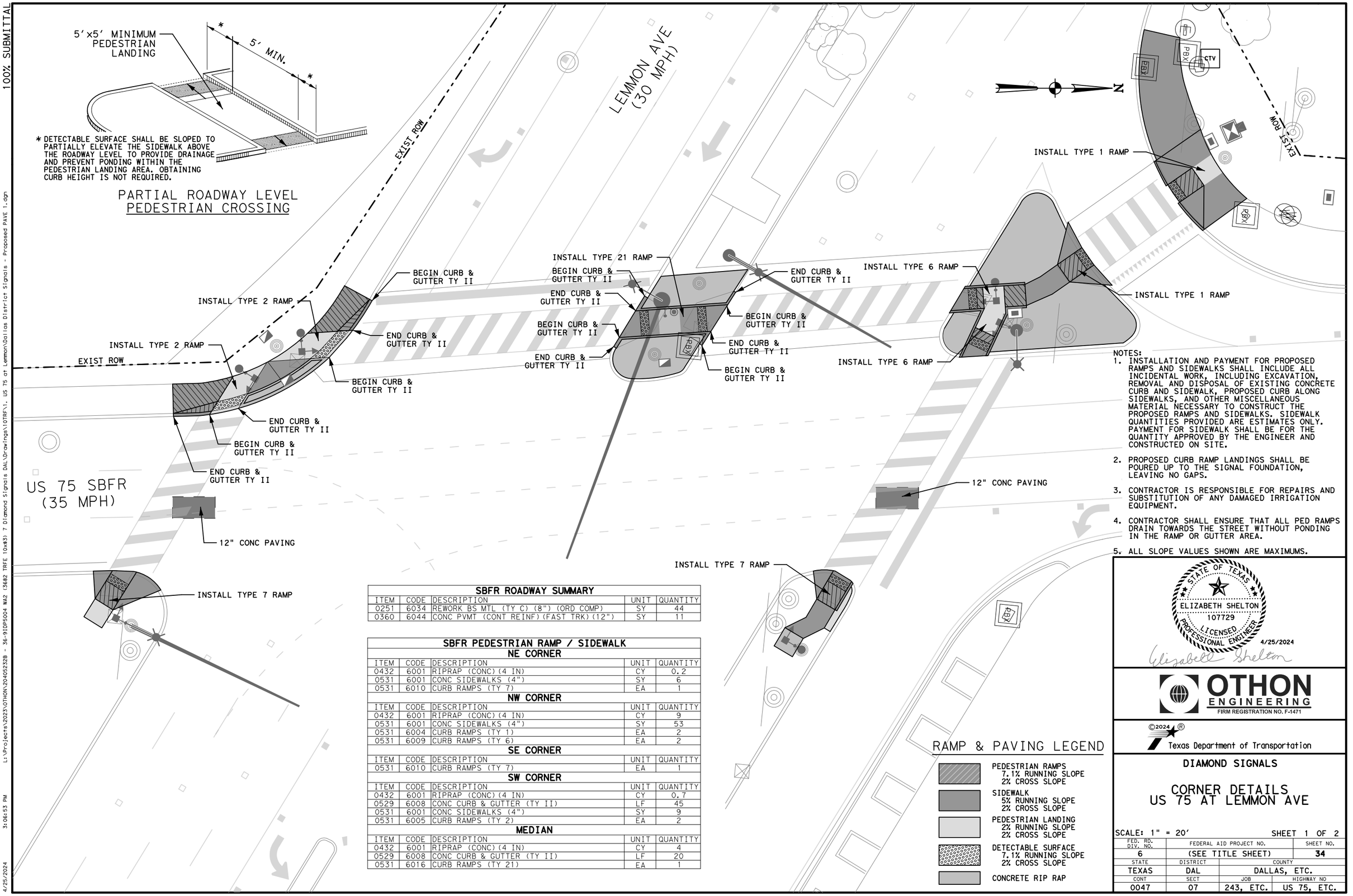
PARTIAL ROADWAY LEVEL
PEDESTRIAN CROSSING



SBFR ROADWAY SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0251	6034	REWORK BS MTL (TY C) (8") (ORD COMP)	SY	44
0360	6044	CONC PVMT (CONT REINF) (FAST TRK) (12")	SY	11

SBFR PEDESTRIAN RAMP / SIDEWALK

NE CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC) (4 IN)	CY	0.2
0531	6001	CONC SIDEWALKS (4")	SY	6
0531	6010	CURB RAMPS (TY 7)	EA	1

NW CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC) (4 IN)	CY	9
0531	6001	CONC SIDEWALKS (4")	SY	53
0531	6004	CURB RAMPS (TY 1)	EA	2
0531	6009	CURB RAMPS (TY 6)	EA	2

SE CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0531	6010	CURB RAMPS (TY 7)	EA	1

SW CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC) (4 IN)	CY	0.7
0529	6008	CONC CURB & GUTTER (TY II)	LF	45
0531	6001	CONC SIDEWALKS (4")	SY	9
0531	6005	CURB RAMPS (TY 2)	EA	2

MEDIAN

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC) (4 IN)	CY	4
0529	6008	CONC CURB & GUTTER (TY II)	LF	20
0531	6016	CURB RAMPS (TY 21)	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. PROPOSED CURB RAMP LANDINGS SHALL BE POURED UP TO THE SIGNAL FOUNDATION, LEAVING NO GAPS.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS AND SUBSTITUTION OF ANY DAMAGED IRRIGATION EQUIPMENT.
4. CONTRACTOR SHALL ENSURE THAT ALL PED RAMPS DRAIN TOWARDS THE STREET WITHOUT PONDING IN THE RAMP OR GUTTER AREA.
5. ALL SLOPE VALUES SHOWN ARE MAXIMUMS.

RAMP & PAVING LEGEND

- PEDESTRIAN RAMPS — 7.1% RUNNING SLOPE, 2% CROSS SLOPE
- SIDEWALK — 5% RUNNING SLOPE, 2% CROSS SLOPE
- PEDESTRIAN LANDING — 2% RUNNING SLOPE, 2% CROSS SLOPE
- DETECTABLE SURFACE — 7.1% RUNNING SLOPE, 2% CROSS SLOPE
- CONCRETE RIP RAP

STATE OF TEXAS
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Elizabeth Shelton

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Texas Department of Transportation

DIAMOND SIGNALS

CORNER DETAILS
US 75 AT LEMMON AVE

SCALE: 1" = 20'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		34
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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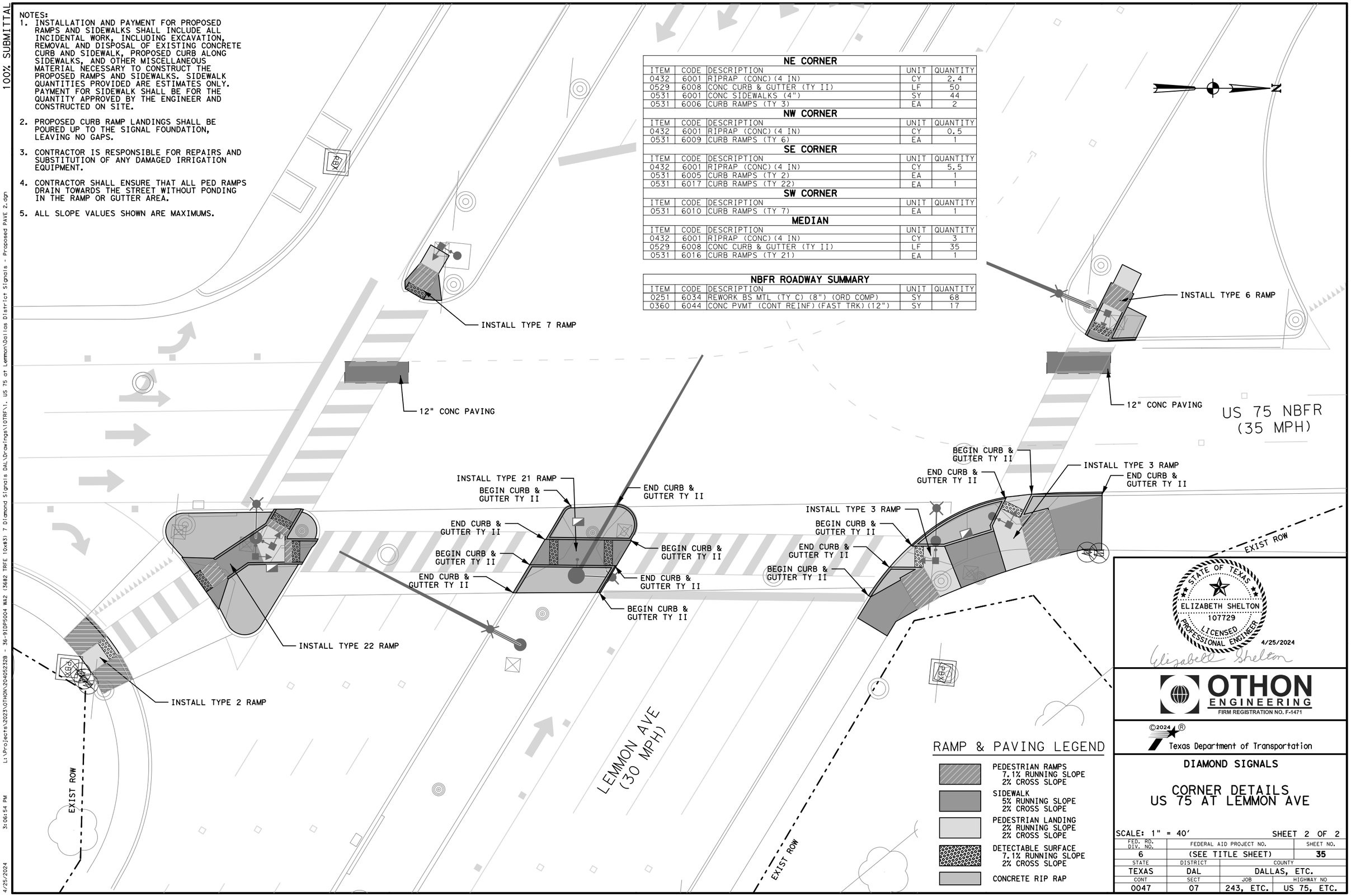
NOTES:
1. INSTALLATION AND PAYMENT FOR PROPOSED RAMPS AND SIDEWALKS SHALL INCLUDE ALL INCIDENTAL WORK, INCLUDING EXCAVATION, REMOVAL AND DISPOSAL OF EXISTING CONCRETE CURB AND SIDEWALK, PROPOSED CURB ALONG SIDEWALKS, AND OTHER MISCELLANEOUS MATERIAL NECESSARY TO CONSTRUCT THE PROPOSED RAMPS AND SIDEWALKS. SIDEWALK QUANTITIES PROVIDED ARE ESTIMATES ONLY. PAYMENT FOR SIDEWALK SHALL BE FOR THE QUANTITY APPROVED BY THE ENGINEER AND CONSTRUCTED ON SITE.
2. PROPOSED CURB RAMP LANDINGS SHALL BE POURED UP TO THE SIGNAL FOUNDATION, LEAVING NO GAPS.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS AND SUBSTITUTION OF ANY DAMAGED IRRIGATION EQUIPMENT.
4. CONTRACTOR SHALL ENSURE THAT ALL PED RAMPS DRAIN TOWARDS THE STREET WITHOUT PONDING IN THE RAMP OR GUTTER AREA.
5. ALL SLOPE VALUES SHOWN ARE MAXIMUMS.

NE CORNER				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	2.4
0529	6008	CONC CURB & GUTTER (TY II)	LF	50
0531	6001	CONC SIDEWALKS (4")	SY	44
0531	6006	CURB RAMPS (TY 3)	EA	2
NW CORNER				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	0.5
0531	6009	CURB RAMPS (TY 6)	EA	1
SE CORNER				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	5.5
0531	6005	CURB RAMPS (TY 2)	EA	1
0531	6017	CURB RAMPS (TY 22)	EA	1
SW CORNER				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0531	6010	CURB RAMPS (TY 7)	EA	1
MEDIAN				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	3
0529	6008	CONC CURB & GUTTER (TY II)	LF	35
0531	6016	CURB RAMPS (TY 21)	EA	1

NBFR ROADWAY SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0251	6034	REWORK BS MTL (TY C) (8") (ORD COMP)	SY	68
0360	6044	CONC PVMT (CONT REINF)(FAST TRK)(12")	SY	17



RAMP & PAVING LEGEND

- PEDESTRIAN RAMPS 7.1% RUNNING SLOPE 2% CROSS SLOPE
- SIDEWALK 5% RUNNING SLOPE 2% CROSS SLOPE
- PEDESTRIAN LANDING 2% RUNNING SLOPE 2% CROSS SLOPE
- DETECTABLE SURFACE 7.1% RUNNING SLOPE 2% CROSS SLOPE
- CONCRETE RIP RAP

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DIAMOND SIGNALS

CORNER DETAILS US 75 AT LEMMON AVE

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		35
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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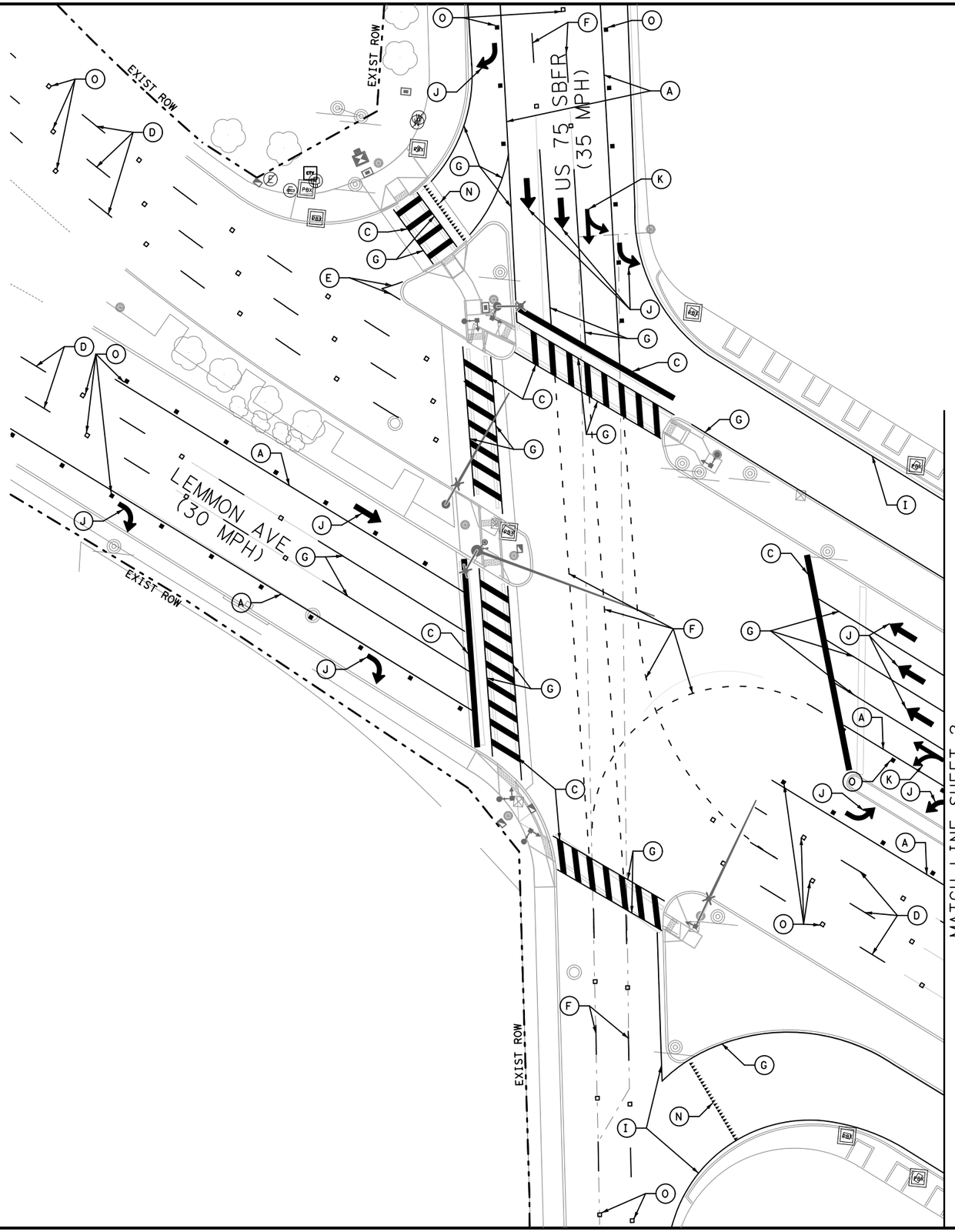
NOTES:
1. REFER TO THE CITY STANDARDS FOR ADDITIONAL INFORMATION REGARDING TYPICAL PAVEMENT MARKING PLACEMENT.
2. LANE WIDTHS SHALL MATCH EXISTING LANES. ALL PROPOSED PAVEMENT MARKINGS SHALL BE TIED TO EXISTING MARKINGS WHERE APPLICABLE TO REFRESH THE INTERSECTION PAVEMENT MARKINGS.
3. CONTRACTOR SHALL APPLY PAVEMENT SEALER IN AREAS WHERE NEW THERMO IS TO BE APPLIED.
4. ALL EXISTING SIGNS AND PAVEMENT MARKINGS TO REMAIN UNLESS OTHERWISE NOTED. ALL PROPOSED SIGNS TO BE PROVIDED BY THE CONTRACTOR.
5. STRIPING CONTRACTOR SHALL CONTACT COD TRANSPORTATION OPERATIONS AND TxDOT TRAFFIC SIGNAL OFFICE AT LEAST 24 HOURS IN ADVANCE OF MOBILIZATION. COD STAFF MUST BE PRESENT TO CONFIRM LAYOUT PRIOR TO THE APPLICATION OF ANY PAVEMENT MARKINGS.
6. REFRESH PAVEMENT MARKINGS WITHIN THE INTERSECTION AND 250' FROM STOP BAR.
7. SEE SUMMARY OF PAVEMENT MARKINGS TABLE ON THE PROPOSED QUANTITIES SHEET.



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PAVEMENT MARKING LEGEND

A	REFL PAV MRK TY I (W)8"(SLD)(100MIL)
B	REFL PAV MRK TY I (W)(12")(SLD)(100 MIL)
C	REFL PAV MRK TY I (W)(24")(SLD)(100 MIL)
D	RE PM W/RET REQ TY I (W)(4")(BRK)(100MIL)
E	RE PM W/RET REQ TY I (W)(4")(SLD)(100MIL)
F	RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
G	RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
H	RE PM W/RET REQ TY I (Y)(4")(SLD)(100MIL)
I	RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
J	PREFAB PAV MRK TY C (W)(ARROW)
K	PREFAB PAV MRK TY C (W)(DBL ARROW)
L	PREFAB PAV MRK TY C (W)(UTURN ARROW)
M	PREFAB PAV MRK TY C (W)(WORD)
N	PREFAB PAV MRK TY C (W) (18")(YLD TRI)
O	REFL PAV MRK TY II-C-R
P	REFL PAV MRK TY II-A-A

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DIAMOND SIGNALS

PROPOSED PAVEMENT MARKING US 75 AT LEMMON AVE

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		36
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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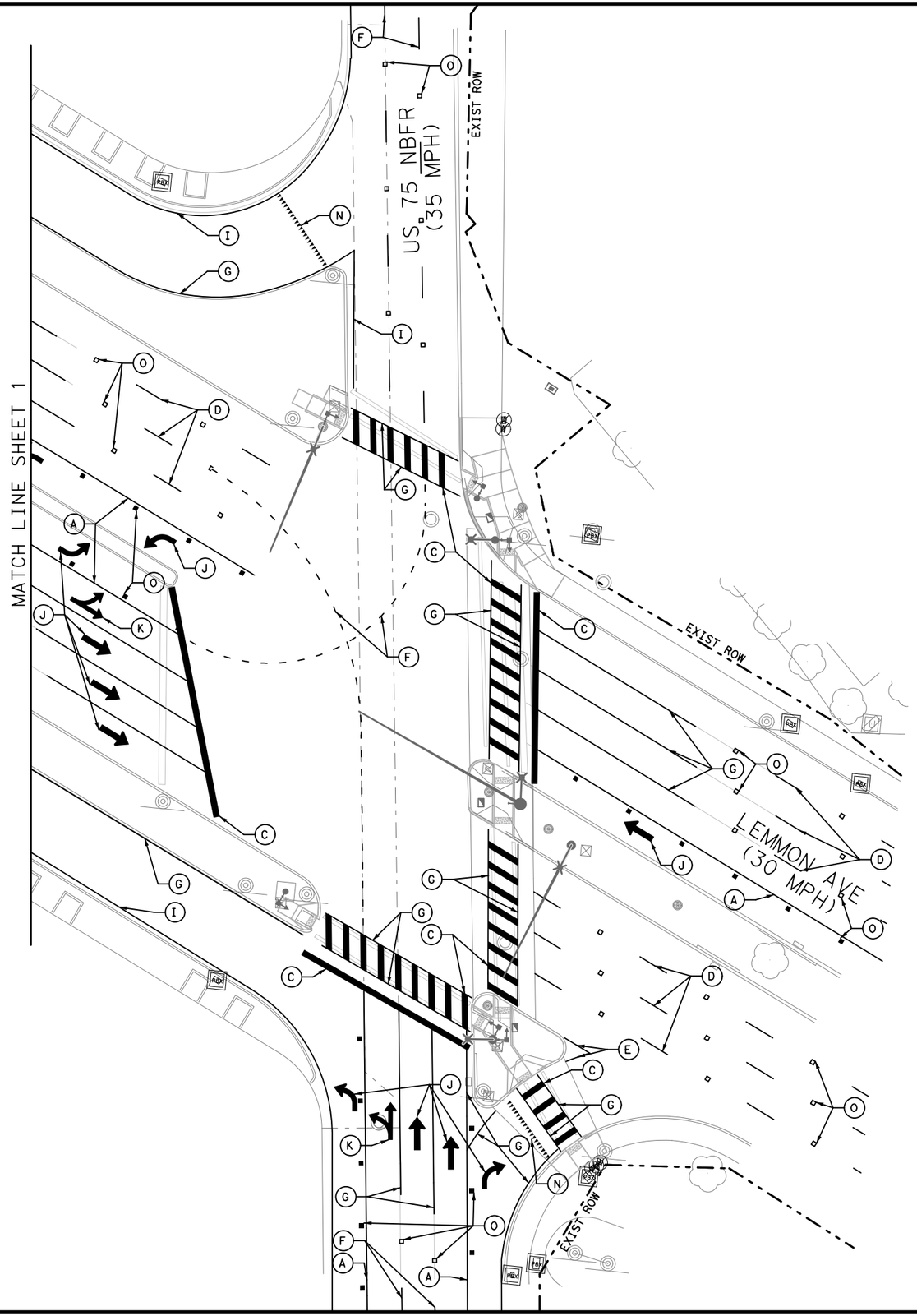
NOTES:
1. REFER TO THE CITY STANDARDS FOR ADDITIONAL INFORMATION REGARDING TYPICAL PAVEMENT MARKING PLACEMENT.
2. LANE WIDTHS SHALL MATCH EXISTING LANES. ALL PROPOSED PAVEMENT MARKINGS SHALL BE TIED TO EXISTING MARKINGS WHERE APPLICABLE TO REFRESH THE INTERSECTION PAVEMENT MARKINGS.
3. CONTRACTOR SHALL APPLY PAVEMENT SEALER IN AREAS WHERE NEW THERMO IS TO BE APPLIED.
4. ALL EXISTING SIGNS AND PAVEMENT MARKINGS TO REMAIN UNLESS OTHERWISE NOTED. ALL PROPOSED SIGNS TO BE PROVIDED BY THE CONTRACTOR.
5. STRIPING CONTRACTOR SHALL CONTACT COD TRANSPORTATION OPERATIONS AND TxDOT TRAFFIC SIGNAL OFFICE AT LEAST 24 HOURS IN ADVANCE OF MOBILIZATION. COD STAFF MUST BE PRESENT TO CONFIRM LAYOUT PRIOR TO THE APPLICATION OF ANY PAVEMENT MARKINGS.
6. REFRESH PAVEMENT MARKINGS WITHIN THE INTERSECTION AND 250' FROM STOP BAR.
7. SEE SUMMARY OF PAVEMENT MARKINGS TABLE ON THE PROPOSED QUANTITIES SHEET.



N

PAVEMENT MARKING LEGEND

- (A) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100 MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100 MIL)
- (D) RE PM W/RET REQ TY I (W)(4")(BRK)(100MIL)
- (E) RE PM W/RET REQ TY I (W)(4")(SLD)(100MIL)
- (F) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (G) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (H) RE PM W/RET REQ TY I (Y)(4")(SLD)(100MIL)
- (I) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (J) PREFAB PAV MRK TY C (W)(ARROW)
- (K) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (L) PREFAB PAV MRK TY C (W)(UTURN ARROW)
- (M) PREFAB PAV MRK TY C (W)(WORD)
- (N) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- (O) REFL PAV MRK TY II-C-R
- (P) REFL PAV MRK TY II-A-A

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED PAVEMENT MARKINGS US 75 AT LEMMON AVE

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		37
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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PAVEMENT MARKING SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1490
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	1308
666	6224	PAVEMENT SEALER 4"	LF	630
666	6225	PAVEMENT SEALER 6"	LF	4165
666	6226	PAVEMENT SEALER 8"	LF	1490
666	6230	PAVEMENT SEALER 24"	LF	1308
666	6231	PAVEMENT SEALER (ARROW)	EA	22
666	6234	PAVEMENT SEALER (DBL ARROW)	EA	4
666	6243	PAVEMENT SEALER (YLD TRI)	EA	84
666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	630
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	580
666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	2460
666	6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	1125
668	6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	22
668	6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	4
668	6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	84
672	6010	REFL PAV MRKR TY II-C-R	EA	196
678	6001	PAV SURF PREP FOR MRK (4")	LF	630
678	6002	PAV SURF PREP FOR MRK (6")	LF	4165
678	6004	PAV SURF PREP FOR MRK (8")	LF	1490
678	6008	PAV SURF PREP FOR MRK (24")	LF	1308
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	22
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	4
678	6022	PAV SURF PREP FOR MRK (18")(YLD TRI)	EA	84
678	6033	PAV SURF PREP FOR MRK (RPM)	EA	196

PEDESTRIAN RAMP / SIDEWALK SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	25.3
0529	6008	CONC CURB & GUTTER (TY II)	LF	150
0531	6001	CONC SIDEWALKS (4")	SY	112
0531	6004	CURB RAMPS (TY 1)	EA	2
0531	6005	CURB RAMPS (TY 2)	EA	3
0531	6006	CURB RAMPS (TY 3)	EA	2
0531	6009	CURB RAMPS (TY 6)	EA	3
0531	6010	CURB RAMPS (TY 7)	EA	3
0531	6012	CURB RAMPS (TY 21)	EA	2
0531	6013	CURB RAMPS (TY 22)	EA	1

ROADWAY SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0251	6034	REWORK BS MTL (TY C) (8") (ORD COMP)	SY	112
0360	6044	CONC PVMT (CONT REINF)(FAST TRK)(12")	SY	28

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Texas Department of Transportation

DIAMOND SIGNALS

PAVING AND PAVEMENT MARKING QUANTITIES US 75 AT LEMMON AVE

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		38
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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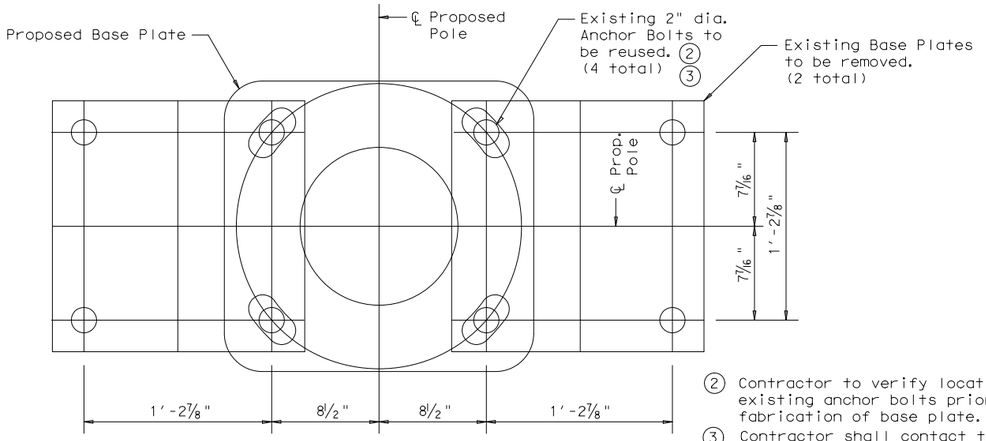
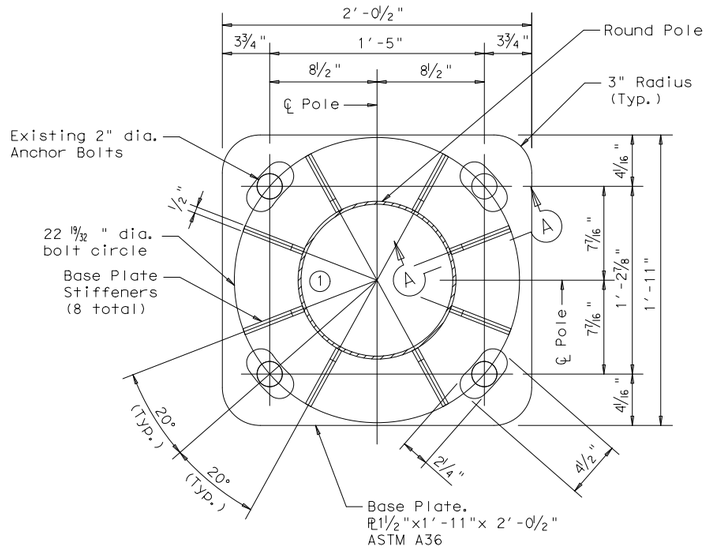


EXISTING ANCHOR BOLT PLAN

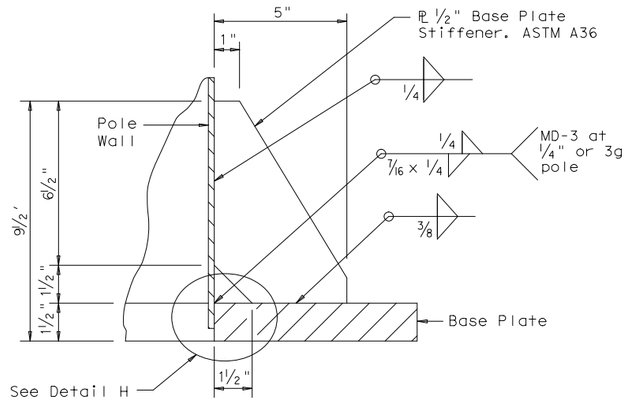
② Contractor to verify location of existing anchor bolts prior to fabrication of base plate.

③ Contractor shall contact the project engineer to complete an inspection of the existing foundation and anchor bolts for damage prior to installing base plate.

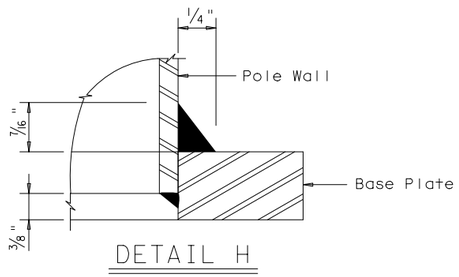


① Diameter of hole in base plate to be 1/16 " greater than the diameter of the pole base.

POLE BASE PLAN



SECTION A-A



DETAIL H

GENERAL NOTES:

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

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

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

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

Steel for the base plate and stiffeners shall conform to ASTM A36 and Item 442, "Metal for Structures".

Each existing anchor bolt to be reused shall have installed (2) new heavy hex nuts conforming to ASTM A194 or A563 and (2)new flat washers conforming to ASTM F436. Nuts and washers shallconform to Item 449, "Anchor Bolts".

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

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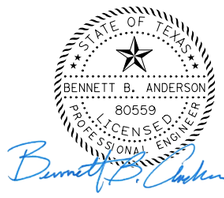

OTHON, INC.
F-1471

04/25/2024 SHEET 1 OF 1

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES SPECIAL BASEPLATE 44' MAST ARM POLE LEMMON AVE

REVISIONS	DN: BA	CK: SH	DW: BA	CK: SH
	CONT	SECT	JOB	HIGHWAY
	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		39

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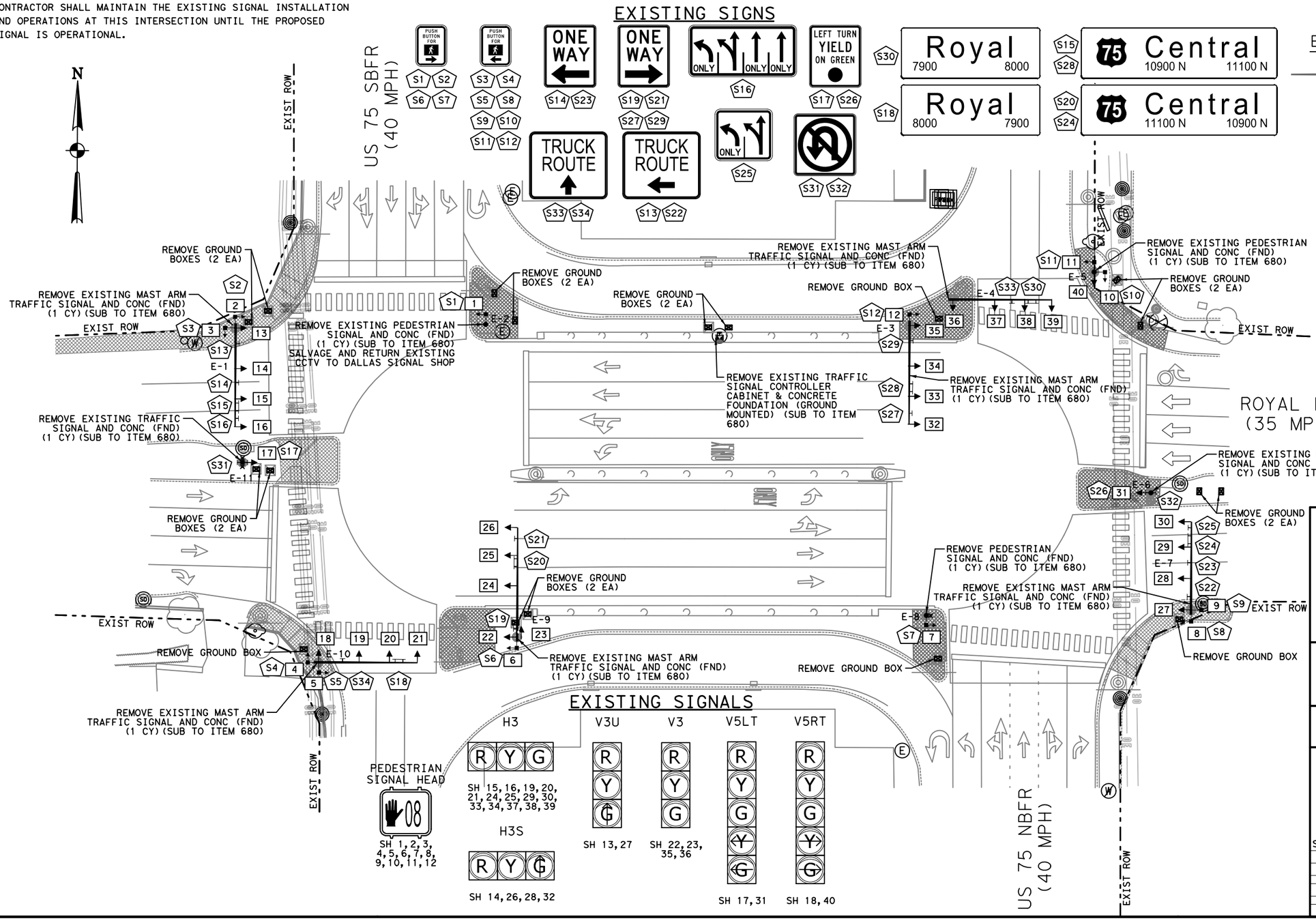
NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
3. CONTRACTOR SHALL MAINTAIN THE EXISTING SIGNAL INSTALLATION AND OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED SIGNAL IS OPERATIONAL.
4. CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AFTER PROPOSED SIGNAL EQUIPMENT IS OPERATIONAL. EXISTING FOUNDATIONS AND GROUND BOXES SHALL BE REMOVED, SIGNAL POLE FOUNDATIONS SHALL BE REMOVED TO A MINIMUM OF 2' BELOW EXISTING GROUND, AND BACK FILLED WITH SIMILAR MATERIALS IN THE SURROUNDING AREA. SEE GENERAL NOTES AND SPECIFICATIONS FOR MORE INFORMATION.
5. ELIMINATE ALL EXISTING PAVEMENT MARKINGS WITHIN THE INTERSECTION AND ALONG 150' IN EACH DIRECTION FROM STOP BAR. REFER TO PAVEMENT MARKING SHEET FOR ADDITIONAL INFORMATION.
6. EXISTING SIGNS S1-S34 SHALL BE REMOVED WITH TRAFFIC SIGNAL EQUIPMENT.
7. PAVING REMOVAL (CURB, RAMP, PAVERS AND SIDEWALK) SHALL BE SUBSIDIARY TO THE INSTALLATION OF NEW CURB, RAMP, RIPRAP OR CONCRETE SIDEWALK (SEE ITEMS 421 & 531 QTYS AND PROPOSED PEDESTRIAN RAMP AND SIDEWALK LAYOUT).
8. ALL GROUND MOUNTED SIGNS SHALL REMAIN AS INSTALLED UNLESS OTHERWISE NOTED.

REMOVAL SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0624	6028	REMOVE GROUND BOX	EA	17
0677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	590
0677	6002	ELIM EXT PAV MRK & MRKS (6")	LF	2640
0677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	995
0677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	893
0677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	27
0677	6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	10
0677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	15
0677	6036	ELIM EXT PAV MRK & MRKS (UTURN ARROW)	EA	4
0680	6012	REMOVING TRAFFIC SIGNALS (DIAMOND)	EA	1



STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

EXISTING CONDITIONS AND REMOVALS US 75 AT ROYAL LN

SCALE: 1" = 40'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		40
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF DALLAS TRAFFIC MANAGEMENT CENTER AT (214-670-3095) 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, RADAR DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
4. CONTRACTOR SHALL COORDINATE WITH ONCOR CONCERNING TRAFFIC SIGNAL ELECTRICAL SERVICE. CONTACT ONCOR (MATTHEW NORTH AT MATTHEW.NORTH@ONCOR.COM) REGARDING POINT OF DELIVERY AND DISTRIBUTION TO ELECTRICAL PEDESTAL SERVICE. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. THE FOLLOWING ITEMS WILL BE FURNISHED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR: SIGNAL CABINET AND INTERNAL HARDWARE, RADAR AND RADAR CABLE AND ALL PROPOSED SIGNS. CONTACT MR. ALFRED LEMON AT 214-670-4812 TO SCHEDULE PICK-UP OF MATERIALS.
6. INSTALL BASE MOUNTED CONTROLLER CABINET (TYPE 332I CABINET) AND FOUNDATION.
7. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
8. SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BLACK POWDERCOATED ALUMINUM VISORS AND BACK PLATES.
9. RADAR DETECTION ZONES TO BE PROGRAMMED BY THE CITY OF DALLAS. CONTACT SRINIVASA VEERAMALLU, PE. AT 214-670-5892 WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.
10. ALL SIGNAL CABLES SHALL BE WIRED IN ACCORDANCE WITH THE CABINET PREPARATION NOTES SUPPLIED BY THE CITY OF DALLAS.
11. CONTRACTOR SHALL COORDINATE THE TRAFFIC SIGNAL POLE FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED FIRST, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER SO A FIELD MEETING CAN BE SCHEDULED TO DETERMINE IF FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL POLE FOUNDATIONS ARE INSTALLED FIRST, THE CURB RAMPS AND SIDEWALKS SHALL BE MODIFIED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS ARE 10" OR LESS.
12. PROPOSED APS UNITS SHALL BE PLACED ADJACENT TO A LEVEL LANDING AREA (2% MAX IN ANY DIRECTION). IF THE DISTANCE FROM THE PUSH BUTTON TO THE EDGE OF ACCESSIBLE PATH EXCEEDS 10", THE CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON EXTENDER TO MAKE THE REACH 10" OR LESS. MEASUREMENT AND PAYMENT SHALL BE CONSIDERED SUBSIDIARY TO THE INSTALLATION OF THE TRAFFIC SIGNAL EQUIPMENT.
13. 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.
14. PROPOSED CURB RAMP LANDING SHALL BE POURED UP TO THE SIGNAL FOUNDATION LEAVING NO GAPS.
15. CONTRACTOR TO MAINTAIN FULL ACCESS TO A MINIMUM OF TWO PEDESTRIAN CROSSINGS AT ALL TIMES DURING CONSTRUCTION.
16. CCTV AND CABLING SHALL BE PROVIDED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR. INSTALLATION SHALL BE PAID UNDER ITEM 680.

PROPOSED SIGNS

S13 S29 — 75 Central 10900 N 11100 N

S19 S23 — 75 Central 11100 N 10900 N

S32 — Royal 7900 8000

S16 — Royal 8000 7900

R10-3ELR 9"x15"

S35 S36

S3 S5 S9 S11 S12

S1 S2 S4 S6 S7 S8 S10

R6-2L 30"x36"

S14 S15 S24 S25

R6-2R 30"x36"

S20 S21 S27 S28

R3-8LM 36"x30"

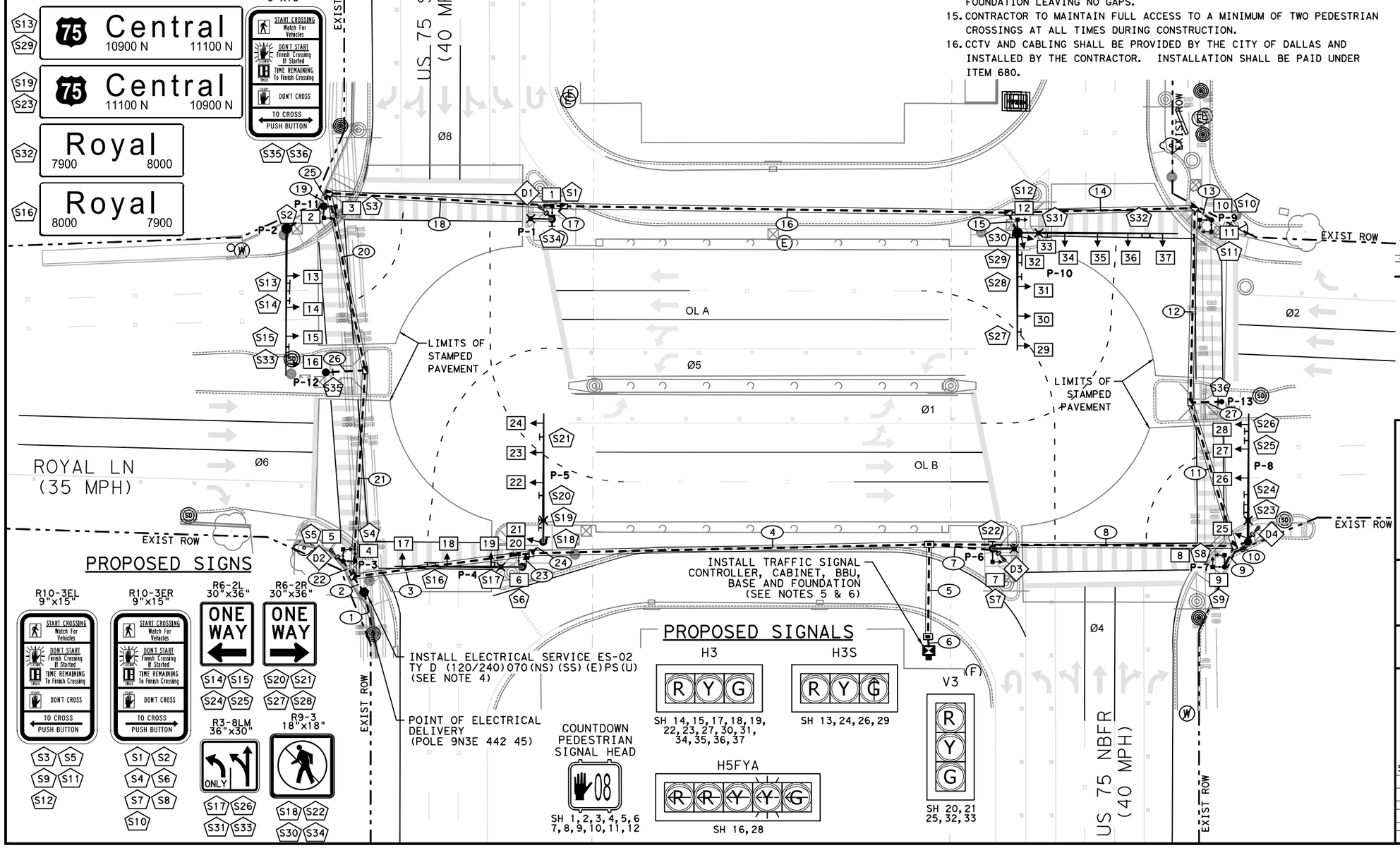
S17 S26 S31 S33

R9-3 18"x18"

S18 S22 S30 S34

PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINAIRE (250W EQ)
- RADAR VEHICLE DETECTOR (DALLAS)
- VIDEO VEHICLE DETECTOR (RICHARDSON)
- OPTICOM (RICHARDSON)
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE D GROUND BOX
- TYPE 1 ITS GROUND BOX
- ELECTRICAL SERVICE
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- CONDUIT (RMC)
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- (S1) SIGN LABEL
- (D1) VEHICLE DETECTOR LABEL
- P-* PROPOSED TRAFFIC SIGNAL POLE NUMBER



PROPOSED SIGNALS

H3

SH 14, 15, 17, 18, 19, 22, 23, 27, 30, 31, 34, 35, 36, 37

H3S

SH 13, 24, 26, 29

V3 (F)

SH 20, 21 25, 32, 33

COUNTDOWN PEDESTRIAN SIGNAL HEAD

SH 1, 2, 3, 4, 5, 6 7, 8, 9, 10, 11, 12

H5FYA

SH 16, 28

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

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DIAMOND SIGNALS

PROPOSED CONDITIONS US 75 AT ROYAL LN

SCALE: 1" = 40'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		41
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT: ITEM 618 (SCH 80) 2" PVC (RISER) QTY	2" PVC (RISER) LF	2" PVC (TRENCHED) QTY	2" PVC (TRENCHED) LF	2" PVC (BORED) QTY	2" PVC (BORED) LF	3" PVC (TRENCHED) QTY	3" PVC (TRENCHED) LF	3" PVC (BORED) QTY	3" PVC (BORED) LF	4" PVC (BORED) QTY	4" PVC (BORED) LF	CABLE STATUS	CONDUCTORS: ITEM 620 ELECTRICAL CONDUCTORS NO. 4 XHHW WIRE QTY	NO. 4 XHHW WIRE LF	NO. 4 BARE WIRE QTY	NO. 4 BARE WIRE LF	NO. 6 BARE WIRE QTY	NO. 6 BARE WIRE LF	NO. 8 XHHW WIRE QTY	NO. 8 XHHW WIRE LF	NO. 12 XHHW WIRE QTY	NO. 12 XHHW WIRE LF	ITEM 684 TRAFFIC SIGNAL CABLES TY C 2 CNDR NO. 12 QTY	TY C 2 CNDR NO. 12 LF	TY A 5 CNDR NO. 14 QTY	TY A 5 CNDR NO. 14 LF	TY A 7 CNDR NO. 14 QTY	TY A 7 CNDR NO. 14 LF	TY A 10 CNDR NO. 14 QTY	TY A 10 CNDR NO. 14 LF	TY A 20 CNDR NO. 14 QTY	TY A 20 CNDR NO. 14 LF	CITY PROVIDED EQUIPMENT CCTV** QTY	CCTV** LF	RADAR COMM CABLE** QTY	RADAR COMM CABLE** LF	TOTAL LENGTH OF RUN	RUN NO
1*	I	1	10	1	20									I	ELECTRICAL CONDUCTORS TO BE INSTALLED BY ONCOR FROM THE POINT OF DELIVERY TO THE METER																								30	1*
2	I			1	10									I	2	30	1	15			4	60																10	2
3	I											1	70	I					1	75					6	450					2	150	1	75			2	150	70	3
	I									1	70			I	FUTURE COMMUNICATION CONDUIT																								70	
	I					1	70							I	2	150	1	75			2	150																	70	
4	I											1	150	I					1	155					7	1085			2	310									150	4
	I											1	150	I					1	155													3	465			2	310	150	
	I									1	150			I	FUTURE COMMUNICATION CONDUIT																								150	
	I					1	150							I	2	310	1	155			2	310																	150	
5	I											1	35	I					1	40					14	560			5	200			1	40	4	160	35	5
	I											1	35	I					1	40													6	240				35	
	I									2	70			I	FUTURE COMMUNICATION CONDUIT																								35	
	I					1	35							I	2	80	1	40																				35	
6	I											1	5	I					1	10					14	140			5	50			1	10	4	40	5	6
	I											1	5	I					1	10													6	60				5	
	I									2	10			I	FUTURE COMMUNICATION CONDUIT																								5	
	I					1	5							I	2	20	1	10																				5	
7	I							1	30					I					1	35	4	140			1	35									1	35	30	7
8	I											1	115	I					1	120					6	720			2	240	3	360	1	120	1	120	115	8
	I											1	30	I					2	70	2	70																30	
	I									1	115			I	FUTURE COMMUNICATION CONDUIT																								115	
9	I							1	10					I					1	15					2	30			1	15							10	9
10	I							1	10					I					1	15	4	60											1	15	1	15	10	10
11	I											1	60	I					1	65	2	130			4	260			1	65	2	130					60	11
	I									1	60			I	FUTURE COMMUNICATION CONDUIT																								60	
12	I											1	75	I					1	80	2	160			3	240					1	80	2	160				75	12
	I									1	75			I	FUTURE COMMUNICATION CONDUIT																								75	
13	I							1	10					I					1	15					2	30			1	15							10	13
14	I											1	70	I					1	75	2	150			1	75							2	150				70	14
	I									1	70			I	FUTURE COMMUNICATION CONDUIT																								70	
15	I							1	10					I					1	15	4	60			1	15							2	30				10	15
16	I											1	170	I					1	175	2	350																170	16
	I									1	170			I	FUTURE COMMUNICATION CONDUIT																								170	
17	I							1	10					I					1	15	4	60			1	15			1	15					1	15	10	17
18	I											1	90	I					1	95					1	95			1	95					1	95	90	18
	I									1	90			I	FUTURE COMMUNICATION CONDUIT																								90	
19	I							1	25					I					1	30					2	60					1	30					25	19
20	I											1	70	I					1	75					3	225			1	75	1	75			1	75	70	20
	I									1	70			I	FUTURE COMMUNICATION CONDUIT																								70	
21	I											1	80	I					1	85					4	340			1	85	1	85			1	85	80	21
	I									1	80			I	FUTURE COMMUNICATION CONDUIT																								80	
22	I							1	10					I					1	15					2	30			1	15					1	15	10	22
23	I							1	10					I					1	15	4	60			1	15							1	15			10	23
24	I							1	10					I					1	15	4	60											1	15			10	24
25	I							1	10					I											2	20											10	25
26	I							1	15					I					1	20					1	15											15	26
27	I							1	15					I					1	20					1	15											15	27
SUBTOTAL		10		30		260		175		1030		1210			590		295		1565		1820			4470			1445		1905		185		1115				
P-1	P													P									90	5	10											P-1	
P-2	P													P											150	80											P-2	
P-3	P													P					1	10					10	20											P-3	
P-4	P													P									40	5	180											P-4	
P-5	P													P									40		185											P-5	
P-6	P													P									90	5	10											P-6	
P-7	P													P										10	20											P-7	
P-8	P													P									40		125	65							20				P-8	
P-9	P													P										10	20											P-9	
P-10 (60')	P													P									40	5											P-10 (60')	
P-10 (44')	P													P																							P-10 (44')	
P-11	P													P										10	20											P-11	
P-12	P													P										5												P-12	
P-13	P													P										5												P-13	
SUBTOTAL																							340	70	740	145						20					
TOTAL		10		30		260		175		1030		1210			590		295		1565		1820		340	4540	740	145	1445		1905		205		1115				

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

P-# - REFERS TO THE WIRING INSIDE THE SIGNAL POLE AND MAST ARM.

*- THE CONTRACTOR SHALL INSTALL A 2" PVC CONDUIT FROM THE POINT OF DELIVERY TO THE PEDESTAL METER.

**- CABLE PROVIDED BY THE CITY AND INSTALLED BY THE CONTRACTOR

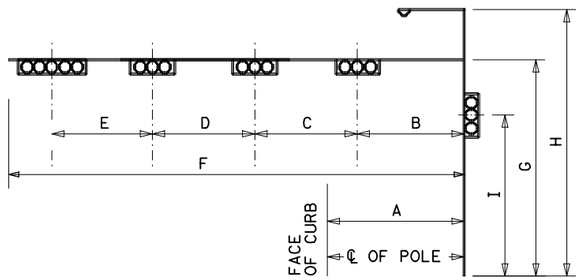
SIGNAL HEAD AND POLE PLACEMENT (FT)

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	I (FT)	NO. OF HEADS (EA)*	LUM	CITY PROVIDED EQUIPMENT CCTV**	CITY PROVIDED EQUIPMENT RADAR DET.** (EA)	DRILLED SHAFT LENGTH (LF) 24" DIA SUB TO ITEM 687	30" DIA ITEM 416	36" DIA TYPE A ITEM 416	48" DIA TYPE A ITEM 416
P-1	I	9	LUMINAIRE POLE W/ APS						40			Y		1		8		
P-2	I	8	18	12	11	11	55	19			4							22
P-3	I	8	PEDESTRIAN SIGNAL POLE					10						1	6			
P-4	I	10	12	17	16		48	19	30	13	3	Y					13	
P-5	I	7	22	11	11		48	19	30	13	3	Y					13	
P-6	I	10	LUMINAIRE POLE W/ APS						40			Y		1		8		
P-7	I	8	PEDESTRIAN SIGNAL POLE					10							6			
P-8	I	8	24	11	11		48	19	30	13	3	Y	1	1			13	
P-9	I	7	PEDESTRIAN SIGNAL POLE					1							6			
P-10	I	10	18	12	12	12	60	19	30	13	4	Y						22
	I	6	20	11	11		44				3							
P-11	I	7	PEDESTRIAN SIGNAL POLE					10							6			
P-12	I	8	PEDESTRIAN SIGNAL POLE												6			
P-13	I	5	PEDESTRIAN SIGNAL POLE												6			
										TOTAL:			1	4	36	16	39	44

SIGNAL POLE STATUS: I=INSTALL; E=EXISTING; REM=REMOVE; F=INSTALL IN FUTURE PHASE

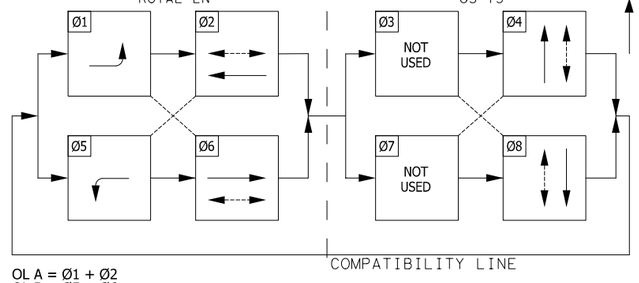
*- DOES NOT INCLUDE VERTICAL SIDEMOUNT SIGNAL HEADS OR PEDESTRIAN SIGNAL HEADS

**- EQUIPMENT TO BE PROVIDED BY THE CITY AND INSTALLED BY THE CONTRACTOR



PHASE SEQUENCE

— — COMPATIBLE PHASES
<--> PEDESTRIAN MOVEMENT



OL A = Ø1 + Ø2
OL B = Ø5 + Ø6

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

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Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED TABLES
US 75 AT ROYAL LN

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	42
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

4/25/2024 3:07:01 PM L:\Projects\2023\OTHON\204052328 - 36-91DP5004 WA2 (3682 TRFE 10x$3) 7 Diamond Signals DAL\Drawings\10TRF\2. US 75 at Royal\Dallas District Signals - Proposed Tables 1.dgn

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CABLE TERMINATION CHART

CNDR. NO.	CONDUCTOR COLOR	CABLE 1 10 CNDR. FROM P-1 TO CNTRL.	CABLE 2 20 CNDR. FROM P-2 TO CNTRL.	CABLE 3 10 CNDR. FROM P-3 TO CNTRL.	CABLE 4 20 CNDR. FROM P-4 TO CNTRL.	CABLE 5 20 CNDR. FROM P-5 TO CNTRL.	CABLE 6 10 CNDR. FROM P-6 TO CNTRL.	CABLE 7 10 CNDR. FROM P-7 TO CNTRL.	CABLE 8 20 CNDR. FROM P-8 TO CNTRL.	CABLE 9 10 CNDR. FROM P-9 TO CNTRL.	CABLE 10 20 CNDR. FROM P-10 TO CNTRL.	CABLE 11 20 CNDR. FROM P-10 TO CNTRL.	CABLE 12 10 CNDR. FROM P-11 TO CNTRL.
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON
3	RED	SPARE	SH 13,14,15 OLA R	SPARE	SH 17,18,19,20 PH 8 R	SH 21,22,23,24 PH 6 R	SPARE	SPARE	SH 25,26,27 OLB R	SPARE	SH 29,30,31,33 PH 2 R	SH 32,34,35,36,37 PH 4 R	SPARE
4	GREEN	SPARE	SH 13,14,15 OLA G	SPARE	SH 17,18,19,20 PH 8 G	SH 21,22,23,24 PH 6 G	SPARE	SPARE	SH 25,26,27 OLB G	SPARE	SH 29,30,31,33 PH 2 G	SH 32,34,35,36,37 PH 4 G	SPARE
5	ORANGE	SPARE	SH 13,14,15 OLA Y	SPARE	SH 17,18,19,20 PH 8 Y	SH 21,22,23,24 PH 6 Y	SPARE	SPARE	SH 25,26,27 OLB Y	SPARE	SH 29,30,31,33 PH 2 Y	SH 32,34,35,36,37 PH 4 Y	SPARE
6	BLUE	SH 1 OLA DW	SPARE	SH 4 PH 8 DW	SH 6 PH 6 DW	SPARE	SH 7 OLB DW	SH 8 OLB DW	SPARE	SH 10 PH 4 DW	SH 12 PH 2 DW	SPARE	SH 2 OLA DW
7	WHITE/BLACK	SH 1 OLA W	SPARE	SH 4 PH 8 W	SH 6 PH 6 W	SPARE	SH 7 OLB W	SH 8 OLB W	SPARE	SH 10 PH 4 W	SH 12 PH 2 W	SPARE	SH 2 OLA W
8	RED/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
9	GREEN/BLACK	SPARE	SPARE	SH 5 PH 6 DW	SPARE	SPARE	SPARE	SH 9 PH 4 DW	SPARE	SH 11 PH 2 DW	SPARE	SPARE	SH 3 PH 8 DW
10	ORANGE/BLACK	SPARE	SPARE	SH 5 PH 6 W	SPARE	SPARE	SPARE	SH 9 PH 4 W	SPARE	SH 11 PH 2 W	SPARE	SPARE	SH 3 PH 8 W
11	BLUE/BLACK		SPARE		SPARE	SPARE			SPARE		SPARE	SPARE	
12	BLACK/WHITE		SPARE		SPARE	SPARE			SPARE		SPARE	SPARE	
13	RED/WHITE		SH 16 PH 5 R (LT ARW)		SPARE	SPARE			SH 28 PH 1 R (LT ARW)		SPARE	SPARE	
14	GREEN/WHITE		SH 16 PH 5 G (LT ARW)		SPARE	SPARE			SH 28 PH 1 G (LT ARW)		SPARE	SPARE	
15	BLUE/WHITE		SH 16 PH 5 Y (LT ARW)		SPARE	SPARE			SH 28 PH 1 Y (LT ARW)		SPARE	SPARE	
16	BLACK/RED		SPARE		SPARE	SPARE			SPARE		SPARE	SPARE	
17	WHITE/RED		SPARE		SPARE	SPARE			SPARE		SPARE	SPARE	
18	ORANGE/RED		SPARE		SPARE	SPARE			SPARE		SPARE	SPARE	
19	BLUE/RED		SH 16 PH 5 FY (LT ARW)		SPARE	SPARE			SH 28 PH 1 FY (LT ARW)		SPARE	SPARE	
20	RED/GREEN		SPARE		SPARE	SPARE			SPARE		SPARE	SPARE	

NOTE: HOME RUN 2 CNDR TO ALL POLES WITH APS BUTTONS

ITEM 6292 RADAR DETECTION ZONE DETAILS

RADAR PANEL NUMBER	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATIONS	ZONES(S)	SETBACK DISTANCE
D1	P-1	18'	STOP BAR	SB	N/A
D2	P-3	18'	STOP BAR	EB	N/A
D3	P-6	18'	STOP BAR	NB	N/A
D4	P-8	18'	STOP BAR	WB	N/A

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
P-9	Phase 2	BUTTON PUSH ON DW	WAIT TO CROSS US-75 NBFR AT ROYAL LN
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 NBFR AT ROYAL LN
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	US-75 NBFR, WALK SIGN IS ON TO CROSS US-75 NBFR
P-10	Phase 2	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 NBFR AT ROYAL LN
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-7	Phase 4	BUTTON PUSH ON DW	WAIT TO CROSS ROYAL LN AT US-75 NBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS ROYAL LN AT US-75 NBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	ROYAL LN, WALK SIGN IS ON TO CROSS ROYAL LN
P-9	Phase 4	BUTTON PUSH ON DW	WAIT TO CROSS ROYAL LN AT US-75 NBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS ROYAL LN AT US-75 NBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	ROYAL LN, WALK SIGN IS ON TO CROSS ROYAL LN
P-6	OL-B	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 NBFR AT ROYAL LN
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-7	OL-B	BUTTON PUSH ON DW	WAIT TO CROSS US-75 NBFR AT ROYAL LN
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 NBFR AT ROYAL LN
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	US-75 NBFR, WALK SIGN IS ON TO CROSS US-75 NBFR
P-1	OL-A	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ROYAL LN
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-11	OL-A	BUTTON PUSH ON DW	WAIT TO CROSS US-75 SBFR AT ROYAL LN
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ROYAL LN
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	US-75 SBFR, WALK SIGN IS ON TO CROSS US-75 SBFR
P-3	Phase 6	BUTTON PUSH ON DW	WAIT TO CROSS US-75 SBFR AT ROYAL LN
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ROYAL LN
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	US-75 SBFR, WALK SIGN IS ON TO CROSS US-75 SBFR
P-4	Phase 6	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ROYAL LN
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	WAIT
P-11	Phase 8	BUTTON PUSH ON DW	WAIT TO CROSS ROYAL LN AT US-75 SBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS ROYAL LN AT US-75 SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	ROYAL LN, WALK SIGN IS ON TO CROSS ROYAL LN
P-3	Phase 8	BUTTON PUSH ON DW	WAIT TO CROSS ROYAL LN AT US-75 SBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS ROYAL LN AT US-75 SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	ROYAL LN, WALK SIGN IS ON TO CROSS ROYAL LN

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED TABLES
US 75 AT ROYAL LN

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	43

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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SIGNS SUMMARY

SIGN #	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION
S1	R10-3ER	APS PUSH BUTTON	I	P-1	9" x 15"
S2	R10-3ER	APS PUSH BUTTON	I	P-11	9" x 15"
S3	R10-3EL	APS PUSH BUTTON	I	P-11	9" x 15"
S4	R10-3ER	APS PUSH BUTTON	I	P-3	9" x 15"
S5	R10-3EL	APS PUSH BUTTON	I	P-3	9" x 15"
S6	R10-3ER	APS PUSH BUTTON	I	P-4	9" x 15"
S7	R10-3ER	APS PUSH BUTTON	I	P-6	9" x 15"
S8	R10-3ER	APS PUSH BUTTON	I	P-7	9" x 15"
S9	R10-3EL	APS PUSH BUTTON	I	P-7	9" x 15"
S10	R10-3ER	APS PUSH BUTTON	I	P-9	9" x 15"
S11	R10-3EL	APS PUSH BUTTON	I	P-9	9" x 15"
S12	R10-3EL	APS PUSH BUTTON	I	P-10	9" x 15"
S13	D3-1	STREET NAME	I	P-2	24" x VARIES
S14	R6-2L	ONE WAY	I	P-2	30" x 36"
S15	R6-2L	ONE WAY	I	P-2	30" x 36"
S16	D3-1	STREET NAME	I	P-4	24" x VARIES
S17	R3-8LM	LANE ASSIGNMENT	I	P-4	36" x 30"
S18	R9-3	NO PED CROSSING	I	P-5	18" x 18"
S19	D3-1	STREET NAME	I	P-5	24" x VARIES
S20	R6-2R	ONE WAY	I	P-5	30" x 36"
S21	R6-2R	ONE WAY	I	P-5	30" x 36"
S22	R9-3	NO PED CROSSING	I	P-6	18" x 18"
S23	D3-1	STREET NAME	I	P-8	24" x VARIES
S24	R6-2L	ONE WAY	I	P-8	30" x 36"
S25	R6-2L	ONE WAY	I	P-8	30" x 36"
S26	R3-8LM	LANE ASSIGNMENT	I	P-8	36" x 30"
S27	R6-2R	ONE WAY	I	P-10	30" x 36"
S28	R6-2R	ONE WAY	I	P-10	30" x 36"
S29	D3-1	STREET NAME	I	P-10	24" x VARIES
S30	R9-3	NO PED CROSSING	I	P-10	18" x 18"
S31	R3-8LM	LANE ASSIGNMENT	I	P-10	36" x 30"
S32	D3-1	STREET NAME	I	P-10	24" x VARIES
S33	R3-8LM	LANE ASSIGNMENT	I	P-2	36" x 30"
S34	R9-3	NO PED CROSSING	I	P-1	18" x 18"
S35	R10-3ELR	APS PUSH BUTTON	I	P-12	9" x 15"
S36	R10-3ELR	APS PUSH BUTTON	I	P-13	9" x 15"

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

ITEM 0682 SIGNAL HEADS

SIGNAL HEAD NUMBER	SIGNAL HEAD TYPE	STATUS	12-INCH SIGNAL HEAD UNITS								PED SIG SEC (LED) (COUNTDOWN)
			BACKPLATES		LED SIGNAL LAMPS						
			3 SEC	5 SEC	G	<- G	Y	<- Y	R	<- R	
			EA	EA	EA	EA	EA	EA	EA	EA	EA
1	PED	I									1
2	PED	I									1
3	PED	I									1
4	PED	I									1
5	PED	I									1
6	PED	I									1
7	PED	I									1
8	PED	I									1
9	PED	I									1
10	PED	I									1
11	PED	I									1
12	PED	I									1
13	H3S	I	1			1	1		1		
14	H3	I	1		1		1		1		
15	H3	I	1		1		1		1		
16	H5FYA	I		1		1		2		2	
17	H3	I	1		1		1		1		
18	H3	I	1		1		1		1		
19	H3	I	1		1		1		1		
20	V3	I	1		1		1		1		
21	V3	I	1		1		1		1		
22	H3	I	1		1		1		1		
23	H3	I	1		1		1		1		
24	H3S	I	1			1	1		1		
25	H3S	I	1			1	1		1		
26	H3	I	1		1		1		1		
27	H3	I	1		1		1		1		
28	H5FYA	I		1		1		2		2	
29	H3S	I	1			1	1		1		
30	H3	I	1		1		1		1		
31	H3	I	1		1		1		1		
32	V3	I	1		1		1		1		
33	V3	I	1		1		1		1		
34	H3	I	1		1		1		1		
35	H3	I	1		1		1		1		
36	H3	I	1		1		1		1		
37	H3	I	1		1		1		1		
TOTAL (NEW)			23	2	19	6	23	4	23	4	12

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

GROUND BOX SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QTY.
624	6010	GROUND BOX TY D (162922)W/APRON	EA	9
6186	6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA	2

ELECTRICAL SERVICE DATA

ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED(5)-14)	SERVICE CONDUIT SIZE (PVC)**	SERVICE CONDUCTORS NO. / SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE / AMP	TWO-POLE CONTACTOR AMPS	PANELBD. / LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE / AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-2	TY D (120/240) 070 (NS) SS (E) PS (U)	2"	3 / #4	N/A	2P / 70	30	100	T.S.	1P / 50	24	<7.1
								LIGHTING	2P / 15	2	
								LIGHTING	2P / 15	4	

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LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

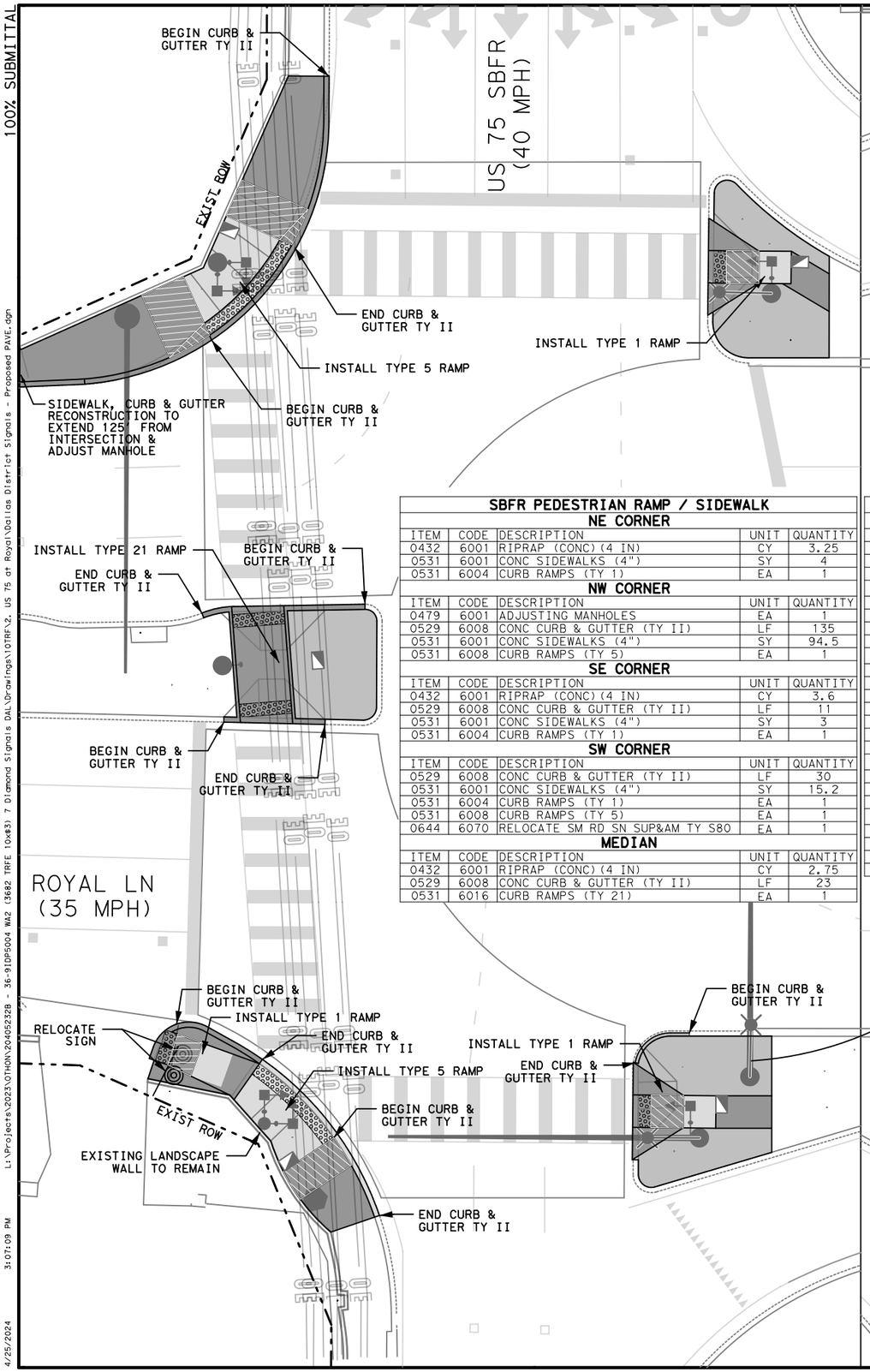
DIAMOND SIGNALS

PROPOSED TABLES
US 75 AT ROYAL LN

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	44
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

100% SUBMITTAL



SBFR PEDESTRIAN RAMP / SIDEWALK

NE CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	3.25
0531	6001	CONC SIDEWALKS (4")	SY	4
0531	6004	CURB RAMPS (TY 1)	EA	1

NW CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0479	6001	ADJUSTING MANHOLES	EA	1
0529	6008	CONC CURB & GUTTER (TY II)	LF	135
0531	6001	CONC SIDEWALKS (4")	SY	94.5
0531	6008	CURB RAMPS (TY 5)	EA	1

SE CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	3.6
0529	6008	CONC CURB & GUTTER (TY II)	LF	11
0531	6001	CONC SIDEWALKS (4")	SY	3
0531	6004	CURB RAMPS (TY 1)	EA	1

SW CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0529	6008	CONC CURB & GUTTER (TY II)	LF	30
0531	6001	CONC SIDEWALKS (4")	SY	15.2
0531	6004	CURB RAMPS (TY 1)	EA	1
0531	6008	CURB RAMPS (TY 5)	EA	1
0644	6070	RELOCATE SM RD SN SUP&AM TY S80	EA	1

MEDIAN

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	2.75
0529	6008	CONC CURB & GUTTER (TY II)	LF	23
0531	6016	CURB RAMPS (TY 21)	EA	1

NBFR PEDESTRIAN RAMP / SIDEWALK

NE CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0529	6008	CONC CURB & GUTTER (TY II)	LF	20
0531	6001	CONC SIDEWALKS (4")	SY	19.6
0531	6008	CURB RAMPS (TY 5)	EA	1

NW CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	3.5
0531	6001	CONC SIDEWALKS (4")	SY	9
0531	6004	CURB RAMPS (TY 1)	EA	1

SE CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	0.5
0529	6002	CONC CURB (TY II)	LF	25
0529	6008	CONC CURB & GUTTER (TY II)	LF	30
0531	6001	CONC SIDEWALKS (4")	SY	12
0531	6008	CURB RAMPS (TY 5)	EA	1
0531	6010	CURB RAMPS (TY 7)	EA	1

SW CORNER

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	1.5
0531	6004	CURB RAMPS (TY 1)	EA	1

MEDIAN

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	4
0529	6008	CONC CURB & GUTTER (TY II)	LF	25
0531	6016	CURB RAMPS (TY 21)	EA	1

RAMP & PAVING LEGEND

- PEDESTRIAN RAMPS — 7.1% RUNNING SLOPE, 2% CROSS SLOPE
- SIDEWALK — 5% RUNNING SLOPE, 2% CROSS SLOPE
- PEDESTRIAN LANDING — 2% RUNNING SLOPE, 2% CROSS SLOPE
- DETECTABLE SURFACE — 7.1% RUNNING SLOPE, 2% CROSS SLOPE
- CONCRETE RIP RAP

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. PROPOSED CURB RAMP LANDINGS SHALL BE POURED UP TO THE SIGNAL FOUNDATION, LEAVING NO GAPS.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS AND SUBSTITUTION OF ANY DAMAGED IRRIGATION EQUIPMENT.
4. CONTRACTOR SHALL ENSURE THAT ALL PED RAMPS DRAIN TOWARDS THE STREET WITHOUT PONDING IN THE RAMP OR GUTTER AREA.
5. ALL SLOPE VALUES SHOWN ARE MAXIMUMS.

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

DIAMOND SIGNALS

CORNER DETAILS US 75 AT ROYAL LN

SCALE: 1" = 20'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	45

STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.

CONT	SECT	JOB	HIGHWAY NO
0047	07	243, etc.	US 75, etc.

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NOTES:
1. REFER TO THE CITY STANDARDS FOR ADDITIONAL INFORMATION REGARDING TYPICAL PAVEMENT MARKING PLACEMENT.
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. CONTRACTOR SHALL APPLY PAVEMENT SEALER IN AREAS WHERE NEW THERMO IS TO BE APPLIED.
4. ALL EXISTING SIGNS AND PAVEMENT MARKINGS TO REMAIN UNLESS OTHERWISE NOTED. ALL PROPOSED SIGNS TO BE PROVIDED BY THE CITY OF DALLAS. CONTACT MR. DENNIS SCHIMKA AT 214-670-3773 TO SCHEDULE PICK -UP OF SIGNS.
5. STRIPING CONTRACTOR SHALL CONTACT COD TRANSPORTATION OPERATIONS AND TxDOT TRAFFIC SIGNAL OFFICE AT LEAST 24 HOURS IN ADVANCE OF MOBILIZATION. COD STAFF MUST BE PRESENT TO CONFIRM LAYOUT PRIOR TO THE APPLICATION OF ANY PAVEMENT MARKINGS.
6. REFRESH PAVEMENT MARKINGS WITHIN THE INTERSECTION AND 150' FROM STOP BAR.
7. SEE SUMMARY OF PAVEMENT MARKINGS TABLE ON THE PROPOSED QUANTITIES SHEET.

N

PAVEMENT MARKING LEGEND

- (A) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100 MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100 MIL)
- (D) RE PM W/RET REQ TY I (W)(4")(BRK)(100MIL)
- (E) RE PM W/RET REQ TY I (W)(4")(SLD)(100MIL)
- (F) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (G) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (H) RE PM W/RET REQ TY I (Y)(4")(SLD)(100MIL)
- (I) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (J) PREFAB PAV MRK TY C (W)(ARROW)
- (K) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (L) PREFAB PAV MRK TY C (W)(UTURN ARROW)
- (M) PREFAB PAV MRK TY C (W)(WORD)
- (N) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- (O) REFL PAV MRK TY II-C-R
- (P) REFL PAV MRK TY II-A-A

US 75 SBFR (40 MPH)
US 75 NBFR (40 MPH)
ROYAL LN (35 MPH)
EXIST ROW

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DIAMOND SIGNALS

PROPOSED PAVEMENT MARKING US 75 AT ROYAL LN

SCALE: 1" = 40'

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		46
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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PAVEMENT MARKING SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1430
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	1200
666	6224	PAVEMENT SEALER 4"	LF	230
666	6225	PAVEMENT SEALER 6"	LF	3915
666	6226	PAVEMENT SEALER 8"	LF	1430
666	6230	PAVEMENT SEALER 24"	LF	1200
666	6231	PAVEMENT SEALER (ARROW)	EA	22
666	6234	PAVEMENT SEALER (DBL ARROW)	EA	10
666	6236	PAVEMENT SEALER (UTURN ARROW)	EA	4
666	6243	PAVEMENT SEALER (YLD TRI)	EA	30
666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	230
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	360
666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	2660
666	6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	895
668	6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	22
668	6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	10
668	6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA	4
668	6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	30
672	6010	REFL PAV MRKR TY II-C-R	EA	131
678	6001	PAV SURF PREP FOR MRK (4")	LF	230
678	6002	PAV SURF PREP FOR MRK (6")	LF	3915
678	6004	PAV SURF PREP FOR MRK (8")	LF	1430
678	6008	PAV SURF PREP FOR MRK (24")	LF	1200
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	10
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	22
678	6012	PAV SURF PREP FOR MRK (UTURN ARR)	EA	4
678	6022	PAV SURF PREP FOR MRK (18")(YLD TRI)	EA	30
678	6033	PAV SURF PREP FOR MRK (RPM)	EA	131

PEDESTRIAN RAMP / SIDEWALK SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	19.1
0479	6001	ADJUSTING MANHOLES	EA	1
0529	6002	CONC CURB (TY II)	LF	25
0529	6008	CONC CURB & GUTTER (TY II)	LF	274
0531	6001	CONC SIDEWALKS (4")	SY	157.3
0531	6004	CURB RAMPS (TY 1)	EA	5
0531	6008	CURB RAMPS (TY 5)	EA	4
0531	6010	CURB RAMPS (TY 7)	EA	1
0531	6016	CURB RAMPS (TY 21)	EA	2
0644	6070	RELOCATE SM RD SN SUP&AM TY S80	EA	1

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4/25/2024
Elizabeth Shelton

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Texas Department of Transportation

DIAMOND SIGNALS

PAVING AND PAVEMENT MARKING QUANTITIES US 75 AT ROYAL LN

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		47
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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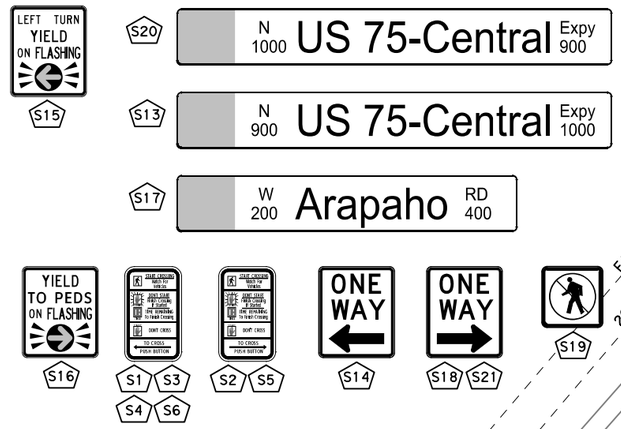
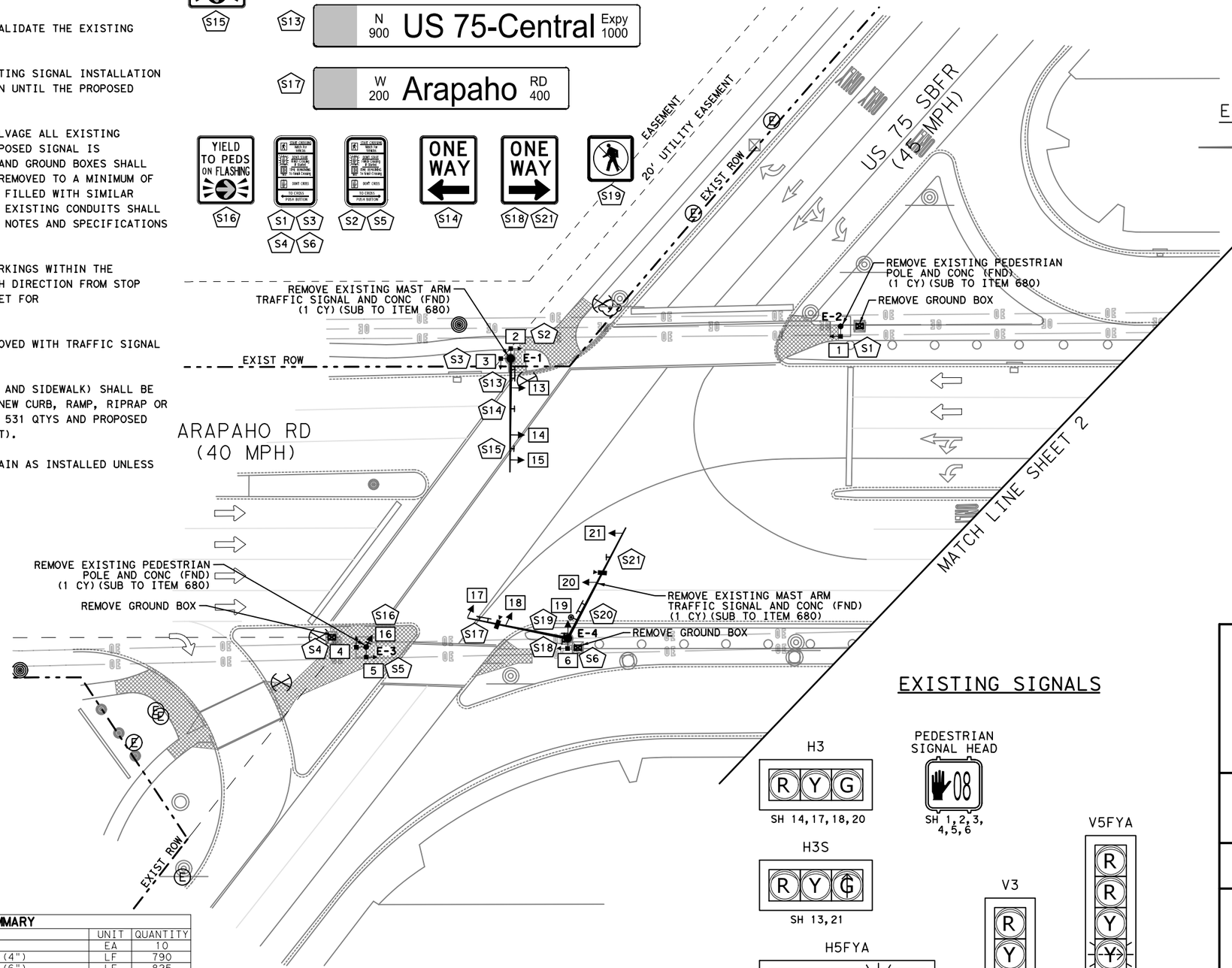
NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
3. CONTRACTOR SHALL MAINTAIN THE EXISTING SIGNAL INSTALLATION AND OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED SIGNAL IS OPERATIONAL.
4. THE CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AFTER PROPOSED SIGNAL IS OPERATIONAL. EXISTING FOUNDATIONS AND GROUND BOXES SHALL BE REMOVED, WITH POLE FOUNDATIONS REMOVED TO A MINIMUM OF 2' BELOW EXISTING GROUND, AND BACK FILLED WITH SIMILAR MATERIALS IN THE SURROUNDING AREA. EXISTING CONDUITS SHALL BE ABANDONED IN PLACE. SEE GENERAL NOTES AND SPECIFICATIONS FOR MORE INFORMATION.
5. ELIMINATE ALL EXISTING PAVEMENT MARKINGS WITHIN THE INTERSECTION AND ALONG 200' IN EACH DIRECTION FROM STOP BAR. REFER TO PAVEMENT MARKING SHEET FOR ADDITIONAL INFORMATION.
6. EXISTING SIGNS S1-S30 SHALL BE REMOVED WITH TRAFFIC SIGNAL EQUIPMENT.
7. PAVING REMOVAL (CURB, RAMP, PAVERS AND SIDEWALK) SHALL BE SUBSIDIARY TO THE INSTALLATION OF NEW CURB, RAMP, RIPRAP OR CONCRETE SIDEWALK (SEE ITEMS 421 & 531 QTYS AND PROPOSED PEDESTRIAN RAMP AND SIDEWALK LAYOUT).
8. ALL GROUND MOUNTED SIGNS SHALL REMAIN AS INSTALLED UNLESS OTHERWISE NOTED.

