FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	STP 2024(095) HES		1
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC	UA 90, ETC

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT
PROJECT NO. STP 2024(095)HES
CCSJ: 0025-03-105

GUADALUPE
UA 90

LIMITS FROM: AT VAUGHAN
TO: N/A

NET LENGTH OF ROADWAY = 1,056.00 FT = 0.200 MI
NET LENGTH OF BRIDGE =
NET LENGTH OF PROJECT = 1,056.00 FT = 0.200 MI

FOR WORK CONSISTING OF IMPROVE/REBUILD TRAFFIC SIGNALS

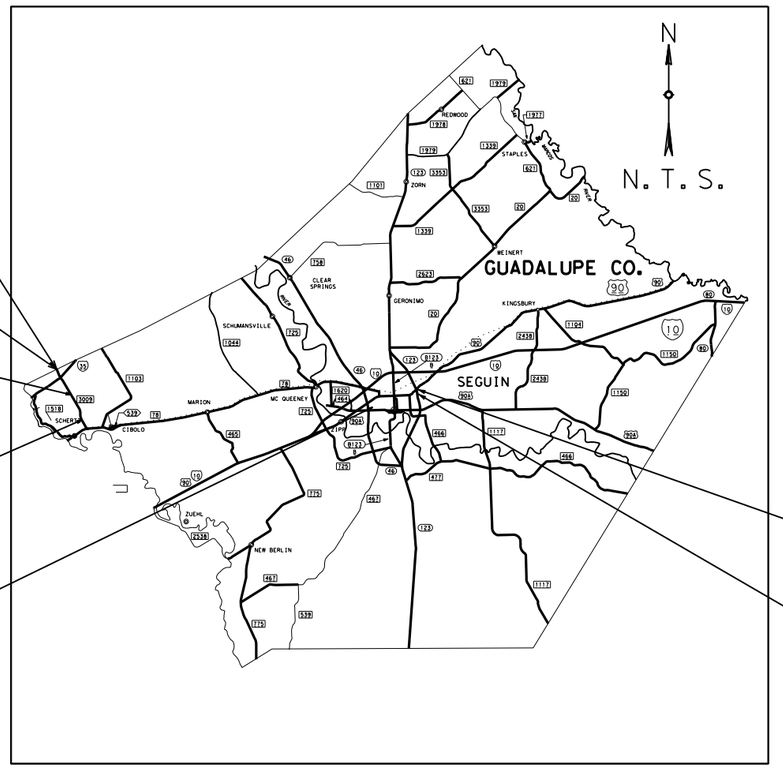
DESIGN SPEED = N/A
AREA OF DISTURBED SOIL = N/A
ADT: 11,728 (2021)
15,012(2041)

ACCESSIBILITY STANDARDS = PROWAG

REGISTERED ACCESSIBILITY SPECIALIST INSPECTION REQUIRED
TDLR NO.

INDEX OF SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS



PROJECT LOCATION #1
FM 3009 AT FOUR OAKS LANE
CSJ 3107-02-038

PROJECT LOCATION #2
FM 3009 AT IH 35
CSJ 3107-02-039

PROJECT LOCATION #3
FM 3009 AT WOODLAND OAKS DR.
CSJ 3107-02-040

PROJECT LOCATION #4
FM 3009 AT ELBEL/BORGFELD RD.
CSJ 3107-02-037

PROJECT LOCATION #5
UA 90 AT VAUGHN AVE.
CSJ 0025-03-105

PROJECT LOCATION #6
SH 123 AT US 90
CSJ 0366-03-071

PROJECT LOCATION #7
SH 123 AT CEDAR/MIDDLETOWNE
CSJ 0366-02-097

EXCEPTIONS: N/A
EQUATIONS: N/A
R.R. CROSSINGS: N/A

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

FINAL PLANS

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR: _____

FINAL PLANS STATEMENT:

THE CONSTRUCTION WORK WAS PERFORMED IN ACCORDANCE WITH THE PLANS.

_____ P.E. _____
AREA ENGINEER DATE

TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED for LETTING
DocuSigned by: 8/24/2023
Orlando Gallegos, P.E.
TRANSPORTATION ENGINEER SUPERVISOR

RECOMMENDED for LETTING
DocuSigned by: 8/24/2023
Clayton Ripps, P.E.
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

REVIEWED for LETTING
DocuSigned by: 8/24/2023
H Rogers, P.E.
TRANSPORTATION ENGINEER SUPERVISOR

APPROVED for LETTING
DocuSigned by: 8/24/2023
Gina E. Gallegos, P.E.
DISTRICT ENGINEER

FILE LOCATION AND NAME
T:\Engdata\Standards\Design\TITLESHEET-2014Specs.DGN

LEVELS DISPLAYED

COUNTY _____ PROJ. NO. _____
HWY. NO. _____ LETTING DATE _____
DATE ACCEPTED _____

INDEX OF SHEETS

NOTES:
1: (*) INDICATES STATE STANDARDS
2: (**) INDICATES SAN ANTONIO DISTRICT STANDARDS

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos P.E. 8-27-23
JOSE O. GALLEGOS RUIZ, P.E. DATE

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

INDEX OF SHEETS

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		2
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

8/25/2023
T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\Title, Index, Loc Map\TITLE SHEET.dgn

**********GENERAL NOTES**********
2014 Specification Book

Contact the Engineer or the City when construction operations are within 400 feet of a signalized intersection to determine/verify the location of loop detectors, conduit, ground-boxes, etc. Repair or replace any signal equipment damaged by construction operations. The method of repair or replacement shall be pre-approved and inspected. Depending on the type and extent of the damage, the Engineer reserves the right to perform the repair or replacement work and the Contractor will be billed for this work.

City of San Antonio: (210) 207-8642

Any materials removed and not reused and determined to be salvageable shall be stored within the project limits at an approved location or delivered undamaged to the storage yard as directed. Deface traffic signs so that they will not reappear in public as signs.

Any sign panels that are adjusted or removed and replaced, shall be done the same workday unless otherwise approved. This work shall be considered subsidiary to Item 502.

Notify the Engineer at least two weeks prior to a proposed traffic pattern change(s) that will require a revision to traffic signals.

Locate and reference all manholes and valves within the construction area with station and offset or GPS. Each manhole and valve shall be identified by its owner (SAWS, CPS, etc.). No roadwork will begin until this list has been submitted. All valves and manhole covers have to be accessible at all times, therefore; temp. CTB, material stockpiles, etc. cannot be placed over these valves or covers.

Hurricane Evacuation

Hurricane Season is from June 1 thru November 30. As the closest metropolitan city inland from the Texas Coast, the City of San Antonio is a major shelter destination during mandatory hurricane evacuations. As such, planned work zone lane or road closures may be restricted and/or suspended during mandatory hurricane evacuation operations. The District will coordinate these restrictions at a minimum H-120 from any projected impact to the Texas Coast.

No time charges will be made if the Engineer determines that work on the project was impacted by the hurricane.

The Engineer may order changes in the Traffic Control Plan to accommodate evacuation traffic, and may suspend the work, all or in part, to ensure timely completion of this work. All work to implement changes in the Traffic Control Plan will be paid through existing bid prices or through Item 9.5, Force Account. However, the Department will not entertain any request for delay damages, loss of efficiency that may be attributed to the restriction or suspension of road or lane closures, or to changes in the Traffic Control Plan.

The Contractor should be aware that the "City Public Service" (CPS) will be consulted by the Engineer in matters concerning the execution of the work, materials and testing related to the CPS work. As such, a CPS employee may be observing the construction and related operations as they progress.

Submit locate request for SAWS water and sewer to TXDOTlocates@saws.org.

In accordance with the Underground Facility Damage Prevention Act (One Call Bill) the phone number for a utility locator is 811. It is the Contractor's responsibility to plan for utility locators as needed.

Underground utilities owned by the Texas Department of Transportation may be present within the Right-Of-Way. Call or email the TxDOT offices listed below 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 signal and ITS locates call TransGuide at 210-731-5136 or email sat_its_locates@txdot.gov for ITS locates and signal.request@txdot.gov for signal locates.

Contractor questions on this project are to be addressed to the following individual(s):
Traffic Engineer, Orlando Gallegos, P.E., Orlando.Gallegos@txdot.gov

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

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

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

The Contractor must measure the vertical clearance at each structure after the final surface of the roadway is completed and provide the vertical clearance measurement to the Engineer.

--Item 5--
Prevention of Migratory Bird Nesting

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

Structures

Bridge and culvert construction operations cannot begin until swallow nesting prevention is implemented, until after October 1 if it's determined that swallow nesting is actively occurring, or until it's determined swallow nests have been abandoned. If the State installed nesting deterrent on the bridges and culverts, maintain the existing nesting deterrent to prevent swallow nesting until October 1 or completion of the bridge and culvert work, whichever occurs earlier. If new nests are built and occupied after the beginning of the work, do not perform work that can interfere with or discourage swallows from returning to their nests. Prevention of swallow nesting can be performed by one of the following methods:

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape, or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

2. By February 15 place a nesting deterrent (which prevents access to the bridge and culvert by swallows) on the entire bridge (except deck and railing) and culverts. This work is subsidiary to the various bid items.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows.

Provide a non-intrusive back-up alarm system on all heavy equipment used in close proximity to residential areas. This item is subsidiary to various bid items.

Excavation within 5 feet of an existing CPS Energy pole will require pole bracing. Contact CPS Energy utility coordination to request pole bracing (Customer Engineering 210-353-4050). The estimated duration for the pole bracing process is approximately 10 to 15 weeks.

--Item 6--
Show the stockpile lot and/or sub lot numbers on all tickets for all materials.

Steel Wrapped or Asbestos Utility Lines:

Existing steel wrapped natural gas and/or asbestos cement (AC) water lines that will no longer be in service are usually abandoned in place (AIP). However, if any of these lines have to be removed for whatever reason (in the way of other construction, to make tie-ins, etc.), comply with Item 6.

If removal of AC water lines is included in the construction contract, then notify the Engineer of proposed dates of removal of the AC water lines in accordance to Item 6. Excavate to the top of the AC water line to allow a separate contractor hired by the State to remove the AC water line. The excavation for the AC water line removal is subsidiary to the work that created the need for the removal (excavation for structures, roadway, a new line, tie-ins, etc.).

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

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

--Item 7--
The total disturbed area within the project is anticipated at less than one (1) acre. Due to this type of construction, the project qualifies for exclusion under the Construction General Permit (CGP) issued by the Texas Commission on Environmental Quality (TCEQ). However, should the sum of the Engineer's anticipated disturbances and the Contractor's (On ROW and off ROW) PSL's equal or exceed the one (1) acre threshold; both TxDOT and the Contractor have project responsibilities under the CGP that reverts to non-exclusion status. Obtain approval for all non-depicted areas of disturbance that increases the initial soil and vegetation disturbed area estimates before work starts at these locations.

Notify the Engineer of the disturbed acreage within one (1) mile of the project limits. Obtain authorization from the TCEQ for Contractor PSL's for construction support activities on or off ROW.

Roadway closures during the following key dates and/or special event are prohibited.
See the general notes under Item 502 for these dates.
--Item 8--
Working days will be computed and charged in accordance with Article 8.3.1.4 Standard work week.

A Special Provision to Item 8 for a delayed authorized date to begin work has been included in the contract. The reason for including the Special Provision is for material processing or contractor mobilization.

Create and maintain a Bar Chart schedule.

--Item 9--
When approved, provide uniformed, off-duty law enforcement officers with marked vehicles during work that requires a lane closure. The officer in marked vehicles shall be located as approved to monitor or direct traffic during the closure. The method used to direct traffic at signalized intersections shall be as approved. Additional officers and vehicles may be provided when approved or directed.

Complete the daily 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.

Show proof of certification by the Texas Commission on Law Enforcement Standards.

All law enforcement personnel used in Work Zone Traffic Control shall be trained for performing duties in work zones and are required to take "Safe and Effective Use of Law Enforcement Personnel in Work Zones" (Course #133119) which can be found online at the following site: www.nhi.fhwa.dot.gov

Certificates of completion should be available to all who finish the course. These should be kept by the officers to substantiate completion when reporting to the work site.

Minimums, scheduling fees, etc. will not be paid; TxDOT will consider paying cancellation fees on a case-by-case basis.

Removal and disposal of existing abandoned utilities that were unable to be identified before letting required to support this project's construction shall be performed under the overall Preparing Right of Way. If you are uncertain whether the utility is active, contact the District Utility Section.

All reclaimable asphalt pavement (RAP) material will be retained by the Contractor.

--Item 420--
Mass concrete will be measured in place.

Pier and Bent Concrete will be paid for as "Plans Quantity".

--Item 421--
Use an automated ticket that contains the same information as shown in the standard specification. Submit the ticket for approval prior to use. The concrete producer will contact the District Laboratory or the Engineer's Office (outside the San Antonio area) to inform TxDOT of scheduled structural concrete batching. The Engineer may suspend concrete operations if ticket information is incomplete/incorrect.

Entrained air is allowed for Class P and Class HES concrete only. Air content testing is waived for all classes of concrete.

--Item 423--
The backfill material for precast retaining walls shall be approved before placement. Build stockpile(s) in lifts not to exceed 2 feet and a minimum working face of not less than 10 feet, but not more than 20 feet.

--Item 465--
Concrete Class B invert shaping is required at all inlets, manholes and junction boxes to insure positive flow. The material and work performed for the placement of the inverts shall be considered subsidiary to this item.

--Item 496--
The Contractor will submit a demolition plan for all structures to be replaced and/or removed in accordance with Item 496.

--Item 500--
"Materials on Hand" payments will not be considered in determining percentages for mobilization payments.

--Item 502--
General

In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have an employee available to respond on the project for emergencies and for taking corrective measures within 2 hours or within a reasonable time frame as specified by the Engineer.

Treat the pavement drop-offs as shown in the TCP.
Avoid placing stockpiles, equipment, and other construction materials within the roadway's horizontal clear zone or at any location that will constitute a hazard and will endanger traffic. If a stockpile is placed within the clear zone, address in accordance with the TMUTCD.

If Nighttime work is required and work is not behind positive barrier then full Class 3 reflective gear is required to be worn by all workers, hard hat halos are required to be worn by the flaggers at flagging stations, TY III barricades are required to be spaced at 500 ft, and a mandatory night work meeting is required.

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.

Mounting and moving the mailbox as needed for the various construction phases is subsidiary to Item 502.

Access to adjoining property must be maintained at all times.

Barricades, Signs, and Traffic Control Devices

When advanced warning flashing arrow panels and/or changeable message sign is specified, have one standby unit in good condition at the job site. Standby time shall be considered subsidiary to the bid item.

After written notification, the time frame is provided on the Form 599 to provide properly maintained signs and barricades before considered in non-compliance with this item.

Moving an existing sign to a temporary location is subsidiary to Item 502. Installations with permanent supports at permanent locations will be paid for under the applicable bid item(s).

Cover permanent signs if not used. This is subsidiary to Item 502.

Lane and Ramp Closures and Detours

Notify the Engineer in writing 10 business days in advance of any temporary or permanent lane, ramp, connector, etc. closures/detours, restrictions to lane widths, alterations to vertical clearances, or modifications to radii. Any other modifications to the roadway that may adversely affect the mobility of oversized/overweight trucks also require 10 business days advance written notice to the Engineer. At least one lane must always remain open.

For closures not listed in the TCP; the lane closures are limited to between the hours of 9 P.M.to 5 A.M., and at least one lane must remain open at all times.

At no time shall two consecutive intersecting roadways be closed at one time during construction.

Unless otherwise noted in the plans and/or as directed by the Engineer, daily lane closures shall be limited according to the following restrictions:

Nighttime:
(With uniformed off duty law enforcement officers)

Weekend closures when approved by the Engineer: Weekend work is not permitted.

No lane closures will be permitted for the following dates and/or special events:
Between December 15 and January 1
Fiesta Week and Sales Tax Holidays (Bexar County Only)
Wednesday before Thanksgiving thru the Sunday after Thanksgiving
Saturday and Sunday before Memorial Day and Labor Day
Saturday or Sunday when July 4 falls on a Friday or Monday
Election days (Bexar County Only)
During major events at the AT&T Center (Spurs home games, Rodeo, concerts, etc.) Alamodome, and/or Convention Center (Bexar County Only)
Easter Weekend - April 7th to 9th

Traffic Signals

There are traffic signals at the intersection of FM 3009 at Four Oaks Ln, IH 35, Woodland Oaks Dr, Elbel/ Borgfeld, and UA 90 at Vaughn Ave and SH 123 at US 90 and Cedar/ Middletowne. Always keep the signals in operation except when necessary for specific installation operations, including any modifications to existing signal heads to always maintain clear visibility. Adjustment of any signal head will be subsidiary to Item 502. When it is necessary for a signal to be turned off, or when left-turn lanes are closed, hire off duty police officers to control the traffic until the signals are back in satisfactory condition.

Moving or adjustment of traffic signal heads, VIVDS, and radar detection for the purpose of alignment with the shifting of lanes in conjunction with the traffic control plan will be subsidiary to various bid items.

Coordinate with the appropriate entity (City of San Antonio, City of New Braunfels, etc.) or TxDOT when left-turn lanes are closed and/or for signal timing revisions as necessary.

Hauling

The use of rubber-tired equipment will be required for moving dirt or other materials along or across pavement surfaces. Where the contractor desires to move any equipment not licensed for operation on public highways, on or across pavement, they shall protect the pavement from damage as directed/approved by the Engineer.

Throughout construction operations, the Contractor will be required to conduct their hauling operations in a manner such that vehicles will not haul over previously recompacted subgrade or compacted base material, except in short sections for dumping manipulations.

The Contractor shall keep the roadway clean and free of dirt or other materials during hauling operations. If the Contractor does not maintain a clean roadway, they shall cease all construction operations, when directed by the Engineer, to clean the roadway to the satisfaction of the Engineer.

--Item 506--
An Inspector will perform a regularly scheduled SWP3 inspection every 7 calendar days.

The Storm Water Pollution Prevention Plan (SWP3) consists of temporary erosion control measures needed and provided for under this Item. The disturbed area is less than one acre and use of erosion control measures is not anticipated. If physical conditions encountered at the job site require necessary controls, BMP installation, maintenance, and removal will be paid as extra work on a force account basis per Articles 4.4 and 9.7. An Inspector will perform a regularly scheduled SW3P inspection every 7 calendar days if erosion control measures are installed.

Failure to address items noted on the SW3P inspection report within two report cycles may result in the Department stopping all construction operations, exclusive of time charges, or withholding that month's estimate until the SW3P deficiencies are corrected unless the Engineer determines that the area is too wet to correct SW3P deficiencies.

Failure to correctly maintain daily monitoring reports and submitting to TxDOT on a daily/weekly basis may result in the monthly estimate being withheld.

The lamps in light fixtures may contain hazardous levels of mercury, halide, and sodium vapors. Observe and comply with all federal, state, and local laws, ordinances, and regulations regarding the management of these lamps. Prevent the breakage of the lamps. At a minimum, package all lamps removed from the light fixture(s) in a container that minimizes the breakage of the lamps. Broken lamps shall be collected in a sealed plastic bag (i.e. Ziploc). Broken lamps shall be stored in separate containers from unbroken lamps. Furnish a suitable container and attach a label stating "Universal Waste Lamps" on the container. Write the date the first lamp was placed in the container on the "Universal Waste Lamp" label. Within one (1) week after the first lamp is placed in a container, notify the Engineer. The lamps and PCB containing ballast/capacitors, placed in properly labeled containers, will remain the property of the State. Place the container in an area where it is protected from damage and the elements. The Engineer will plan to collect, transport, and dispose/recycle the container. The ballast/capacitor and lamp's removal and storage are subsidiary to this item.

--Item 618--
It might be necessary to cut concrete for placement of conduit. Saw cut existing concrete, remove the concrete from the steel reinforcement (bars or fabric) and bend the steel to install the conduit. After the conduit has been placed, bend the steel back to its original position and back-fill the trench with an approved concrete. This work is subsidiary to this Item.

The conduit depth for illumination under the City of San Antonio streets is 36 inches.

--Item 628--
Make all arrangements for electrical service, and compliance with local standards and practices for proper installations.

--Item 644--
The wedge anchor system shown on State Standard Sheet SMD (TWT) is not allowed.

Triangular Slipbase Systems with set screws are not allowed.

--Item 666--
Use TY II markings (vs. an acrylic or epoxy) on asphalt surfaces as the sealer for the TY I markings, unless otherwise approved by the Engineer.

--Item 672--
Place all adhesive material directly from the heated dispenser to the pavement. Do not use portable or non-heated containers. Use adhesive of sufficient thickness so that when the marker is pressed into the adhesive, 1/8" or more adhesive will remain under 100% of the marker. The adhesive should extend not less than 1/2" but not more than 1 1/2" beyond the perimeter of the marker.

--Item 677--
Obtain approval before using the mechanical method for the elimination of existing thermoplastic pavement markings.

--Item 680--
Furnish and install all required materials and equipment necessary for the complete and operating traffic signal installation at the following intersections:
FM 3009 at Four Oaks Ln, IH 35, Woodland Oaks Dr, Elbel/ Borgfeld, and UA 90 at Vaughn Ave and SH 123 at US 90 and Cedar/ Middletowne.

The locations shown on the plans for signal pole foundations, controller foundations, conduit and other items may be adjusted to better fit field conditions as approved.
Furnish and install a new Henke Enterprises or Mobotrex eight-phase NEMA TS2 Type 2 controller and cabinet, meeting the requirements of Departmental Materials Specifications DMS-11170. Provide detector panel toggle switches that additionally permit the user to disconnect the detector. For both ground and pole-mount cabinets, provide cabinet configuration with 16 position load bay.

Deliver TS type 2 controller cabinet and assembly to the TxDOT San Antonio district signal shop for programming and testing two weeks in advance prior to contractor installing equipment in the field. Coordinate drop off and pick up with Mark Perez (210) 218-7430.

Connect all field wiring to the controller assembly into the polyphaser. The Signal Shop representative 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. Have a qualified technician on the project site to place the traffic signals in operation.

Once final punch list is complete, contractor is allowed to begin flashing signal operations. Signal shall flash for a minimum of 7 days prior to full operation, unless otherwise approved by the Engineer.

Use LED lamps from the prequalified material producer lists as shown on the Texas Department of Transportation (TxDOT) – Construction Division's (CST) material producer list. Category is "Roadway Illumination and Electrical Supplies." under item 610. No substitutions will be allowed for materials found on this list.

Demonstrate that the field wiring is properly installed. Install the electrical equipment in a neat and workmanlike manner.

Use the following wiring sequence when connecting signal sections to the cabinet:

Conductor No.	Base Color	Tracer Color	Signal Face
1	Black		Yellow Ball
2	White		Neutral
3	Red		Red Ball
4	Green		Green Ball
5	Orange		Yellow Arrow
6	Blue		Green Arrow
7	White	Black	Spare

All existing signal equipment with the exception of the signal controller and related equipment become the property of the Contractor. Deliver the controller and related equipment to the Signal shop, located at 4615 NW Loop 410 (corner of IH 410 and Callaghan Road) in San Antonio, Texas or to the Area Office as directed.

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.

Integrate the proposed traffic signal(s) into the existing Advanced Traffic Management System (ATMS) as shown on the plans. Centracs ATMS software, which utilizes Econolite controllers, is currently in use in the San Antonio District. Provide controllers on this project that fully communicate with the existing ATMS software.

This project includes the installation of at least one cellular modem at the location(s) specified in the plans. Cellular modem(s) and power supply(s) will be furnished by the department. Provide all materials not supplied by the department necessary for the cellular modem installation. All materials provided by the contractor must be new unless otherwise shown on the plans. Equipment provided by the department shall be stored by the department for pick up at the TxDOT San Antonio TransGuide Office, 3500 NW Loop 410 San Antonio, TX 78229. Prevent damage to all cellular modem components supplied by the department. Replace any component that is damaged or lost during transportation or installation at the contractor's expense. Verify operation of the cellular modem(s) together with operation of its links; demonstrate that data can be transmitted at a satisfactory rate from the field location to the central location. Demonstrate that the cellular modem(s) data packets are being received at the central site via a networked computer. Transportation, installation and incidentals for installation of the cellular modem(s) shall be considered subsidiary to item 680.

Provide a submittal compliance matrix with all traffic signal submittals.

Field verify the depths of the drill shafts to meet the minimum clearances specified in the plans before ordering materials.

Ensure that all TMS (Traffic Management System) equipment furnished and installed is completely compatible with the existing hardware and software located within the TransGuide operations center (i.e. TransGuide central software). The contractor shall contact the traffic management engineer for details on the system network architecture.

Contractor shall be responsible for integrating and testing all new TMS equipment and any existing TMS equipment that is relocated into the existing network management system, subsidiary to the various bid items.
--Item 682--
Pedestrian signals may be by a different manufacturer than the vehicle signal heads.

Cover all signal faces until placed in operation. This work is subsidiary to various bid items.

All mounting attachments shall be constructed of steel pipe and mounted as shown on the plans.

--Item 684--
Provide an extra 10' for each cable terminating in the controller cabinet. All cables must be continuous without splices from terminal point to terminal point. All proposed signal cable must be #12 AWG stranded copper.

--Item 686 & 687--

County: Guadalupe

Highway: UA 90, Etc.

Provide all signal poles from the same manufacturer. Pedestrian poles may be from a different manufacturer.

--Item 688--
The sealant used for vehicle loop wire must be approved.

The button placement must be coordinated with the concrete pad to access the button according to ADA and TAS. If any mounting modifications are needed (extensions, brackets, etc.) to meet ADA and TAS requirements the adjustment will be subsidiary to Item 688. The concrete pad (if required) will be paid separately.

The pedestrian push button must be wired with a 2/C#14 loop detector cable in lieu of a #12 A.W.G. XHHW wire.

Furnish and install new Polara Enterprises accessible pedestrian signals (APS) push buttons or approved equivalent.

--Item 730--
Mow full-width and hand trim the right of way, including newly seeded or sodded areas, when vegetation reaches a height of 16” or when directed. Removal of brush sprouts growing within guardrail, concrete barriers or at other locations where mowing or hand trimming is done within the limits of construction is required and subsidiary to this item. Mowing may be required more often in newly sodded or seeded areas than in other parts of the project because of the supplemental irrigation these areas receive and the resulting weed growth. Coordinate mowing to avoid rutting or compaction of the soil when mowing where supplemental irrigation is being used. Use mowing equipment that will not adversely affect soil retention blankets or mulches that have been applied. Work performed under this item does not replace the mowing required when placing permanent seeding in an area that has established temporary seeding as described in Article 164.3, Construction.

--Item 734--
Perform Litter Removal once a month or as directed by the Engineer.

During hurricane season (June-October), special attention should be given to remove and dispose of litter and debris from the right of way.

--Item 735--
Perform Debris Removal as directed by the Engineer.

During hurricane season (June-October), special attention should be given to keep center medians, mainlanes, HOV lanes, shoulders, frontage roads, entrance and exit ramps, and direct connector ramps clear of debris.

--Item 738--
Perform Cleaning and Sweeping Highways once a month or as directed by the Engineer.

--Item 3076, 3077, 3079, 3080, 3081, & 3082 --
1. Table 10 in Item 3076 and Table 11in Item 3077, Hamburg Wheel Test Requirements tested in accordance with Tex-242-F are changed for PG 64-22 or lower and PG 70-22. Minimum number of passes at 12.55 mm Rut Depth, Tested at 50 degrees C will be 5,000 and 10,000 respectively.

Submit a copy of the Tex 233-F production charts on a weekly basis. At the end of the ACP work, provide all originals.

Do not use diesel or solvents as asphalt release agents in production, transportation, or construction. A list of approved asphalt release agents is available from the District Laboratory.

--Item 6185--
2 shadow vehicles with TMA will be required for this project. The TMA’s will be measured and paid for by the DAY for each TMA/TA set up and operational on the worksite. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMA’s needed for the project. See TMA and TA Summary sheet in the plans.

--Item 6292--
Radar presence detection device must utilize true-presence detection. Systems using locking algorithms to attempt presence detection will not be accepted. In addition, radar systems will not be allowed to use extensions/delays or place the controller on locking detection to aid in presence detection.
Radar presence detection device must be able to detect up to 10 lanes with a minimum offset of 6’ and have at least 16 zones and channels per unit.
Radar presence detection device must be mounted on the same side of the intersection as the lanes it is set to detect.

Final placement of radar devices must be approved by the engineer.