EXISTING SIGNS

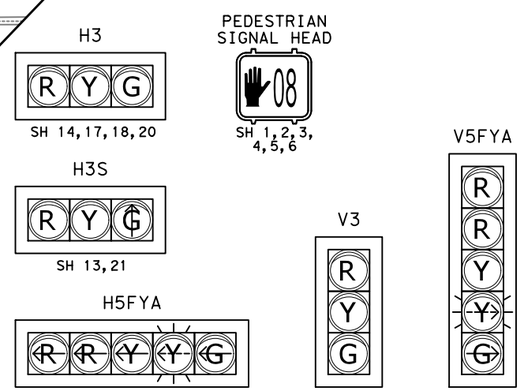




EXISTING SIGNAL LEGEND

- MAST ARM POLE
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LUMINAIRE
- VEHICLE DETECTOR
- OPTICOM
- CCTV
- EXISTING SIGNAL CONTROLLER CABINET
- EXISTING GROUND BOX
- SIGNAL HEAD NUMBER
- SIGN LABEL
- EXISTING ELECTRICAL SERVICE
- E-# EXISTING SIGNAL POLE NUMBER
- PAVING REMOVAL

EXISTING SIGNALS



REMOVAL SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0624	6028	REMOVE GROUND BOX	EA	10
0677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	790
0677	6002	ELIM EXT PAV MRK & MRKS (6")	LF	825
0677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	1109
0677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	930
0677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	302
0677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	11
0677	6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	5
0677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	13
0677	6036	ELIM EXT PAV MRK & MRKS (UTURN ARROW)	EA	2
0680	6012	REMOVING TRAFFIC SIGNALS (DIAMOND)	EA	1

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DIAMOND SIGNALS

EXISTING CONDITIONS AND REMOVALS US 75 AT ARAPAHO RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	48

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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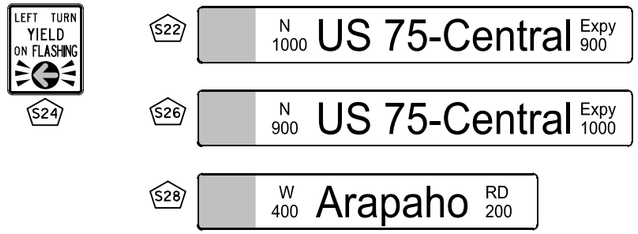
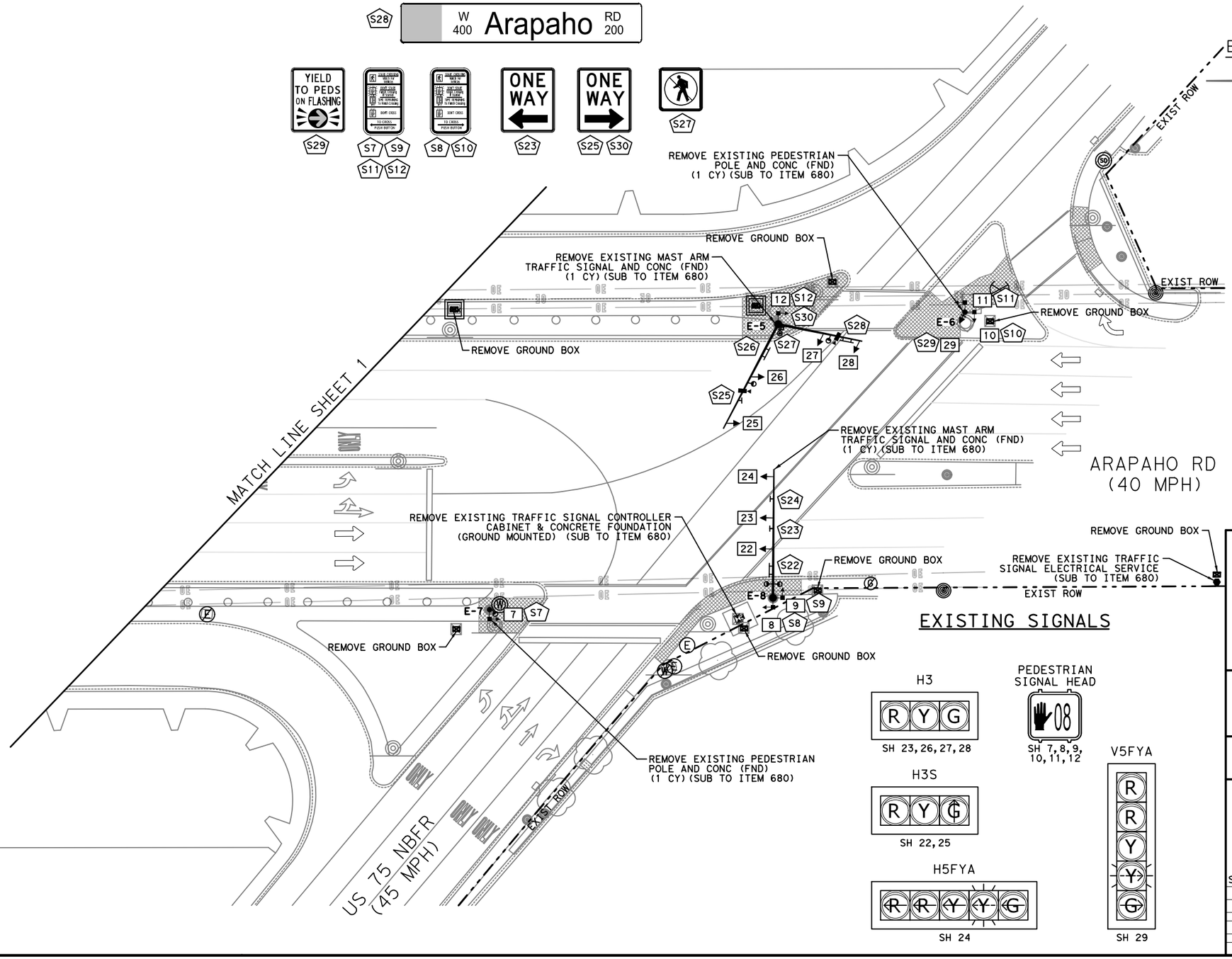
EXISTING SIGNS





EXISTING SIGNAL LEGEND

- MAST ARM POLE
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LUMINAIRE
- VEHICLE DETECTOR
- OPTICOM
- CCTV
- EXISTING SIGNAL CONTROLLER CABINET
- EXISTING GROUND BOX
- 1 — SIGNAL HEAD NUMBER
- S1 — SIGN LABEL
- EXISTING ELECTRICAL SERVICE
- E-# — EXISTING SIGNAL POLE NUMBER
- PAVING REMOVAL

EXISTING SIGNALS

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DIAMOND SIGNALS

EXISTING CONDITIONS AND REMOVALS US 75 AT ARAPAHO RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	49
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

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NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF RICHARDSON TRAFFIC MANAGEMENT CENTER AT (972-744-4330) 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, RADAR DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
4. CONTRACTOR SHALL COORDINATE WITH ONCOR CONCERNING TRAFFIC SIGNAL ELECTRICAL SERVICE. CONTACT ONCOR (RODAS A LULSEGED AT RODAS.LULSEGED@ONCOR.COM) REGARDING POINT OF DELIVERY AND DISTRIBUTION TO ELECTRICAL PEDESTAL SERVICE. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. THE FOLLOWING ITEMS WILL BE FURNISHED BY THE CITY OF RICHARDSON AND INSTALLED BY THE CONTRACTOR: SIGNAL CABINET AND INTERNAL HARDWARE W/ BBU, OPTICOM & CABLING, ENFORCEMENT LIGHTS & CABLING, VIVIDS DETECTION & CABLING AND STREET NAME SIGNS. CONTACT CODY WILDONER AT 972-744-4465 TO SCHEDULE PICK-UP OF MATERIALS.
6. INSTALL BASE MOUNTED P44 ATC CONTROLLER CABINET (TYPE TS2 CABINET) AND FOUNDATION.
7. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
8. SIGNAL HEADS SHALL BE YELLOW WITH YELLOW POWDER COATED ALUMINUM VISORS AND WITH A 2" YELLOW BORDER.
9. DETECTION ZONES TO BE PROGRAMMED BY THE CITY OF RICHARDSON. CONTACT CITY OF RICHARDSON TRAFFIC MANAGEMENT CENTER WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.
10. ALL SIGNAL CABLES SHALL BE WIRED IN ACCORDANCE WITH THE CABINET PREPARATION NOTES SUPPLIED BY THE CITY OF RICHARDSON.

NOTES CONTINUED ON NEXT SHEET.

PROPOSED SIGNS

R10-3EL 9"x15" (S2, S5, S6)

R10-3ER 9"x15" (S1, S3, S4)

R10-17T 36"x42" — LEFT TURN YIELD ON FLASHING YELLOW ARROW (S18)

R6-2L 30"x36" — ONE WAY (S15, S16)

R6-2R 30"x36" — ONE WAY (S25, S26)

R3-8LM 36"x30" — ONLY (S17, S22)

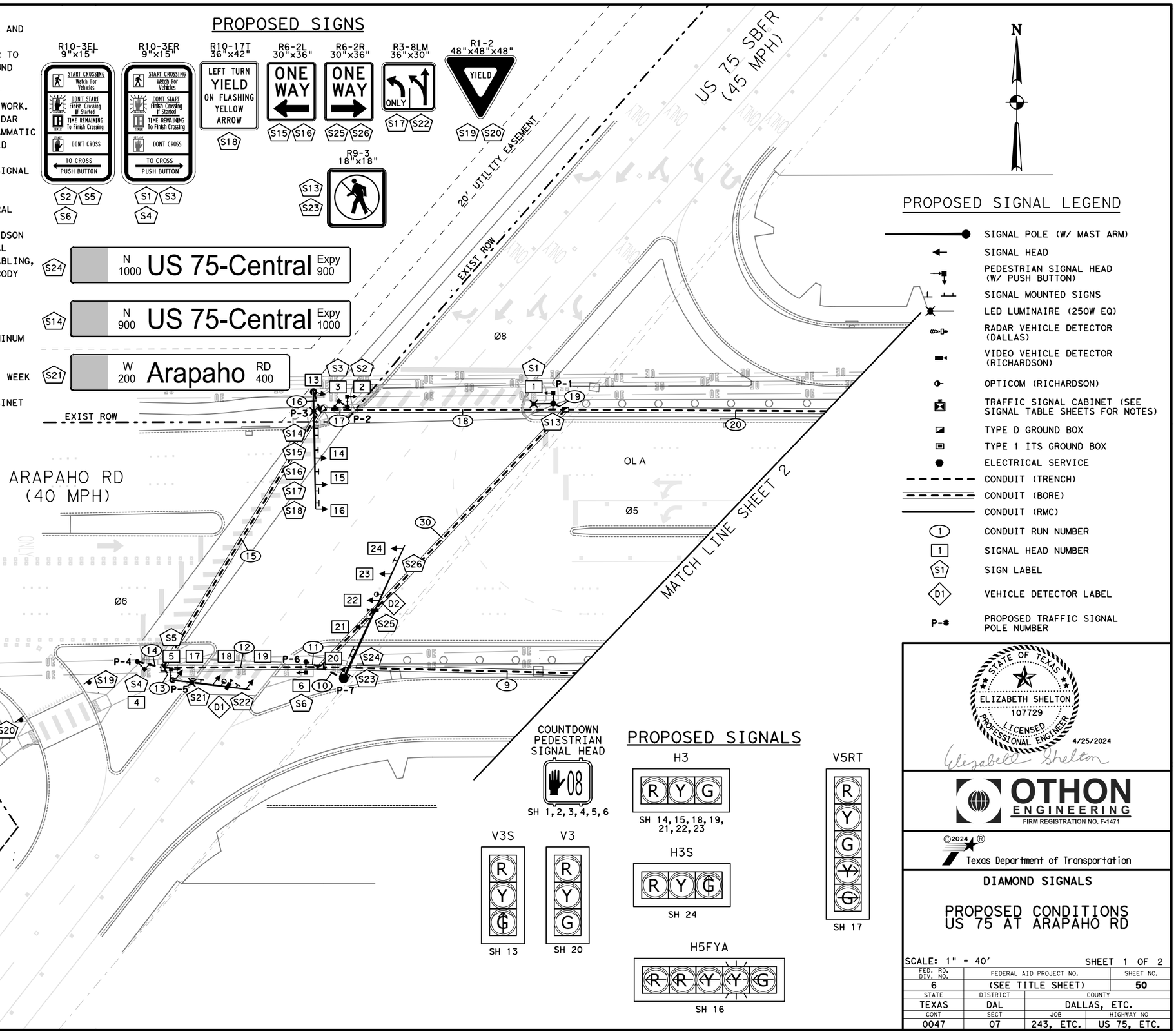
R1-2 48"x48"x48" — YIELD (S19, S20)

R9-3 18"x18" (S13, S23)

S24: N 1000 US 75-Central Expy 900

S14: N 900 US 75-Central Expy 1000

S21: W 200 Arapaho RD 400



PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINAIRE (250W EQ)
- RADAR VEHICLE DETECTOR (DALLAS)
- VIDEO VEHICLE DETECTOR (RICHARDSON)
- OPTICOM (RICHARDSON)
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE D GROUND BOX
- TYPE 1 ITS GROUND BOX
- ELECTRICAL SERVICE
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- CONDUIT (RMC)
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- D1 VEHICLE DETECTOR LABEL
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

COUNTDOWN PEDESTRIAN SIGNAL HEAD

SH 1, 2, 3, 4, 5, 6

PROPOSED SIGNALS

V3S

SH 13

V3

SH 20

H3

SH 14, 15, 18, 19, 21, 22, 23

H3S

SH 24

H5FYA

SH 16

V5RT

SH 17

ELIZABETH SHELTON 107729 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS 4/25/2024

OTHON ENGINEERING FIRM REGISTRATION NO. F-1471

DIAMOND SIGNALS

PROPOSED CONDITIONS US 75 AT ARAPAHO RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		50
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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100% SUBMITTAL

NOTES CONTINUED:

11. CONTRACTOR SHALL COORDINATE THE TRAFFIC SIGNAL POLE FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED FIRST, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER SO A FIELD MEETING CAN BE SCHEDULED TO DETERMINE IF FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL POLE FOUNDATIONS ARE INSTALLED FIRST, THE CURB RAMPS AND SIDEWALKS SHALL BE MODIFIED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS ARE 10" OR LESS.
12. PROPOSED APS UNITS SHALL BE PLACED ADJACENT TO A LEVEL LANDING AREA (2% MAX IN ANY DIRECTION). IF THE DISTANCE FROM THE PUSH BUTTON TO THE EDGE OF ACCESSIBLE PATH EXCEEDS 10", THE CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON EXTENDER TO MAKE THE REACH 10" OR LESS. MEASUREMENT AND PAYMENT SHALL BE CONSIDERED SUBSIDIARY TO THE INSTALLATION OF THE TRAFFIC SIGNAL EQUIPMENT.
13. 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.
14. PROPOSED CURB RAMP LANDING SHALL BE POURED UP TO THE SIGNAL FOUNDATION LEAVING NO GAPS.
15. CONTRACTOR TO MAINTAIN FULL ACCESS TO A MINIMUM OF TWO PEDESTRIAN CROSSINGS AT ALL TIMES DURING CONSTRUCTION.

PROPOSED SIGNS

R10-3EL 9"x15" — START CROSSING Watch For Vehicles; DON'T START Finish Crossing If Started; TIME REMAINING To Finish Crossing; DON'T CROSS; TO CROSS PUSH BUTTON ← — S8, S11, S12

R10-3ER 9"x15" — START CROSSING Watch For Vehicles; DON'T START Finish Crossing If Started; TIME REMAINING To Finish Crossing; DON'T CROSS; TO CROSS PUSH BUTTON → — S7, S9, S10

R6-2L 30"x36" — ONE WAY ← — S29, S30

R6-2R 30"x36" — ONE WAY → — S33, S34

R3-8LM 36"x30" — ONLY — S31, S37

S28: N 1000 US 75-Central Expy 900

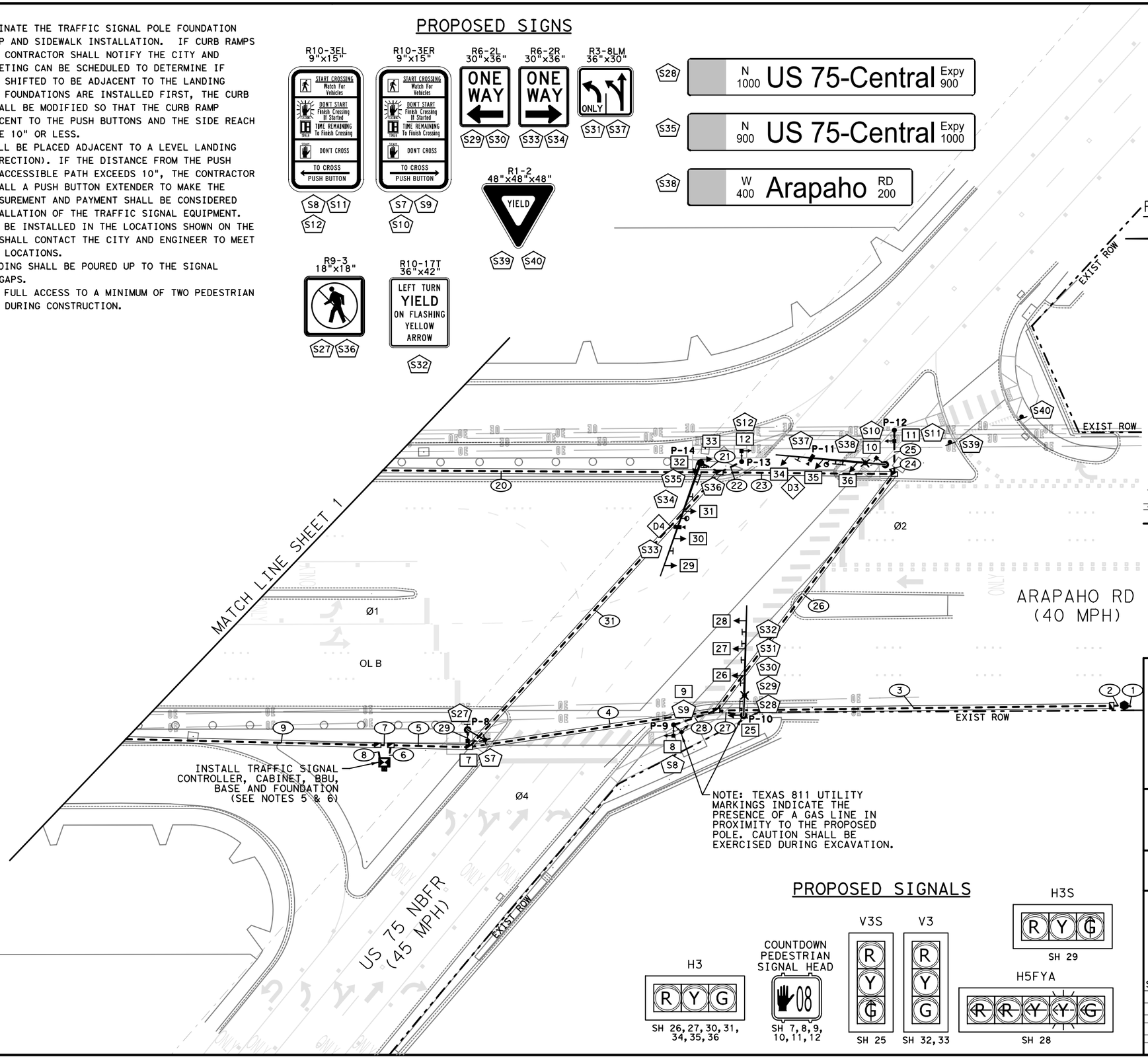
S35: N 900 US 75-Central Expy 1000

S38: W 400 Arapaho RD 200

R1-2 48"x48"x48" — YIELD — S39, S40

R9-3 18"x18" — S27, S36

R10-17T 36"x42" — LEFT TURN YIELD ON FLASHING YELLOW ARROW — S32



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PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINAIRE (250W EQ)
- RADAR VEHICLE DETECTOR (DALLAS)
- VIDEO VEHICLE DETECTOR (RICHARDSON)
- OPTICOM (RICHARDSON)
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE D GROUND BOX
- TYPE 1 ITS GROUND BOX
- ELECTRICAL SERVICE
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- CONDUIT (RMC)
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- D1 VEHICLE DETECTOR LABEL
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

PROPOSED SIGNALS

H3 — R Y G — SH 26, 27, 30, 31, 34, 35, 36

COUNTDOWN PEDESTRIAN SIGNAL HEAD — 08 — SH 7, 8, 9, 10, 11, 12

V3S — R Y G — SH 25

V3 — R Y G — SH 32, 33

H3S — R Y G — SH 29

H5FYA — R R Y Y G — SH 28

STATE OF TEXAS — ELIZABETH SHELTON — 107729 — LICENSED PROFESSIONAL ENGINEER — 4/25/2024

OTHON ENGINEERING — FIRM REGISTRATION NO. F-1471

DIAMOND SIGNALS

PROPOSED CONDITIONS US 75 AT ARAPAHO RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	51

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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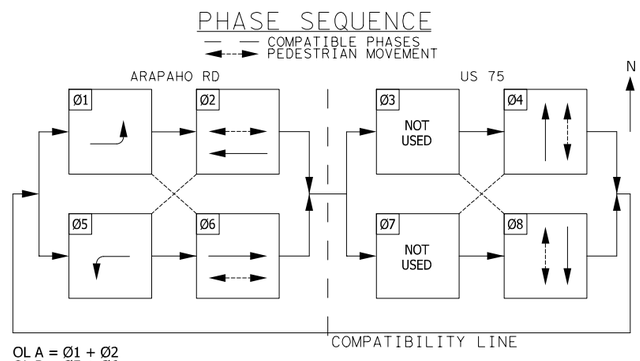
CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT: ITEM 618 (SCH 80) 2" PVC (RISER) QTY	2" PVC (RISER) LF	2" PVC (TRENCH) QTY	2" PVC (TRENCH) LF	3" PVC (TRENCH) QTY	3" PVC (TRENCH) LF	4" PVC (TRENCH) QTY	4" PVC (TRENCH) LEN	4" PVC (BORED) QTY	4" PVC (BORED) LF	CABLE STATUS	CONDUCTORS: ITEM 620 ELECTRICAL CONDUCTORS NO. 6 XHHW WIRE QTY	NO. 6 XHHW WIRE LEN	NO. 6 BARE WIRE QTY	NO. 6 BARE WIRE LF	NO. 8 XHHW WIRE QTY	NO. 8 XHHW WIRE LF	NO. 12 XHHW WIRE QTY	NO. 12 XHHW WIRE LF	ITEM 684 TRAFFIC SIGNAL CABLES TY C 2 CNDR NO. 12 QTY	TY C 2 CNDR NO. 12 LF	TY A 5 CNDR NO. 14 QTY	TY A 5 CNDR NO. 14 LF	TY A 7 CNDR NO. 14 QTY	TY A 7 CNDR NO. 14 LF	TY A 20 CNDR NO. 14 QTY	TY A 20 CNDR NO. 14 LF	SUB TO ITEM 680** VEHICLE DETE TOR CABLE QTY	VEHICLE DETE TOR CABLE LF	OPTICOM CABLE QTY	OPTICOM CABLE LF	ENFORCEMENT LIGHT CABLE QTY	ENFORCEMENT LIGHT CABLE LF	TOTAL LENGTH OF RUN	RUN NO
1*	I	1	10	1	10							I	ELECTRICAL CONDUCTORS TO BE INSTALLED BY ONCOR FROM THE POINT OF DELIVERY TO THE METER																							20	1*
2	I			1	10							I	2	30	1	15	2	30																	10	2
3	I			1	160							I	2	330	1	165	2	330																	160	3
4	I			1	105					1	105	I	2	220	1	110	4	440			5	550					2	220	2	220	2	220			105	4
5	I			1	35							I	2	80	1	40	2	80			6	240			1	40	3	120	2	80	2	80			35	5
6	I			1	10	1	10	1	10			I	2	30	1	15					6	90			1	15	3	45	2	30	2	30			10	6
7	I							1	10			I			1	15	2	30																	10	7
8	I					1	10	1	10			I			1	15					6	90					3	45	2	30	2	30			10	8
9	I									1	210	I			1	215	2	430			6	1290					3	645	2	430	2	430			210	9
10	I					1	15					I			1	20									1	20	1	20	1	20	1	20			15	10
11	I					1	10					I			1	15					1	15			1	15									10	11
12	I									1	65	I			1	70	2	140			4	280					2	140	1	70	1	70			65	12
13	I					1	10					I			1	15	4	60			1	15			1	15	1	15	1	15	1	15			10	13
14	I					1	15					I			1	20					1	20			1	20									15	14
15	I									1	125	I			1	130	2	260			2	260					1	130							125	15
16	I					1	10					I			1	15	4	60			1	15			2	30	1	15							10	16
17	I					1	15					I			1	20					1	20			1	20									15	17
18	I									1	105	I			1	110	2	220							1	110									105	18
19	I					1	10					I			1	15	2	30			1	15													10	19
20	I									1	245	I			1	250																			245	20
21	I					1	10					I			1	15									1	15	1	15							10	21
22	I					1	10					I			1	15					1	15			1	15									10	22
23	I									1	70	I			1	75																			70	23
24	I					1	10					I			1	15	2	30			1	15			1	15	1	15	1	15	1	15			10	24
25	I					1	20					I			1	25					1	25			1	25									20	25
26	I									1	120	I			1	125	2	250			2	250					1	125	1	125	1	125			120	26
27	I					1	15					I			1	20	6	120			1	20			1	20	1	20	1	20	1	20			15	27
28	I					1	20					I			1	25					1	25			1	25									20	28
29	I					1	10					I			1	15					1	15			1	15									10	29
30	I									1	150	I									1	155													150	30
31	I									1	150	I									1	155					1	155							150	31
SUBTOTAL			10		330		200		30		1345			690		1600		2510				3575			415		1725		1055		1055					
P-1	P											P										5		10											P-1
P-2	P											P										10		20											P-2
P-3	P											P								80				105		70							25		P-3
P-4	P											P										5		10											P-4
P-5	P											P								80		5		120					45		45		25		P-5
P-6	P											P										5		10											P-6
P-7	P											P												210					60		60		25		P-7
P-8	P											P										5		10											P-8
P-9	P											P										10		20											P-9
P-10	P											P								80				105		60							25		P-10
P-11	P											P								80		5		140					50		50		25		P-11
P-12	P											P										5		10											P-12
P-13	P											P										5		10											P-13
P-14	P											P												195					50		50		25		P-14
SUBTOTAL																				320		60		975		130			205		205		150		
TOTAL			10		330		200		30		1345			690		1600		2510		320		3635		975		545		1725	1260		1260		150		

CONDUIT STATUS: I=INSTALL; E=EXISTING; P=WIRE TO BE INSTALLED INSIDE STEEL POLE; A=ABANDON; R=REMOVE AND SALVAGE; AC=AERIAL CABLE
P-# - REFERS TO THE WIRING INSIDE THE SIGNAL POLE AND MAST ARM.
*- THE CONTRACTOR SHALL INSTALL A 2" PVC CONDUIT FROM THE POINT OF DELIVERY TO THE PEDESTAL METER.
**- FURNISHED BY THE CITY OF RICHARDSON AND INSTALLED BY THE CONTRACTOR. INSTALLATION SHALL BE SUBSIDIARY TO ITEM 680. CONTACT CODY WILDONER AT 972-744-4465 OR CODY.WILDONER@COR.GOV TO SCHEDULE PICKUP.

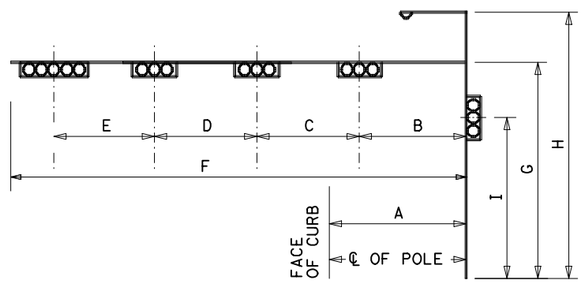
PHASE SEQUENCE



OL A = Ø1 + Ø2
OL B = Ø5 + Ø6

SIGNAL HEAD AND POLE PLACEMENT (FT)

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	I (FT)	NO. OF HEADS (EA)*	LUM	SUB TO ITEM 680 VIVDS CAM ASSY (INSTALL ONLY)	DRILLED SHAFT LENGTH (LF) 24" DIA SUB TO ITEM 687	30" DIA ITEM 416	30" DIA TYPE A ITEM 416	36" DIA TYPE A ITEM 416	48" DIA TYPE A ITEM	FDN. TYPE WIND ZONE 80 MPH
P-1	I	7	LUMINAIRE POLE W/ APS					30							8				N/A
P-2	I	7	PEDESTRIAN SIGNAL POLE					10						6					24A
P-3	I	14	27	11	10		48	19	30		3	Y					14		36A
P-4	I	7	PEDESTRIAN SIGNAL POLE					10						6					24A
P-5	I	8	17	14			32	19	30	13	2	Y	1			12			30A
P-6	I	5	PEDESTRIAN SIGNAL POLE					10						6					24A
P-7	I	16	23	12	12	12	60	19	30	13	4	N	1					22	48A
P-8	I	9	LUMINAIRE POLE W/ APS					30							8				N/A
P-9	I	5	PEDESTRIAN SIGNAL POLE					10						6					24A
P-10	I	6	16	11	11		44	19	30	13	3	Y					14		36A
P-11	I	17	11	14	14		44	19	30	13	3	Y	1				14		36A
P-12	I	7	PEDESTRIAN SIGNAL POLE					10						6					24A
P-13	I	4	PEDESTRIAN SIGNAL POLE					10						6					24A
P-14	I	7	20	12	12		48	19		13	3	N	1				14		36A
										TOTAL:	4			36	16	12	56	22	



SIGNAL POLE STATUS: I=INSTALL; E=EXISTING; REM=REMOVE; F=INSTALL IN FUTURE PHASE
*- DOES NOT INCLUDE VERTICAL SIDEMOUNT SIGNAL HEADS OR PEDESTRIAN SIGNAL HEADS
**- EQUIPMENT TO BE PROVIDED BY THE CITY AND INSTALLED BY THE CONTRACTOR

ELECTRICAL SERVICE DATA

ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED(5)-14)	SERVICE CONDUIT SIZE (PVC)**	SERVICE CONDUCTORS NO. / SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE / AMP	TWO-POLE CONTACTOR AMPS	PANELBD. / LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE / AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-3	TY D (120/240) 070 (NS) SS (E) PS (U)	2"	3 / #4	N/A	2P / 70	30	100	T.S.	1P / 30	24	<7.1
								LIGHTING	2P / 15	3	
								LIGHTING	2P / 15	3	

** - VERIFY SERVICE CONDUIT SIZE WITH UTILITY. SIZE MAY CHANGE DUE TO THE UTILITY METER REQUIREMENTS. ENSURE CONDUIT SIZE MEETS THE NATIONAL ELECTRICAL CODE.

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED TABLES US 75 AT ARAPAHO RD

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	52
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

100% SUBMITTAL

CABLE TERMINATION CHART

CNDR. NO.	CONDUCTOR COLOR	CABLE 1 7 CNDR. FROM P-1 TO P-3.	CABLE 2 7 CNDR. FROM P-2 TO P-3	CABLE 3 20 CNDR. FROM P-3 TO CNTRL.	CABLE 4 7 CNDR. FROM P-4 TO P-5	CABLE 5 20 CNDR. FROM P-5 TO CNTRL.	CABLE 6 7 CNDR. FROM P-6 TO P-7	CABLE 7 20 CNDR. FROM P-7 TO CNTRL.	CABLE 8 7 CNDR. FROM P-8 TO CNTRL.	CABLE 9 7 CNDR. FROM P-9 TO P-10.	CABLE 10 20 CNDR. FROM P-10 TO CNTRL.	CABLE 11 20 CNDR. FROM P-11 TO CNTRL.	CABLE 12 7 CNDR. FROM P-12 TO P-11.	CABLE 13 7 CNDR. FROM P-13 TO P-14.	CABLE 14 20 CNDR. FROM P-14 TO CNTRL.
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON
3	RED	SH 1 PH 6 (LS 11) DW	SH 2 PH 6 (LS 11) DW	SH 13,14,15 OL-A (LS 13) R	SH 4 PH 8 (LS 12) DW	SH 17,18,19 PH 8 (LS 8) R	SH 6 PH 6 (LS 11) DW	SH 21,22,23,24 PH 6 (LS 6) R	SH 7 PH 2 (LS 9) DW	SH 8 PH 2 (LS 9) DW	SH 25,26,27 OL-B (LS 14) R	SH 34,35,36 PH 4 (LS 4) R	SH 11 PH 2 (LS 9) DW	SH 12 PH 2 (LS 9) DW	SH 29,30,31,33 PH 2 (LS 2) R
4	GREEN	SH 1 PH 6 (LS 11) W	SH 2 PH 6 (LS 11) W	SH 13,14,15 OL-A (LS 13) G	SH 4 PH 8 (LS 12) W	SH 17,18,19 PH 8 (LS 8) G	SH 6 PH 6 (LS 11) W	SH 21,22,23,24 PH 6 (LS 6) G	SH 7 PH 2 (LS 9) W	SH 8 PH 2 (LS 9) W	SH 25,26,27 OL-B (LS 14) G	SH 34,35,36 PH 4 (LS 4) G	SH 11 PH 2 (LS 9) W	SH 12 PH 2 (LS 9) W	SH 29,30,31,33 PH 2 (LS 2) G
5	ORANGE	SPARE	SH 3 PH 8 (LS 12) DW	SH 13,14,15 OL-A (LS 13) Y	SPARE	SH 17,18,19 PH 8 (LS 8) Y	SPARE	SH 21,22,23,24 PH 6 (LS 6) Y	SPARE	SH 9 PH 4 (LS 10) DW	SH 25,26,27 OL-B (LS 14) Y	SH 34,35,36 PH 4 (LS 4) Y	SPARE	SPARE	SH 29,30,31,33 PH 2 (LS 2) Y
6	BLUE	SPARE	SH 3 PH 8 (LS 12) W	SH 16 PH 5 (LS 11) FY (LT ARW)	SPARE	SPARE	SPARE	SPARE	SPARE	SH 9 PH 4 (LS 10) W	SH 28 PH 1 (LS 9) FY (LT 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 16 PH 5 (LS 5) R (LT ARW)		SPARE		SH 20 PH 8 (LS 8) R			SH 28 PH 1 (LS 1) R (LT ARW)	SPARE			SH 32 PH 4 (LS 4) R
9	GREEN/BLACK			SH 16 PH 5 (LS 5) G (LT ARW)		SPARE		SH 20 PH 8 (LS 8) G			SH 28 PH 1 (LS 1) G (LT ARW)	SPARE			SH 32 PH 4 (LS 4) G
10	ORANGE/BLACK			SH 16 PH 5 (LS 5) Y (LT ARW)		SPARE		SH 20 PH 8 (LS 8) Y			SH 28 PH 1 (LS 1) Y (LT ARW)	SPARE			SH 32 PH 4 (LS 4) Y
11	BLUE/BLACK			SPARE		SPARE		SPARE			SPARE	SPARE			SPARE
12	BLACK/WHITE			SPARE		SPARE		SPARE			SPARE	SPARE			SPARE
13	RED/WHITE			SH 1 PH 6 (LS 11) DW		SH 4 PH 8 (LS 12) DW		SH 6 PH 6 (LS 11) DW			SH 8 PH 2 (LS 9) DW	SH 10 PH 4 (LS 10) DW			SH 12 PH 2 (LS 9) DW
14	GREEN/WHITE			SH 1 PH 6 (LS 11) W		SH 4 PH 8 (LS 12) W		SH 6 PH 6 (LS 11) W			SH 8 PH 2 (LS 9) W	SH 10 PH 4 (LS 10) W			SH 12 PH 2 (LS 9) W
15	BLUE/WHITE			SH 2 PH 6 (LS 11) DW		SH 5 PH 6 (LS 11) DW		SPARE			SH 9 PH 4 (LS 10) DW	SH 11 PH 2 (LS 9) DW			SPARE
16	BLACK/RED			SH 2 PH 6 (LS 11) W		SH 5 PH 6 (LS 11) W		SPARE			SH 9 PH 4 (LS 10) W	SH 11 PH 2 (LS 9) W			SPARE
17	WHITE/RED			SH 3 PH 8 (LS 12) DW		SPARE		SPARE			SPARE	SPARE			SPARE
18	ORANGE/RED			SH 3 PH 8 (LS 12) W		SPARE		SPARE			SPARE	SPARE			SPARE
19	BLUE/RED			ENFORCEMENT LAMP COMMON		ENFORCEMENT LAMP COMMON		ENFORCEMENT LAMP COMMON			ENFORCEMENT LAMP COMMON	ENFORCEMENT LAMP COMMON			ENFORCEMENT LAMP COMMON
20	RED/GREEN			ENFORCEMENT LAMP		ENFORCEMENT LAMP		ENFORCEMENT LAMP			ENFORCEMENT LAMP	ENFORCEMENT LAMP			ENFORCEMENT LAMP

NOTE: HOME RUN 2 CNDR TO ALL POLES WITH APS BUTTONS

DETECTION ZONE DETAILS

DETECTOR NUMBER	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATIONS	ZONES(S)	SETBACK DISTANCE
D1	P-5	18'	STOP BAR	SB	N/A
D2	P-7	18'	STOP BAR	EB	N/A
D3	P-11	18'	STOP BAR	NB	N/A
D4	P-14	18'	STOP BAR	WB	N/A

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED TABLES
US 75 AT ARAPAHO RD

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		53
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

100% SUBMITTAL

SIGNS SUMMARY

SIGN #	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R10-3ER	APS PUSH BUTTON	I	P-1	9" x 15"
S2	R10-3EL	APS PUSH BUTTON	I	P-2	9" x 15"
S3	R10-3ER	APS PUSH BUTTON	I	P-2	9" x 15"
S4	R10-3ER	APS PUSH BUTTON	I	P-4	9" x 15"
S5	R10-3EL	APS PUSH BUTTON	I	P-5	9" x 15"
S6	R10-3EL	APS PUSH BUTTON	I	P-6	9" x 15"
S7	R10-3ER	APS PUSH BUTTON	I	P-8	9" x 15"
S8	R10-3EL	APS PUSH BUTTON	I	P-9	9" x 15"
S9	R10-3ER	APS PUSH BUTTON	I	P-9	9" x 15"
S10	R10-3ER	APS PUSH BUTTON	I	P-11	9" x 15"
S11	R10-3EL	APS PUSH BUTTON	I	P-12	9" x 15"
S12	R10-3EL	APS PUSH BUTTON	I	P-13	9" x 15"
S13	R9-3	NO PEDESTRIAN CROSSINGS	I	P-1	18" x 18"
S14	D3-1	STREET NAME	I	P-3	24" x VARIES
S15	R6-2L	ONE WAY	I	P-3	30" x 36"
S16	R6-2L	ONE WAY	I	P-3	30" x 36"
S17	R3-8LM	LANE ASSIGNMENT	I	P-3	36" x 30"
S18	R10-17T	LEFT TURN YIELD ON FLAHSING YELLOW ARROW	I	P-3	36" x 42"
S19	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S20	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S21	D3-1	STREET NAME	I	P-5	24" x VARIES
S22	R3-8LM	LANE ASSIGNMENT	I	P-5	36" x 30"
S23	R9-3	NO PEDESTRIAN CROSSINGS	I	P-7	18" x 18"
S24	D3-1	STREET NAME	I	P-7	24" x VARIES
S25	R6-2R	ONE WAY	I	P-7	30" x 36"
S26	R6-2R	ONE WAY	I	P-7	30" x 36"
S27	R9-3	NO PEDESTRIAN CROSSINGS	I	P-8	18" x 18"
S28	D3-1	STREET NAME	I	P-10	24" x VARIES
S29	R6-2L	ONE WAY	I	P-10	30" x 36"
S30	R6-2L	ONE WAY	I	P-10	30" x 36"
S31	R3-8LM	LANE ASSIGNMENT	I	P-10	36" x 30"
S32	R10-17T	LEFT TURN YIELD ON FLAHSING YELLOW ARROW	I	P-10	36" x 42"
S33	R6-2R	ONE WAY	I	P-14	30" x 36"
S34	R6-2R	ONE WAY	I	P-14	30" x 36"
S35	D3-1	STREET NAME	I	P-14	24" x VARIES
S36	R9-3	NO PEDESTRIAN CROSSINGS	I	P-14	18" x 18"
S37	R3-8LM	LANE ASSIGNMENT	I	P-11	36" x 30"
S38	D3-1	STREET NAME	I	P-11	24" x VARIES
S39	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S40	R1-2	YIELD	I	10 BWG	48" x 48" x 48"

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

GROUND BOX SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QTY.
624	6010	GROUND BOX TY D (162922)W/APRON	EA	10

ITEM 0682 SIGNAL HEADS

SIGNAL HEAD NUMBER	SIGNAL HEAD TYPE	STATUS	12-INCH SIGNAL HEAD UNITS								PED SIG SEC (LED) (COUNTDOWN)
			BACKPLATES		LED SIGNAL LAMPS						
			3 SEC	5 SEC	G	<- G	Y	<- Y	R	<- R	
			EA	EA	EA	EA	EA	EA	EA	EA	EA
1	PED	I									1
2	PED	I									1
3	PED	I									1
4	PED	I									1
5	PED	I									1
6	PED	I									1
7	PED	I									1
8	PED	I									1
9	PED	I									1
10	PED	I									1
11	PED	I									1
12	PED	I									1
13	V3S	I	1			1	1		1		
14	H3	I	1		1		1		1		
15	H3	I	1		1		1		1		
16	H5FYA	I		1		1		2		2	
17	V5RT	I		1	1	1	1	1		1	
18	H3	I	1		1		1		1		
19	H3	I	1		1		1		1		
20	V3	I	1			1	1		1		
21	H3	I	1		1		1		1		
22	H3	I	1		1		1		1		
23	H3	I	1		1		1		1		
24	H3S	I	1			1	1		1		
25	V3S	I	1			1	1		1		
26	H3	I	1		1		1		1		
27	H3	I	1		1		1		1		
28	H5FYA	I		1		1		2		2	
29	H3S	I	1			1	1		1		
30	H3	I	1		1		1		1		
31	H3	I	1		1		1		1		
32	V3	I	1		1		1		1		
33	V3	I	1		1		1		1		
34	H3	I	1		1		1		1		
35	H3	I	1		1		1		1		
36	H3	I	1		1		1		1		
TOTAL (NEW)			21	3	17	8	22	5	21	5	12

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

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
P-1	OLA	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ARAPAHO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-2	OLA	BUTTON PUSH ON DW	WAIT TO CROSS US-75 SBFR AT ARAPAHO RD
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ARAPAHO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	US-75 SBFR, WALK SIGN IS ON TO CROSS US-75 SBFR
P-5	Phase 6	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ARAPAHO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-6	Phase 6	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ARAPAHO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	WAIT
P-2	Phase 8	BUTTON PUSH ON DW	WAIT TO CROSS ARAPAHO RD AT US-75 SBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS ARAPAHO RD AT US-75 SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	ARAPAHO RD, WALK SIGN IS ON TO CROSS ARAPAHO RD
P-4	Phase 8	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS ARAPAHO RD AT US-75 SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-12	Phase 2	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ARAPAHO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-13	Phase 2	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ARAPAHO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-9	Phase 4	BUTTON PUSH ON DW	WAIT TO CROSS ARAPAHO RD AT US-75 SBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS ARAPAHO RD AT US-75 SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	ARAPAHO RD, WALK SIGN IS ON TO CROSS ARAPAHO RD
P-11	Phase 4	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS ARAPAHO RD AT US-75 SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-8	OLB	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ARAPAHO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-9	OLB	BUTTON PUSH ON DW	WAIT TO CROSS US-75 SBFR AT ARAPAHO RD
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-75 SBFR AT ARAPAHO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	US-75 SBFR, WALK SIGN IS ON TO CROSS US-75 SBFR

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4/25/2024

OTHON ENGINEERING
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DIAMOND SIGNALS

PROPOSED TABLES
US 75 AT ARAPAHO RD

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	54

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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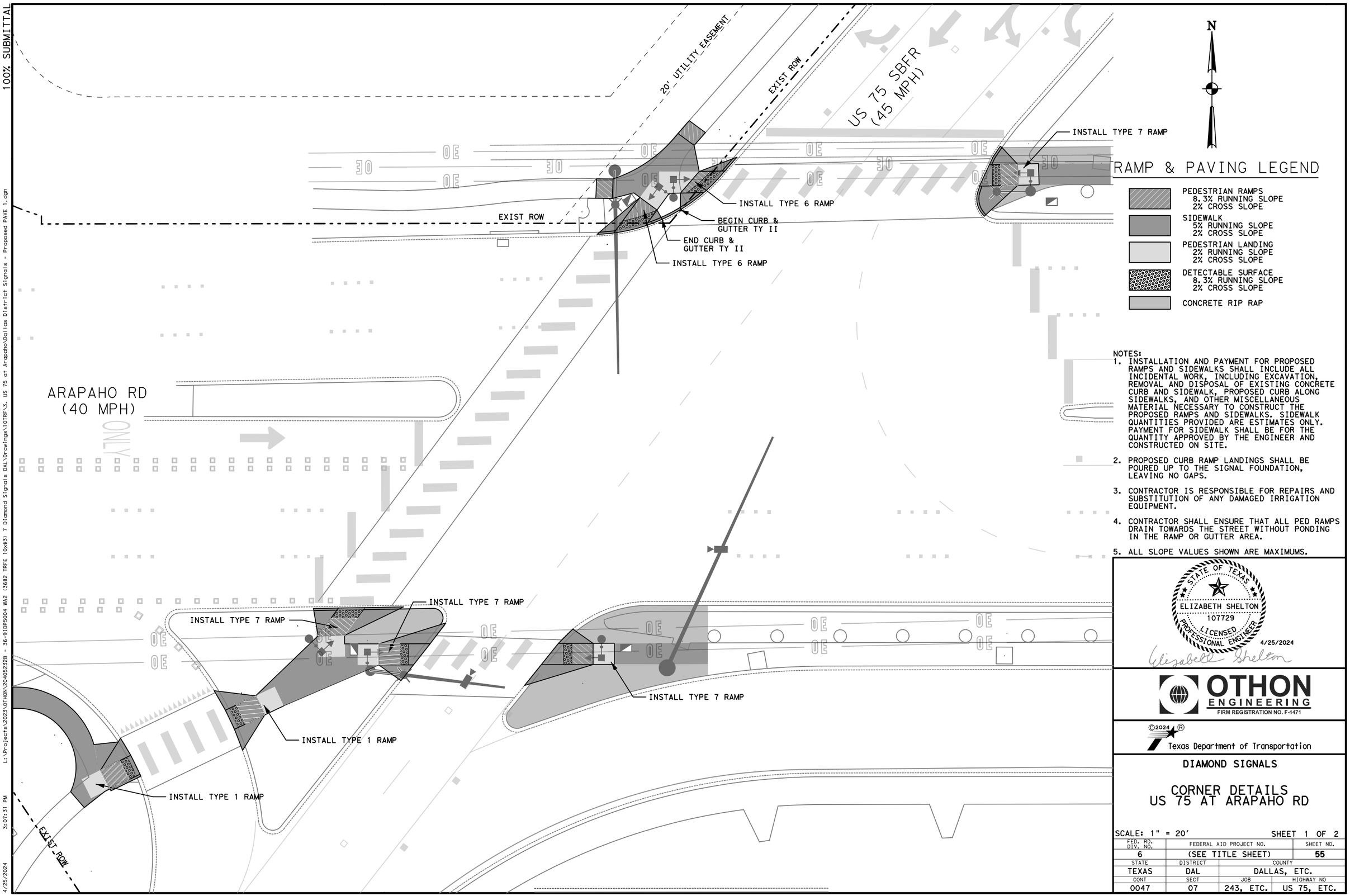

RAMP & PAVING LEGEND

- PEDESTRIAN RAMPS
  8.3% RUNNING SLOPE
  2% CROSS SLOPE
- SIDEWALK
  5% RUNNING SLOPE
  2% CROSS SLOPE
- PEDESTRIAN LANDING
  2% RUNNING SLOPE
  2% CROSS SLOPE
- DETECTABLE SURFACE
  8.3% RUNNING SLOPE
  2% CROSS SLOPE
- CONCRETE RIP RAP

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. PROPOSED CURB RAMP LANDINGS SHALL BE POURED UP TO THE SIGNAL FOUNDATION, LEAVING NO GAPS.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS AND SUBSTITUTION OF ANY DAMAGED IRRIGATION EQUIPMENT.
4. CONTRACTOR SHALL ENSURE THAT ALL PED RAMPS DRAIN TOWARDS THE STREET WITHOUT PONDING IN THE RAMP OR GUTTER AREA.
5. ALL SLOPE VALUES SHOWN ARE MAXIMUMS.

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DIAMOND SIGNALS

CORNER DETAILS
US 75 AT ARAPAHO RD

SCALE: 1" = 20'

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		55
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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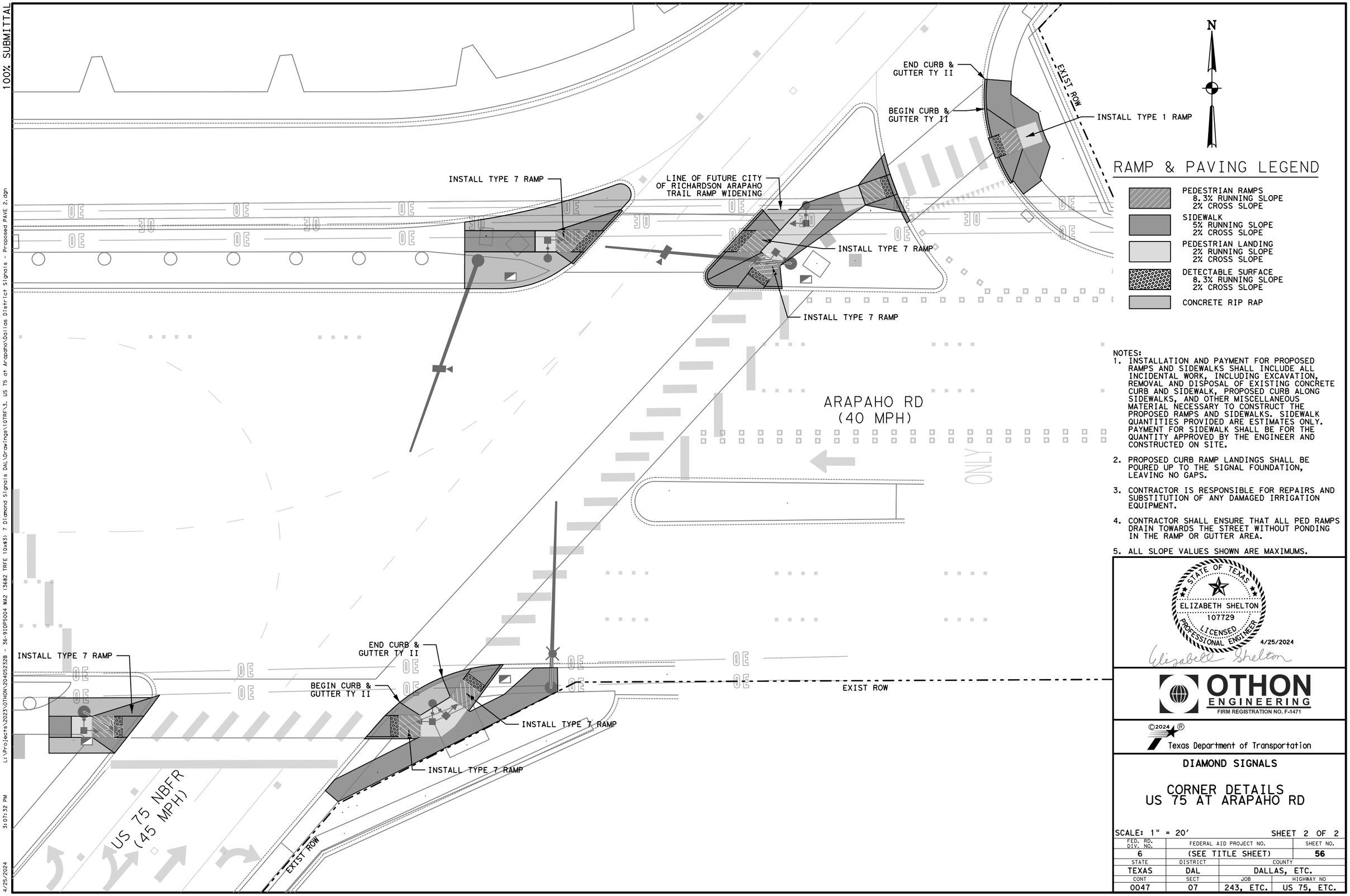

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RAMP & PAVING LEGEND

- PEDESTRIAN RAMPS — 8.3% RUNNING SLOPE, 2% CROSS SLOPE
- SIDEWALK — 5% RUNNING SLOPE, 2% CROSS SLOPE
- PEDESTRIAN LANDING — 2% RUNNING SLOPE, 2% CROSS SLOPE
- DETECTABLE SURFACE — 8.3% RUNNING SLOPE, 2% CROSS SLOPE
- CONCRETE RIP RAP

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. PROPOSED CURB RAMP LANDINGS SHALL BE POURED UP TO THE SIGNAL FOUNDATION, LEAVING NO GAPS.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS AND SUBSTITUTION OF ANY DAMAGED IRRIGATION EQUIPMENT.
4. CONTRACTOR SHALL ENSURE THAT ALL PED RAMPS DRAIN TOWARDS THE STREET WITHOUT PONDING IN THE RAMP OR GUTTER AREA.
5. ALL SLOPE VALUES SHOWN ARE MAXIMUMS.

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DIAMOND SIGNALS

CORNER DETAILS US 75 AT ARAPAHO RD

SCALE: 1" = 20' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	56

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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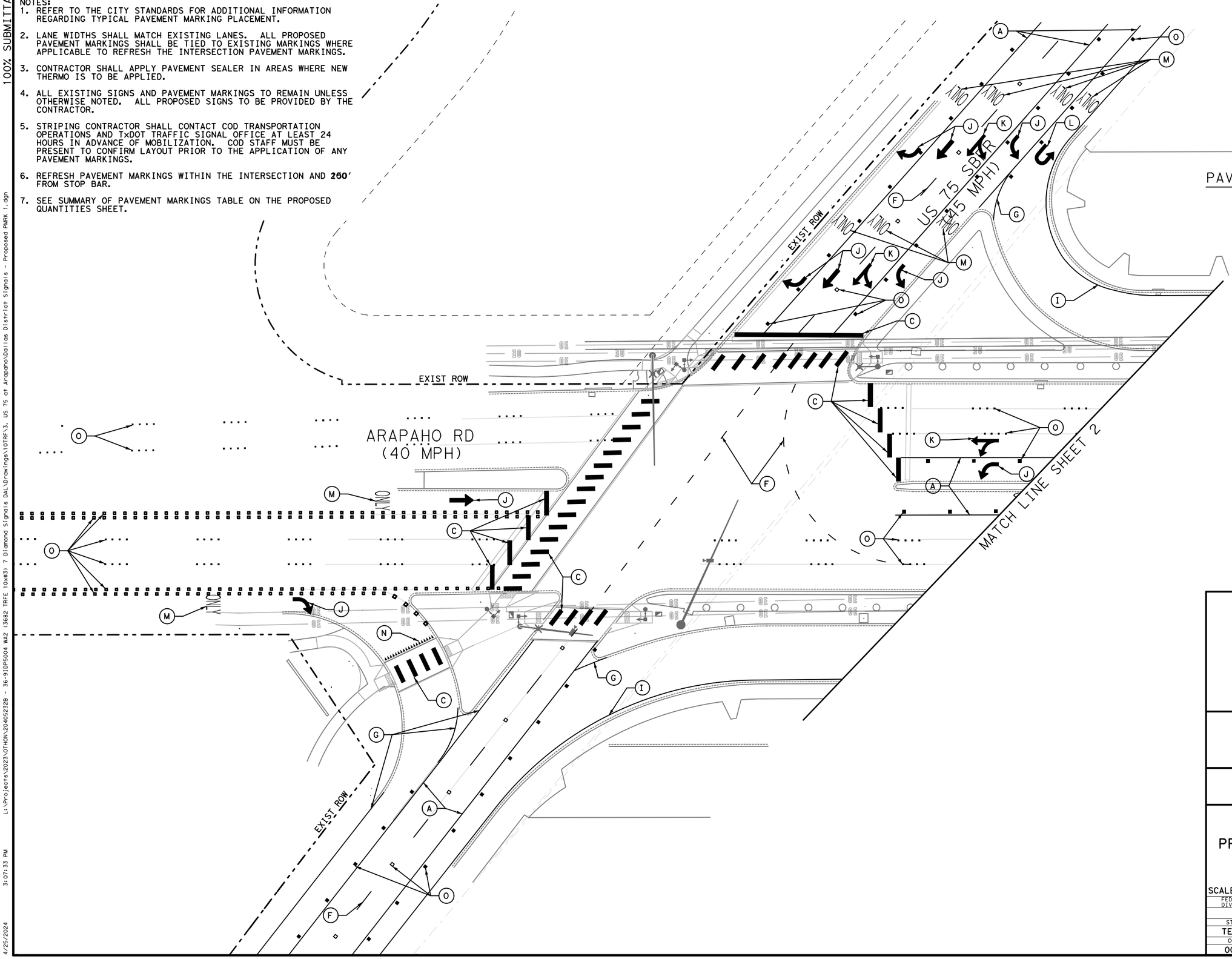
NOTES:
1. REFER TO THE CITY STANDARDS FOR ADDITIONAL INFORMATION REGARDING TYPICAL PAVEMENT MARKING PLACEMENT.
2. LANE WIDTHS SHALL MATCH EXISTING LANES. ALL PROPOSED PAVEMENT MARKINGS SHALL BE TIED TO EXISTING MARKINGS WHERE APPLICABLE TO REFRESH THE INTERSECTION PAVEMENT MARKINGS.
3. CONTRACTOR SHALL APPLY PAVEMENT SEALER IN AREAS WHERE NEW THERMO IS TO BE APPLIED.
4. ALL EXISTING SIGNS AND PAVEMENT MARKINGS TO REMAIN UNLESS OTHERWISE NOTED. ALL PROPOSED SIGNS TO BE PROVIDED BY THE CONTRACTOR.
5. STRIPING CONTRACTOR SHALL CONTACT COD TRANSPORTATION OPERATIONS AND TxDOT TRAFFIC SIGNAL OFFICE AT LEAST 24 HOURS IN ADVANCE OF MOBILIZATION. COD STAFF MUST BE PRESENT TO CONFIRM LAYOUT PRIOR TO THE APPLICATION OF ANY PAVEMENT MARKINGS.
6. REFRESH PAVEMENT MARKINGS WITHIN THE INTERSECTION AND 250' FROM STOP BAR.
7. SEE SUMMARY OF PAVEMENT MARKINGS TABLE ON THE PROPOSED QUANTITIES SHEET.



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PAVEMENT MARKING LEGEND

A	REFL PAV MRK TY I (W)8"(SLD)(100MIL)
B	REFL PAV MRK TY I (W)(12")(SLD)(100 MIL)
C	REFL PAV MRK TY I (W)(24")(SLD)(100 MIL)
D	RE PM W/RET REQ TY I (W)(4")(BRK)(100MIL)
E	RE PM W/RET REQ TY I (W)(4")(SLD)(100MIL)
F	RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
G	RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
H	RE PM W/RET REQ TY I (Y)(4")(SLD)(100MIL)
I	RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
J	PREFAB PAV MRK TY C (W)(ARROW)
K	PREFAB PAV MRK TY C (W)(DBL ARROW)
L	PREFAB PAV MRK TY C (W)(UTURN ARROW)
M	PREFAB PAV MRK TY C (W)(WORD)
N	PREFAB PAV MRK TY C (W) (18")(YLD TRI)
O	REFL PAV MRK TY II-C-R
P	REFL PAV MRK TY II-A-A

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DIAMOND SIGNALS

PROPOSED PAVEMENT MARKING US 75 AT ARAPAHO RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		57
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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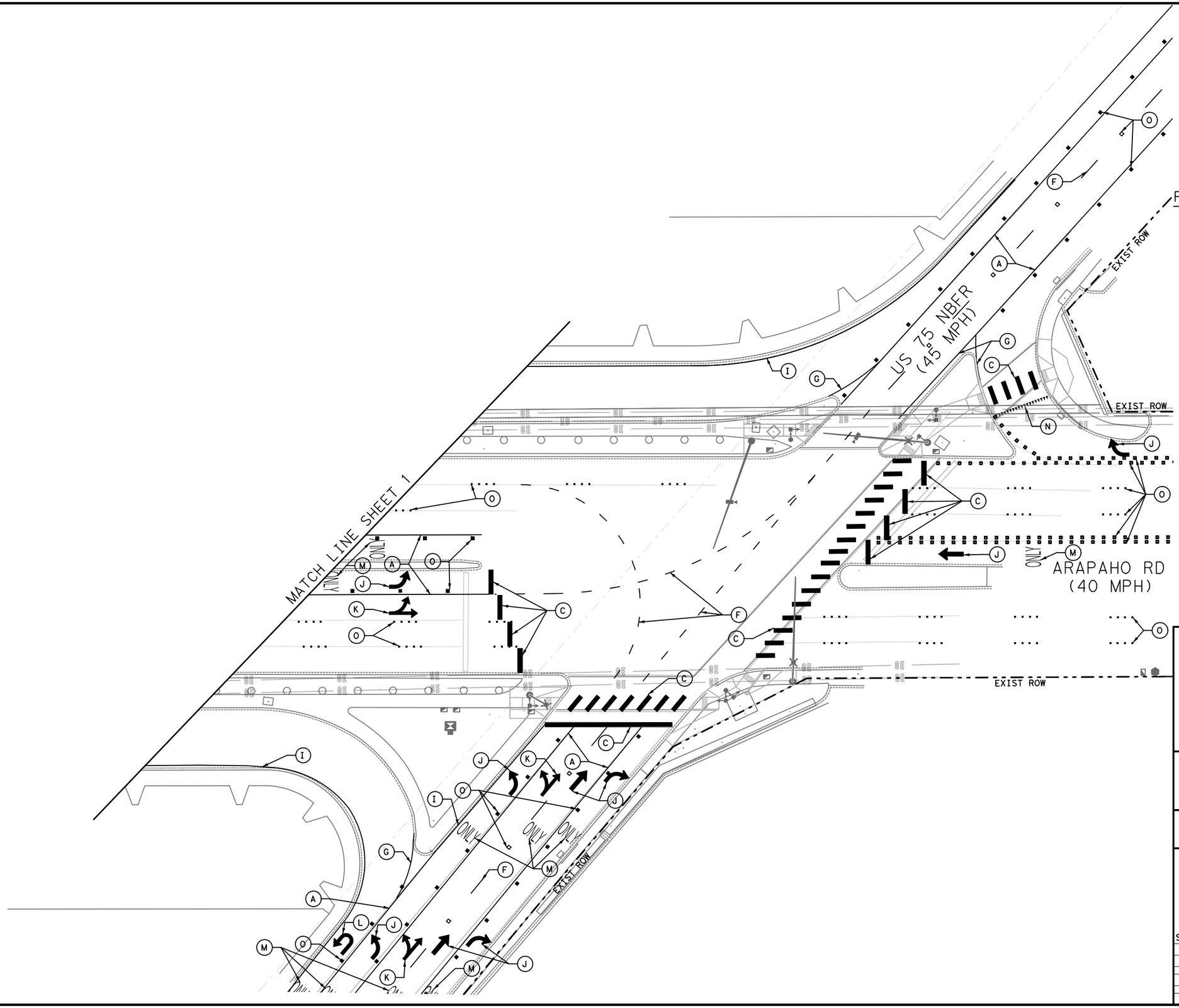

PAVEMENT MARKING LEGEND

- (A) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100 MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100 MIL)
- (D) RE PM W/RET REQ TY I (W)(4")(BRK)(100MIL)
- (E) RE PM W/RET REQ TY I (W)(4")(SLD)(100MIL)
- (F) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (G) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (H) RE PM W/RET REQ TY I (Y)(4")(SLD)(100MIL)
- (I) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (J) PREFAB PAV MRK TY C (W)(ARROW)
- (K) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (L) PREFAB PAV MRK TY C (W)(UTURN ARROW)
- (M) PREFAB PAV MRK TY C (W)(WORD)
- (N) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- (O) REFL PAV MRK TY II-C-R
- (P) REFL PAV MRK TY II-A-A

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DIAMOND SIGNALS

PROPOSED PAVEMENT MARKING US 75 AT ARAPAHO RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		58
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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PAVEMENT MARKING SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	2430
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	905
666	6225	PAVEMENT SEALER 6"	LF	1960
666	6226	PAVEMENT SEALER 8"	LF	2430
666	6230	PAVEMENT SEALER 24"	LF	905
666	6231	PAVEMENT SEALER (ARROW)	EA	18
666	6232	PAVEMENT SEALER (WORD)	EA	20
666	6234	PAVEMENT SEALER (DBL ARROW)	EA	6
666	6243	PAVEMENT SEALER (YLD TRI)	EA	38
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	420
666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	260
666	6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	1280
668	6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	18
668	6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	6
668	6085	PREFAB PAV MRK TY C (W) (WORD)	EA	20
668	6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	38
672	6010	REFL PAV MRKR TY II-C-R	EA	888
678	6002	PAV SURF PREP FOR MRK (6")	LF	1960
678	6004	PAV SURF PREP FOR MRK (8")	LF	2430
678	6008	PAV SURF PREP FOR MRK (24")	LF	905
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	18
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	6
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	20
678	6022	PAV SURF PREP FOR MRK (18")(YLD TRI)	EA	38
678	6033	PAV SURF PREP FOR MRK (RPM)	EA	920

PEDESTRIAN RAMP / SIDEWALK SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	18.9
0529	6008	CONC CURB & GUTTER (TY II)	LF	31
0531	6001	CONC SIDEWALKS (4")	SY	143
0531	6004	CURB RAMPS (TY 1)	EA	3
0531	6009	CURB RAMPS (TY 6)	EA	2
0531	6010	CURB RAMPS (TY 7)	EA	10

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DIAMOND SIGNALS

PAVING AND PAVEMENT MARKING QUANTITIES US 75 AT ARAPAHO RD

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		59
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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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 THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.

2. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.

3. CONTRACTOR SHALL MAINTAIN THE EXISTING SIGNAL INSTALLATION AND OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED SIGNAL IS OPERATIONAL.

4. CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AFTER PROPOSED SIGNAL EQUIPMENT IS OPERATIONAL. THE EXISTING GROUND BOXES SHALL BE REMOVED AND BACKFILLED WITH SIMILAR MATERIAL TO AN EQUIVALENT CONDITION UNLESS IT IS IDENTIFIED IN THE PLANS TO REMAIN. THE EXISTING FOUNDATIONS SHALL BE REMOVED AND THE SIGNAL POLE FOUNDATIONS SHALL BE REMOVED TO A MINIMUM OF 2 FT BELOW EXISTING SURFACE AND BACKFILLED WITH SIMILAR MATERIAL TO AN EQUIVALENT CONDITION IN THE SURROUNDING AREA, SEE GENERAL NOTES AND SPECIFICATIONS FOR MORE INFORMATION.

5. ELIMINATE THE EXISTING PAVEMENT MARKINGS WITHIN THE INTERSECTION AND ALONG 175 FT IN EACH DIRECTION FROM THE STOP BAR, REFER TO PAVEMENT MARKING SHEET FOR ADDITIONAL INFORMATION.

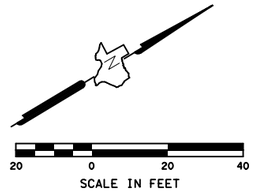
6. EXISTING SIGNS (1) - (6) SHALL BE REMOVED WITH TRAFFIC SIGNAL EQUIPMENT.

7. CURB RAMP AND SIDEWALK REMOVALS SHALL BE SUBSIDIARY TO THE INSTALLATION OF NEW CURB RAMP OR CONCRETE SIDEWALK , (SEE ITEM 531 QTYS AND PROPOSED PEDESTRIAN RAMP AND SIDEWALK LAYOUT)

REMOVAL SUMMARY (1 OF 2)

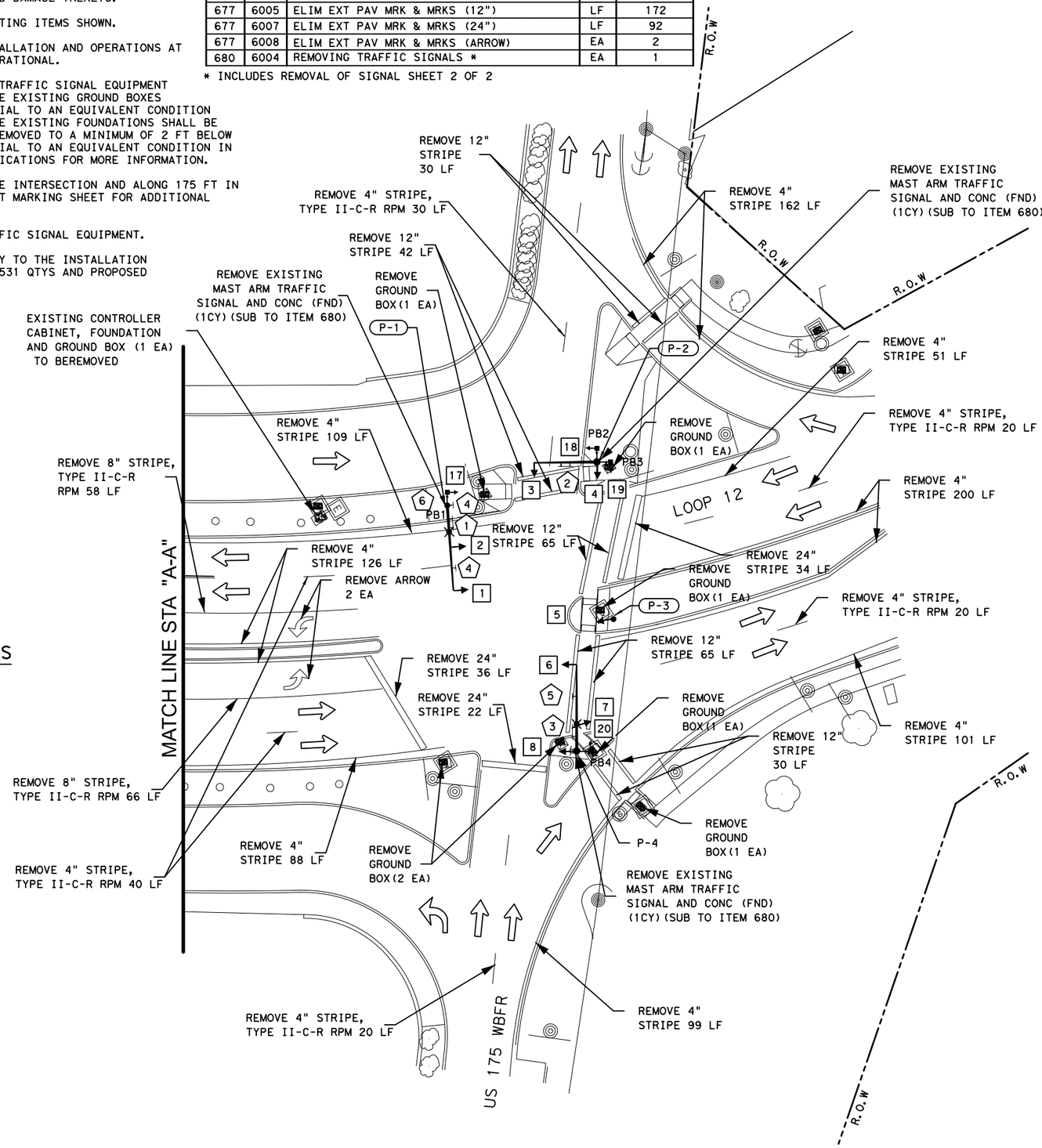
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
624	6028	REMOVE GROUND BOX	EA	8
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	1066
677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	124
677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	172
677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	92
677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	2
680	6004	REMOVING TRAFFIC SIGNALS *	EA	1

* INCLUDES REMOVAL OF SIGNAL SHEET 2 OF 2



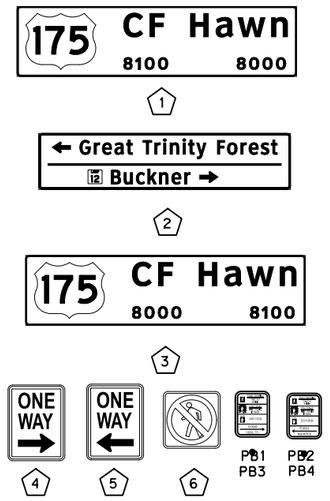
EXISTING SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- 24" PED POLE
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINARE (250W EQ)
- TRAFFIC SIGNAL CABINET
- TYPE D GROUND BOX
- 16 SIGNAL HEAD NUMBER
- 1 SIGN LABEL
- ELECTRICAL SERVICE
- P-# EXISTING TRAFFIC SIGNAL POLE NUMBER
- EXISTING ROADSIDE SIGN
- DIRECTION OF TRAVEL



EXISTING SIGNAL HEADS

EXISTING POLE AND MAST ARM SIGNS



STATE OF TEXAS
CHARLES R. STEVENS, JR.
101286
LICENSED PROFESSIONAL ENGINEER
CHARLES R. STEVENS, JR., P.E.
4/25/2024
DATE

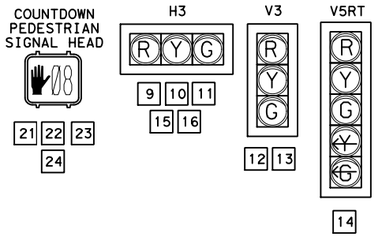
STEVENS TECHNICAL
TEXAS REGISTERED ENGINEERING FIRM F-13097
8131 JACKRABBIT RD
Houston, TX. 77095
PHONE: (713) 828-4742

US 175 AT LOOP 12 EXISTING CONDITIONS AND REMOVAL

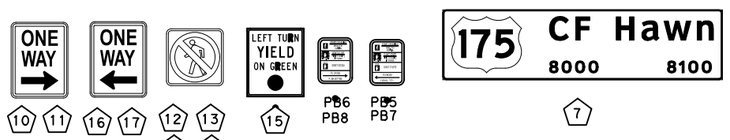
SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		60
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS	
CONT	SECT	JOB	HIGHWAY NO
0197	02	134	US 175

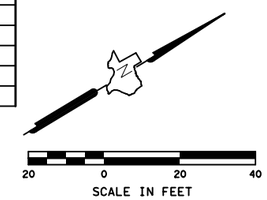
EXISTING SIGNAL HEADS

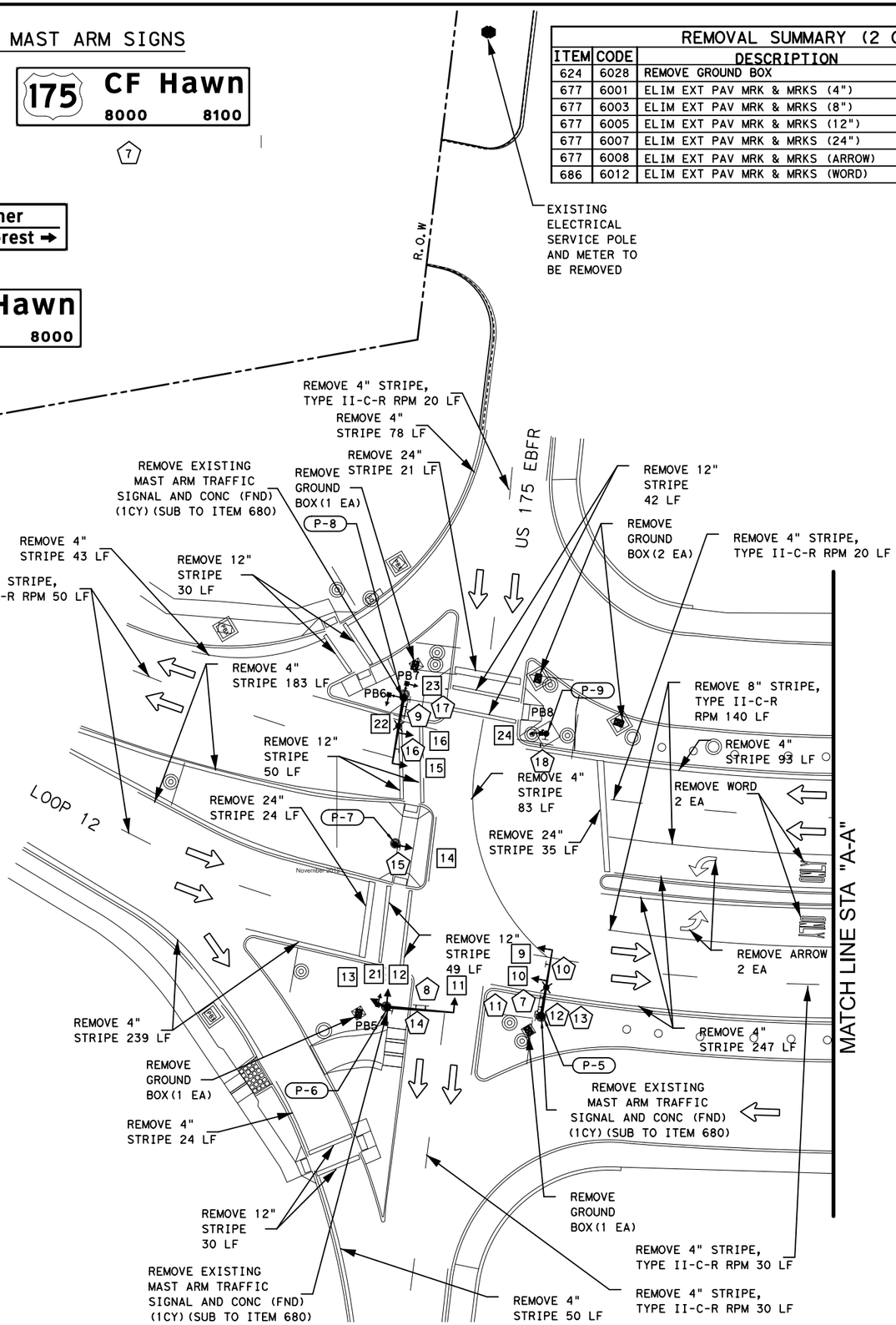


EXISTING POLE AND MAST ARM SIGNS



REMOVAL SUMMARY (2 OF 2)				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
624	6028	REMOVE GROUND BOX	EA	5
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	1190
677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	140
677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	201
677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	80
677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	2
686	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	2





EXISTING SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- 24" PED POLE
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINARE (250W EQ)
- TRAFFIC SIGNAL CABINET
- TYPE D GROUND BOX
- 16 — SIGNAL HEAD NUMBER
- S1 — SIGN LABEL
- ELECTRICAL SERVICE
- P-# — EXISTING TRAFFIC SIGNAL POLE NUMBER
- EXISTING ROADSIDE SIGN
- DIRECTION OF TRAVEL

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
3. CONTRACTOR SHALL MAINTAIN THE EXISTING SIGNAL INSTALLATION AND OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED SIGNAL IS OPERATIONAL.
4. CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AFTER PROPOSED SIGNAL EQUIPMENT IS OPERATIONAL. THE EXISTING GROUND BOXES SHALL BE REMOVED AND BACKFILLED WITH SIMILAR MATERIAL TO AN EQUIVALENT CONDITION UNLESS IT IS IDENTIFIED IN THE PLANS TO REMAIN. THE EXISTING FOUNDATIONS SHALL BE REMOVED AND THE SIGNAL POLE FOUNDATIONS SHALL BE REMOVED TO A MINIMUM OF 2 FT BELOW EXISTING SURFACE AND BACKFILLED WITH SIMILAR MATERIAL TO AN EQUIVALENT CONDITION IN THE SURROUNDING AREA, SEE GENERAL NOTES AND SPECIFICATIONS FOR MORE INFORMATION.
5. ELIMINATE THE EXISTING PAVEMENT MARKINGS WITHIN THE INTERSECTION AND ALONG 175 FT IN EACH DIRECTION FROM THE STOP BAR, REFER TO PAVEMENT MARKING SHEET FOR ADDITIONAL INFORMATION.
6. EXISTING SIGNS (7) - (18) SHALL BE REMOVED WITH TRAFFIC SIGNAL EQUIPMENT.
7. CURB RAMP AND SIDEWALK REMOVALS SHALL BE SUBSIDIARY TO THE INSTALLATION OF NEW CURB RAMP OR CONCRETE SIDEWALK , (SEE ITEM 531 QTYS AND PROPOSED PEDESTRIAN RAMP AND SIDEWALK LAYOUT)

STATE OF TEXAS
CHARLES R. STEVENS, JR
101286
LICENSED PROFESSIONAL ENGINEER

CHARLES R. STEVENS, JR., P.E. — 4/25/2024 DATE

STEVENS TECHNICAL
TEXAS REGISTERED ENGINEERING FIRM F-13097
8131 JACKRABBIT RD
Houston, TX. 77095
PHONE: (713) 828-4742

US 175 AT LOOP 12
EXISTING CONDITIONS AND REMOVAL

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		61
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS	
CONT	SECT	JOB	HIGHWAY NO
0197	02	134	US 175

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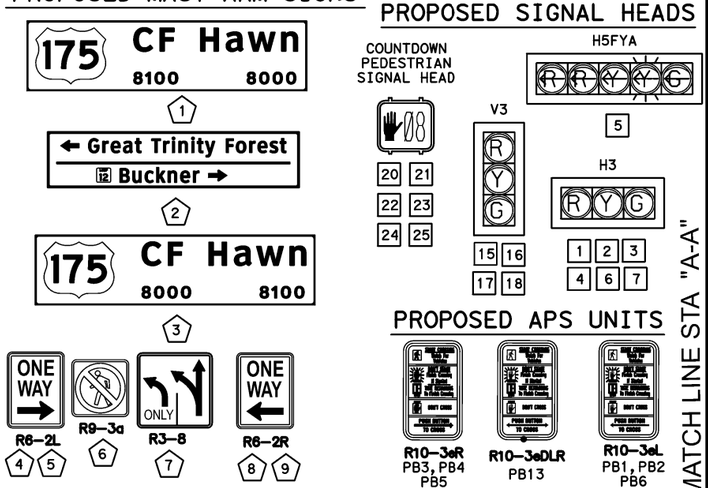
NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF DALLAS TRAFFIC MANAGEMENT CENTER AT (214-670-3095) 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, RADAR DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
4. CONTRACTOR SHALL COORDINATE WITH ONCOR CONCERNING TRAFFIC SIGNAL ELECTRICAL SERVICE. CONTACT ONCOR (CORWIN CALLOWAY AT corwin.calloway@ONCOR.COM REGARDING POINT OF DELIVERY AND DISTRIBUTION TO ELECTRICAL PEDESTAL SERVICE. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. THE FOLLOWING ITEMS WILL BE FURNISHED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR: SIGNAL CABINET AND INTERNAL HARDWARE, RADAR AND RADAR CABLE AND ALL PROPOSED SIGNS. CONTACT MR. ALFRED LEMON AT 214-670-4812 TO SCHEDULE PICK-UP OF MATERIALS.
6. INSTALL BASE MOUNTED CONTROLLER CABINET (TYPE 332 CABINET) AND FOUNDATION.
7. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
8. SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BLACK POWDERCOATED ALUMINUM VISORS AND BACK PLATES.
9. RADAR DETECTION ZONES TO BE PROGRAMMED BY THE CITY OF DALLAS. CONTACT SRINIVASA VEERAMALLU, PE. AT 214-670-5892 WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.

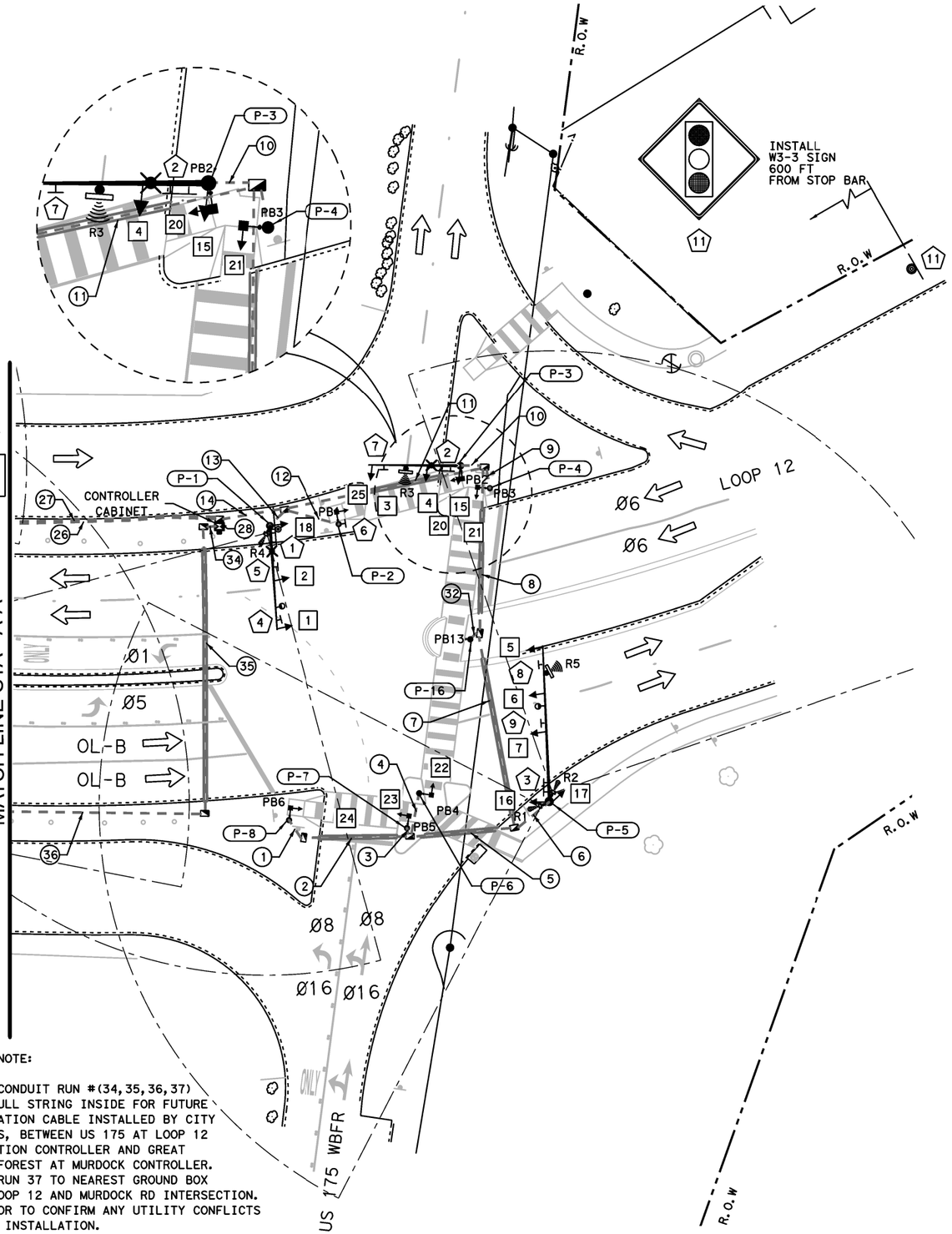
PROPOSED MAST ARM SIGNS



PROPOSED SIGNAL HEADS

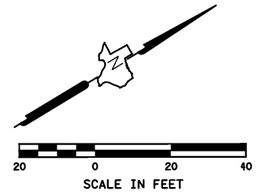
PROPOSED APS UNITS

10. ALL SIGNAL CABLES SHALL BE WIRED IN ACCORDANCE WITH THE CABINET PREPARATION NOTES SUPPLIED BY THE CITY OF DALLAS.
11. CONTRACTOR SHALL COORDINATE THE TRAFFIC SIGNAL POLE FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED FIRST, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER SO A FIELD MEETING CAN BE SCHEDULED TO DETERMINE IF FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL POLE FOUNDATIONS ARE INSTALLED FIRST, THE CURB RAMPS AND SIDEWALKS SHALL BE MODIFIED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS ARE 10" OR LESS.
12. PROPOSED APS UNITS SHALL BE PLACED ADJACENT TO A LEVEL LANDING AREA (2% MAX IN ANY DIRECTION). IF THE DISTANCE FROM THE PUSH BUTTON TO THE EDGE OF ACCESSIBLE PATH EXCEEDS 10", THE CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON EXTENDER TO MAKE THE REACH 10" OR LESS. MEASUREMENT AND PAYMENT SHALL BE CONSIDERED SUBSIDIARY TO THE INSTALLATION OF THE TRAFFIC SIGNAL EQUIPMENT.
13. 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.
14. PROPOSED CURB RAMP LANDING SHALL BE POURED UP TO THE SIGNAL FOUNDATION LEAVING NO GAPS.
15. CONTRACTOR TO MAINTAIN FULL ACCESS TO A MINIMUM OF TWO PEDESTRIAN CROSSINGS AT ALL TIMES DURING CONSTRUCTION.



SPECIAL NOTE:

INSTALL CONDUIT RUN #(34, 35, 36, 37) WITH A PULL STRING INSIDE FOR FUTURE COMMUNICATION CABLE INSTALLED BY CITY OF DALLAS, BETWEEN US 175 AT LOOP 12 INTERSECTION CONTROLLER AND GREAT TRINITY FOREST AT MURDOCK CONTROLLER. CONNECT RUN 37 TO NEAREST GROUND BOX AT THE LOOP 12 AND MURDOCK RD INTERSECTION. CONTRACTOR TO CONFIRM ANY UTILITY CONFLICTS PRIOR TO INSTALLATION.



PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINARE (250W EQ)
- RADAR PRESENCE DETECTOR
- RADAR DETECTOR - ADVANCE
- OPTICOM
- CCTV
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE C GROUND BOX
- TYPE I ITS GROUND BOX
- CONDUIT "TRENCH"
- CONDUIT "BORE"
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- (S1) SIGN LABEL
- ELECTRICAL SERVICE
- (P-#) PROPOSED TRAFFIC SIGNAL POLE NUMBER
- PROPOSED ROADSIDE SIGN

STATE OF TEXAS
CHARLES R. STEVENS, JR.
101286
LICENSED PROFESSIONAL ENGINEER

CHARLES R. STEVENS, JR., P.E. — 4/25/2024 DATE

STEVENS TECHNICAL
TEXAS REGISTERED ENGINEERING FIRM F-13097
8131 JACKRABBIT RD
Houston, TX. 77095
PHONE: (713) 828-4742

Texas Department of Transportation

US 175 AT LOOP 12 PROPOSED SIGNAL LAYOUT

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		62
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS	
CONT	SECT	JOB	HIGHWAY NO
0197	02	134	US 175

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NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF DALLAS TRAFFIC MANAGEMENT CENTER AT (214-670-3095) 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, RADAR DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
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6. INSTALL BASE MOUNTED CONTROLLER CABINET (TYPE 332 CABINET) AND FOUNDATION.
7. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
8. SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BLACK POWDERCOATED ALUMINUM VISORS AND BACK PLATES.
9. RADAR DETECTION ZONES TO BE PROGRAMMED BY THE CITY OF DALLAS. CONTACT SRINIVASA VEERAMALLU, PE. AT 214-670-5892 WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.

PROPOSED SIGNAL HEADS

COUNTDOWN PEDESTRIAN SIGNAL HEAD — 26 27 28 / 29 30 31

H5FYA — 12

H3 — 8 9 10 / 11 13 14

V3 — 19

PROPOSED MAST ARM SIGNS

175 CF Hawn 8100 8000 — 12

175 CF Hawn 8000 8100 — 10

ONE WAY — R6-2L — 13 14

R9-3a — 15

ONLY — R3-8 — 16

ONE WAY — R6-2R — 17 18

← 12 Buckner
Great Trinity Forest → — 11

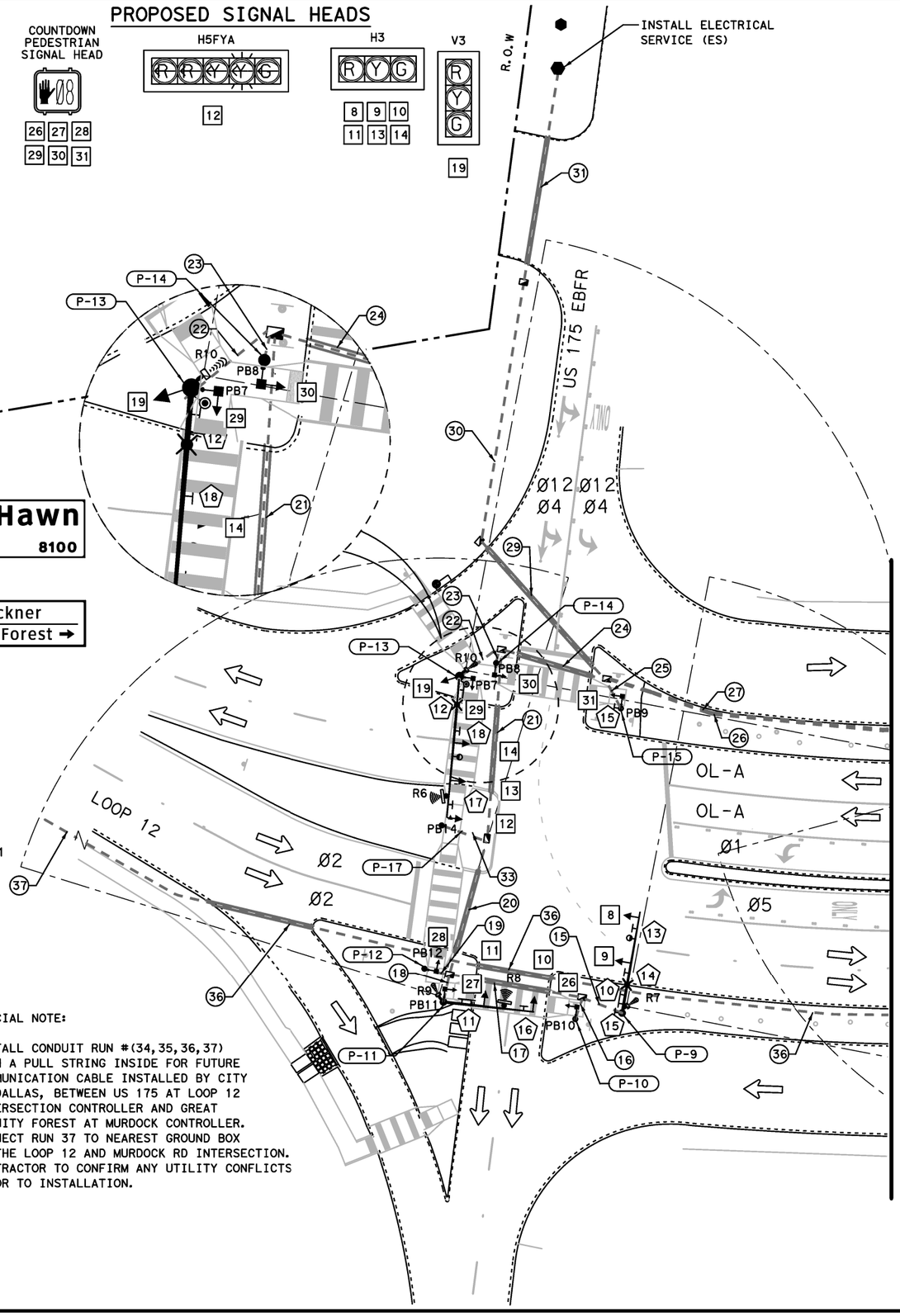
PROPOSED APS UNITS

R10-3eR — PB8, PB9, PB10, PB12

R10-3eDLR — PB14

R10-3eL — PB7, PB11

10. ALL SIGNAL CABLES SHALL BE WIRED IN ACCORDANCE WITH THE CABINET PREPARATION NOTES SUPPLIED BY THE CITY OF DALLAS.
11. CONTRACTOR SHALL COORDINATE THE TRAFFIC SIGNAL POLE FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED FIRST, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER SO A FIELD MEETING CAN BE SCHEDULED TO DETERMINE IF FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL POLE FOUNDATIONS ARE INSTALLED FIRST, THE CURB RAMPS AND SIDEWALKS SHALL BE MODIFIED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS ARE 10" OR LESS.
12. PROPOSED APS UNITS SHALL BE PLACED ADJACENT TO A LEVEL LANDING AREA (2% MAX IN ANY DIRECTION). IF THE DISTANCE FROM THE PUSH BUTTON TO THE EDGE OF ACCESSIBLE PATH EXCEEDS 10", THE CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON EXTENDER TO MAKE THE REACH 10" OR LESS. MEASUREMENT AND PAYMENT SHALL BE CONSIDERED SUBSIDIARY TO THE INSTALLATION OF THE TRAFFIC SIGNAL EQUIPMENT.
13. 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.
14. PROPOSED CURB RAMP LANDING SHALL BE POURED UP TO THE SIGNAL FOUNDATION LEAVING NO GAPS.
15. CONTRACTOR TO MAINTAIN FULL ACCESS TO A MINIMUM OF TWO PEDESTRIAN CROSSINGS AT ALL TIMES DURING CONSTRUCTION.



SPECIAL NOTE:

INSTALL CONDUIT RUN #(34,35,36,37) WITH A PULL STRING INSIDE FOR FUTURE COMMUNICATION CABLE INSTALLED BY CITY OF DALLAS, BETWEEN US 175 AT LOOP 12 INTERSECTION CONTROLLER AND GREAT TRINITY FOREST AT MURDOCK CONTROLLER. CONNECT RUN 37 TO NEAREST GROUND BOX AT THE LOOP 12 AND MURDOCK RD INTERSECTION. CONTRACTOR TO CONFIRM ANY UTILITY CONFLICTS PRIOR TO INSTALLATION.

N

20 0 20 40
SCALE IN FEET

PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINARE (250W EQ)
- RADAR PRESENCE DETECTOR
- RADAR DETECTOR - ADVANCE
- OPTICOM
- CCTV
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE C GROUND BOX
- TYPE I ITS GROUND BOX
- CONDUIT "TRENCH"
- CONDUIT "BORE"
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- ELECTRICAL SERVICE
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

STATE OF TEXAS
CHARLES R. STEVENS, JR.
101286
LICENSED PROFESSIONAL ENGINEER

CHARLES R. STEVENS, JR., P.E. — 4/25/2024 DATE

STEVENS TECHNICAL
TEXAS REGISTERED ENGINEERING FIRM F-13097
8131 JACKRABBIT RD Houston, TX. 77095 PHONE: (713) 828-4742

Texas Department of Transportation

US 175 AT LOOP 12 PROPOSED SIGNAL LAYOUT

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		63
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS	
CONT	SECT	JOB	HIGHWAY NO
0197	02	134	US 175

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SUMMARY OF CONDUIT AND CABLES

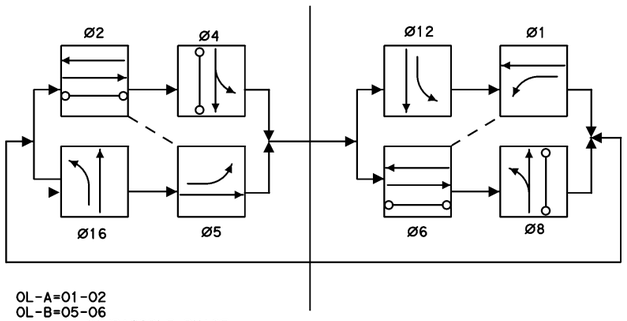
RUN NO.	LENGTH	CONDUIT(618) PVC SCH 80										ELECTRICAL CONDUCTORS (620)								TRAFFIC SIGNAL CABLES (684)										* RADAR (6292)				* OPTICOM		PTZ CABLE	
		TRENCH(6046) 2"		(6047)BORE 2"		TRENCH(6053) 3"		(6058)TRENCH 4"		(6059)BORE 4"		GROUND(6009) #6 (BARE)		POWER(6010) #6 (XHHW)		LUM(6008) #8 (XHHW)		LUM(6004) #12 (XHHW)		PB(6079) TY C 2/C #12		PED(6036) TY A 10/C #14		VEH(6031) TY A 5/C #14		VEH(6033) TY A 7/C #14		VEH(6046) TY A 20/C #14		ADVANCE COMM. CABLE*		PRESENCE COMM. CABLE*		COMM. CABLE*		CAT 5E	
		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	EA	LF	EA	LF
1	10	1	10									1	10							1	10	1	10												
2	35			1	35							1	35							1	35	1	35												
3	5	1	5									1	5							1	5	1	5												
4	15	1	15									1	15							1	15	1	15												
5	30			1	30							1	30							3	30	3	30												
6	15					1	15					1	15															1	15	1	15	2	15	1	15		
7	60									1	60	1	60							3	60	3	60					1	60	1	60	2	60	1	60		
8	50							1	15	1	35	1	50							4	50	3	50					1	50	1	50	2	50	1	50		
9	10	1	10									1	10							1	10	1	10												
10	20	1	10			1	10					2	10			2	10			1	10							1	10	1	10						
11	65							1	35	1	30	1	65			2	65			6	65	4	65					2	65	2	65	2	65	1	65		
12	20	1	20									1	20							1	20	1	20												
13	10					1	10					1	10			2	10											1	10			1	10	1	10		
14	20	1	20			2	20					3	20			2	20			7	20	5	20					3	20	2	20	3	20	2	20	1	20
15	15					1	15					1	15			2	15											1	15			1	15	1	15		
16	10	1	10									1	10							1	10	1	10												
17	40							1	5	1	35	1	40			2	40			1	40	1	40					1	40			1	40	1	40		
18	10					1	10					1	10							1	10							1	10	1	10	1	10				
19	10	1	10									1	10							1	10	1	10												
20	45							1	10	1	35	1	45			2	45			3	45	2	45					2	45	1	45	2	45	1	45		
21	60							1	20	1	40	1	60			2	60			4	60	2	60					2	60	1	60	2	60	1	60		
22	15					1	15					1	15							1	15							1	15	1	15	1	15	1	15
23	5	1	5									1	5							1	5	1	5												
24	35									2	35	2	35			2	35			6	35	3	35					3	35	2	35	3	35	2	35	1	35
25	10	1	10									1	10							1	10	1	10												
26	160					2	160					2	160							7	160	4	160					3	160	2	160	3	160	2	160	1	160
27	160					1	160					1	160	2	160	2	160																		
28	5	1	5			1	5	1	5			3	5							14	5	9	5					6	5	4	5	6	5	4	5	2	5
29	60			1	60							1	60	2	60	4	60																		
30	85	1	85									1	85	2	85	4	85																		
31	70	1	20	1	50							1	70	2	70	4	70																		
32	5	1	5									1	5							1	5														
33	10	1	10									1	10							1	10														
34	5	1	5																																
35	90			1	90																														
36	325	1	245	1	80																														
37	150	1	40		110																														
TOTALS			650		515		600		90		305		1420		750		1780				2995		1950						1240		845		1355		825		250

CABLES INSIDE POLES

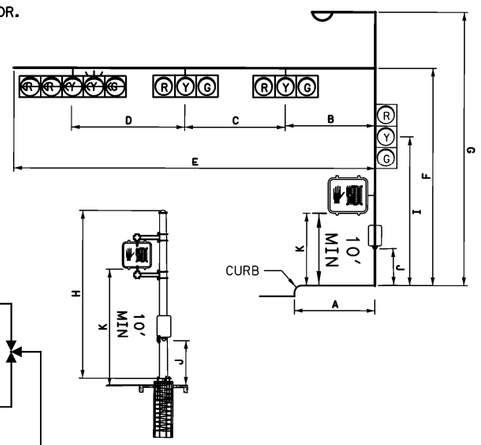
POLE ID.																																	
P-1												80			104											1	20	1	45	1	20		
P-2													5	10																			
P-3												80	5	10	91						1	35											
P-4													5	10																			
P-5															126	70				1	60	2	20	1	50							
P-6													5	10																			
P-7													5	10																			
P-8													5	10																			
P-9												80			88											1	20	1	44				
P-10													5	10																			
P-11													5	10	80					1	39	1	20										
P-12													5	10																			
P-13												80	5	10	107	65				1	57	1	20	1	45			1	20				
P-14													5	10																			
P-15													5	10																			
P-16													5																				
P-17													5																				
TOTALS												320	70	120	596	135					191		120					184		40				

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

PHASING SEQUENCE



OL-A=01-02
OL-B=05-06
— — — COMPATIBLE PHASE
o——o PEDESTRIAN PHASE



POLE DETAILS

POLE ID.	DIMINSIONS (SEE FIGURE) A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	I (FT)	J (FT)	K (FT)	SIG HEADS ON MAST ARM	LUM ARM	ITEM 688 APS UNITS	ITEM 416 FOUNDATION *24"	30"	36"	48"	FND TYPE 80 MPH ZONE
P-1	4	16	15		32	19	30		15			2	1			12'			30-A
P-2	PEDESTRIAN SIGNAL POLE							15		3.5	10			1	6'				24-A
P-3	5	9	17		28	19	30		15	3.5	10	2	1	1		12'			30-A
P-4	PEDESTRIAN SIGNAL POLE							15		3.5	10			1	6'				24-A
P-5	4	21	12	14	48	19			15			3					14'		36-A
P-6	PEDESTRIAN SIGNAL POLE							15		3.5	10			1	6'				24-A
P-7	PEDESTRIAN SIGNAL POLE							15		3.5	10			1	6'				24-A
P-8	PEDESTRIAN SIGNAL POLE							15		3.5	10			1	6'				24-A
P-9	8	16	15		32	19	30					2	1			12'			30-A
P-10	PEDESTRIAN SIGNAL POLE							15		3.5	10			1	6'				24-A
P-11	8	12	16		28	19				3.5	10	2		1		12'			30-A
P-12	PEDESTRIAN SIGNAL POLE							15		3.5	10			1	6'				24-A
P-13	6	20	12	12	44	19	30			3.5	10	3	1	1			14'		36-A
P-14	PEDESTRIAN SIGNAL POLE							15		3.5	10			1	6'				24-A
P-15	PEDESTRIAN SIGNAL POLE							15		3.5	10			1	6'				24-A
P-16	PEDESTRIAN SIGNAL POLE							15		3.5				1	6'				24-A
P-17	PEDESTRIAN SIGNAL POLE							15		3.5				1	6'				24-A
TOTALS												14	4	14	66	48'	28'		

* SUBSIDIARY TO ITEM 687.

GROUND BOX SUMMARY			
ITEM NO	DESCRIPTION	UNIT	QTY.
0624 - 6008	GROUND BOX TY C (162911) W/ APRON	EA	14
6186 - 6001	ITS GND BOX(POLY)(TY1)(243624)W/APRON	EA	2

SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED (5) - 14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CKT. BKR. POLE/AMPS	FOUR-POLE CONTACTOR AMPS	PANELBD/ LOADCENTER AMP RATING	BRANCH CIRCUIT ID	BRANCH CKT. BKR. POLE/AMP	BRANCH CIRCUIT AMPS	KVA LOAD
ES	ELEC SERV TY D (120/240) 070(NS)SS(E)PS(U)	2"	3/#4	N/A	2P/70		100	SIG	1P/50	40	
						30		LUM-EBFR	2P/20	2.13	<7.1
						30		LUM-WBFR	2P/20	2.13	

SIGNAL HEADS "LED" (ITEM 682)

SIGNAL HEAD NO	SIGNAL HEAD TYPE	12" LED SIGNAL INDICATION BACK PLATE 3 SEC	5 SEC	<-R-	SIGNAL HEADS R	Y	<-Y-	<-G-	G	PED SIG SEC (LED)
		EA	EA	EA	EA	EA	EA	EA	EA	EA
1	H3	1			1	1			1	
2	H3	1			1	1			1	
3	H3	1			1	1			1	
4	H3	1			1	1			1	
5	H5FYA		1	2			2	1		
6	H3	1			1	1			1	
7	H3	1			1	1			1	
8	H3	1			1	1			1	
9	H3	1			1	1			1	
10	H3	1			1	1			1	
11	H3	1			1	1			1	
12	H5FYA		1	2			2	1		
13	H3	1			1	1			1	
14	H3	1			1	1			1	
15	V3	1			1	1			1	
16	V3	1			1	1			1	
17	V3	1			1	1			1	
18	V3	1			1	1			1	
19	V3	1			1	1			1	
20	PED									1
21	PED									1
22	PED									1
23	PED									1
24	PED									1
25	PED									1
26	PED									1
27	PED									1
28	PED									1
29	PED									1
30	PED									1
31	PED									1
TOTAL		17	2	4	17	17	4	2	17	12

STATE OF TEXAS
CHARLES R. STEVENS, JR.
101286
PROFESSIONAL ENGINEER

CHARLES R. STEVENS, JR., P.E. — 4/25/2024 DATE

STEVENS TECHNICAL
TEXAS REGISTERED ENGINEERING FIRM F-13097
8131 JACKRABBIT RD
Houston, TX. 77095
PHONE: (713) 828-4742

Texas Department of Transportation

US 175 AT LOOP 12 PROPOSED SIGNAL DETAILS

SCALE: 1" = 40' — SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	64

STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS

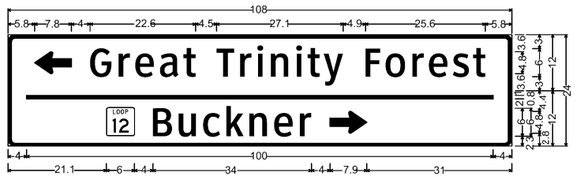
CONT	SECT	JOB	HIGHWAY NO
0197	02	134	US 175

CABLE TERMINATION

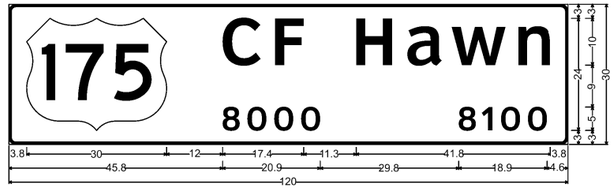
CNDR NO.	CNDR COLOR	CABLE 1 FROM P-5 TO CABINET 20/C #14	CABLE 2 FROM P-3 TO CABINET 20/C #14	CABLE 3 FROM P-1 TO CABINET 20/C #14	CABLE 4 FROM P-9 TO CABINET 20/C #14	CABLE 5 FROM P-11 TO CABINET 20/C #14	CABLE 6 FROM P-13 TO CABINET 20/C #14	CABLE 1 FROM P-8 TO P-5 10/C #14	CABLE 2 FROM P-7 TO P-5 10/C #14	CABLE 3 FROM P-6 TO P-5 10/C #14	CABLE 10 FROM P-4 TO P-3 10/C #14	CABLE 11 FROM P-2 TO P-1 10/C #14	CABLE 12 FROM P-10 TO P-9 10/C #14	CABLE 13 FROM P-12 FROM P-11 10/C #14	CABLE 13 FROM P-14 FROM P-13 10/C #14	CABLE 13 FROM P-15 TO CABINET 10/C #14
1	BLACK	SPARE	SPARE	SPARE	SPARE	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	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON
3	RED	SH 6-7-16 OL-B RED	SH 3-4 Ø8 RED	SH 1-2 Ø6 RED	SH 8-9 Ø2 RED	SH 10-11 Ø4 RED	SH 13-14 OL-A RED	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
4	GREEN	SH 6-7-16 OL-B GRN	SH 3-4 Ø8 GRN	SH 1-2 Ø6 GRN	SH 8-8 Ø2 GRN	SH 10-11 Ø4 GRN	SH 13-14 OL-A GRN	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
5	ORANGE	SH 6-7-16 OL-B YEL	SH 3-4 Ø8 YEL	SH 1-2 Ø6 YEL	SH 8-9 Ø2 YEL	SH 10-11 Ø4 YEL	SH 13-14 OL-A YEL	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
6	BLUE	SPARE	SH 20 Ø6 DONT WALK	SPARE	SPARE	SH 27 Ø2 DONT WALK	SH 29 Ø4 DONT WALK	SH 24 Ø2 DONT WALK	SH 23 Ø2 DONT WALK	SH 22 Ø8 DONT WALK	SH 21 Ø8 DONT WALK	SH 25 Ø6 DONT WALK	SH 26 Ø2 DONT WALK	SH 28 Ø4 DONT WALK	SH 30 Ø2 DONT WALK	SH 31 Ø2 DONT WALK
7	WHITE/ BLACK	SPARE	SH 20 Ø6 WALK	SPARE	SPARE	SH 27 Ø2 WALK	SH 29 Ø4 WALK	SH 24 Ø2 WALK	SH 23 Ø2 WALK	SH 22 Ø8 WALK	SH 21 Ø8 WALK	SH 25 Ø6 WALK	SH 26 Ø2 WALK	SH 28 Ø4 WALK	SH 30 Ø2 WALK	SH 31 Ø2 WALK
8	RED/ BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
9	GREEN/ BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE									
10	ORANGE/ BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE									
11	BLUE/ BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE									
12	BLACK/ WHITE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE									
13	RED/ WHITE	SH 5 OLC RED(LT ARW)	SH 15 Ø8 RED	SH 18 Ø6 RED	SPARE	SPARE	SH 12 OLD RED(LT ARW)									
14	GREEN/ WHITE	SH 5 OLC GRN(LT ARW)	SH 15 Ø8 GRN	SH 18 Ø6 GRN	SPARE	SPARE	SH 12 OLD GRN(LT ARW)									
15	BLUE/ WHITE	SH 5 OLC YEL(LT ARW)	SH 15 Ø8 YEL	SH 18 Ø6 YEL	SPARE	SPARE	SH 12 OLD YEL(LT ARW)									
16	BLACK/ RED	SH 17 Ø6 RED	SPARE	SPARE	SPARE	SPARE	SH 19 Ø2 RED									
17	WHITE/ RED	SH 17 Ø6 YEL	SPARE	SPARE	SPARE	SPARE	SH 19 Ø2 YEL									
18	ORANGE/ RED	SH 17 Ø6 GRN	SPARE	SPARE	SPARE	SPARE	SH 19 Ø2 GRN									
19	BLUE/ RED	SH 5 OLC FY(LT ARW)	SPARE	SPARE	SPARE	SPARE	SH 12 OLD FY(LT ARW)									
20	RED/ GREEN	SPARE	SPARE	SPARE	SPARE	SPARE										

UNIT ID	MOUNTING LOCAION	TYPE OF DETECTION	MOUNTING LOCAION
R-1	P-5	PRESENCE	PHASE 8 STOP BAR
R-2	P-5	PRESENCE	PHASE 6 STOP BAR
R-3	P-3	ADVANCE	PHASE 8 245' TO 360' FROM STOP BAR
R-4	P-1	PRESENCE	PHASE 5 STOP BAR
R-5	P-5	ADVANCE	PHASE 6 245' TO 360' FROM STOP BAR
R-6	P-13	ADVANCE	PHASE 2 245' TO 360' FROM STOP BAR
R-7	P-9	PRESENCE	PHASE 1 STOP BAR
R-8	P-11	ADVANCE	PHASE 4 245' TO 360' FROM STOP BAR
R-9	P-11	PRESENCE	PHASE 2 STOP BAR
R-10	P-13	PRESENCE	PHASE 4 STOP BAR

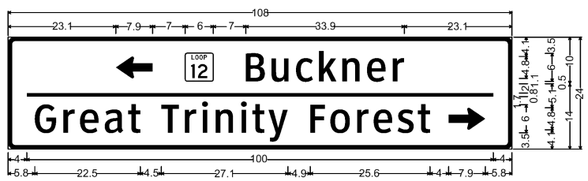
ALL PRESENCE RADAR UNITS SHALL HAVE A MOUNTING HEIGHT OF 25'



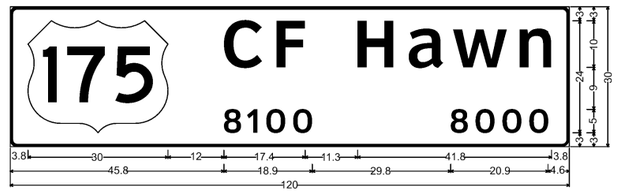
D21-2T_VARx24;
1.5" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 7.9" X 4.8" 180"; "Great Trinity Forest", ClearviewHwy-3-W;
1.5" Radius, White on Green; Loop 12; M1-6L 6"X6"
1.5" Radius, 0.8" Border, White on Green;
"Buckner", ClearviewHwy-3-W; Standard Arrow Custom 7.9" X 4.8" 0";



D3-1G-78"X24";
1.5" Radius, 0.5" Border, White on Green;
US 175 M1-4; "CF Hawn", ClearviewHwy-5-W; "8000", ClearviewHwy-5-W; "8100", ClearviewHwy-5-W; "", ClearviewHwy-3-W;



D21-2T_VARx24;
1.5" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 7.9" X 4.8" 180"; "Buckner", ClearviewHwy-3-W;
1.5" Radius, White on Green; Loop 12; M1-6L 6"X6"
1.5" Radius, 0.8" Border, White on Green;
"Great Trinity Forest", ClearviewHwy-3-W; Standard Arrow Custom 7.9" X 4.8" 0";



D3-1G-78"X24";
1.5" Radius, 0.5" Border, White on Green;
US 175 M1-4; "CF Hawn", ClearviewHwy-5-W; "8100", ClearviewHwy-5-W; "8000", ClearviewHwy-5-W; "", ClearviewHwy-3-W;

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
P-2 P-3	PHASE 6	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUS	WAIT TO CROSS US 175 WESTBOUND FRONTAGE AT LOOP 12
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
P-4 P-6	PHASE 8	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUS	WAIT TO CROSS LOOP 12 AT US 175 WESTBOUND FRONTAGE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
P-7 P-8	PHASE 2	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUS	WAIT TO CROSS US 175 WESTBOUND FRONTAGE AT LOOP 12
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
P-10 P-11	PHASE 2	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUS	WAIT TO CROSS LOOP 12 AT US 175 EASTBOUND FRONTAGE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
P-12 P-13	PHASE 4	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUS	WAIT TO CROSS LOOP 12 AT US 175 EASTBOUND FRONTAGE
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK
P-14 P-15	PHASE 6	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUS	WAIT TO CROSS US 175 EASTBOUND FRONTAGE AT LOOP 12
		LOCATOR TONE	SLOW TICK
		WALK INDICATION*	RAPID TICK

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

NOTES:

1-IF DURING CONSTRUCTION SITUATIONS ARISE THAT FORCES TWO APS UNITS TO BE CLOSER THAN 10 FEET FROM EACH OTHER, A VERBAL EXTENDED MESSAGE ON WALK AND DON'T WALK WILL BE REQUIRED. CONTACT INSPECTING ENGINEER FOR APPROVAL.

2-APS UNITS TO MAINTAIN WIRED CONFIGURATION.

STATE OF TEXAS
CHARLES R. STEVENS, JR
101286
LICENSED PROFESSIONAL ENGINEER

CHARLES R. STEVENS, JR., P.E. — 4/25/2024 DATE

STEVENS TECHNICAL
TEXAS REGISTERED ENGINEERING FIRM F-13097
8131 JACKRABBIT RD
Houston, TX. 77095
PHONE: (713) 828-4742

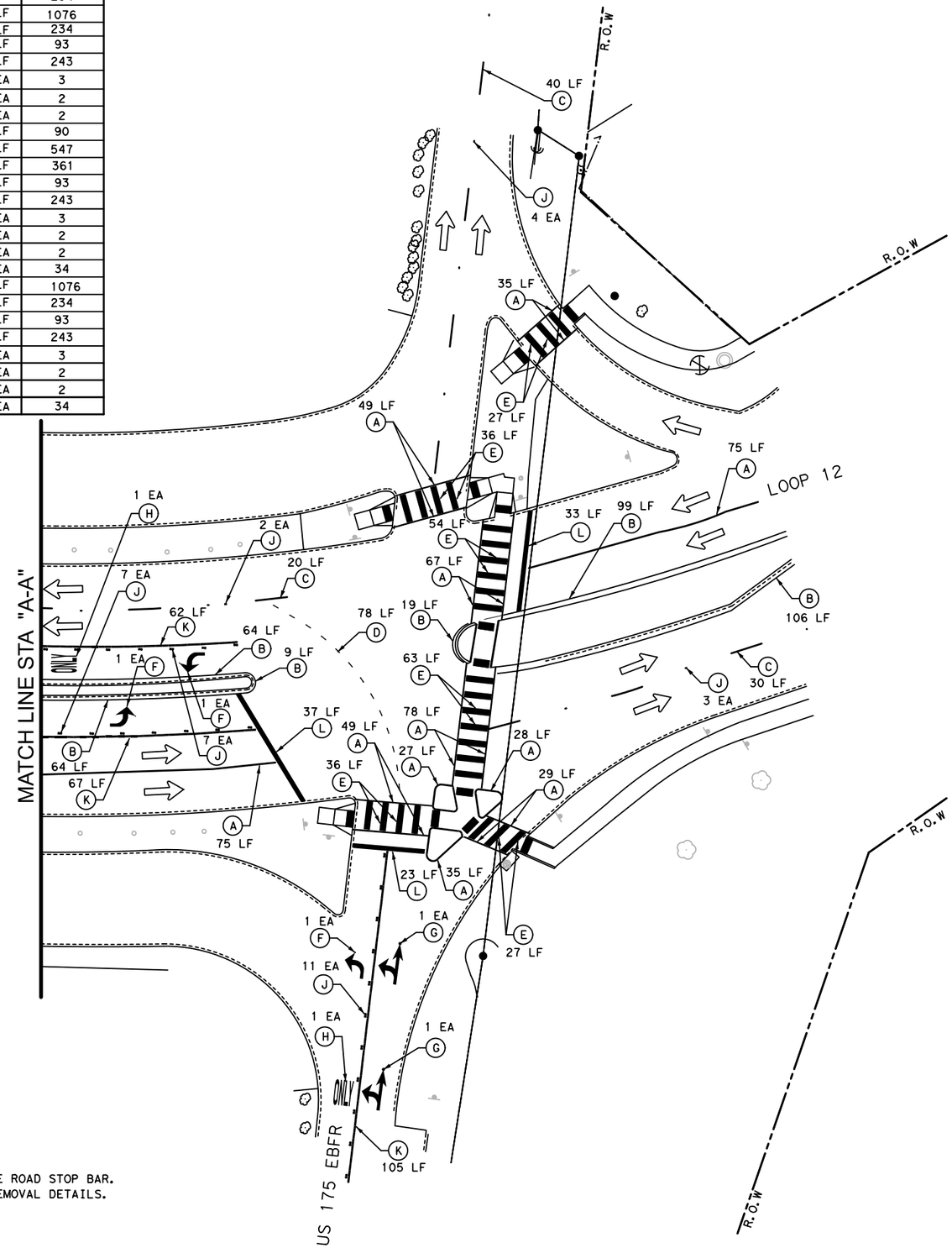
US 175 AT LOOP 12 PROPOSED SIGNAL DETAILS

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		65
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS	
CONT	SECT	JOB	HIGHWAY NO
0197	02	134	US 175

PAVEMENT MARKING SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
666	6018	REFL PAV MRKR TY I(W)6"(DOT)(100 MIL)	LF	78
666	6036	REFL PAV MRKR TY I(W)8"(SLD)(100MIL)	LF	234
666	6225	PAVEMENT SEALER 6"	LF	1076
666	6226	PAVEMENT SEALER 8"	LF	234
666	6229	PAVEMENT SEALER 18"	LF	93
666	6230	PAVEMENT SEALER 24"	LF	243
666	6231	PAVEMENT SEALER (ARROW)	EA	3
666	6232	PAVEMENT SEALER (WORD)	EA	2
666	6234	PAVEMENT SEALER (DBLE ARROW)	EA	2
666	6306	RE PM W/RET REQ TYI(W)6"(BRK)(100)	LF	90
666	6309	RE PM W/RET REQ TYI(W)6"(SLD)(100)	LF	547
666	6321	RE PM W/RET REQ TYI(Y)6"(SLD)(100)	LF	361
668	6075	PREFAB PAV MRK TY C (W)(18")(SLD)	LF	93
668	6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	243
668	6077	PREFAB PAV MRK TY C (W)(ARROW)	EA	3
668	6078	PREFAB PAV MRK TY C (W)(DBL ARROW)	EA	2
668	6085	PREFAB PAV MRK TY C (W)(WORD)	EA	2
672	6010	REFL PAV MRKR TY II-C-R	EA	34
678	6002	PAV SURF PREP FOR MRK(6")	LF	1076
678	6004	PAV SURF PREP FOR MRK(8")	LF	234
678	6007	PAV SURF PREP FOR MRK(18")	LF	93
678	6008	PAV SURF PREP FOR MRK(24")	LF	243
678	6009	PAV SURF PREP FOR MRK(ARROW)	EA	3
678	6010	PAV SURF PREP FOR MRK(DBLE ARROW)	EA	2
678	6016	PAV SURF PREP FOR MRK(WORD)	EA	2
678	6033	PAV SURF PREP FOR MRK(RPM)	EA	34



N

20 0 20 40

SCALE IN FEET

LEGEND:

- (A) RE PM W/RET REQ TYI(W)6"(SLD)
- (B) RE PM W/RET REQ TYI(Y)6"(SLD)
- (C) RE PM W/RET REQ TYI(W)6"(BRK)
- (D) REFL PAV MRKR TY I(W)6"(DOT)
- (E) PREFAB PAV MRK TY C (W)(24")(SLD)
- (F) PREFAB PAV MRK TY C (W)(ARROW)(SLD)
- (G) PREFAB PAV MRK TY C (W)(DBL ARROW)(SLD)
- (H) PREFAB PAV MRK TY C (W)(WORD)(SLD)
- (J) REFL PAV MRKR TY II-C-R
- (K) REFL PAV MRKR TY I(W)8"(SLD)
- (L) PREFAB PAV MRK TY C (W)(18")(SLD)
- ⇦ DIRECTION OF TRAFFIC FLOW

NOTES:

1. ALL INTERIOR AND EXISTING STRIPING, 150', FROM CROSS STREET AND 175' FROM FRONTAGE ROAD STOP BAR. TO BE REMOVED AND RESTRIPED, UNLESS SHOWN OTHERWISE. SEE EXISTING CONDITION AND REMOVAL DETAILS.

2. STRIPING SHALL CONFORM TO TXDOT STANDARDS, PM(1)-22, PM(2)-22 AND PM(4)-22A

STATE OF TEXAS
CHARLES R. STEVENS, JR.
101286
LICENSED PROFESSIONAL ENGINEER

CHARLES R. STEVENS, JR., P.E. — 4/25/2024 DATE

STEVENS TECHNICAL
TEXAS REGISTERED ENGINEERING FIRM F-13097
8131 JACKRABBIT RD
Houston, TX. 77095
PHONE: (713) 828-4742

US 175 AT LOOP 12
PROPOSED PAVEMENT MARKING LAYOUT

SCALE: 1" = 40' SHEET 1 OF 2

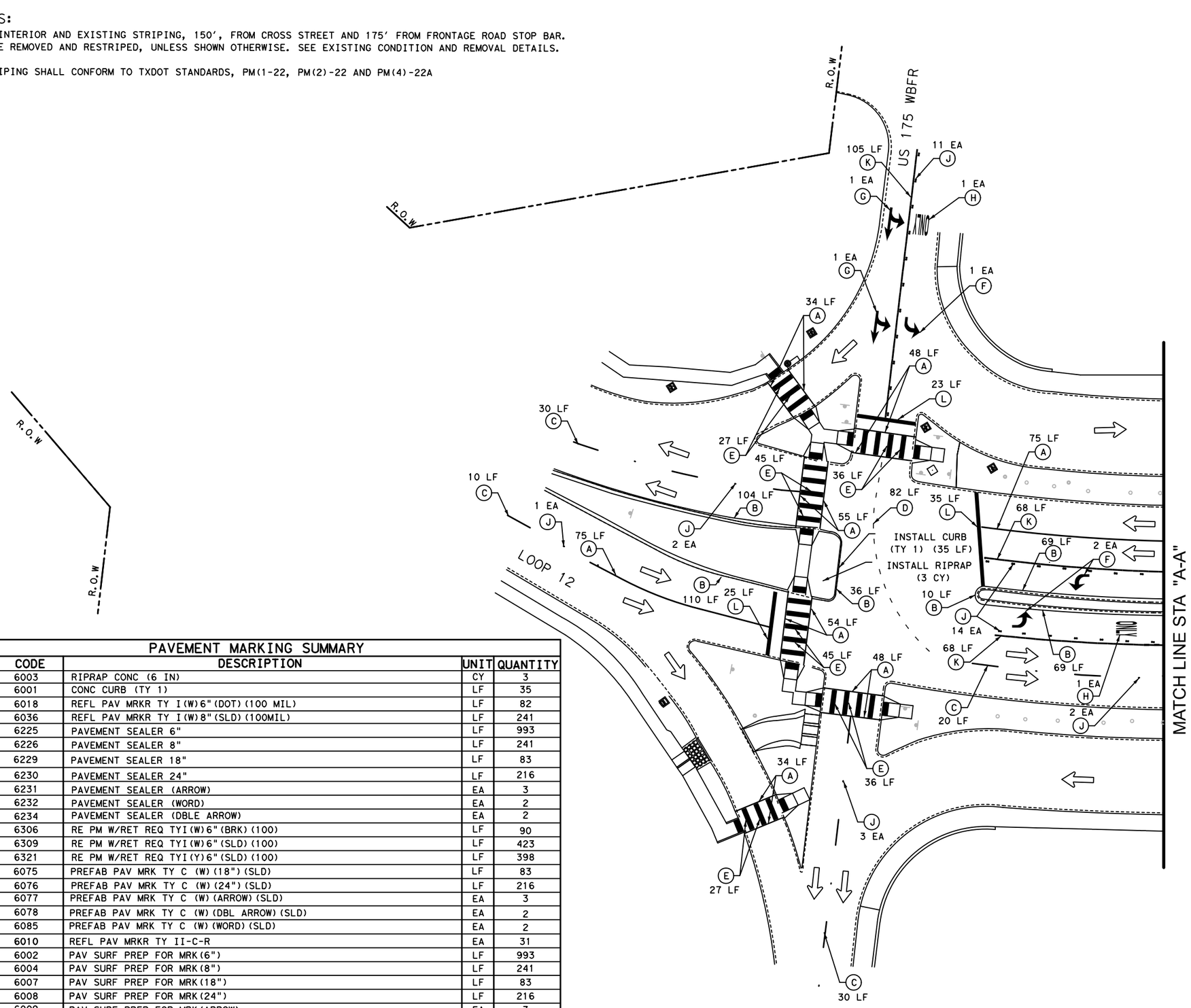
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		66
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS	
CONT	SECT	JOB	HIGHWAY NO
0197	02	134	US 175

4/25/2024 4:38:10 PM S:\Projects\1911101 Othon (36-91DP5004) WA2 - Signals\6.0 Design\6.1 CAD Files\SHEETS - Revised - 2\7-PROPOSED PAVEMENT MARKING LAYOUT.dgn

NOTES:

1. ALL INTERIOR AND EXISTING STRIPING, 150', FROM CROSS STREET AND 175' FROM FRONTAGE ROAD STOP BAR. TO BE REMOVED AND RESTRIPED, UNLESS SHOWN OTHERWISE. SEE EXISTING CONDITION AND REMOVAL DETAILS.

2. STRIPING SHALL CONFORM TO TXDOT STANDARDS, PM(1-22, PM(2)-22 AND PM(4)-22A



PAVEMENT MARKING SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
432	6003	RIPRAP CONC (6 IN)	CY	3
529	6001	CONC CURB (TY 1)	LF	35
666	6018	REFL PAV MRKR TY I(W)6"(DOT)(100 MIL)	LF	82
666	6036	REFL PAV MRKR TY I(W)8"(SLD)(100MIL)	LF	241
666	6225	PAVEMENT SEALER 6"	LF	993
666	6226	PAVEMENT SEALER 8"	LF	241
666	6229	PAVEMENT SEALER 18"	LF	83
666	6230	PAVEMENT SEALER 24"	LF	216
666	6231	PAVEMENT SEALER (ARROW)	EA	3
666	6232	PAVEMENT SEALER (WORD)	EA	2
666	6234	PAVEMENT SEALER (DBLE ARROW)	EA	2
666	6306	RE PM W/RET REQ TYI(W)6"(BRK)(100)	LF	90
666	6309	RE PM W/RET REQ TYI(W)6"(SLD)(100)	LF	423
666	6321	RE PM W/RET REQ TYI(Y)6"(SLD)(100)	LF	398
668	6075	PREFAB PAV MRK TY C (W)(18")(SLD)	LF	83
668	6076	PREFAB PAV MRK TY C (W)(24")(SLD)	LF	216
668	6077	PREFAB PAV MRK TY C (W)(ARROW)(SLD)	EA	3
668	6078	PREFAB PAV MRK TY C (W)(DBL ARROW)(SLD)	EA	2
668	6085	PREFAB PAV MRK TY C (W)(WORD)(SLD)	EA	2
672	6010	REFL PAV MRKR TY II-C-R	EA	31
678	6002	PAV SURF PREP FOR MRK(6")	LF	993
678	6004	PAV SURF PREP FOR MRK(8")	LF	241
678	6007	PAV SURF PREP FOR MRK(18")	LF	83
678	6008	PAV SURF PREP FOR MRK(24")	LF	216
678	6009	PAV SURF PREP FOR MRK(ARROW)	EA	3
678	6010	PAV SURF PREP FOR MRK(DBLE ARROW)	EA	2
678	6016	PAV SURF PREP FOR MRK(WORD)	EA	2
678	6033	PAV SURF PREP FOR MRK(RPM)	EA	31

SCALE IN FEET
20 0 20 40

LEGEND:

- (A) RE PM W/RET REQ TYI(W)6"(SLD)
- (B) RE PM W/RET REQ TYI(Y)6"(SLD)
- (C) RE PM W/RET REQ TYI(W)6"(BRK)
- (D) REFL PAV MRKR TY I(W)6"(DOT)
- (E) PREFAB PAV MRK TY C (W)(24")(SLD)
- (F) PREFAB PAV MRK TY C (W)(ARROW)(SLD)
- (G) PREFAB PAV MRK TY C (W)(DBL ARROW)(SLD)
- (H) PREFAB PAV MRK TY C (W)(WORD)(SLD)
- (J) REFL PAV MRKR TY II-C-R
- (K) REFL PAV MRKR TY I(W)8"(SLD)
- (L) PREFAB PAV MRK TY C (W)(18")(SLD)
- DIRECTION OF TRAFFIC FLOW

STATE OF TEXAS
CHARLES R. STEVENS, JR.
101286
LICENSED PROFESSIONAL ENGINEER

CHARLES R. STEVENS, JR., P.E. — 4/25/2024 DATE

STEVENS TECHNICAL
TEXAS REGISTERED ENGINEERING FIRM F-13097
8131 JACKRABBIT RD
Houston, TX. 77095
PHONE: (713) 828-4742

US 175 AT LOOP 12
PROPOSED PAVEMENT MARKING LAYOUT

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	67

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS	
CONT	SECT	JOB	HIGHWAY NO
0197	02	134	US 175

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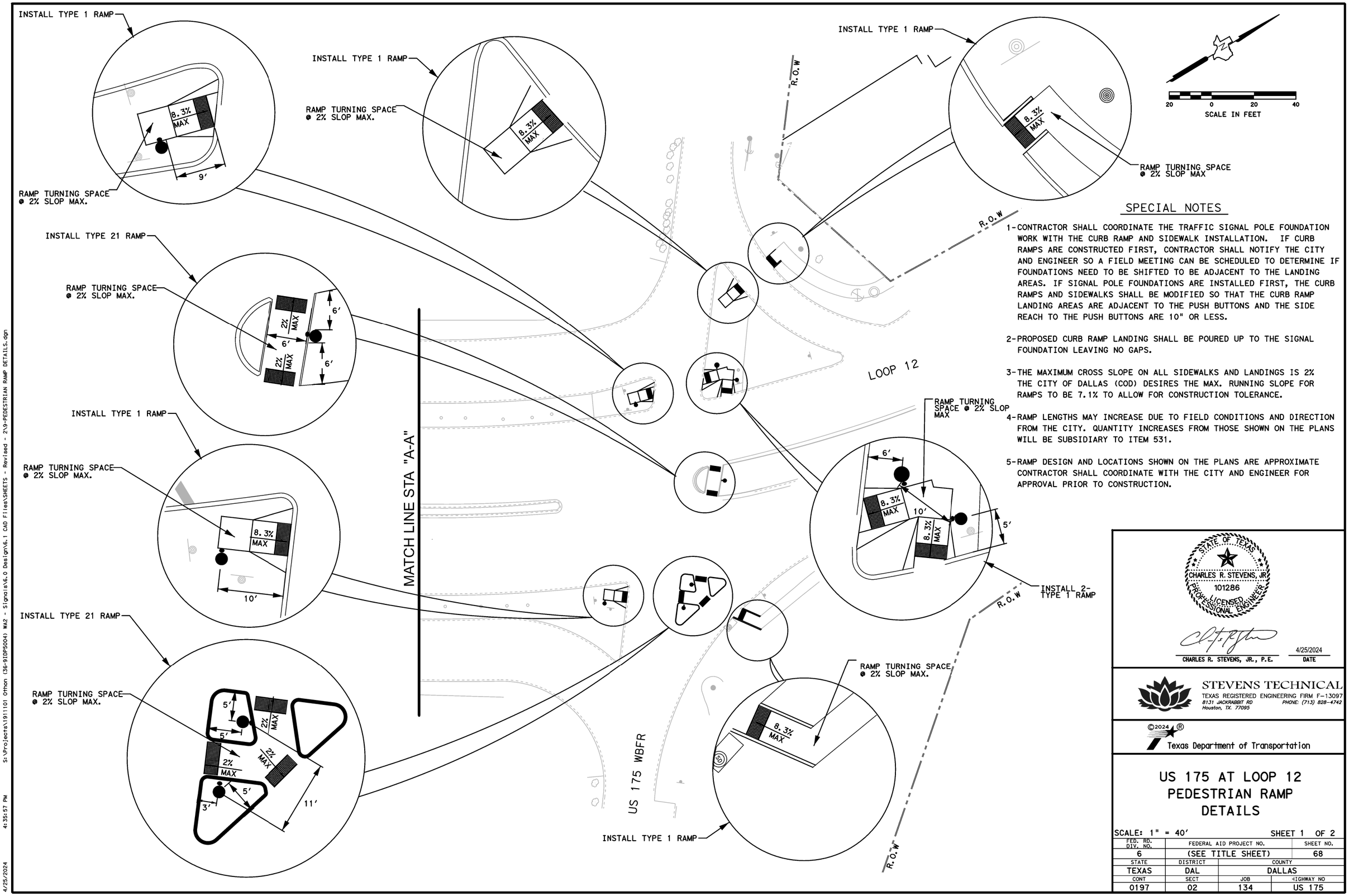

SPECIAL NOTES

1- CONTRACTOR SHALL COORDINATE THE TRAFFIC SIGNAL POLE FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED FIRST, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER SO A FIELD MEETING CAN BE SCHEDULED TO DETERMINE IF FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL POLE FOUNDATIONS ARE INSTALLED FIRST, THE CURB RAMPS AND SIDEWALKS SHALL BE MODIFIED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS ARE 10" OR LESS.

2- PROPOSED CURB RAMP LANDING SHALL BE POURED UP TO THE SIGNAL FOUNDATION LEAVING NO GAPS.

3- THE MAXIMUM CROSS SLOPE ON ALL SIDEWALKS AND LANDINGS IS 2% THE CITY OF DALLAS (COD) DESIRES THE MAX. RUNNING SLOPE FOR RAMPS TO BE 7.1% TO ALLOW FOR CONSTRUCTION TOLERANCE.

4- RAMP LENGTHS MAY INCREASE DUE TO FIELD CONDITIONS AND DIRECTION FROM THE CITY. QUANTITY INCREASES FROM THOSE SHOWN ON THE PLANS WILL BE SUBSIDIARY TO ITEM 531.

5- RAMP DESIGN AND LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE CONTRACTOR SHALL COORDINATE WITH THE CITY AND ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

STATE OF TEXAS
CHARLES R. STEVENS, JR.
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CHARLES R. STEVENS, JR., P.E. — 4/25/2024 DATE

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Houston, TX. 77095
PHONE: (713) 828-4742

Texas Department of Transportation

US 175 AT LOOP 12 PEDESTRIAN RAMP DETAILS

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		68
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS	
CONT	SECT	JOB	HIGHWAY NO
0197	02	134	US 175

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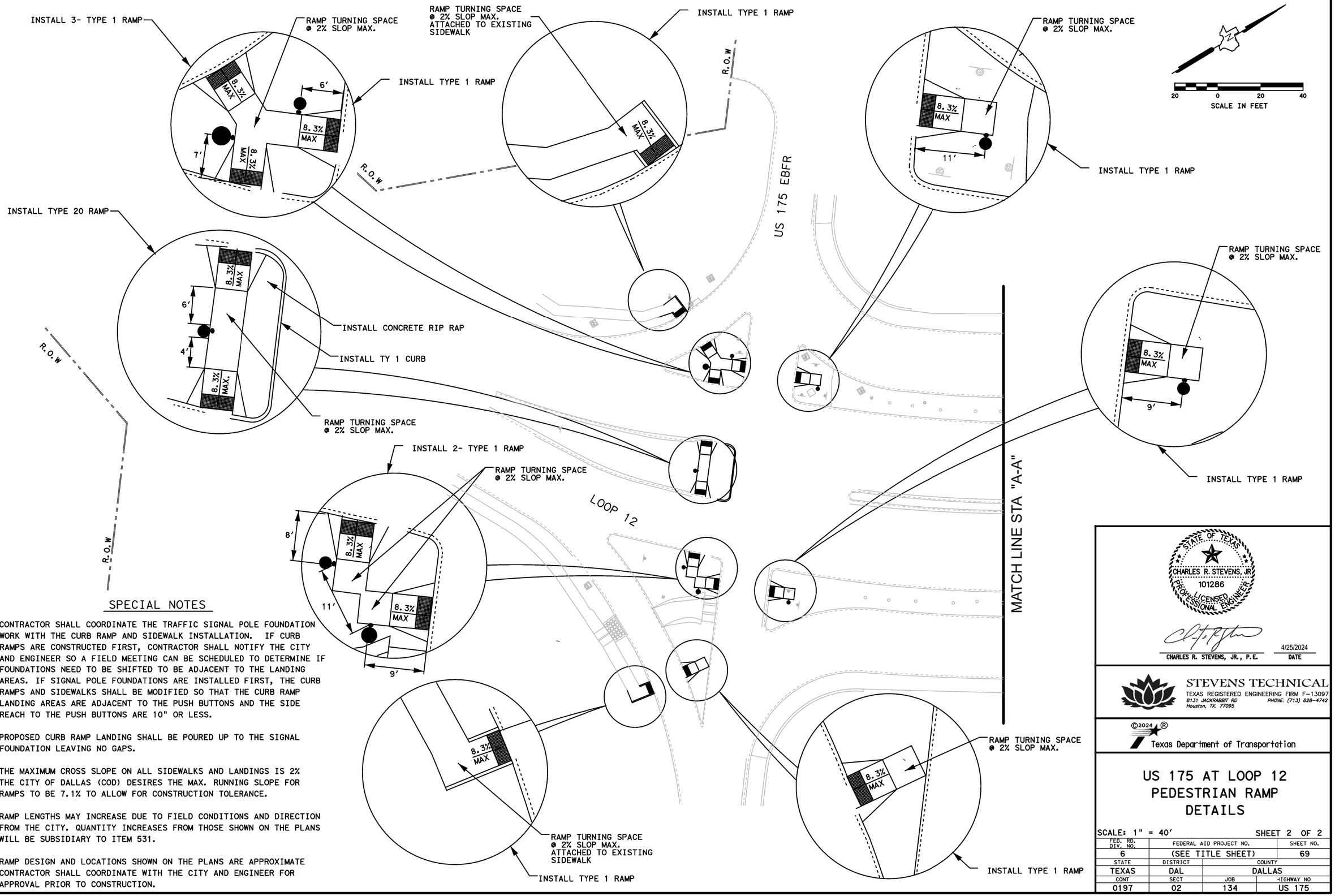

SPECIAL NOTES

1- CONTRACTOR SHALL COORDINATE THE TRAFFIC SIGNAL POLE FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED FIRST, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER SO A FIELD MEETING CAN BE SCHEDULED TO DETERMINE IF FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL POLE FOUNDATIONS ARE INSTALLED FIRST, THE CURB RAMPS AND SIDEWALKS SHALL BE MODIFIED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS ARE 10" OR LESS.

2- PROPOSED CURB RAMP LANDING SHALL BE POURED UP TO THE SIGNAL FOUNDATION LEAVING NO GAPS.

3- THE MAXIMUM CROSS SLOPE ON ALL SIDEWALKS AND LANDINGS IS 2% THE CITY OF DALLAS (COD) DESIRES THE MAX. RUNNING SLOPE FOR RAMPS TO BE 7.1% TO ALLOW FOR CONSTRUCTION TOLERANCE.

4- RAMP LENGTHS MAY INCREASE DUE TO FIELD CONDITIONS AND DIRECTION FROM THE CITY. QUANTITY INCREASES FROM THOSE SHOWN ON THE PLANS WILL BE SUBSIDIARY TO ITEM 531.

5- RAMP DESIGN AND LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE CONTRACTOR SHALL COORDINATE WITH THE CITY AND ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

STATE OF TEXAS
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Texas Department of Transportation

US 175 AT LOOP 12 PEDESTRIAN RAMP DETAILS

SCALE: 1" = 40′ SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		69
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS	
CONT	SECT	JOB	HIGHWAY NO
0197	02	134	US 175

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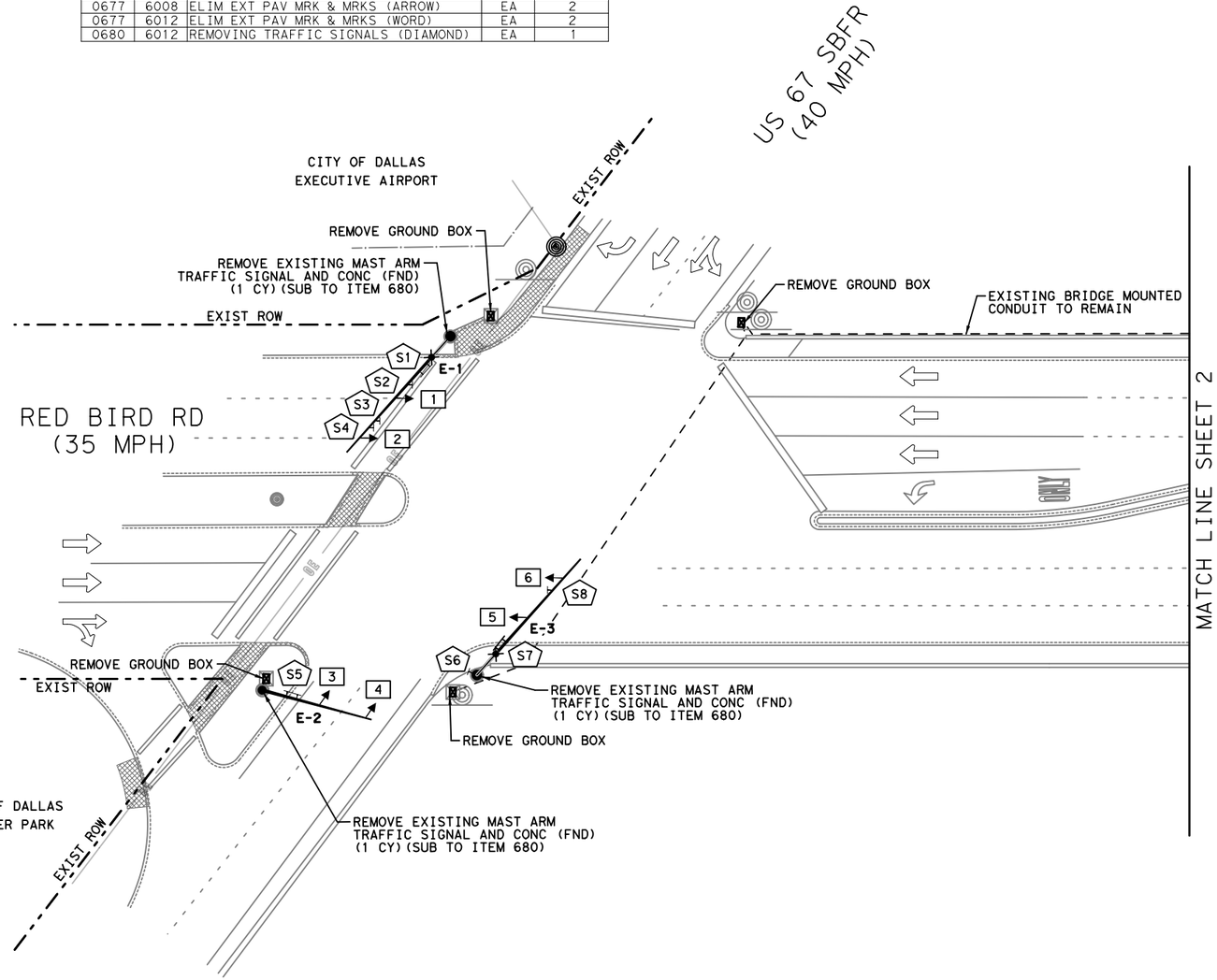
NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
3. CONTRACTOR SHALL MAINTAIN THE EXISTING SIGNAL INSTALLATION AND OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED SIGNAL IS OPERATIONAL.
4. THE CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AFTER PROPOSED SIGNAL IS OPERATIONAL. EXISTING FOUNDATIONS AND GROUND BOXES SHALL BE REMOVED, WITH POLE FOUNDATIONS REMOVED TO A MINIMUM OF 2' BELOW EXISTING GROUND, AND BACK FILLED WITH SIMILAR MATERIALS IN THE SURROUNDING AREA. EXISTING CONDUITS SHALL BE ABANDONED IN PLACE. SEE GENERAL NOTES AND SPECIFICATIONS FOR MORE INFORMATION.
5. ELIMINATE ALL EXISTING PAVEMENT MARKINGS WITHIN THE INTERSECTION AND ALONG 150' IN EACH DIRECTION FROM STOP BAR. REFER TO PAVEMENT MARKING SHEET FOR ADDITIONAL INFORMATION.
6. EXISTING SIGNS S1-S17 SHALL BE REMOVED WITH TRAFFIC SIGNAL EQUIPMENT.
7. PAVING REMOVAL (CURB, RAMP, PAVERS AND SIDEWALK) SHALL BE SUBSIDIARY TO THE INSTALLATION OF NEW CURB, RAMP, RIPRAP OR CONCRETE SIDEWALK (SEE ITEMS 421 & 531 QTYS AND PROPOSED PEDESTRIAN RAMP AND SIDEWALK LAYOUT).
8. ALL GROUND MOUNTED SIGNS SHALL REMAIN AS INSTALLED UNLESS OTHERWISE NOTED.

REMOVAL SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0624	6028	REMOVE GROUND BOX	EA	11
0677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	500
0677	6002	ELIM EXT PAV MRK & MRKS (6")	LF	1665
0677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	150
0677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	386
0677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	258
0677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	2
0677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	2
0680	6012	REMOVING TRAFFIC SIGNALS (DIAMOND)	EA	1



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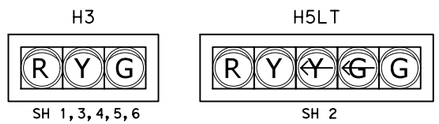
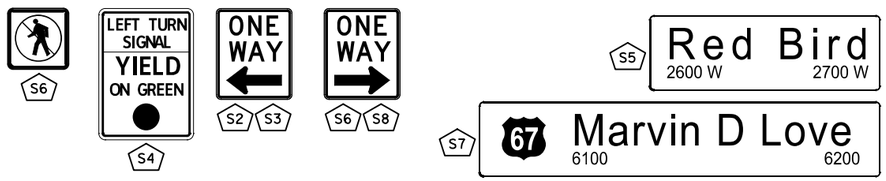
EXISTING SIGNAL LEGEND

- MAST ARM POLE
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LUMINAIRE
- VEHICLE DETECTOR
- OPTICOM
- CCTV
- EXISTING SIGNAL CONTROLLER CABINET
- EXISTING GROUND BOX
- 1 — SIGNAL HEAD NUMBER
- S1 — SIGN LABEL
- EXISTING ELECTRICAL SERVICE
- E-# — EXISTING SIGNAL POLE NUMBER
- PAVING REMOVAL

EXISTING SIGNALS



EXISTING SIGNS



ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

DIAMOND SIGNALS

EXISTING CONDITIONS AND REMOVALS
US 67 AT RED BIRD RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	70
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

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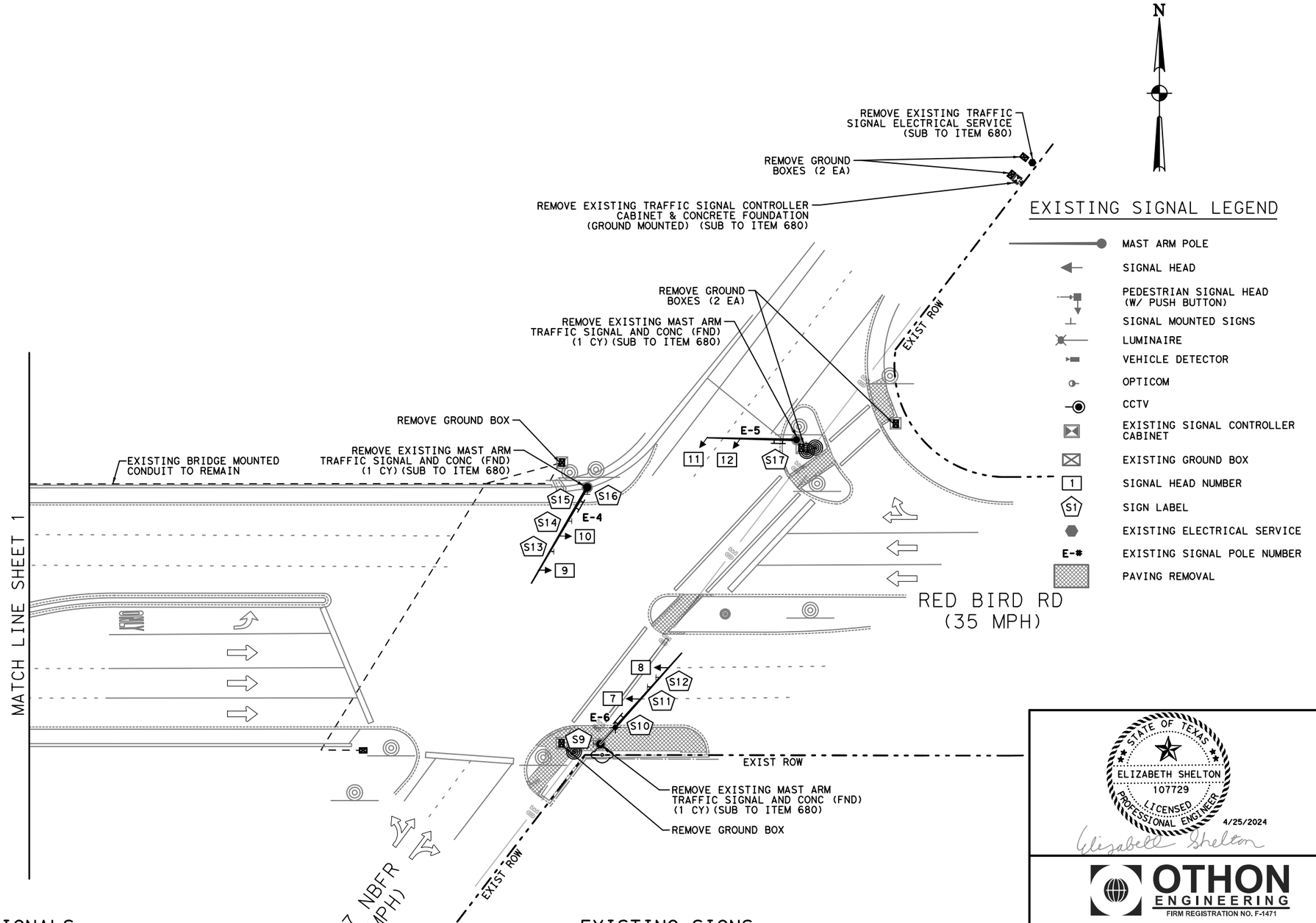
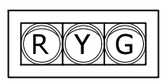


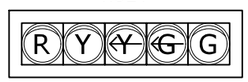
EXISTING SIGNALS

H3



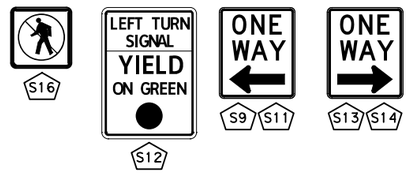
SH 7, 9, 10, 11, 12

H5LT



SH 8

EXISTING SIGNS



STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

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DIAMOND SIGNALS

EXISTING CONDITIONS AND REMOVALS US 67 AT RED BIRD RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		71
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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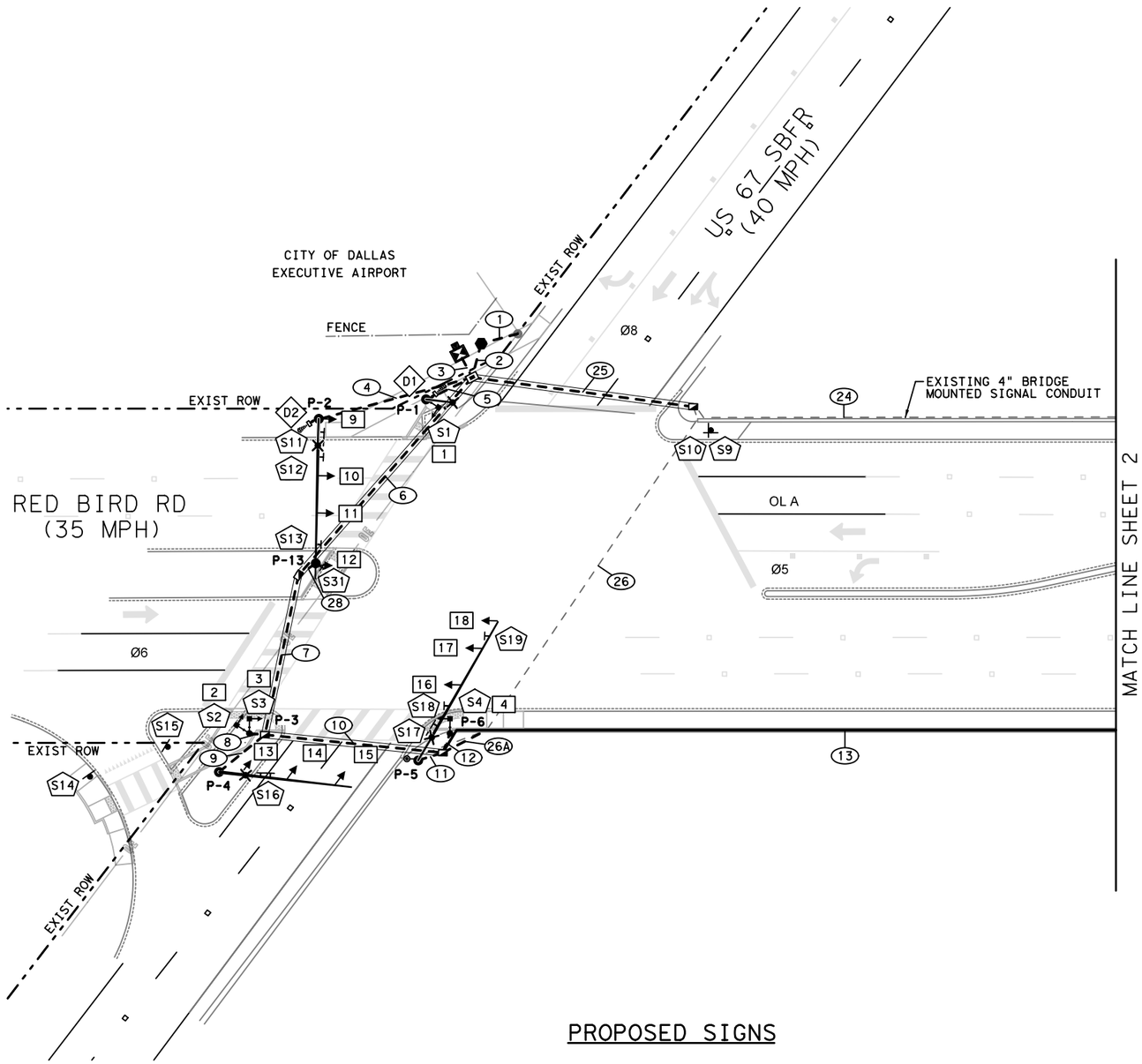
NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF DALLAS TRAFFIC MANAGEMENT CENTER AT (214-670-3095) 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, RADAR DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
4. CONTRACTOR SHALL COORDINATE WITH ONCOR CONCERNING TRAFFIC SIGNAL ELECTRICAL SERVICE. CONTACT ONCOR (ROCKY BUI AT ANOURACK.BUI@ONCOR.COM) REGARDING POINT OF DELIVERY AND DISTRIBUTION TO ELECTRICAL PEDESTAL SERVICE. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. THE FOLLOWING ITEMS WILL BE FURNISHED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR: SIGNAL CABINET AND INTERNAL HARDWARE, RADAR AND RADAR CABLE. CONTACT MR. ALFRED LEMON AT 214-670-4812 TO SCHEDULE PICK-UP OF MATERIALS.
6. INSTALL BASE MOUNTED CONTROLLER CABINET (TYPE 332I CABINET) AND FOUNDATION.
7. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
8. SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BLACK POWDERCOATED ALUMINUM VISORS AND BACK PLATES.
9. RADAR DETECTION ZONES TO BE PROGRAMMED BY THE CITY OF DALLAS. CONTACT SRINIVASA VEERAMALLU, PE. AT 214-670-5892 WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.
10. ALL SIGNAL CABLES SHALL BE WIRED IN ACCORDANCE WITH THE CABINET PREPARATION NOTES SUPPLIED BY THE CITY OF DALLAS.
11. CONTRACTOR SHALL COORDINATE THE TRAFFIC SIGNAL POLE FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED FIRST, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER SO A FIELD MEETING CAN BE SCHEDULED TO DETERMINE IF FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL POLE FOUNDATIONS ARE INSTALLED FIRST, THE CURB RAMPS AND SIDEWALKS SHALL BE MODIFIED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS ARE 10" OR LESS.
12. PROPOSED APS UNITS SHALL BE PLACED ADJACENT TO A LEVEL LANDING AREA (2% MAX IN ANY DIRECTION). IF THE DISTANCE FROM THE PUSH BUTTON TO THE EDGE OF ACCESSIBLE PATH EXCEEDS 10", THE CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON EXTENDER TO MAKE THE REACH 10" OR LESS. MEASUREMENT AND PAYMENT SHALL BE CONSIDERED SUBSIDIARY TO THE INSTALLATION OF THE TRAFFIC SIGNAL EQUIPMENT.
13. 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.
14. PROPOSED CURB RAMP LANDING SHALL BE POURED UP TO THE SIGNAL FOUNDATION LEAVING NO GAPS.
15. CONTRACTOR TO MAINTAIN FULL ACCESS TO A MINIMUM OF TWO PEDESTRIAN CROSSINGS AT ALL TIMES DURING CONSTRUCTION.
16. CCTV AND CABLING SHALL BE PROVIDED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR. INSTALLATION SHALL BE PAID UNDER ITEM 680.

CITY OF DALLAS
BOULDER PARK



PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINAIRE (250W EQ)
- RADAR VEHICLE DETECTOR (DALLAS)
- VIDEO VEHICLE DETECTOR (RICHARDSON)
- OPTICOM (RICHARDSON)
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE D GROUND BOX
- TYPE 1 ITS GROUND BOX
- ELECTRICAL SERVICE
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- CONDUIT (RMC)
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- (S1) SIGN LABEL
- (D1) VEHICLE DETECTOR LABEL
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

PROPOSED SIGNALS

COUNTDOWN PEDESTRIAN SIGNAL HEAD
SH 1, 2, 3, 4

H3
SH 10, 11, 13, 14, 15, 16, 17

V3S
SH 9

H5FYA
SH 12

H3S
SH 18

PROPOSED SIGNS

R10-3ELR 9"x15" — S31
R10-3EL 9"x15" — S1 S2 S3
R10-3ER 9"x15" — S4
R6-2L 30"x36" — S13 S12
R6-2R 30"x36" — S18 S19
R9-3 18"x18" — S9 S10
R1-2 48"x48"x48" — S14 S15

S16 Red Bird 2600 W 2700 W
S17 67 Marvin D Love 6100 6200
S11 67 Marvin D Love 6200 6100

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024
Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

DIAMOND SIGNALS

PROPOSED CONDITIONS
US 67 AT RED BIRD RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	72
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

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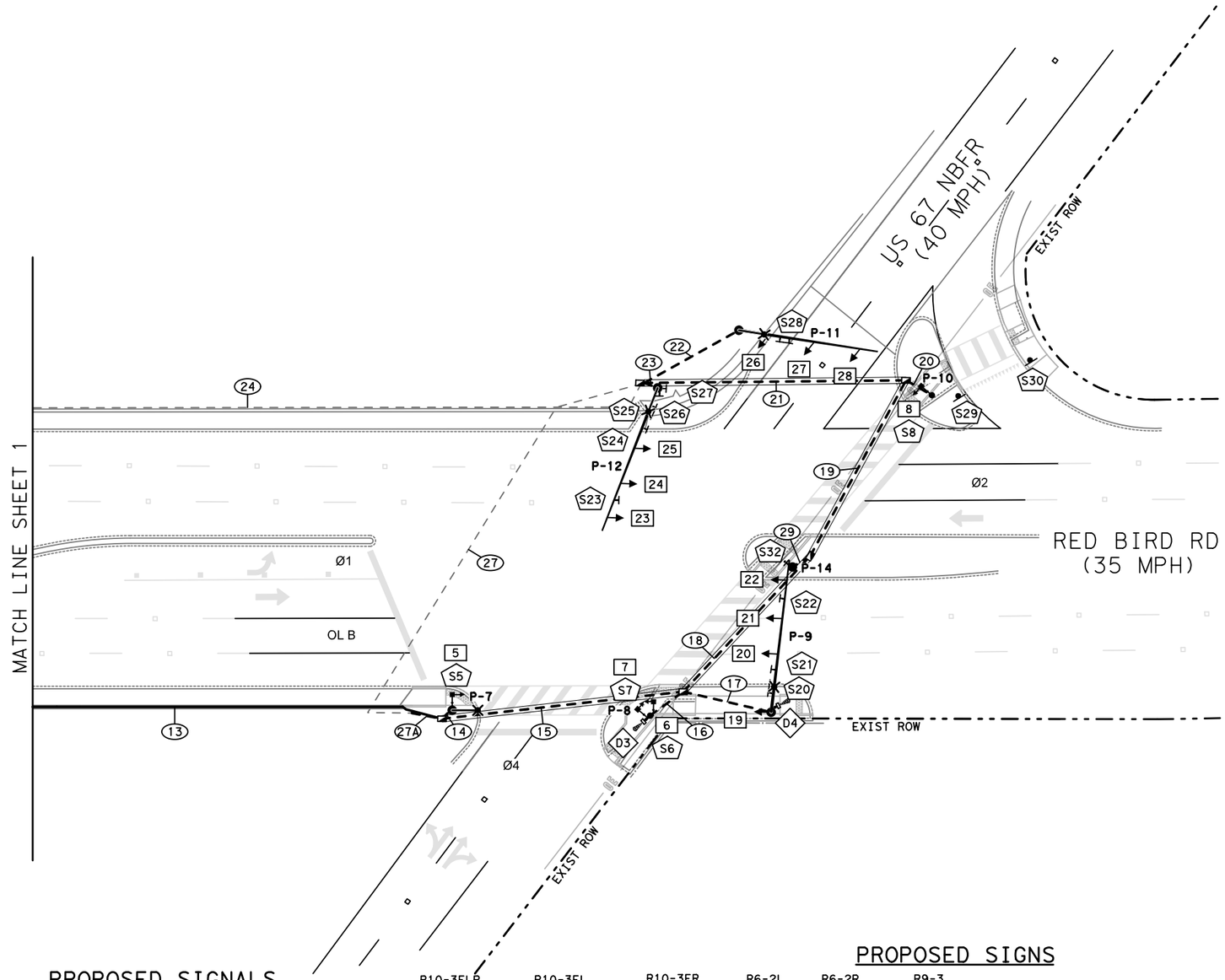

PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINAIRE (250W EQ)
- RADAR VEHICLE DETECTOR (DALLAS)
- VIDEO VEHICLE DETECTOR (RICHARDSON)
- OPTICOM (RICHARDSON)
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE D GROUND BOX
- TYPE 1 ITS GROUND BOX
- ELECTRICAL SERVICE
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- CONDUIT (RMC)
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- D1 VEHICLE DETECTOR LABEL
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

PROPOSED SIGNALS

COUNTDOWN PEDESTRIAN SIGNAL HEAD
SH 5, 6, 7, 8

H3 (R Y G)
SH 20, 21, 24, 25, 26, 27, 28

V3S (R Y G)
SH 19

H5FYA (R R Y Y G)
SH 22

H3S (R Y G)
SH 23

PROPOSED SIGNS

R10-3ELR 9"x15" — START CROSSING Watch For Vehicles; DON'T START Finish Crossing If Started; TIME REMAINING To Finish Crossing; DON'T CROSS; TO CROSS PUSH BUTTON — S32

R10-3EL 9"x15" — START CROSSING Watch For Vehicles; DON'T START Finish Crossing If Started; TIME REMAINING To Finish Crossing; DON'T CROSS; TO CROSS PUSH BUTTON — S5, S7

R10-3ER 9"x15" — START CROSSING Watch For Vehicles; DON'T START Finish Crossing If Started; TIME REMAINING To Finish Crossing; DON'T CROSS; TO CROSS PUSH BUTTON — S6, S8

R6-2L 30"x36" — ONE WAY — S21, S22

R6-2R 30"x36" — ONE WAY — S23, S24

R9-3 18"x18" — S26, S27

R1-2 48"x48"x48" — YIELD — S29, S30

S28 Red Bird 2600 W 2500 W

S20 67 Marvin D Love 6100 6200

S25 67 Marvin D Love 6200 6100

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

DIAMOND SIGNALS

PROPOSED CONDITIONS US 67 AT RED BIRD RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	73
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

L:\Projects\2023\OTHON\204052328 - 36-91DP5004 WA2 (3682 TRFE 10x$3) 7 Diamond Signals DAL\Drawings\10TRFE\S, US 67 at Red Bird\Dallas District Signals - Proposed Layout 2.dgn
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100% SUBMITTAL

CONDUIT AND CABLE CHART

CONDUIT

RUN NO	CONDUIT STATUS	ITEM 618 (SCH 80) 2" PVC (RISER) QTY	2" PVC (RISER) LF	2" PVC (TRENCH) QTY	2" PVC (TRENCH) LF	3" PVC (TRENCH) QTY	3" PVC (TRENCH) LF	3" PVC (BORED) QTY	3" PVC (BORED) LF	4" PVC (TRENCH) QTY	4" PVC (TRENCH) LEN	4" PVC (BORED) QTY	4" PVC (BORED) LF	4" RMC QTY	4" RMC LEN	ITEM 6027 PREPARE (CONDUIT) QTY	PREPARE (CONDUIT) LEN
1*	I	1	10	1	15												
2	I			1	15												
3	I									1	10						
	I									1	10						
	I					2	20										
	I			1	10												
4	I					1	50										
5	I					1	20										
6	I											1	80				
	I							1	80								
7	I											1	50				
	I							1	50								
8	I					1	5										
9	I					1	20										
10	I											1	55				
	I							1	55								
11	I							1	10								
12	I							1	10								
13	I													1	350		
14	I					1	5										
15	I											1	80				
	I							1	80								
16	I					1	15										
17	I					1	30										
18	I											1	60				
	I							1	60								
19	I											1	65				
	I							1	65								
20	I					1	15										
21	I											1	85				
	I							1	85								
22	I					1	35										
23	I					1	5										
24	I															1	350
25	I											1	70				
	I							1	70								
26	I															1	140
26A	I									1	20						
27	I															1	180
27A	I									1	15						
28	I					1	10										
29	I					1	10										
SUBTOTAL			10		40		240		565		55		545		350		670
P-1	P																
P-2	P																
P-3	P																
P-4	P																
P-5	P																
P-6	P																
P-7	P																
P-8	P																
P-9	P																
P-10	P																
P-11	P																
P-12	P																
P-13	P																
P-14	P																
SUBTOTAL																	
TOTAL			10		40		240		565		55		545		350		670

CONDUCTORS

RUN NO	CABLE STATUS	ITEM 620 ELECTRICAL CONDUCTORS NO. 6 XHHW WIRE QTY	NO. 6 XHHW WIRE LEN	NO. 6 BARE WIRE QTY	NO. 6 BARE WIRE LF	NO. 8 XHHW WIRE QTY	NO. 8 XHHW WIRE LF	NO. 12 XHHW WIRE QTY	NO. 12 XHHW WIRE LF	ITEM 684 TRAFFIC SIGNAL CABLES TY C 2 CNDR NO. 12 QTY	TY C 2 CNDR NO. 12 LF	TY A 5 CNDR NO. 14 QTY	TY A 5 CNDR NO. 14 LF	TY A 7 CNDR NO. 14 QTY	TY A 7 CNDR NO. 14 LF	TY A 10 CNDR NO. 14 QTY	TY A 10 CNDR NO. 14 LF	TY A 20 CNDR NO. 14 QTY	TY A 20 CNDR NO. 14 LF	CITY PROVIDED EQUIPMENT CCTV** QTY	CCTV** LF	RADAR COMM CABLE** QTY	RADAR COMM CABLE** LF	TOTAL LENGTH OF RUN	RUN NO
1*	I	ELECTRICAL CONDUCTORS TO BE INSTALLED BY ONCOR FROM THE POINT OF DELIVERY TO THE METER																						25	1*
2	I	2	40	1	20	4	80																	15	2
3	I			1	15					10	150					6	90			1	15			10	3
	I			1	15													6	90			4	60	10	
	I	FUTURE COMMUNICATION CONDUIT																						10	
	I	2	30	1	15																			10	
4	I			1	55	4	220											1	55			1	55	50	4
5	I			1	25	6	150			1	25					1	25					1	25	20	5
6	I			1	85	2	170			4	340					2	170	5	425	1	85	2	170	80	6
	I	FUTURE COMMUNICATION CONDUIT																						80	
7	I			1	55	2	110			3	165					2	110	5	275	1	55	2	110	50	7
	I	FUTURE COMMUNICATION CONDUIT																						50	
8	I			1	10					2	20					1	10							5	8
9	I			1	25	4	100											1	25					20	9
10	I			1	60	2	120			1	60					1	60	4	240	1	60	2	120	55	10
	I	FUTURE COMMUNICATION CONDUIT																						55	
11	I			1	15	4	60											1	15	1	15			10	11
12	I			1	15					1	15					1	15							10	12
13	I			1	355													3	1065			2	710	350	13
14	I			1	10	4	40			1	10					1	10							5	14
15	I			1	85	2	170			1	85					1	85	3	255			2	170	80	15
	I	FUTURE COMMUNICATION CONDUIT																						80	
16	I			1	20					2	40					1	20					1	20	15	16
17	I			1	35	4	140											1	35			1	35	30	17
18	I			1	65					3	195							2	130					60	18
	I	FUTURE COMMUNICATION CONDUIT																						60	
19	I			1	70					4	280							2	140					65	19
	I	FUTURE COMMUNICATION CONDUIT																						65	
20	I			1	20					1	20					1	20							15	20
21	I			1	90					5	450					1	90	2	180					85	21
	I	FUTURE COMMUNICATION CONDUIT																						85	
22	I			1	40	4	160											1	40					35	22
23	I			1	10	6	60											1	10					5	23
24	I			1	355	2	710			5	1775					3	1065							350	24
25	I			1	75	2	150			5	375					3	225							70	25
	I	FUTURE COMMUNICATION CONDUIT																						70	
26	I			1	145																			140	26
26A	I			1	25																			20	26A
27	I			1	185	2	370									2	370					2	370	180	27
27A	I			1	20	2	40									2	40					2	40	15	27A
28	I			1	15					1	15													10	28
29	I			1	15					1	15													10	29
SUBTOTAL			70		2045		2850				4035						2405		2980		230		1885		
P-1	P							90			5		10												P-1
P-2	P							80					105		65										P-2
P-3	P										10		20												P-3
P-4	P							80					125												P-4
P-5	P							80					176								20				P-5
P-6	P										5		10												P-6
P-7	P							90			5		10												P-7
P-8	P										10		20												P-8
P-9	P							80					110		65										P-9
P-10	P										5		10												P-10
P-11	P							80					135												P-11
P-12	P							80					160												P-12
P-13	P										5														P-13
P-14	P										5														P-14
SUBTOTAL								660			50		891		130						20				
TOTAL			70		2045		2850	660			4085		891		130		2405		2980		250		1885		

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

P-# - REFERS TO THE WIRING INSIDE THE SIGNAL POLE AND MAST ARM.