Furnish and install new Wavetronix SmartSensor Matrix, or approved equivalent, for radar presence detectors and Wavetronix SmartSensor Advance, or approved equivalent, for radar advanced detection devices.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0025-03-105 **DISTRICT** San Antonio **COUNTY** Guadalupe
HIGHWAY FM 3009, SH 123, UA 90

				0025-03-105		0366-02-097		0366-03-071		3107-02-037		3107-02-038		3107-02-039	
			CONTROL SECTION JOB												
			PROJECT ID	A00188343		A00188349		A00188350		A00188344		A00188345		A00188346	
			COUNTY	Guadalupe		Guadalupe		Guadalupe		Guadalupe		Guadalupe		Guadalupe	
			HIGHWAY	UA 90		SH 123		SH 123		FM 3009		FM 3009		FM 3009	
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	104-6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	100.000						127.000					
	416-6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	11.300						23.000					
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	13.200						27.000					
	500-6001	MOBILIZATION	LS	0.778		0.110						0.081			
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	2.000		2.000		2.000		2.000		2.000		2.000	
	529-6001	CONC CURB (TY I)	LF	86.000						7.000					
	531-6001	CONC SIDEWALKS (4")	SY							15.000					
	531-6004	CURB RAMPS (TY 1)	EA							1.000					
	531-6005	CURB RAMPS (TY 2)	EA	2.000											
	531-6008	CURB RAMPS (TY 5)	EA							1.000					
	531-6017	CURB RAMPS (TY 22)	EA							4.000					
	531-6037	CURB RAMP (TY 1) (MOD)	EA	4.000						2.000					
	536-6004	CONC DIRECTIONAL ISLAND	SY							136.000					
	610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA			4.000						2.000		6.000	
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	165.000						180.000					
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	155.000						245.000					
	618-6053	CONDT (PVC) (SCH 80) (3")	LF	95.000						105.000					
	618-6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF	250.000						490.000					
	620-6009	ELEC CONDR (NO.6) BARE	LF	665.000		905.000		845.000		1,020.000		730.000		1,145.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	40.000						60.000					
	621-6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	95.000		210.000		180.000		810.000		530.000		710.000	
	624-6009	GROUND BOX TY D (162922)	EA							4.000					
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	6.000						1.000					
	628-6002	REMOVE ELECTRICAL SERVICES	EA	1.000						1.000					
	628-6164	ELC SRV TY D 120/240 070(NS)AL(E)PS(U)	EA	1.000						1.000					
	636-6001	ALUMINUM SIGNS (TY A)	SF											15.000	
	636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF			15.000		21.000						13.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA												
	666-6016	REFL PAV MRK TY I (W)6"(DOT)(060MIL)	LF											560.000	
	666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF			2,280.000		3,440.000				1,185.000		3,250.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	210.000						1,160.000					
	666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF			535.000		900.000				410.000		805.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	277.000						598.000					
	666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA			8.000		21.000				8.000		12.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	2.000						10.000					
	666-6055	REFL PAV MRK TY I(W)(DBL ARROW)(060MIL)	EA											6.000	
	666-6057	REFL PAV MRK TY I(W)(DBL ARROW)(100MIL)	EA							2.000					

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0025-03-105 **DISTRICT** San Antonio **COUNTY** Guadalupe
HIGHWAY FM 3009, SH 123, UA 90

				0025-03-105		0366-02-097		0366-03-071		3107-02-037		3107-02-038		3107-02-039	
		CONTROL SECTION JOB													
		PROJECT ID		A00188343		A00188349		A00188350		A00188344		A00188345		A00188346	
		COUNTY		Guadalupe		Guadalupe		Guadalupe		Guadalupe		Guadalupe		Guadalupe	
		HIGHWAY		UA 90		SH 123		SH 123		FM 3009		FM 3009		FM 3009	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	666-6061	REFL PAV MRK TY I(W)(UTURN ARW)(060MIL)	EA					2.000						2.000	
	666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA			8.000		22.000				6.000		13.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2.000						10.000					
	666-6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA							22.000					
	666-6105	REFL PAV MRK TY I (W)(BIKE ARW)(100MIL)	EA									2.000			
	666-6111	REFL PAV MRK TY I(W)(BIKE SYML)(100MIL)	EA									2.000			
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF												
	666-6156	REFL PAV MRK TY I(Y)(MED NOSE)(100MIL)	EA												
	666-6224	PAVEMENT SEALER 4"	LF	1,916.000						2,557.000					
	666-6226	PAVEMENT SEALER 8"	LF	210.000						1,160.000					
	666-6230	PAVEMENT SEALER 24"	LF	277.000						598.000					
	666-6231	PAVEMENT SEALER (ARROW)	EA	2.000						10.000					
	666-6232	PAVEMENT SEALER (WORD)	EA	2.000						10.000					
	666-6233	PAVEMENT SEALER (MED NOSE)	EA												
	666-6234	PAVEMENT SEALER (DBL ARROW)	EA							2.000					
	666-6243	PAVEMENT SEALER (YLD TRI)	EA							22.000					
	666-6298	RE PM W/RET REQ TY I (W)4"(BRK)(060MIL)	LF			300.000						280.000		460.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	200.000						450.000					
	666-6301	RE PM W/RET REQ TY I (W)4"(SLD)(060MIL)	LF			955.000						290.000		580.000	
	666-6304	RE PM W/RET REQ TY I (W)6"(BRK)(060MIL)	LF					420.000				280.000		460.000	
	666-6307	RE PM W/RET REQ TY I (W)6"(SLD)(060MIL)	LF					1,860.000				290.000		330.000	
	666-6310	RE PM W/RET REQ TY I (Y)4"(BRK)(060MIL)	LF									30.000			
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	80.000						40.000					
	666-6313	RE PM W/RET REQ TY I (Y)4"(SLD)(060MIL)	LF			1,170.000						1,185.000		490.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	1,636.000						2,067.000					
	672-6007	REFL PAV MRKR TY I-C	EA	20.000		53.000		85.000		219.000		24.000		175.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	80.000						104.000		19.000			
	672-6010	REFL PAV MRKR TY II-C-R	EA									61.000			
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	1,200.000						2,070.000					
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF							1,200.000					
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	255.000						620.000					
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA							5.000					
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA												
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA							5.000					
	678-6001	PAV SURF PREP FOR MRK (4")	LF	1,916.000						2,557.000					
	678-6004	PAV SURF PREP FOR MRK (8")	LF	210.000						1,160.000					
	678-6008	PAV SURF PREP FOR MRK (24")	LF	277.000						598.000					

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0025-03-105 **DISTRICT** San Antonio **COUNTY** Guadalupe
HIGHWAY FM 3009, SH 123, UA 90

				0025-03-105		0366-02-097		0366-03-071		3107-02-037		3107-02-038		3107-02-039	
		CONTROL SECTION JOB													
		PROJECT ID		A00188343		A00188349		A00188350		A00188344		A00188345		A00188346	
		COUNTY		Guadalupe		Guadalupe		Guadalupe		Guadalupe		Guadalupe		Guadalupe	
		HIGHWAY		UA 90		SH 123		SH 123		FM 3009		FM 3009		FM 3009	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	2.000						10.000					
	678-6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA							2.000					
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA	2.000						10.000					
	678-6023	PAV SURF PREP FOR MRK (36")(YLD TRI)	EA							22.000					
	678-6024	PAV SURF PREP FOR MRK (MED NOSE)	EA												
	680-6002	INSTALL HWY TRF SIG (ISOLATED)	EA	1.000						1.000					
	680-6004	REMOVING TRAFFIC SIGNALS	EA	1.000						1.000					
	680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA			1.000		1.000				1.000		1.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	8.000		12.000		13.000		8.000		8.000		16.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	2.000		2.000		4.000		4.000		3.000		8.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	8.000		12.000		13.000		8.000		8.000		14.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	4.000		4.000		6.000		4.000		5.000		6.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	8.000		12.000		13.000		8.000		8.000		14.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	2.000		2.000		4.000		2.000		2.000		4.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	6.000		8.000		12.000		8.000		6.000		12.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	8.000		12.000		15.000		6.000		7.000		16.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	2.000		2.000		2.000		4.000		2.000		2.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA									1.000		2.000	
	684-6009	TRF SIG CBL (TY A)(12 AWG)(4 CONDR)	LF	535.000		350.000		300.000		1,175.000		1,175.000		5,060.000	
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	695.000		905.000		845.000		1,110.000		710.000		845.000	
	684-6028	TRF SIG CBL (TY A)(14 AWG)(2 CONDR)	LF			2,050.000		2,445.000				1,130.000		5,060.000	
	684-6080	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)	LF	500.000		350.000		300.000		1,135.000				400.000	
	686-6027	INS TRF SIG PL AM(S)1 ARM(24')LUM	EA	1.000						2.000					
	686-6035	INS TRF SIG PL AM(S)1 ARM(32')LUM	EA												
	686-6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA							2.000					
	686-6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	EA												
	687-6001	PED POLE ASSEMBLY	EA							4.000					
	688-6001	PED DETECT PUSH BUTTON (APS)	EA	6.000		8.000				8.000		6.000		12.000	
	688-6002	PED DETECT PUSH BUTTON (STANDARD)	EA					12.000							
	688-6003	PED DETECTOR CONTROLLER UNIT	EA	1.000		1.000		1.000		1.000		1.000		1.000	
	690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA			20.000		13.000				17.000		30.000	
	690-6030	REMOVAL OF PEDESTRIAN PUSH BUTTONS	EA			8.000		10.000				6.000		12.000	
	690-6086	REMOVE VID IMAGE VEH DET SYS (VIVDS)	EA			8.000		8.000				6.000		5.000	
	6004-6031	ITS COM CBL (ETHERNET)	LF	150.000		400.000		420.000		105.000		112.000		130.000	
	6010-6010	CCTV FIELD EQUIP (ANALOG) (INSTL ONLY)	EA	1.000		1.000		2.000		1.000		1.000		1.000	
	6027-6003	CONDUIT (PREPARE)	LF			905.000		845.000				710.000		845.000	
	6027-6008	GROUND BOX (PREPARE)	EA			10.000		9.000				5.000		8.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0025-03-105 **DISTRICT** San Antonio **COUNTY** Guadalupe
HIGHWAY FM 3009, SH 123, UA 90

			CONTROL SECTION JOB	**0025-03-105**		**0366-02-097**		**0366-03-071**		**3107-02-037**		**3107-02-038**		**3107-02-039**	
			PROJECT ID	**A00188343**		**A00188349**		**A00188350**		**A00188344**		**A00188345**		**A00188346**	
			COUNTY	**Guadalupe**		**Guadalupe**		**Guadalupe**		**Guadalupe**		**Guadalupe**		**Guadalupe**	
			HIGHWAY	**UA 90**		**SH 123**		**SH 123**		**FM 3009**		**FM 3009**		**FM 3009**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	6185-6002	TMA (STATIONARY)	DAY	10.000		20.000		40.000		10.000		20.000		20.000	
	6292-6001	RVDS(PRESENCE DETECTION ONLY)	EA	4.000		2.000		6.000		4.000		4.000		6.000	
	6292-6002	RVDS(ADVANCE DETECTION ONLY)	EA			2.000		4.000		2.000		2.000		6.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000											
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000											

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0025-03-105 **DISTRICT** San Antonio **COUNTY** Guadalupe
HIGHWAY FM 3009, SH 123, UA 90

			CONTROL SECTION JOB		**3107-02-040**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00188347**		
			COUNTY		**Guadalupe**		
			HIGHWAY		**FM 3009**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	104-6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	120.000		347.000	
	416-6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	23.000		57.300	
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	26.000		66.200	
	500-6001	MOBILIZATION	LS	0.031		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	2.000		14.000	
	529-6001	CONC CURB (TY I)	LF			93.000	
	531-6001	CONC SIDEWALKS (4")	SY			15.000	
	531-6004	CURB RAMPS (TY 1)	EA			1.000	
	531-6005	CURB RAMPS (TY 2)	EA	1.000		3.000	
	531-6008	CURB RAMPS (TY 5)	EA			1.000	
	531-6017	CURB RAMPS (TY 22)	EA	4.000		8.000	
	531-6037	CURB RAMP (TY 1) (MOD)	EA			6.000	
	536-6004	CONC DIRECTIONAL ISLAND	SY	71.000		207.000	
	610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA			12.000	
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	100.000		445.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	300.000		700.000	
	618-6053	CONDT (PVC) (SCH 80) (3")	LF	115.000		315.000	
	618-6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF	600.000		1,340.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	1,115.000		6,425.000	
	620-6010	ELEC CONDR (NO.6) INSULATED	LF	10.000		110.000	
	621-6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	795.000		3,330.000	
	624-6009	GROUND BOX TY D (162922)	EA			4.000	
	624-6010	GROUND BOX TY D (162922)W/APRON	EA	5.000		12.000	
	628-6002	REMOVE ELECTRICAL SERVICES	EA	1.000		3.000	
	628-6164	ELC SRV TY D 120/240 070(NS)AL(E)PS(U)	EA	1.000		3.000	
	636-6001	ALUMINUM SIGNS (TY A)	SF	9.000		24.000	
	636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF			49.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1.000		1.000	
	666-6016	REFL PAV MRK TY I (W)6"(DOT)(060MIL)	LF			560.000	
	666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF			10,155.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	982.000		2,352.000	
	666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF			2,650.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	564.000		1,439.000	
	666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA			49.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	11.000		23.000	
	666-6055	REFL PAV MRK TY I(W)(DBL ARROW)(060MIL)	EA			6.000	
	666-6057	REFL PAV MRK TY I(W)(DBL ARROW)(100MIL)	EA	4.000		6.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0025-03-105 **DISTRICT** San Antonio **COUNTY** Guadalupe
HIGHWAY FM 3009, SH 123, UA 90

			CONTROL SECTION JOB		**3107-02-040**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00188347**		
			COUNTY		**Guadalupe**		
			HIGHWAY		**FM 3009**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	666-6061	REFL PAV MRK TY I(W)(UTURN ARW)(060MIL)	EA			4.000	
	666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA			49.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	11.000		23.000	
	666-6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	21.000		43.000	
	666-6105	REFL PAV MRK TY I (W)(BIKE ARW)(100MIL)	EA			2.000	
	666-6111	REFL PAV MRK TY I(W)(BIKE SYML)(100MIL)	EA			2.000	
	666-6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF	52.000		52.000	
	666-6156	REFL PAV MRK TY I(Y)(MED NOSE)(100MIL)	EA	2.000		2.000	
	666-6224	PAVEMENT SEALER 4"	LF	1,433.000		5,906.000	
	666-6226	PAVEMENT SEALER 8"	LF	982.000		2,352.000	
	666-6230	PAVEMENT SEALER 24"	LF	616.000		1,491.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	11.000		23.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	11.000		23.000	
	666-6233	PAVEMENT SEALER (MED NOSE)	EA	2.000		2.000	
	666-6234	PAVEMENT SEALER (DBL ARROW)	EA	4.000		6.000	
	666-6243	PAVEMENT SEALER (YLD TRI)	EA	21.000		43.000	
	666-6298	RE PM W/RET REQ TY I (W)4"(BRK)(060MIL)	LF			1,040.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	240.000		890.000	
	666-6301	RE PM W/RET REQ TY I (W)4"(SLD)(060MIL)	LF			1,825.000	
	666-6304	RE PM W/RET REQ TY I (W)6"(BRK)(060MIL)	LF			1,160.000	
	666-6307	RE PM W/RET REQ TY I (W)6"(SLD)(060MIL)	LF			2,480.000	
	666-6310	RE PM W/RET REQ TY I (Y)4"(BRK)(060MIL)	LF			30.000	
	666-6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	40.000		160.000	
	666-6313	RE PM W/RET REQ TY I (Y)4"(SLD)(060MIL)	LF			2,845.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	1,153.000		4,856.000	
	672-6007	REFL PAV MRKR TY I-C	EA	231.000		807.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	76.000		279.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA			61.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	1,406.000		4,676.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	1,149.000		2,349.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	637.000		1,512.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	10.000		15.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	5.000		5.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	10.000		15.000	
	678-6001	PAV SURF PREP FOR MRK (4")	LF	1,433.000		5,906.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	982.000		2,352.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	616.000		1,491.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0025-03-105 **DISTRICT** San Antonio **COUNTY** Guadalupe
HIGHWAY FM 3009, SH 123, UA 90

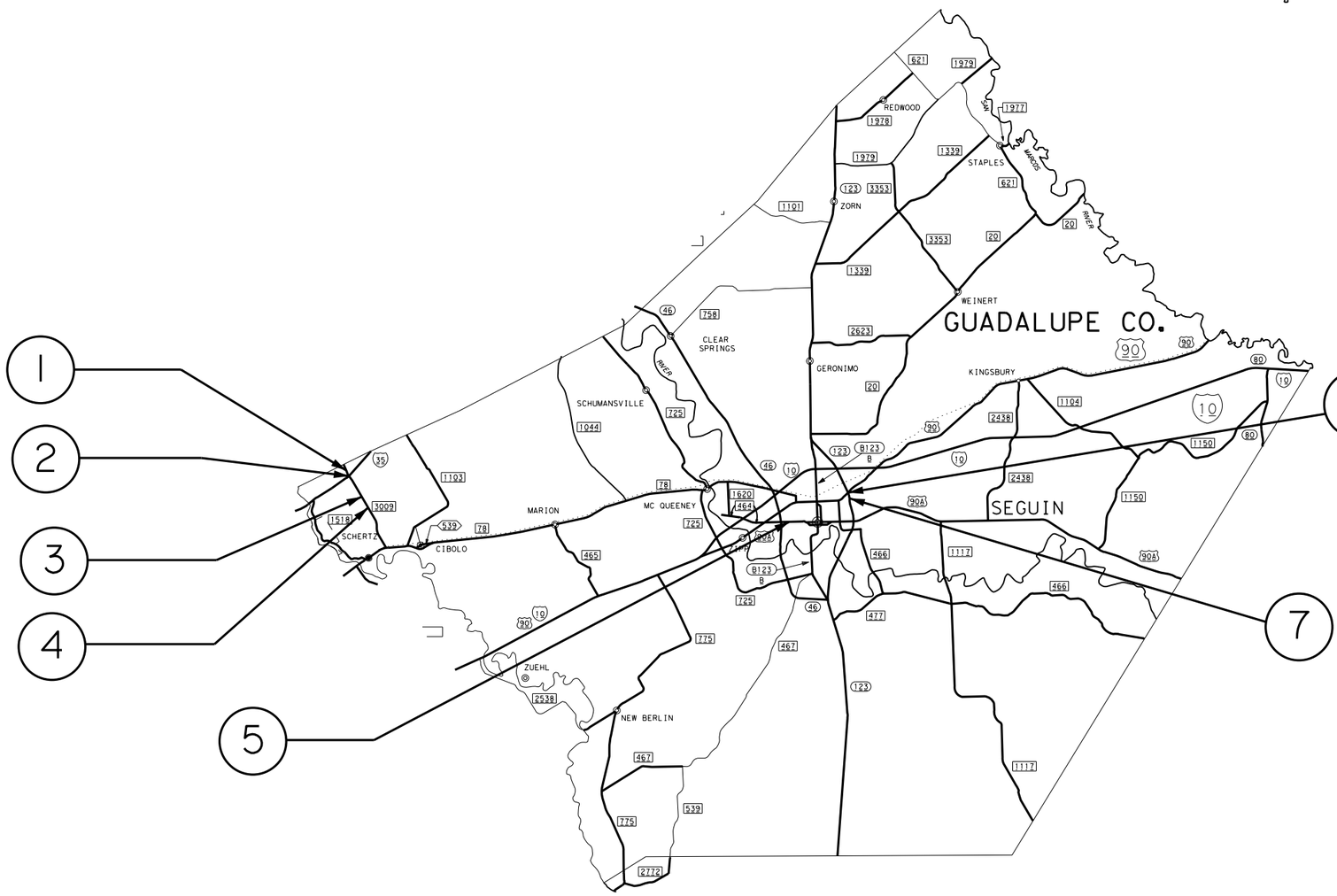
				CONTROL SECTION JOB	3107-02-040		TOTAL EST.	TOTAL FINAL
				PROJECT ID	A00188347			
				COUNTY	Guadalupe			
				HIGHWAY	FM 3009			
ALT	BID CODE	DESCRIPTION	UNIT		EST.	FINAL		
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA		11.000		23.000	
	678-6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA		4.000		6.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA		11.000		23.000	
	678-6023	PAV SURF PREP FOR MRK (36")(YLD TRI)	EA		21.000		43.000	
	678-6024	PAV SURF PREP FOR MRK (MED NOSE)	EA		2.000		2.000	
	680-6002	INSTALL HWY TRF SIG (ISOLATED)	EA		1.000		3.000	
	680-6004	REMOVING TRAFFIC SIGNALS	EA		1.000		3.000	
	680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA				4.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA		8.000		73.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA		4.000		27.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA		8.000		71.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA		8.000		37.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA		8.000		71.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA		4.000		20.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA		6.000		58.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA		8.000		72.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA		4.000		18.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA				3.000	
	684-6009	TRF SIG CBL (TY A)(12 AWG)(4 CONDR)	LF		555.000		9,150.000	
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF		1,440.000		6,550.000	
	684-6028	TRF SIG CBL (TY A)(14 AWG)(2 CONDR)	LF				10,685.000	
	684-6080	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)	LF		525.000		3,210.000	
	686-6027	INS TRF SIG PL AM(S)1 ARM(24')LUM	EA				3.000	
	686-6035	INS TRF SIG PL AM(S)1 ARM(32')LUM	EA		2.000		2.000	
	686-6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA				2.000	
	686-6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	EA		2.000		2.000	
	687-6001	PED POLE ASSEMBLY	EA		2.000		6.000	
	688-6001	PED DETECT PUSH BUTTON (APS)	EA		6.000		46.000	
	688-6002	PED DETECT PUSH BUTTON (STANDARD)	EA				12.000	
	688-6003	PED DETECTOR CONTROLLER UNIT	EA		1.000		7.000	
	690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA				80.000	
	690-6030	REMOVAL OF PEDESTRIAN PUSH BUTTONS	EA				36.000	
	690-6086	REMOVE VID IMAGE VEH DET SYS (VIVDS)	EA				27.000	
	6004-6031	ITS COM CBL (ETHERNET)	LF				1,317.000	
	6010-6010	CCTV FIELD EQUIP (ANALOG) (INSTL ONLY)	EA		1.000		8.000	
	6027-6003	CONDUIT (PREPARE)	LF				3,305.000	
	6027-6008	GROUND BOX (PREPARE)	EA				32.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0025-03-105 **DISTRICT** San Antonio **COUNTY** Guadalupe
HIGHWAY FM 3009, SH 123, UA 90

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**3107-02-040**			
		PROJECT ID		**A00188347**			
		COUNTY		**Guadalupe**			
		HIGHWAY		**FM 3009**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	6185-6002	TMA (STATIONARY)	DAY	10.000		130.000	
	6292-6001	RVDS(PRESENCE DETECTION ONLY)	EA	4.000		30.000	
	6292-6002	RVDS(ADVANCE DETECTION ONLY)	EA	2.000		18.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS			1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS			1.000	

— 1 — FM 3009 AT FOUR OAKS LN
— 2 — FM 3009 AT IH 35
— 3 — FM 3009 AT WOODLAND OAKS DR
— 4 — FM 3009 AT ELBEL/BORGFELD
— 5 — UA 90 AT VAUGHN AVE
— 6 — SH 123 AT US 90
— 7 — SH 123 AT CEDAR/MIDDLETOWNE



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N. T. S.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation
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LOCATION MAP

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		5
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

7/27/2023
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LOC NO.	TCP PHASE	SPECIFIC TCP PLAN SHEET OR TCP STANDARD SHEET	FURNISH TMA/TA	RELOCATE/REUSE TMA/TA	TOTAL TMA/TA PER SET UP	DURATION OF TMA/TA SET UP	6185 6002 TMA (STATIONARY)
		INTERSECTION	EA	EA	EA	DAYS PER TMA/TA USE	DAY
1	FM 3009	FOUR OAKS LN	2		2	10	20
2	FM 3009	IH 35		2	2	10	20
3	FM 3009	WOODLAND OAKS RD		2	2	10	20
4	FM 3009	BLBEL/BORGFELD		2	2	10	20
5	UA 90	VAUGHN AVE		2	2	10	20
6	SH 123	US 90		2	2	10	20
7	SH 123	CEDAR/MIDDLETOWNE		2	2	10	20
		TOTALS	2	12	14	70	140

NOTE.
FURNISH TMA/TA - THE NUMBER OF ATTENUATORS BEING FURNISHED FOR THE SPECIFIC TCP.
RELOCATE/REUSE TMA/TA - THE NUMBER OF ATTENUATORS BEING REUSED FROM A PREVIOUS TCP FOR THE SPECIFIC TCP.
TOTAL TMA/TA PER SET UP = (FURNISH TMA/TA) + (RELOCATE/REUSE TMA/TA)
DURATION OF TMA/TA SET UP - THE NUMBER OF DAYS THE ATTENTUATORS WILL BE USED FOR THE SPECIFIC TCP.
TMA/TA (STATIONARY) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)
TMA/TA (MOBILE OPERATION) = (TOTAL TMA/TA PER SET UP) X (THE DURATION OF TMA/TA SET UP)

TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA) SUMMARY SHEET

FILE: tma.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS 3/2018	0025	03	105, ETC	UA 90, ETC
	DIST	COUNTY	
	SAT	GUADALUPE	
	FEDERAL AID PROJECT	SHEET NO.
	GUADALUPE	6

TRAFFIC CONTROL PLAN SEQUENCE OF WORK

(1) THIS PROJECT WILL BE CONSTRUCTED IN 2 PHASES. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS AND BARRICADES AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. DAILY LANE CLOSURES WILL BE USED IN ACCORDANCE WITH STATE TCP STANDARDS. DROP OFF CONDITIONS OF GREATER THAN 2" MUST HAVE A 3:1 SLOPE AT THE END OF EACH DAY, AS WELL AS THROUGHOUT THE PROJECT WHERE ACCESS TO ADJACENT PROPERTIES IS ALLOWED TO DRIVEWAYS AND SIDE STREETS.

(2) PREPARING ROW / REMOVAL OF EXISTING ITEMS TO BE DONE ONLY IN AREAS WHERE WORK IS OCCURING, AS PER THE PHASES NOTED BELOW.

(3) PLANING, SURFACE TREATMENTS AND OVERLAYS SHALL BE PERFORMED IN THE DIRECTION OF TRAFFIC. BEGIN SURFACE CONSTRUCTION ON HIGH SIDE OF ROAD TO AVOID WATER PONDING ISSUES.

(4) THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC" AND ITEM 502, "BARRICADES, SIGNS, AND TRAFFIC HANDLING", OF THE STANADARD SPECIFICATIONS, AND TO THE GENERAL NOTES.

(5) A BRIEF DESCRIPTION OF THESE PHASES ARE AS FOLLOWS:

PHASE 1 (TRAFFIC SIGNAL UPGRADES)

THE INTENT OF THIS PHASE IS TO UPGRADE TRAFFIC SIGNALS AT LOCATIONS 1, 2, 6 AND 7.
THIS PHASE APPLIES TO EACH LOCATION INDEPENDENTLY.

(1) PLACE PROJECT BARRICADES AND INSTALL ADVANCE WARNING SIGNS (USE TXDOT BC STANDARDS).

(2) USE TCP(2-1)-18, TCP(2-4)-18, AND TCP(2-6)-18 FOR LANE CLOSURES AS NEEDED.

(3) REMOVE EXISTING TRAFFIC SIGNAL ELEMENTS, AS SHOWN IN THE PLANS. ENSURE TRAFFIC SIGNAL REMAINS IN OPERATION AT ALL TIMES.

(4) INSTALL PROPOSED TRAFFIC SIGNAL EQUIPMENT AND RADAR DETECTION, AS SHOWN IN THE PLANS. ENSURE TRAFFIC SIGNAL REMAINS IN OPERATION AT ALL TIMES.

(5) INSTALL PROPOSED PAVEMENT MARKINGS.

(6). PERFORM CLEAN UP.

PHASE 2 (TRAFFIC SIGNAL REBUILD)

THE INTENT OF THIS PHASE IS TO REBUILD TRAFFIC SIGNALS AT LOCATIONS 3, 4 AND 5. THIS PHASE APPLIES TO EACH LOCATION INDEPENDENTLY.

(1) PLACE PROJECT BARRICADES AND INSTALL ADVANCE WARNING SIGNS (USE TXDOT BC STANDARDS).

(2) USE TCP(2-1)-18, TCP(2-4)-18, AND TCP(2-6)-18 FOR LANE CLOSURES AS NEEDED.

(3) INSTALL TEMPORARY EROSION CONTROL MEASURES AS NEEDED.

(4) INSTALL GROUND BOXES, CONDUIT, AND DRILL SHAFT FOUNDATIONS FOR TRAFFIC SIGNAL POLES AND PEDESTRIAN PUSH BUTTONS.

(5) INSTALL TRAFFIC SIGNAL POLES AND TRAFFIC SIGNAL EQUIPMENT.

(6). CONSTRUCT ALL CONCRETE FLATWORK FOR PROPOSED PEDESTRIAN ELEMENTS. MAINTAIN PEDESTRIAN ACCESS AT ALL TIMES USING WZ(BTS-2)-13.

(7). INSTALL PROPOSED PAVEMENT MARKINGS.