*- THE CONTRACTOR SHALL INSTALL A 2" PVC CONDUIT FROM THE POINT OF DELIVERY TO THE PEDESTAL METER.

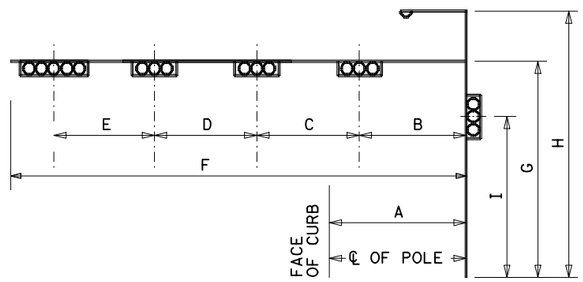
SIGNAL HEAD AND POLE PLACEMENT (FT)

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	I (FT)	NO. OF HEADS (EA)*	LUM	CITY PROVIDED EQUIPMENT CCTV**	CITY PROVIDED EQUIPMENT RADAR DET.** (EA)	DRILLED SHAFT LENGTH (LF) 24" DIA SUB TO ITEM 687	DRILLED SHAFT LENGTH (LF) 30" DIA ITEM 416	DRILLED SHAFT LENGTH (LF) 36" DIA TYPE A ITEM 416	FDN. TYPE WIND ZONE 80 MPH
P-1	I	11	LUMINAIRE POLE W/ APS					40	40		3	Y		1		10		N/A
P-2	I	6	17	11	16		48	19	30	13	3	Y		1			14	36A
P-3	I	7	PEDESTRIAN SIGNAL POLE					10							6			24A
P-4	I	10	6	14	14		40	19	30		3	Y					14	36A
P-5	I	17	26	12	10		48	19	30		3	Y	1				14	36A
P-6	I	6	PEDESTRIAN SIGNAL POLE					10							6			24A
P-7	I	6	LUMINAIRE POLE W/ APS					40	40		3	Y				10		N/A
P-8	I	8	PEDESTRIAN SIGNAL POLE					15						1	6			24A
P-9	I	9	18	11	12		48	19	30	13	3	Y		1			14	36A
P-10	I	8	PEDESTRIAN SIGNAL POLE					10							6			24A
P-11	I	10	9	15	15		44	19	30		3	Y					14	36A
P-12	I	14	20	12	12		48	19	30		3	Y					14	36A
P-13	I	5	PEDESTRIAN SIGNAL POLE												6			24A
P-14	I	3	PEDESTRIAN SIGNAL POLE												6			24A
										TOTAL:			1	4	36	20	84	

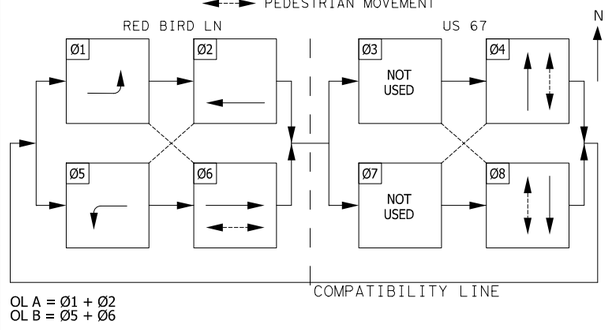
SIGNAL POLE STATUS: I=INSTALL; E=EXISTING; REM=REMOVE; F=INSTALL IN FUTURE PHASE

*- DOES NOT INCLUDE VERTICAL SIDEMOUNT SIGNAL HEADS OR PEDESTRIAN SIGNAL HEADS

**- EQUIPMENT TO BE PROVIDED BY THE CITY AND INSTALLED BY THE CONTRACTOR



PHASE SEQUENCE



OL A = Ø1 + Ø2
OL B = Ø5 + Ø6

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

DIAMOND SIGNALS

PROPOSED TABLES
US 67 AT RED BIRD LN

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	74
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

100% SUBMITTAL

CABLE TERMINATION CHART

CNDR. NO.	CONDUCTOR COLOR	CABLE 1 10 CNDR. FROM P-1 TO CNTRL.	CABLE 2 20 CNDR. FROM P-2 TO CNTRL.	CABLE 3 10 CNDR. FROM P-3 TO CNTRL.	CABLE 4 20 CNDR. FROM P-4 TO CNTRL.	CABLE 5 20 CNDR. FROM P-5 TO CNTRL.	CABLE 6 10 CNDR. FROM P-6 TO CNTRL.	CABLE 7 10 CNDR. FROM P-7 TO CNTRL.	CABLE 8 10 CNDR. FROM P-8 TO CNTRL.	CABLE 9 20 CNDR. FROM P-9 TO CNTRL.	CABLE 10 10 CNDR. FROM P-10 TO CNTRL.	CABLE 11 20 CNDR. FROM P-11 TO CNTRL.	CABLE 12 20 CNDR. FROM P-12 TO CNTRL.
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON
3	RED	SPARE	SH 9, 10, 11 OL-A R	SPARE	SH 13, 14, 15 PH 8 R	SH 16, 17, 18 PH 6 R	SPARE	SPARE	SPARE	SH 19, 20, 21 OL-B R	SPARE	SH 26, 27, 28 PH 4 R	SH 23, 24, 25 PH 2 R
4	GREEN	SPARE	SH 9, 10, 11 OL-A G	SPARE	SH 13, 14, 15 PH 8 G	SH 16, 17, 18 PH 6 G	SPARE	SPARE	SPARE	SH 19, 20, 21 OL-B G	SPARE	SH 26, 27, 28 PH 4 G	SH 23, 24, 25 PH 2 G
5	ORANGE	SPARE	SH 9, 10, 11 OL-A Y	SPARE	SH 13, 14, 15 PH 8 Y	SH 16, 17, 18 PH 6 Y	SPARE	SPARE	SPARE	SH 19, 20, 21 OL-B Y	SPARE	SH 26, 27, 28 PH 4 Y	SH 23, 24, 25 PH 2 Y
6	BLUE	SH 1 PH 8 DW	SPARE	SH 2 PH 8 DW	SPARE	SPARE	SH 4 PH 6 DW	SH 5 OL-B DW	SH 6 OL-B DW	SPARE	SH 8 PH 4 DW	SPARE	SPARE
7	WHITE/BLACK	SH 1 PH 8 W	SPARE	SH 2 PH 8 W	SPARE	SPARE	SH 4 PH 6 W	SH 5 OL-B W	SH 6 OL-B W	SPARE	SH 8 PH 4 W	SPARE	SPARE
8	RED/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
9	GREEN/BLACK	SPARE	SPARE	SH 3 PH 6 DW	SPARE	SPARE	SPARE	SPARE	SH 7 PH 4 DW	SPARE	SPARE	SPARE	SPARE
10	ORANGE/BLACK	SPARE	SPARE	SH 3 PH 6 W	SPARE	SPARE	SPARE	SPARE	SH 7 PH 4 W	SPARE	SPARE	SPARE	SPARE
11	BLUE/BLACK		SPARE		SPARE	SPARE				SPARE		SPARE	SPARE
12	BLACK/WHITE		SPARE		SPARE	SPARE				SPARE		SPARE	SPARE
13	RED/WHITE		SH 12 PH 5 R (LT ARW)		SPARE	SPARE				SH 22 PH 1 R (LT ARW)		SPARE	SPARE
14	GREEN/WHITE		SH 12 PH 5 G (LT ARW)		SPARE	SPARE				SH 22 PH 1 G (LT ARW)		SPARE	SPARE
15	BLUE/WHITE		SH 12 PH 5 Y (LT ARW)		SPARE	SPARE				SH 22 PH 1 Y (LT ARW)		SPARE	SPARE
16	BLACK/RED		SPARE		SPARE	SPARE				SPARE		SPARE	SPARE
17	WHITE/RED		SPARE		SPARE	SPARE				SPARE		SPARE	SPARE
18	ORANGE/RED		SPARE		SPARE	SPARE				SPARE		SPARE	SPARE
19	BLUE/RED		SH 12 PH 5 FY (LT ARW)		SPARE	SPARE				SH 22 PH 1 FY (LT ARW)		SPARE	SPARE
20	RED/GREEN		SPARE		SPARE	SPARE				SPARE		SPARE	SPARE

NOTE: HOME RUN 2 CNDR TO ALL POLES WITH APS BUTTONS

ITEM 6292 RADAR DETECTION ZONE DETAILS

RADAR PANEL NUMBER	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATIONS	ZONES(S)	SETBACK DISTANCE
D1	P-1	18'	STOP BAR	SB	N/A
D2	P-2	18'	STOP BAR	EB	N/A
D3	P-8	18'	STOP BAR	NB	N/A
D4	P-9	18'	STOP BAR	WB	N/A

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
P-3	Phase 6	BUTTON PUSH ON DW	WAIT TO CROSS US-67 SBFR AT RED BIRD RD
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-67 SBFR AT RED BIRD RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	US-67 SBFR, WALK SIGN IS ON TO CROSS US-67 SBFR
P-6	Phase 6	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-67 SBFR AT RED BIRD RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	WAIT
P-1	Phase 8	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS RED BIRD RD AT US-67 SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-3	Phase 8	BUTTON PUSH ON DW	WAIT TO CROSS RED BIRD RD AT US-67 SBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS RED BIRD RD AT US-67 SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RED BIRD RD, WALK SIGN IS ON TO CROSS RED BIRD RD
P-8	Phase 4	BUTTON PUSH ON DW	WAIT TO CROSS RED BIRD RD AT US-67 NBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS RED BIRD RD AT US-67 NBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RED BIRD RD, WALK SIGN IS ON TO CROSS RED BIRD RD
P-10	Phase 4	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS RED BIRD RD AT US-67 NBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-7	OL-B	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-67 NBFR AT RED BIRD RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-8	OL-B	BUTTON PUSH ON DW	WAIT TO CROSS US-67 NBFR AT RED BIRD RD
		EXTENDED BUTTON PUSH	WAIT TO CROSS US-67 NBFR AT RED BIRD RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	US-67 NBFR, WALK SIGN IS ON TO CROSS US-67 NBFR

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED TABLES
US 67 AT RED BIRD LN

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	75

STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.

CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

4/25/2024 3:22:53 PM L:\Projects\2023\OTHON\204052328 - 36-91DP5004 WA2 (3682 TRFE 10x#3) 7 Diamond Signals DAL\Drawings\10TRF\5, US 67 at Red Bird\Dallas District Signals - Proposed Tables 2.dgn

100% SUBMITTAL

SIGNS SUMMARY

SIGN #	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R10-3EL	APS PUSH BUTTON	I	P-1	9" x 15"
S2	R10-3EL	APS PUSH BUTTON	I	P-3	9" x 15"
S3	R10-3EL	APS PUSH BUTTON	I	P-3	9" x 15"
S4	R10-3ER	APS PUSH BUTTON	I	P-6	9" x 15"
S5	R10-3EL	APS PUSH BUTTON	I	P-7	9" x 15"
S6	R10-3ER	APS PUSH BUTTON	I	P-8	9" x 15"
S7	R10-3EL	APS PUSH BUTTON	I	P-8	9" x 15"
S8	R10-3ER	APS PUSH BUTTON	I	P-10	9" x 15"
S9	R9-3	NO PEDESTRIAN CROSSINGS	I	10 BWG	18" x 18"
S10	R9-3	NO PEDESTRIAN CROSSINGS	I		18" x 18"
S11	D3-1	STREET NAME	I	P-2	24" x VARIES
S12	R6-2L	ONE WAY	I	P-2	30" x 36"
S13	R6-2L	ONE WAY	I	P-2	30" x 36"
S14	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S15	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S16	D3-1	STREET NAME	I	P-4	24" x VARIES
S17	D3-1	STREET NAME	I	P-5	24" x VARIES
S18	R6-2R	ONE WAY	I	P-5	30" x 36"
S19	R6-2R	ONE WAY	I	P-5	30" x 36"
S20	D3-1	STREET NAME	I	P-9	24" x VARIES
S21	R6-2L	ONE WAY	I	P-9	30" x 36"
S22	R6-2L	ONE WAY	I	P-9	30" x 36"
S23	R6-2R	ONE WAY	I	P-12	30" x 36"
S24	R6-2R	ONE WAY	I	P-12	30" x 36"
S25	D3-1	STREET NAME	I	P-12	24" x VARIES
S26	R9-3	NO PEDESTRIAN CROSSINGS	I	P-12	18" x 18"
S27	R9-3	NO PEDESTRIAN CROSSINGS	I	P-12	18" x 18"
S28	D3-1	STREET NAME	I	P-11	24" x VARIES
S29	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S30	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S31	R10-3ELR	APS PUSH BUTTON	I	P-13	9" x 15"
S32	R10-3ELR	APS PUSH BUTTON	I	P-14	9" x 15"

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

ITEM 0682 SIGNAL HEADS

SIGNAL HEAD NUMBER	SIGNAL HEAD TYPE	STATUS	12-INCH SIGNAL HEAD UNITS								PED SIG SEC (LED) (COUNTDOWN)
			BACKPLATES		LED SIGNAL LAMPS						
			3 SEC	5 SEC	G	<- G	Y	<- Y	R	<- R	
			EA	EA	EA	EA	EA	EA	EA	EA	EA
1	PED	I									1
2	PED	I									1
3	PED	I									1
4	PED	I									1
5	PED	I									1
6	PED	I									1
7	PED	I									1
8	PED	I									1
9	V3S	I	1			1	1		1		
10	H3	I	1		1		1		1		
11	H3	I	1		1		1		1		
12	H5FYA	I		1		1		2		2	
13	H3	I	1		1		1		1		
14	H3	I	1		1		1		1		
15	H3	I	1		1		1		1		
16	H3	I	1		1		1		1		
17	H3	I	1		1		1		1		
18	H3S	I	1			1	1		1		
19	V3S	I	1			1	1		1		
20	H3	I	1		1		1		1		
21	H3	I	1		1		1		1		
22	H5FYA	I		1		1		2		2	
23	H3S	I	1			1	1		1		
24	H3	I	1		1		1		1		
25	H3	I	1		1		1		1		
26	H3	I	1		1		1		1		
27	H3	I	1		1		1		1		
28	H3	I	1		1		1		1		
TOTAL (NEW)			18	2	14	6	18	4	18	4	8

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

GROUND BOX SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QTY.
624	6010	GROUND BOX TY D (162922)W/APRON	EA	9
6186	6002	ITS GND BOX(PCAST) TY 1 (243636)W/APRN	EA	1

ELECTRICAL SERVICE DATA

ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED(5)-14)	SERVICE CONDUIT SIZE (PVC)**	SERVICE CONDUCTORS NO. / SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE / AMP	TWO-POLE CONTACTOR AMPS	PANELBD. / LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE / AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-5	TY D (120/240) 070 (NS) SS (E) PS (U)	2"	3 / #4	N/A	2P / 70	30	100	T.S.	1P / 30	24	<7.1
								LIGHTING	2P / 15	4	
								LIGHTING	2P / 15	4	

** - VERIFY SERVICE CONDUIT SIZE WITH UTILITY. SIZE MAY CHANGE DUE TO THE UTILITY METER REQUIREMENTS. ENSURE CONDUIT SIZE MEETS THE NATIONAL ELECTRICAL CODE.

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED TABLES
US 67 AT RED BIRD LN

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	76
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

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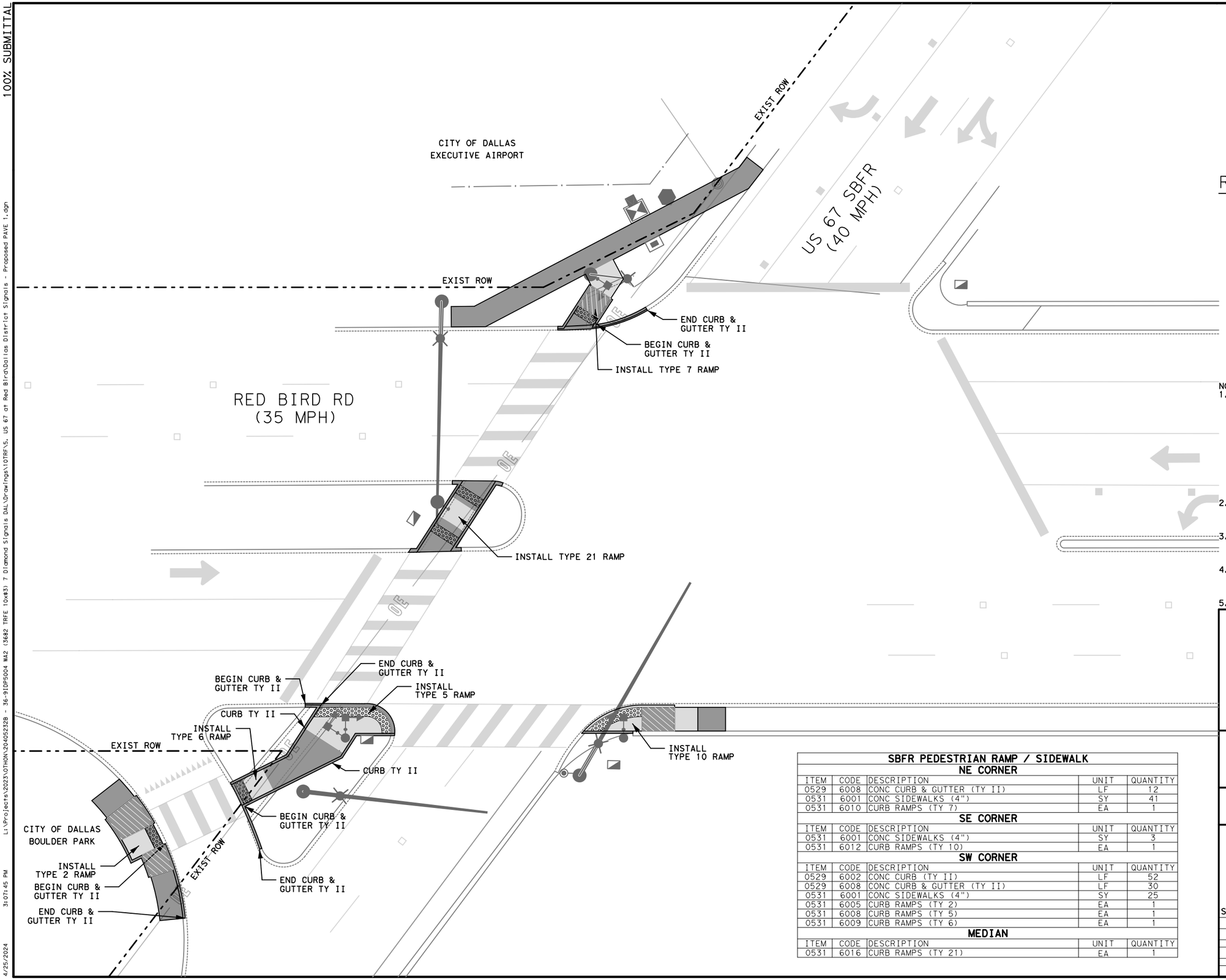

RAMP & PAVING LEGEND

- PEDESTRIAN RAMPS
  7.1% RUNNING SLOPE
  2% CROSS SLOPE
- SIDEWALK
  5% RUNNING SLOPE
  2% CROSS SLOPE
- PEDESTRIAN LANDING
  2% RUNNING SLOPE
  2% CROSS SLOPE
- DETECTABLE SURFACE
  7.1% RUNNING SLOPE
  2% CROSS SLOPE
- CONCRETE RIP RAP

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. PROPOSED CURB RAMP LANDINGS SHALL BE POURED UP TO THE SIGNAL FOUNDATION, LEAVING NO GAPS.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS AND SUBSTITUTION OF ANY DAMAGED IRRIGATION EQUIPMENT.
4. CONTRACTOR SHALL ENSURE THAT ALL PED RAMPS DRAIN TOWARDS THE STREET WITHOUT PONDING IN THE RAMP OR GUTTER AREA.
5. ALL SLOPE VALUES SHOWN ARE MAXIMUMS.

SBFR PEDESTRIAN RAMP / SIDEWALK				
NE CORNER				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0529	6008	CONC CURB & GUTTER (TY II)	LF	12
0531	6001	CONC SIDEWALKS (4")	SY	41
0531	6010	CURB RAMPS (TY 7)	EA	1
SE CORNER				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0531	6001	CONC SIDEWALKS (4")	SY	3
0531	6012	CURB RAMPS (TY 10)	EA	1
SW CORNER				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0529	6002	CONC CURB (TY II)	LF	52
0529	6008	CONC CURB & GUTTER (TY II)	LF	30
0531	6001	CONC SIDEWALKS (4")	SY	25
0531	6005	CURB RAMPS (TY 2)	EA	1
0531	6008	CURB RAMPS (TY 5)	EA	1
0531	6009	CURB RAMPS (TY 6)	EA	1
MEDIAN				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0531	6016	CURB RAMPS (TY 21)	EA	1

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Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED PAVEMENT
US 67 AT RED BIRD RD

SCALE: 1" = 20' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		77
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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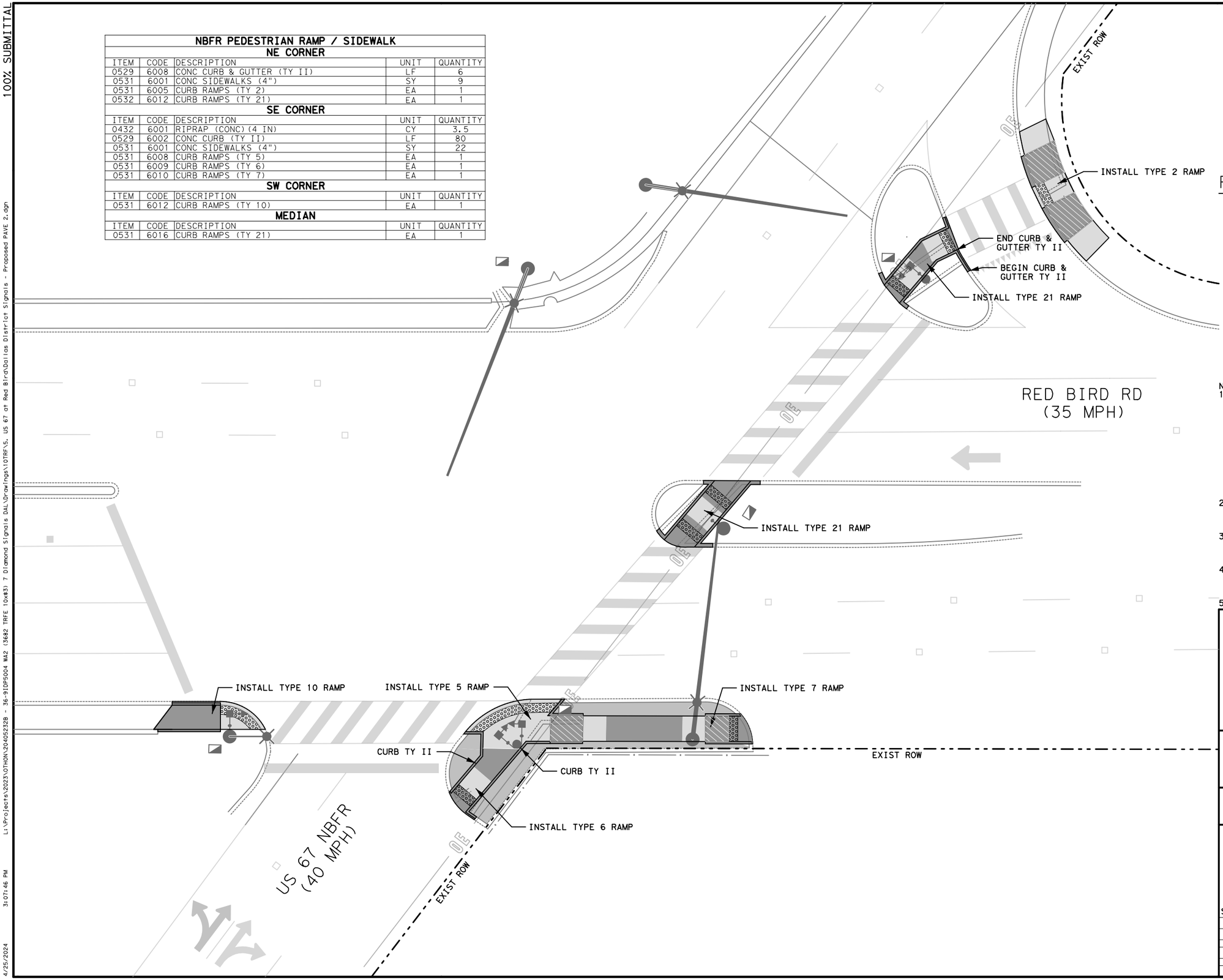
NBFR PEDESTRIAN RAMP / SIDEWALK				
NE CORNER				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0529	6008	CONC CURB & GUTTER (TY II)	LF	6
0531	6001	CONC SIDEWALKS (4")	SY	9
0531	6005	CURB RAMPS (TY 2)	EA	1
0532	6012	CURB RAMPS (TY 21)	EA	1
SE CORNER				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	3.5
0529	6002	CONC CURB (TY II)	LF	80
0531	6001	CONC SIDEWALKS (4")	SY	22
0531	6008	CURB RAMPS (TY 5)	EA	1
0531	6009	CURB RAMPS (TY 6)	EA	1
0531	6010	CURB RAMPS (TY 7)	EA	1
SW CORNER				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0531	6012	CURB RAMPS (TY 10)	EA	1
MEDIAN				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0531	6016	CURB RAMPS (TY 21)	EA	1



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RAMP & PAVING LEGEND

- PEDESTRIAN RAMPS — 7.1% RUNNING SLOPE, 2% CROSS SLOPE
- SIDEWALK — 5% RUNNING SLOPE, 2% CROSS SLOPE
- PEDESTRIAN LANDING — 2% RUNNING SLOPE, 2% CROSS SLOPE
- DETECTABLE SURFACE — 7.1% RUNNING SLOPE, 2% CROSS SLOPE
- CONCRETE RIP RAP

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. PROPOSED CURB RAMP LANDINGS SHALL BE POURED UP TO THE SIGNAL FOUNDATION, LEAVING NO GAPS.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS AND SUBSTITUTION OF ANY DAMAGED IRRIGATION EQUIPMENT.
4. CONTRACTOR SHALL ENSURE THAT ALL PED RAMPS DRAIN TOWARDS THE STREET WITHOUT PONDING IN THE RAMP OR GUTTER AREA.
5. ALL SLOPE VALUES SHOWN ARE MAXIMUMS.

STATE OF TEXAS
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DIAMOND SIGNALS

PROPOSED PAVEMENT US 67 AT RED BIRD RD

SCALE: 1" = 20' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		78
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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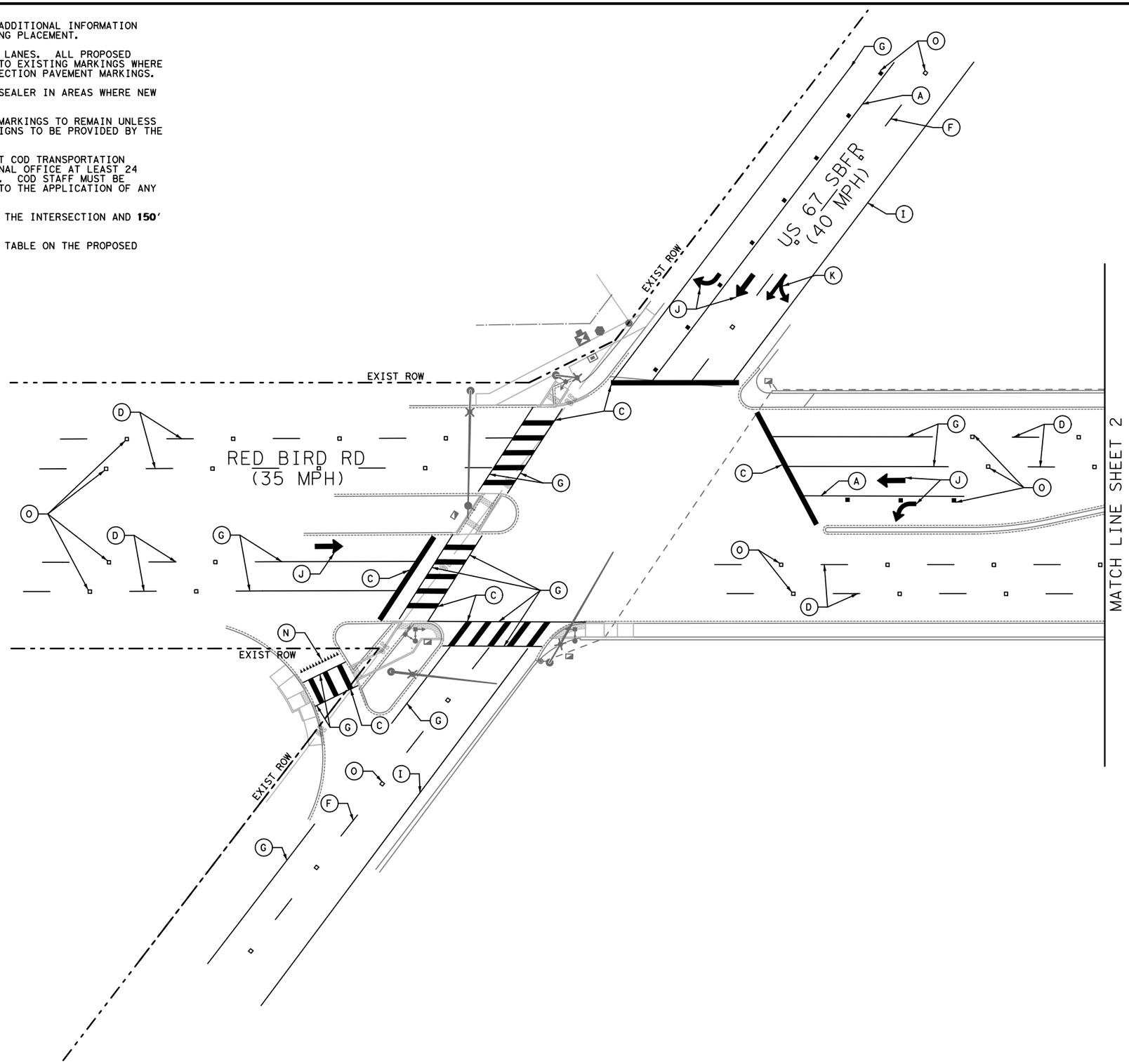
NOTES:
1. REFER TO THE CITY STANDARDS FOR ADDITIONAL INFORMATION REGARDING TYPICAL PAVEMENT MARKING PLACEMENT.
2. LANE WIDTHS SHALL MATCH EXISTING LANES. ALL PROPOSED PAVEMENT MARKINGS SHALL BE TIED TO EXISTING MARKINGS WHERE APPLICABLE TO REFRESH THE INTERSECTION PAVEMENT MARKINGS.
3. CONTRACTOR SHALL APPLY PAVEMENT SEALER IN AREAS WHERE NEW THERMO IS TO BE APPLIED.
4. ALL EXISTING SIGNS AND PAVEMENT MARKINGS TO REMAIN UNLESS OTHERWISE NOTED. ALL PROPOSED SIGNS TO BE PROVIDED BY THE CONTRACTOR.
5. STRIPING CONTRACTOR SHALL CONTACT COD TRANSPORTATION OPERATIONS AND TxDOT TRAFFIC SIGNAL OFFICE AT LEAST 24 HOURS IN ADVANCE OF MOBILIZATION. COD STAFF MUST BE PRESENT TO CONFIRM LAYOUT PRIOR TO THE APPLICATION OF ANY PAVEMENT MARKINGS.
6. REFRESH PAVEMENT MARKINGS WITHIN THE INTERSECTION AND **150'** FROM STOP BAR.
7. SEE SUMMARY OF PAVEMENT MARKINGS TABLE ON THE PROPOSED QUANTITIES SHEET.



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PAVEMENT MARKING LEGEND

- (A) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100 MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100 MIL)
- (D) RE PM W/RET REQ TY I (W)(4")(BRK)(100MIL)
- (E) RE PM W/RET REQ TY I (W)(4")(SLD)(100MIL)
- (F) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (G) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (H) RE PM W/RET REQ TY I (Y)(4")(SLD)(100MIL)
- (I) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (J) PREFAB PAV MRK TY C (W)(ARROW)
- (K) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (L) PREFAB PAV MRK TY C (W)(UTURN ARROW)
- (M) PREFAB PAV MRK TY C (W)(WORD)
- (N) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- (O) REFL PAV MRK TY II-C-R
- (P) REFL PAV MRK TY II-A-A

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DIAMOND SIGNALS

PROPOSED PAVEMENT MARKING US 67 AT RED BIRD RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		79
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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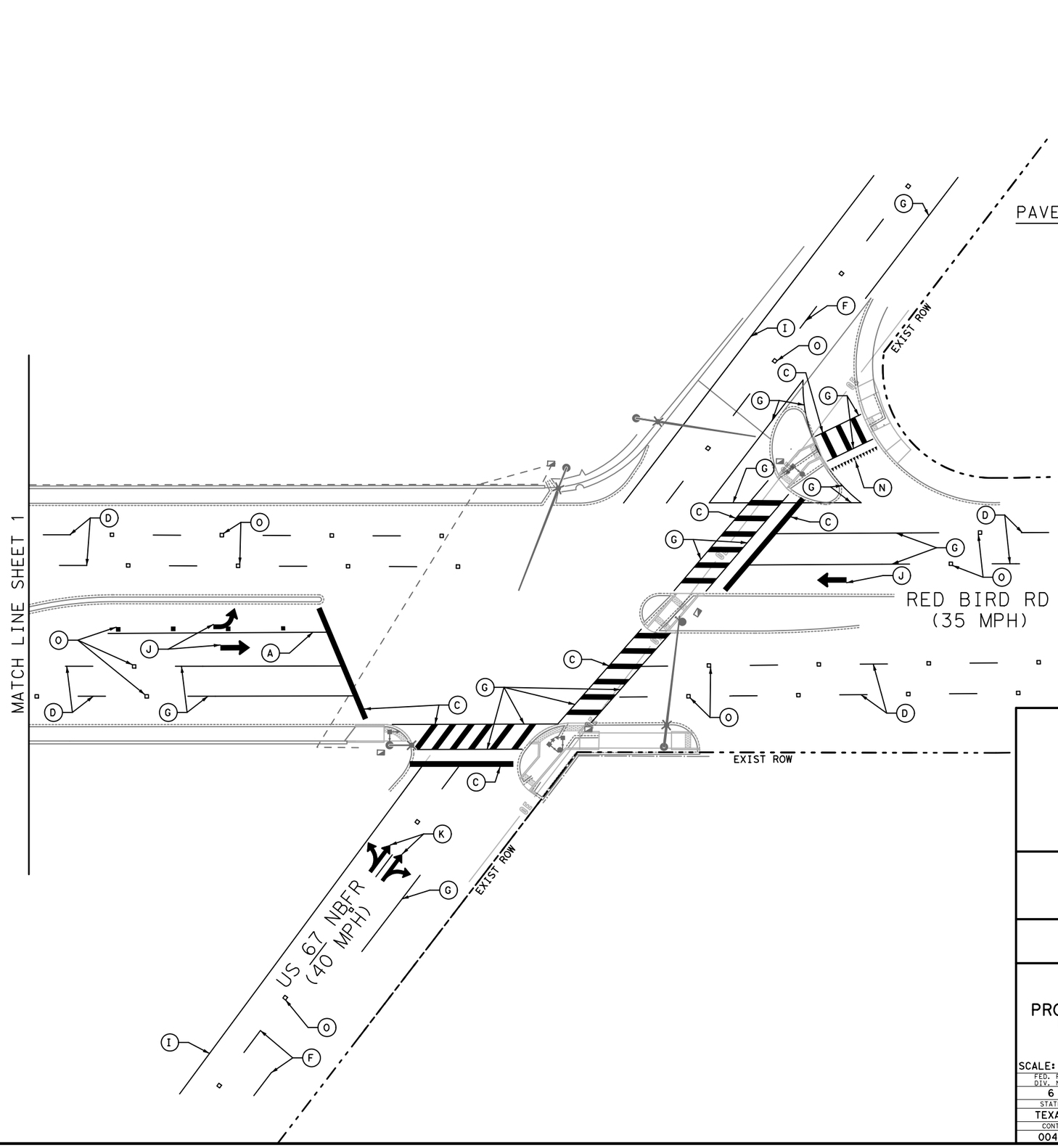
NOTES:
1. REFER TO THE CITY STANDARDS FOR ADDITIONAL INFORMATION REGARDING TYPICAL PAVEMENT MARKING PLACEMENT.
2. LANE WIDTHS SHALL MATCH EXISTING LANES. ALL PROPOSED PAVEMENT MARKINGS SHALL BE TIED TO EXISTING MARKINGS WHERE APPLICABLE TO REFRESH THE INTERSECTION PAVEMENT MARKINGS.
3. CONTRACTOR SHALL APPLY PAVEMENT SEALER IN AREAS WHERE NEW THERMO IS TO BE APPLIED.
4. ALL EXISTING SIGNS AND PAVEMENT MARKINGS TO REMAIN UNLESS OTHERWISE NOTED. ALL PROPOSED SIGNS TO BE PROVIDED BY THE CONTRACTOR.
5. STRIPING CONTRACTOR SHALL CONTACT COD TRANSPORTATION OPERATIONS AND TxDOT TRAFFIC SIGNAL OFFICE AT LEAST 24 HOURS IN ADVANCE OF MOBILIZATION. COD STAFF MUST BE PRESENT TO CONFIRM LAYOUT PRIOR TO THE APPLICATION OF ANY PAVEMENT MARKINGS.
6. REFRESH PAVEMENT MARKINGS WITHIN THE INTERSECTION AND 150' FROM STOP BAR.
7. SEE SUMMARY OF PAVEMENT MARKINGS TABLE ON THE PROPOSED QUANTITIES SHEET.



PAVEMENT MARKING LEGEND

A	REFL PAV MRK TY I (W)8"(SLD)(100MIL)
B	REFL PAV MRK TY I (W)(12")(SLD)(100 MIL)
C	REFL PAV MRK TY I (W)(24")(SLD)(100 MIL)
D	RE PM W/RET REQ TY I (W)(4")(BRK)(100MIL)
E	RE PM W/RET REQ TY I (W)(4")(SLD)(100MIL)
F	RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
G	RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
H	RE PM W/RET REQ TY I (Y)(4")(SLD)(100MIL)
I	RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
J	PREFAB PAV MRK TY C (W)(ARROW)
K	PREFAB PAV MRK TY C (W)(DBL ARROW)
L	PREFAB PAV MRK TY C (W)(UTURN ARROW)
M	PREFAB PAV MRK TY C (W)(WORD)
N	PREFAB PAV MRK TY C (W) (18")(YLD TRI)
O	REFL PAV MRK TY II-C-R
P	REFL PAV MRK TY II-A-A

STATE OF TEXAS
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Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED PAVEMENT MARKING US 67 AT RED BIRD RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		80
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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PAVEMENT MARKING SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	290
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	804
666	6224	PAVEMENT SEALER 4"	LF	600
666	6225	PAVEMENT SEALER 6"	LF	2160
666	6226	PAVEMENT SEALER 8"	LF	290
666	6230	PAVEMENT SEALER 24"	LF	804
666	6231	PAVEMENT SEALER (ARROW)	EA	8
666	6234	PAVEMENT SEALER (DBL ARROW)	EA	3
666	6243	PAVEMENT SEALER (YLD TRI)	EA	28
666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	300
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	160
666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	1400
666	6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	600
668	6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	8
668	6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	3
668	6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	28
672	6010	REFL PAV MRKR TY II-C-R	EA	61
678	6001	PAV SURF PREP FOR MRK (4")	LF	600
678	6002	PAV SURF PREP FOR MRK (6")	LF	2160
678	6004	PAV SURF PREP FOR MRK (8")	LF	290
678	6008	PAV SURF PREP FOR MRK (24")	LF	804
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	8
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	3
678	6022	PAV SURF PREP FOR MRK (18")(YLD TRI)	EA	28
678	6033	PAV SURF PREP FOR MRK (RPM)	EA	61

PEDESTRIAN RAMP / SIDEWALK SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	3.5
0529	6002	CONC CURB (TY II)	LF	132
0529	6008	CONC CURB & GUTTER (TY II)	LF	48
0531	6001	CONC SIDEWALKS (4")	SY	100
0531	6005	CURB RAMPS (TY 2)	EA	2
0531	6008	CURB RAMPS (TY 5)	EA	2
0531	6009	CURB RAMPS (TY 6)	EA	2
0531	6010	CURB RAMPS (TY 7)	EA	2
0531	6013	CURB RAMPS (TY 10)	EA	2
0531	6016	CURB RAMPS (TY 21)	EA	3

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DIAMOND SIGNALS

PAVING AND PAVEMENT MARKING QUANTITIES US 67 AT RED BIRD RD

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		81
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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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 THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.

2. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.

3. CONTRACTOR SHALL MAINTAIN THE EXISTING SIGNAL INSTALLATION AND OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED SIGNAL IS OPERATIONAL.

4. THE CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AFTER PROPOSED SIGNAL IS OPERATIONAL. EXISTING FOUNDATIONS AND GROUND BOXES SHALL BE REMOVED, WITH POLE FOUNDATIONS REMOVED TO A MINIMUM OF 2' BELOW EXISTING GROUND, AND BACK FILLED WITH SIMILAR MATERIALS IN THE SURROUNDING AREA. EXISTING CONDUITS SHALL BE ABANDONED IN PLACE. SEE GENERAL NOTES AND SPECIFICATIONS FOR MORE INFORMATION.

5. ELIMINATE ALL EXISTING PAVEMENT MARKINGS WITHIN THE INTERSECTION AND ALONG 150' IN EACH DIRECTION FROM STOP BAR. REFER TO PAVEMENT MARKING SHEET FOR ADDITIONAL INFORMATION.

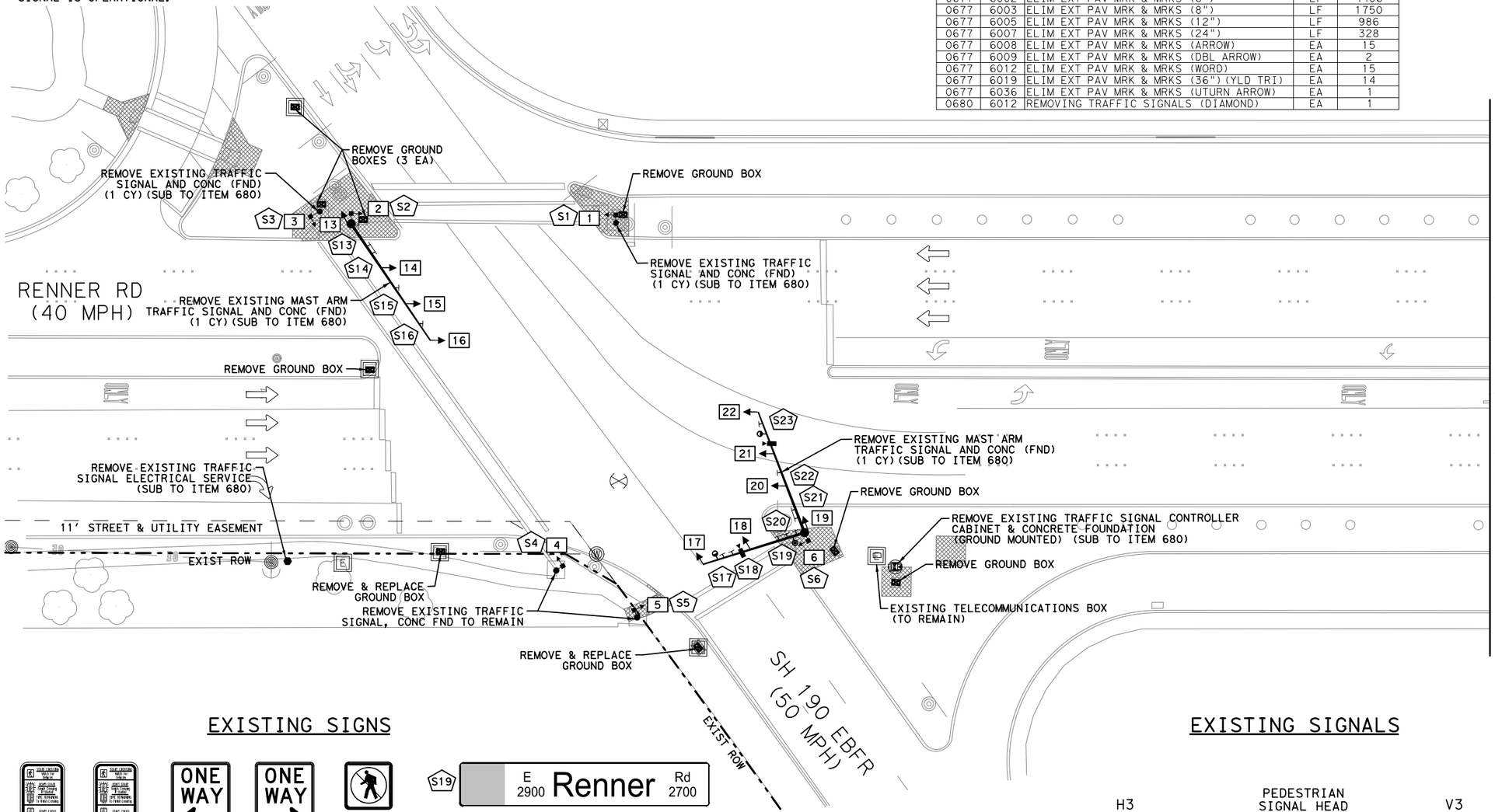
6. EXISTING SIGNS S1-S33 SHALL BE REMOVED WITH TRAFFIC SIGNAL EQUIPMENT.

7. CURB, RAMP AND SIDEWALK REMOVALS SHALL BE SUBSIDIARY TO THE INSTALLATION OF NEW CURB, RAMP OR CONCRETE SIDEWALK (SEE ITEM 531 QTYS AND PROPOSED PEDESTRIAN RAMP AND SIDEWALK LAYOUT).

8. ALL GROUND MOUNTED SIGNS SHALL REMAIN AS INSTALLED UNLESS OTHERWISE NOTED.

REMOVAL SUMMARY

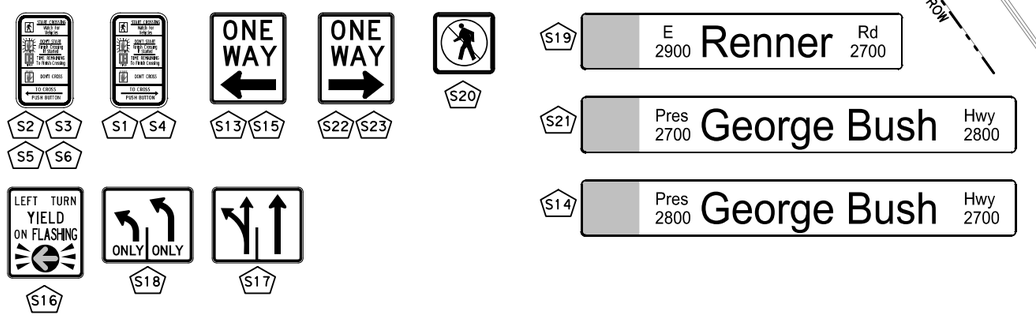
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0624	6028	REMOVE GROUND BOX	EA	17
0677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	753
0677	6002	ELIM EXT PAV MRK & MRKS (6")	LF	4406
0677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	1750
0677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	986
0677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	328
0677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	15
0677	6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	2
0677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	15
0677	6019	ELIM EXT PAV MRK & MRKS (36")(YLD TRI)	EA	14
0677	6036	ELIM EXT PAV MRK & MRKS (UTURN ARROW)	EA	1
0680	6012	REMOVING TRAFFIC SIGNALS (DIAMOND)	EA	1



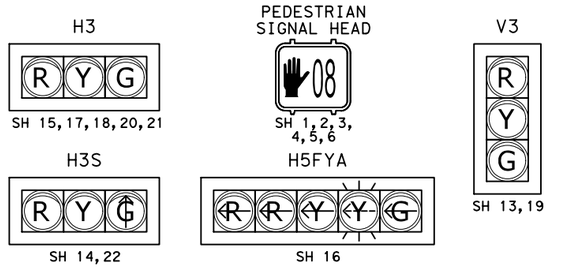
EXISTING SIGNAL LEGEND

- MAST ARM POLE
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LUMINAIRE
- VEHICLE DETECTOR
- OPTICOM
- CCTV
- EXISTING SIGNAL CONTROLLER CABINET
- EXISTING GROUND BOX
- 1 — SIGNAL HEAD NUMBER
- S1 — SIGN LABEL
- EXISTING ELECTRICAL SERVICE
- E-# — EXISTING SIGNAL POLE NUMBER
- PAVING REMOVAL

EXISTING SIGNS



EXISTING SIGNALS



STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024
Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

DIAMOND SIGNALS

EXISTING CONDITIONS AND REMOVALS SH 190 AT RENNER RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	82

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

L:\Projects\2023\OTHON\204052328 - 36-91DP5004 MA2 (3682 TRFE 10x$3) 7 Diamond Signals DAL\Drawings\10TRFE6, SH 190 at Renner\Dallas District Signals - Existing Layout 1.dgn
4/25/2024 3:58:54 PM

100% SUBMITTAL

MATCH LINE SHEET 1

SH 190 WBFR
(50 MPH)

EXIST ROW

REMOVE EXISTING TRAFFIC SIGNAL AND CONC (FND) (1 CY) (SUB TO ITEM 680)

REMOVE GROUND BOX

REMOVE EXISTING MAST ARM TRAFFIC SIGNAL AND CONC (FND) (1 CY) (SUB TO ITEM 680)

REMOVE GROUND BOXES (2 EA)

REMOVE GROUND BOXES (3 EA)

RENNER RD
(40 MPH)

EXISTING SIGNAL LEGEND

- MAST ARM POLE
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LUMINAIRE
- VEHICLE DETECTOR
- OPTICOM
- CCTV
- EXISTING SIGNAL CONTROLLER CABINET
- EXISTING GROUND BOX
- 1 SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- EXISTING ELECTRICAL SERVICE
- E-# EXISTING SIGNAL POLE NUMBER
- PAVING REMOVAL

EXISTING SIGNS

S8 S9 S11 S12 — S7 S10 — S24 S26 — S28 S29 — S31

S27 — S33

S32: E 2700 Renner Rd 2900

S30: Pres 2700 George Bush Hwy 2800

S25: Pres 2800 George Bush Hwy 2700

EXISTING SIGNALS

V5RT — SH 30

H3 — SH 23,24,27, 28,31,32

H3S — SH 26

PEDESTRIAN SIGNAL HEAD — SH 7,8,9, 10,11,12

H5FYA — SH 25

V3 — SH 29

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

EXISTING CONDITIONS AND REMOVALS SH 190 AT RENNER RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	83

STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.

CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

L:\Projects\2023\OTHON\204052328 - 36-91DP5004 MA2 (3682 TRFE 10x$3) 7 Diamond Signals DAL\Drawings\10TRF\6. SH 190 at Renner\Dallas District Signals - Existing Layout 2.dgn
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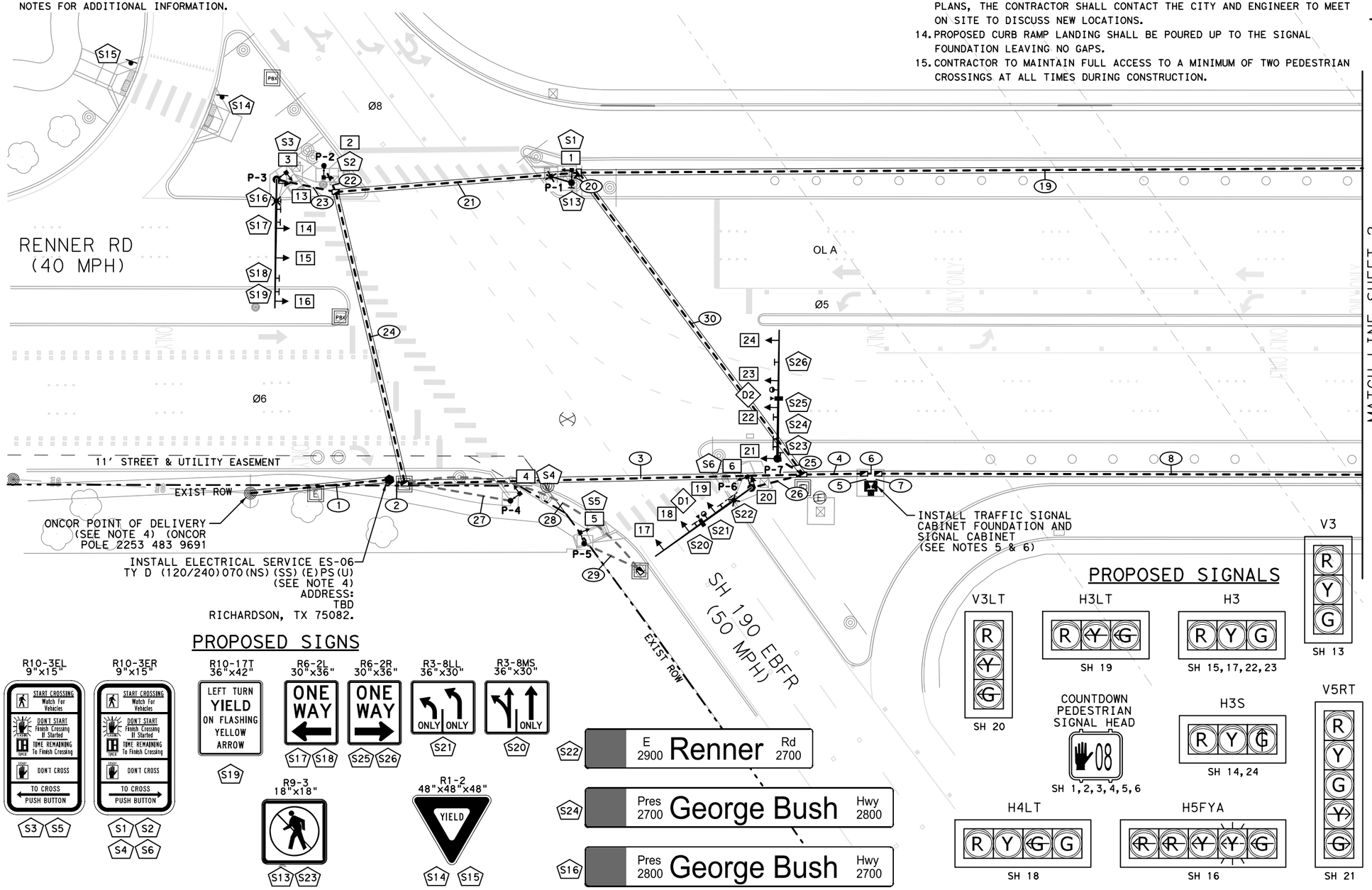
100% SUBMITTAL

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF DALLAS TRAFFIC MANAGEMENT CENTER AT (214-670-3095) 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, RADAR DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
4. CONTRACTOR SHALL COORDINATE WITH ONCOR CONCERNING TRAFFIC SIGNAL ELECTRICAL SERVICE. CONTACT ONCOR (RODAS A LULSEGED AT RODAS.LULSEGED@ONCOR.COM) REGARDING POINT OF DELIVERY AND DISTRIBUTION TO ELECTRICAL PEDESTAL SERVICE. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. THE FOLLOWING ITEMS WILL BE FURNISHED BY THE CITY OF RICHARDSON AND INSTALLED BY THE CONTRACTOR: SIGNAL CABINET AND INTERNAL HARDWARE W/ BBU, OPTICOM & CABLING, ENFORCEMENT LIGHTS & CABLING, VIVDS DETECTION & CABLING AND STREET NAME SIGNS. CONTACT CODY WILDONER AT 972-744-4465 TO SCHEDULE PICK-UP OF MATERIALS.
6. INSTALL BASE MOUNTED P44 ATC CONTROLLER CABINET (TYPE TS2 CABINET) AND FOUNDATION.
7. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
8. SIGNAL HEADS SHALL BE YELLOW WITH YELLOW POWDER COATED ALUMINUM VISORS AND WITH A 2" YELLOW BORDER.
9. DETECTION ZONES TO BE PROGRAMMED BY THE CITY OF RICHARDSON. CONTACT CITY OF RICHARDSON TRAFFIC MANAGEMENT CENTER WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.
10. ALL SIGNAL CABLES SHALL BE WIRED IN ACCORDANCE WITH THE CABINET PREPARATION NOTES SUPPLIED BY THE CITY OF RICHARDSON.
11. CONTRACTOR SHALL COORDINATE THE TRAFFIC SIGNAL POLE FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED FIRST, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER SO A FIELD MEETING CAN BE SCHEDULED TO DETERMINE IF FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL POLE FOUNDATIONS ARE INSTALLED FIRST, THE CURB RAMPS AND SIDEWALKS SHALL BE MODIFIED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS ARE 10" OR LESS.
12. PROPOSED APS UNITS SHALL BE PLACED ADJACENT TO A LEVEL LANDING AREA (2% MAX IN ANY DIRECTION). IF THE DISTANCE FROM THE PUSH BUTTON TO THE EDGE OF ACCESSIBLE PATH EXCEEDS 10", THE CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON EXTENDER TO MAKE THE REACH 10" OR LESS. MEASUREMENT AND PAYMENT SHALL BE CONSIDERED SUBSIDIARY TO THE INSTALLATION OF THE TRAFFIC SIGNAL EQUIPMENT.
13. 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.
14. PROPOSED CURB RAMP LANDING SHALL BE POURED UP TO THE SIGNAL FOUNDATION LEAVING NO GAPS.
15. CONTRACTOR TO MAINTAIN FULL ACCESS TO A MINIMUM OF TWO PEDESTRIAN CROSSINGS AT ALL TIMES DURING CONSTRUCTION.



MATCH LINE SHEET 2

PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINAIRE (250W EQ)
- RADAR VEHICLE DETECTOR (DALLAS)
- VIDEO VEHICLE DETECTOR (RICHARDSON)
- OPTICOM (RICHARDSON)
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE D GROUND BOX
- TYPE 1 ITS GROUND BOX
- ELECTRICAL SERVICE
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- CONDUIT (RMC)
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- (S1) SIGN LABEL
- (D1) VEHICLE DETECTOR LABEL
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

PROPOSED SIGNS

R10-3EL 9"x15" (S3, S5)

R10-3ER 9"x15" (S1, S2, S4, S6)

R10-17T 36"x42" (S19)

R6-2L 30"x36" (S17, S18)

R6-2R 30"x36" (S25, S26)

R3-8LL 36"x30" (S21)

R3-8MS 36"x30" (S20)

R9-3 18"x18" (S13, S23)

R1-2 48"x48"x48" (S14, S15)

PROPOSED SIGNALS

V3LT — SH 20

H3LT — SH 19

H3 — SH 15, 17, 22, 23

V3 — SH 13

COUNTDOWN PEDESTRIAN SIGNAL HEAD — SH 1, 2, 3, 4, 5, 6

H3S — SH 14, 24

V5RT — SH 21

H4LT — SH 18

H5FYA — SH 16

STATE OF TEXAS
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FIRM REGISTRATION NO. F-1471

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DIAMOND SIGNALS

PROPOSED CONDITIONS SH 190 AT RENNER RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		84
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

100% SUBMITTAL

MATCH LINE SHEET 1

SH 190 WBFR
(50 MPH)

EXIST ROW

STREET EASEMENT
(LOCATION PENDING VERIFICATION)

EXIST ROW

RENNER RD
(40 MPH)

EXIST ROW

Ø1

Ø2

Ø4

OL B

P-8 P-9 P-10 P-11 P-12 P-13 P-14

S7 S8 S9 S10 S11 S12 S27 S28 S29 S30 S31 S32 S33 S34 S35 S36 S37 S38 S39

D3 D4

7 8 9 10 11 12 13 14 15 16 17 18 19 25 26 27 28 29 30 31 32 33 34 35 36

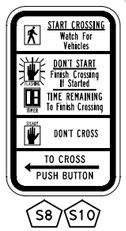
PBX

PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINAIRE (250W EQ)
- RADAR VEHICLE DETECTOR (DALLAS)
- VIDEO VEHICLE DETECTOR (RICHARDSON)
- OPTICOM (RICHARDSON)
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE D GROUND BOX
- TYPE 1 ITS GROUND BOX
- ELECTRICAL SERVICE
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- CONDUIT (RMC)
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- D1 VEHICLE DETECTOR LABEL
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

PROPOSED SIGNS

R10-3EL 9"x15"



S8 S10

R10-3ER 9"x15"

S7 S9 S11 S12

R10-17T 36"x42"

S31

R3-8LM 36"x30"

S37

R6-2L 30"x36"

S29 S30

R6-2R 30"x36"

S32 S33

R9-3 18"x18"

S27 S35

R1-2 48"x48"x48"

S38 S39

S36 E 2700 Renner Rd 2900

S34 Pres 2700 George Bush Hwy 2800

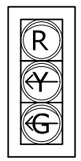
S28 Pres 2800 George Bush Hwy 2700

COUNTDOWN PEDESTRIAN SIGNAL HEAD

SH 7, 8, 9, 10, 11, 12

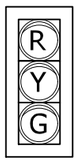
PROPOSED SIGNALS

V3LT



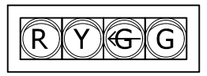
SH 33

V3



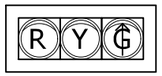
SH 25

H4LT



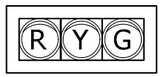
SH 34

H3S



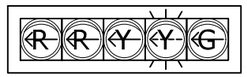
SH 26, 29

H3



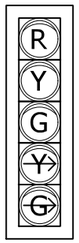
SH 27, 30, 31, 35, 36

H5FYA



SH 28

V5RT



SH 32

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED CONDITIONS SH 190 AT RENNER RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		85
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

L:\Projects\2023\OTHON\204052328 - 36-91DP5004 WA2 (3682 TRFE 10x3) 7 Diamond Signals DAL\Drawings\10TRF\6, SH 190 at Renner\Dallas District Signals - Proposed Layout 2.dgn
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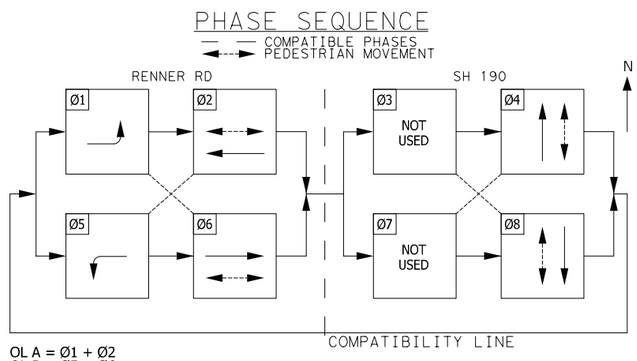
CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT: ITEM 618 (SCH 80) 2" PVC (RISER) QTY	2" PVC (RISER) LF	2" PVC (TRENCH) QTY	2" PVC (TRENCH) LF	3" PVC (TRENCH) QTY	3" PVC (TRENCH) LF	4" PVC (TRENCH) QTY	4" PVC (TRENCH) LEN	4" PVC (BORED) QTY	4" PVC (BORED) LF	ITEM 6027 PREPARE (CONDUIT) QTY	PREPARE (CONDUIT) LEN	CABLE STATUS	CONDUCTORS: ITEM 620 ELECTRICAL CONDUCTORS NO. 6 XHHW WIRE QTY	NO. 6 XHHW WIRE LEN	NO. 6 BARE WIRE QTY	NO. 6 BARE WIRE LF	NO. 8 XHHW WIRE QTY	NO. 8 XHHW WIRE LF	NO. 12 XHHW WIRE QTY	NO. 12 XHHW WIRE LF	ITEM 684 TRAFFIC SIGNAL CABLES TY C 2 CNDR NO. 12 QTY	TY C 2 CNDR NO. 12 LF	TY A 5 CNDR NO. 14 QTY	TY A 5 CNDR NO. 14 LF	TY A 7 CNDR NO. 14 QTY	TY A 7 CNDR NO. 14 LF	TY A 20 CNDR NO. 14 QTY	TY A 20 CNDR NO. 14 LF	SUB TO ITEM 680** VEHICLE DETECTOR CABLE QTY	VEHICLE DETECTOR CABLE LF	OPTICOM CABLE QTY	OPTICOM CABLE LF	ENFORCEMENT LIGHT CABLE QTY	ENFORCEMENT LIGHT CABLE LF	TOTAL LENGTH OF RUN	RUN NO
1*	I	1	10	1	55									I	ELECTRICAL CONDUCTORS TO BE INSTALLED BY ONCOR FROM THE POINT OF DELIVERY TO THE METER																							65	1*
2	I			1	10									I	2	30	1	15	4	60																	10	2
3	I			1	155									I	2	320	1	160	2	320			2	320			2	320	1	160							155	3
4	I			1	25									I	2	60	1	30	2	60			6	180					3	90	2	60	2	60			25	4
5	I			1	10	1	10	1	10					I	2	30	1	15					6	90					3	45	2	30	2	30			10	5
6	I							2	20					I	2	30	1	15	2	30																	10	6
7	I					1	10	1	10					I			1	15					6	90					3	45	2	30	2	30			10	7
8	I							1	435					I			1	440	2	880			6	2640					3	1320	2	880	2	880			435	8
9	I					1	10							I			1	15	4	60			1	15			1	15									10	9
10	I									1	105			I			1	110	2	220			5	550			1	110	1	110							105	10
11	I					1	15							I			1	20					2	40			1	20									15	11
12	I					1	10							I			1	15	2	30							2	30	1	15							10	12
13	I									1	140			I			1	145					3	435													140	13
14	I					1	10							I			1	15					1	15			1	15									10	14
15	I					1	15							I			1	20					1	20			1	20									15	15
16	I									1	105			I			1	110					1	110			2	220									105	16
17	I					1	10							I			1	15	4	60			1	15			2	30	1	15	1	15	1	15			10	17
18	I					1	10							I			1	15	2	30									1	15	1	15	1	15			10	18
19	I									1	490			I			1	495	2	990																	490	19
20	I					1	10							I			1	15	4	60			1	15			1	15									10	20
21	I									1	95			I			1	100	2	200			2	200			1	100									95	21
22	I					1	15							I			1	20					1	20			1	20									15	22
23	I					1	25							I			1	30	4	120			1	30			2	60	1	30							25	23
24	I									1	115			I			1	120	2	240									1	120							115	24
25	I					1	15							I			1	20									2	40	1	20	1	20	1	20			15	25
26	I					1	20							I			1	25	4	100			1	25					1	25	1	25	1	25			20	26
27	I											1	40	I			1	45					1	45			1	45									40	27
28	I											1	100	I			1	105					1	105			1	105									100	28
29	I											1	25	I			1	30					1	30			1	30									25	29
30	I									1	145			I			1	150					3	450													145	30
31	I									1	130			I			1	135											2	270	2	270	2	270			130	31
SUBTOTAL			10		255		185		475		1325		165			470		2460		3460				5440			1195		2280		1345		1345					
P-1	P													P										5		10											P-1
P-2	P													P										5		10											P-2
P-3	P													P								80		5		80		70							25		P-3
P-4	P													P										5		10											P-4
P-5	P													P										5		10											P-5
P-6	P													P								80		5		160					45		45		25		P-6
P-7	P													P								80				175					50		50		25		P-7
P-8	P													P										5		10											P-8
P-9	P													P										10		20											P-9
P-10	P													P								80				110		70							25		P-10
P-11	P													P										5		10											P-11
P-12	P													P										5		10											P-12
P-13	P													P								80		5		180					45		45		25		P-13
P-14	P													P								80				170					45		45		25		P-14
SUBTOTAL																						480		60		965		140			185		185		150		
TOTAL			10		255		185		475		1325		165			470		2460		3460		480		5500		965		1335		2280		1530		1530		150		

CONDUIT STATUS: I=INSTALL; E=EXISTING; P=WIRE TO BE INSTALLED INSIDE STEEL POLE; A=ABANDON; R=REMOVE AND SALVAGE; AC=AERIAL CABLE
P-# - REFERS TO THE WIRING INSIDE THE SIGNAL POLE AND MAST ARM.
*- THE CONTRACTOR SHALL INSTALL A 2" PVC CONDUIT FROM THE POINT OF DELIVERY TO THE PEDESTAL METER.
**- FURNISHED BY THE CITY OF RICHARDSON AND INSTALLED BY THE CONTRACTOR. INSTALLATION SHALL BE SUBSIDIARY TO ITEM 680. CONTACT CODY WILDONER AT 972-744-4465 OR CODY.WILDONER@COR.GOV TO SCHEDULE PICKUP.

PHASE SEQUENCE

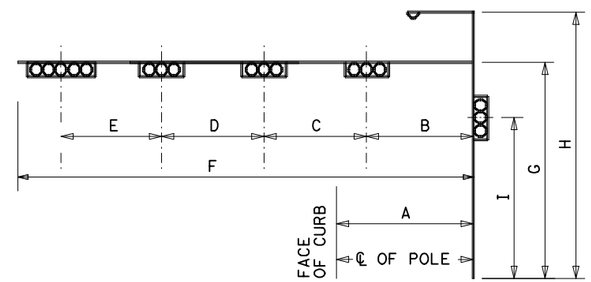


OL A = Ø1 + Ø2
OL B = Ø5 + Ø6

SIGNAL HEAD AND POLE PLACEMENT (FT)

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	I (FT)	NO. OF HEADS (EA)*	LUM	SUB TO ITEM 680 VIVDS CAM ASSY (INSTALL ONLY)	DRILLED SHAFT LENGTH (LF) 24" DIA SUB TO ITEM 687	30" DIA ITEM 416	36" DIA TYPE A ITEM 416	FDN. TYPE WIND ZONE 80 MPH
P-1	I	6	LUMINAIRE POLE W/ APS					30							8		N/A
P-2	I	8	PEDESTRIAN SIGNAL POLE					10						6			24A
P-3	I	7	18	11	16		48	19	30	13	3	Y				14	36A
P-4	I	9	PEDESTRIAN SIGNAL POLE					10									EXIST
P-5	I	11	PEDESTRIAN SIGNAL POLE					10									EXIST
P-6	I	9	16	12	12		44	19	30	13	3	Y	1			14	36A
P-7	I	7	19	11	15		48	19	30	13	3	N	1			14	36A
P-8	I	7	LUMINAIRE POLE W/ APS					30							8		N/A
P-9	I	8	PEDESTRIAN SIGNAL POLE					10						6			24A
P-10	I	9	20	11	15		48	19	30	13	3	Y				14	36A
P-11	I	7	PEDESTRIAN SIGNAL POLE					10						6			24A
P-12	I	5	PEDESTRIAN SIGNAL POLE					10						6			24A
P-13	I	8	16	12	12		44	19	30	13	3	Y	1			14	36A
P-14	I	5	17	12	11		44	19	30	13	3	Y	1			14	36A
										TOTAL:			4	24	16	84	

SIGNAL POLE STATUS: I=INSTALL; E=EXISTING; REM=REMOVE; F=INSTALL IN FUTURE PHASE
*- DOES NOT INCLUDE VERTICAL SIDEMOUNT SIGNAL HEADS OR PEDESTRIAN SIGNAL HEADS
**- EQUIPMENT TO BE PROVIDED BY THE CITY AND INSTALLED BY THE CONTRACTOR



ELECTRICAL SERVICE DATA

ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED(5)-14)	SERVICE CONDUIT SIZE (PVC)**	SERVICE CONDUCTORS NO. / SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE / AMP	TWO-POLE CONTACTOR AMPS	PANELBD. / LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE / AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-6	TY D (120/240) 070 (NS) SS (E) PS (U)	2"	3 / #4	N/A	2P / 70	30	100	T.S.	1P / 30	24	<7.1
								LIGHTING	2P / 15	4	
								LIGHTING	2P / 15	4	

CITY PROVIDED ITEMS NOTES:
1. INSTALLATION OF CITY SUPPLIED ITEMS SHALL BE PAID SUBSIDIARY TO ITEM 680.

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

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Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED TABLES
SH 190 AT RENNER RD

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	86
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

100% SUBMITTAL

CABLE TERMINATION CHART

CNDR. NO.	CONDUCTOR COLOR	CABLE 1 7 CNDR. FROM P-1 TO P-3.	CABLE 2 7 CNDR. FROM P-2 TO P-3	CABLE 3 20 CNDR. FROM P-3 TO CNTRL.	CABLE 4 7 CNDR. FROM P-4 TO P-7	CABLE 5 7 CNDR. FROM P-5 TO P-7	CABLE 6 20 CNDR. FROM P-6 TO CNTRL.	CABLE 7 20 CNDR. FROM P-7 TO CNTRL.	CABLE 8 7 CNDR. FROM P-8 TO P-10	CABLE 9 7 CNDR. FROM P-9 TO P-10.	CABLE 10 20 CNDR. FROM P-10 TO CNTRL.	CABLE 11 7 CNDR. FROM P-11 TO P-14.	CABLE 12 7 CNDR. FROM P-12 TO P-14.	CABLE 13 20 CNDR. FROM P-13 TO CNTRL.	CABLE 14 20 CNDR. FROM P-14 TO CNTRL.
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON
3	RED	SH 1 OLA (LS 11) DW	SH 2 OLA (LS 11) DW	SH 13,14,15 OL-A (LS 13) R	SH 4 PH 8 (LS 12) DW	SH 5 PH 6 (LS 11) DW	SH 17,18,19,20 PH 8 (LS 8) R	SH 21,22,23,24 PH 6 (LS 6) R	SH 7 OLB (LS 9) DW	SH 8 OLB (LS 9) DW	SH 25,26,27 OL-B (LS 14) R	SH 10 PH 4 (LS 10) DW	SH 11 PH 2 (LS 9) DW	SH 33,34,35,36 PH 4 (LS 4) R	SH 29,30,31,32 PH 2 (LS 2) R
4	GREEN	SH 1 OLA (LS 11) W	SH 2 OLA (LS 11) W	SH 13,14,15 OL-A (LS 13) G	SH 4 PH 8 (LS 12) W	SH 5 PH 6 (LS 11) W	SH 17,18,19,20 PH 8 (LS 8) G + G (LT ARW)	SH 21,22,23,24 PH 6 (LS 6) G	SH 7 OLB (LS 9) W	SH 8 OLB (LS 9) W	SH 25,26,27 OL-B (LS 14) G	SH 10 PH 4 (LS 10) W	SH 11 PH 2 (LS 9) W	SH 33,34,35,36 PH 4 (LS 4) G + G (LT ARW)	SH 29,30,31,32 PH 2 (LS 2) G
5	ORANGE	SPARE	SPARE	SH 13,14,15 OL-A (LS 13) Y	SPARE	SPARE	SH 17,18,19,20 PH 8 (LS 8) Y + Y (LT ARW)	SH 21,22,23,24 PH 6 (LS 6) Y	SPARE	SH 9 PH 4 (LS 10) DW	SH 25,26,27 OL-B (LS 14) Y	SPARE	SPARE	SH 33,34,35,36 PH 4 (LS 4) Y + Y (LT ARW)	SH 29,30,31,32 PH 2 (LS 2) Y
6	BLUE	SPARE	SPARE	SH 16 PH 5 (LS 11) FY (LT ARW)	SPARE	SPARE	SPARE	SH 21 PH 6 (LS 15) G (RT ARW)	SPARE	SH 9 PH 4 (LS 10) W	SH 28 PH 1 (LS 9) FY (LT ARW)	SPARE	SPARE	SPARE	SH 32 PH 6 (LS 16) G (RT ARW)
7	WHITE/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SH 21 PH 6 (LS 15) Y (RT ARW)	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SH 32 PH 6 (LS 16) Y (RT ARW)
8	RED/BLACK			SH 16 PH 5 (LS 5) R (LT ARW)			SPARE	SPARE			SH 28 PH 1 (LS 1) R (LT ARW)			SPARE	SPARE
9	GREEN/BLACK			SH 16 PH 5 (LS 5) G (LT ARW)			SPARE	SPARE			SH 28 PH 1 (LS 1) G (LT ARW)			SPARE	SPARE
10	ORANGE/BLACK			SH 16 PH 5 (LS 5) Y (LT ARW)			SPARE	SPARE			SH 28 PH 1 (LS 1) Y (LT ARW)			SPARE	SPARE
11	BLUE/BLACK			SPARE			SPARE	SPARE			SPARE			SPARE	SPARE
12	BLACK/WHITE			SPARE			SPARE	SPARE			SPARE			SPARE	SPARE
13	RED/WHITE			SH 1 OLA (LS 11) DW			SH 6 PH 6 (LS 11) DW	SH 4 PH 8 (LS 12) DW			SH 8 OLB (LS 9) DW			SH 12 PH 2 (LS 9) DW	SH 10 PH 4 (LS 10) DW
14	GREEN/WHITE			SH 1 OLA (LS 11) W			SH 6 PH 6 (LS 11) W	SH 4 PH 8 (LS 12) W			SH 8 OLB (LS 9) W			SH 12 PH 2 (LS 9) W	SH 10 PH 4 (LS 10) W
15	BLUE/WHITE			SH 2 OLA (LS 11) DW			SPARE	SH 5 PH 6 (LS 11) DW			SH 9 PH 4 (LS 10) DW			SPARE	SH 11 PH 2 (LS 9) DW
16	BLACK/RED			SH 2 OLA (LS 11) W			SPARE	SH 5 PH 6 (LS 11) W			SH 9 PH 4 (LS 10) W			SPARE	SH 11 PH 2 (LS 9) W
17	WHITE/RED			SH 3 PH 8 (LS 12) DW			SPARE	SPARE			SH 7 OLB (LS 9) DW			SPARE	SPARE
18	ORANGE/RED			SH 3 PH 8 (LS 12) W			SPARE	SPARE			SH 7 OLB (LS 9) W			SPARE	SPARE
19	BLUE/RED			ENFORCEMENT LAMP COMMON			ENFORCEMENT LAMP COMMON	ENFORCEMENT LAMP COMMON			ENFORCEMENT LAMP COMMON			ENFORCEMENT LAMP COMMON	ENFORCEMENT LAMP COMMON
20	RED/GREEN			ENFORCEMENT LAMP			ENFORCEMENT LAMP	ENFORCEMENT LAMP			ENFORCEMENT LAMP			ENFORCEMENT LAMP	ENFORCEMENT LAMP

NOTE: HOME RUN 2 CNDR TO ALL POLES WITH APS BUTTONS

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
P-1	OLA	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT SBFR AT RENNER RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-2	OLA	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT SBFR AT RENNER RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-5	Phase 6	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT SBFR AT RENNER RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-6	Phase 6	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT SBFR AT RENNER RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	WAIT
P-3	Phase 8	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS RENNER RD AT PGBT SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-4	Phase 8	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS RENNER RD AT PGBT SBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
P-12	Phase 2	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT NBFR AT RENNER RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-13	Phase 2	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT NBFR AT RENNER RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-9	Phase 4	BUTTON PUSH ON DW	WAIT TO CROSS RENNER RD AT PGBT NBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS RENNER RD AT PGBT NBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RENNER RD, WALK SIGN IS ON TO CROSS RENNER RD
P-11	Phase 4	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS RENNER RD AT PGBT NBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-8	OLB	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT NBFR AT RENNER RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-9	OLB	BUTTON PUSH ON DW	WAIT TO CROSS PGBT NBFR AT RENNER RD
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT NBFR AT RENNER RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	PGBT NBFR, WALK SIGN IS ON TO CROSS PGBT NBFR

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED TABLES
SH 190 AT RENNER RD

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		87
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

100% SUBMITTAL

SIGNS SUMMARY

SIGN #	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R10-3ER	APS PUSH BUTTON	I	P-1	9" x 15"
S2	R10-3ER	APS PUSH BUTTON	I	P-2	9" x 15"
S3	R10-3EL	APS PUSH BUTTON	I	P-3	9" x 15"
S4	R10-3ER	APS PUSH BUTTON	I	P-4	9" x 15"
S5	R10-3EL	APS PUSH BUTTON	I	P-5	9" x 15"
S6	R10-3ER	APS PUSH BUTTON	I	P-6	9" x 15"
S7	R10-3ER	APS PUSH BUTTON	I	P-8	9" x 15"
S8	R10-3EL	APS PUSH BUTTON	I	P-9	9" x 15"
S9	R10-3ER	APS PUSH BUTTON	I	P-9	9" x 15"
S10	R10-3EL	APS PUSH BUTTON	I	P-11	9" x 15"
S11	R10-3ER	APS PUSH BUTTON	I	P-12	9" x 15"
S12	R10-3ER	APS PUSH BUTTON	I	P-13	9" x 15"
S13	R9-3	NO PEDESTRIAN CROSSINGS	I	P-1	18" x 18"
S14	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S15	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S16	D3-1	STREET NAME	I	P-3	24" x VARIES
S17	R6-2L	ONE WAY	I	P-3	30" x 36"
S18	R6-2L	ONE WAY	I	P-3	30" x 36"
S19	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	P-3	36" x 42"
S20	R3-8MS	LANE ASSIGNMENT	I	P-6	36" x 30"
S21	R3-8LL	LANE ASSIGNMENT	I	P-6	36" x 30"
S22	D3-1	STREET NAME	I	P-6	24" x VARIES
S23	R9-3	NO PEDESTRIAN CROSSINGS	I	P-7	18" x 18"
S24	D3-1	STREET NAME	I	P-7	24" x VARIES
S25	R6-2R	ONE WAY	I	P-7	30" x 36"
S26	R6-2R	ONE WAY	I	P-7	30" x 36"
S27	R9-3	NO PEDESTRIAN CROSSINGS	I	P-8	18" x 18"
S28	D3-1	STREET NAME	I	P-10	24" x VARIES
S29	R6-2L	ONE WAY	I	P-10	30" x 36"
S30	R6-2L	ONE WAY	I	P-10	30" x 36"
S31	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	P-10	36" x 42"
S32	R6-2R	ONE WAY	I	P-14	30" x 36"
S33	R6-2R	ONE WAY	I	P-14	30" x 36"
S34	D3-1	STREET NAME	I	P-14	24" x VARIES
S35	R9-3	NO PEDESTRIAN CROSSINGS	I	P-14	18" x 18"
S36	D3-1	STREET NAME	I	P-13	24" x VARIES
S37	R3-8LM	LANE ASSIGNMENT	I	P-13	36" x 30"
S38	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S39	R1-2	YIELD	I	10 BWG	48" x 48" x 48"

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

ITEM 0682 SIGNAL HEADS

SIGNAL HEAD NUMBER	SIGNAL HEAD TYPE	STATUS	12-INCH SIGNAL HEAD UNITS									PED SIG SEC (LED) (COUNTDOWN)
			BACKPLATES			LED SIGNAL LAMPS						
			3 SEC	4 SEC	5 SEC	G	<- G	Y	<- Y	R	<- R	
			EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
1	PED	I										1
2	PED	I										1
3	PED	I										1
4	PED	I										1
5	PED	I										1
6	PED	I										1
7	PED	I										1
8	PED	I										1
9	PED	I										1
10	PED	I										1
11	PED	I										1
12	PED	I										1
13	V3	I	1			1		1		1		
14	H3S	I	1				1	1		1		
15	H3	I	1			1		1		1		
16	H5FYA	I			1		1		2		2	
17	H3	I	1			1		1		1		
18	H4LT	I		1		1	1	1		1		
19	H3LT	I	1				1		1	1		
20	V3LT	I	1				1		1	1		
21	V5RT	I			1	1	1	1	1	1		
22	H3	I	1			1		1		1		
23	H3	I	1			1		1		1		
24	H3S	I	1				1	1		1		
25	V3	I	1			1		1		1		
26	H3S	I	1				1	1		1		
27	H3	I	1			1		1		1		
28	H5FYA	I			1		1		2		2	
29	H3S	I	1				1	1		1		
30	H3	I	1			1		1		1		
31	H3	I	1			1		1		1		
32	V5RT	I			1	1	1	1	1	1		
33	V3LT	I	1				1		1	1		
34	H4LT	I		1		1	1	1		1		
35	H3	I	1			1		1		1		
36	H3	I	1			1		1		1		
TOTAL (NEW)			18	2	4	15	13	19	9	22	4	12

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

GROUND BOX SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QTY.
624	6010	GROUND BOX TY D (162922)W/APRON	EA	11

DETECTION ZONE DETAILS

VEHICLE DETECTOR	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATIONS	ZONES(S)	SETBACK DISTANCE
D1	P-6	18'	STOP BAR	SB	N/A
D2	P-7	18'	STOP BAR	EB	N/A
D3	P-13	18'	STOP BAR	NB	N/A
D4	P-14	18'	STOP BAR	WB	N/A

DETECTION ZONES TO BE PROGRAMMED BY THE CITY OF RICHARDSON

STATE OF TEXAS
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107729
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4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

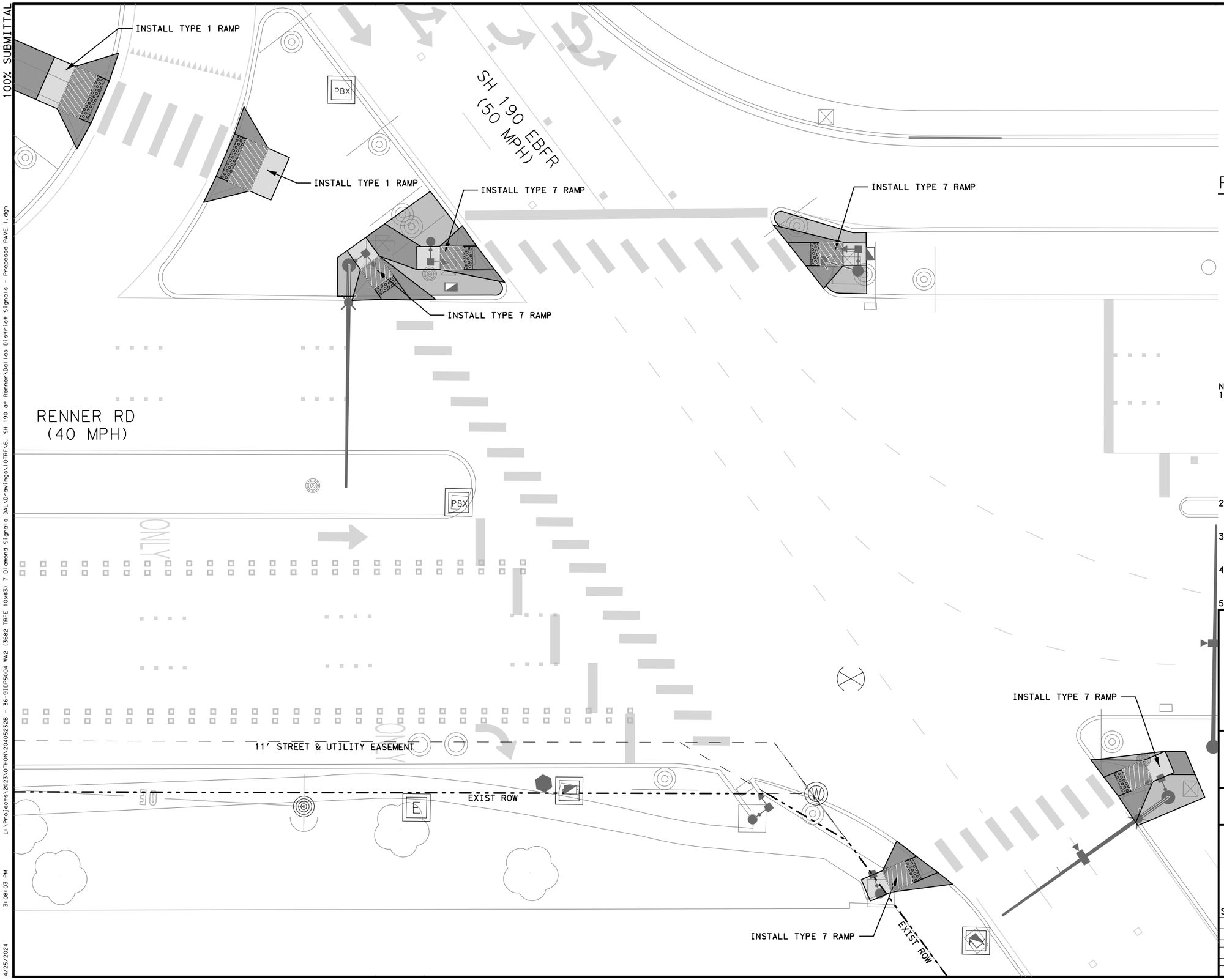
DIAMOND SIGNALS

PROPOSED TABLES
SH 190 AT RENNER RD

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		88
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

100% SUBMITTAL



N

RAMP & PAVING LEGEND

- PEDESTRIAN RAMPS
  8.3% RUNNING SLOPE
  2% CROSS SLOPE
- SIDEWALK
  5% RUNNING SLOPE
  2% CROSS SLOPE
- PEDESTRIAN LANDING
  2% RUNNING SLOPE
  2% CROSS SLOPE
- DETECTABLE SURFACE
  8.3% RUNNING SLOPE
  2% CROSS SLOPE
- CONCRETE RIP RAP

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. PROPOSED CURB RAMP LANDINGS SHALL BE POURED UP TO THE SIGNAL FOUNDATION, LEAVING NO GAPS.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS AND SUBSTITUTION OF ANY DAMAGED IRRIGATION EQUIPMENT.
4. CONTRACTOR SHALL ENSURE THAT ALL PED RAMPS DRAIN TOWARDS THE STREET WITHOUT PONDING IN THE RAMP OR GUTTER AREA.
5. ALL SLOPE VALUES SHOWN ARE MAXIMUMS.

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

CORNER DETAILS
SH 190 AT RENNER RD

SCALE: 1" = 20'

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	89

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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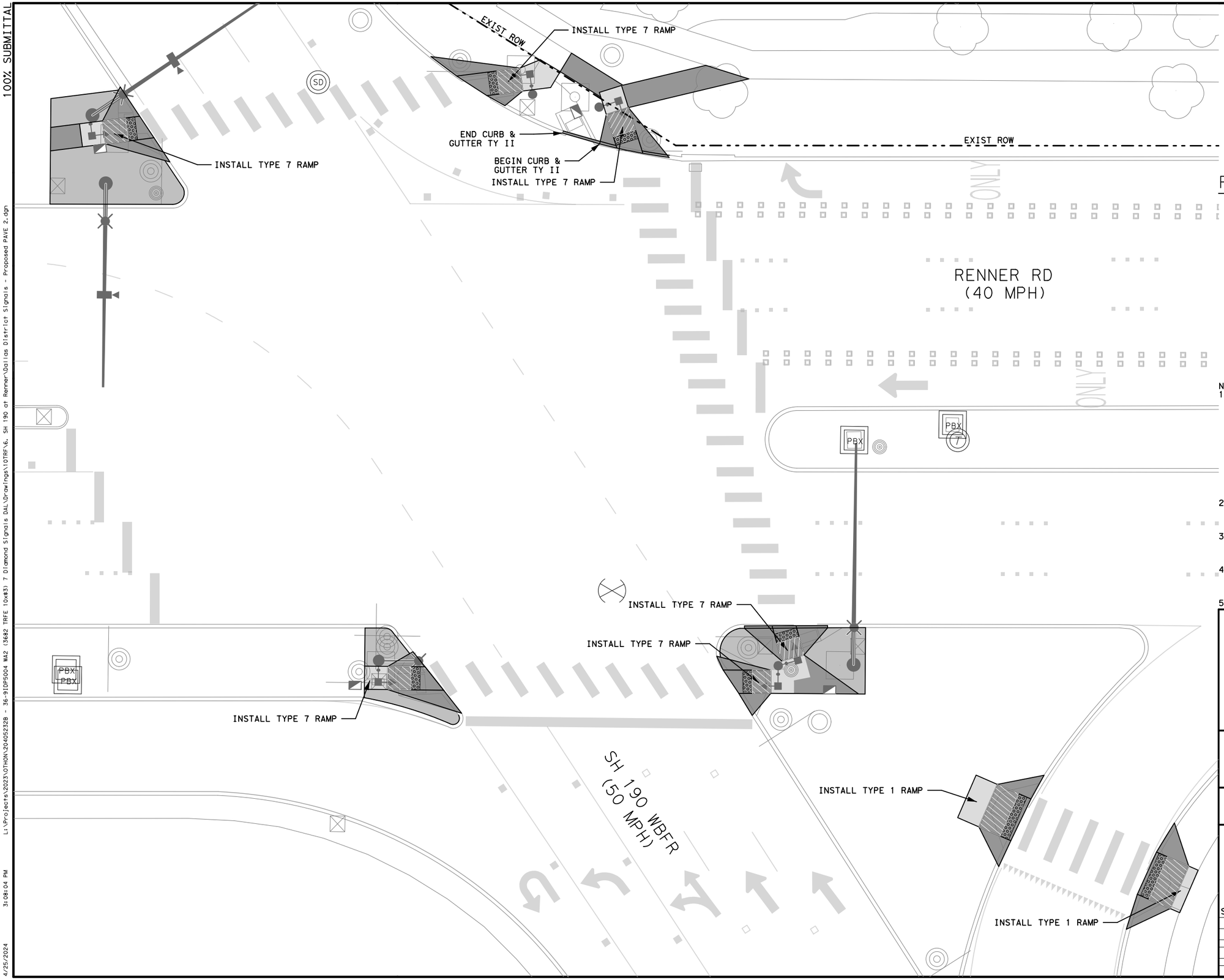

N

RAMP & PAVING LEGEND

- PEDESTRIAN RAMPS 8.3% RUNNING SLOPE 2% CROSS SLOPE
- SIDEWALK 5% RUNNING SLOPE 2% CROSS SLOPE
- PEDESTRIAN LANDING 2% RUNNING SLOPE 2% CROSS SLOPE
- DETECTABLE SURFACE 8.3% RUNNING SLOPE 2% CROSS SLOPE
- CONCRETE RIP RAP

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. PROPOSED CURB RAMP LANDINGS SHALL BE POURED UP TO THE SIGNAL FOUNDATION, LEAVING NO GAPS.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS AND SUBSTITUTION OF ANY DAMAGED IRRIGATION EQUIPMENT.
4. CONTRACTOR SHALL ENSURE THAT ALL PED RAMPS DRAIN TOWARDS THE STREET WITHOUT PONDING IN THE RAMP OR GUTTER AREA.
5. ALL SLOPE VALUES SHOWN ARE MAXIMUMS.

STATE OF TEXAS
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4/25/2024
Elizabeth Shelton

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DIAMOND SIGNALS

CORNER DETAILS SH 190 AT RENNER RD

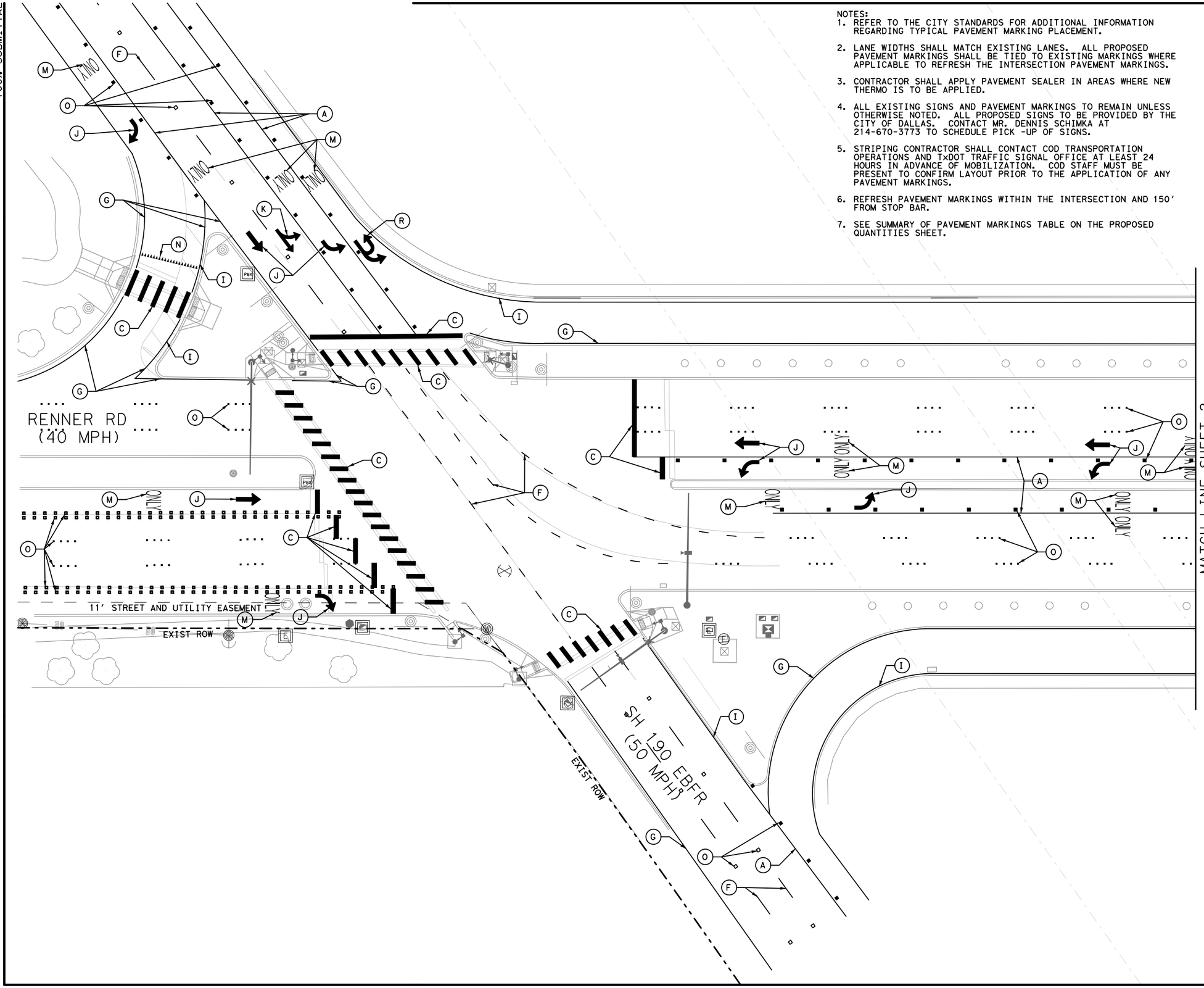
SCALE: 1" = 20' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	90

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

100% SUBMITTAL

NOTES:
1. REFER TO THE CITY STANDARDS FOR ADDITIONAL INFORMATION REGARDING TYPICAL PAVEMENT MARKING PLACEMENT.
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. CONTRACTOR SHALL APPLY PAVEMENT SEALER IN AREAS WHERE NEW THERMO IS TO BE APPLIED.
4. ALL EXISTING SIGNS AND PAVEMENT MARKINGS TO REMAIN UNLESS OTHERWISE NOTED. ALL PROPOSED SIGNS TO BE PROVIDED BY THE CITY OF DALLAS. CONTACT MR. DENNIS SCHIMKA AT 214-670-3773 TO SCHEDULE PICK -UP OF SIGNS.
5. STRIPING CONTRACTOR SHALL CONTACT COD TRANSPORTATION OPERATIONS AND TxDOT TRAFFIC SIGNAL OFFICE AT LEAST 24 HOURS IN ADVANCE OF MOBILIZATION. COD STAFF MUST BE PRESENT TO CONFIRM LAYOUT PRIOR TO THE APPLICATION OF ANY PAVEMENT MARKINGS.
6. REFRESH PAVEMENT MARKINGS WITHIN THE INTERSECTION AND 150' FROM STOP BAR.
7. SEE SUMMARY OF PAVEMENT MARKINGS TABLE ON THE PROPOSED QUANTITIES SHEET.



N

PAVEMENT MARKING LEGEND

A	REFL PAV MRK TY I (W)8"(SLD)(100MIL)
B	REFL PAV MRK TY I (W)(12")(SLD)(100 MIL)
C	REFL PAV MRK TY I (W)(24")(SLD)(100 MIL)
D	RE PM W/RET REQ TY I (W)(4")(BRK)(100MIL)
E	RE PM W/RET REQ TY I (W)(4")(SLD)(100MIL)
F	RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
G	RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
H	RE PM W/RET REQ TY I (Y)(4")(SLD)(100MIL)
I	RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
J	PREFAB PAV MRK TY C (W)(ARROW)
K	PREFAB PAV MRK TY C (W)(DBL ARROW)
L	PREFAB PAV MRK TY C (W)(UTURN ARROW)
M	PREFAB PAV MRK TY C (W)(WORD)
N	PREFAB PAV MRK TY C (W) (18")(YLD TRI)
O	REFL PAV MRK TY II-C-R
P	REFL PAV MRK TY II-A-A
R	PREFAB PAV MRK TY C (W) (U-LT ARROW)

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024
Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED PAVEMENT MARKING SH 190 AT RENNER RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		91
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

4/25/2024 3:08:05 PM L:\Projects\2023\OTHON\20405232B - 36-91DP5004 WA2 (3682 TRFE 10x83) 7 Diamond Signals DAL\Drawings\10TRF16, SH 190 at Renner\Dallas District Signals - Proposed PMRK 1.dgn

100% SUBMITTAL

NOTES:
1. REFER TO THE CITY STANDARDS FOR ADDITIONAL INFORMATION REGARDING TYPICAL PAVEMENT MARKING PLACEMENT.
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. CONTRACTOR SHALL APPLY PAVEMENT SEALER IN AREAS WHERE NEW THERMO IS TO BE APPLIED.
4. ALL EXISTING SIGNS AND PAVEMENT MARKINGS TO REMAIN UNLESS OTHERWISE NOTED. ALL PROPOSED SIGNS TO BE PROVIDED BY THE CITY OF DALLAS. CONTACT MR. DENNIS SCHIMKA AT 214-670-3773 TO SCHEDULE PICK -UP OF SIGNS.
5. STRIPING CONTRACTOR SHALL CONTACT COD TRANSPORTATION OPERATIONS AND TxDOT TRAFFIC SIGNAL OFFICE AT LEAST 24 HOURS IN ADVANCE OF MOBILIZATION. COD STAFF MUST BE PRESENT TO CONFIRM LAYOUT PRIOR TO THE APPLICATION OF ANY PAVEMENT MARKINGS.
6. REFRESH PAVEMENT MARKINGS WITHIN THE INTERSECTION AND 150' FROM STOP BAR.
7. SEE SUMMARY OF PAVEMENT MARKINGS TABLE ON THE PROPOSED QUANTITIES SHEET.

N

PAVEMENT MARKING LEGEND

- (A) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100 MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100 MIL)
- (D) RE PM W/RET REQ TY I (W)(4")(BRK)(100MIL)
- (E) RE PM W/RET REQ TY I (W)(4")(SLD)(100MIL)
- (F) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (G) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (H) RE PM W/RET REQ TY I (Y)(4")(SLD)(100MIL)
- (I) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (J) PREFAB PAV MRK TY C (W)(ARROW)
- (K) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (L) PREFAB PAV MRK TY C (W)(UTURN ARROW)
- (M) PREFAB PAV MRK TY C (W)(WORD)
- (N) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- (O) REFL PAV MRK TY II-C-R
- (P) REFL PAV MRK TY II-A-A
- (R) PREFAB PAV MRK TY C (W) (U-LT ARROW)

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

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FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

PROPOSED PAVEMENT MARKING SH 190 AT RENNER RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	92

STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.

CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

4/25/2024 3:08:06 PM L:\Projects\2023\OTHON\204052328 - 36-910P5004 WA2 (3682 TRFE 10x#3) 7 Diamond Signals DAL\Drawings\10TRF\6. SH 190 at Renner\Dallas District Signals - Proposed PMRK 2.dgn

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PAVEMENT MARKING SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	2080
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	1185
666	6225	PAVEMENT SEALER 6"	LF	4010
666	6226	PAVEMENT SEALER 8"	LF	2080
666	6230	PAVEMENT SEALER 24"	LF	1185
666	6231	PAVEMENT SEALER (ARROW)	EA	18
666	6232	PAVEMENT SEALER (WORD)	EA	23
666	6234	PAVEMENT SEALER (DBL ARROW)	EA	2
666	6236	PAVEMENT SEALER (UTURN ARROW)	EA	1
666	6238	PAVEMENT SEALER (U-L ARROW)	EA	1
666	6243	PAVEMENT SEALER (YLD TRI)	EA	43
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	450
666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	1960
666	6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	1600
668	6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	18
668	6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	2
668	6085	PREFAB PAV MRK TY C (W) (WORD)	EA	23
668	6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA	1
668	6081	PREFAB PAV MRK TY C (W) (U-LT ARROW)	EA	1
668	6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	43
672	6010	REFL PAV MRKR TY II-C-R	EA	789
678	6002	PAV SURF PREP FOR MRK (6")	LF	4010
678	6004	PAV SURF PREP FOR MRK (8")	LF	2080
678	6008	PAV SURF PREP FOR MRK (24")	LF	1185
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	18
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	2
678	6012	PAV SURF PREP FOR MRK (UTURN ARR)	EA	1
678	6013	PAV SURF PREP FOR MRK (U/LT ARROW)	EA	1
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	23
678	6022	PAV SURF PREP FOR MRK (18")(YLD TRI)	EA	43
678	6033	PAV SURF PREP FOR MRK (RPM)	EA	789

PEDESTRIAN RAMP / SIDEWALK SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	14.2
0529	6008	CONC CURB & GUTTER (TY II)	LF	15
0531	6001	CONC SIDEWALKS (4")	SY	35
0531	6004	CURB RAMPS (TY 1)	EA	4
0531	6010	CURB RAMPS (TY 7)	EA	11

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OTHON ENGINEERING
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Texas Department of Transportation

DIAMOND SIGNALS

PAVING AND PAVEMENT MARKING QUANTITIES SH 190 AT RENNER RD

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		93
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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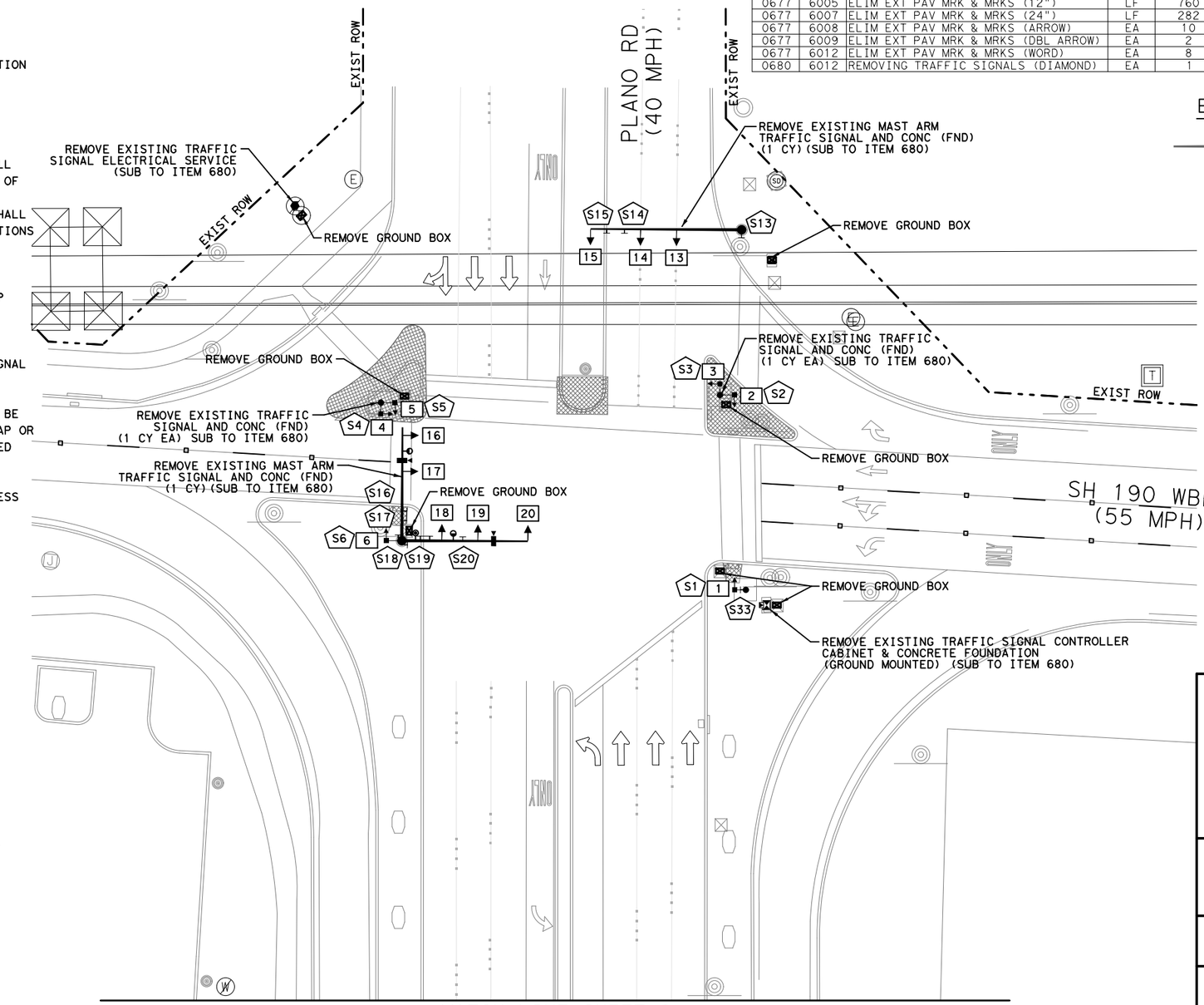
100% SUBMITTAL

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
3. CONTRACTOR SHALL MAINTAIN THE EXISTING SIGNAL INSTALLATION AND OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED SIGNAL IS OPERATIONAL.
4. THE CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AFTER PROPOSED SIGNAL IS OPERATIONAL. EXISTING FOUNDATIONS AND GROUND BOXES SHALL BE REMOVED, WITH POLE FOUNDATIONS REMOVED TO A MINIMUM OF 2' BELOW EXISTING GROUND, AND BACK FILLED WITH SIMILAR MATERIALS IN THE SURROUNDING AREA. EXISTING CONDUITS SHALL BE ABANDONED IN PLACE. SEE GENERAL NOTES AND SPECIFICATIONS FOR MORE INFORMATION.
5. ELIMINATE ALL EXISTING PAVEMENT MARKINGS WITHIN THE INTERSECTION AND ALONG 150' IN EACH DIRECTION FROM STOP BAR. REFER TO PAVEMENT MARKING SHEET FOR ADDITIONAL INFORMATION.
6. EXISTING SIGNS S 1-S 33 SHALL BE REMOVED WITH TRAFFIC SIGNAL EQUIPMENT.
7. PAVING REMOVAL (CURB, RAMP, PAVERS AND SIDEWALK) SHALL BE SUBSIDIARY TO THE INSTALLATION OF NEW CURB, RAMP, RIPRAP OR CONCRETE SIDEWALK (SEE ITEMS 421 & 531 QTYS AND PROPOSED PEDESTRIAN RAMP AND SIDEWALK LAYOUT).
8. ALL GROUND MOUNTED SIGNS SHALL REMAIN AS INSTALLED UNLESS OTHERWISE NOTED.

REMOVAL SUMMARY

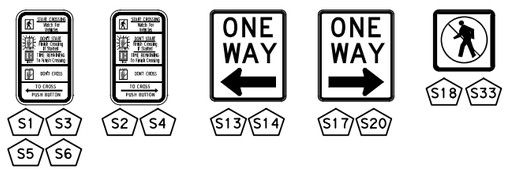
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0104	6001	REMOVING CONC (PAV)	SY	88
0110	6001	EXCAVATION (ROADWAY)	CY	74
0624	6028	REMOVE GROUND BOX	EA	13
0644	6076	REMOVE SM RD SN SUP&AM	EA	2
0677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	490
0677	6002	ELIM EXT PAV MRK & MRKS (6")	LF	2153
0677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	2025
0677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	760
0677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	282
0677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	10
0677	6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	2
0677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	8
0680	6012	REMOVING TRAFFIC SIGNALS (DIAMOND)	EA	1



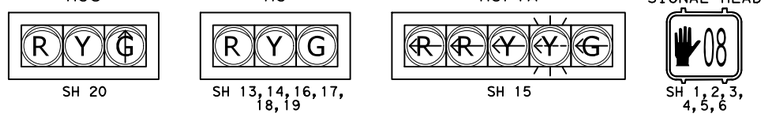
EXISTING SIGNAL LEGEND

- MAST ARM POLE
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LUMINAIRE
- VEHICLE DETECTOR
- OPTICOM
- CCTV
- EXISTING SIGNAL CONTROLLER CABINET
- EXISTING GROUND BOX
- SIGNAL HEAD NUMBER
- SIGN LABEL
- EXISTING ELECTRICAL SERVICE
- EXISTING SIGNAL POLE NUMBER
- PAVING REMOVAL

EXISTING SIGNS



EXISTING SIGNALS



STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

EXISTING CONDITIONS AND REMOVALS SH 190 AT PLANO RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		94
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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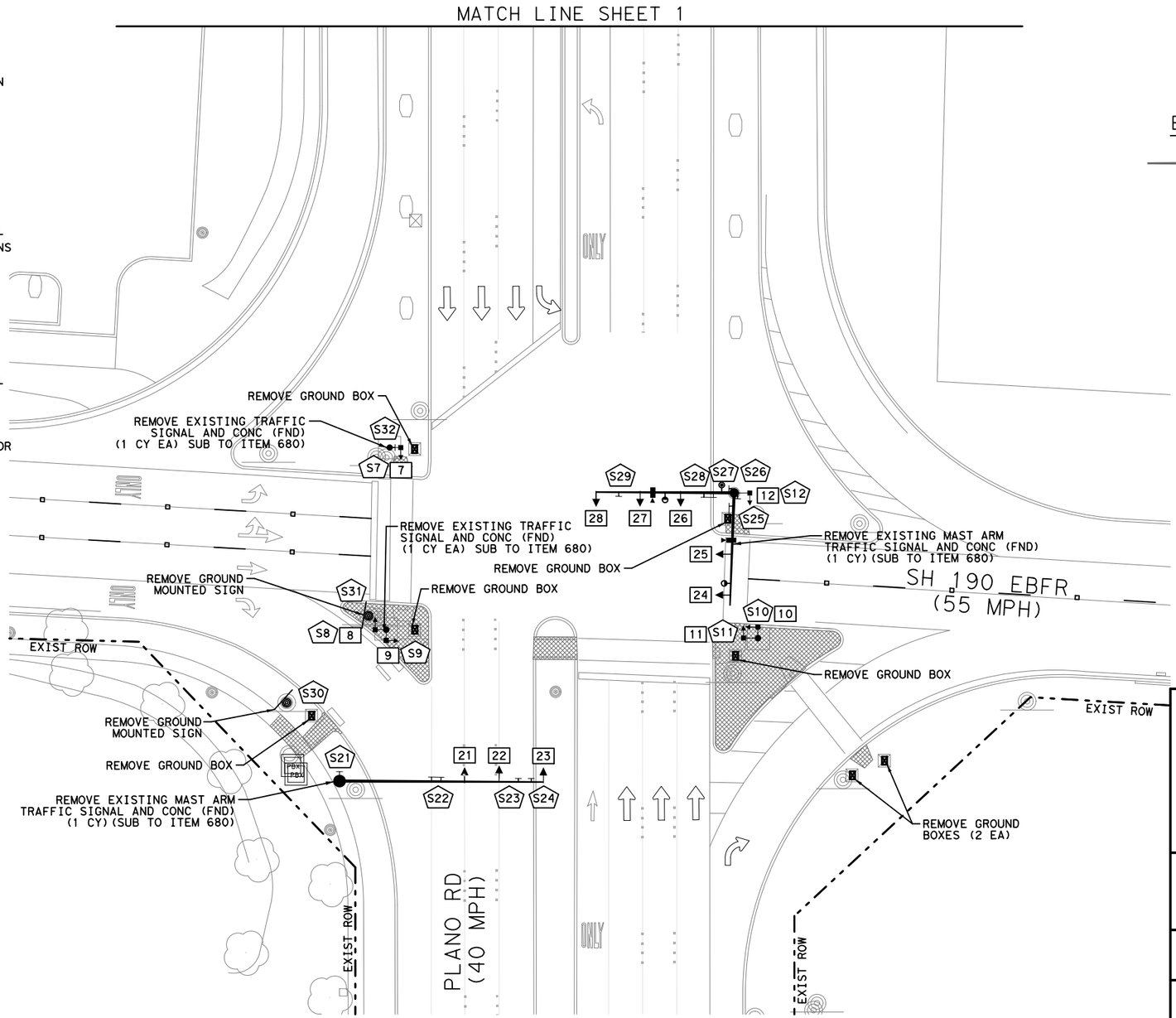
100% SUBMITTAL

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE EXISTING TRAFFIC SIGNAL HARDWARE, PAVEMENT MARKINGS, SIGNING, RIGHT-OF-WAY, AND THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. THE ENGINEER DOES NOT CONFIRM OR VALIDATE THE EXISTING ITEMS SHOWN.
3. CONTRACTOR SHALL MAINTAIN THE EXISTING SIGNAL INSTALLATION AND OPERATIONS AT THIS INTERSECTION UNTIL THE PROPOSED SIGNAL IS OPERATIONAL.
4. THE CONTRACTOR SHALL REMOVE AND SALVAGE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AFTER PROPOSED SIGNAL IS OPERATIONAL. EXISTING FOUNDATIONS AND GROUND BOXES SHALL BE REMOVED, WITH POLE FOUNDATIONS REMOVED TO A MINIMUM OF 2' BELOW EXISTING GROUND, AND BACK FILLED WITH SIMILAR MATERIALS IN THE SURROUNDING AREA. EXISTING CONDUITS SHALL BE ABANDONED IN PLACE. SEE GENERAL NOTES AND SPECIFICATIONS FOR MORE INFORMATION.
5. ELIMINATE ALL EXISTING PAVEMENT MARKINGS WITHIN THE INTERSECTION AND ALONG 150' IN EACH DIRECTION FROM STOP BAR. REFER TO PAVEMENT MARKING SHEET FOR ADDITIONAL INFORMATION.
6. EXISTING SIGNS S1-S33 SHALL BE REMOVED WITH TRAFFIC SIGNAL EQUIPMENT.
7. PAVING REMOVAL (CURB, RAMP, PAVERS AND SIDEWALK) SHALL BE SUBSIDIARY TO THE INSTALLATION OF NEW CURB, RAMP, RIPRAP OR CONCRETE SIDEWALK (SEE ITEMS 421 & 531 QTYS AND PROPOSED PEDESTRIAN RAMP AND SIDEWALK LAYOUT).
8. ALL GROUND MOUNTED SIGNS SHALL REMAIN AS INSTALLED UNLESS OTHERWISE NOTED.

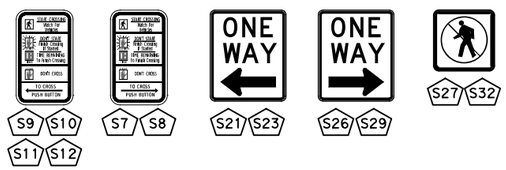


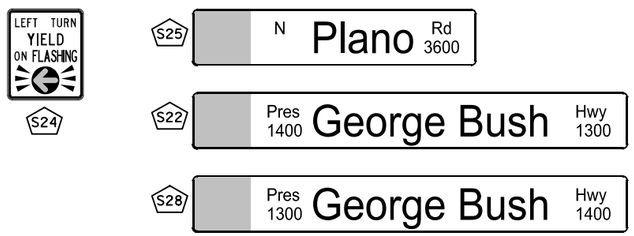
N

EXISTING SIGNAL LEGEND

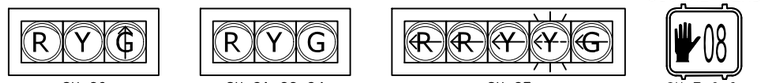
- MAST ARM POLE
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LUMINAIRE
- VEHICLE DETECTOR
- OPTICOM
- CCTV
- EXISTING SIGNAL CONTROLLER CABINET
- EXISTING GROUND BOX
- 1 — SIGNAL HEAD NUMBER
- S1 — SIGN LABEL
- EXISTING ELECTRICAL SERVICE
- E-# — EXISTING SIGNAL POLE NUMBER
- PAVING REMOVAL

EXISTING SIGNS





EXISTING SIGNALS



STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

DIAMOND SIGNALS

EXISTING CONDITIONS AND REMOVALS SH 190 AT PLANO RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	95

STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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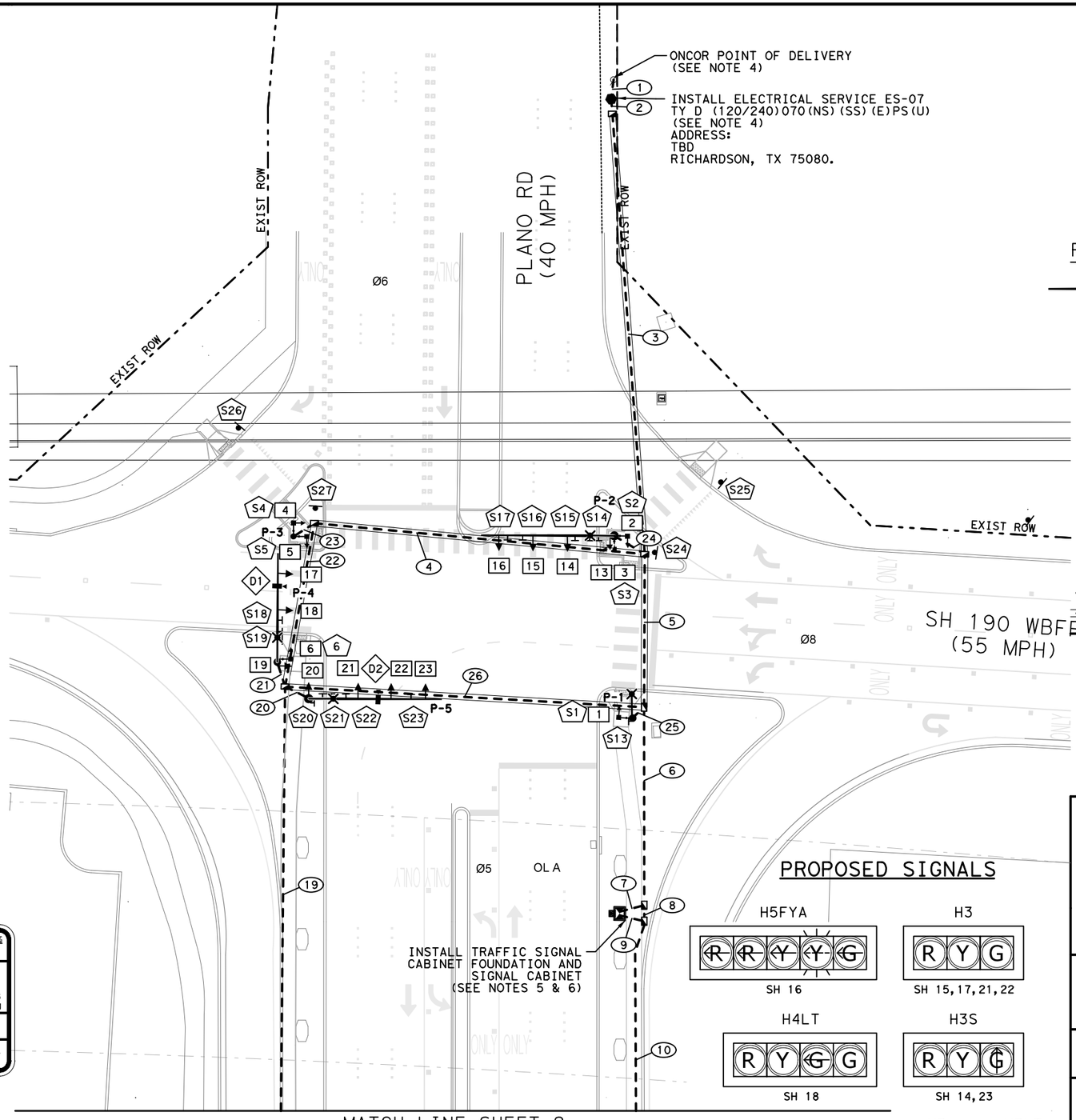
100% SUBMITTAL

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF DALLAS TRAFFIC MANAGEMENT CENTER AT (214-670-3095) 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, RADAR DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
4. CONTRACTOR SHALL COORDINATE WITH ONCOR CONCERNING TRAFFIC SIGNAL ELECTRICAL SERVICE. CONTACT ONCOR (LUKE FAIRBROTHER AT LUKE.FAIRBROTHER@ONCOR.COM) REGARDING POINT OF DELIVERY AND DISTRIBUTION TO ELECTRICAL PEDESTAL SERVICE. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. THE FOLLOWING ITEMS WILL BE FURNISHED BY THE CITY OF RICHARDSON AND INSTALLED BY THE CONTRACTOR: SIGNAL CABINET AND INTERNAL HARDWARE W/ BBU, OPTICOM & CABLING, ENFORCEMENT LIGHTS & CABLING, VIVDS DETECTION & CABLING. CONTACT CODY WILDONER AT 972-744-4465 TO SCHEDULE PICK-UP OF MATERIALS.
6. INSTALL BASE MOUNTED P44 ATC CONTROLLER CABINET (TYPE TS2 CABINET) AND FOUNDATION.
7. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
8. SIGNAL HEADS SHALL BE YELLOW WITH YELLOW POWDER COATED ALUMINUM VISORS AND WITH A 2" YELLOW BORDER.
9. DETECTION ZONES TO BE PROGRAMMED BY THE CITY OF RICHARDSON. CONTACT CITY OF RICHARDSON TRAFFIC MANAGEMENT CENTER WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.
10. ALL SIGNAL CABLES SHALL BE WIRED IN ACCORDANCE WITH THE CABINET PREPARATION NOTES SUPPLIED BY THE CITY OF RICHARDSON.
    WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED FIRST, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER SO A FIELD MEETING CAN BE SCHEDULED TO DETERMINE IF FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL POLE FOUNDATIONS ARE INSTALLED FIRST, THE CURB RAMPS AND SIDEWALKS SHALL BE MODIFIED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS ARE 10" OR LESS.
12. PROPOSED APS UNITS SHALL BE PLACED ADJACENT TO A LEVEL LANDING AREA (2% MAX IN ANY DIRECTION). IF THE DISTANCE FROM THE PUSH BUTTON TO THE EDGE OF ACCESSIBLE PATH EXCEEDS 10", THE CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON EXTENDER TO MAKE THE REACH 10" OR LESS. MEASUREMENT AND PAYMENT SHALL BE CONSIDERED SUBSIDIARY TO THE INSTALLATION OF THE TRAFFIC SIGNAL EQUIPMENT.
13. 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.
14. PROPOSED CURB RAMP LANDING SHALL BE POURED UP TO THE SIGNAL FOUNDATION LEAVING NO GAPS.
15. CONTRACTOR TO MAINTAIN FULL ACCESS TO A MINIMUM OF TWO PEDESTRIAN CROSSINGS AT ALL TIMES DURING CONSTRUCTION.
16. CCTV AND CABLING SHALL BE PROVIDED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR. INSTALLATION SHALL BE PAID UNDER ITEM 680.



PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINAIRE (250W EQ)
- RADAR VEHICLE DETECTOR (DALLAS)
- VIDEO VEHICLE DETECTOR (RICHARDSON)
- OPTICOM (RICHARDSON)
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE D GROUND BOX
- TYPE 1 ITS GROUND BOX
- ELECTRICAL SERVICE
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- CONDUIT (RMC)
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- (S1) SIGN LABEL
- (D1) VEHICLE DETECTOR LABEL
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

PROPOSED SIGNS

R9-3 18"×18" — S13 S20

R1-2 48"×48"×48" YIELD — S24 S25 S26 S27

R10-3EL 9"×15" / R10-3ER 9"×15" — START CROSSING / Watch For Vehicles / DON'T START Finish Crossing If Started / TIME REMAINING To Finish Crossing / DON'T CROSS / TO CROSS PUSH BUTTON — S1 S2 S3 S4 S5 / S6

R10-17T 36"×42" — LEFT TURN YIELD ON FLASHING YELLOW ARROW — S17

R6-2L 30"×36" — ONE WAY — S16 S15

R6-2R 30"×36" — ONE WAY — S22 S23

R3-8LM 36"×30" — ONLY — S18

S14: Pres 1000 George Bush Hwy 1100

S21: Pres 1100 George Bush Hwy 1000

S19: ← Plano Rd / Avenue K →

PROPOSED SIGNALS

H5FYA — R R Y Y G — SH 16

H3 — R Y G — SH 15,17,21,22

H4LT — R Y G G — SH 18

H3S — R Y G — SH 14,23

COUNTDOWN PEDESTRIAN SIGNAL HEAD — 08 — SH 1,2,3,4,5,6

V3 — R Y G — SH 13,20

V3LT — R Y G — SH 19

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024
Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

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DIAMOND SIGNALS

PROPOSED CONDITIONS SH 190 AT PLANO RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	96
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

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100% SUBMITTAL

NOTES:

1. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. BEFORE CONSTRUCTION, CONTRACTOR TO MAKE DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES TO AVOID DAMAGE THERETO.
2. CONTRACTOR TO CONTACT CITY OF DALLAS TRAFFIC MANAGEMENT CENTER AT (214-670-3095) 48 HOURS IN ADVANCE TO COORDINATE WORK.
3. THE LOCATION OF THE PROPOSED SIGNAL POLES, SIGNAL HEADS, RADAR DETECTORS, CONDUIT, GROUND BOXES, AND CONDUCTORS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED BY THE ENGINEER TO ACCOMMODATE FIELD CONDITIONS.
4. CONTRACTOR SHALL COORDINATE WITH ONCOR CONCERNING TRAFFIC SIGNAL ELECTRICAL SERVICE. CONTACT ONCOR (LUKE FAIRBROTHER AT LUKE.FAIRBROTHER@ONCOR.COM) REGARDING POINT OF DELIVERY AND DISTRIBUTION TO ELECTRICAL PEDESTAL SERVICE. REFER TO GENERAL NOTES FOR ADDITIONAL INFORMATION.
5. THE FOLLOWING ITEMS WILL BE FURNISHED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR: SIGNAL CABINET AND INTERNAL HARDWARE, RADAR AND RADAR CABLE. CONTACT MR. ALFRED LEMON AT 214-670-4812 TO SCHEDULE PICK-UP OF MATERIALS.
6. INSTALL BASE MOUNTED CONTROLLER CABINET (TYPE 332† CABINET) AND FOUNDATION.
7. SIGNAL POLES SHALL BE GALVANIZED STEEL FINISH.
8. SIGNAL HEADS SHALL BE BLACK POLYCARBONATE WITH BLACK POWDERCOATED ALUMINUM VISORS AND BACK PLATES.
9. RADAR DETECTION ZONES TO BE PROGRAMMED BY THE CITY OF DALLAS. CONTACT SRINIVASA VEERAMALLU, PE. AT 214-670-5892 WITH 1 WEEK NOTICE TO SCHEDULE PROGRAMMING AND SIGNAL ACTIVATION.
10. ALL SIGNAL CABLES SHALL BE WIRED IN ACCORDANCE WITH THE CABINET PREPARATION NOTES SUPPLIED BY THE CITY OF DALLAS.
11. CONTRACTOR SHALL COORDINATE THE TRAFFIC SIGNAL POLE FOUNDATION WORK WITH THE CURB RAMP AND SIDEWALK INSTALLATION. IF CURB RAMPS ARE CONSTRUCTED FIRST, CONTRACTOR SHALL NOTIFY THE CITY AND ENGINEER SO A FIELD MEETING CAN BE SCHEDULED TO DETERMINE IF FOUNDATIONS NEED TO BE SHIFTED TO BE ADJACENT TO THE LANDING AREAS. IF SIGNAL POLE FOUNDATIONS ARE INSTALLED FIRST, THE CURB RAMPS AND SIDEWALKS SHALL BE MODIFIED SO THAT THE CURB RAMP LANDING AREAS ARE ADJACENT TO THE PUSH BUTTONS AND THE SIDE REACH TO THE PUSH BUTTONS ARE 10" OR LESS.
12. PROPOSED APS UNITS SHALL BE PLACED ADJACENT TO A LEVEL LANDING AREA (2% MAX IN ANY DIRECTION). IF THE DISTANCE FROM THE PUSH BUTTON TO THE EDGE OF ACCESSIBLE PATH EXCEEDS 10", THE CONTRACTOR SHALL FURNISH AND INSTALL A PUSH BUTTON EXTENDER TO MAKE THE REACH 10" OR LESS. MEASUREMENT AND PAYMENT SHALL BE CONSIDERED SUBSIDIARY TO THE INSTALLATION OF THE TRAFFIC SIGNAL EQUIPMENT.
13. 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.
14. PROPOSED CURB RAMP LANDING SHALL BE POURED UP TO THE SIGNAL FOUNDATION LEAVING NO GAPS.
15. CONTRACTOR TO MAINTAIN FULL ACCESS TO A MINIMUM OF TWO PEDESTRIAN CROSSINGS AT ALL TIMES DURING CONSTRUCTION.
16. CCTV AND CABLING SHALL BE PROVIDED BY THE CITY OF DALLAS AND INSTALLED BY THE CONTRACTOR. INSTALLATION SHALL BE PAID UNDER ITEM 680.

PROPOSED SIGNS

R9-3 18"x18" — S28 S37

R1-2 48"x48"x48" YIELD — S29 S30 S41 S42

R10-3EL 9"x15" — S7 S8 S10

R10-3ER 9"x15" — S9 S11 S12

R10-17T 36"x42" LEFT TURN YIELD ON FLASHING YELLOW ARROW — S34

R6-2L 30"x36" ONE WAY — S32 S33

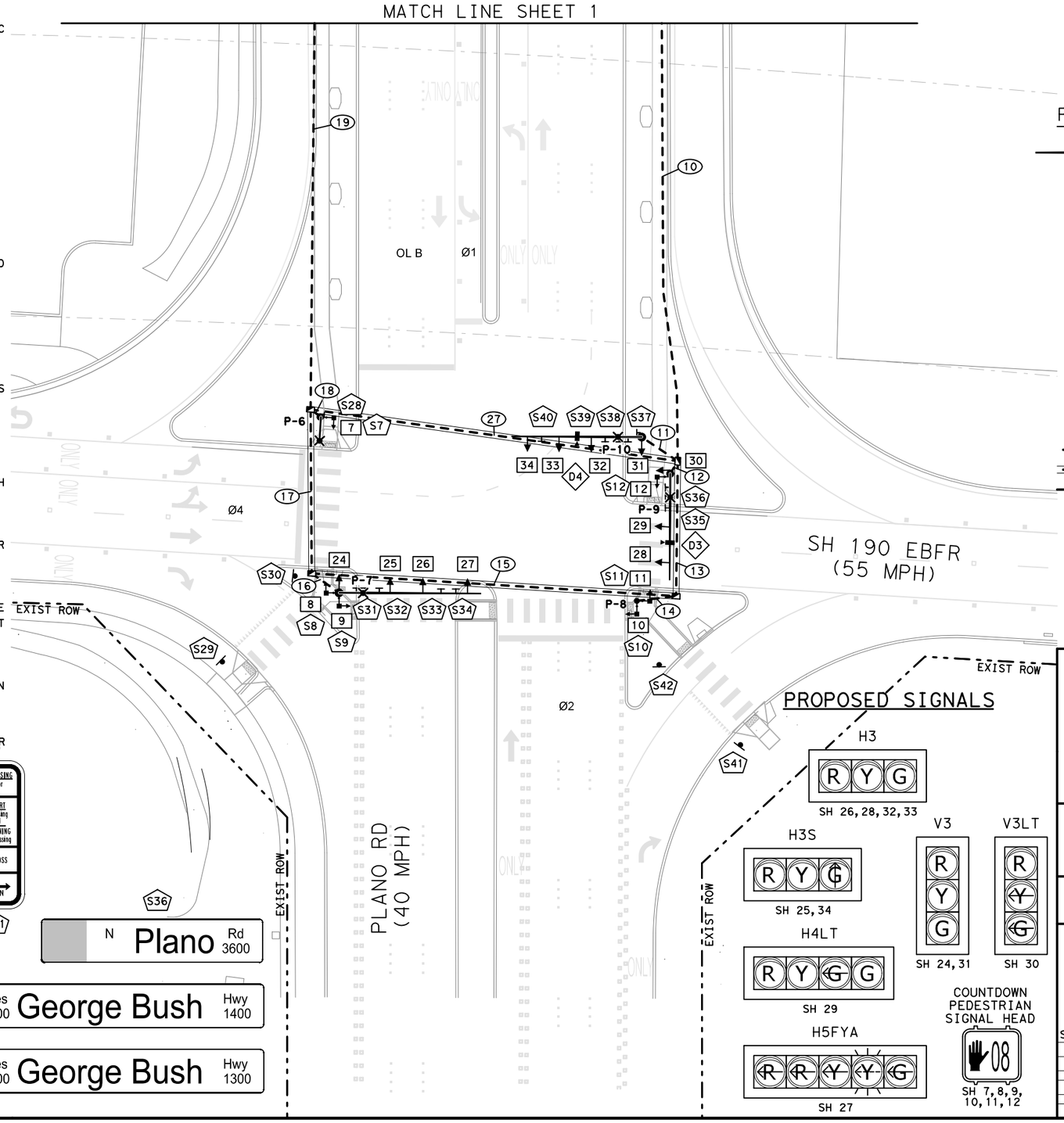
R6-2R 30"x36" ONE WAY — S39 S40

R3-8LM 36"x30" ONLY — S35

S36 — N Plano Rd 3600

S38 — Pres 1300 George Bush Hwy 1400

S31 — Pres 1400 George Bush Hwy 1300



PROPOSED SIGNAL LEGEND

- SIGNAL POLE (W/ MAST ARM)
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD (W/ PUSH BUTTON)
- SIGNAL MOUNTED SIGNS
- LED LUMINAIRE (250W EQ)
- RADAR VEHICLE DETECTOR (DALLAS)
- VIDEO VEHICLE DETECTOR (RICHARDSON)
- OPTICOM (RICHARDSON)
- TRAFFIC SIGNAL CABINET (SEE SIGNAL TABLE SHEETS FOR NOTES)
- TYPE D GROUND BOX
- TYPE 1 ITS GROUND BOX
- ELECTRICAL SERVICE
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- CONDUIT (RMC)
- (1) CONDUIT RUN NUMBER
- [1] SIGNAL HEAD NUMBER
- S1 SIGN LABEL
- D1 VEHICLE DETECTOR LABEL
- P-# PROPOSED TRAFFIC SIGNAL POLE NUMBER

PROPOSED SIGNALS

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

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DIAMOND SIGNALS

PROPOSED CONDITIONS SH 190 AT PLANO RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		97
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

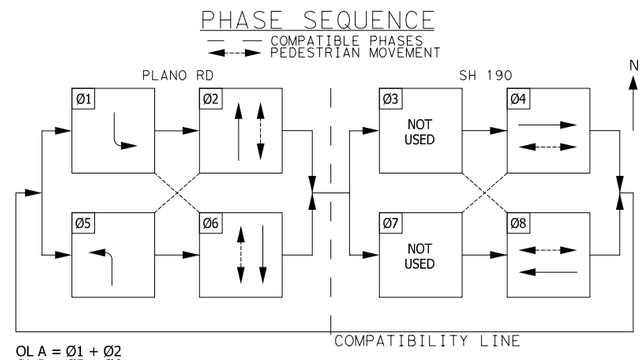
100% SUBMITTAL

CONDUIT AND CABLE CHART

RUN NO	CONDUIT STATUS	CONDUIT: ITEM 618 (SCH 80) 2" PVC (RISER) QTY	2" PVC (RISER) LF	2" PVC (TRENCH) QTY	2" PVC (TRENCH) LF	2" PVC (BORED) QTY	2" PVC (BORED) LF	3" PVC (TRENCH) QTY	3" PVC (TRENCH) LF	4" PVC (TRENCH) QTY	4" PVC (TRENCH) LEN	4" PVC (BORED) QTY	4" PVC (BORED) LF	CABLE STATUS	CONDUCTORS: ITEM 620 ELECTRICAL CONDUCTORS — NO. 6 XHHW WIRE QTY	NO. 6 XHHW WIRE LEN	NO. 6 BARE WIRE QTY	NO. 6 BARE WIRE LF	NO. 8 XHHW WIRE QTY	NO. 8 XHHW WIRE LF	NO. 12 XHHW WIRE QTY	NO. 12 XHHW WIRE LF	ITEM 684 TRAFFIC SIGNAL CABLES — TY C 2 CNDR NO. 12 QTY	TY C 2 CNDR NO. 12 LF	TY A 5 CNDR NO. 14 QTY	TY A 5 CNDR NO. 14 LF	TY A 7 CNDR NO. 14 QTY	TY A 7 CNDR NO. 14 LF	TY A 20 CNDR NO. 14 QTY	TY A 20 CNDR NO. 14 LF	SUB TO ITEM 680** VEHICLE DETECTOR CABLE QTY	VEHICLE DETECTOR CABLE LF	OPTICOM CABLE QTY	OPTICOM CABLE LF	ENFORCEMENT LIGHT CABLE QTY	ENFORCEMENT LIGHT CABLE LF	TOTAL LENGTH OF RUN	RUN NO
1*	I	1	10	1	10									I	ELECTRICAL CONDUCTORS TO BE INSTALLED BY ONCOR FROM THE POINT OF DELIVERY TO THE METER																						20	1*
2	I			1	10									I	2	30	1	15	4	60																10	2
3	I					1	170							I	2	350	1	175	4	700																170	3
4	I											1	110	I			1	115	2	230			3	345												110	4
5	I					1	55					1	55	I	2	120	1	60	2	120			5	300					1	60						55	5
6	I			1	70									I	2	150	1	75	2	150			6	450					3	225	2	150	2	150		70	6
7	I			1	10			1	10	1	10			I			1	15					6	90					3	45	2	30	2	30		10	7
8	I									1	10			I			1	15	2	30																10	8
9	I							1	10	1	10			I			1	15					6	90					3	45	2	30	2	30		10	9
10	I									1	210			I			1	215	2	430			6	1290					3	645	2	430	2	430		210	10
11	I							1	15					I			1	20	4	80							1	20	1	20	1	20	1	20		15	11
12	I							1	10					I			1	15	4	60			1	15					1	15	1	15	1	15		10	12
13	I											1	50	I			1	55					5	275			1	55	1	55						50	13
14	I							1	15					I			1	20					2	40			1	20								15	14
15	I											1	125	I			1	130					3	390					1	130						125	15
16	I							1	15					I			1	20	2	40			2	40			1	20	1	20						15	16
17	I											1	60	I			1	65	2	130							1	65								60	17
18	I							1	10					I			1	15	4	60			1	15			1	15								10	18
19	I									1	275			I			1	280	2	560																275	19
20	I							1	10					I			1	15	4	60							1	15	1	15	1	15	1	15		10	20
21	I							1	10					I			1	15	4	60			1	15					1	15	1	15	1	15		10	21
22	I											1	55	I			1	60	2	120			1	60			1	60					2	120	2	120	55	22
23	I							1	10					I			1	15					2	30			1	15								10	23
24	I							1	15					I			1	20	4	80			2	40					1	20						15	24
25	I							1	10					I			1	15	4	60			1	15												10	25
26	I											1	120	I			1	125											2	250	2	250	2	250		120	26
27	I											1	130	I			1	135					1	135												130	27
SUBTOTAL			10		100		225		140		515		705			650		1720		3030				3635			285		1560		1075		1075				
P-1	P													P										5		10										P-1
P-2	P													P							40			10		125		60						25		P-2
P-3	P													P										10		20										P-3
P-4	P													P							40			5		110							45		45	P-4
P-5	P													P							40					165							45		45	P-5
P-6	P													P										5		10										P-6
P-7	P													P							80			10		130		65						25		P-7
P-8	P													P										10		20										P-8
P-9	P													P							80			5		120							45		45	P-9
P-10	P													P							80					170							50		50	P-10
SUBTOTAL																					440			65		1230		125					275		275	200	
TOTAL			10		100		225		140		515		705			650		1720		3030	440			3700		1230		410		1560		1350		1350	200		

CONDUIT STATUS: I=INSTALL; E=EXISTING; P=WIRE TO BE INSTALLED INSIDE STEEL POLE; A=ABANDON; R=REMOVE AND SALVAGE; AC=AERIAL CABLE
P-# - REFERS TO THE WIRING INSIDE THE SIGNAL POLE AND MAST ARM.
*- THE CONTRACTOR SHALL INSTALL A 2" PVC CONDUIT FROM THE POINT OF DELIVERY TO THE PEDESTAL METER.
**- FURNISHED BY THE CITY OF RICHARDSON AND INSTALLED BY THE CONTRACTOR. INSTALLATION SHALL BE SUBSIDIARY TO ITEM 680. CONTACT CODY WILDONER AT 972-744-4465 OR CODY.WILDONER@COR.GOV TO SCHEDULE PICKUP.

PHASE SEQUENCE

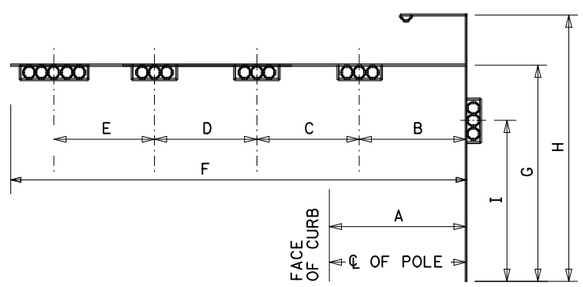


OL A = Ø1 + Ø2
OL B = Ø5 + Ø6

SIGNAL HEAD AND POLE PLACEMENT (FT)

POLE NUMBER	STATUS	A (FT)	B (FT)	C (FT)	D (FT)	E (FT)	F (FT)	G (FT)	H (FT)	I (FT)	NO. OF HEADS (EA)*	LUM	SUB TO ITEM 680 VIVDS CAM ASSY (INSTALL ONLY)	DRILLED SHAFT LENGTH (LF) 24" DIA SUB TO ITEM 687	30" DIA ITEM 416	36" DIA TYPE A ITEM 416	FDN. TYPE WIND ZONE 80 MPH
P-1	I	10	LUMINAIRE POLE W/ APS					30							8		N/A
P-2	I	6	16	11	11		44	19	30	13	3	Y				14	36A
P-3	I	5	PEDESTRIAN SIGNAL POLE					10						6			24A
P-4	I	10	17	12			36	19	30	13	2	Y	1			14	36A
P-5	I	6	16	11	11		44	19	30	13	3	Y	1			14	36A
P-6	I	10	LUMINAIRE POLE W/ APS					30							8		N/A
P-7	I	7	17	11	15		48	19	30	13	3	Y				14	36A
P-8	I	4	PEDESTRIAN SIGNAL POLE					10						6			24A
P-9	I	10	17	12			36	19	30	13	2	Y	1			14	36A
P-10	I	6	17	11	11		44	19	30	13	3	Y	1			14	36A
										TOTAL:			4	12	16	84	

SIGNAL POLE STATUS: I=INSTALL; E=EXISTING; REM=REMOVE; F=INSTALL IN FUTURE PHASE
*- DOES NOT INCLUDE VERTICAL SIDEMOUNT SIGNAL HEADS OR PEDESTRIAN SIGNAL HEADS
**- EQUIPMENT TO BE PROVIDED BY THE CITY AND INSTALLED BY THE CONTRACTOR



ELECTRICAL SERVICE DATA

ELEC. SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED(5)-14)	SERVICE CONDUIT SIZE (PVC)**	SERVICE CONDUCTORS NO. / SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE / AMP	TWO-POLE CONTACTOR AMPS	PANELBD. / LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE / AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES-7	TY D (120/240) 070 (NS) SS (E) PS (U)	2"	3 / #4	N/A	2P / 70	30	100	T.S.	1P / 30	24	<7.1
								LIGHTING	2P / 15	4	
								LIGHTING	2P / 15	4	

** - VERIFY SERVICE CONDUIT SIZE WITH UTILITY. SIZE MAY CHANGE DUE TO THE UTILITY METER REQUIREMENTS. ENSURE CONDUIT SIZE MEETS THE NATIONAL ELECTRICAL CODE.

CITY PROVIDED ITEMS NOTES:
1. INSTALLATION OF CITY SUPPLIED ITEMS SHALL BE PAID SUBSIDIARY TO ITEM 680.

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

DESIGN TABLES
SH 190 AT PLANO RD

SHEET 1 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	98

STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.

CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

100% SUBMITTAL

CABLE TERMINATION CHART

CNDR. NO.	CONDUCTOR COLOR	CABLE 1 7 CNDR. FROM P-1 TO CNTRL.	CABLE 2 20 CNDR. FROM P-2 TO CNTRL.	CABLE 3 7 CNDR. FROM P-3 TO P-5	CABLE 4 20 CNDR. FROM P-4 TO CNTRL.	CABLE 5 20 CNDR. FROM P-5 TO CNTRL.	CABLE 6 7 CNDR. FROM P-6 TO P-7	CABLE 7 20 CNDR. FROM P-7 TO CNTRL.	CABLE 8 7 CNDR. FROM P-8 TO P-10	CABLE 9 20 CNDR. FROM P-9 TO CNTRL.	CABLE 10 20 CNDR. FROM P-10 TO CNTRL.
1	BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
2	WHITE	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON	SH COMMON
3	RED	SH 1 OLA (LS 11) DW	SH 13,14,15 OLA (LS 13) R	SH 4 PH 8 (LS 12) DW	SH 17,18,19 PH 8 (LS 8) R	SH 20,21,22,23 PH 6 (LS 6) R	SH 7 OLB (LS 9) DW	SH 24,25,26 OLB (LS 14) R	SH 10 PH 4 (LS 10) DW	SH 28,29,30 PH 4 (LS 4) R	SH 31,32,33,34 PH 2 (LS 2) R
4	GREEN	SH 1 OLA (LS 11) W	SH 13,14,15 OLA (LS 13) G	SH 4 PH 8 (LS 12) W	SH 17,18,19 PH 8 (LS 8) G + G (LT ARW)	SH 20,21,22,23 PH 6 (LS 6) G	SH 7 OLB (LS 9) W	SH 24,25,26 OLB (LS 14) G	SH 10 PH 4 (LS 10) W	SH 28,29,30 PH 4 (LS 4) G + G (LT ARW)	SH 31,32,33,34 PH 2 (LS 2) G
5	ORANGE	SPARE	SH 13,14,15 OLA (LS 13) Y	SH 5 PH 6 (LS 11) DW	SH 17,18,19 PH 8 (LS 8) Y + Y (LT ARW)	SH 20,21,22,23 PH 6 (LS 6) Y	SPARE	SH 24,25,26 OLB (LS 14) Y	SH 11 PH 2 (LS 9) DW	SH 28,29,30 PH 4 (LS 4) Y + Y (LT ARW)	SH 31,32,33,34 PH 2 (LS 2) Y
6	BLUE	SPARE	SH 16 PH 5 (LS 11) FY (LT ARW)	SH 5 PH 6 (LS 11) W	SPARE	SPARE	SPARE	SH 27 PH 1 (LS 9) FY (LT ARW)	SH 11 PH 2 (LS 9) W	SPARE	SPARE
7	WHITE/BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
8	RED/BLACK		SH 16 PH 5 (LS 5) R (LT ARW)		SPARE	SPARE		SH 27 PH 1 (LS 1) R (LT ARW)		SPARE	SPARE
9	GREEN/BLACK		SH 16 PH 5 (LS 5) G (LT ARW)		SPARE	SPARE		SH 27 PH 1 (LS 1) G (LT ARW)		SPARE	SPARE
10	ORANGE/BLACK		SH 16 PH 5 (LS 5) Y (LT ARW)		SPARE	SPARE		SH 27 PH 1 (LS 1) Y (LT ARW)		SPARE	SPARE
11	BLUE/BLACK		SPARE		SPARE	SPARE		SPARE		SPARE	SPARE
12	BLACK/WHITE		SPARE		SPARE	SPARE		SPARE		SPARE	SPARE
13	RED/WHITE		SH 1 OLA (LS 11) DW		SH 6 PH 6 (LS 11) DW	SH 4 PH 8 (LS 12) DW		SH 9 PH 4 (LS 10) DW		SH 12 PH 2 (LS 9) DW	SH 10 PH 4 (LS 10) DW
14	GREEN/WHITE		SH 1 OLA (LS 11) W		SH 6 PH 6 (LS 11) W	SH 4 PH 8 (LS 12) W		SH 9 PH 4 (LS 10) W		SH 12 PH 2 (LS 9) W	SH 10 PH 4 (LS 10) W
15	BLUE/WHITE		SH 2 OLA (LS 11) DW		SPARE	SH 5 PH 6 (LS 11) DW		SH 8 PH OLB (LS 9) DW		SPARE	SH 11 PH 2 (LS 9) DW
16	BLACK/RED		SH 2 OLA (LS 11) W		SPARE	SH 5 PH 6 (LS 11) W		SH 8 PH OLB (LS 9) W		SPARE	SH 11 PH 2 (LS 9) W
17	WHITE/RED		SH 3 PH 8 (LS12) DW		SPARE	SPARE		SH 7 OLB (LS 9) DW		SPARE	SPARE
18	ORANGE/RED		SH 3 PH 8 (LS12) W		SPARE	SPARE		SH 7 OLB (LS 9) W		SPARE	SPARE
19	BLUE/RED		ENFORCEMENT LAMP COMMON		ENFORCEMENT LAMP COMMON	ENFORCEMENT LAMP COMMON		ENFORCEMENT LAMP COMMON		ENFORCEMENT LAMP COMMON	ENFORCEMENT LAMP COMMON
20	RED/GREEN		ENFORCEMENT LAMP		ENFORCEMENT LAMP	ENFORCEMENT LAMP		ENFORCEMENT LAMP		ENFORCEMENT LAMP	ENFORCEMENT LAMP

NOTE: HOME RUN 2 CNDR TO ALL POLES WITH APS BUTTONS

APS MESSAGE CHART

POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/SOUND DETAILS
P-1	OLA	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT WBFR AT PLANO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-2	OLA	BUTTON PUSH ON DW	WAIT TO CROSS PGBT WBFR AT PLANO RD
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT WBFR AT PLANO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	PGBT WBFR, WALK SIGN IS ON TO CROSS PGBT WBFR
P-3	Phase 6	BUTTON PUSH ON DW	WAIT TO CROSS PGBT WBFR AT PLANO RD
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT WBFR AT PLANO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	PGBT WBFR, WALK SIGN IS ON TO CROSS PGBT WBFR
P-4	Phase 6	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT WBFR AT PLANO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	WAIT
P-2	Phase 8	BUTTON PUSH ON DW	WAIT TO CROSS PLANO RD AT PGBT WBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS PLANO RD AT PGBT WBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	PLANO RD, WALK SIGN IS ON TO CROSS PLANO RD
P-3	Phase 8	BUTTON PUSH ON DW	WAIT TO CROSS PLANO RD AT PGBT WBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS PLANO RD AT PGBT WBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	PLANO RD, WALK SIGN IS ON TO CROSS PLANO RD
P-8	Phase 2	BUTTON PUSH ON DW	WAIT TO CROSS PGBT EBFR AT PLANO RD
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT EBFR AT PLANO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	PGBT EBFR, WALK SIGN IS ON TO CROSS PGBT EBFR
P-9	Phase 2	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT EBFR AT PLANO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-7	Phase 4	BUTTON PUSH ON DW	WAIT TO CROSS PLANO RD AT PGBT EBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS PLANO RD AT PGBT EBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	PLANO RD, WALK SIGN IS ON TO CROSS PLANO RD
P-8	Phase 4	BUTTON PUSH ON DW	WAIT TO CROSS PLANO RD AT PGBT EBFR
		EXTENDED BUTTON PUSH	WAIT TO CROSS PLANO RD AT PGBT EBFR
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	PLANO RD, WALK SIGN IS ON TO CROSS PLANO RD
P-6	OLB	BUTTON PUSH ON DW	WAIT
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT EBFR AT PLANO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	RAPID TICK
P-7	OLB	BUTTON PUSH ON DW	WAIT TO CROSS PGBT EBFR AT PLANO RD
		EXTENDED BUTTON PUSH	WAIT TO CROSS PGBT EBFR AT PLANO RD
		LOCATOR TONE	SLOW TICK
		WALK INDICATION	PGBT EBFR, WALK SIGN IS ON TO CROSS PGBT EBFR

DETECTION ZONE DETAILS

VEHICLE DETECTOR	MOUNTING LOCATION	MOUNTING HEIGHT	ZONE LOCATIONS	ZONES(S)	SETBACK DISTANCE
D1	P-4	18'	STOP BAR	WB	N/A
D2	P-5	18'	STOP BAR	SB	N/A
D3	P-9	18'	STOP BAR	EB	N/A
D4	P-10	18'	STOP BAR	NB	N/A

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

DIAMOND SIGNALS

DESIGN TABLES
SH 190 AT PLANO RD

SHEET 2 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		99
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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SIGNS SUMMARY

SIGN #	SIGN TYPE	SIGN LEGEND	STATUS	SUPPORT	SIGN DIMENSION (in x in)
S1	R10-3EL	APS PUSH BUTTON	I	P-1	9" x 15"
S2	R10-3EL	APS PUSH BUTTON	I	P-2	9" x 15"
S3	R10-3EL	APS PUSH BUTTON	I	P-2	9" x 15"
S4	R10-3EL	APS PUSH BUTTON	I	P-3	9" x 15"
S5	R10-3EL	APS PUSH BUTTON	I	P-3	9" x 15"
S6	R10-3ER	APS PUSH BUTTON	I	P-4	9" x 15"
S7	R10-3EL	APS PUSH BUTTON	I	P-6	9" x 15"
S8	R10-3EL	APS PUSH BUTTON	I	P-7	9" x 15"
S9	R10-3ER	APS PUSH BUTTON	I	P-7	9" x 15"
S10	R10-3EL	APS PUSH BUTTON	I	P-8	9" x 15"
S11	R10-3ER	APS PUSH BUTTON	I	P-8	9" x 15"
S12	R10-3ER	APS PUSH BUTTON	I	P-9	9" x 15"
S13	R9-3	NO PEDESTRIAN CROSSINGS	I	P-1	18" x 18"
S14	D3-1	STREET NAME	I	P-2	24" x VARIES
S15	R6-2L	ONE WAY	I	P-2	30" x 36"
S16	R6-2L	ONE WAY	I	P-2	30" x 36"
S17	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	P-2	36" x 42"
S18	R3-8LM	LANE ASSIGNMENT	I	P-4	36" x 30"
S19	D3-1	STREET NAME	I	P-4	24" x VARIES
S20	R9-3	NO PEDESTRIAN CROSSINGS	I	P-5	18" x 18"
S21	D3-1	STREET NAME	I	P-5	24" x VARIES
S22	R6-2R	ONE WAY	I	P-5	30" x 36"
S23	R6-2R	ONE WAY	I	P-5	30" x 36"
S24	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S25	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S26	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S27	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S28	R9-3	NO PEDESTRIAN CROSSINGS	I	P-6	18" x 18"
S29	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S30	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S31	D3-1	STREET NAME	I	P-7	24" x VARIES
S32	R6-2L	ONE WAY	I	P-7	30" x 36"
S33	R6-2L	ONE WAY	I	P-7	30" x 36"
S34	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	I	P-7	36" x 42"
S35	R3-8LM	LANE ASSIGNMENT	I	P-9	36" x 30"
S36	D3-1	STREET NAME	I	P-9	24" x VARIES
S37	R9-3	NO PEDESTRIAN CROSSINGS	I	P-10	18" x 18"
S38	D3-1	STREET NAME	I	P-10	24" x VARIES
S39	R6-2R	ONE WAY	I	P-10	30" x 36"
S40	R6-2R	ONE WAY	I	P-10	30" x 36"
S41	R1-2	YIELD	I	10 BWG	48" x 48" x 48"
S42	R1-2	YIELD	I	10 BWG	48" x 48" x 48"

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

GROUND BOX SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QTY.
624	6010	GROUND BOX TY D (162922)W/APRON	EA	11

ITEM 0682 SIGNAL HEADS

SIGNAL HEAD NUMBER	SIGNAL HEAD TYPE	STATUS	12-INCH SIGNAL HEAD UNITS									PED SIG SEC (LED) (COUNTDOWN)
			BACKPLATES			LED SIGNAL LAMPS						
			3 SEC	4 SEC	5 SEC	G	<- G	Y	<- Y	R	<- R	
			EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
1	PED	I										1
2	PED	I										1
3	PED	I										1
4	PED	I										1
5	PED	I										1
6	PED	I										1
7	PED	I										1
8	PED	I										1
9	PED	I										1
10	PED	I										1
11	PED	I										1
12	PED	I										1
13	V3	I	1			1		1		1		
14	H3S	I	1				1	1		1		
15	H3	I	1			1		1		1		
16	H5FYA	I			1		1		2		2	
17	H3	I	1			1		1		1		
18	H4LT	I		1		1	1	1		1		
19	V3LT	I	1				1		1	1		
20	V3	I	1			1		1		1		
21	H3	I	1			1		1		1		
22	H3	I	1			1		1		1		
23	H3S	I	1				1	1		1		
24	V3	I	1			1		1		1		
25	H3S	I	1				1	1		1		
26	H3	I	1			1		1		1		
27	H5FYA	I			1		1		2		2	
28	H3	I	1			1		1		1		
29	H4LT	I		1		1	1	1		1		
30	V3LT	I	1				1		1	1		
31	V3	I	1			1		1		1		
32	H3	I	1			1		1		1		
33	H3	I	1			1		1		1		
34	H3S	I	1				1	1		1		
TOTAL (NEW)			18	2	2	14	10	18	6	20	4	12

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

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER
4/25/2024

Elizabeth Shelton

OTHON ENGINEERING
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Texas Department of Transportation

DIAMOND SIGNALS

DESIGN TABLES
SH 190 AT PLANO RD

SHEET 3 OF 3

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		100
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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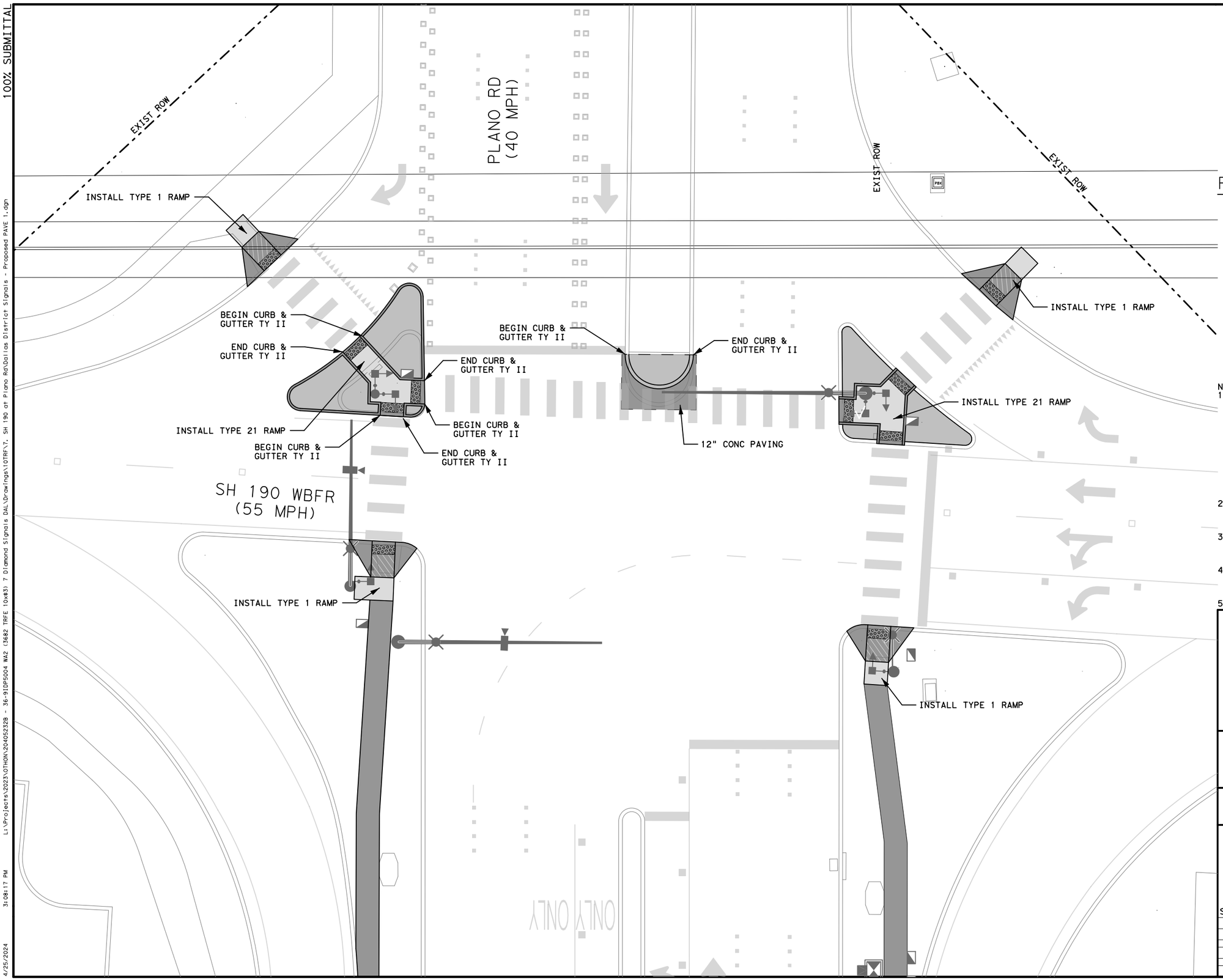

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RAMP & PAVING LEGEND

- PEDESTRIAN RAMPS 8.3% RUNNING SLOPE 2% CROSS SLOPE
- SIDEWALK 5% RUNNING SLOPE 2% CROSS SLOPE
- PEDESTRIAN LANDING 2% RUNNING SLOPE 2% CROSS SLOPE
- DETECTABLE SURFACE 8.3% RUNNING SLOPE 2% CROSS SLOPE
- CONCRETE RIP RAP

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. PROPOSED CURB RAMP LANDINGS SHALL BE POURED UP TO THE SIGNAL FOUNDATION, LEAVING NO GAPS.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS AND SUBSTITUTION OF ANY DAMAGED IRRIGATION EQUIPMENT.
4. CONTRACTOR SHALL ENSURE THAT ALL PED RAMPS DRAIN TOWARDS THE STREET WITHOUT PONDING IN THE RAMP OR GUTTER AREA.
5. ALL SLOPE VALUES SHOWN ARE MAXIMUMS.

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DIAMOND SIGNALS

CORNER DETAILS SH 190 AT PLANO RD

SCALE: 1" = 20'

SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		101
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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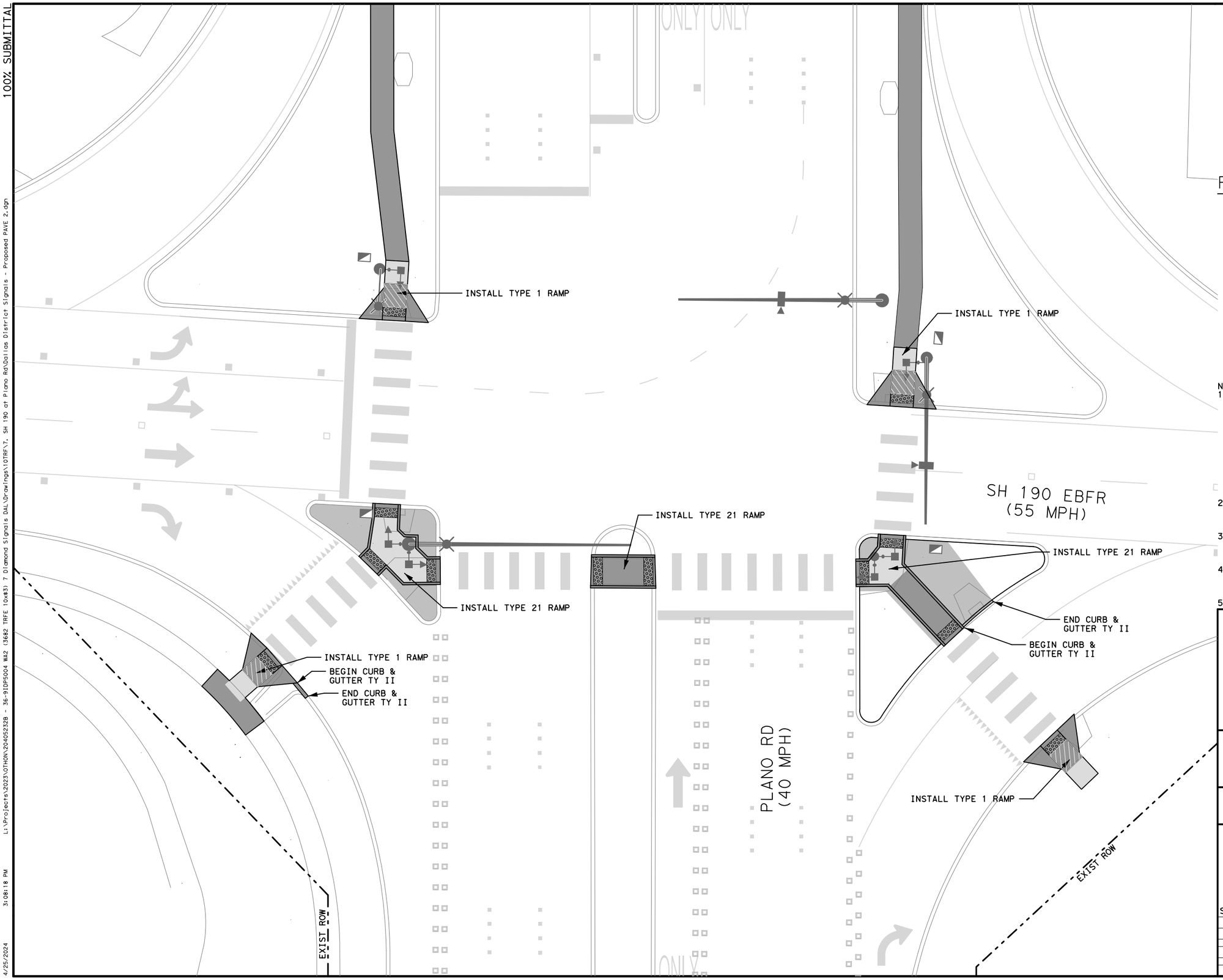

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RAMP & PAVING LEGEND

- PEDESTRIAN RAMPS — 8.3% RUNNING SLOPE, 2% CROSS SLOPE
- SIDEWALK — 5% RUNNING SLOPE, 2% CROSS SLOPE
- PEDESTRIAN LANDING — 2% RUNNING SLOPE, 2% CROSS SLOPE
- DETECTABLE SURFACE — 8.3% RUNNING SLOPE, 2% CROSS SLOPE
- CONCRETE RIP RAP

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.
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DIAMOND SIGNALS

CORNER DETAILS SH 190 AT PLANO RD

SCALE: 1" = 20'

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		102
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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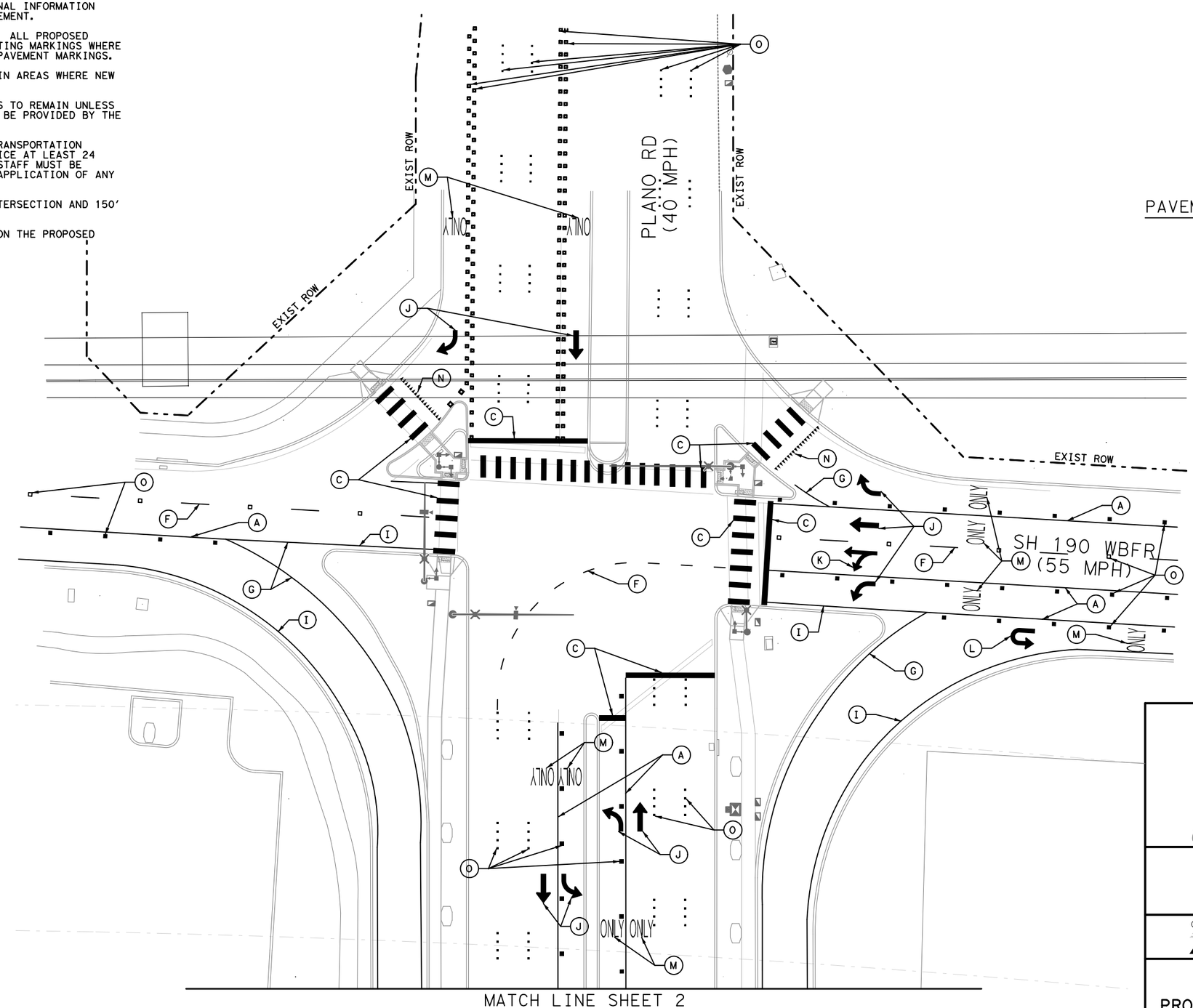
NOTES:
1. REFER TO THE CITY STANDARDS FOR ADDITIONAL INFORMATION REGARDING TYPICAL PAVEMENT MARKING PLACEMENT.
2. LANE WIDTHS SHALL MATCH EXISTING LANES. ALL PROPOSED PAVEMENT MARKINGS SHALL BE TIED TO EXISTING MARKINGS WHERE APPLICABLE TO REFRESH THE INTERSECTION PAVEMENT MARKINGS.
3. CONTRACTOR SHALL APPLY PAVEMENT SEALER IN AREAS WHERE NEW THERMO IS TO BE APPLIED.
4. ALL EXISTING SIGNS AND PAVEMENT MARKINGS TO REMAIN UNLESS OTHERWISE NOTED. ALL PROPOSED SIGNS TO BE PROVIDED BY THE CONTRACTOR.
5. STRIPING CONTRACTOR SHALL CONTACT COD TRANSPORTATION OPERATIONS AND TxDOT TRAFFIC SIGNAL OFFICE AT LEAST 24 HOURS IN ADVANCE OF MOBILIZATION. COD STAFF MUST BE PRESENT TO CONFIRM LAYOUT PRIOR TO THE APPLICATION OF ANY PAVEMENT MARKINGS.
6. REFRESH PAVEMENT MARKINGS WITHIN THE INTERSECTION AND 150' FROM STOP BAR.
7. SEE SUMMARY OF PAVEMENT MARKINGS TABLE ON THE PROPOSED QUANTITIES SHEET.