(8). REMOVE EXISTING TRAFFIC SIGNAL, REMOVE EROSION CONTROL MEASURES, AND PERFORM CLEANUP.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

TRAFFIC CONTROL PLAN NARRATIVE

SHEET 1 OF 1

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		7
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, 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

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	0025	03	105, ETC	UA 90, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
5-10 5-21	SAT	GUADALUPE		8

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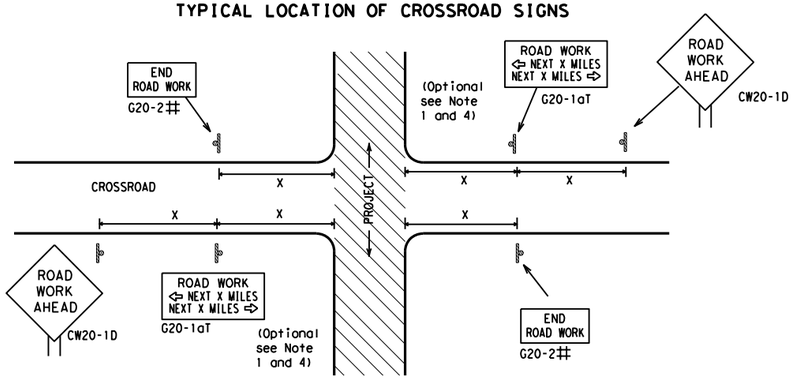
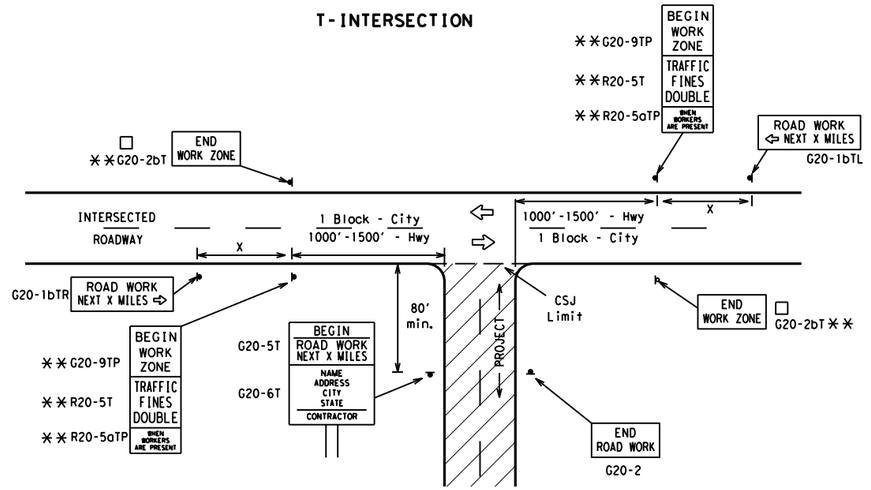
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

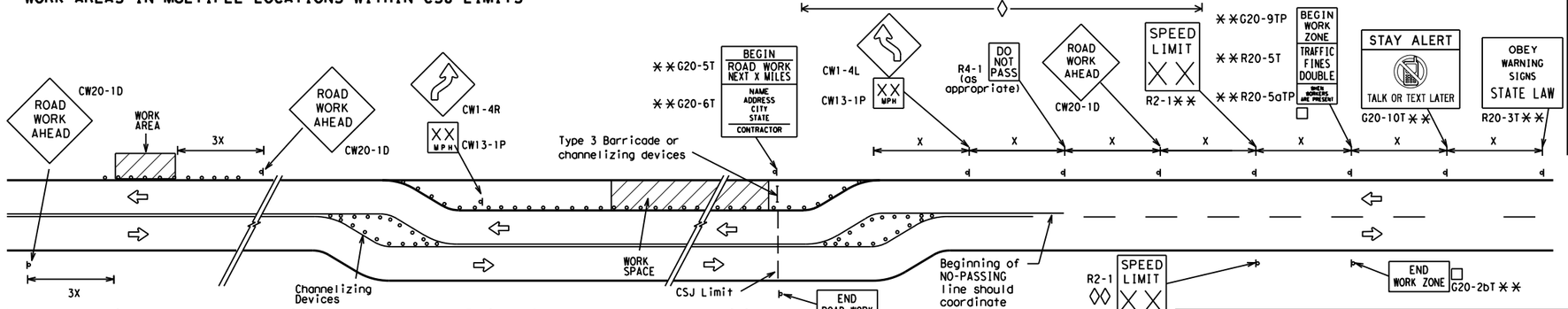
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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.

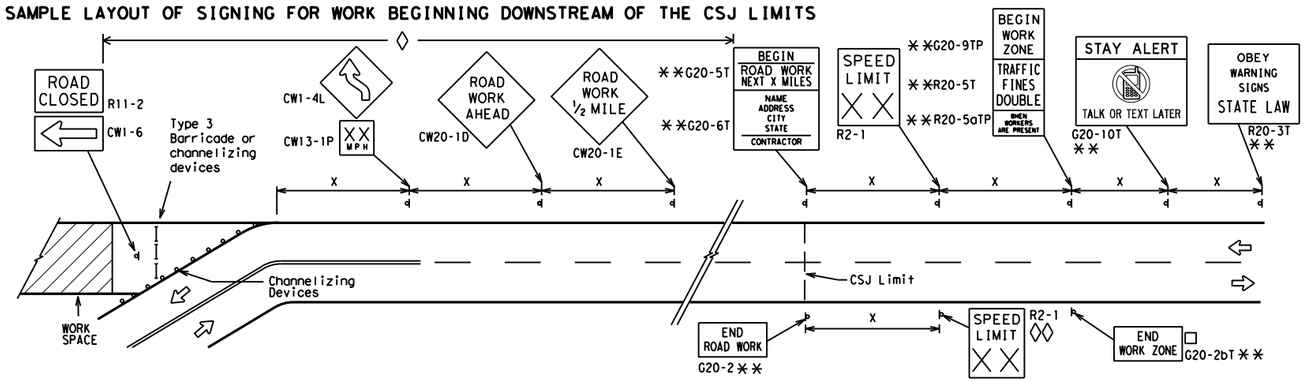
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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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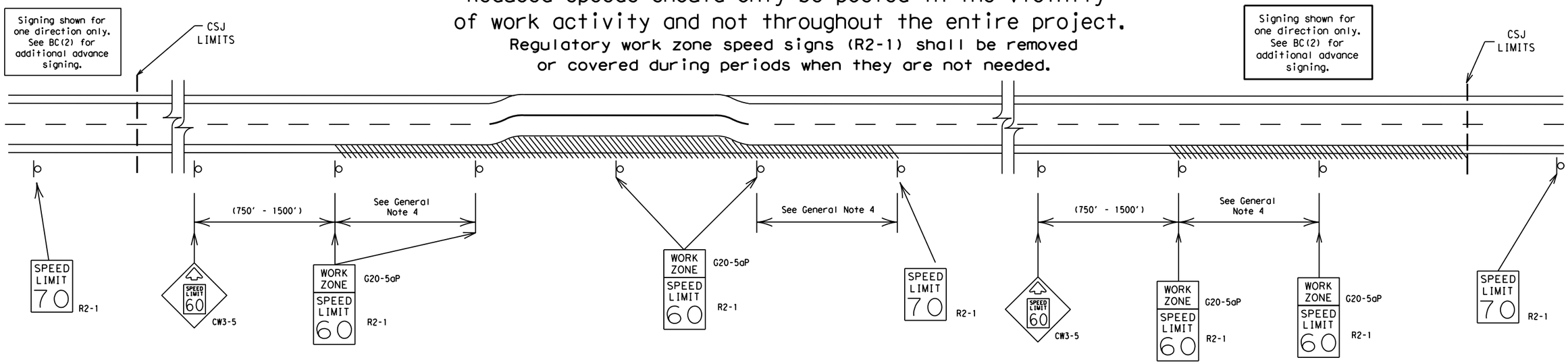
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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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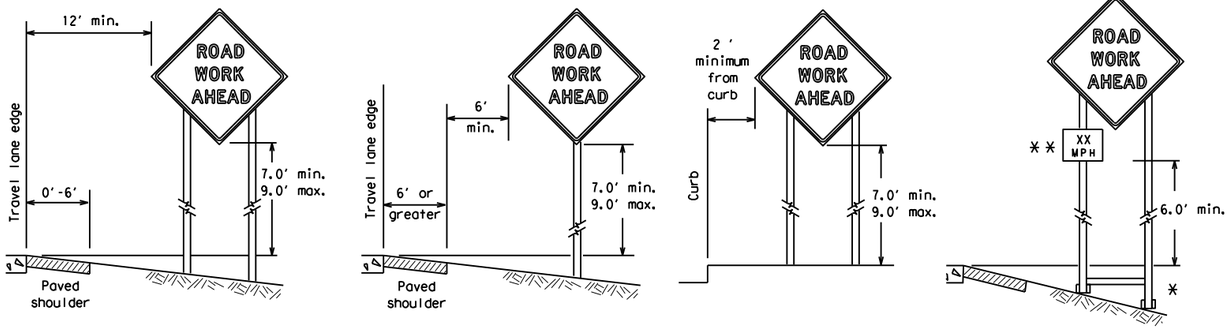
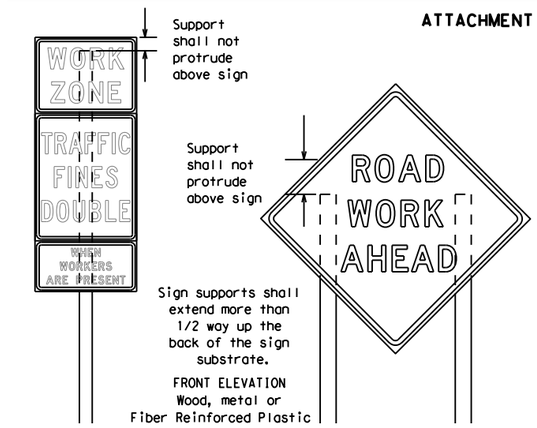
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

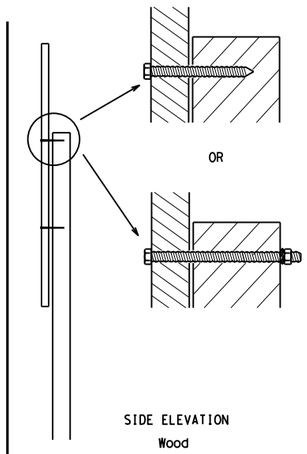


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





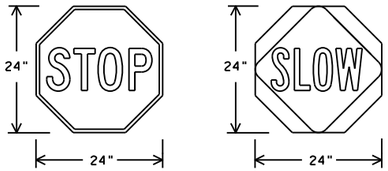
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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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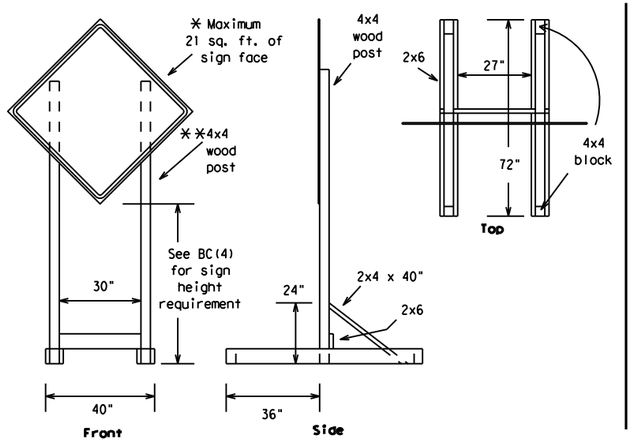
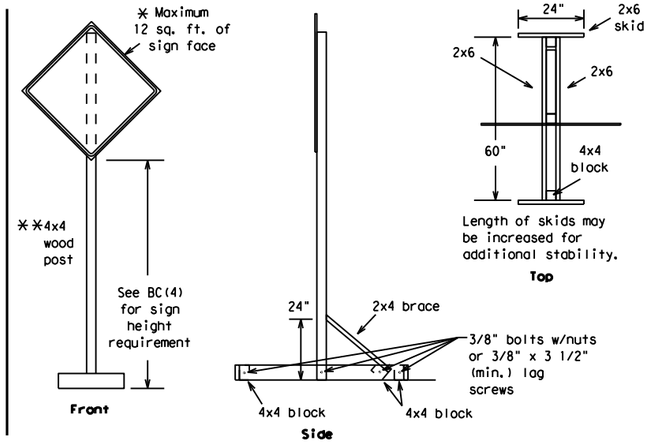
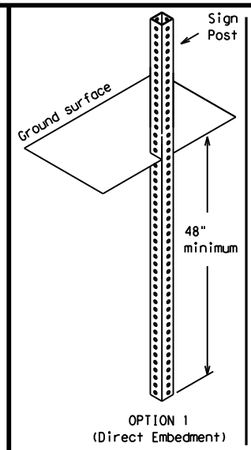
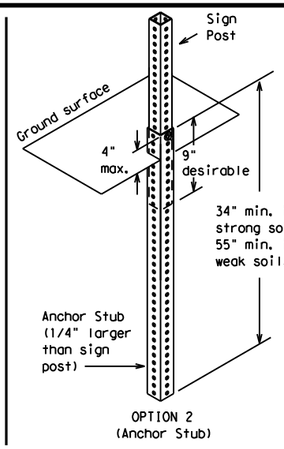


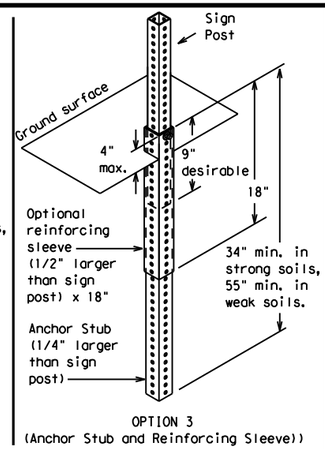


SKID MOUNTED WOOD SIGN SUPPORTS

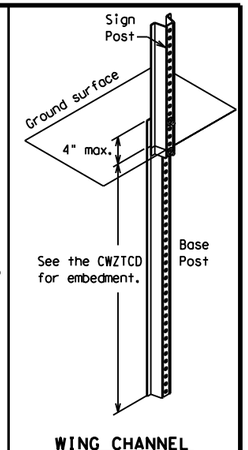
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