N

PAVEMENT MARKING LEGEND

- (A) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100 MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100 MIL)
- (D) RE PM W/RET REQ TY I (W)(4")(BRK)(100MIL)
- (E) RE PM W/RET REQ TY I (W)(4")(SLD)(100MIL)
- (F) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (G) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (H) RE PM W/RET REQ TY I (Y)(4")(SLD)(100MIL)
- (I) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (J) PREFAB PAV MRK TY C (W)(ARROW)
- (K) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (L) PREFAB PAV MRK TY C (W)(UTURN ARROW)
- (M) PREFAB PAV MRK TY C (W)(WORD)
- (N) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- (O) REFL PAV MRK TY II-C-R
- (P) REFL PAV MRK TY II-A-A

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DIAMOND SIGNALS

PROPOSED PAVEMENT MARKING SH 190 AT PLANO RD

SCALE: 1" = 40' SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	(SEE TITLE SHEET)	103
STATE	DISTRICT	COUNTY
TEXAS	DAL	DALLAS, ETC.
CONT	SECT	JOB / HIGHWAY NO
0047	07	243, ETC. / US 75, ETC.

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NOTES:
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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.
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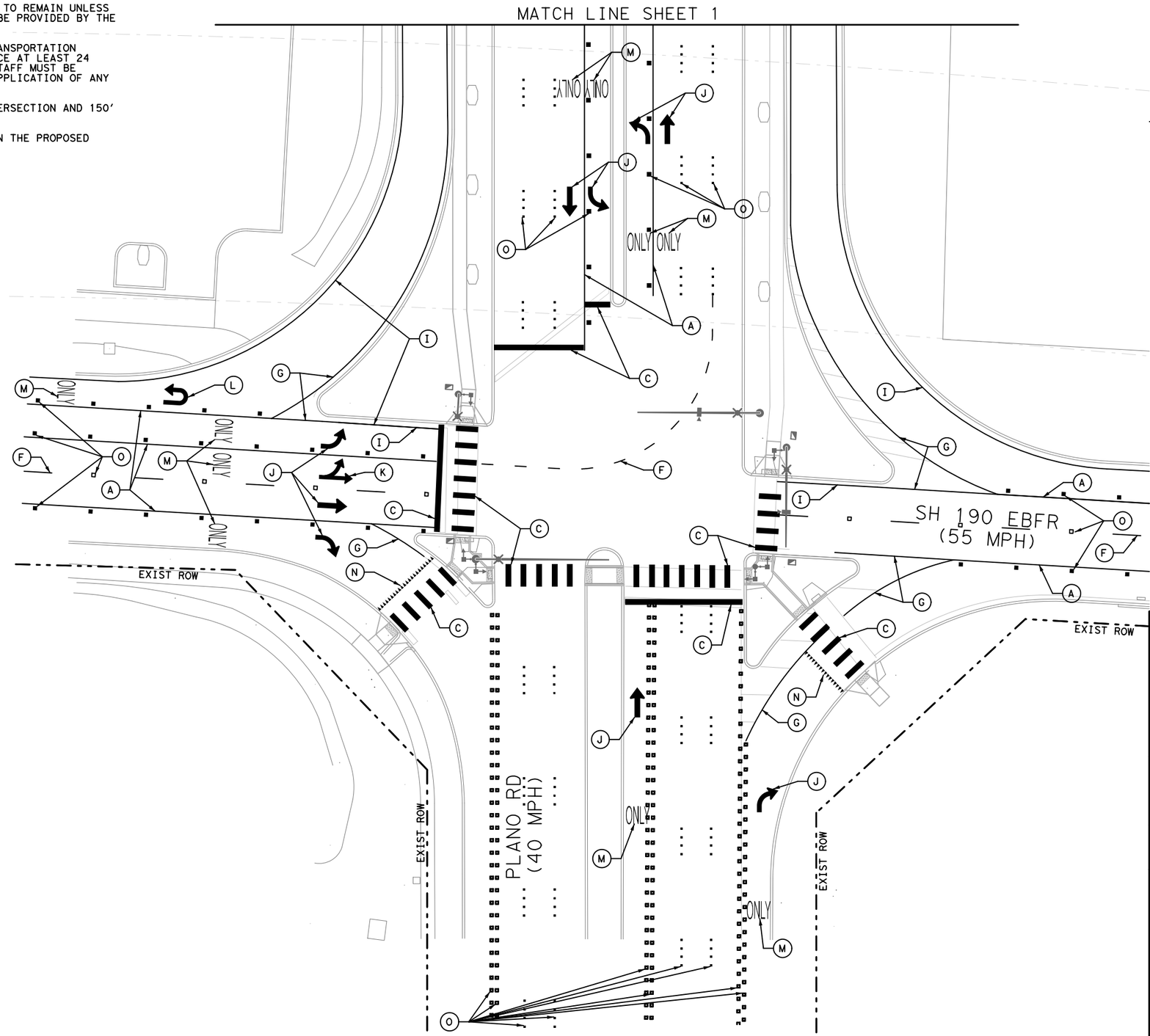
7. SEE SUMMARY OF PAVEMENT MARKINGS TABLE ON THE PROPOSED QUANTITIES SHEET.



PAVEMENT MARKING LEGEND

- (A) REFL PAV MRK TY I (W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100 MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100 MIL)
- (D) RE PM W/RET REQ TY I (W)(4")(BRK)(100MIL)
- (E) RE PM W/RET REQ TY I (W)(4")(SLD)(100MIL)
- (F) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (G) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (H) RE PM W/RET REQ TY I (Y)(4")(SLD)(100MIL)
- (I) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (J) PREFAB PAV MRK TY C (W)(ARROW)
- (K) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (L) PREFAB PAV MRK TY C (W)(UTURN ARROW)
- (M) PREFAB PAV MRK TY C (W)(WORD)
- (N) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- (O) REFL PAV MRK TY II-C-R
- (P) REFL PAV MRK TY II-A-A

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DIAMOND SIGNALS

PROPOSED PAVEMENT MARKING SH 190 AT PLANO RD

SCALE: 1" = 40' SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		104
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

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PAVEMENT MARKING SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1430
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	975
666	6225	PAVEMENT SEALER 6"	LF	2230
666	6226	PAVEMENT SEALER 8"	LF	1430
666	6230	PAVEMENT SEALER 24"	LF	975
666	6231	PAVEMENT SEALER (ARROW)	EA	18
666	6232	PAVEMENT SEALER (WORD)	EA	20
666	6234	PAVEMENT SEALER (DBL ARROW)	EA	2
666	6236	PAVEMENT SEALER (UTURN ARROW)	EA	2
666	6243	PAVEMENT SEALER (YLD TRI)	EA	73
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	150
666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	1000
666	6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	1080
668	6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	18
668	6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA	2
668	6085	PREFAB PAV MRK TY C (W) (WORD)	EA	20
668	6080	PREFAB PAV MRK TY C (W) (UTURN ARROW)	EA	2
668	6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	73
672	6010	REFL PAV MRKR TY II-C-R	EA	639
678	6002	PAV SURF PREP FOR MRK (6")	LF	2230
678	6004	PAV SURF PREP FOR MRK (8")	LF	1430
678	6008	PAV SURF PREP FOR MRK (24")	LF	975
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	18
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	2
678	6012	PAV SURF PREP FOR MRK (UTURN ARR)	EA	2
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	20
678	6022	PAV SURF PREP FOR MRK (18")(YLD TRI)	EA	73
678	6033	PAV SURF PREP FOR MRK (RPM)	EA	639

PEDESTRIAN RAMP / SIDEWALK SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0432	6001	RIPRAP (CONC)(4 IN)	CY	12
0529	6008	CONC CURB & GUTTER (TY II)	LF	104
0531	6001	CONC SIDEWALKS (4")	SY	310
0531	6004	CURB RAMPS (TY 1)	EA	8
0531	6016	CURB RAMPS (TY 21)	EA	5

ROADWAY SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
0251	6034	REWORK BS MTL (TY C) (8") (ORD COMP)	SY	22
0360	6044	CONC PVMT (CONT REINF)(FAST TRK)(12")	SY	22

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

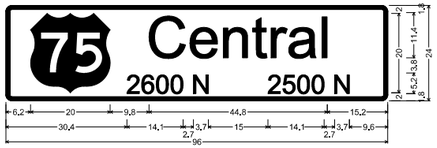
PAVING AND PAVEMENT MARKING QUANTITIES US 190 AT PLANO RD

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		105
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

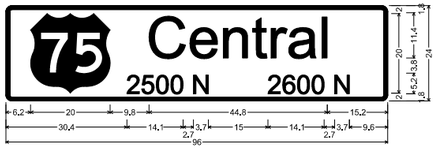
4/25/2024 3:08:21 PM L:\Projects\2023\OTHON\204052328 - 36-91DP5004 WA2 (3682 TRFE 10x3) 7 Diamond Signals DAL\Drawings\10TRFV2. SH 190 at Plano Rd\Dallas District Signals - PMRK Tables.dgn

100% SUBMITTAL

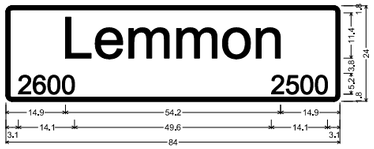
LEMMON AVE.



D3-1G(7) 12in:
1.5" Radius, 1.0" Border, White on Green:
"Central", ClearviewHwy-3-W: "2600 N", ClearviewHwy-3-W: "2500 N", ClearviewHwy-3-W:



D3-1G(7) 12in:
1.5" Radius, 1.0" Border, White on Green:
"Central", ClearviewHwy-3-W: "2500 N", ClearviewHwy-3-W: "2600 N", ClearviewHwy-3-W:



D3-1G(7) 12in:
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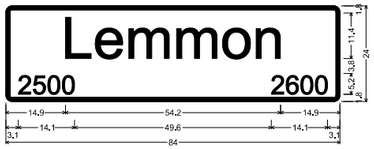
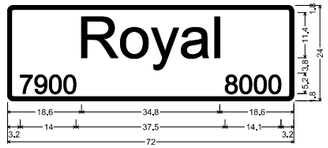
"Lemmon", ClearviewHwy-3-W: "2600", ClearviewHwy-3-W:
"2500", ClearviewHwy-3-W:



D3-1G(7) 12in:
1.5" Radius, 1.0" Border, White on Green:
"Lemmon", ClearviewHwy-3-W: "2500", ClearviewHwy-3-W:
"2600", ClearviewHwy-3-W:

ROYAL LN



D3-1G(7) 12in:
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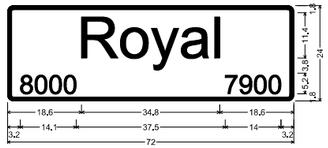
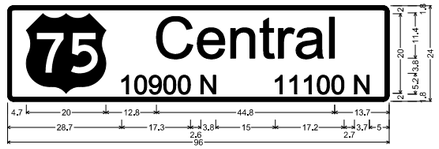
"Royal", ClearviewHwy-3-W: "7900", ClearviewHwy-3-W:
"8000", ClearviewHwy-3-W:



D3-1G(7) 12in:
1.5" Radius, 1.0" Border, White on Green:
"Royal", ClearviewHwy-3-W: "8000", ClearviewHwy-3-W:
"7900", ClearviewHwy-3-W:



D3-1G(7) 12in:
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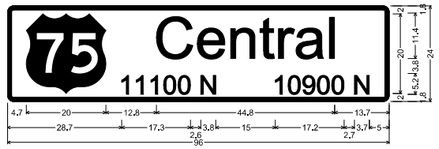
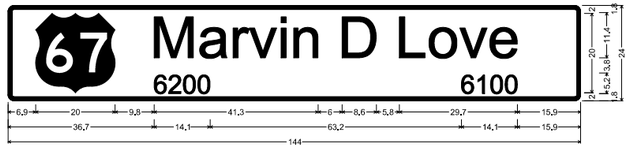
"Central", ClearviewHwy-3-W: "10900 N", ClearviewHwy-3-W: "11100 N", ClearviewHwy-3-W:



D3-1G(7) 12in:
1.5" Radius, 1.0" Border, White on Green:
"Central", ClearviewHwy-3-W: "11100 N", ClearviewHwy-3-W: "10900 N", ClearviewHwy-3-W:

RED BIRD



D3-1G(7) 12in:
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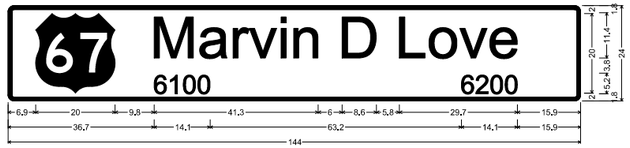
"Marvin D Love", ClearviewHwy-3-W: "6200", ClearviewHwy-3-W: "6100", ClearviewHwy-3-W:



D3-1G(7) 12in:
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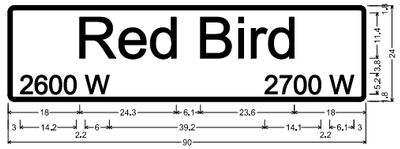
"Marvin D Love", ClearviewHwy-3-W: "6100", ClearviewHwy-3-W: "6200", ClearviewHwy-3-W:



D3-1G(7) 12in:
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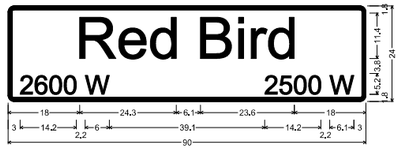
"Red Bird", ClearviewHwy-3-W: "2600 W", ClearviewHwy-3-W:
"2700 W", ClearviewHwy-3-W:



D3-1G(7) 12in:
1.5" Radius, 1.0" Border, White on Green:
"Red Bird", ClearviewHwy-3-W: "2700 W", ClearviewHwy-3-W:
"2600 W", ClearviewHwy-3-W:

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

SIGN DESIGN

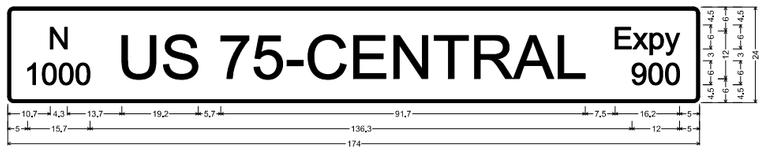
SHEET 1 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		106
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

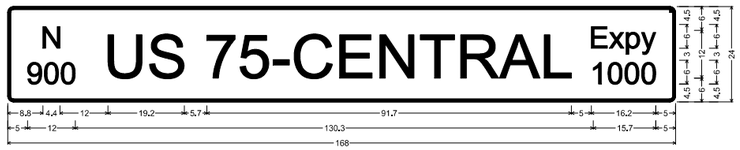
4/25/2024 3:08:25 PM L:\Projects\2023\OTHON\20405232B - 36-910P5004 WA2 (3682 TRFE 10x33) 7 Diamond Signals DAL\Drawings\10TRF\Dallas District Signals - Sign Designs Dallas.dgn

100% SUBMITTAL

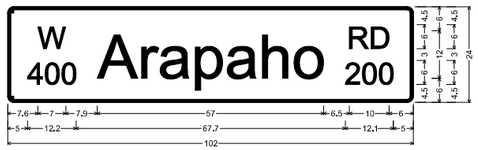
ARAPAHO RD



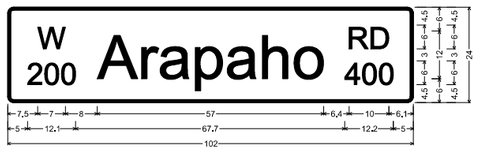
D3-1B(6) 12in:
1.5" Radius, 0.8" Border, White on Blue:
"N", ClearviewHwy-3-W; "1000", ClearviewHwy-3-W; "US 75-CENTRAL", ClearviewHwy-3-W; "Expy", ClearviewHwy-3-W; "900", ClearviewHwy-3-W;



D3-1B(6) 12in:
1.5" Radius, 0.8" Border, White on Blue:
"N", ClearviewHwy-3-W; "900", ClearviewHwy-3-W; "US 75-CENTRAL", ClearviewHwy-3-W; "Expy", ClearviewHwy-3-W; "1000", ClearviewHwy-3-W;

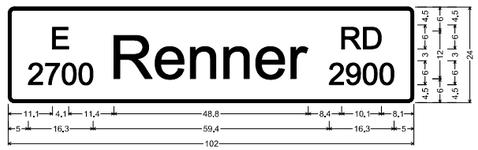


D3-1B(6) 12in:
1.5" Radius, 0.8" Border, White on Blue:
"W", ClearviewHwy-3-W; "400", ClearviewHwy-3-W; "Arapaho", ClearviewHwy-3-W;
"RD", ClearviewHwy-3-W; "200", ClearviewHwy-3-W;

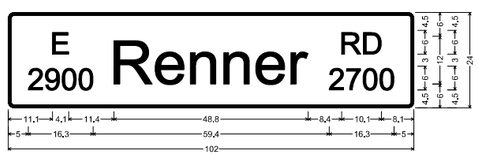


D3-1B(6) 12in:
1.5" Radius, 0.8" Border, White on Blue:
"W", ClearviewHwy-3-W; "200", ClearviewHwy-3-W; "Arapaho", ClearviewHwy-3-W;
"RD", ClearviewHwy-3-W; "400", ClearviewHwy-3-W;

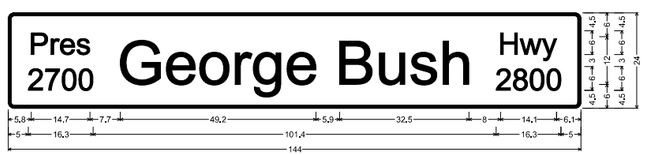
RENNER RD



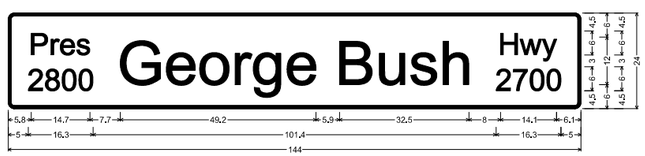
D3-1B(6) 12in:
1.5" Radius, 0.8" Border, White on Blue:
"E", ClearviewHwy-3-W; "2700", ClearviewHwy-3-W; "Renner", ClearviewHwy-3-W;
"RD", ClearviewHwy-3-W; "2900", ClearviewHwy-3-W;



D3-1B(6) 12in:
1.5" Radius, 0.8" Border, White on Blue:
"E", ClearviewHwy-3-W; "2900", ClearviewHwy-3-W; "Renner", ClearviewHwy-3-W;
"RD", ClearviewHwy-3-W; "2700", ClearviewHwy-3-W;

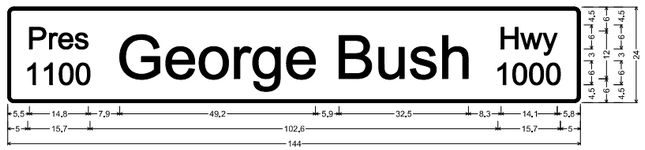


D3-1B(6) 12in:
1.5" Radius, 0.8" Border, White on Blue:
"Pres", ClearviewHwy-3-W; "2700", ClearviewHwy-3-W; "George Bush", ClearviewHwy-3-W; "Hwy", ClearviewHwy-3-W;
"2800", ClearviewHwy-3-W;



D3-1B(6) 12in:
1.5" Radius, 0.8" Border, White on Blue:
"Pres", ClearviewHwy-3-W; "2800", ClearviewHwy-3-W; "George Bush", ClearviewHwy-3-W; "Hwy", ClearviewHwy-3-W;
"2700", ClearviewHwy-3-W;

PLANO RD



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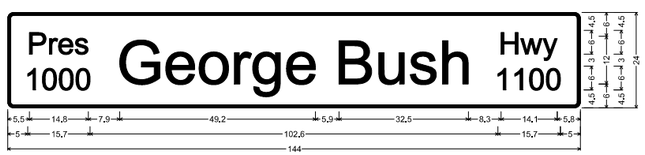
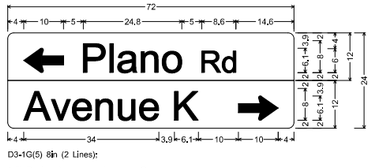
"1000", ClearviewHwy-3-W;



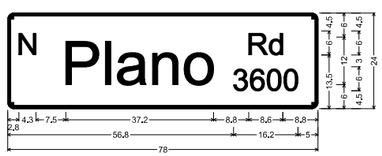
D3-1B(6) 12in:
1.5" Radius, 0.8" Border, White on Blue:
"Pres", ClearviewHwy-3-W; "1000", ClearviewHwy-3-W; "George Bush", ClearviewHwy-3-W; "Hwy", ClearviewHwy-3-W;
"1100", ClearviewHwy-3-W;



D3-1G(5) 8in (2 Lines):

1.5" Radius, No border, None on Green:
Standard Arrow Custom 10,0" X 6,1" 180° White:
"Plano" White, ClearviewHwy-3-W; "Rd" White, ClearviewHwy-2-W;

1.5" Radius, No border, None on Green:
"Avenue K" White, ClearviewHwy-3-W;
Standard Arrow Custom 10,0" X 6,1" 0° White;



D3-1B(6) 12in:
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"N", ClearviewHwy-3-W; " ", ClearviewHwy-3-W; "Plano", ClearviewHwy-3-W;
"Rd", ClearviewHwy-3-W; "3600", ClearviewHwy-3-W;

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED
PROFESSIONAL ENGINEER
4/25/2024

Elizabeth Shelton

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

Texas Department of Transportation

DIAMOND SIGNALS

SIGN DESIGN

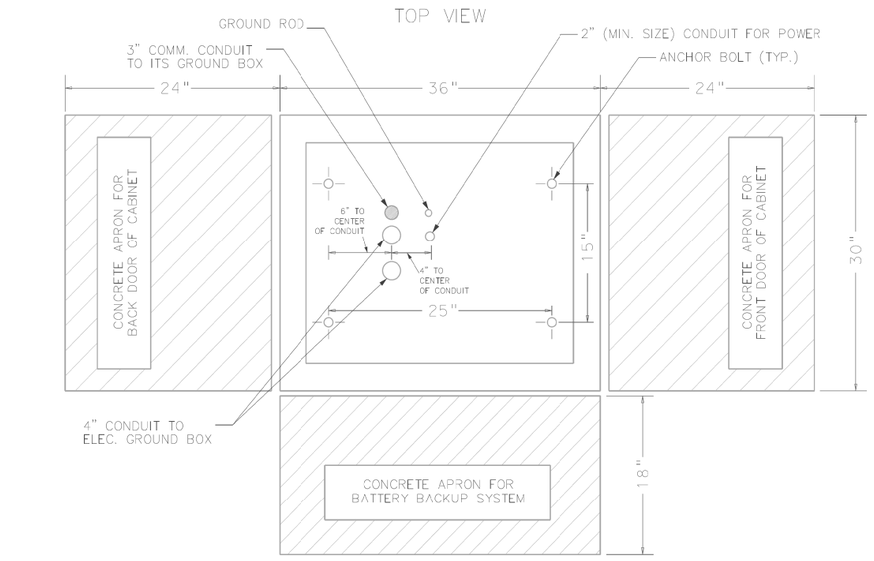
SHEET 2 OF 2

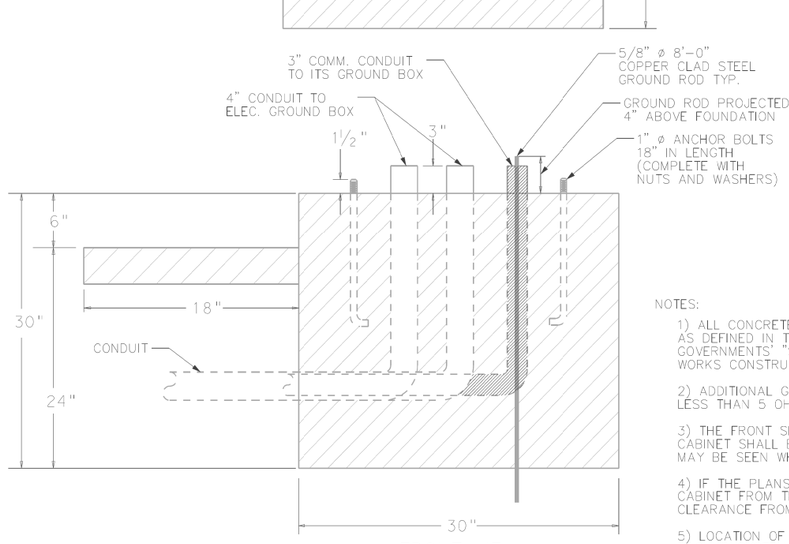
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		107
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

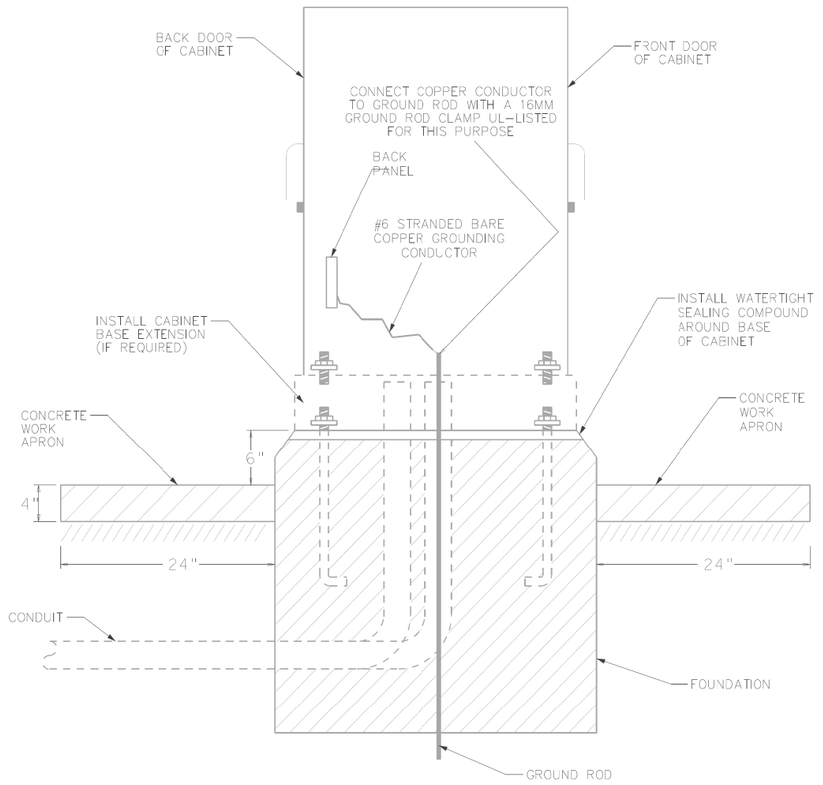
100% SUBMITTAL

BASE MOUNTED CONTROLLER CABINET FOUNDATION DETAILS

(FOR TYPE 332, 332i CONTROLLER CABINETS)







SIDE VIEW

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.

CITY OF DALLAS
DEPARTMENT OF TRANSPORTATION

CITY OF DALLAS
2023 TRAFFIC SIGNAL CONSTRUCTION DESIGN SPECIFICATIONS

DRAWN	DESIGN	DATE	SCALE	VERSION
ACC	SRV	8/10/2023	AS NOTED	1.4

STANDARD APPLIES TO LOCATIONS WITHIN THE CITY OF DALLAS ONLY

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

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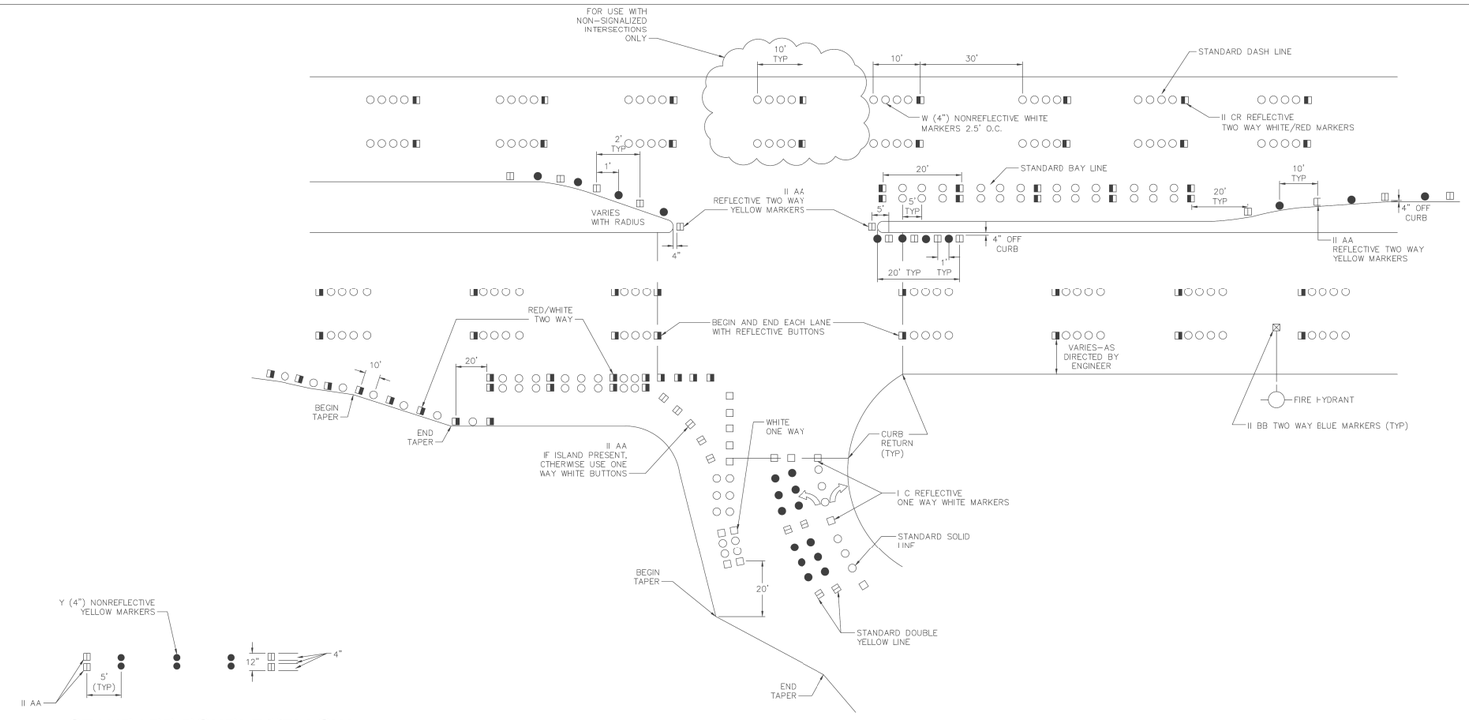
DIAMOND SIGNALS

CITY OF DALLAS
STANDARD BASE MOUNTED CONTROLLER CABINET

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		108
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

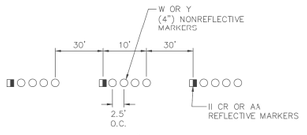
4/25/2024 3:08:23 PM L:\Projects\2023\OTHON\20405232B - 36-91DP5004 WA2 (3682 TRFE 10x83) 7 Diamond Signals DAL\Drawings\23Standards\Dallas Standards\City of Dallas Standard TS_Design.dgn

100% SUBMITTAL

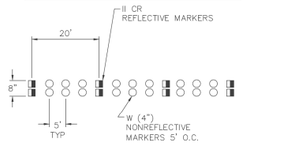


STANDARD DOUBLE YELLOW LINE

CITY OF RICHARDSON RAISED MARKINGS STANDARD DETAIL



STANDARD DASH LINE



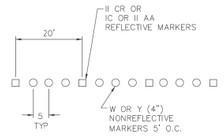
STANDARD BAY LINE

LEGEND

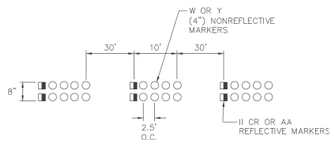
- II CR (4" SQUARE) TWO WAY RETLECTIVE RED/WHITE MARKER
- II AA (4" SQUARE) TWO WAY REFLECTIVE YELLOW MARKER
- II BB (4" SQUARE) TWO WAY RETLECTIVE BLUE MARKER
- I C (4" SQUARE) ONE WAY REFLECTIVE WHITE MARKER
- W (4" ROUND) NON REFLECTIVE WHITE MARKER
- Y (4" ROUND) NON REFLECTIVE YELLOW MARKER

C.O.R. WILL PROVIDE INITIAL DETAIL ASSISTANCE IN PAVING MARKING LAYOUT (AS REQUIRED)

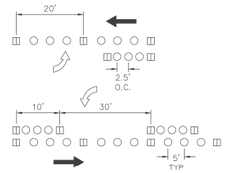
MATERIALS AS PER COR SPECIFICATIONS OR AS DIRECTED BY THE ENGINEER



STANDARD SOLID LINE



DOUBLE DASH BAY LINE CATCH LANES



TWO WAY LEFT TURN LANE RAISED MARKINGS

Revisions:

City of Richardson
411 W. Arapaho Road
Suite 204
Richardson, Texas 75080
voice: 972 744-4280
fax: 972 744-5804

Drawn By: RGB
Checked By: COR

RICHARDSON TEXAS

STANDARD DETAILS

City of Richardson, Texas

NO ADDITIONS OR CHANGES TO STANDARD DETAIL SHEETS UNLESS APPROVED BY CITY OF RICHARDSON

24"x36" Scale:	NTS
11"x17" Scale:	NTS
Vertical Scale:	NA
Project Number:	XXX
Issue Date:	03 MAY 18
Sheet Title:	TRAFFIC
Sheet No.:	T-3

STANDARD APPLIES TO LOCATIONS WITHIN THE CITY OF RICHARDSON ONLY

STATE OF TEXAS
ELIZABETH SHELTON
107729
LICENSED PROFESSIONAL ENGINEER
4/25/2024

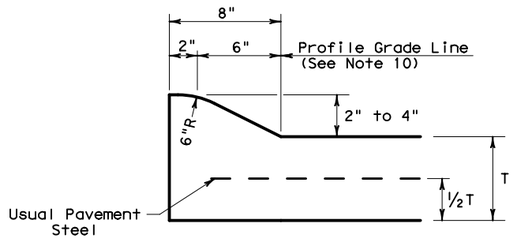
OTHON ENGINEERING
FIRM REGISTRATION NO. F-1471

DIAMOND SIGNALS

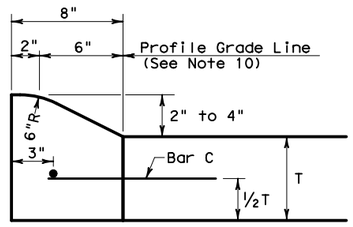
CITY OF RICHARDSON
TRAFFIC STANDARD T-3
PAVEMENT MARKING

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		109
STATE	DISTRICT	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT	SECT	JOB	HIGHWAY NO
0047	07	243, ETC.	US 75, ETC.

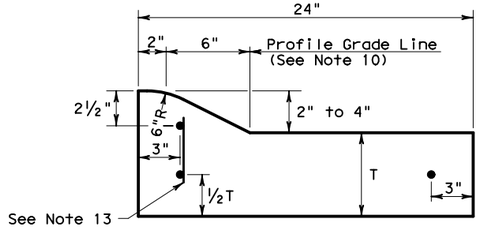
DATE: 4/25/2024
FILE: L:\Projects\2023\OTHON\20405232B - 36-91DP5004 WA2 (3682 TRFE 10x$3) 7 Diamond Signals DAL\Drawings\23Standards\cccg22.dgn



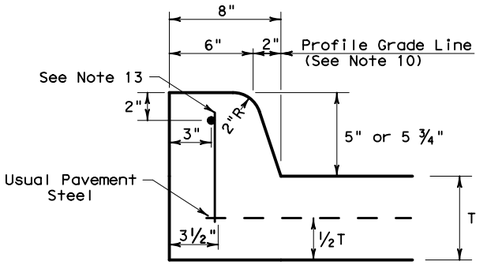
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



TYPE I CURB
2" - 4" HEIGHT



TYPE I CURB AND GUTTER
2" - 4" HEIGHT



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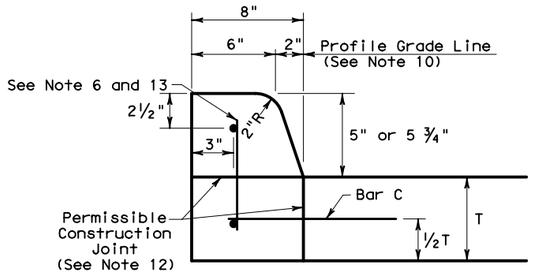
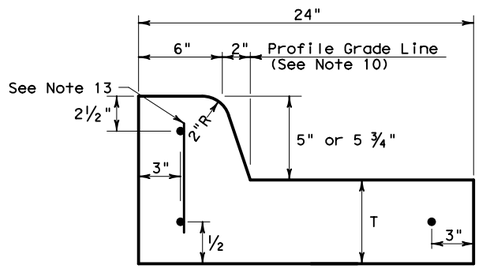
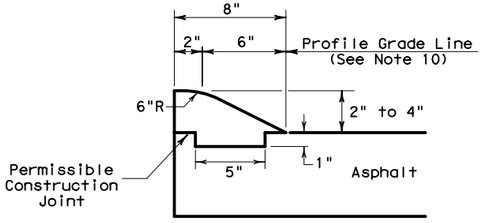
5" - 5 ¾" HEIGHT



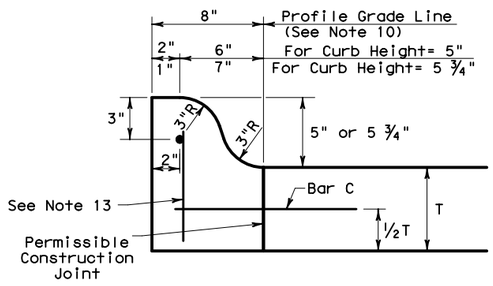
TYPE II CURB
5" - 5 ¾" HEIGHT



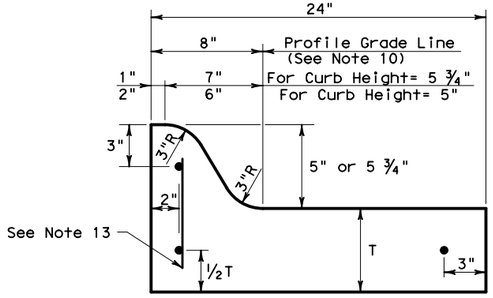
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



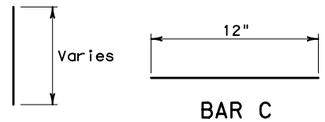
TYPE III CURB (KEYED)
2" - 4" HEIGHT



TYPE IIa CURB
5" - 5 ¾" HEIGHT

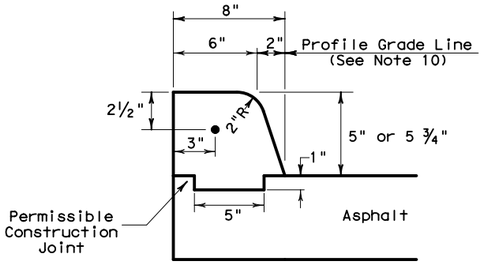


TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

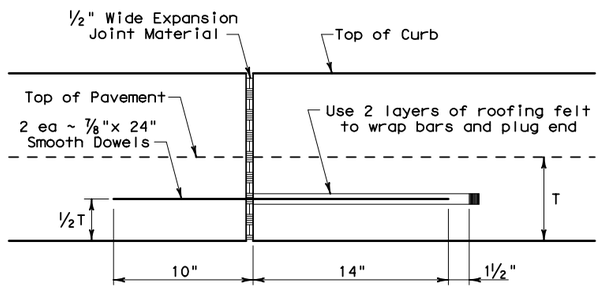


BAR B

BAR C

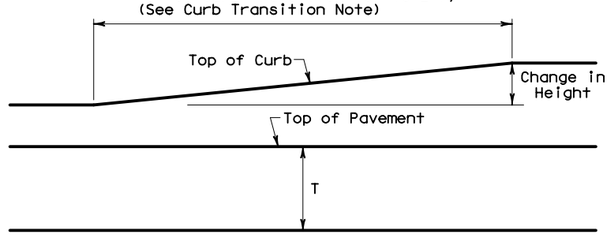


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

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.



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. 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."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and grouted in place, or may be inserted into fresh concrete.
7. 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.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. 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.
13. Bar B placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.

Texas Department of Transportation

Design Division Standard

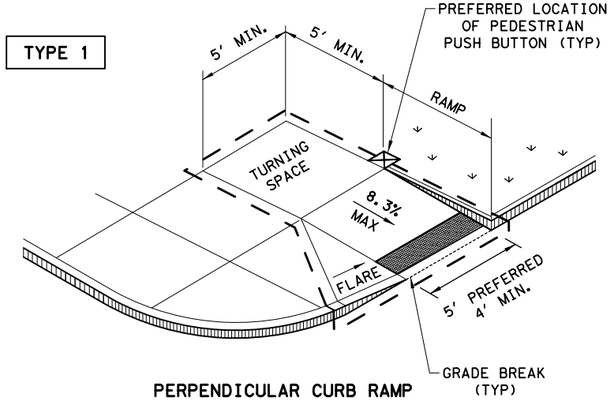
CONCRETE CURB AND CURB AND GUTTER

CCCG-22

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: CS	CK: KM
© TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		110

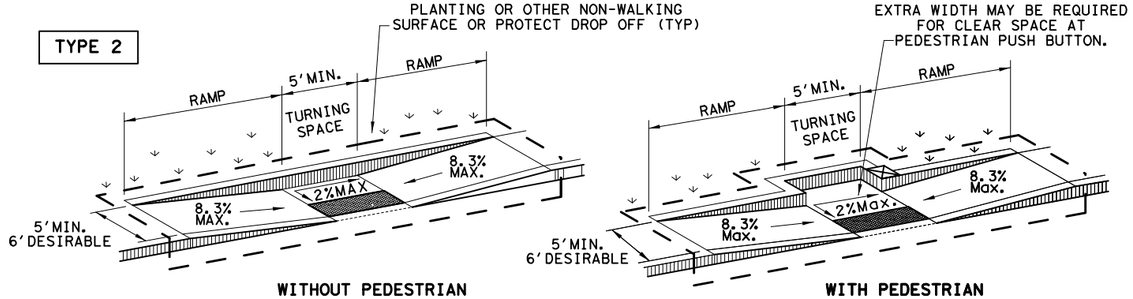
DATE: 4/25/2024
FILE: L:\Projects\2023\OTHON\20405232B - 36-9IDP5004 WA2 (3682 TRFE 10x$3) 7 Diamond Signals DAL\Drawings\23Standards\ped18.dgn

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

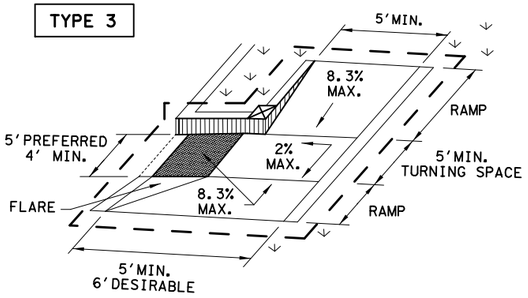


WITHOUT PEDESTRIAN PUSH BUTTON

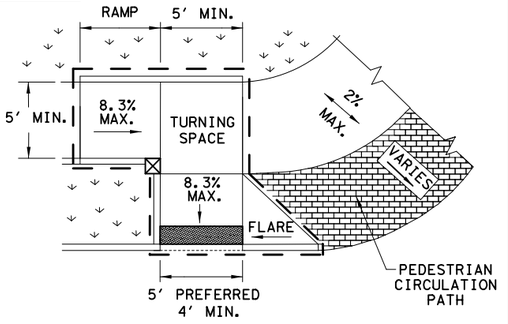
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

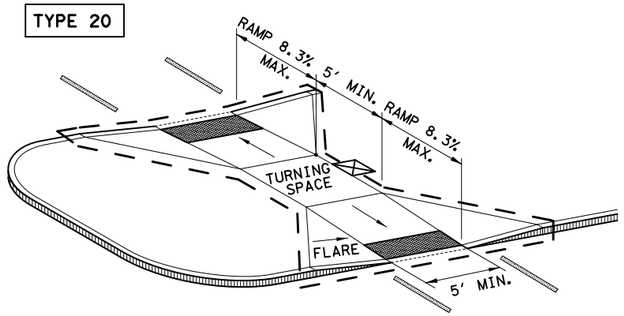


TYPE 6



COMBINATION CURB RAMPS

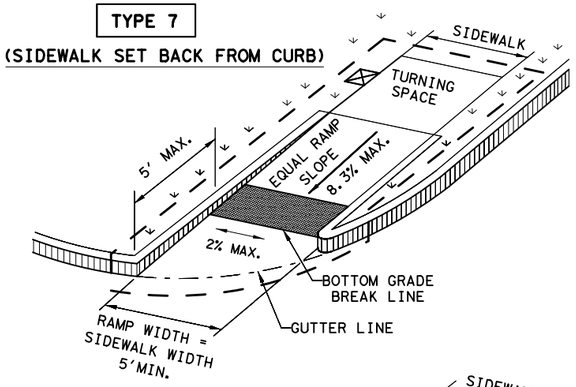
TYPE 20



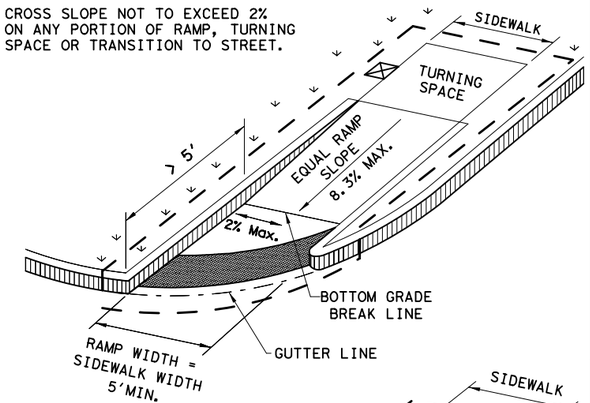
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

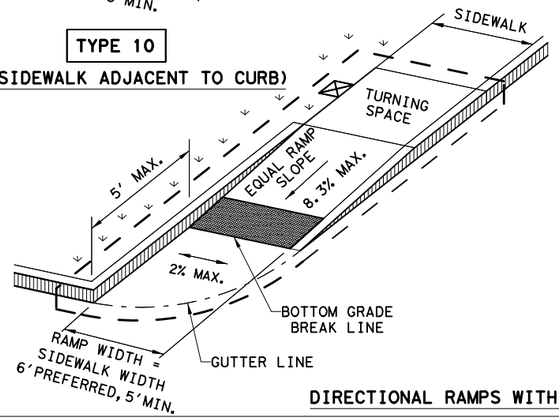


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

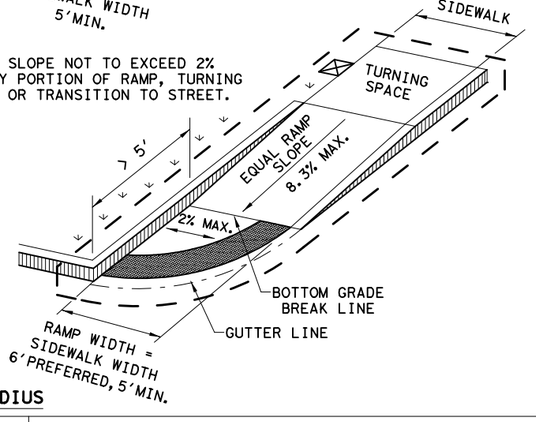


TYPE 10

(SIDEWALK ADJACENT TO CURB)

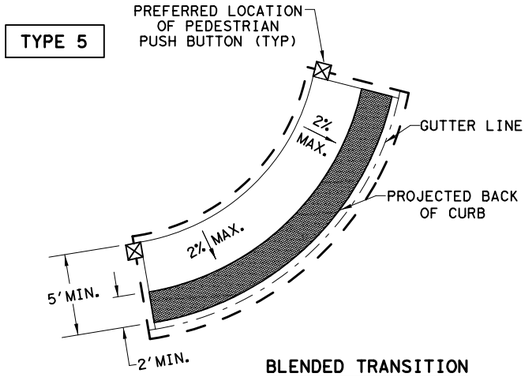


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

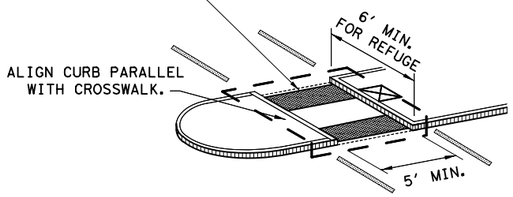
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

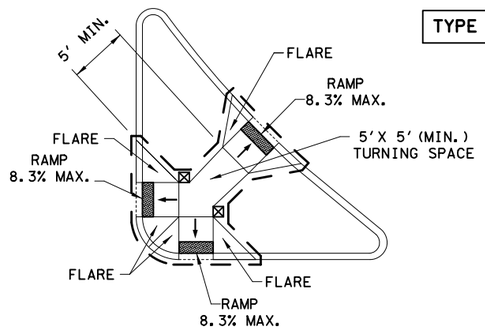
TYPE 21

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



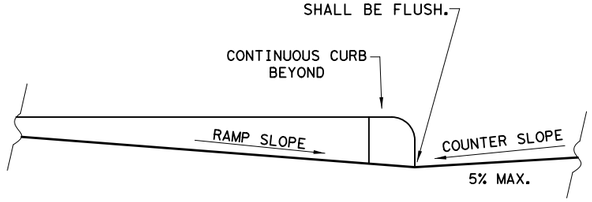
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

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



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

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

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

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		111

DATE: 4/25/2024
FILE: L:\Projects\2023\OTHON\20405232B - 36-9IDP5004 WA2 (3682 TRFE 10x#3) 7 Diamond Signals DAL\Drawings\23Standards\ped18.dgn

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

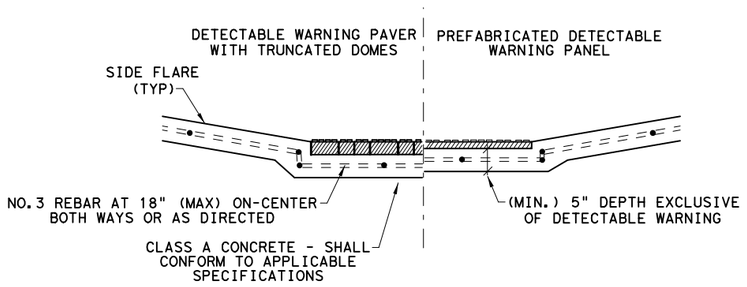
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material 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.

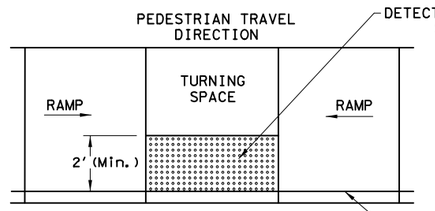
SIDEWALKS

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.

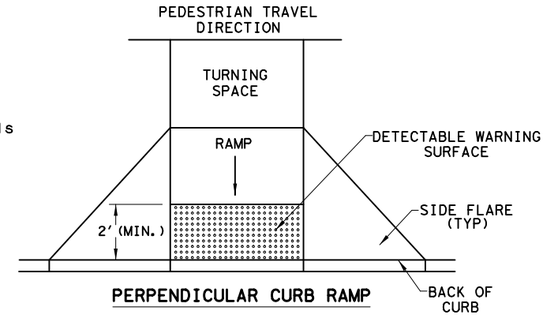


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

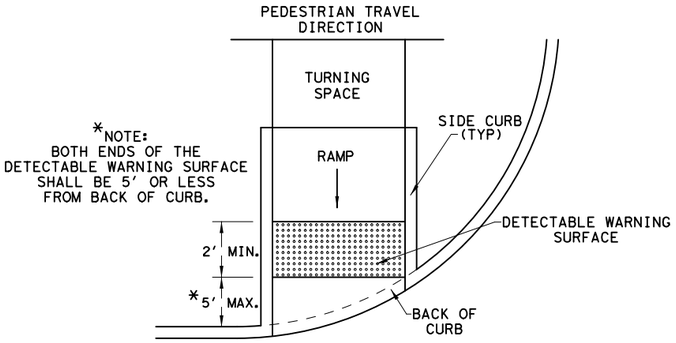
DETECTABLE WARNING SURFACE DETAILS



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.

Texas Department of Transportation — Design Division Standard

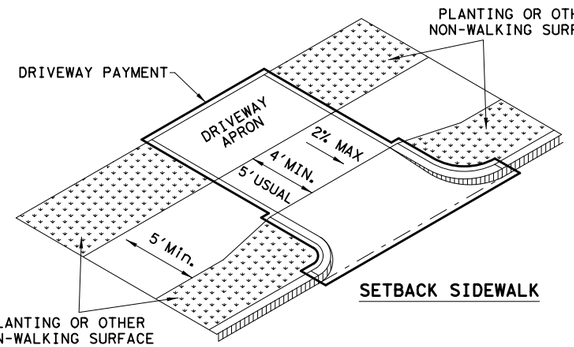
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

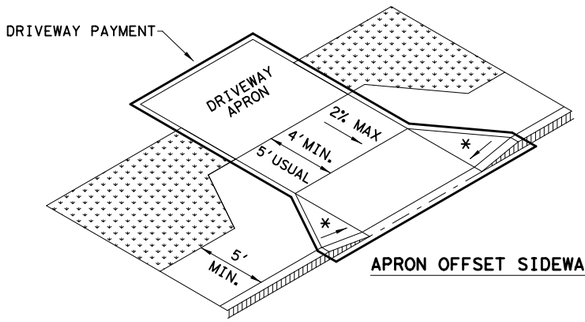
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	0047	07	243, ETC.		US 75, ETC.
	DIST	COUNTY			SHEET NO.
	DAL	DALLAS, ETC.			112

DATE: 4/25/2024
FILE: L:\Projects\2023\OTHON\20405232B - 36-9IDP5004 WA2 (3682 TRFE 10x83) 7 Diamond Signals DAL\Drawings\23Standards\ped18.dgn

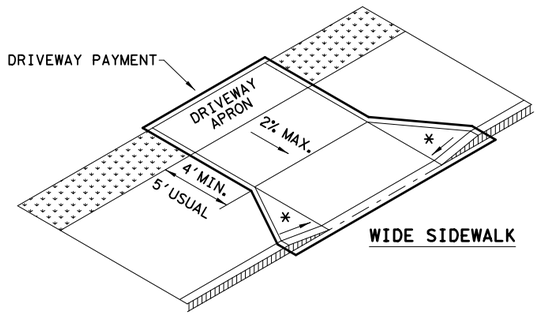
SIDEWALK TREATMENT AT DRIVEWAYS



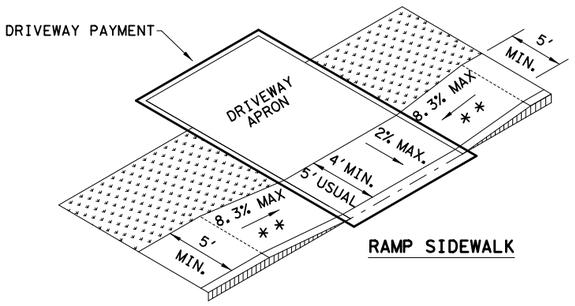
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

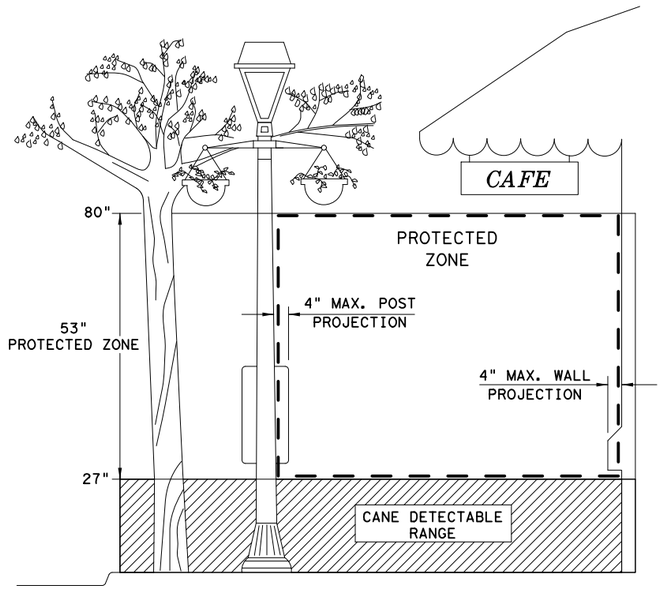


RAMP SIDEWALK

NOTES:

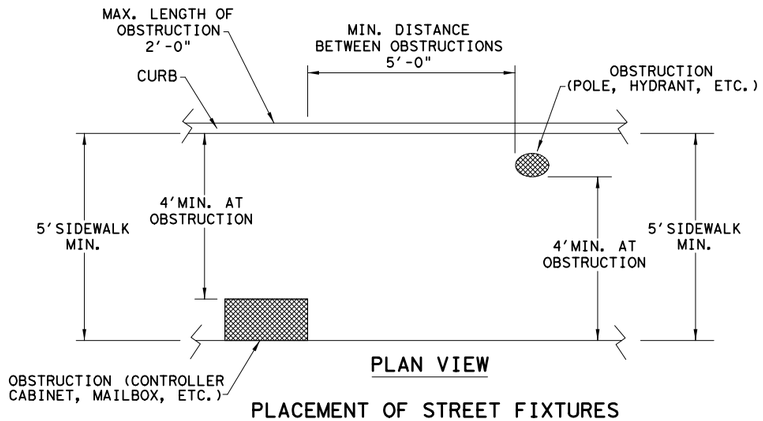
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

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



PROTECTED ZONE

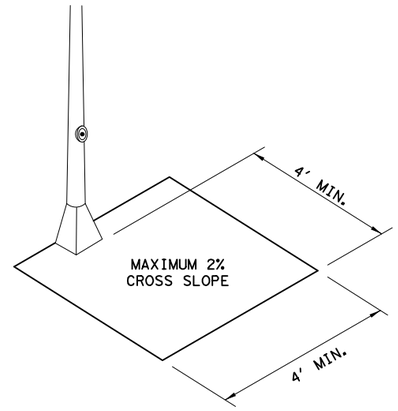
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



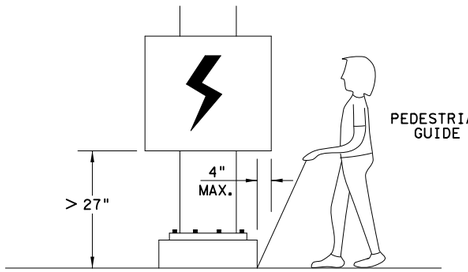
PLAN VIEW

PLACEMENT OF STREET FIXTURES

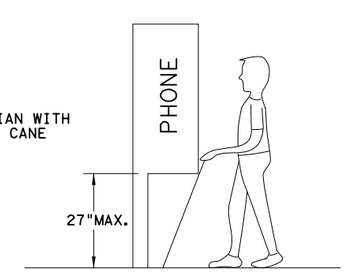
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



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



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

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

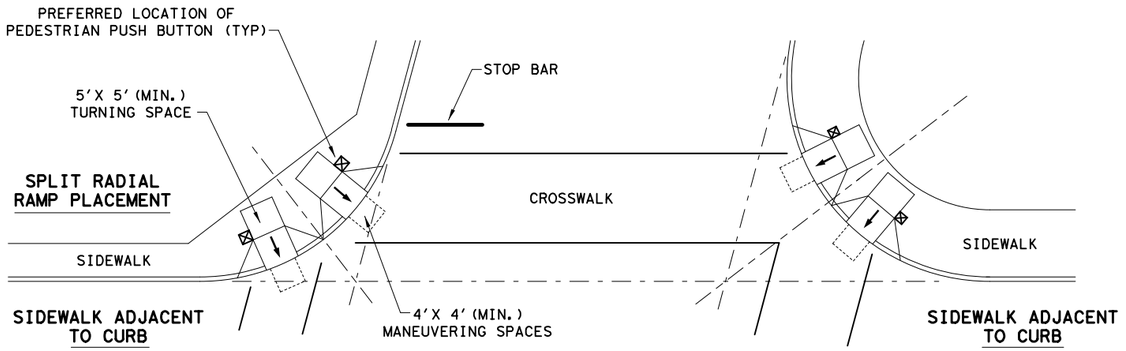
PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		113

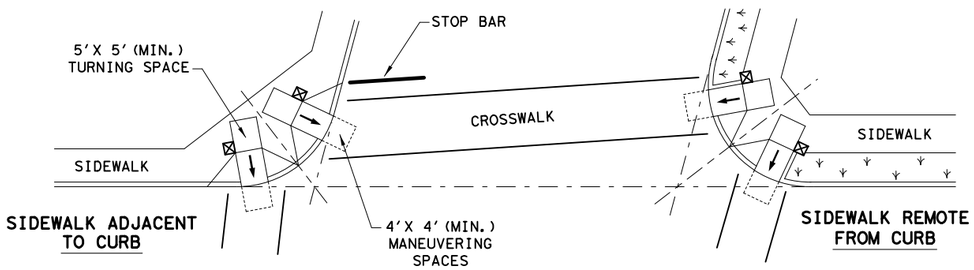
DATE: 4/25/2024
FILE: L:\Projects\2023\OTHON\20405232B - 36-9IDP5004 WA2 (3682 TRFE 10x$3) 7 Diamond Signals DAL\Drawings\23Standards\ped18.dgn

TYPICAL CROSSING LAYOUTS

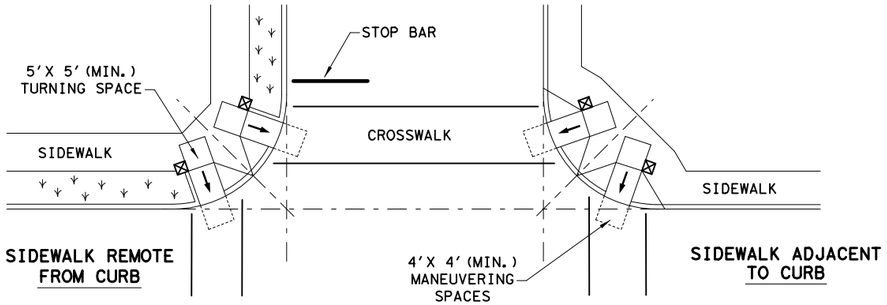
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



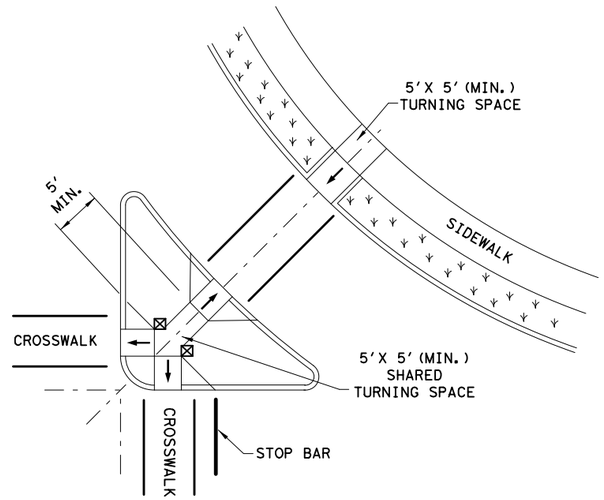
SKEWED INTERSECTION WITH "LARGE" RADIUS



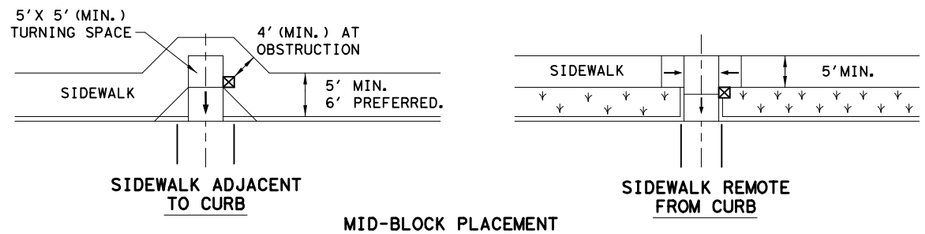
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

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

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

SHEET 4 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		114

DATE:
FILE:

GENERAL NOTES FOR ALL ELECTRICAL WORK

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

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

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

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

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

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

CONDUIT

A. MATERIALS

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

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

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

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

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

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

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

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

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

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

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

B. CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

FILE:	ed1-14.dgn	DN:	CK:	DW:	CK:
© TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS		0047	07	243, ETC.	US 75, ETC.
		DIST	COUNTY		SHEET NO.
		DAL	DALLAS, ETC.		115

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DATE:
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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

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

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

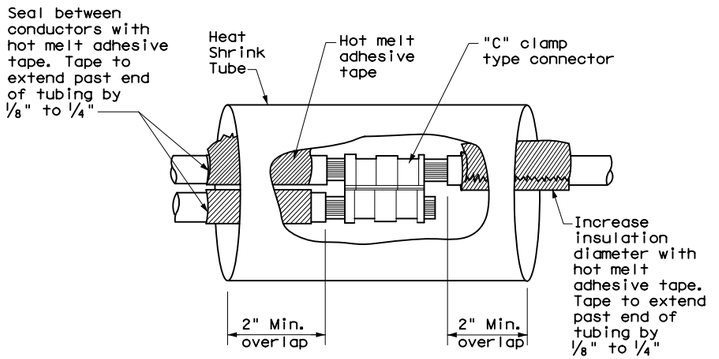
3. Install ground rods so the imprinted part number is at the upper end of the rod.

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

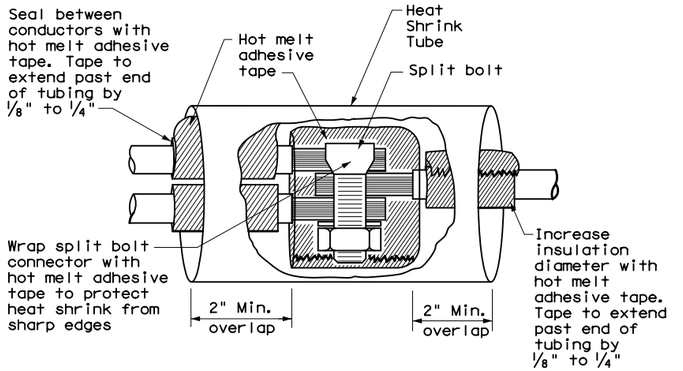
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

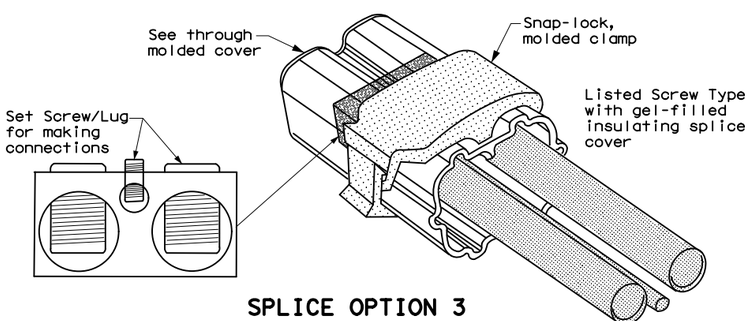
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

FILE: ed3-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		116

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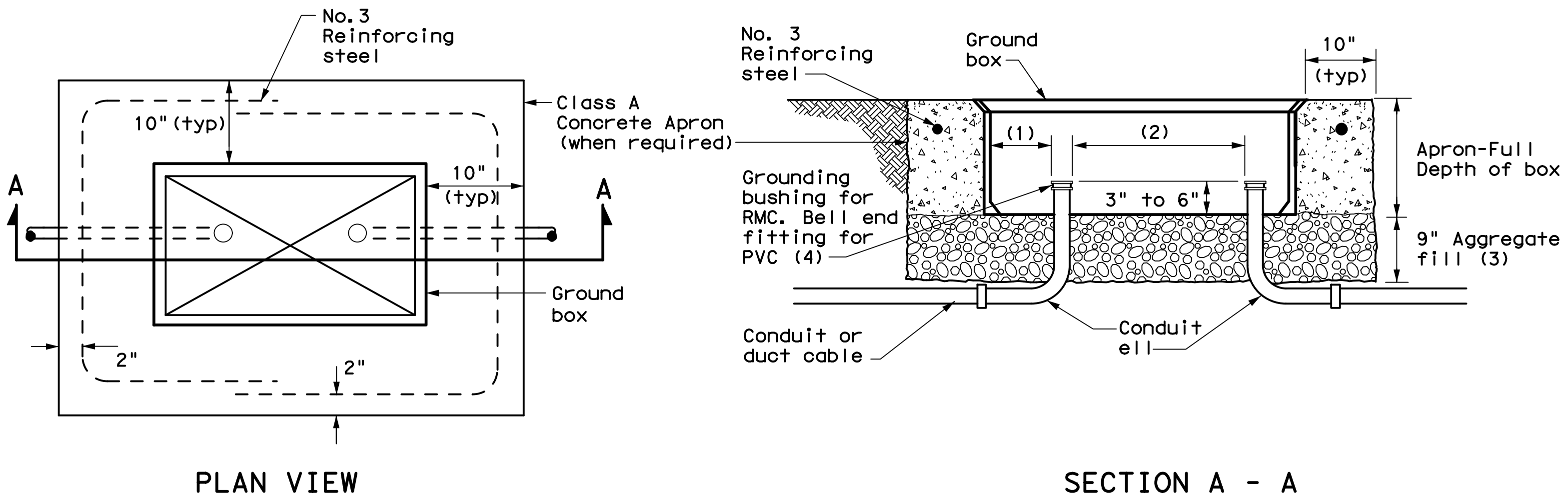


APRON FOR GROUND BOX

(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.

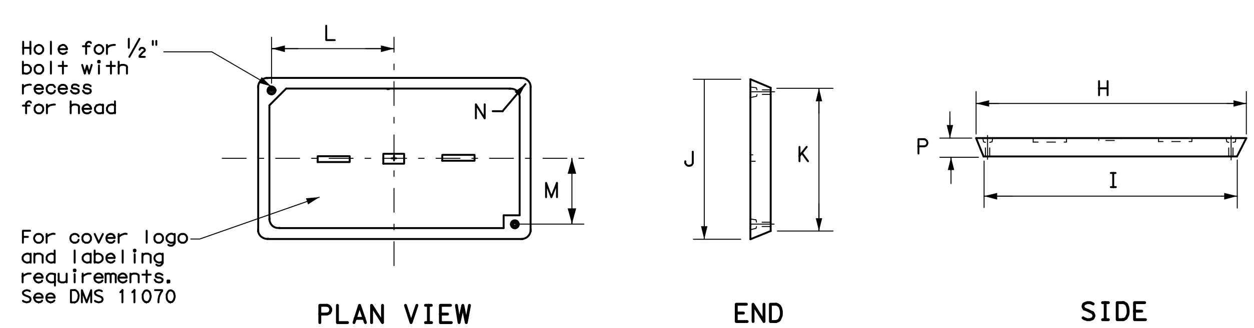
11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

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

Texas Department of Transportation
Traffic Operations Division Standard

ELECTRICAL DETAILS GROUND BOXES

ED(4)-14

FILE: ed4-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
	DIST		COUNTY	SHEET NO.
	DAL		DALLAS, ETC.	117

710

DATE:
FILE:

ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

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

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

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

* ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

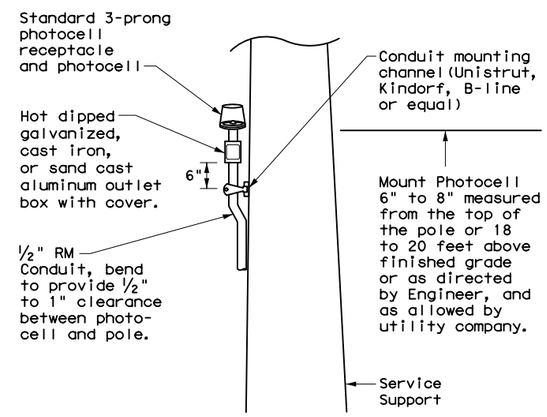
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		118

71E

DATE:
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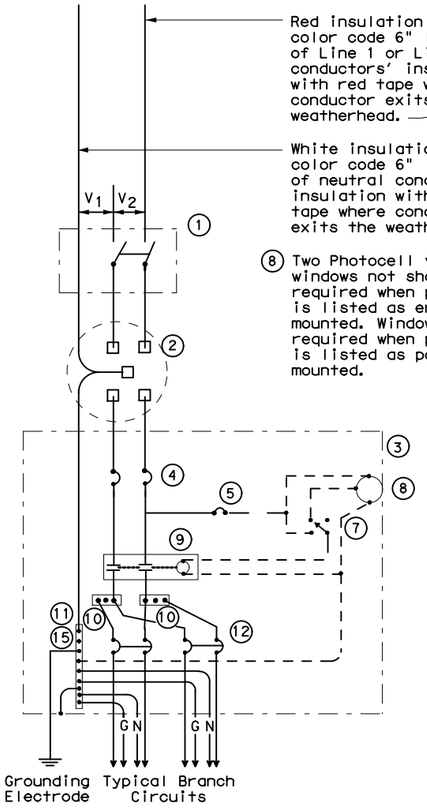
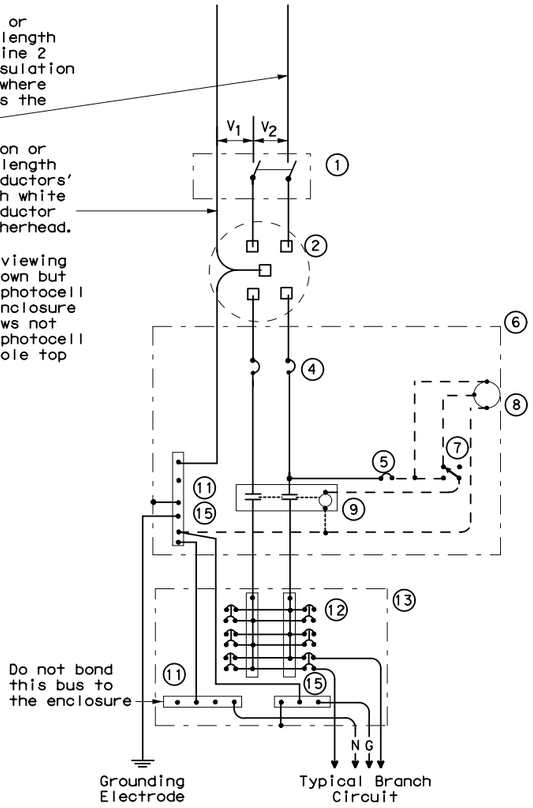
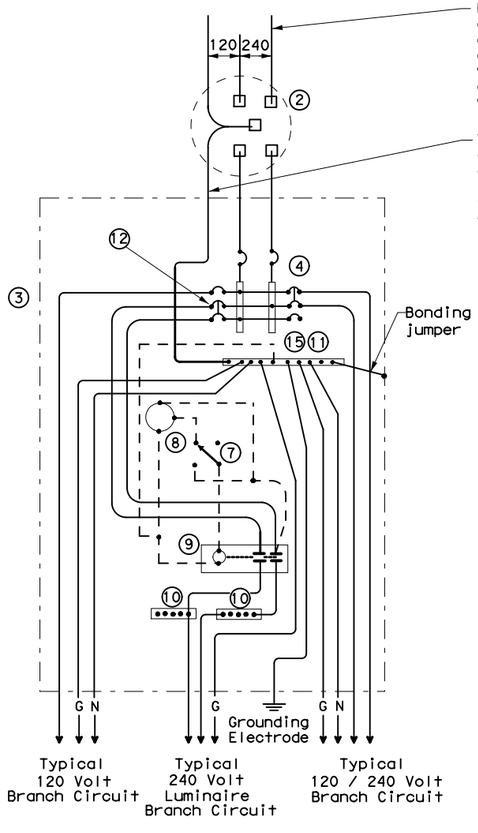


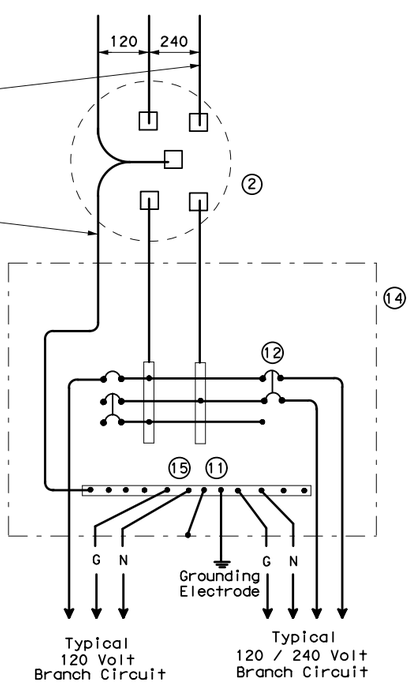
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
- - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

FILE: ed6-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		119

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SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.

2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.

3. Provide and install galvanized ¾ in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized ¾ in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 ¼ in. to 3 ½ in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.

4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.

5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.

6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.

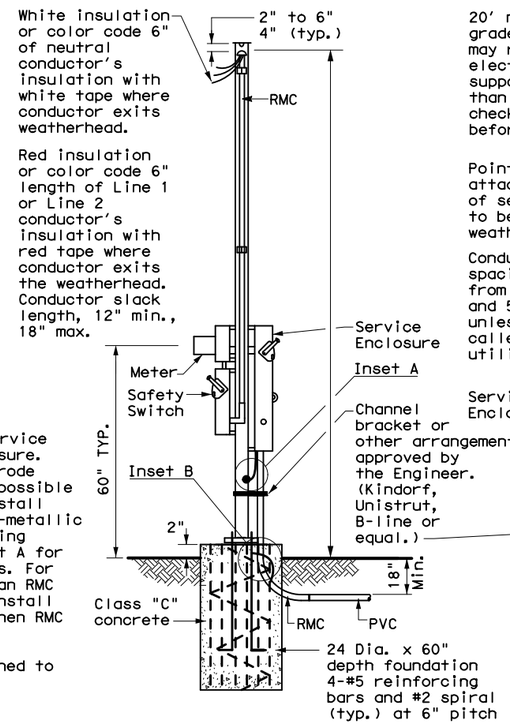
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.

8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.

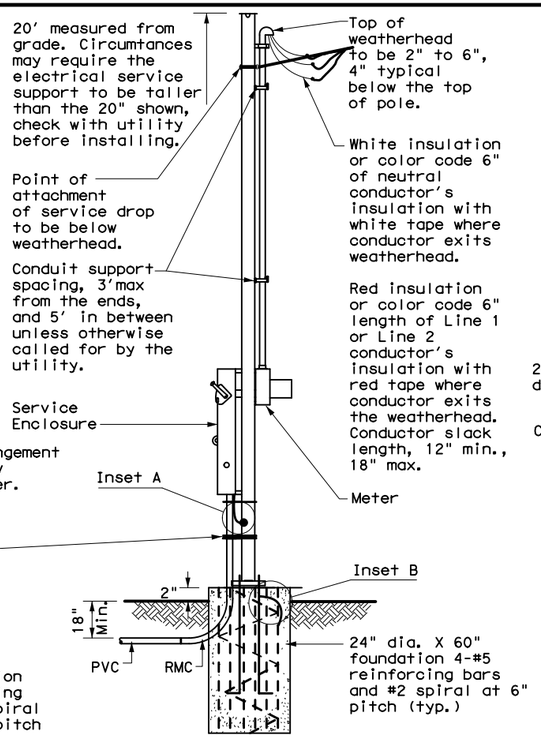
9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.

10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.

11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

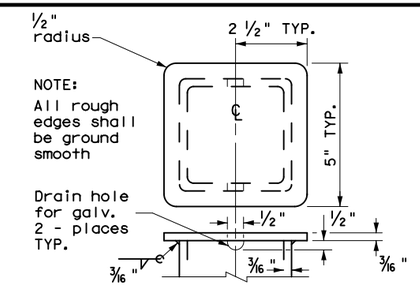


WITH SAFETY SWITCH

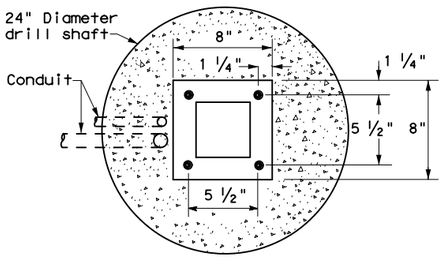


WITHOUT SAFETY SWITCH

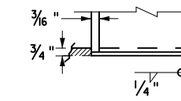
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE



POLE TOP PLATE

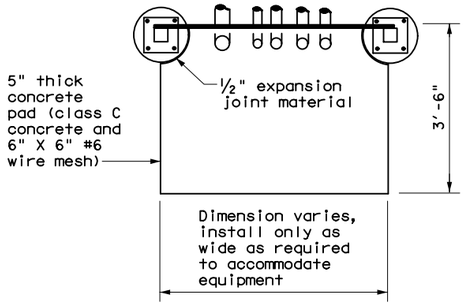


BASE PLATE DETAIL



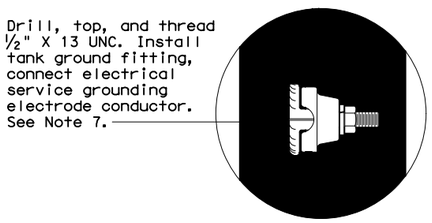
BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



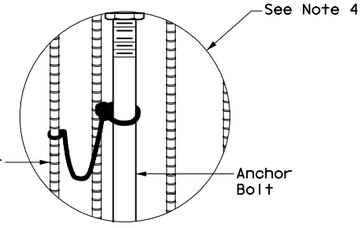
TOP VIEW

SERVICE SUPPORT TY SF (O) & SF (U)

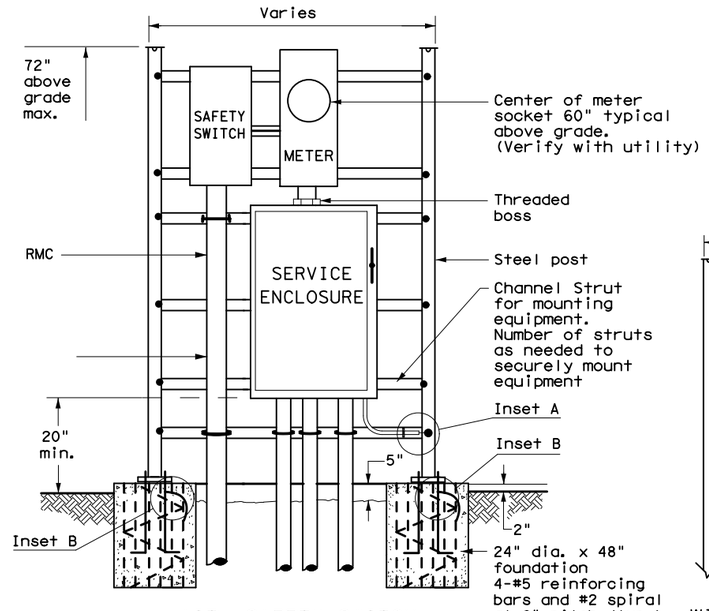


FRONT VIEW

INSET A

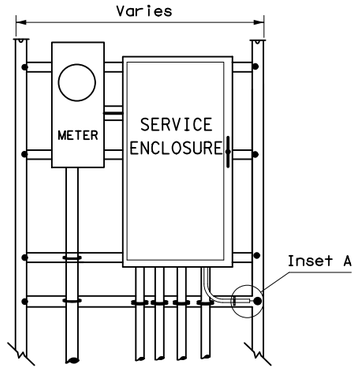


INSET B

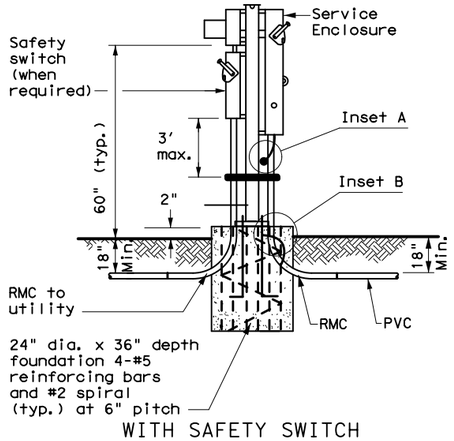


WITH SAFETY SWITCH

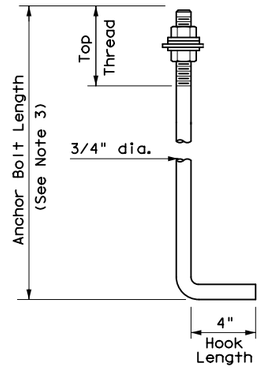
FRONT VIEW



WITHOUT SAFETY SWITCH



WITH SAFETY SWITCH



HOOKED ANCHOR DETAIL

SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE

SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP

ED(7)-14

FILE: ed7-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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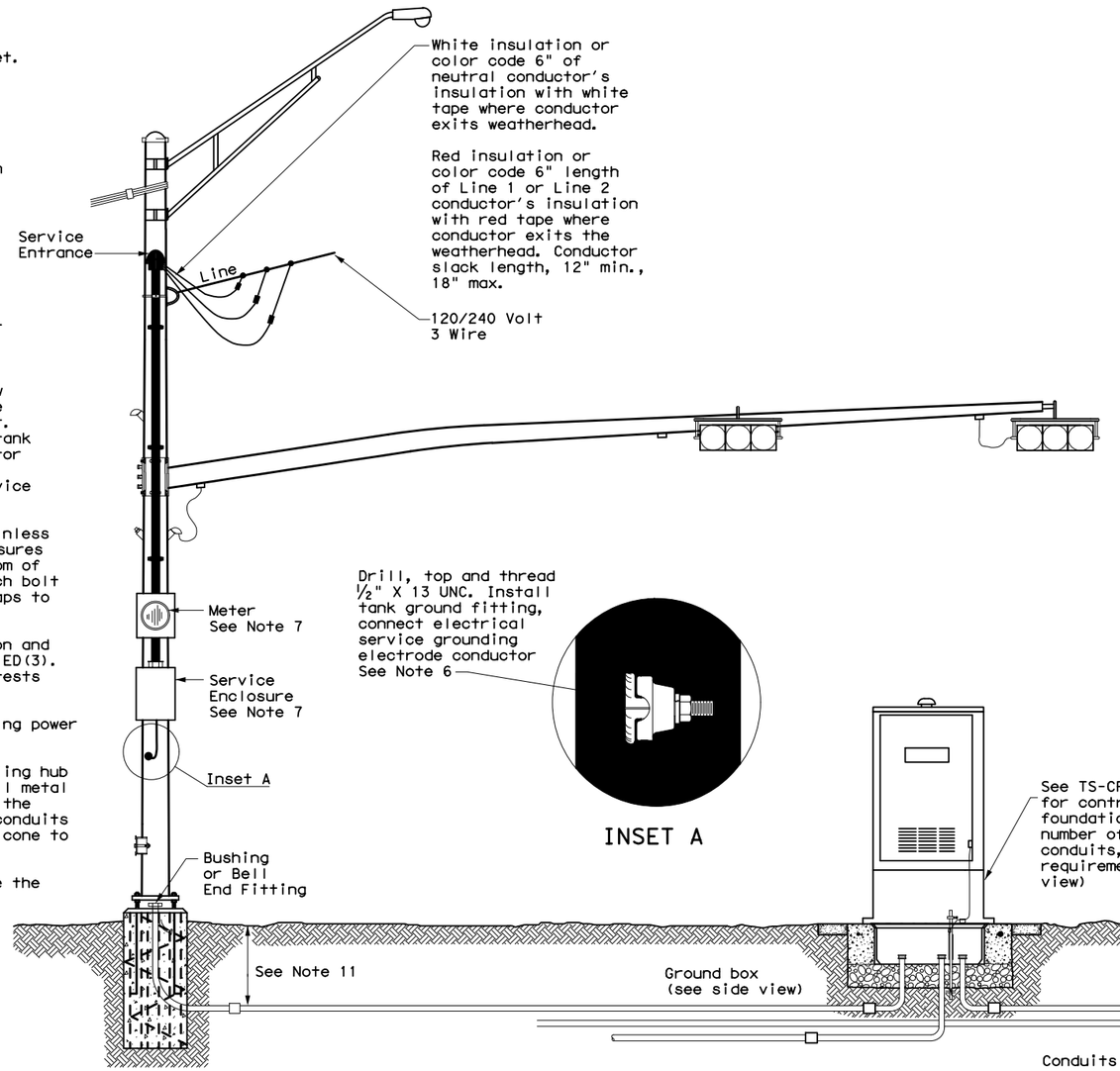
REVISIONS	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		120

71G

DATE:
FILE:

TRAFFIC SIGNAL NOTES

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

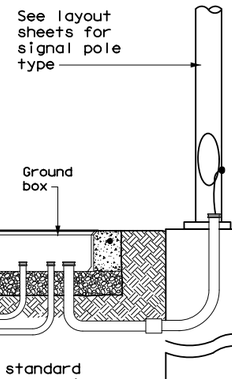


SIGNAL POLE WITH SERVICE

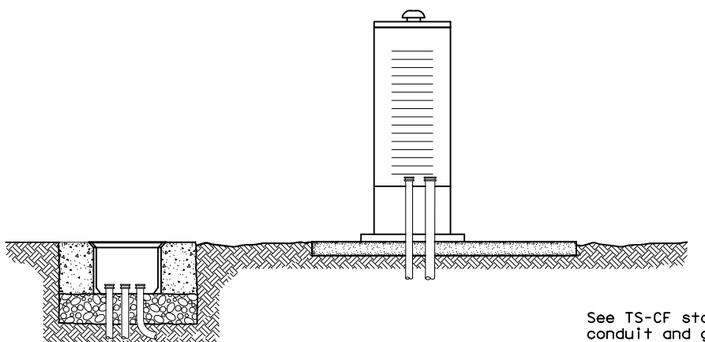
Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

INSET A

SIGNAL CONTROLLER FRONT VIEW



SIGNAL POLE



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

FILE: ed8-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		121

71H

DATE:
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PEDESTAL SERVICE NOTES

1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS)11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services. "Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.

2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.

3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.

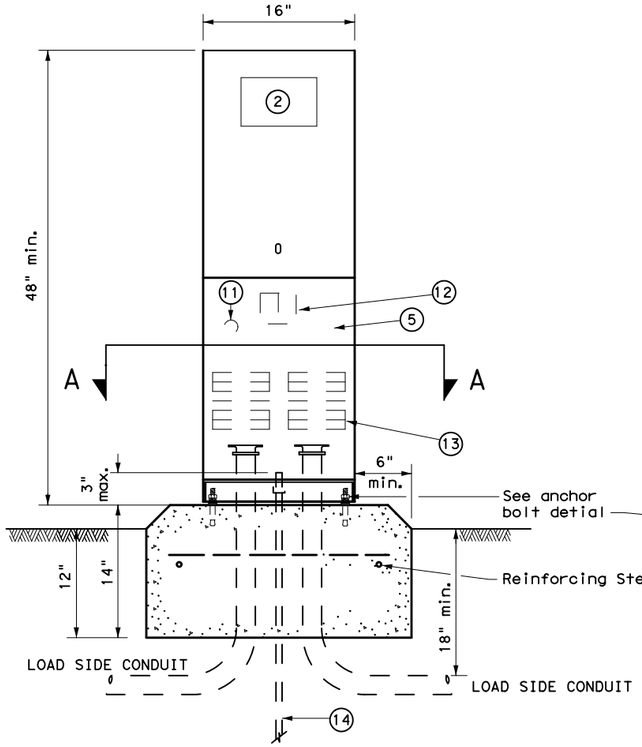
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install ½ in. X 2 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 ½ in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.

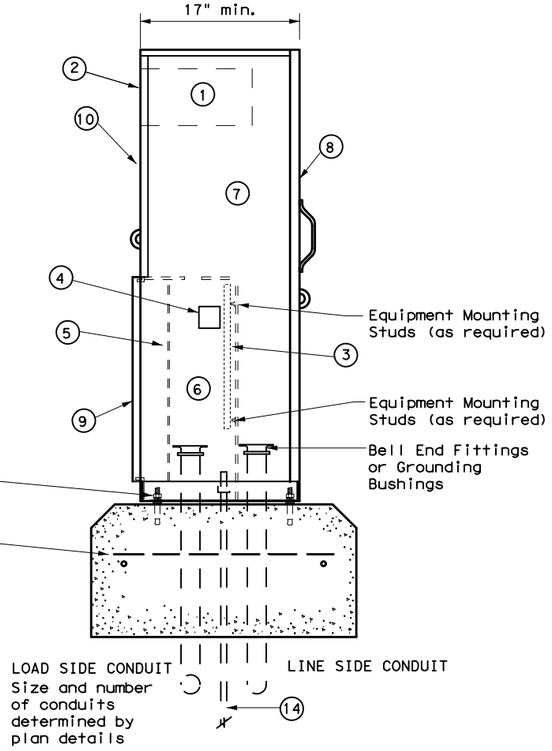
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within ¼ in. Repair rocking or movement of the service enclosure at no additional cost to the department.

7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.

8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.

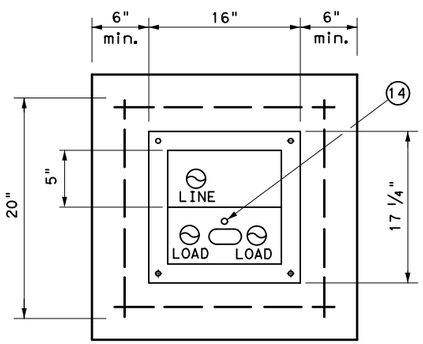


FRONT VIEW

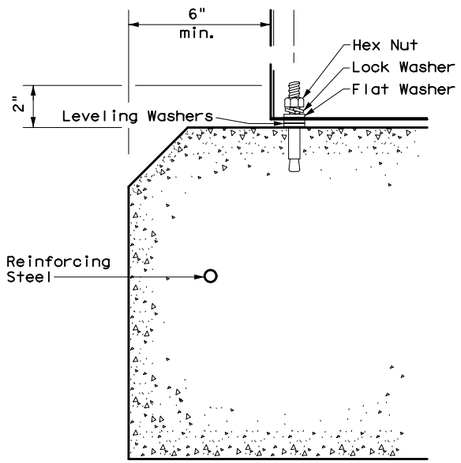


SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A



ANCHOR BOLT DETAIL

LEGEND	
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS

ED(9)-14

FILE: ed9-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
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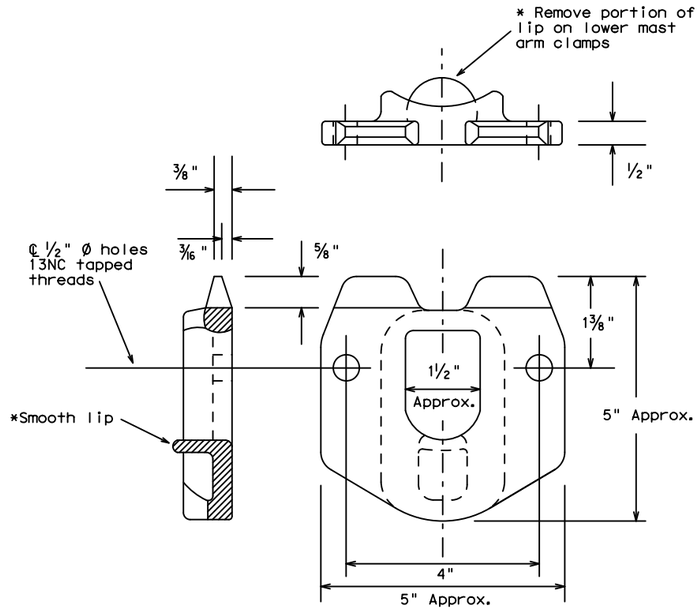
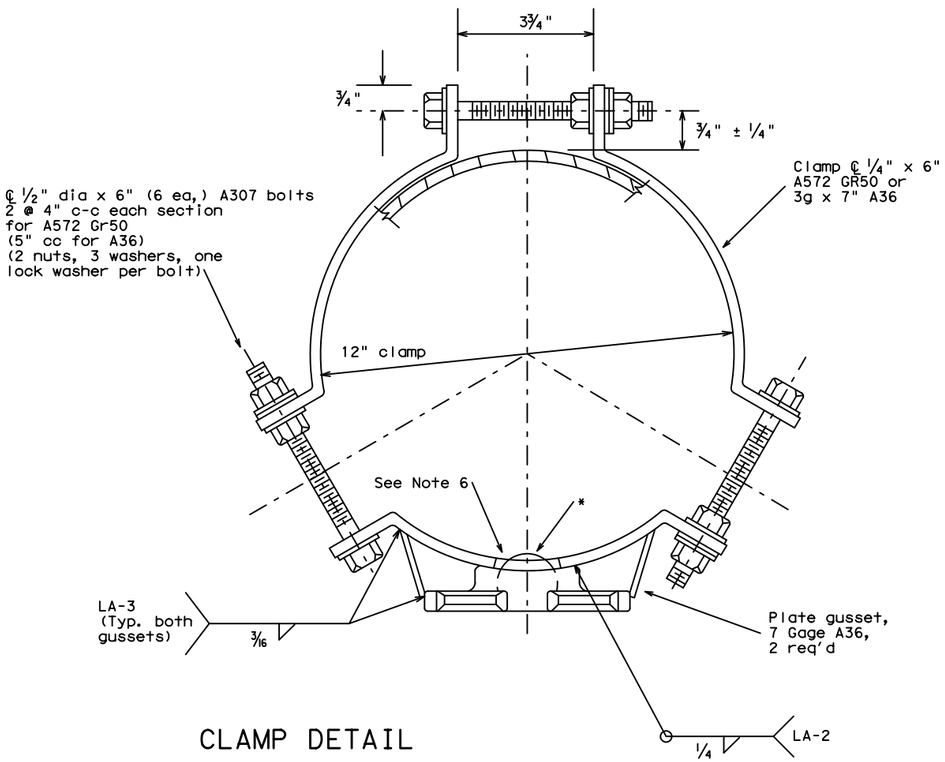
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		122

71J



POLE SIMPLEX DETAILS



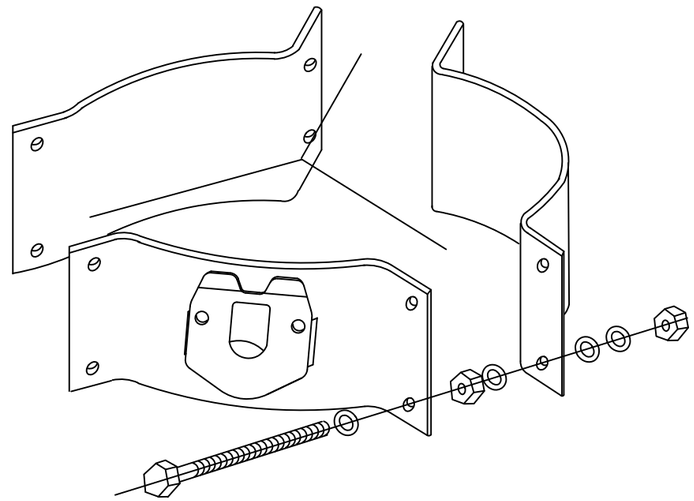
CLAMP DETAIL

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, ½in. X 1½in. 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.



PROJECTION

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

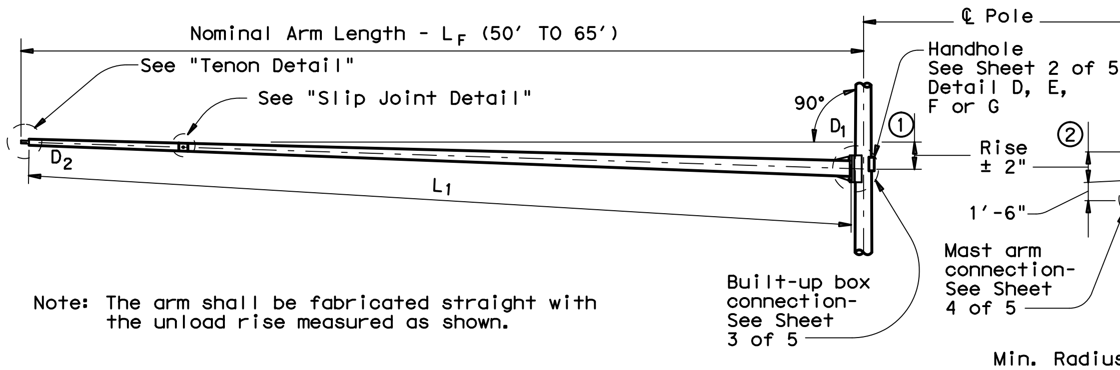
Texas Department of Transportation
Traffic Operations Division

CLAMP ON FITTING ASSEMBLY FOR LUMINAIRE MAST ARM

CFA-12

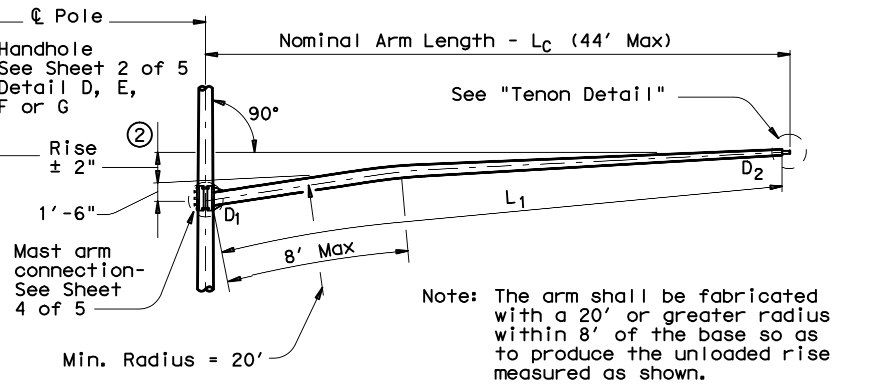
©TxDOT	DN: KAB	CK: RES	DW: FDN	CK: CAL
REVISIONS	CONT	SECT	JOB	HIGHWAY
11-99 1-12	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		123

DATE:
FILE:



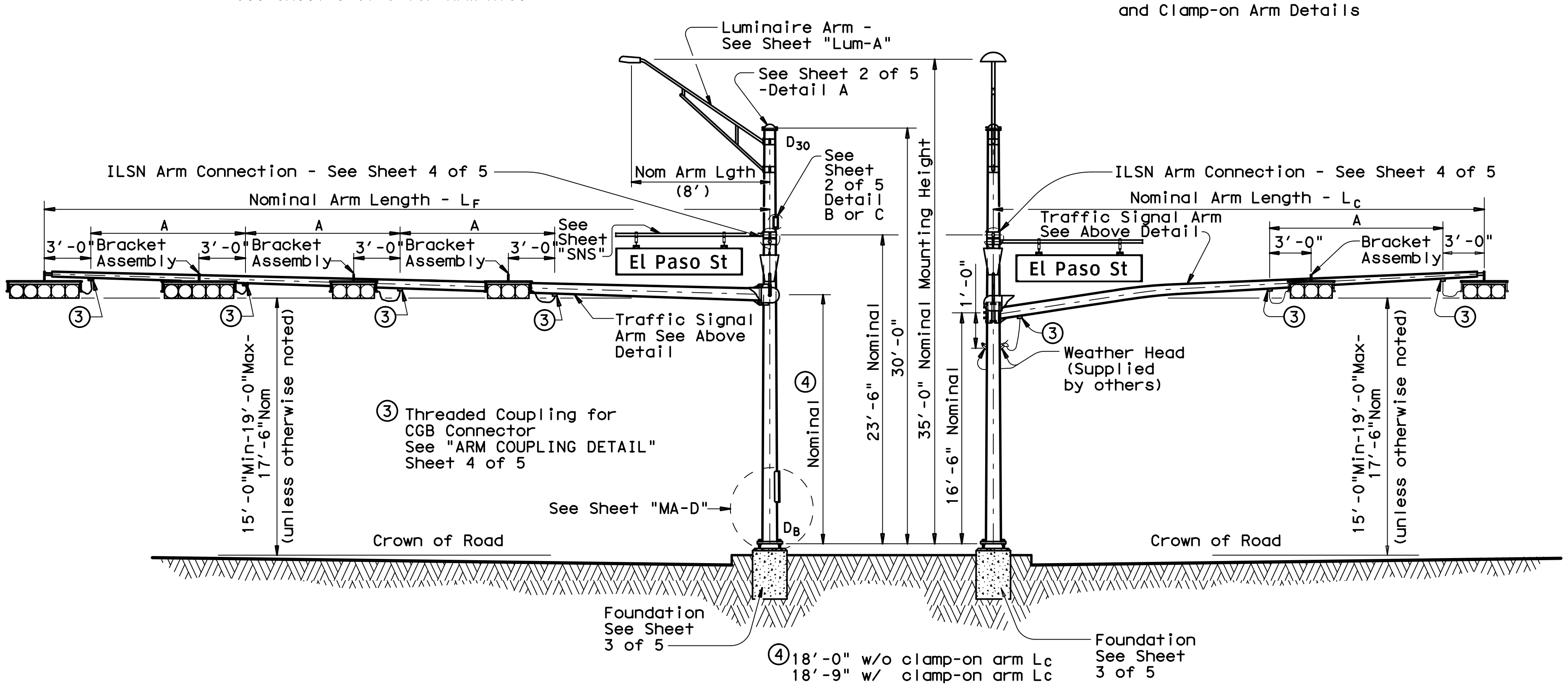
FIXED MOUNT TRAFFIC SIGNAL ARM

(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

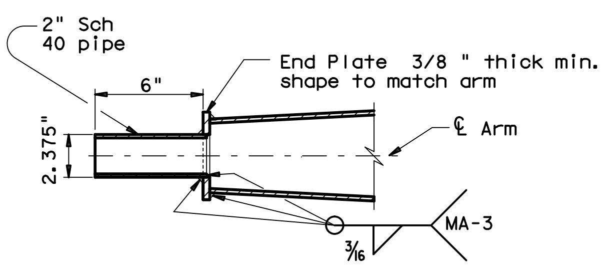


ELEVATION
(Showing fixed mount arm)

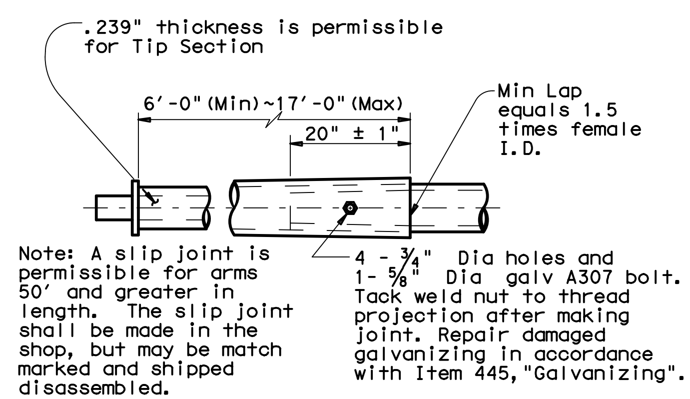
STRUCTURE ASSEMBLY

ELEVATION
(Showing clamp-on arm)

TABLE OF DIMENSIONS "A"										
Arm Length	24'	28'	32'	36'	40'	44'	50'	55'	60'	65'
Arm Type II	10'	11'	12'	13'						
Arm Type III			10'	11'	12'	12'				
Arm Type IV							12'	12'	12'	12'



TENON DETAIL



SLIP JOINT DETAIL (FIXED MOUNT 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 (5)(6)
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 "MA-D" for pole 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.

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.

Texas Department of Transportation
Traffic Operations Division

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

Sheet 1 of 5

REVISIONS: 4-20-01, 1-12

CONT	SECT	JOB	HIGHWAY
0047	07	243, ETC.	US 75, ETC.
DIST		COUNTY	SHEET NO.
DAL		DALLAS, ETC.	124

131A

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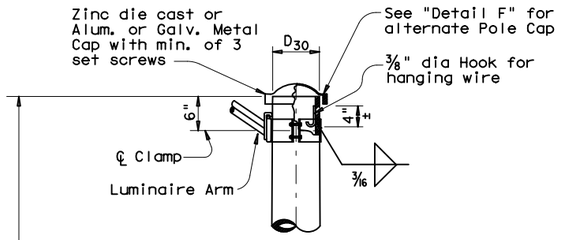
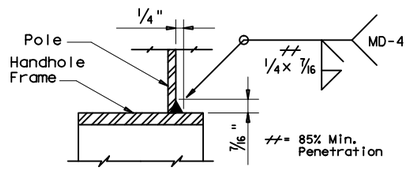
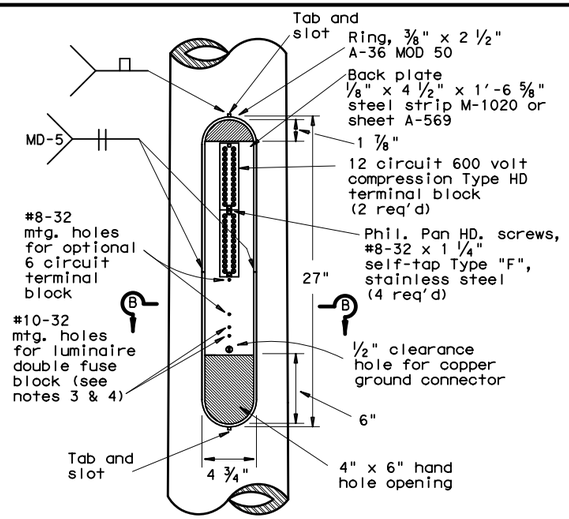


DETAIL A

(for pole with luminaire)



DETAIL H

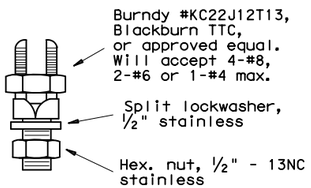


ACCESS COMPARTMENT

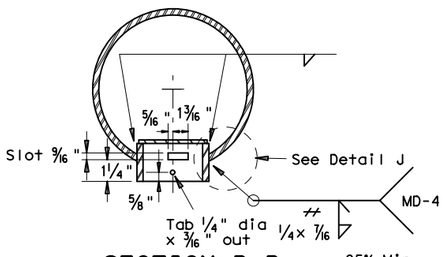
MATERIALS	
Round Shafts or Polygonal Shafts (7)	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 (8)
Plates (7)	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325, or A449 except where noted
Pin Bolts	ASTM A325
Pipe (7)	ASTM A53 Gr.B, A501, 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.

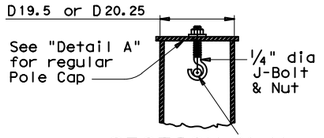


COPPER GROUND CONNECTOR

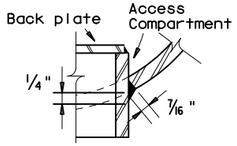


SECTION B-B

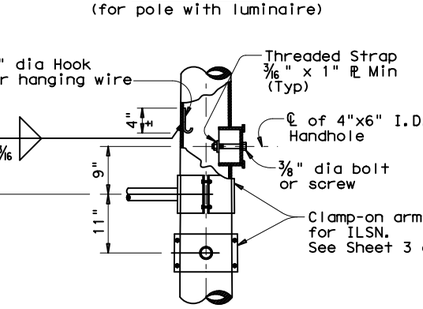
Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.



SECTION Y-Y

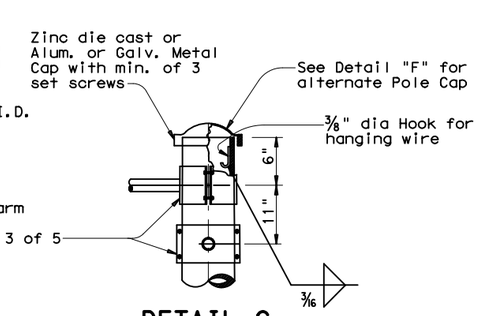


DETAIL J

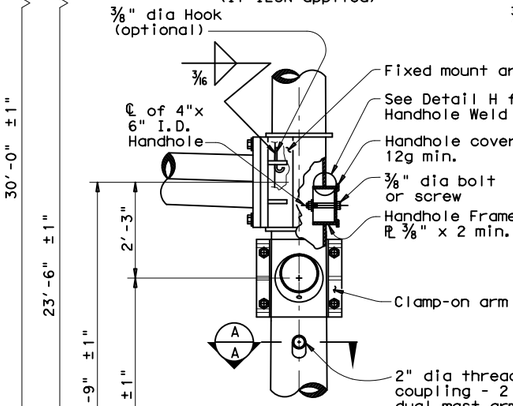


DETAIL B

(If ILSN applied)

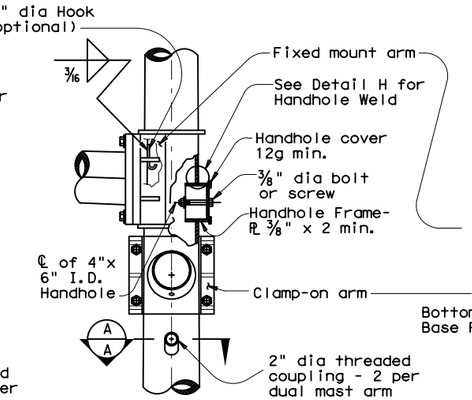


DETAIL C



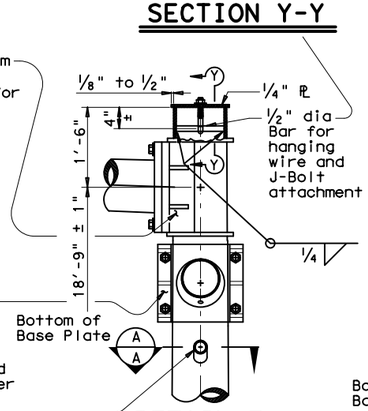
DETAIL D

(for 30' pole with luminaire and ILSN sign)



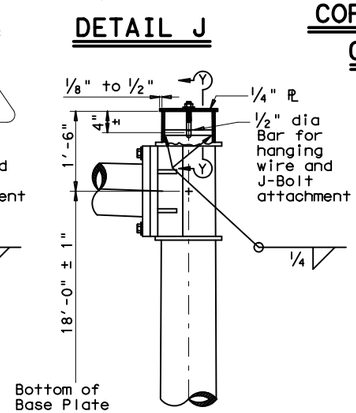
DETAIL E

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



DETAIL F

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

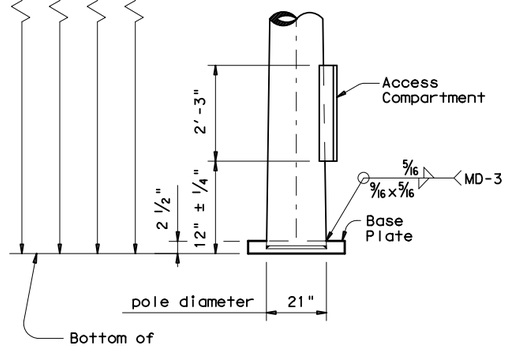


DETAIL G

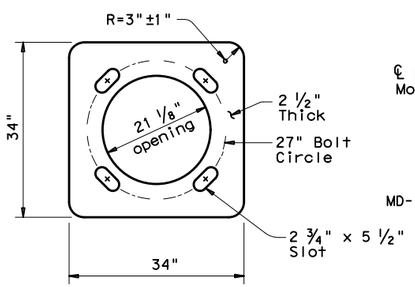
(for 19.5' pole with no ILSN sign and no luminaire, single mast arm)

ACCESS COMPARTMENT NOTES:

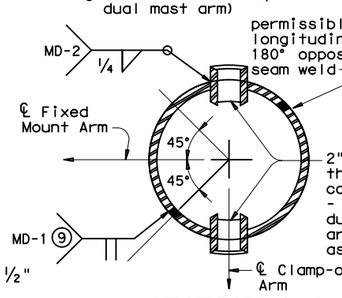
1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20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



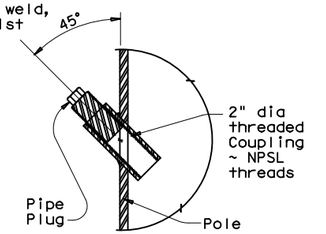
POLE ELEVATION



BASE PLATE



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.

Texas Department of Transportation
Traffic Operations Division

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

Sheet 2 of 5 — LMA(2)-12

DN: JSY	CK: ARC	DW: TGG	CK: JSY

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
DAL	DALLAS, ETC.		125

131B

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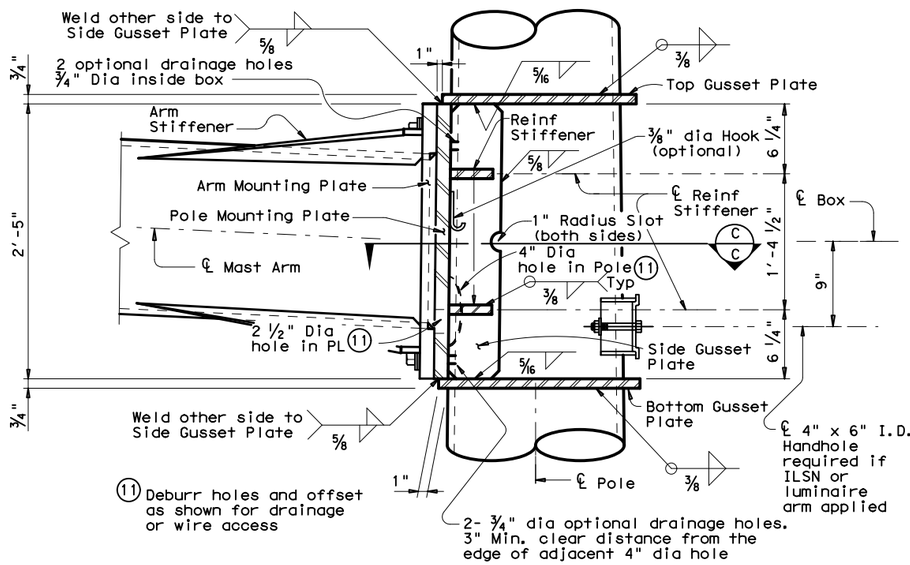
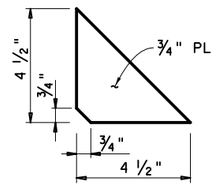
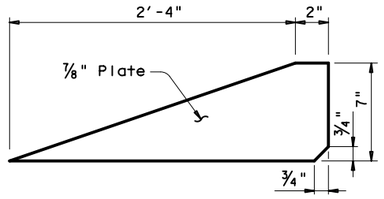


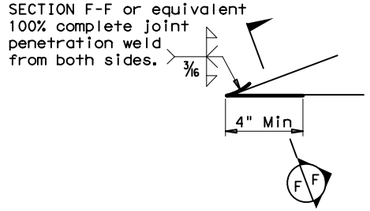
BUILT-UP BOX CONNECTION



REINFORCING STIFFENER

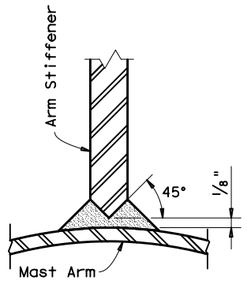


ARM STIFFENER
(Cut to match arm inclination and taper)



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.

DETAIL "K"



SECTION F-F

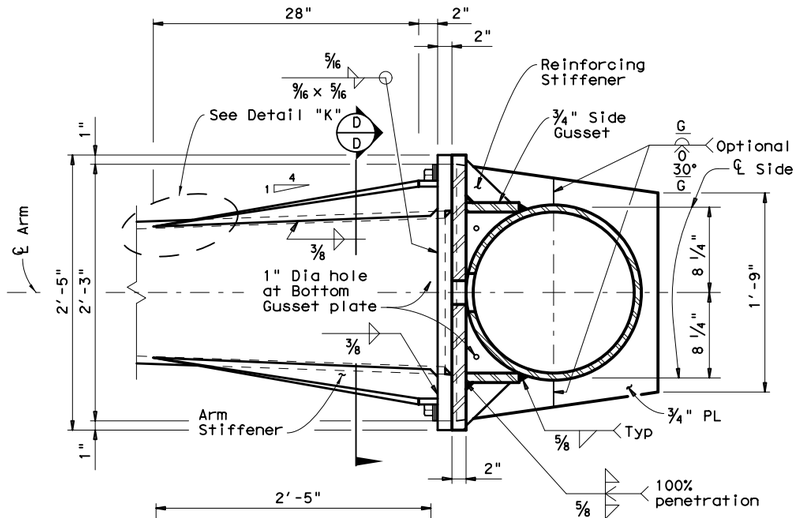
Fixed Mount Arm L_F	ROUND POLES (13)					Foundation Type
	D_B	$D_{19.5}$ or $D_{20.25}$	D_{24}	D_{30}	(12) thk	
ft.	in.	in.	in.	in.	in.	
50', 55' 60', 65'	21.0	18.2	17.6	16.8	.3125	48-A

Fixed Mount Arm L_F	ROUND ARMS (13)				
	L_1	D_1	D_2	(12) thk	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"

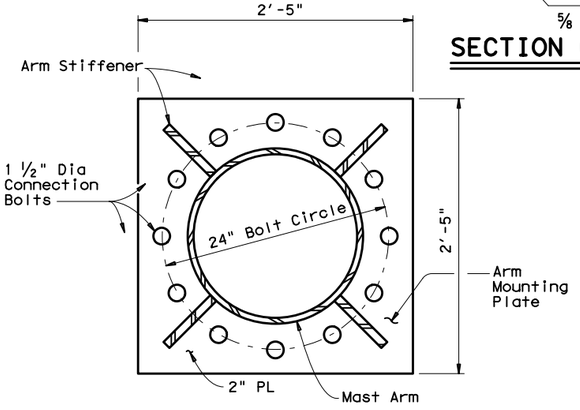
D_B = Pole Base O.D.
$D_{19.5}$ = Pole Top O.D. with no Luminaire and no ILSN (single mast arm)
$D_{20.25}$ = Pole Top O.D. with no Luminaire and no ILSN (dual mast arm)
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L_F = Fixed Arm Length

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

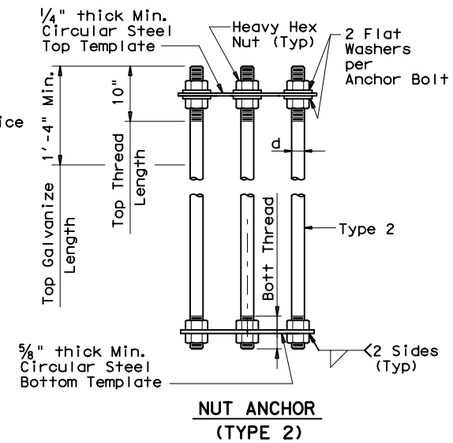
(13) Shaft profile 16-sided or 18-sided is considered to be equivalent to round section.



SECTION C-C

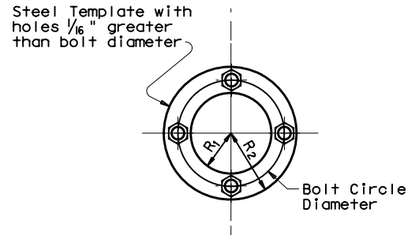


SECTION D-D



NUT ANCHOR
(TYPE 2)

ANCHOR BOLT ASSEMBLY



TEMPLATE DETAIL

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.

FOUNDATION DESIGN TABLE													
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 Laods.

(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.

GENERAL NOTES:

Built-up Box Connection: For the welded arm-to-pole connection as a build-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.

Texas Department of Transportation
Traffic Operations Division

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

REVISIONS	DN: JSY	CK: ARC	DW: TGG	CK: JSY
4-20-01 1-12	CONT	SECT	JOB	HIGHWAY
	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		126

131C

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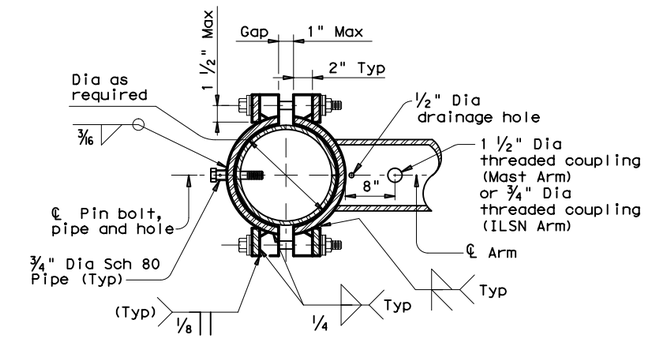
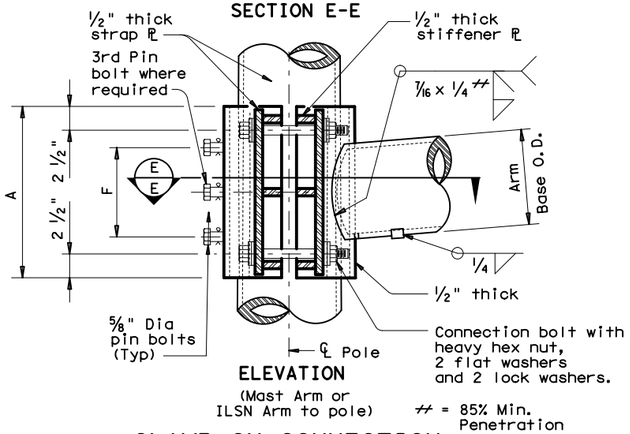


SECTION E-E



ELEVATION
(Mast Arm or ILSN Arm to pole)

= 85% Min. Penetration

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'-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"

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			Dia	No.
in.	in.	in.	in.	in.	ea
3	.216	10	4	¾	2

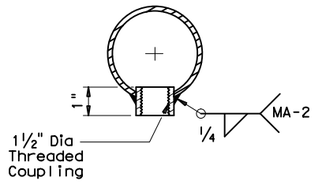
Mast Arm Size		A	F	4 Conn. Bolts	5/8" Dia. Pin Bolts
Base Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
6.5	.179	12	6	1	2
7.5	.179	14	8	1	2
8.0	.179	14	8	1	2
9.0	.179	16	10	1	2
9.5	.179	18	12	1 ¼	3
9.5	.239	18	12	1 ¼	3
10.0	.239	18	12	1 ¼	3
10.5	.239	18	12	1 ¼	3
11.0	.239	18	12	1 ¼	3
11.5	.239	18	12	1 ¼	3

GENERAL NOTES:

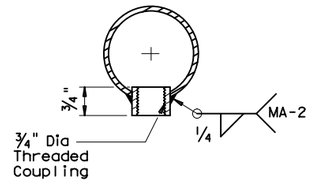
Clamp-on details are used for the second arm on dual mast arm assemblies or ILSN arm support. For a clamp-on mast arm, a maximum 1 ½" wide vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1". For an ILSN arm, a 1 ½" 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.

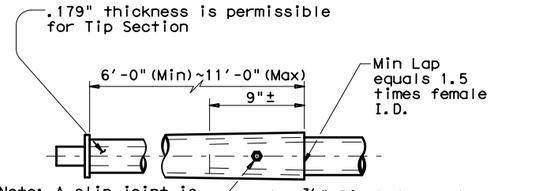
Pin bolts are required to prevent rotation of clamp-on arms under design wind forces. Pin bolts shall be ASTM A325 with threads excluded from the shear plane. Pin bolt and ¾" diameter pipe shall have 3/16" diameter holes for a 1/8" diameter galvanized cotter pin. Back clamp plate shall be furnished with a ¾" diameter hole for each pin bolt. An 11/16" diameter hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.



ARM COUPLING DETAIL



ILSN ARM COUPLING DETAIL

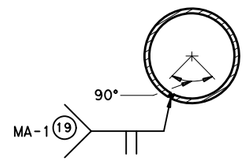


Note: A slip joint is permissible for arms 40' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

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 ½" 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
Traffic Operations Division

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

DN: JK	CK: GRB	DW: FDN	CK: CAL

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0047	07	243, ETC.	US 75, ETC.
DIST	COUNTY		SHEET NO.
DAL	DALLAS, ETC.		127

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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 See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		24' Poles with ILSN See note above plus one small hand hole		19.50' (Single Mast Arm) 20.25' (Dual Mast Arm) Poles with no Luminaire and no ILSN See note above	
Single Mast Arm						
Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	50L		50S		50	
55	55L		55S		55	1
60	60L	1	60S		60	1
65	65L	1	65S		65	

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	
	44	5044L		5044S		5044	
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	
	44	5544L		5544S		5544	
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	
	44	6044L		6044S		6044	
65	20	6520L		6520S		6520	
	24	6524L		6524S		6524	
	28	6528L		6528S		6528	
	32	6532L		6532S		6532	
	36	6536L		6536S		6536	
	40	6540L		6540S		6540	
	44	6544L	1	6544S		6544	

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet)
			48-A
LEMMON AVE			
P-5			22
P-12			22
ROYAL LN			
P-2			22
P-10			22
ARAPAHO RD			
P-7			22
Total Drill Shaft Length			

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.

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) 3 Bracket Assembly and 4 CGB Connectors	
ft.	Designation	Quantity
50	50IV	
55	55IV	1
60	60IV	3
65	65IV	1

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	3

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

Nominal Arm Length	Quantity
7' Arm	
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) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp w/bolts and washers		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp w/bolts and washers	
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					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	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp	
ft.	Designation	Quantity	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)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
2 1/2 "	5' - 3"	5

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.

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

Texas Department of Transportation
Traffic Operations Division

LONG MAST ARM ASSEMBLY PARTS LIST

LMA(5)-12

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DN: JK	CK: GRB	DW: FDN	CK: CAL

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0047	07	243, ETC.	US 75, ETC.
DIST	COUNTY		SHEET NO.
DAL	DALLAS, ETC.		128

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DATE:
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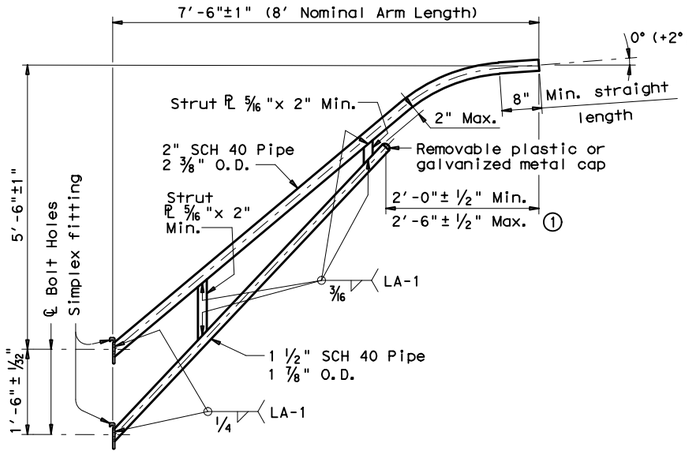
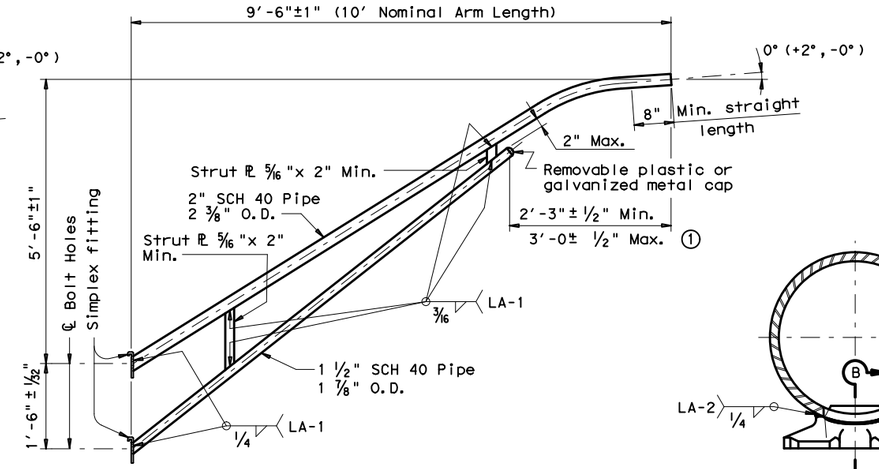
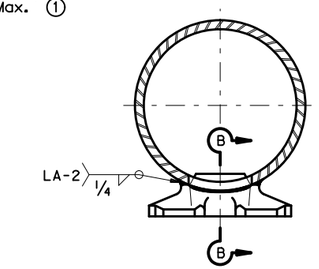


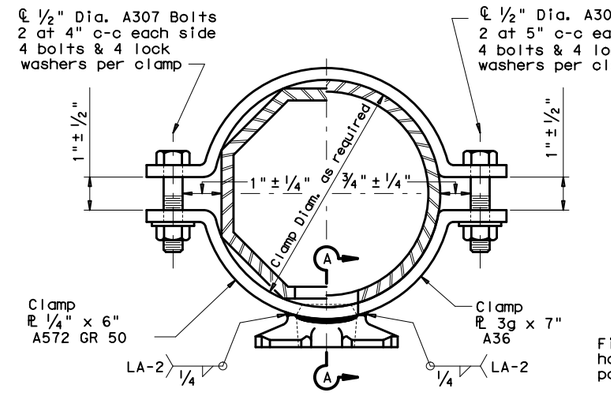
8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM

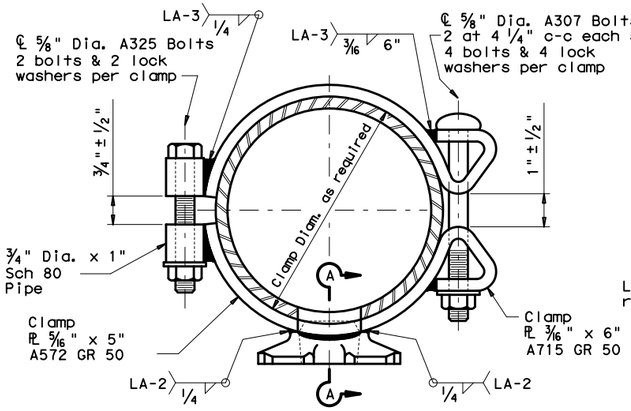


DIRECT ATTACHMENT DETAIL



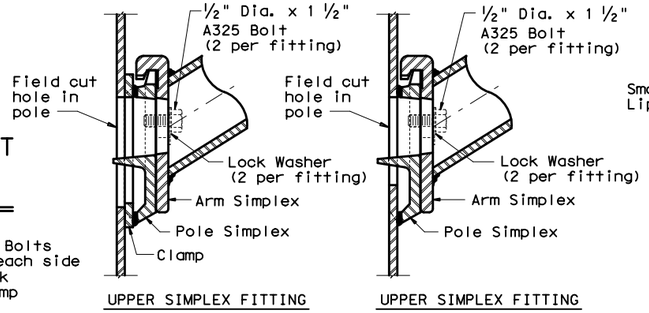
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



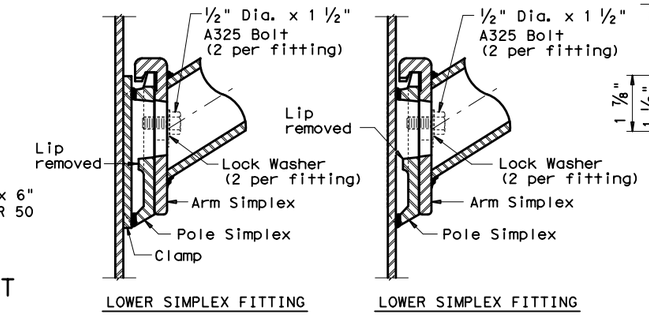
CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)



UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING

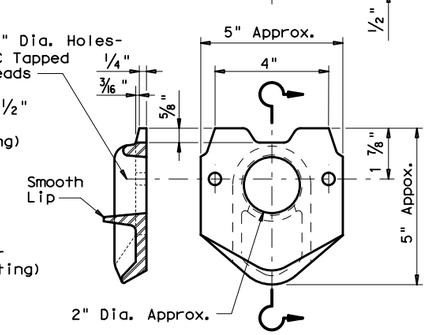


LOWER SIMPLEX FITTING

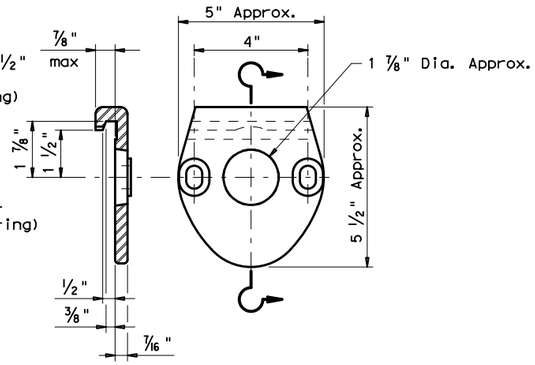
LOWER SIMPLEX FITTING

SECTON A-A

SECTON B-B



POLE SIMPLEX DETAIL



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

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

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

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

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

GENERAL NOTES:

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

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

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

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

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

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

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

LUM-A-12

DN: LEH.	CK: JSY.	DW: LJL	CK: TEH.

REVISIONS
5-96
1-99
1-12

CONT	SECT	JOB	HIGHWAY
0047	07	243, ETC.	US 75, ETC.

DIST	COUNTY	SHEET NO.
DAL	DALLAS, ETC.	129

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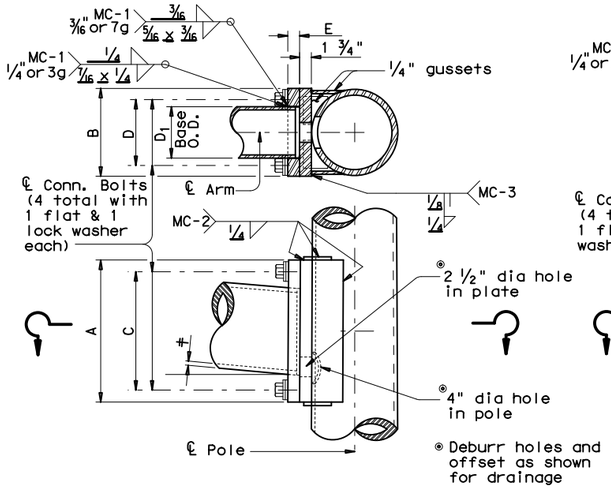
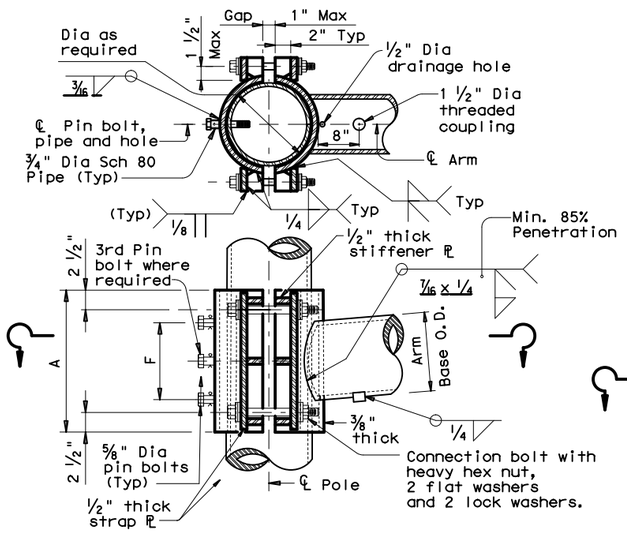
DATE:
FILE:

ARM SIZE D_1	ARM SIZE ∓	A	B	C	D	E	CONN BOLT DIA
in.	in.	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



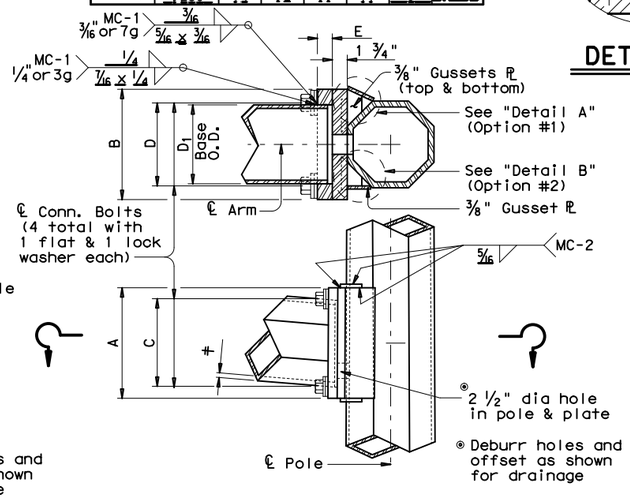
FIXED MOUNT DETAIL 1

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



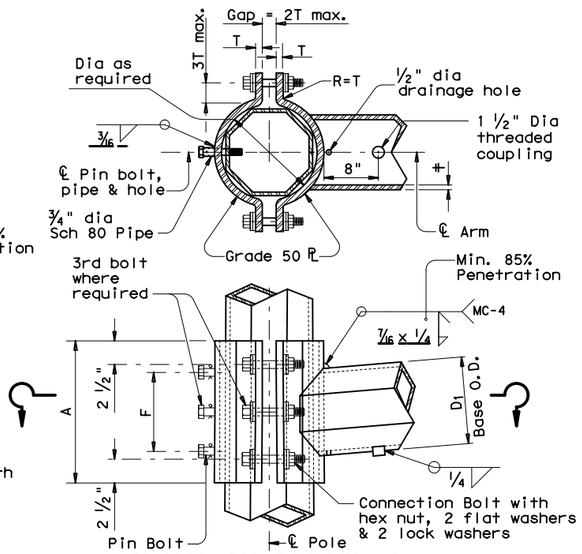
CLAMP-ON DETAIL 1

ARM SIZE D_1	ARM SIZE ∓	A	B	C	D	E	CONN BOLT DIA
in.	in.	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



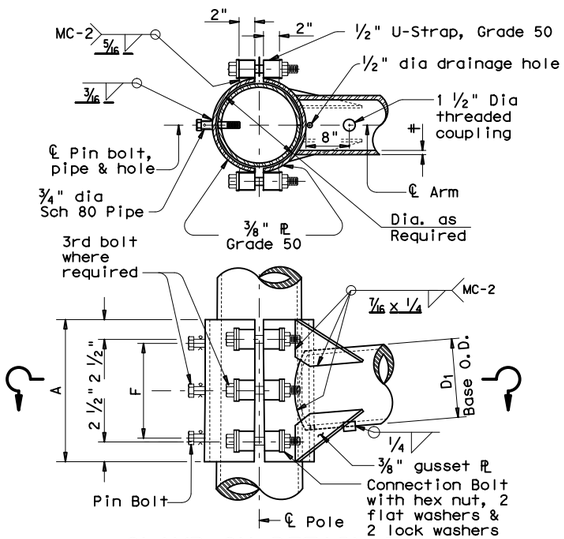
FIXED MOUNT DETAIL 2

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

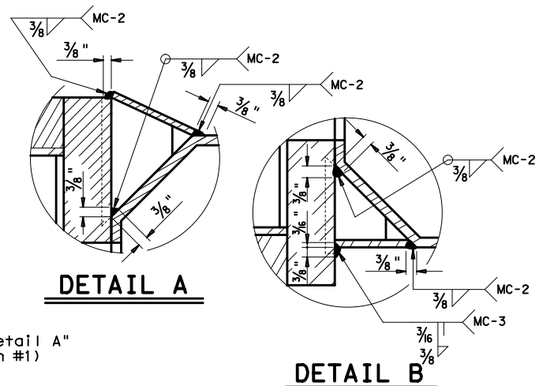


CLAMP-ON DETAIL 2

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

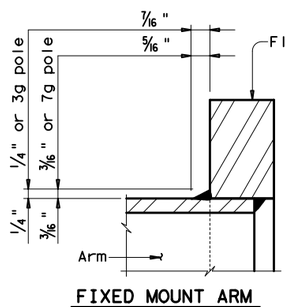


CLAMP-ON DETAIL 3

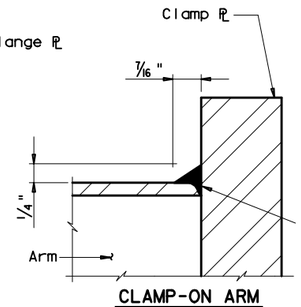


DETAIL A

DETAIL B



FIXED MOUNT ARM



CLAMP-ON ARM

ARM BASE WELD DETAILS

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

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

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

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

GENERAL NOTES:

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

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

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

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

NOTE:

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

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST ARM CONNECTIONS

MA-C-12

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

REVISIONS
5-96
5-09
1-12

CONT	SECT	JOB	HIGHWAY
0047	07	243, ETC.	US 75, ETC.

DIST	COUNTY	SHEET NO.
DAL	DALLAS, ETC.	130

126A

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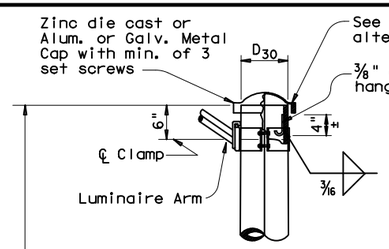
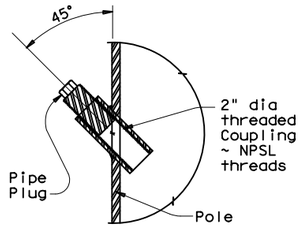
DATE:
FILE:

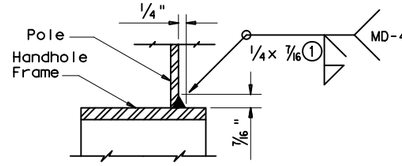


DETAIL A

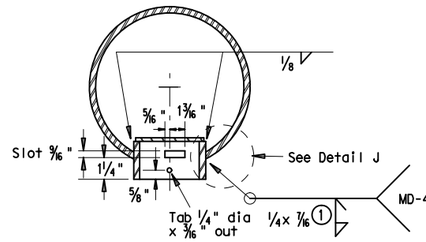
(for pole with luminaire)



POLE COUPLING DETAIL

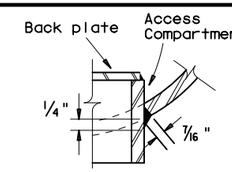


DETAIL G

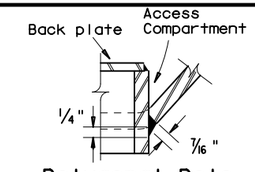


SECTION X-X

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

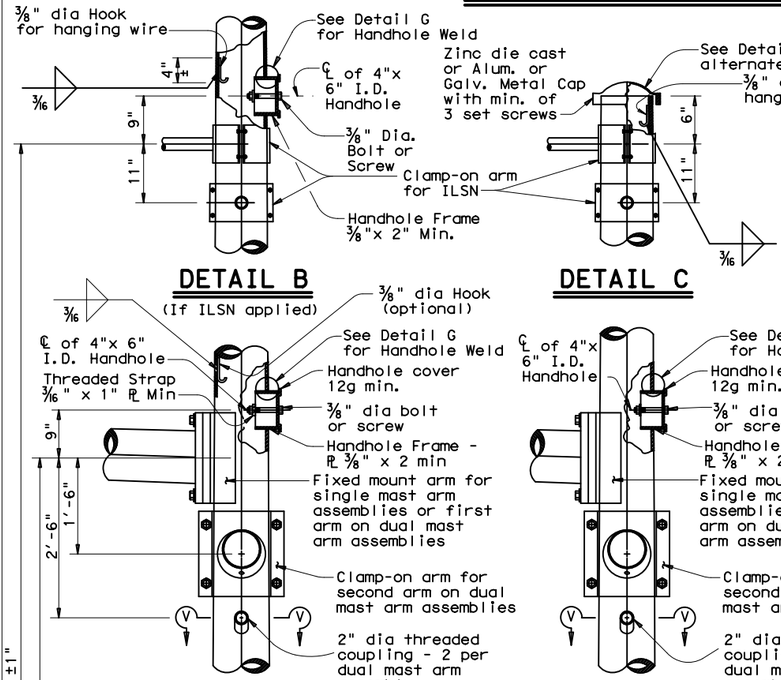


Round Pole

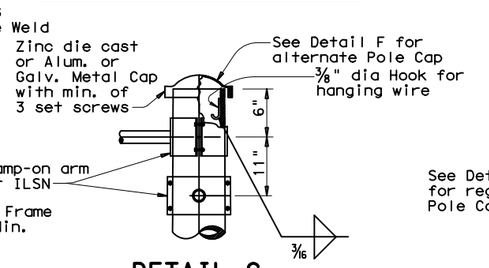


Polygonal Pole

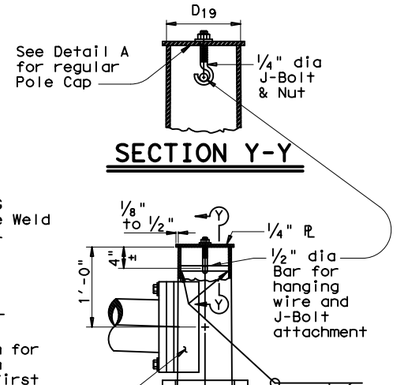
DETAIL J



DETAIL B



DETAIL C

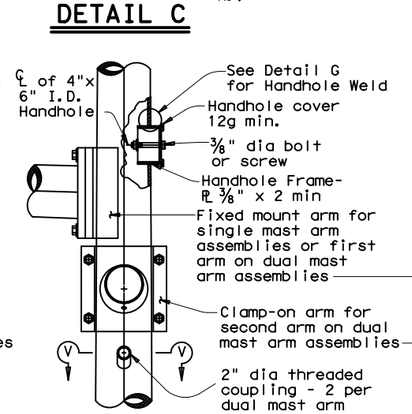


SECTION Y-Y

COPPER GROUND CONNECTOR

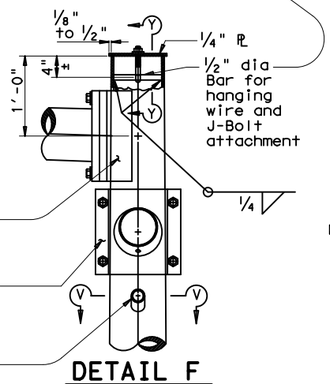
DETAIL D

(for 30' pole with luminaire and ILSN sign)



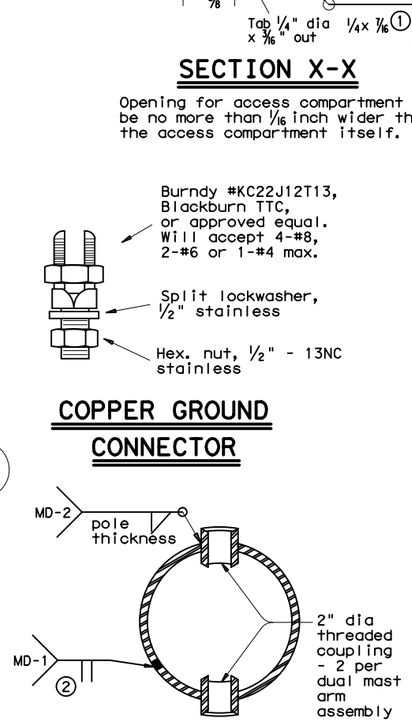
DETAIL E

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

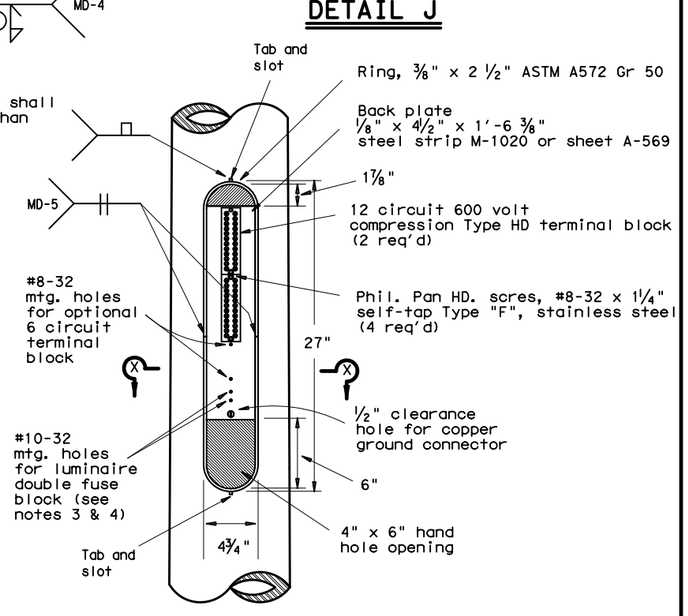


DETAIL F

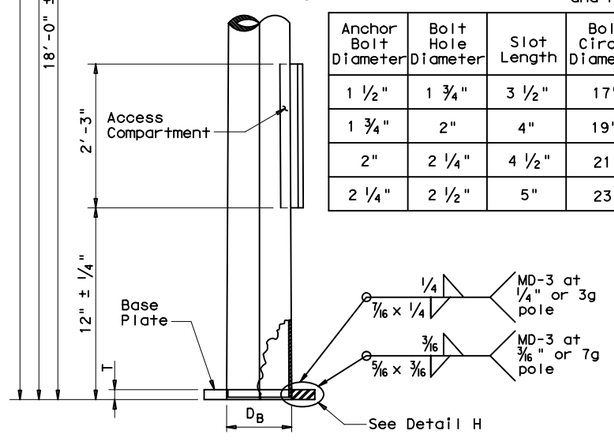
(for 19' pole with no ILSN sign and no luminaire)



SECTION V-V

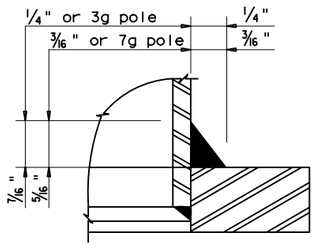


ACCESS COMPARTMENT

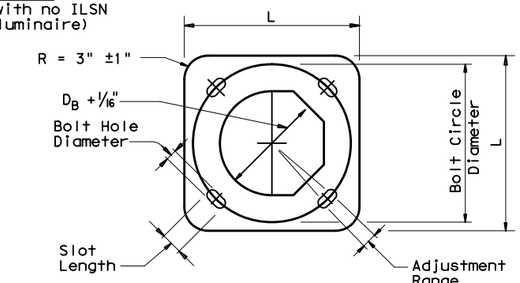


POLE ELEVATION

Anchor Bolt Diameter	Bolt Hole Diameter	Slot Length	Bolt Circle Diameter	Base ℞ 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°



DETAIL H



BASE PLATE PLAN

(1) 85% Min. penetration

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

NOTES:

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

MA-D-12

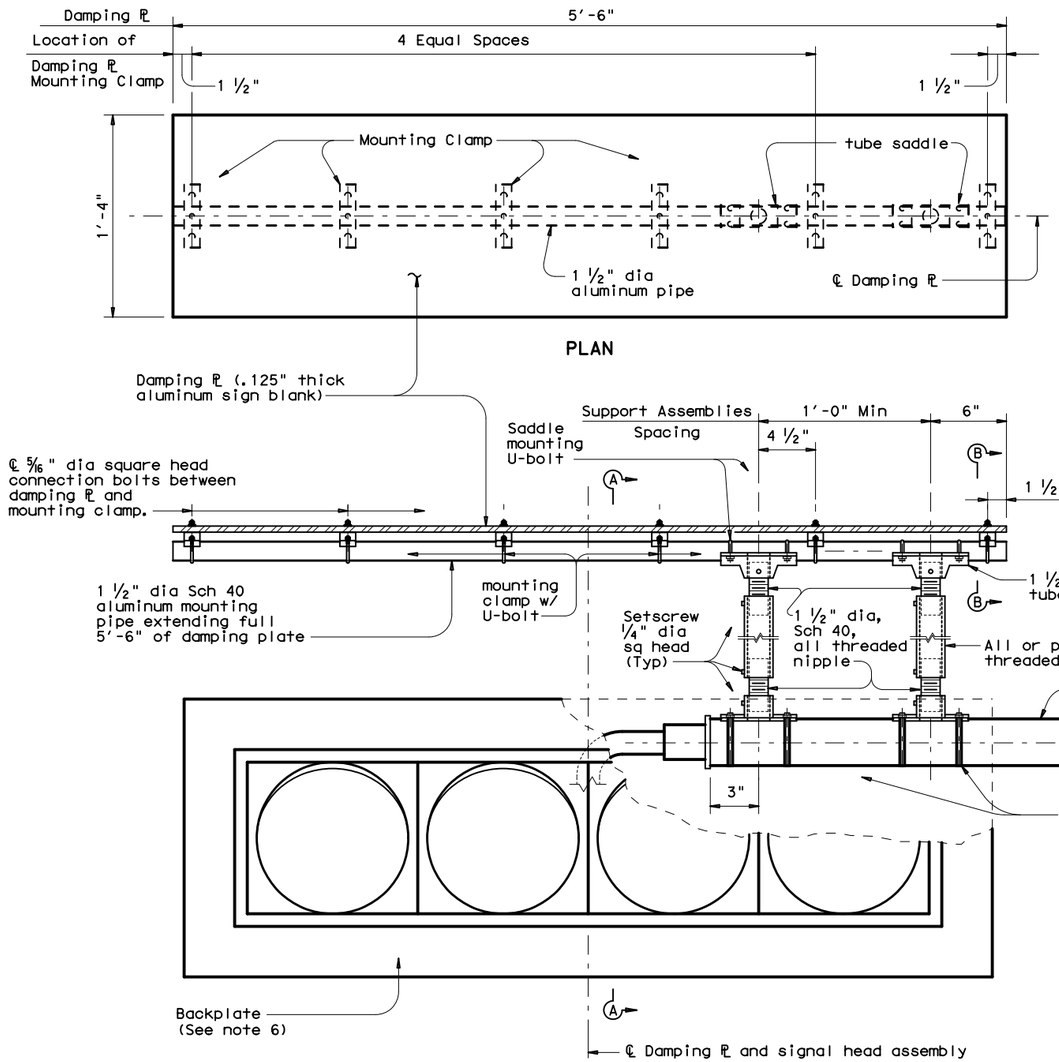
REVISIONS
8-99
1-12

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

CONT	SECT	JOB	HIGHWAY
0047	07	243, ETC.	US 75, ETC.

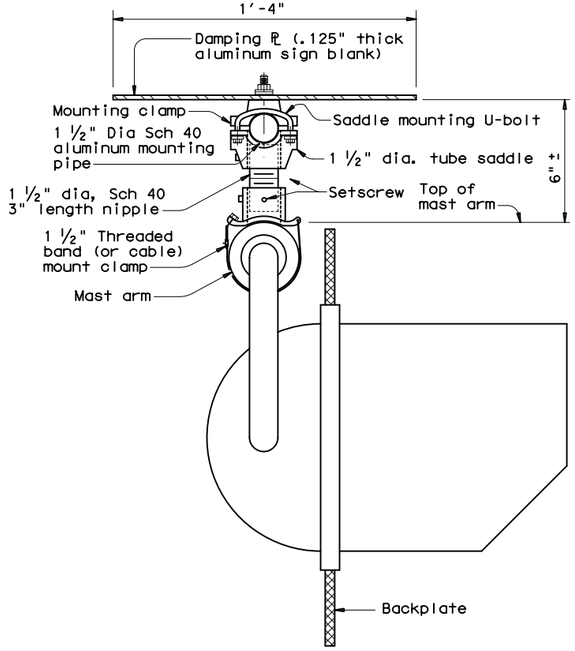
DIST	COUNTY	SHEET NO.
DAL	DALLAS, ETC.	131

DATE:
FILE:



DAMPING PLATE MOUNTING DETAILS

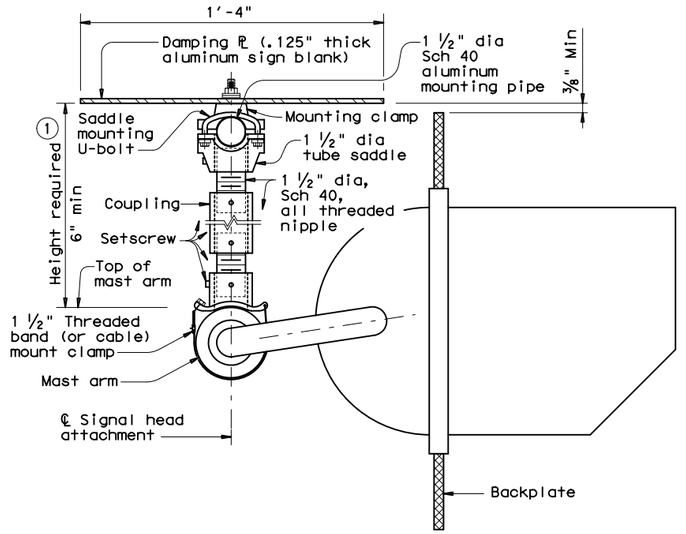
(Showing alternate placement of signal head)



SECTION A-A

(Showing standard placement of signal head)

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

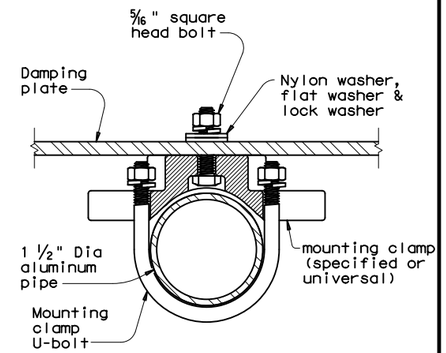


SECTION A-A

(Showing alternate placement of signal head)

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

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



SECTION B-B

(Showing damping plate attachment)

GENERAL NOTES:

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

Texas Department of Transportation

Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

FILE: ma-dpd-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0047	07	243, ETC.	US 75, ETC.
6-20	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		132

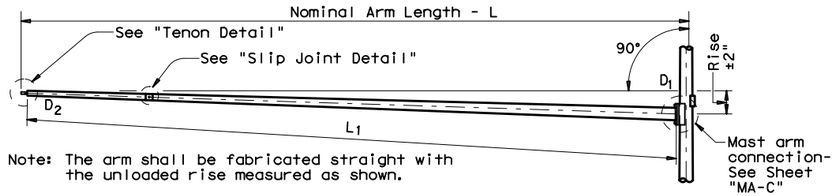
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179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

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

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

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

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



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

TRAFFIC SIGNAL ARM

(Fixed Mount)

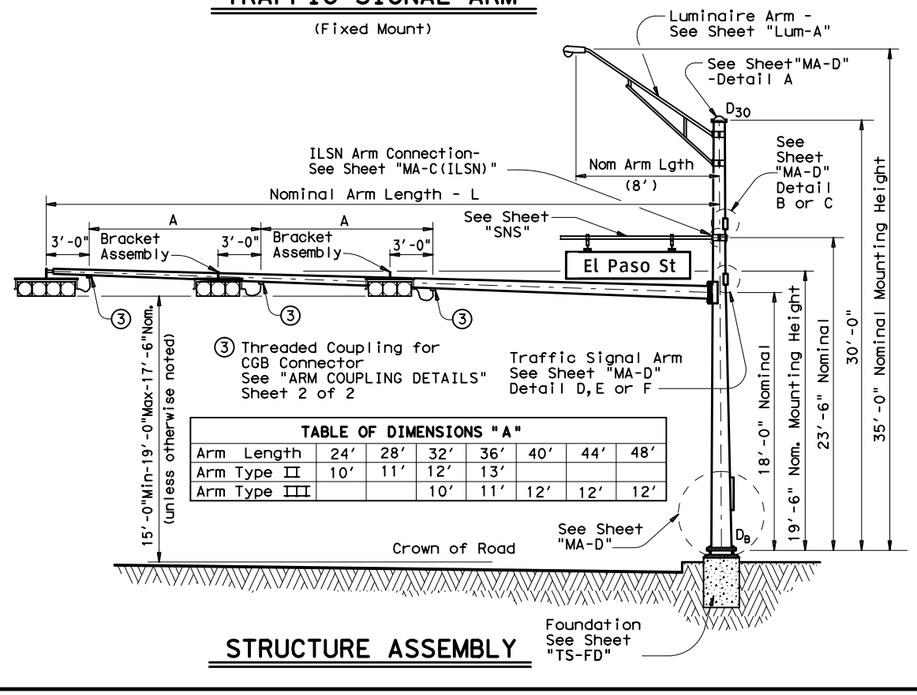


TABLE OF DIMENSIONS "A"

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

STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

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

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-80		20S-80		20-80	
24	24L-80		24S-80		24-80	
28	28L-80	1	28S-80		28-80	1
32	32L-80	3	32S-80		32-80	
36	36L-80	2	36S-80		36-80	
40	40L-80	1	40S-80		40-80	
44	44L-80	13	44S-80		44-80	
48	48L-80	12	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)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors		2 Bracket Assemblies and 3 CGB Connectors	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80	2		
32			32II-80	3	32III-80	
36			36II-80		36III-80	2
40					40III-80	1
44					44III-80	13
48					48III-80	15

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	32

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"	4
1 3/4"	3'-10"	32

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.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(1)-12

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

REVISIONS
5-96
11-99
1-12

CONT	SECT	JOB	HIGHWAY
0047	07	243, ETC.	US 75, ETC.
DIST	COUNTY		SHEET NO.
DAL	DALLAS, ETC.		133

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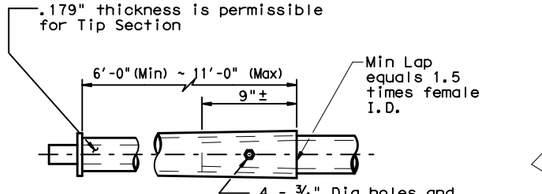
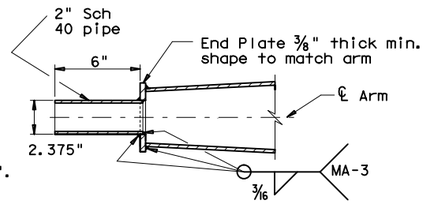


SLIP JOINT DETAIL



TENON DETAIL

VIBRATION WARNING

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

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

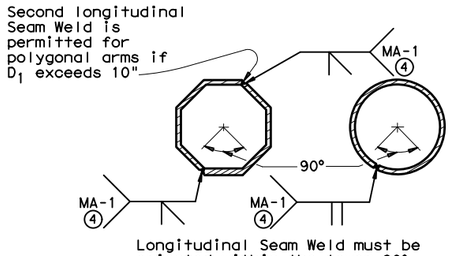
If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

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

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

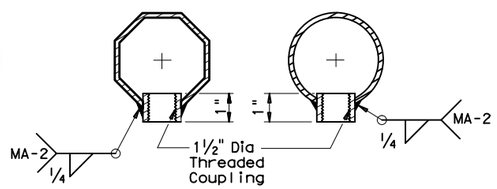
Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

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



ARM COUPLING DETAILS

GENERAL NOTES:

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

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

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

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

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

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(2)-12

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

REVISIONS
5-96
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CONT	SECT	JOB	HIGHWAY
0047	07	243, ETC.	US 75, ETC.
DIST	COUNTY		SHEET NO.
DAL	DALLAS, ETC.		134

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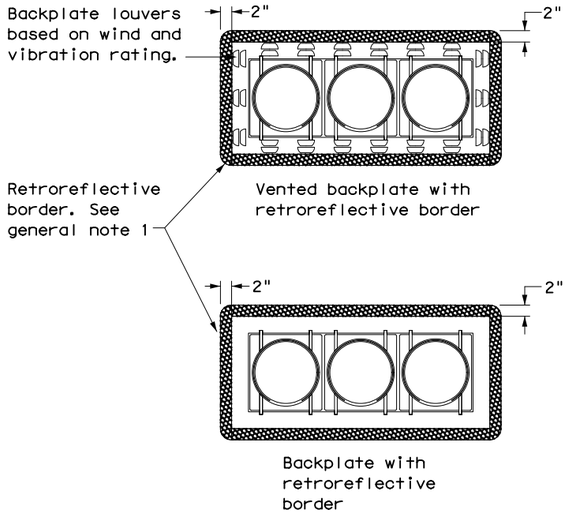
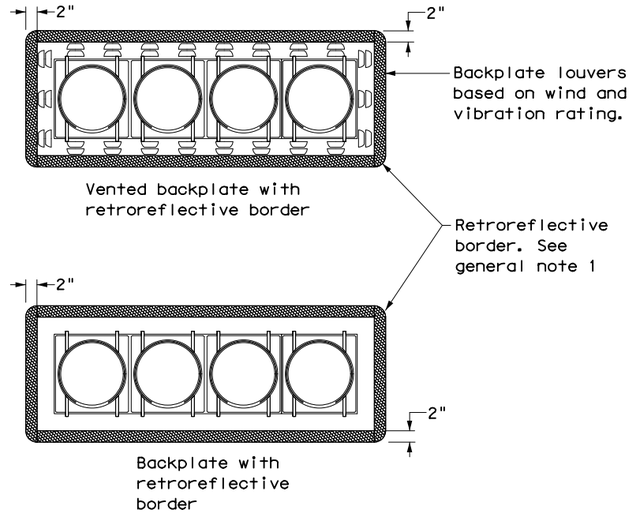
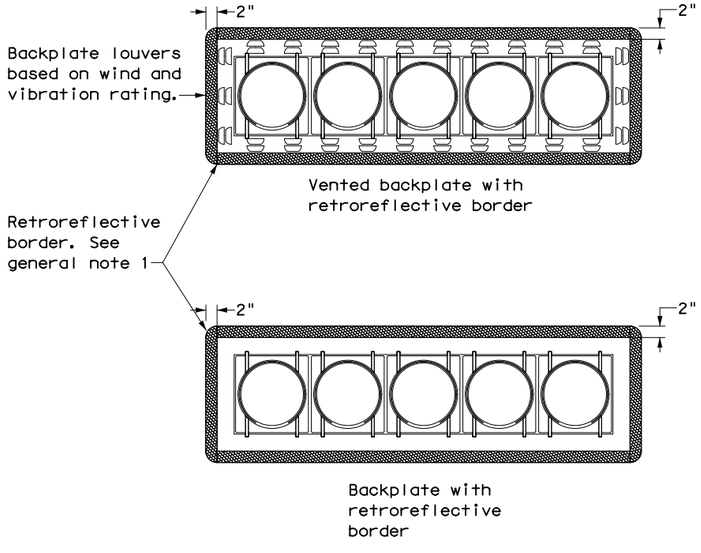


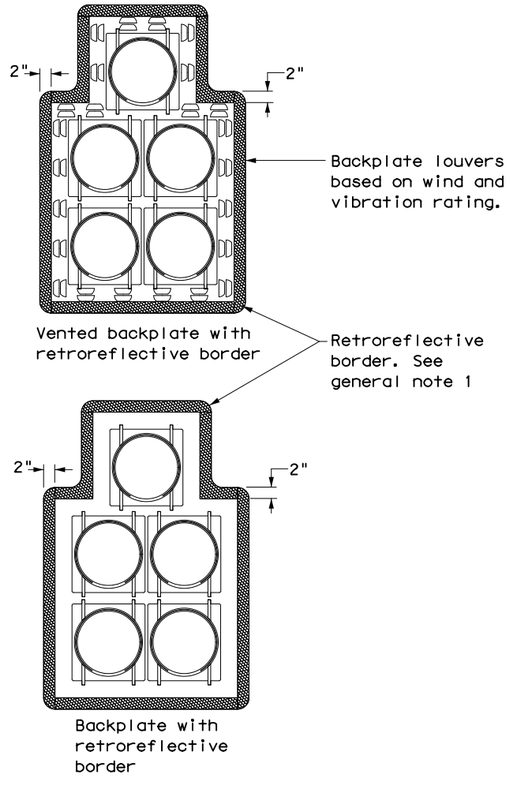
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



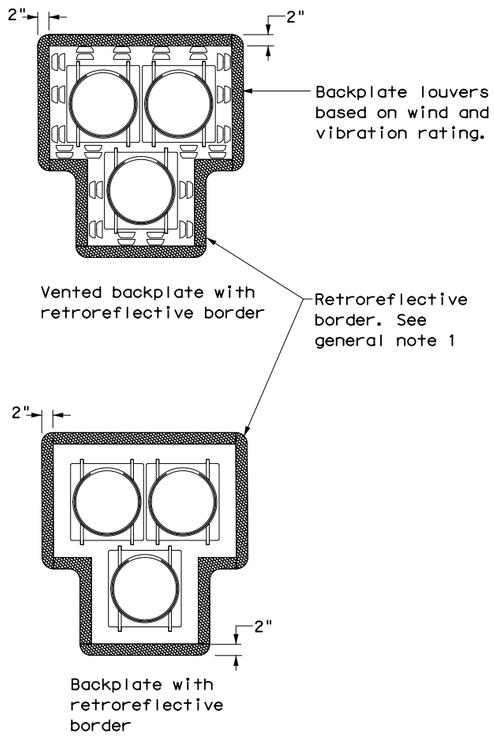
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

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

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE
TS-BP-20

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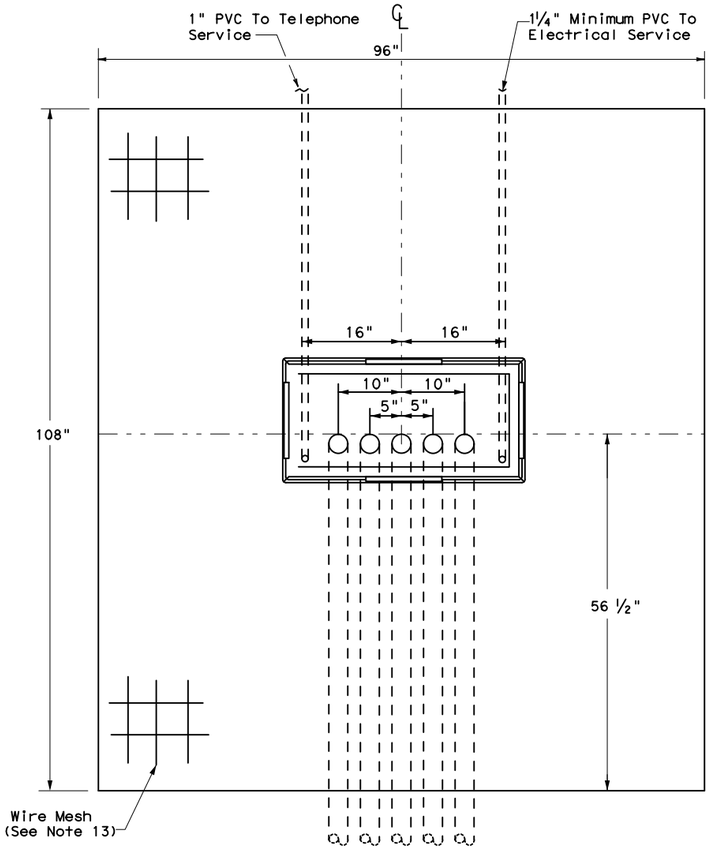
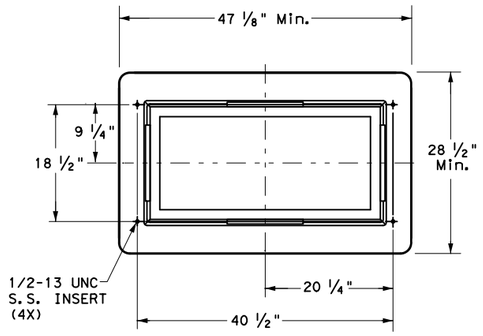
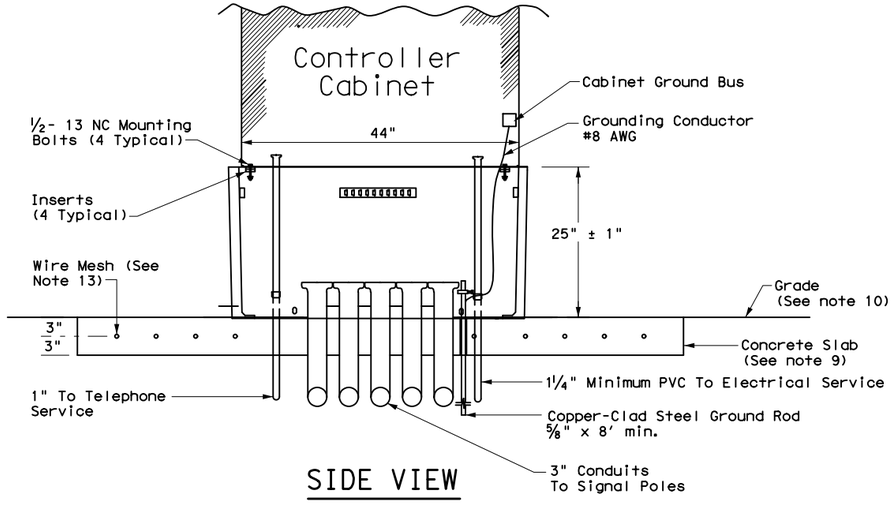
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		135



TOP VIEW



CABINET BASE



SIDE VIEW

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TRAFFIC SIGNAL CONTROLLER BASE:

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

CONCRETE SLAB:

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

CONDUITS:

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

CONTROLLER CABINET:

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

PAYMENT:

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

Texas Department of Transportation

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TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD
TS-CF-21

FILE: ts-cf-21.dgn	DN:	CK:	DW:	CK:
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REVISIONS 12-04 2-21	0047	07	243, ETC.	US 75, ETC.
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		136

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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 10	15	40	ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	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:

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

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

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

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

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

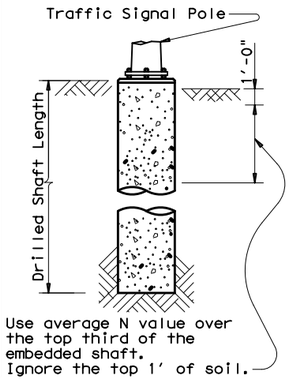
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET) 24-A	30-A	36-A	36-B	42-A
LEMMON AVE								
P-3, P-6, P-7, P-14	10	24-A	4	24				
P-4, P-11	10	36-A	2			28		
ROYAL LN								
P-3, P-7, P-9, P-11, P-12, P-13	10	24-A	6	36				
P-4, P-5, P-8	10	36-A	3			42		
ARAPAHO RD								
P-2, P-4, P-6, P-9, P-12, P-13	10	24-A	6	36				
P-3, P-10, P-11, P-14	10	36-A	4			56		
P-5	10	30-A	1		12			
LOOP 12								
P-1, P-3, P-9, P-11	10	30-A	4		48			
P-2, P-4, P-6, P-7, P-8, P-10, -P-12, P-14, P-15, P-16, P-17	10	24-A	11	66				
P-5, P-13	10	36-A	2			28		
REDBIRD LN								
P-3, P-6, P-8, P-10, P-13, P-14	10	24-A	6	36				
P-2, P-4, P-5, P-9, P11, P-12	10	36-A	6			84		
RENNER RD								
P-2, P-9, P-11, P-12	10	24-A	4	24				
P-3, P-6, P-7, P-10, P-13, P-14	10	36-A	6			84		
PLANO RD								
P-3, P-8	10	24-A	2	12				
P-2, P-4, P-5, P-7, P-9, P-10	10	36-A	6			84		
TOTAL DRILLED SHAFT LENGTHS				234	60	406		

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

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

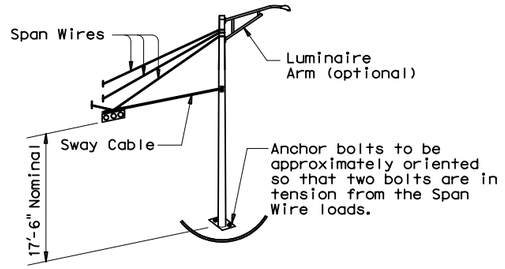


ANCHOR BOLT & TEMPLATE SIZES

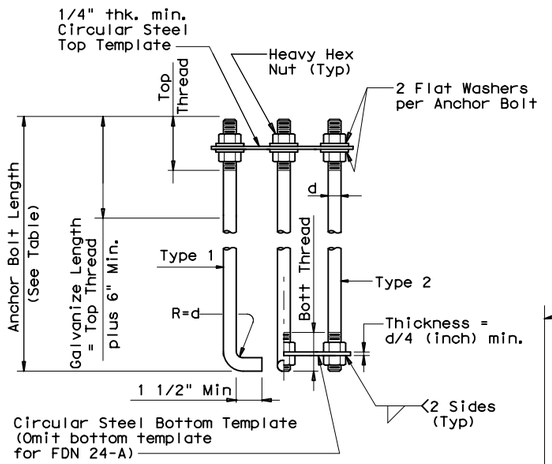
BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
3/4"	1'-6"	3"	—	12 3/4"	7 1/8"	5 5/8"
1 1/2"	3'-4"	6"	4"	17"	10"	7"
1 3/4"	3'-10"	7"	4 1/8"	19"	11 1/4"	7 3/4"
2"	4'-3"	8"	5"	21"	12 1/2"	8 1/2"
2 1/4"	4'-9"	9"	5 1/2"	23"	13 3/4"	9 1/4"

⑦ Min dimensions given, longer bolts are acceptable.