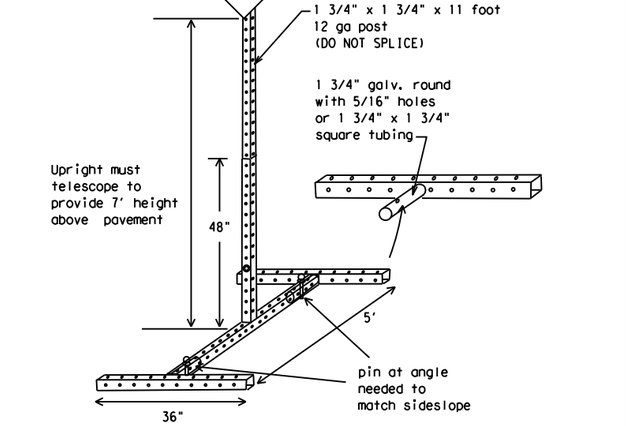
PERFORATED SQUARE METAL TUBING

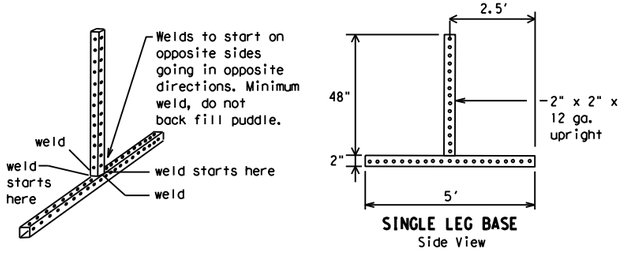


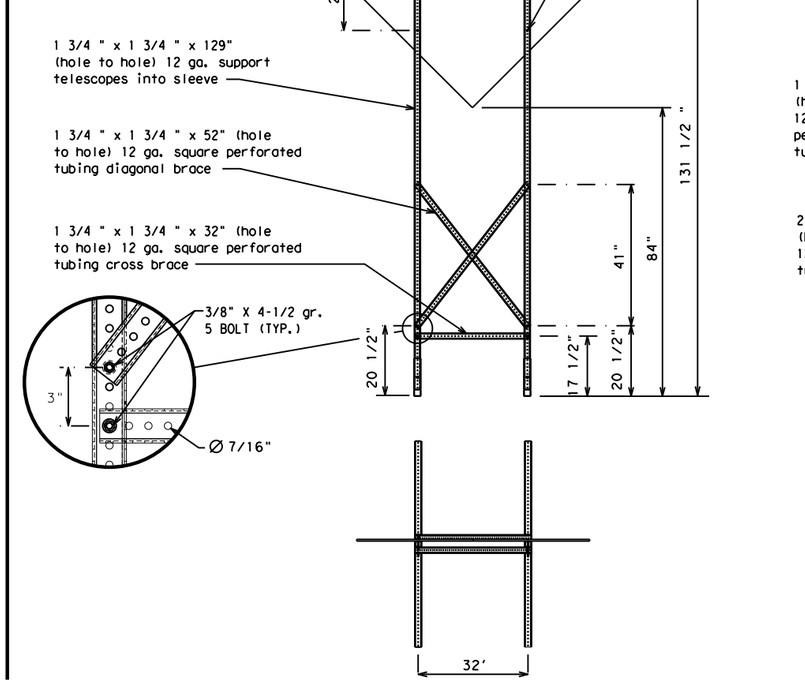
WING CHANNEL
Lap-splice/base bolted anchor

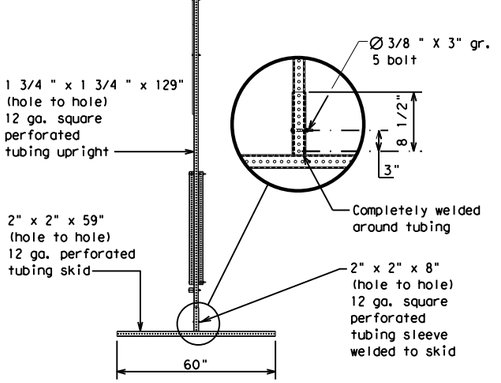
GROUND MOUNTED SIGN SUPPORTS

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









SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

** 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	0025	03	105, ETC	UA 90, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	GUADALUPE		13

100

DATE: 7/27/2023 5:14:55 PM
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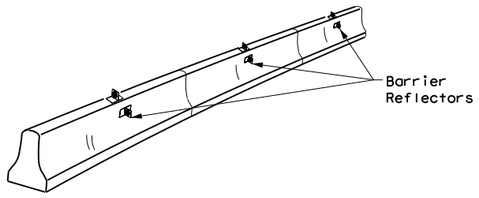
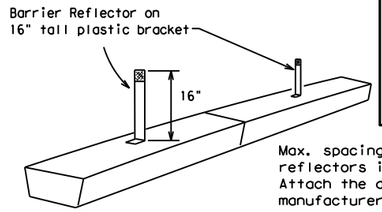
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost 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.

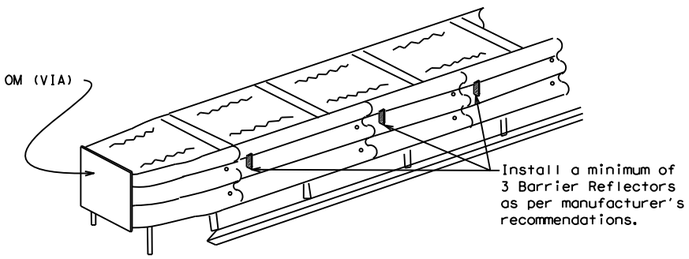


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

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)

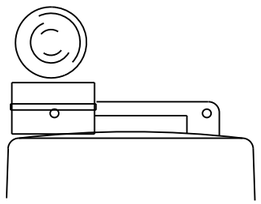


DELINEATION OF END TREATMENTS

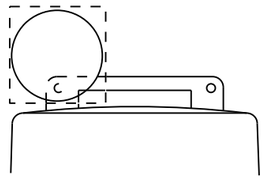
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

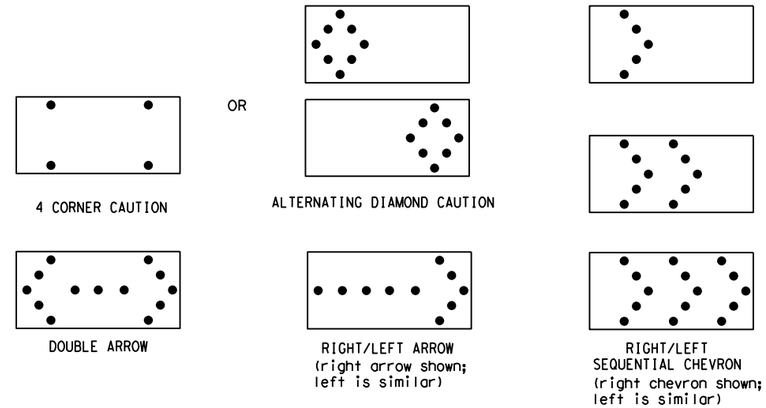
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

SHEET 7 OF 12

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	0025	03	105, ETC	UA 90, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	GUADALUPE		14

101

DATE: 7/27/2023 5:14:56 PM
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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:

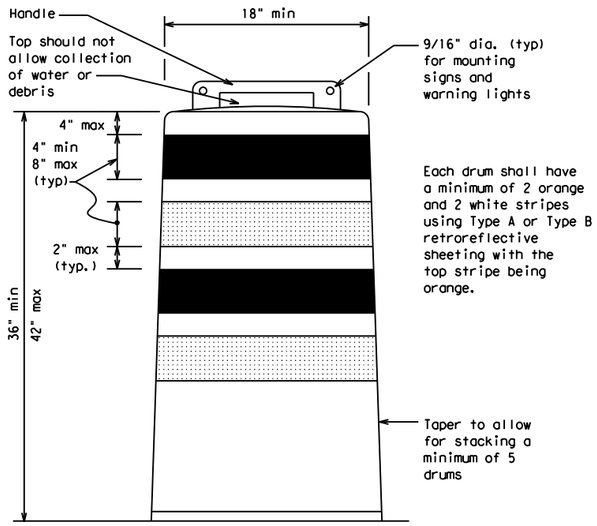
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

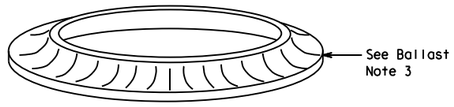
RETROREFLECTIVE SHEETING

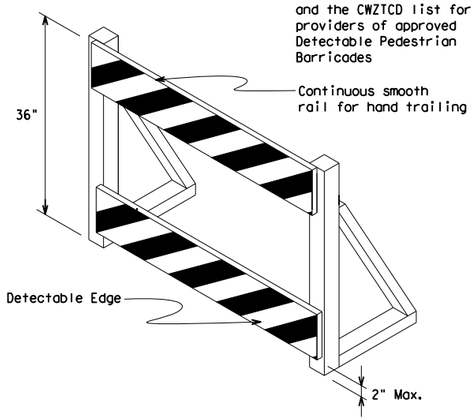
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

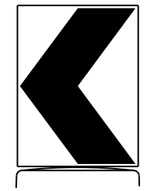




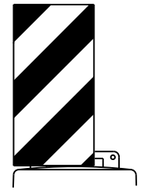


DETECTABLE PEDESTRIAN BARRICADES

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
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REVISIONS	0025	03	105, ETC	UA 90, ETC
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	SAT	GUADALUPE		15
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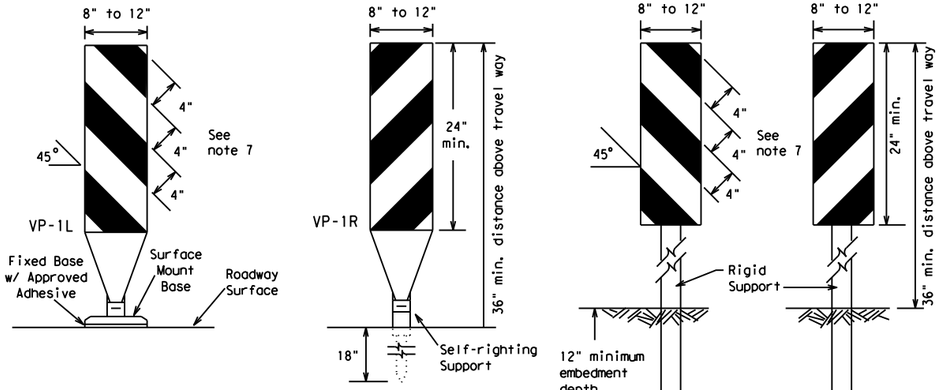
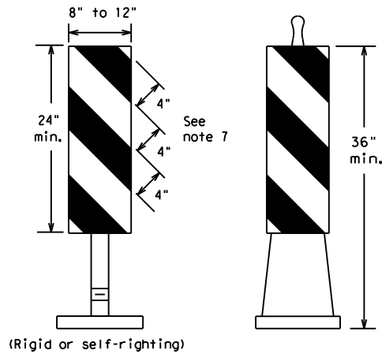


FIXED
(Rigid or self-righting)

DRIVEABLE

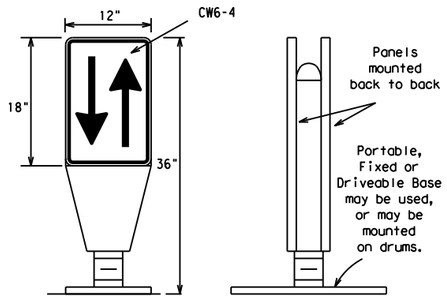


(Rigid or self-righting)

PORTABLE

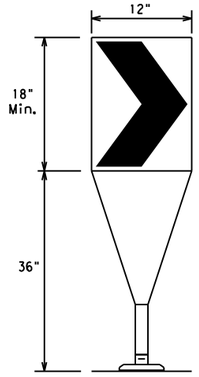
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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)



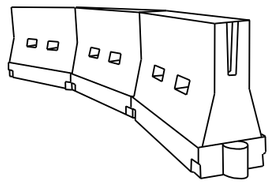
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	SAT	GUADALUPE		16

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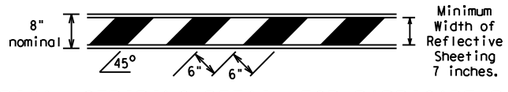
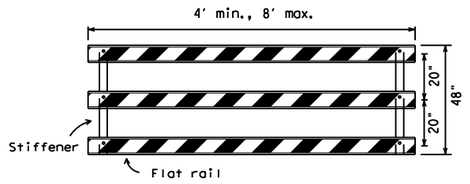
TYPE 3 BARRICADES

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.



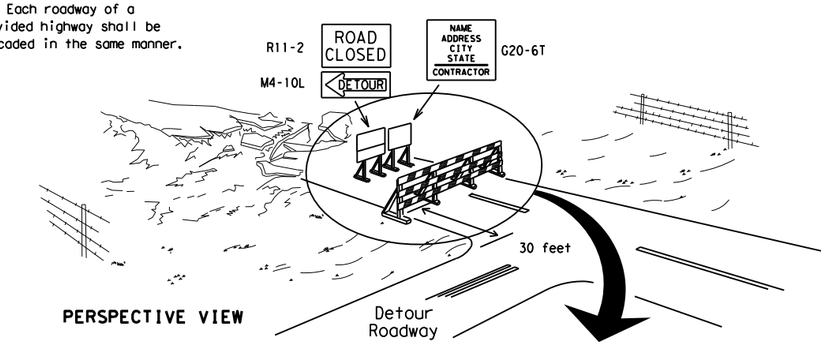
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

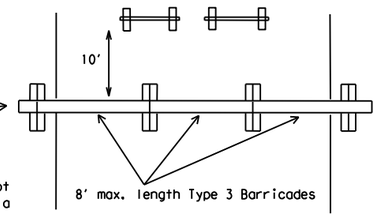
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

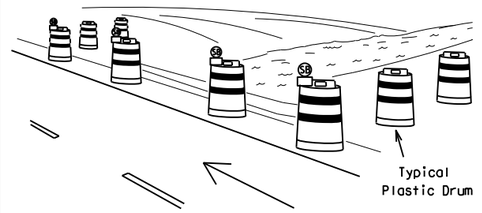
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

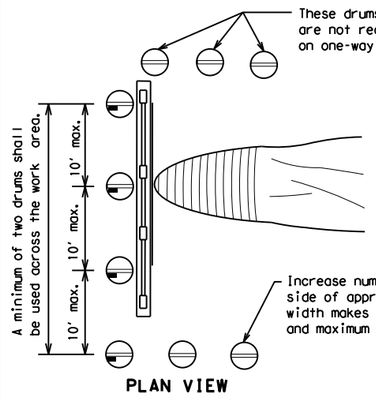
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

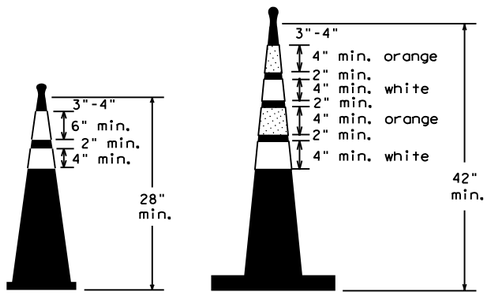
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder 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.



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

PLAN VIEW

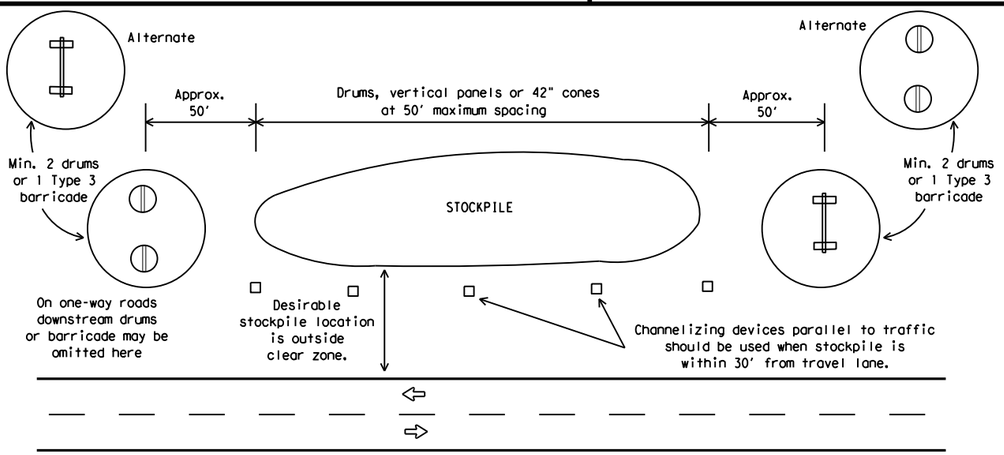
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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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	SAT	GUADALUPE		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.

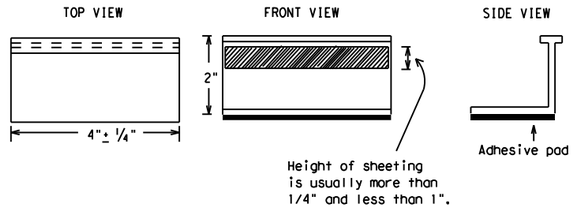
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0025	03	105, ETC	UA 90, ETC
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	SAT	GUADALUPE		18
11-02 8-14				

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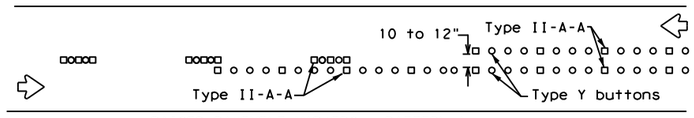
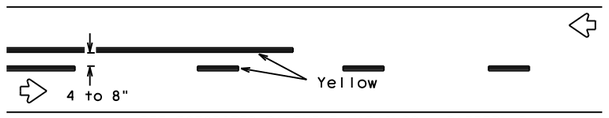
PAVEMENT MARKING PATTERNS

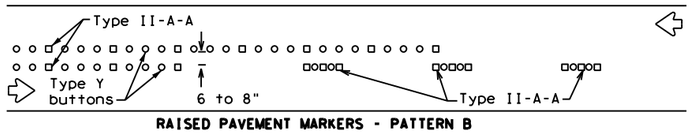
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



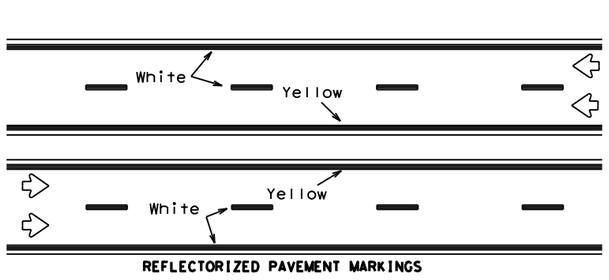
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



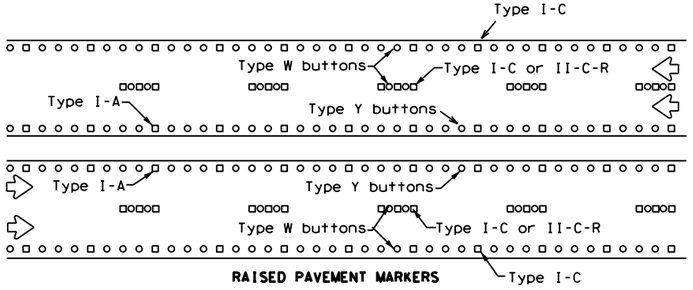
RAISED PAVEMENT MARKERS - PATTERN B

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

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



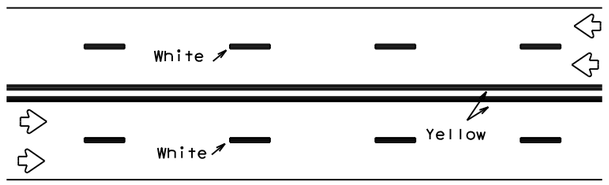
REFLECTORIZED PAVEMENT MARKINGS



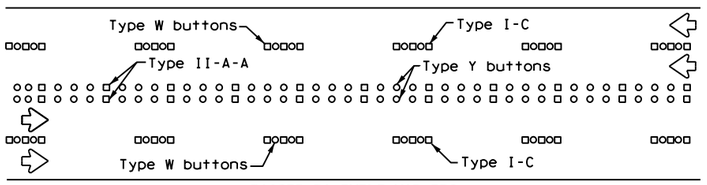
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



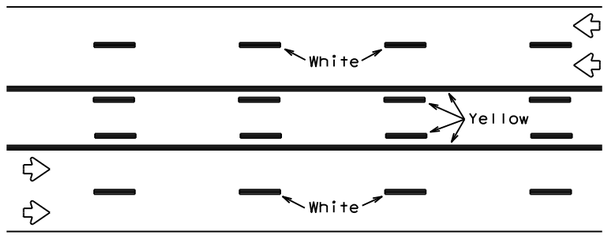
REFLECTORIZED PAVEMENT MARKINGS



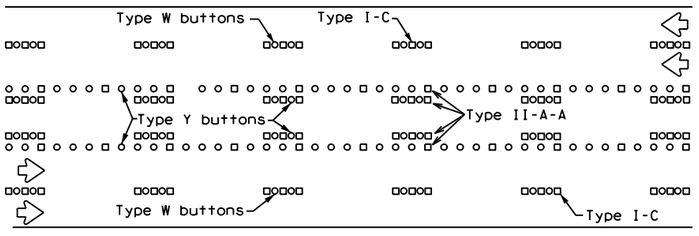
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

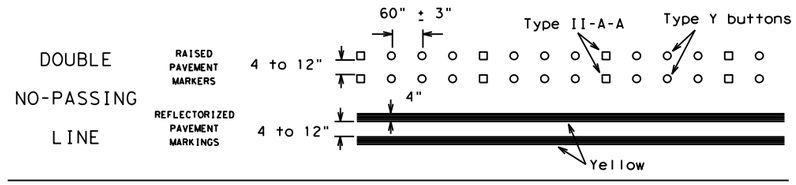
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

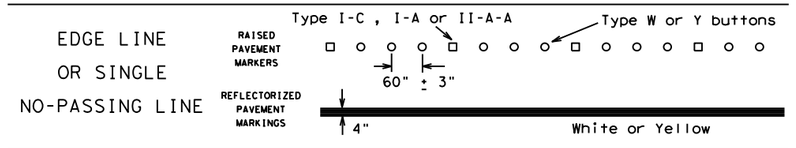
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

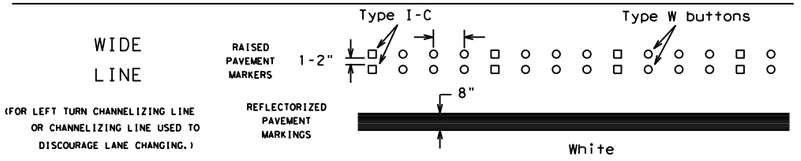


EDGE LINE OR SINGLE NO-PASSING LINE



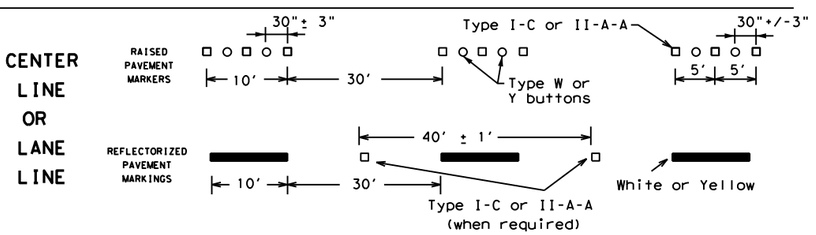
WIDE LINE

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

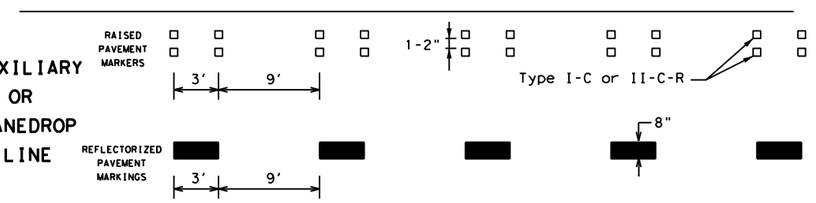


BROKEN LINES

CENTER LINE OR LANE LINE

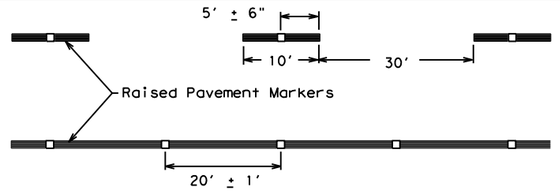


AUXILIARY OR LANEDROP LINE



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
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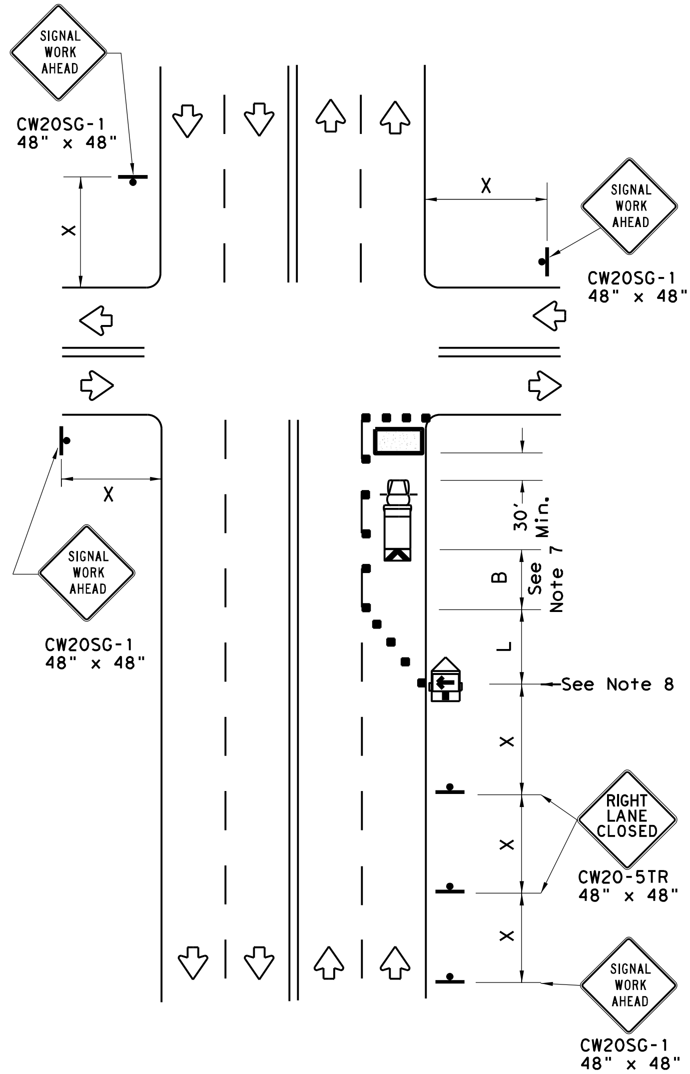
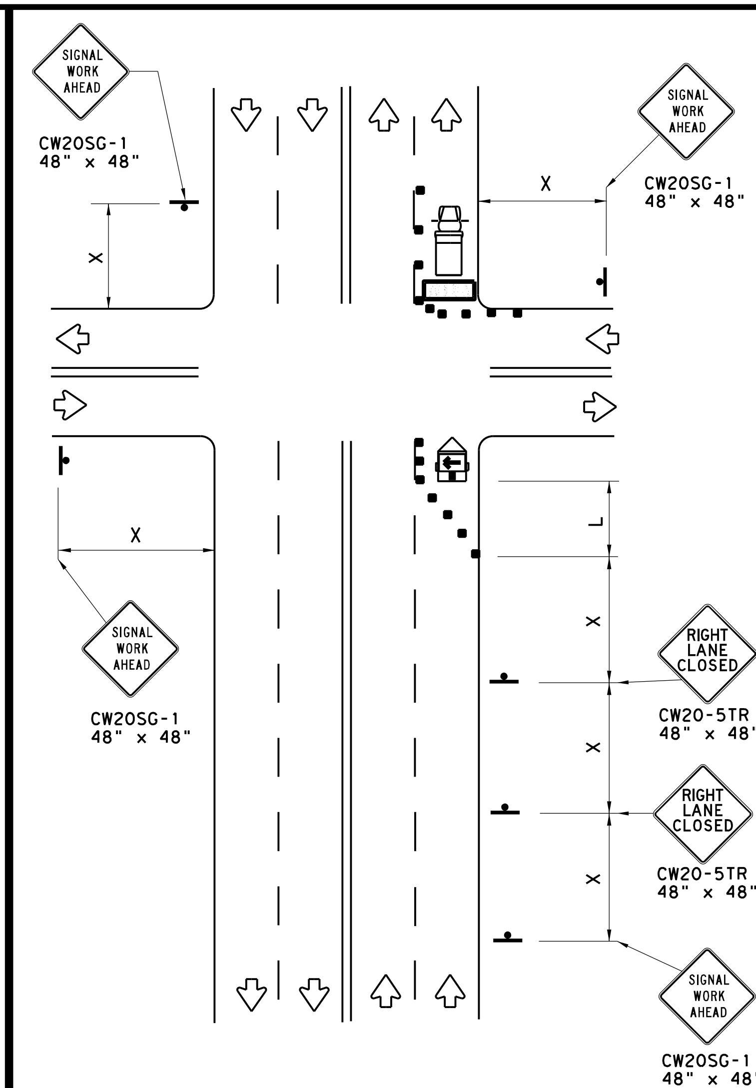
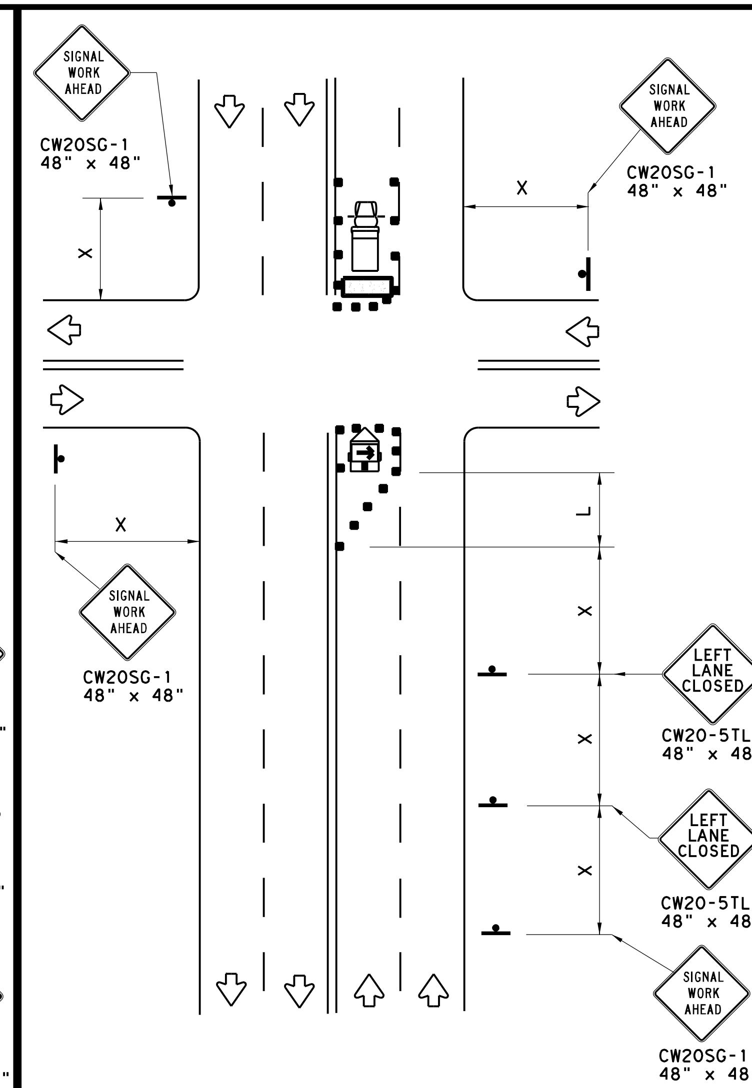
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0025	03	105, ETC	UA 90, ETC
	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		19