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



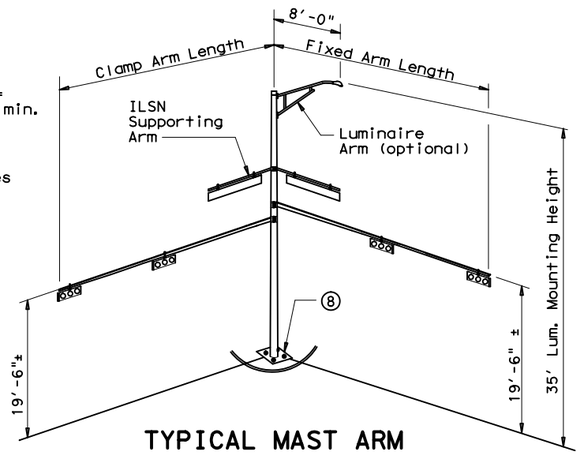
TYPICAL STRAIN POLE ASSEMBLY



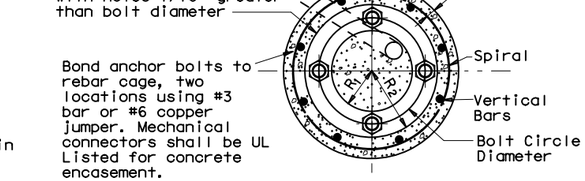
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

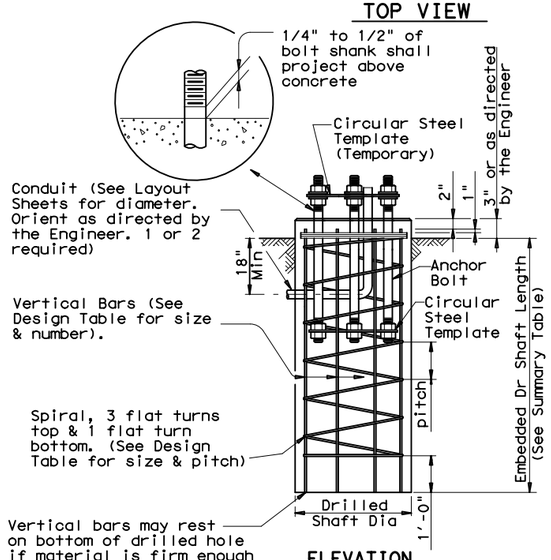
⑧ Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.



TYPICAL MAST ARM ASSEMBLY



TOP VIEW



ELEVATION

FOUNDATION DETAILS

GENERAL NOTES:

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

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

Concrete shall be Class "C".

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

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

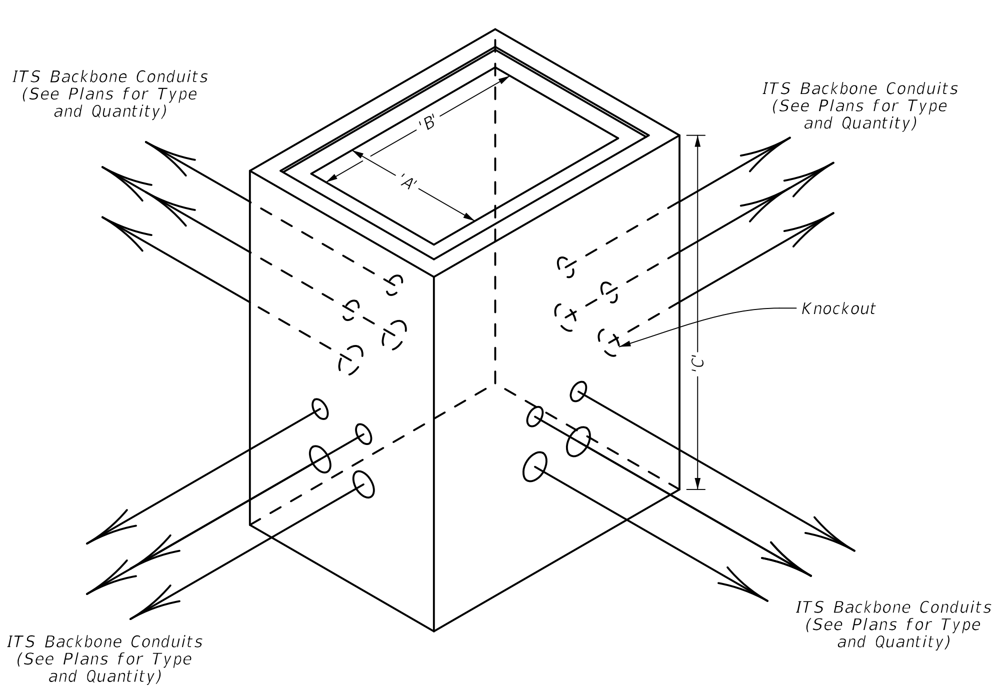
Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

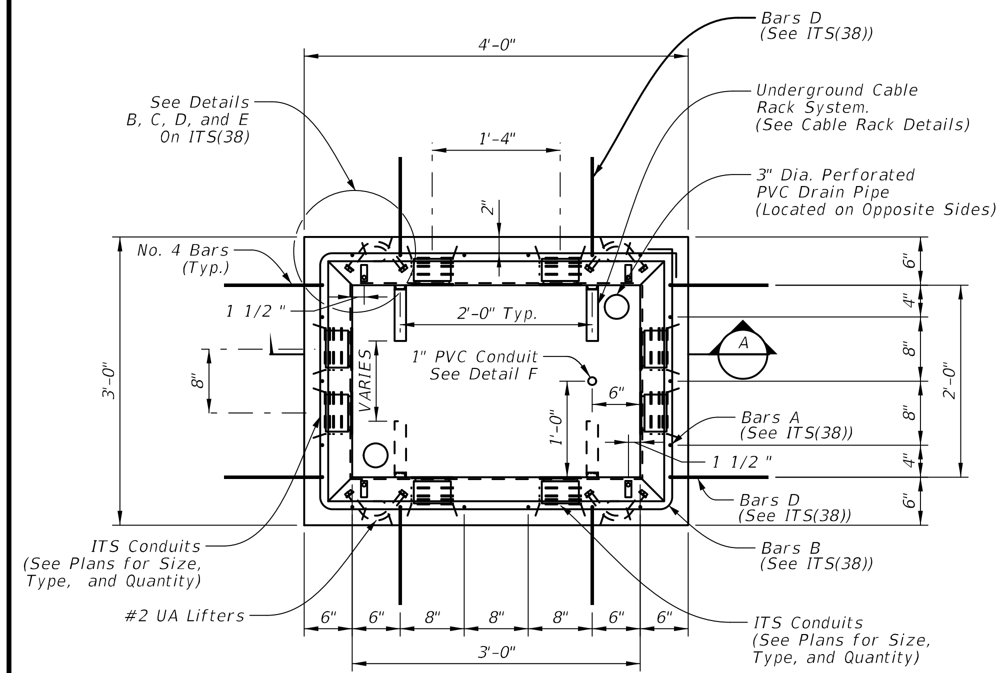
TS-FD-12

REVISIONS	DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB
5-96	CONT	SECT	JOB	HIGHWAY
11-98	0047	07	243, ETC.	US 75, ETC.
1-12	DIST	COUNTY		SHEET NO.
	DAL	DALLAS, ETC.		137



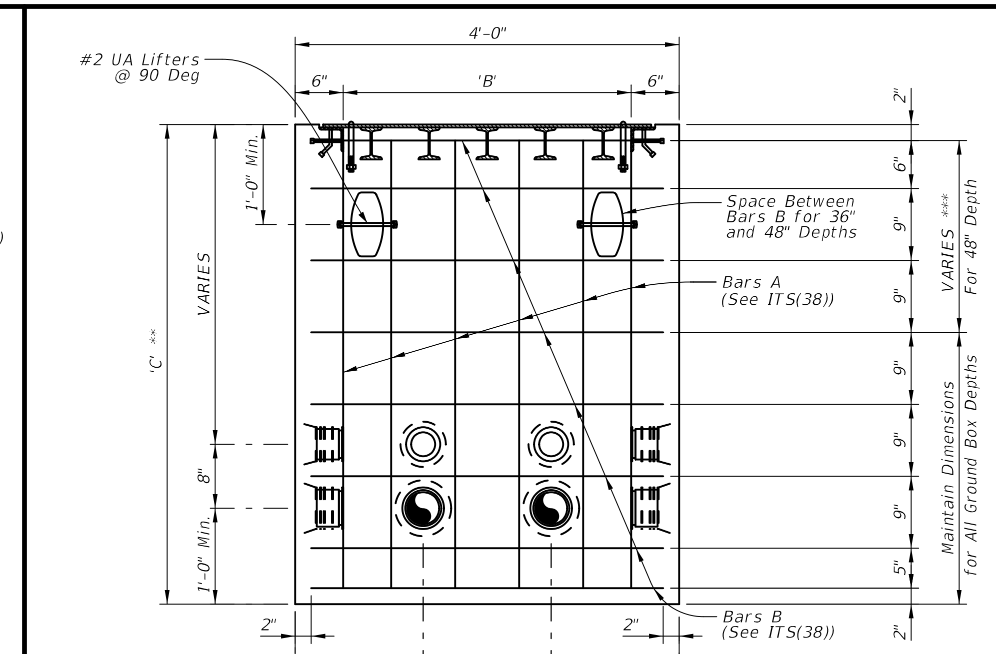
See Ground Box Schedule for A, B, and C Dimensions

Type 1 Ground Box Isometric View



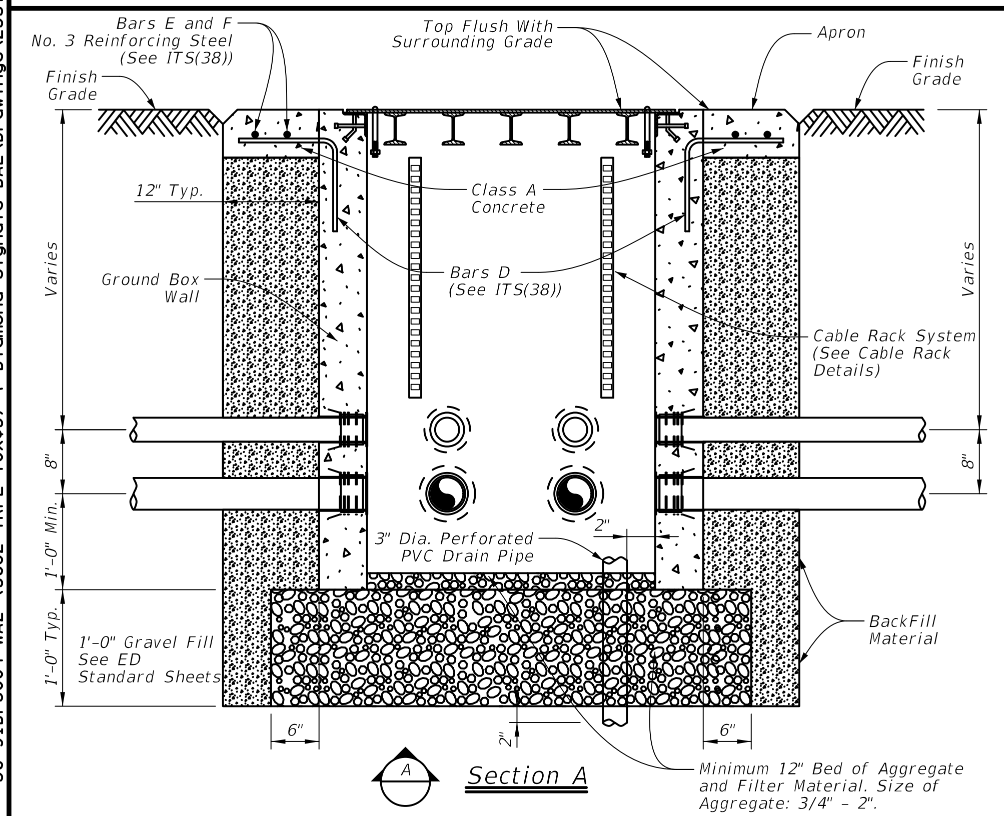
Note: Bar Spacing is The Same on Opposing Sides.

Type 1 Ground Box Plan View

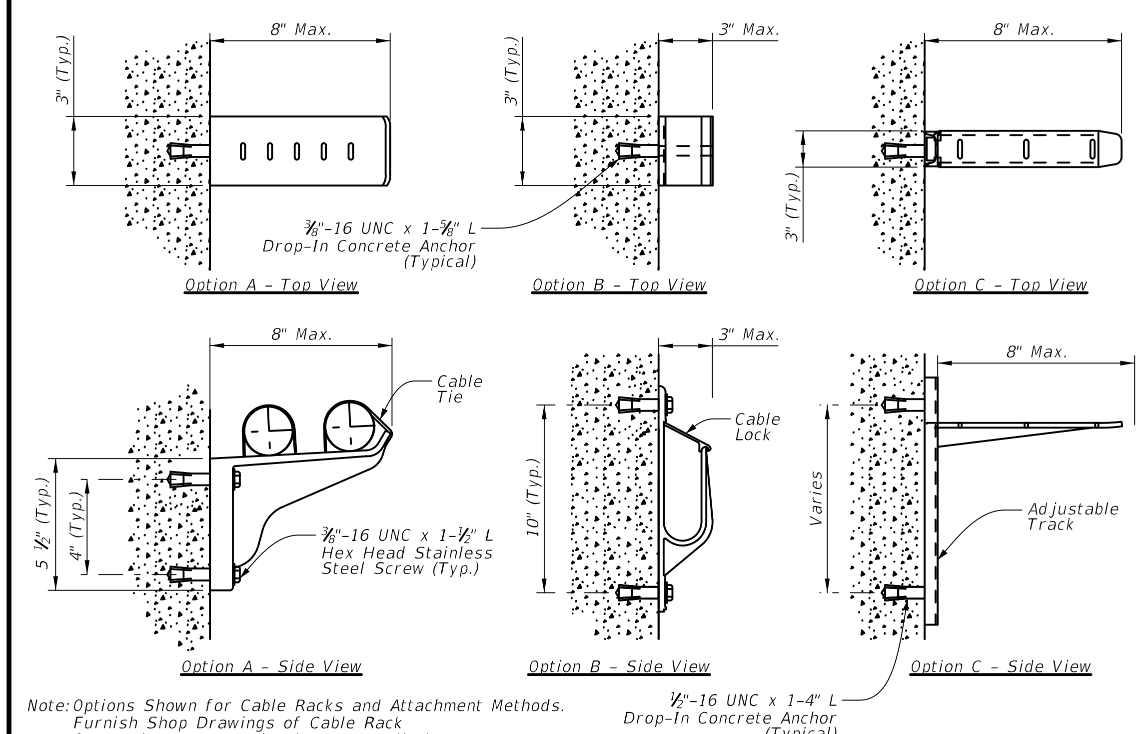


** - Detail representative of 60" deep ground box.
*** - Space Bars B in 6" Intervals for 48" Depth

Type 1 Ground Box Elevation View

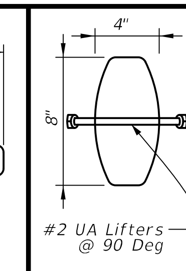


Section A

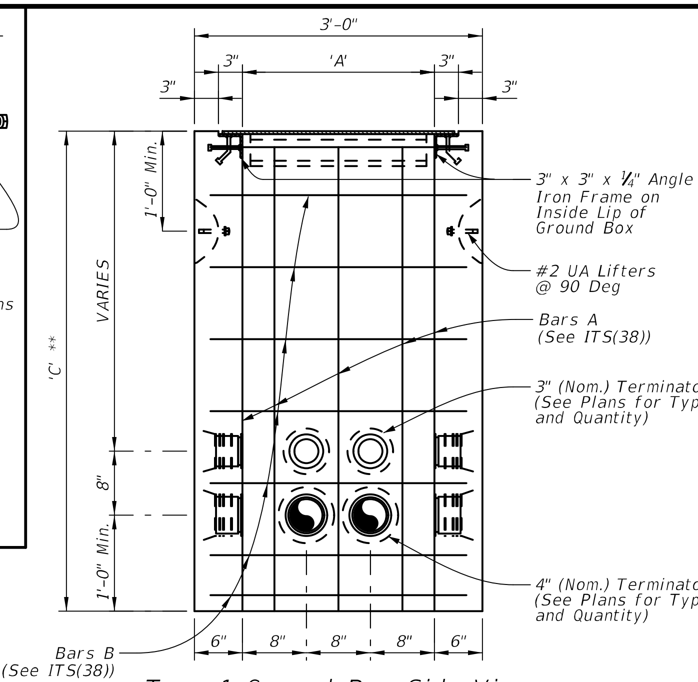


Note: Options Shown for Cable Racks and Attachment Methods. Furnish Shop Drawings of Cable Rack for Engineer Approval Prior to Installation.

Type 1 Cable Rack Details



UA Lifter Detail Dimensions



Type 1 Ground Box Side View

** - Detail representative of 60" deep ground box.

SHEET 1 OF 2

General Notes:

1. Conduit entry points shown represent the standard configuration for backbone conduit as detailed on ITS(27). Additional conduits may be required as shown on the plans.
2. Provide Class A concrete for Type "1" ground boxes.
3. Provide terminators for the PVC conduit 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.
4. Provide terminators appropriately sized for the conduits indicated on the plans. Provide terminators with an air tight and water tight connection.
5. Closed bottom Type "1" ground boxes are acceptable in lieu of open bottom boxes. Provide two 3" Dia. perforated PVC drain pipes on opposite corners to optimize water drainage. Provide 12-inch bed of aggregate that extends 6 inches in all directions from the perimeter of the box for closed bottom boxes. Aggregate bed will be subsidiary to Special Specification, "ITS Ground Box."
6. Install all open bottom Type "1" ground boxes on a 12-inch bed of aggregate that extends 6 inches in all directions from the perimeter of the box. Aggregate bed will be subsidiary to Special Specification, "ITS Ground Box."
7. Cap and seal terminators that do not have conduits attached.
8. 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.
9. Provide a bell fitting on the end of each conduit to ensure a flush fit inside the ground box.
10. 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.
11. Install a nylon string and plug all unused conduits with tug-plugs sized for the particular conduits. Provide split innerduct plugs in conduits or innerducts with cables to seal the innerduct around the cables to prevent water and dirt from entering.
12. Provide steel (ASTM A-153), glass reinforced nylon, or equivalent cable rack assemblies designed to support the amount of cable storage slack identified in the plans. Locate cable rack system on one side only (longer length side) to allow 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 concrete side wall to prevent moisture penetration. Ground metallic cable rack systems to grounding system inside ground box in accordance with the National Electrical Code.

Ground Box Schedule			
Ground Box Type	'A' Width Inside (Inches)	'B' Length Inside (Inches)	'C' Depth Inside (Inches)
Type 1	24	36	36, 48, 60

Sheet Details
Not to Scale

Texas Department of Transportation
Traffic Safety Division Standard

ITS GROUND BOX DETAILS TYPE "1" WITH STEEL COVER

ITS(37)-22

FILE: its(37)-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 02-16 10-22	0047	07	243, ETC.	US 75, ETC.
	DIST		COUNTY	SHEET NO.
	DAL		DALLAS, ETC.	138

262

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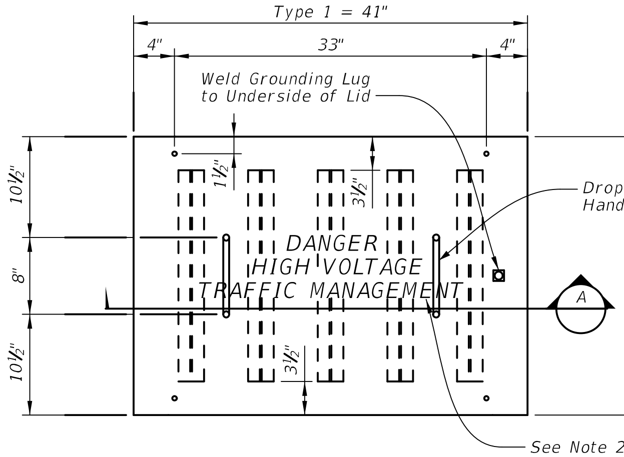
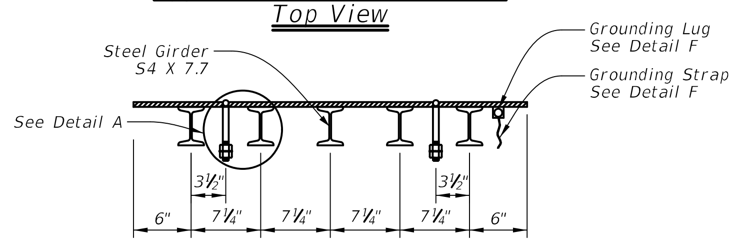
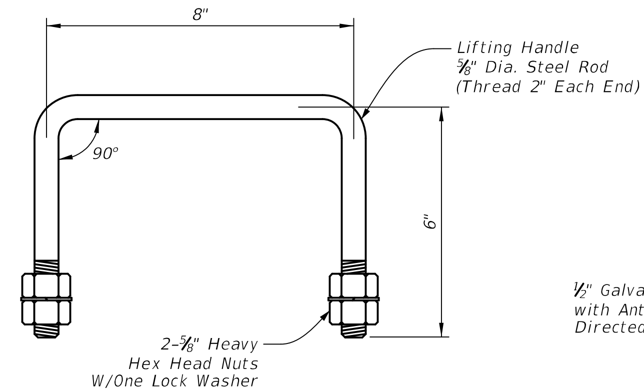


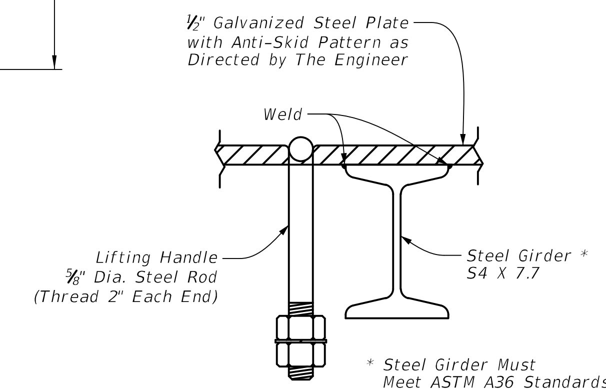
Type 1 Steel Cover Details
Top View



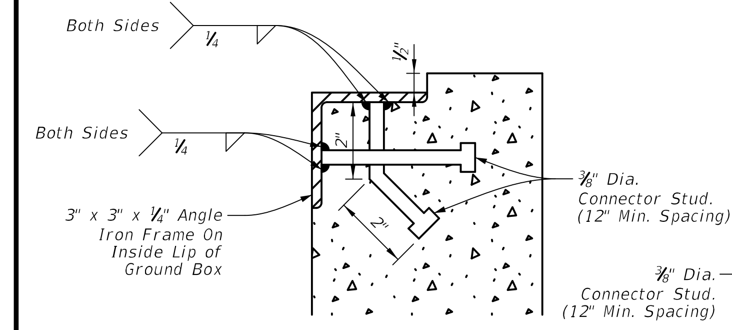
Section A



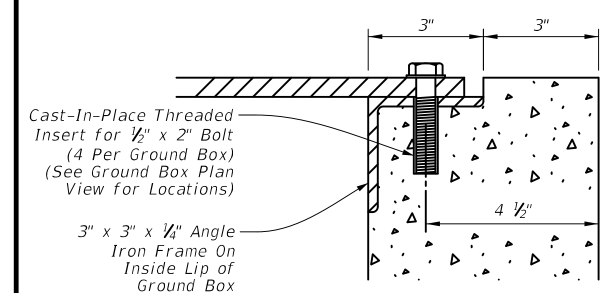
Drop Handle Detail



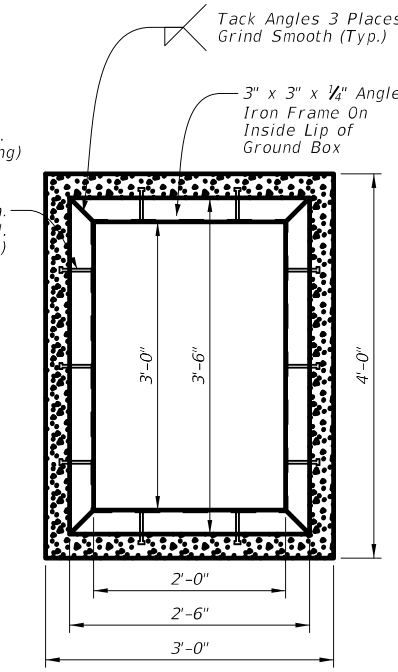
Detail A



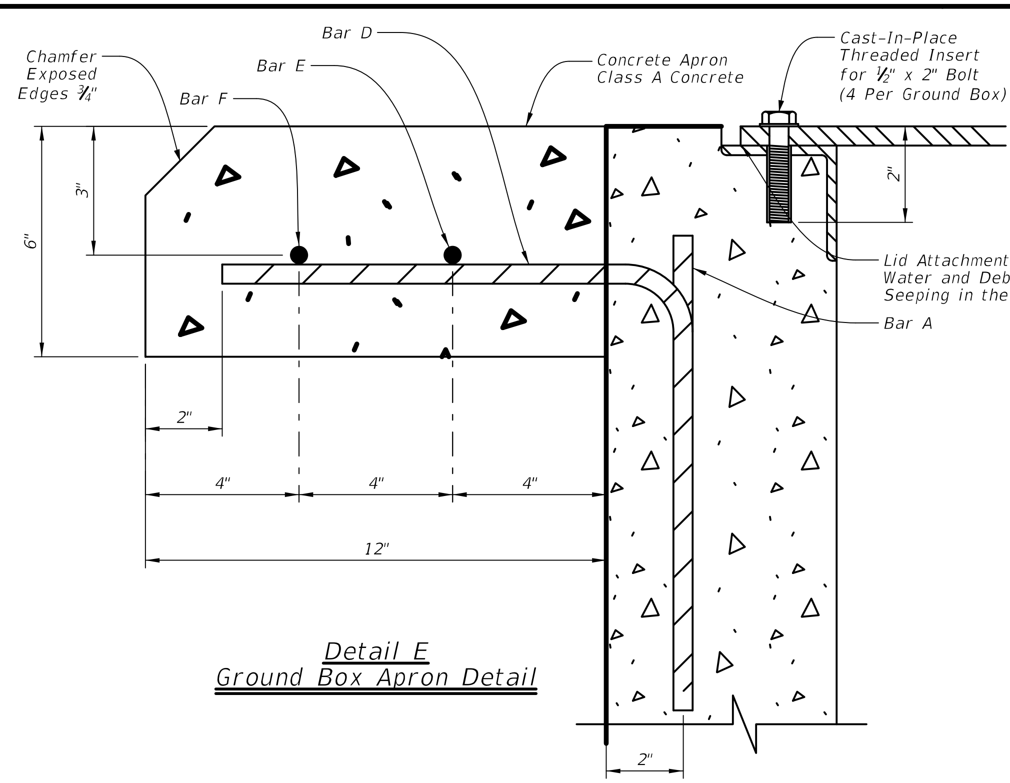
Detail B



Detail C
Lid Attachment Detail



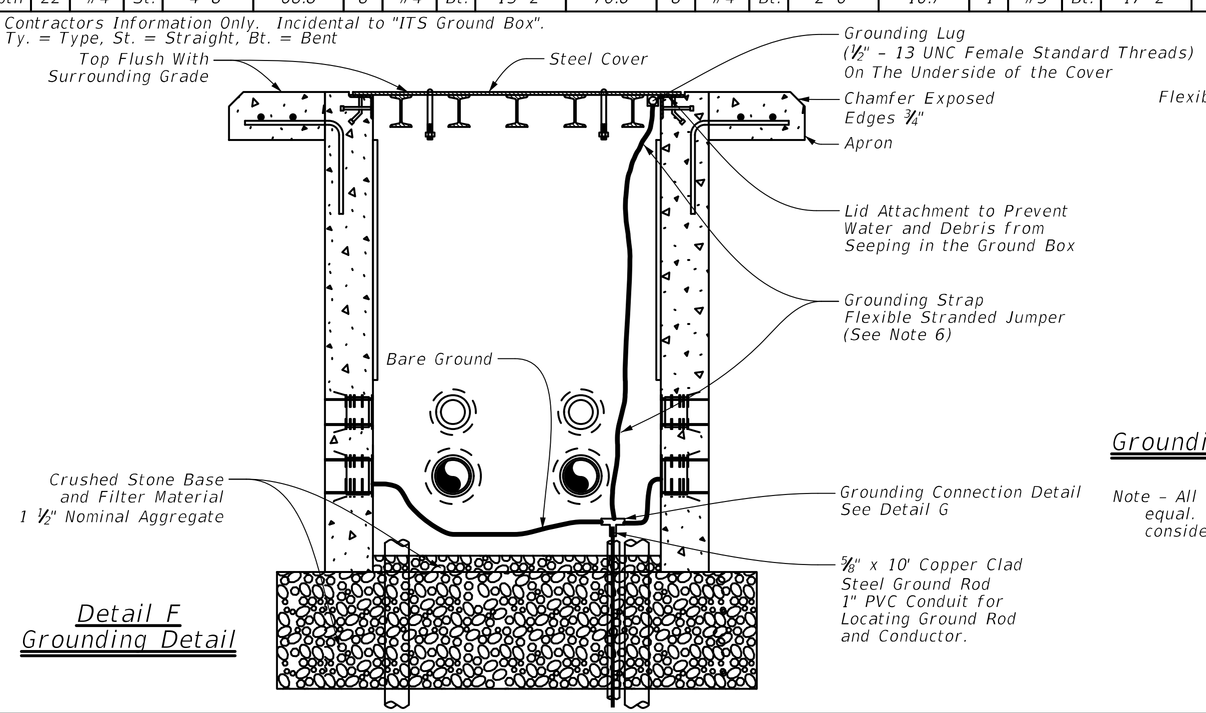
Detail D



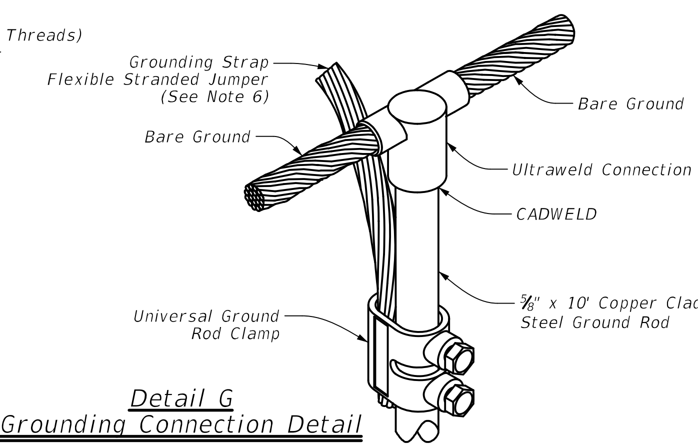
Detail E
Ground Box Apron Detail

Ground Box Type 1	BAR A					BAR B					BAR D					BAR E					BAR F					TOTALS	
	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	No.	Size	Ty.	Length	Weight	Steel * LBS.	Conc. * CY
36" Depth	22	#4	St.	2'-8"	39.3	5	#4	Bt.	13'-2"	44.1	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	108.1	.67
48" Depth	22	#4	St.	3'-8"	54.0	7	#4	Bt.	13'-2"	61.8	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	140.5	.89
60" Depth	22	#4	St.	4'-8"	68.8	8	#4	Bt.	13'-2"	70.6	8	#4	Bt.	2'-0"	10.7	1	#3	Bt.	17'-2"	6.5	1	#3	Bt.	19'-10"	7.5	164.1	1.11

* - For Contractors Information Only. Incidental to "ITS Ground Box".
Legend: Ty. = Type, St. = Straight, Bt. = Bent



Detail F
Grounding Detail



Detail G
Grounding Connection Detail

Note - All grounding connections to be CADWELD or approved equal. This work will not be paid for directly, but is considered incidental to ITS ground box.

SHEET 2 OF 2

General Notes:

1. See ITS(37) for additional Type "1" ground box details.
2. Hot-dip galvanized steel covers after all welds are made.
3. Label top of cover with the words "DANGER HIGH VOLTAGE TRAFFIC MANAGEMENT" using template-guided, hand-welded lettering at a height of 2 inches to ensure neatness.
4. Provide all Type "1" ground boxes with a securable, tamper-proof cover equipped with a bolting system that positively secures the cover in place.
5. Ground steel covers in accordance with the National Electrical Code.
6. Ground covers to the grounding cable using a split-bolt kearney clamp, and a minimum 8-foot long flexible stranded jumper the same size as the grounding conductor. Terminate to metal ground box cover with a tank ground type lug as approved and directed by the Engineer.
7. Provide Type "1" ground box and cover designed for heavy duty loading in accordance with AASHTO H20 loading when located where the box may experience deliberate, continuous vehicular traffic, such as near the shoulder or an auxiliary lane, or immediately adjacent to the unprotected edge of pavement.
8. Provide a Type "1" ground box and cover tested by a laboratory independent of the manufacturer certifying loading requirements are met. Provide certification of such tests to the Engineer for approval.
9. Provide a steel or cast iron cover in accordance with Item 471, Article 471.2, "Frames, Grates, Rings, and Covers." Provide covers with the number of drop handles shown. Provide Class "A" concrete for ground box construction and aprons.
10. Fabricate cover so to fits properly on the ground box, and no undue noise results when traffic contacts the cover.

Sheet Details
Not to Scale

Texas Department of Transportation
Traffic Operations Division Standard

ITS GROUND BOX DETAILS TYPE "1" WITH STEEL COVER

ITS(38)-17

FILE: its(38)-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT FEBRUARY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS 5-17	0047	07	243, ETC.	US 75, ETC.
	DIST		COUNTY	SHEET NO.
	DAL		DALLAS, ETC.	139

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ROADWAY ILLUMINATION ASSEMBLY NOTES

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

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

3. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC),TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA),and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.

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

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

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

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

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

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

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

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

8. Install T-Base with following procedure:

   a. Anchor Bolt Tightening.

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

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

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

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

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

   b. Top Bolt Procedure

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

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

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

   c. Level and Plumb

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

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

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

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

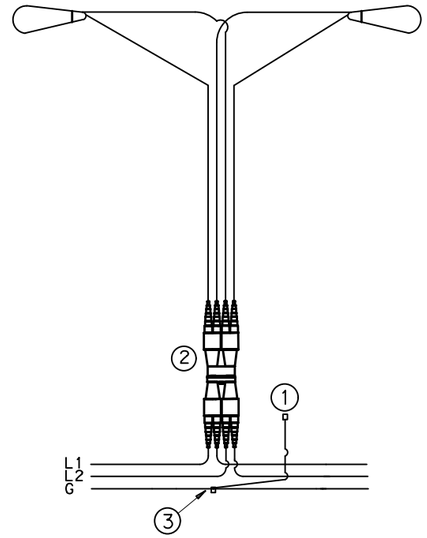
12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

Wiring Diagram Notes:

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

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

(3) Split Bolt or other connector.



L1,L2 = Hot Conductors
G = Grounding Conductor

TYPICAL WIRING DIAGRAM

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

Decorative LED Lighting Notes:

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

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

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

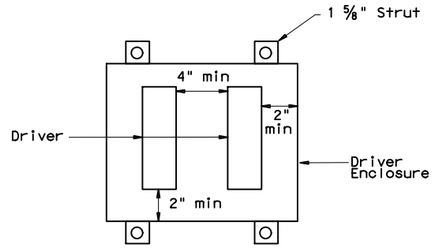
   c. Install drivers with at least 2 inches of space from enclosure walls.

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

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

   f. Provide remote drivers with a maximum of 100 watts

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



Driver Spacing In Remote Enclosure

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS

RID(1)-20

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7-17	DIST	COUNTY		SHEET NO.
12-20	DAL	DALLAS, ETC.		140

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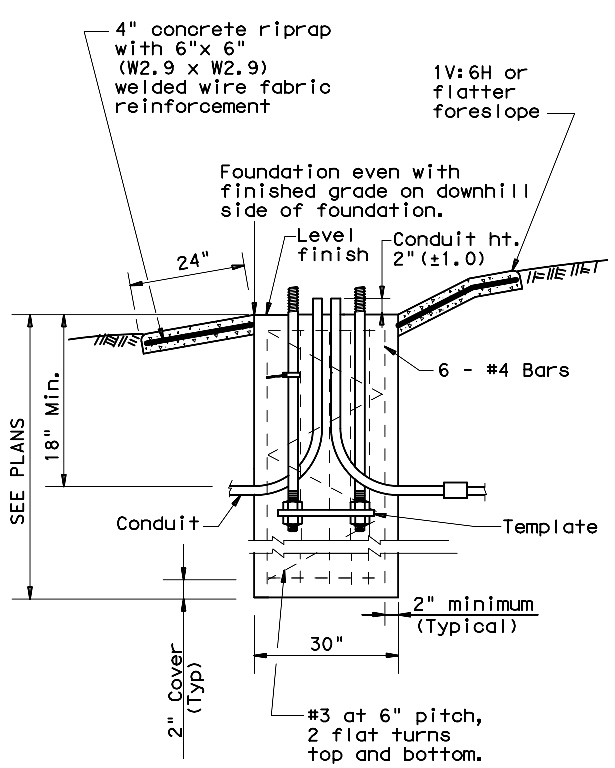
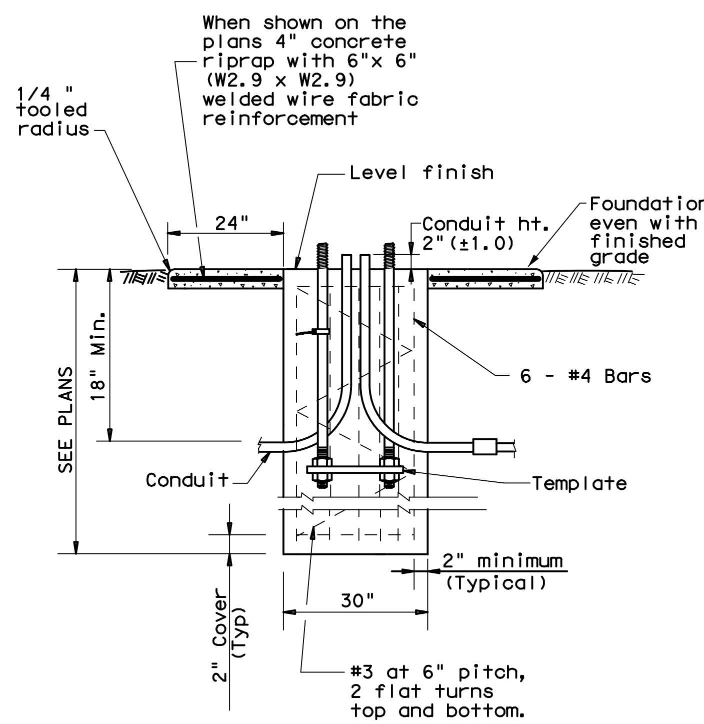


SECTION A-A

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.	1in.x 30in.
40-50 ft.	15 in.	17 ¼in.	1 ¼in. x 30in.

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

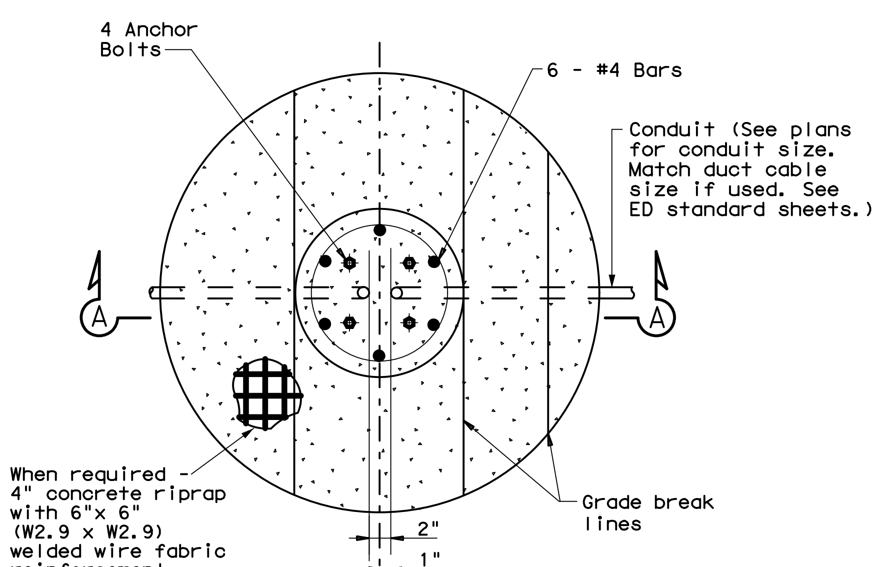
GENERAL NOTES:

1. "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.
2. 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.
3. 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.
4. 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.
5. Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
6. 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.
7. Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
8. 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.
9. Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
10. 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.
11. 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.

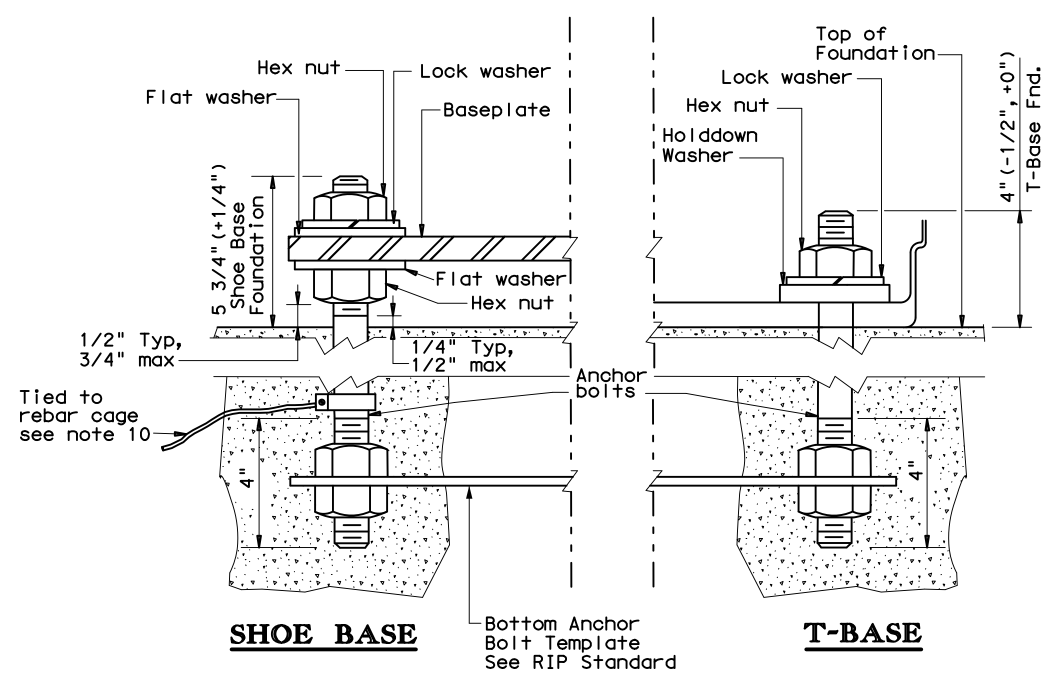
TABLE 4	
BREAKAWAY POLE PLACEMENT (See note 6)	
ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) 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.



FOUNDATION DETAIL



ANCHOR BOLT DETAIL

Texas Department of Transportation | Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS (RDWY ILLUM FOUNDATIONS)

RID(2)-20

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	DAL		DALLAS, ETC.	141

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SHIPPING PARTS LIST - POLES AND LUMINAIRE ARMS

Nominal Mounting Ht. (ft)	Shoe Base – Designation: Pole / A1 / A2	Luminaire	Quantity	T-Base – Designation: Pole / A1 / A2	Luminaire	Quantity	CSB/SSCB Mounted – Designation: Pole / A1 / A2	Luminaire	Quantity
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	
	(Type SA 30 S - 8)	(250W EQ) LED		(Type SA 30 T - 8)	(250W EQ) LED	6	(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	
40	(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	7	(Type SP 38 S - 8)	(250W EQ) LED	
	(Type SA 40 S - 8 - 8)	(250W EQ) LED		(Type SA 40 T - 8 - 8)	(250W EQ) LED		(Type SP 38 S - 8 - 8)	(250W EQ) LED	
	(Type SA 40 S - 10)	(250W EQ) LED		(Type SA 40 T - 10)	(250W EQ) LED		(Type SP 38 S - 10)	(250W EQ) LED	
	(Type SA 40 S - 10 - 10)	(250W EQ) LED		(Type SA 40 T - 10 - 10)	(250W EQ) LED		(Type SP 38 S - 10 - 10)	(250W EQ) LED	
	(Type SA 40 S - 12)	(250W EQ) LED		(Type SA 40 T - 12)	(250W EQ) LED		(Type SP 38 S - 12)	(250W EQ) LED	
	(Type SA 40 S - 12 - 12)	(250W EQ) LED		(Type SA 40 T - 12 - 12)	(250W EQ) LED		(Type SP 38 S - 12 - 12)	(250W EQ) LED	
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	
	(Type SA 50 S - 4 - 4)	(400W EQ) LED		(Type SA 50 T - 4 - 4)	(400W EQ) LED		(Type SP 48 S - 4 - 4)	(400W EQ) LED	
	(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	
	(Type SA 50 S - 10 - 10)	(400W EQ) LED		(Type SA 50 T - 10 - 10)	(400W EQ) LED		(Type SP 48 S - 10 - 10)	(400W EQ) LED	
	(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: Pole	A1	A2	Luminaire	Quantity

GENERAL NOTES:

1. 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.

2. 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.

3. 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.

4. 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.

   a. 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.
   b. 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.
   c. 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.
   d. Anchor Bolt Assembly. Anchor bolt assemblies for optionally designed poles shall be the same as those shown herein.

5. Aluminum Pole Designs. Aluminum pole designs may be allowed, if aluminum poles are permitted or required, pending approval by the Department as outlined below.

   a. Meet all of the requirements stated above for optional steel pole designs and the following:
      1. Aluminum poles shall be fabricated in accordance with "Structural Welding Code-Aluminum" AWS D1.2.
      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.
      3. Aluminum poles shall be equipped with vibration mitigation devices, as approved by the engineer.
      4. 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.

6. Special Designs. Poles with architectural treatments shall meet the requirements shown elsewhere in the plans.

7. 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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ROADWAY ILLUMINATION POLES

RIP(1)-19

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	DAL		DALLAS, ETC.	142

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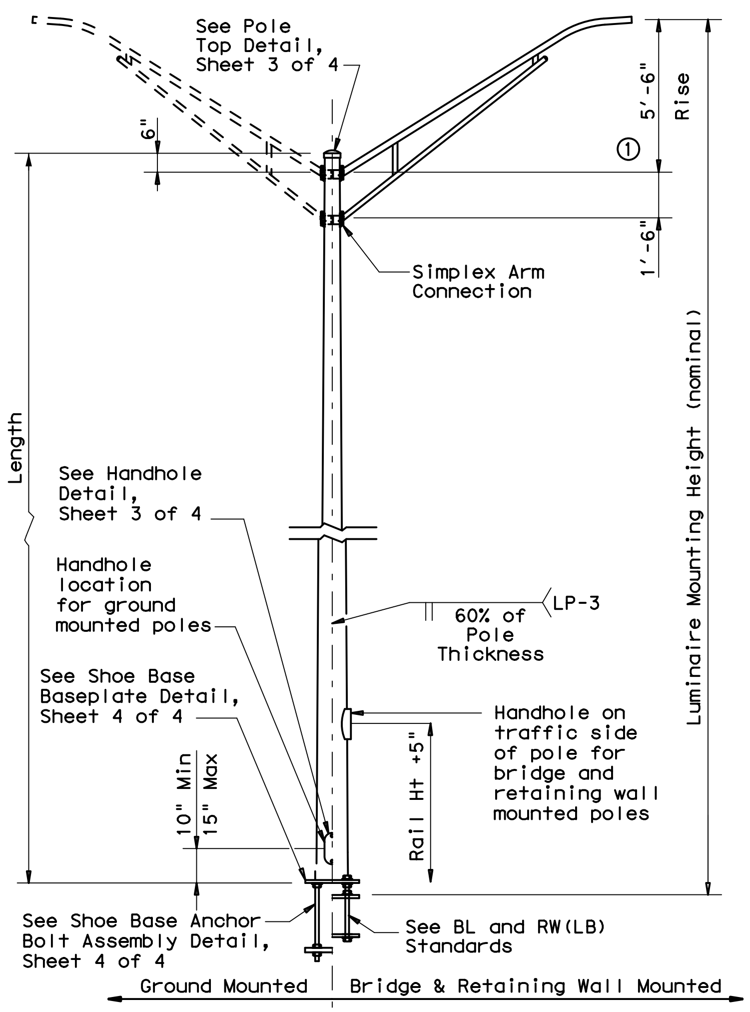
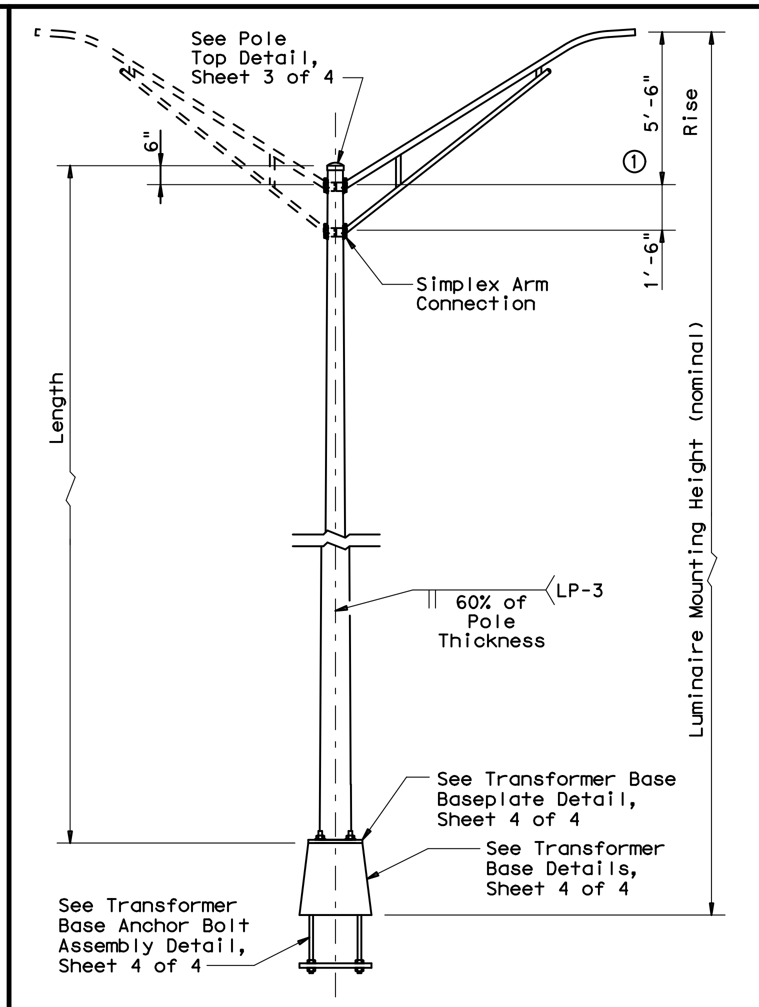
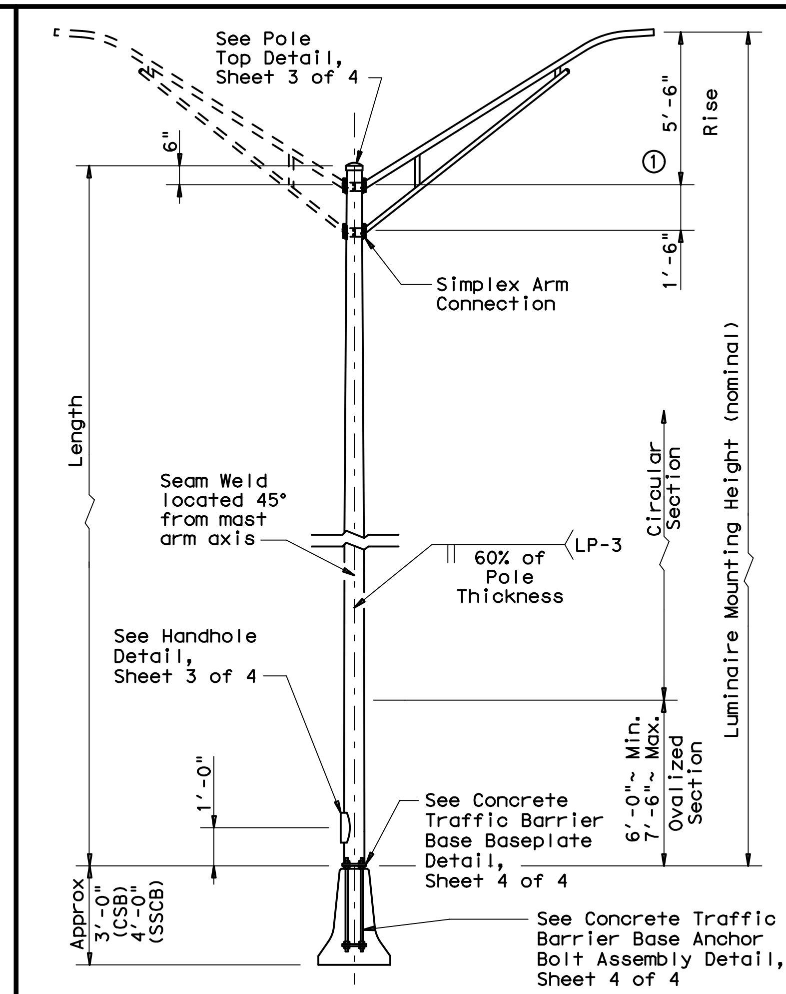


SHOE BASE POLE



TRANSFORMER BASE POLE



CONCRETE TRAFFIC BARRIER 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

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 (CSB/SSCB)

Luminaire Mounting Height (Nominal) (ft)	Base② Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)	
					About ℄ 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

MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)
Pole Shaft (0.14"/ft. Taper)	A572 Gr 50, A595 Gr A, A1011 HSLAS Gr 50 Cl 2 ③, or A1008 HSLAS Gr 50 Cl 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:

① 2'-6" rise for 4 ft. luminaire arms.

② Before ovalized as shown on Concrete Traffic Barrier Base Baseplate details, Sheet 4 of 4.

③ 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"

GENERAL NOTES:

1. 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.

2. 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.

3. 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.

4. For mounting heights between values shown in the tables, use base diameter and thickness values for the larger height.

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

6. 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.

7. 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.

8. Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.

9. Lubricate and tighten anchor bolts, when erecting shoe base poles and concrete traffic barrier base poles, in accordance with Item 449, "Anchor Bolts."

10. 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.

11. 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."

12. 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.

13. Erect transformer base poles in accordance with sheet RID(1).

Texas Department of Transportation — Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(2)-19

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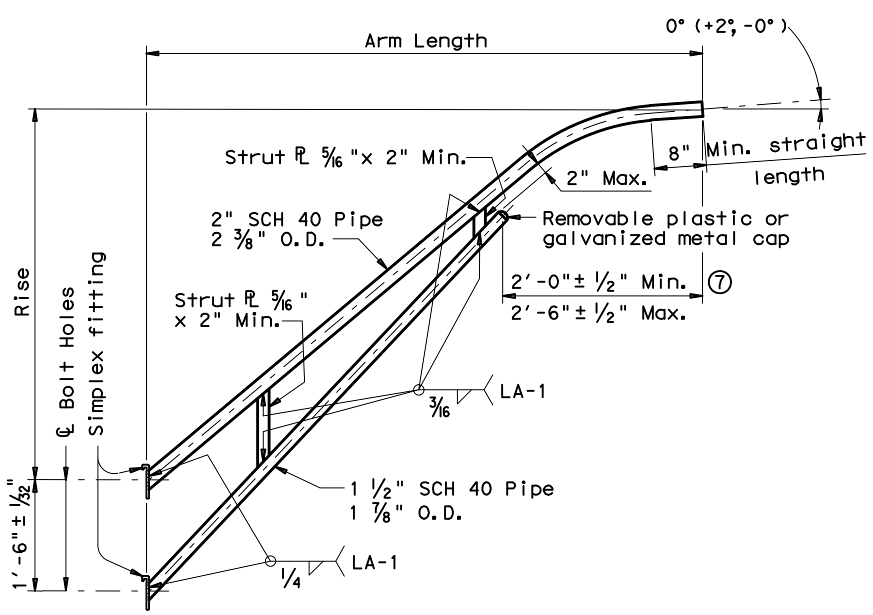
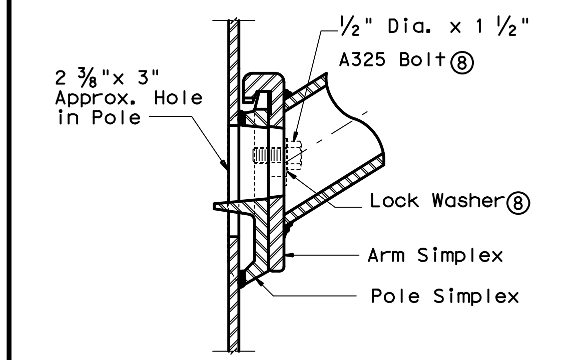


LUMINAIRE ARM

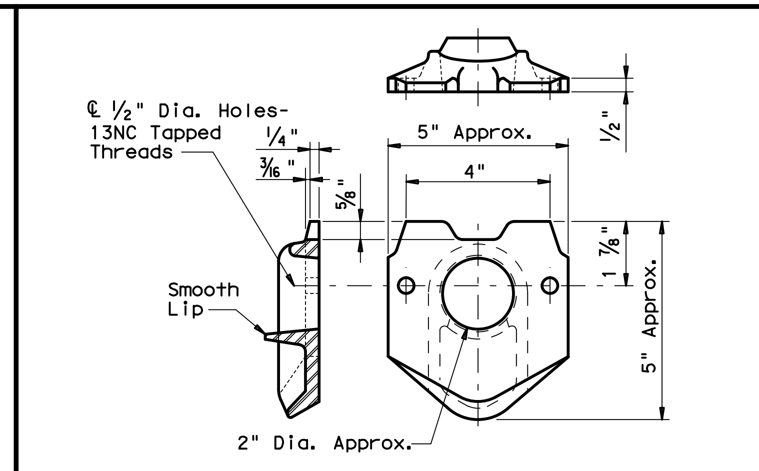
LUMINAIRE ARM DIMENSIONS		
Nominal Arm Length	Arm Length	Rise
4'-0"	3'-6"	2'-6"
6'-0"	5'-6"	5'-6"
8'-0"	7'-6"	5'-6"
10'-0"	9'-6"	5'-6"
12'-0"	11'-6"	5'-6"

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"

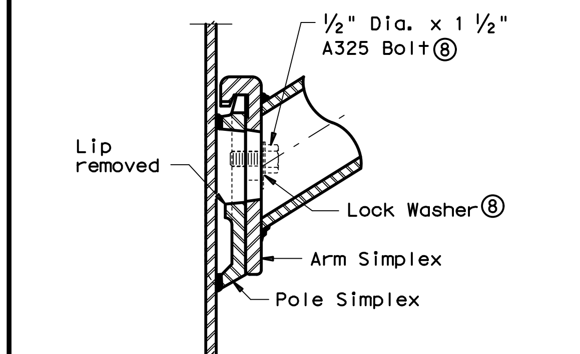


UPPER SIMPLEX FITTING

(Gusset not shown for clarity)



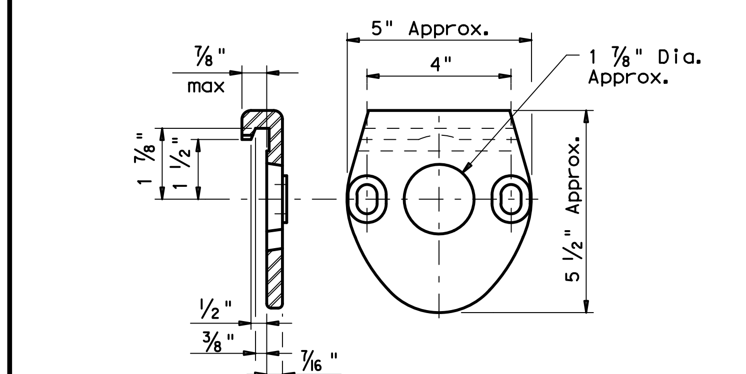
POLE SIMPLEX DETAIL ⑨



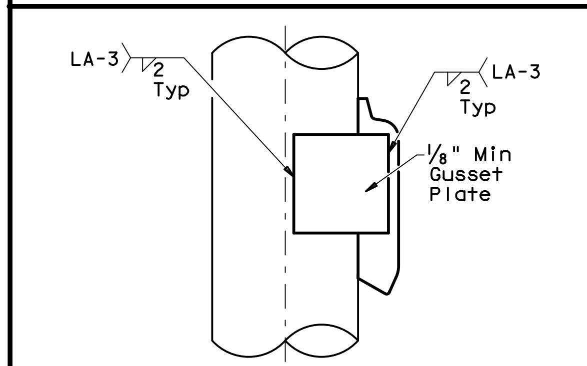
LOWER SIMPLEX FITTING

(Gusset not shown for clarity)

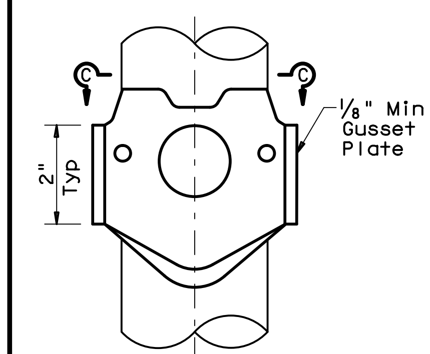
SECTION B-B



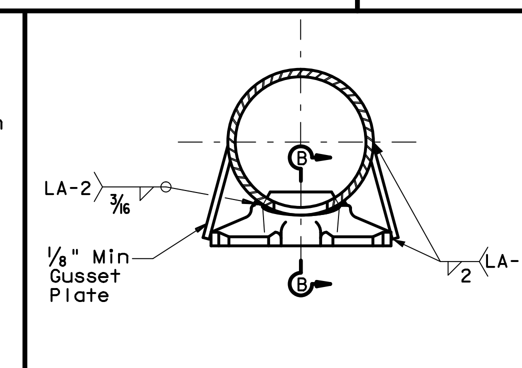
ARM SIMPLEX DETAIL ⑨



SIDE

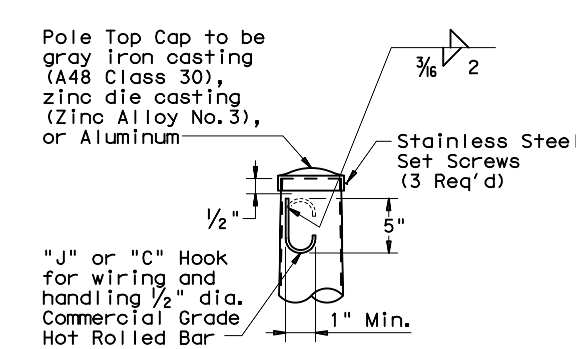


ELEVATION

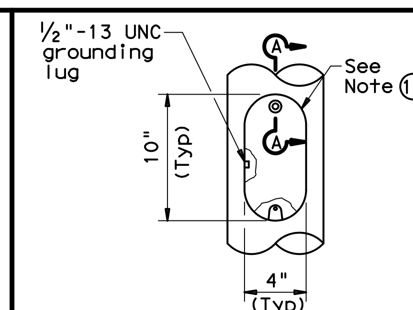


SECTION C-C

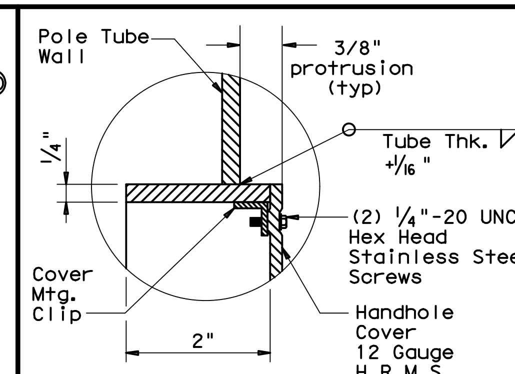
SIMPLEX ATTACHMENT DETAIL



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

Texas Department of Transportation

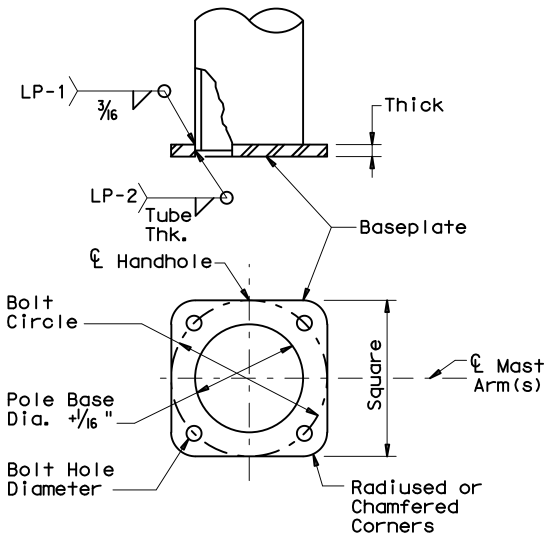
Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(3)-19

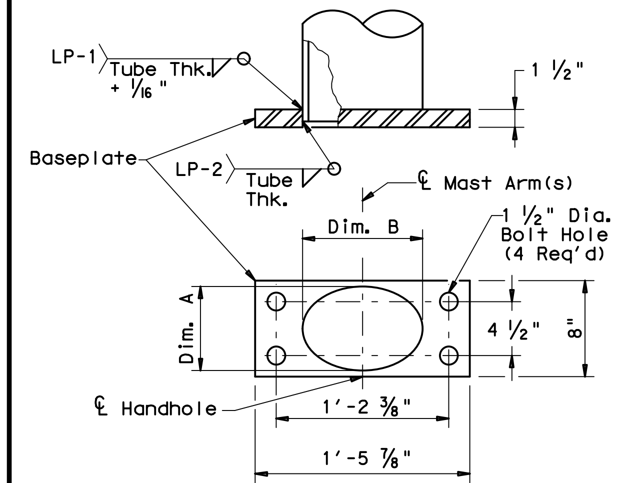
FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS 7-17 12-19	0047	07	243, ETC.	US 75, ETC.
	DIST		COUNTY	SHEET NO.
	DAL		DALLAS, ETC.	144

73C



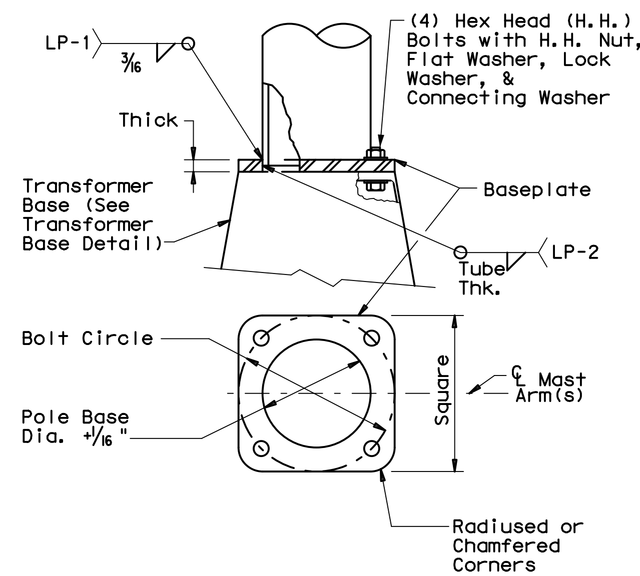
SHOE BASE BASEPLATE

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"



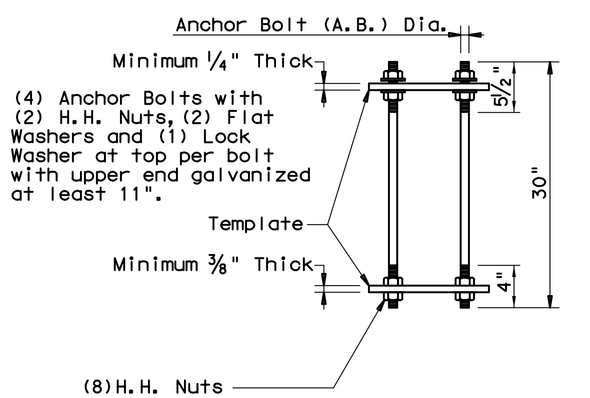
CONCRETE TRAFFIC BARRIER BASE BASEPLATE

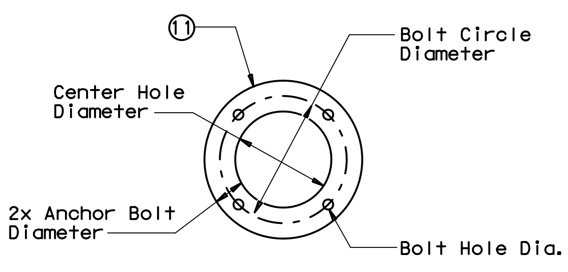
CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA. (12)	DIM. A	DIM. B
28′- 38′	9"	7"± 1/4"	10"± 1/4"
48′	10 1/2"	7"± 1/4"	13"± 1/4"



TRANSFORMER BASE BASEPLATE

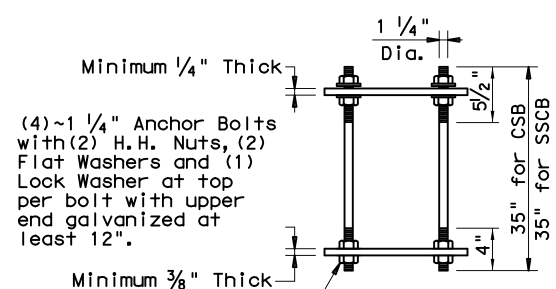
TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFORMER BASE TYPE
20′- 39′	13"	13"	1 1/4"	1"	1 1/4"	A
40′	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50′	15"	15"	1 1/2"	1 1/4"	1 1/2"	B

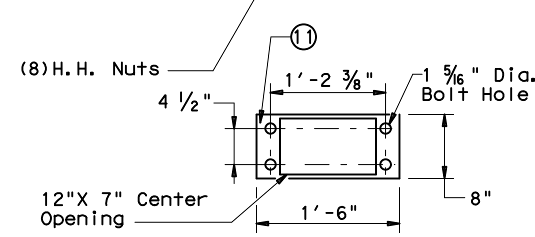




SHOE BASE ANCHOR BOLT ASSEMBLY

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"

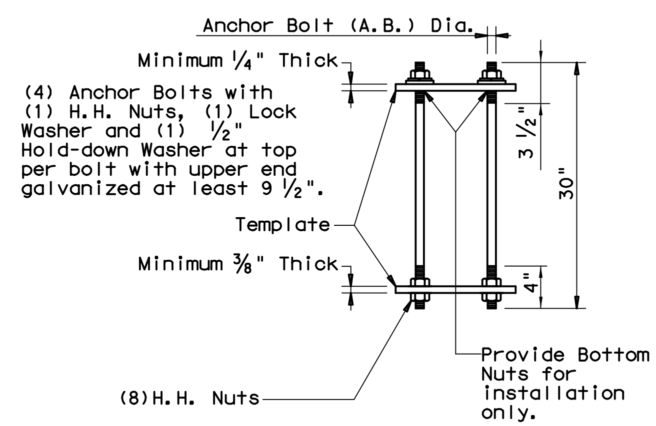


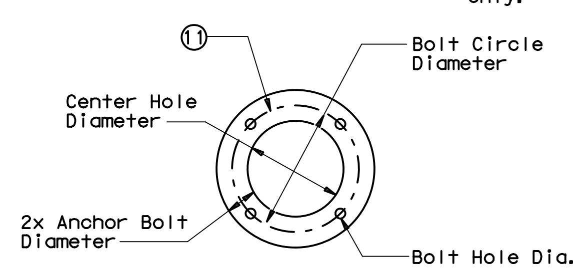


TEMPLATE

CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

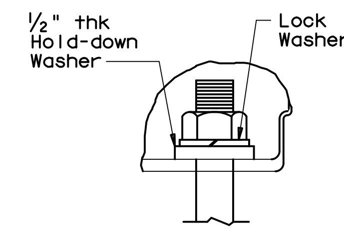
TRANSFORMER BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20′- 39′	1"	14"	12"	1 1/16"
40′- 50′	1 1/4"	17 1/4"	14 3/4"	1 5/16"



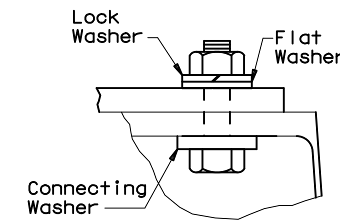


TRANSFORMER BASE ANCHOR BOLT ASSEMBLY

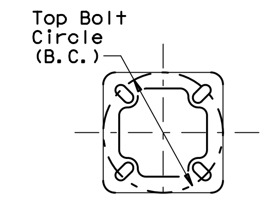
TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



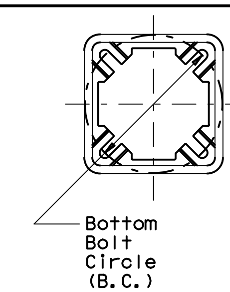
DETAIL A



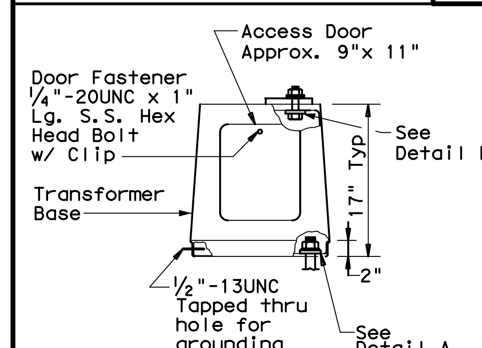
DETAIL B



TOP PLAN



BOTTOM PLAN



ELEVATION

TRANSFORMER BASE DETAILS

GENERAL NOTES:

1. For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
2. 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.
3. 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.
4. 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.
5. 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:

(11) Anchor Bolt Templates do not need to be galvanized.

(12) Pole diameter before ovalized.

ANCHOR BOLT FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"

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 0047	SECT 07	JOB 243, ETC.	HIGHWAY US 75, ETC.
REVISIONS 7-17 12-19	DIST DAL	COUNTY DALLAS, ETC.		SHEET NO. 145

730

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DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damage resulting from its use.

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.)

1. CITY OF DALLAS PHASE II MS 4 - CONTACT KEVIN HURLEY
2. CITY OF RICHARDSON PHASE II MS 4 - CONTACT BILL ALSUP
3. CITY OF PLANO PHASE 1 MS4 - CONTACT ECHO REXROAD

☐ No Action Required ☒ Required Action

Action Number:

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas. No equipment is allowed in any sream 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.

Action Number:

1.

2.

3.

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action Number:

1.
2.

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:

1.
2.

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:

1. Follow Special Notes.

Special Notes:

1. 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.
2. 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.
3. 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:

1.

2.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action Number:

1.

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.

LAST REVISION: 1/15/15

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

 Texas Department of Transportation
Dallas District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		US75
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	SHEET NO.
0047	07	243	146

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

For projects with less than one acre of soil disturbing activity and that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

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):
See Title Sheet

1.2 PROJECT LIMITS:
From: See Title Sheet

To: See Title Sheet

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 32.8037 N ,(Long) 96.7938 W

END: (Lat) 32.8032 N ,(Long) 96.7925 N

1.4 TOTAL PROJECT AREA (Acres): 21.50

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.75

1.6 NATURE OF CONSTRUCTION ACTIVITY:
Traffic signal installation and improvements to pedestrian facilities consisting of: pavement removal of median improvements, conduit, ground box, and controller cabinet installations, etc.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Houston Black Clay, 0% to 1% slopes	100% Clay, Moderately Well Drained, High Rate of Runoff, Slight Erosion Potential
Eddy-Urban land complex, 4 to 8% slopes	Eddy soil 65%, Urban land 25% Minor components 10%, Well drained, Mod low erosion poential
Axtell-Urban Land Complex 1 to 5% slopes	Axtell soil 70%, Urban land 25% Minor components 5%, Mod well d rained, Mod low erosion poential
Urban land	100% urban land

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

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

Type	Sheet #s

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

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

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

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

Tributaries	Classified Waterbody

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

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

July 2023 Sheet 1 of 2
Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		147
STATE	STATE DIST.	COUNTY	
TEXAS	DAL	DALLAS, ETC.	
CONT.	SECT.	JOB	HIGHWAY NO.
0047	07	243, ETC.	US 75, ETC.

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 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 .

2.10 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)

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Texas Department of Transportation

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6	(SEE TITLE SHEET)		148
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CONT.	SECT.	JOB	HIGHWAY NO.
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