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

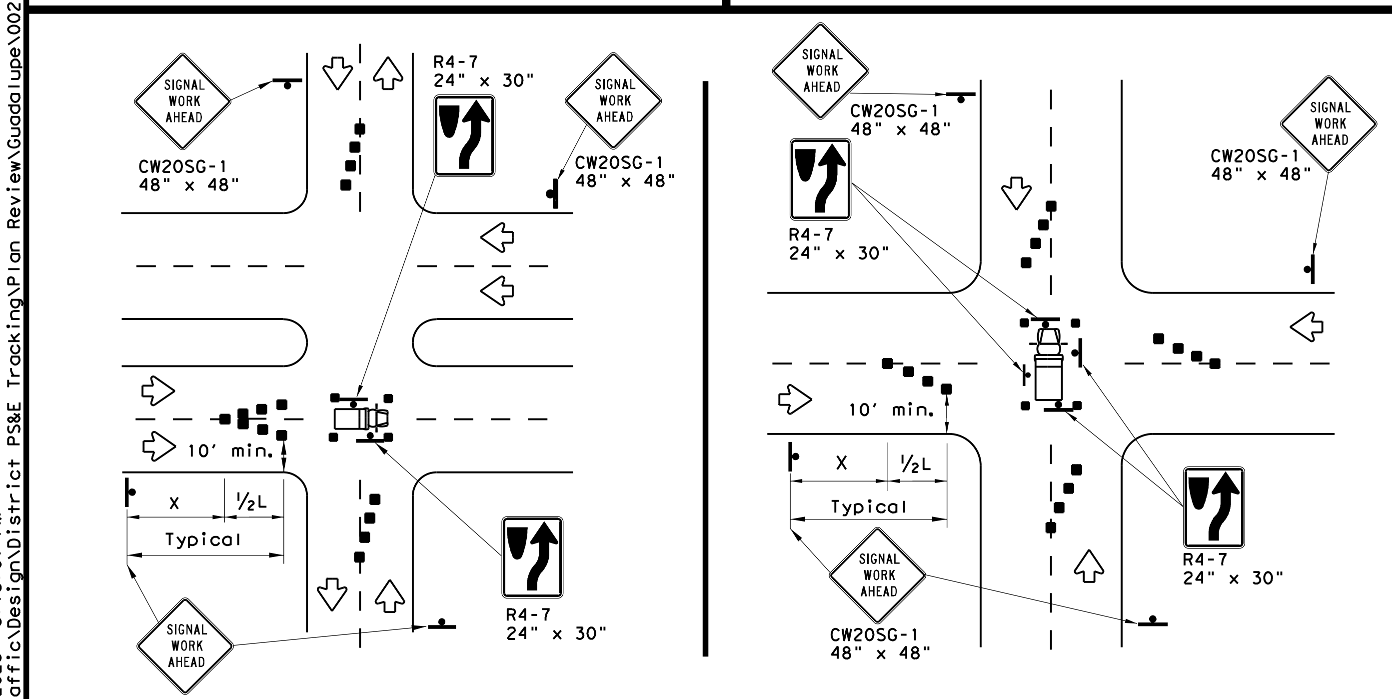
(symbol)	Type 3 Barricade	(symbol)	Channelizing Devices
(symbol)	Heavy Work Vehicle	(symbol)	Truck Mounted Attenuator (TMA)
(symbol)	Trailer Mounted Flashing Arrow Board	(symbol)	Portable Changeable Message Sign (PCMS)
(symbol)	Sign	(symbol)	Traffic Flow
(symbol)	Flag	(symbol)	Flagger

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

* Conventional Roads Only

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

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



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

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© TxDOT April 1992	CONT 0025	SECT 03	JOB 105, ETC	HIGHWAY UA 90, ETC
REVISIONS 2-98 10-99 7-13 4-98 3-03	DIST SAT		COUNTY GUADALUPE	SHEET NO. 20

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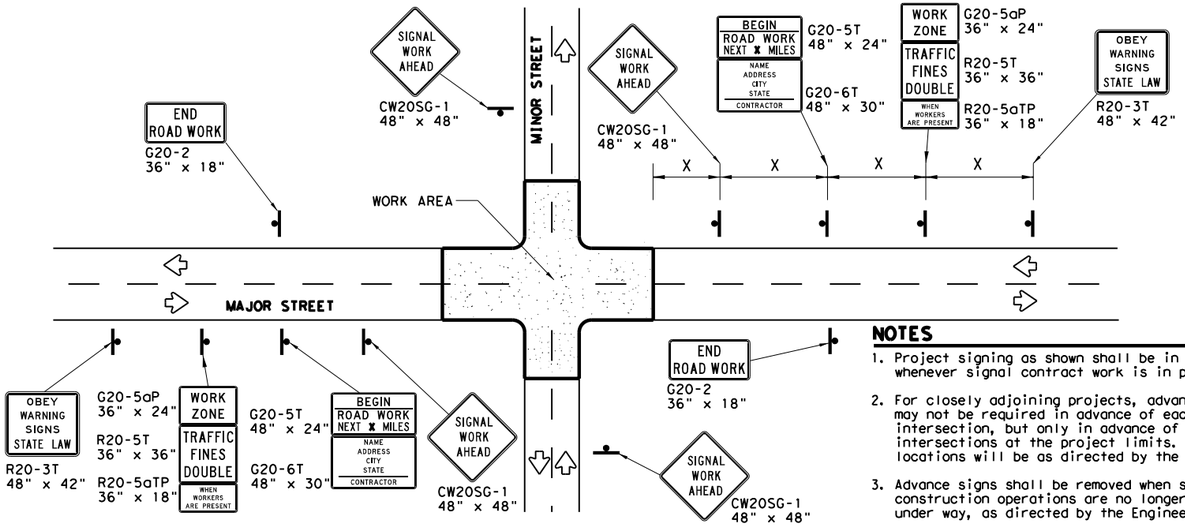


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

DURATION OF WORK

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

SIGN MOUNTING HEIGHT

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

REMOVING OR COVERING

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

REFLECTIVE SHEETING

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

SIGN SUPPORT WEIGHTS

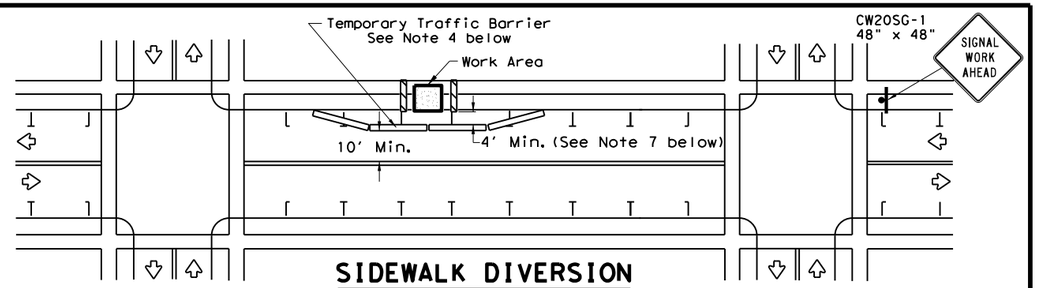
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

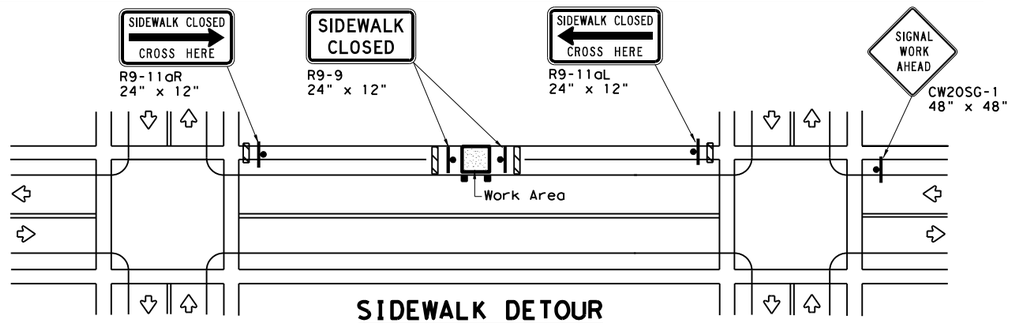
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

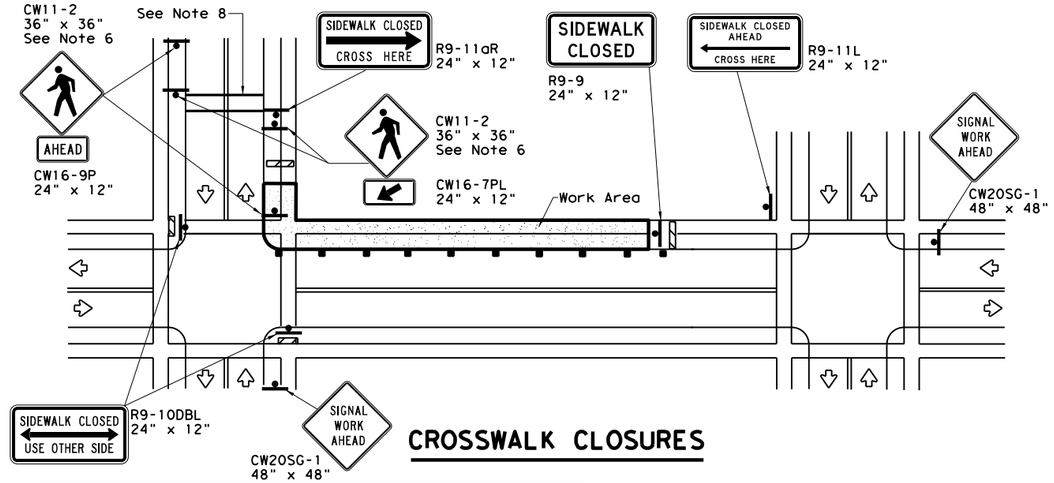
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

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

SHEET 2 OF 2

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
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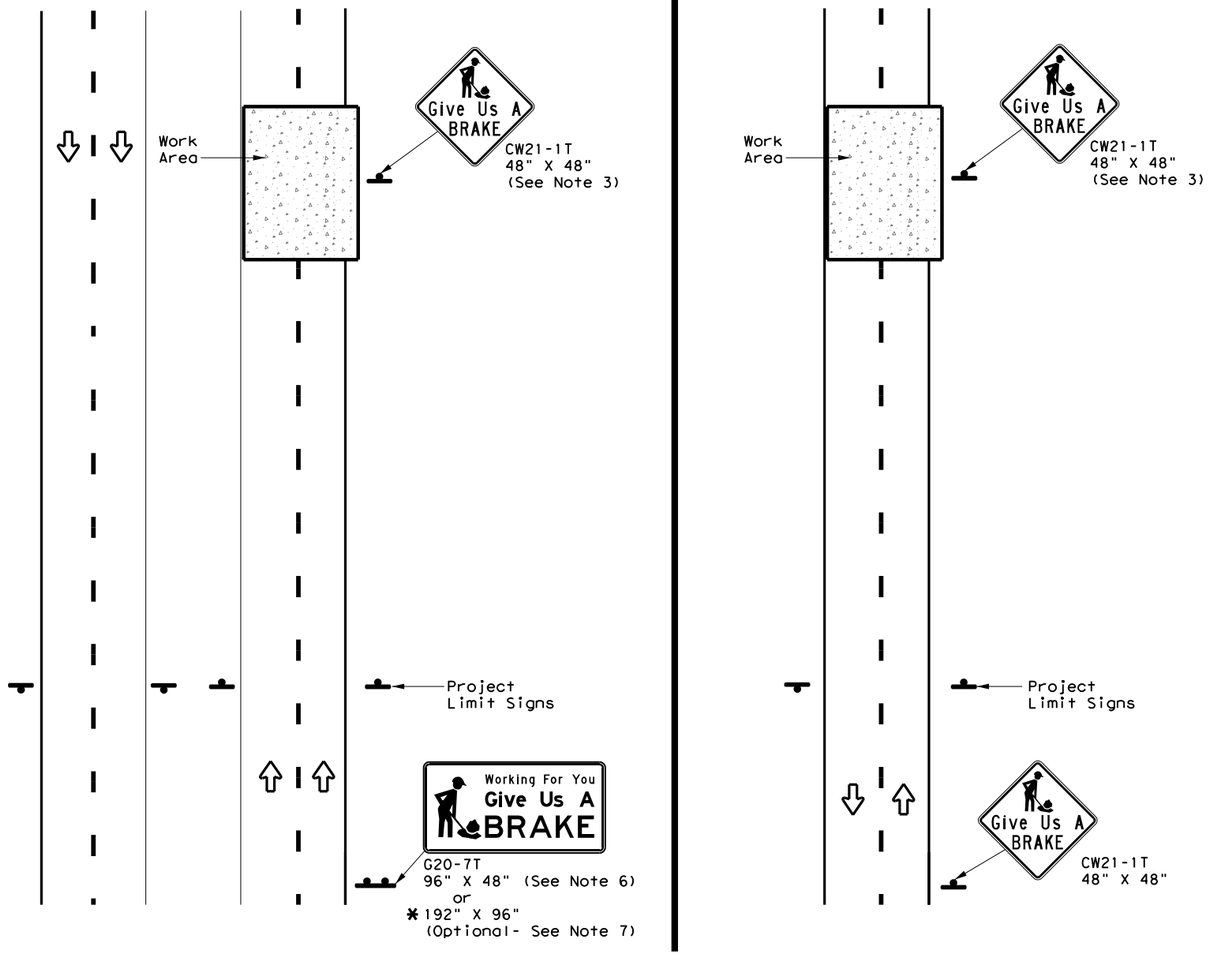
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	SAT	GUADALUPE		21



DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

DATE:
FILE:

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
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.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
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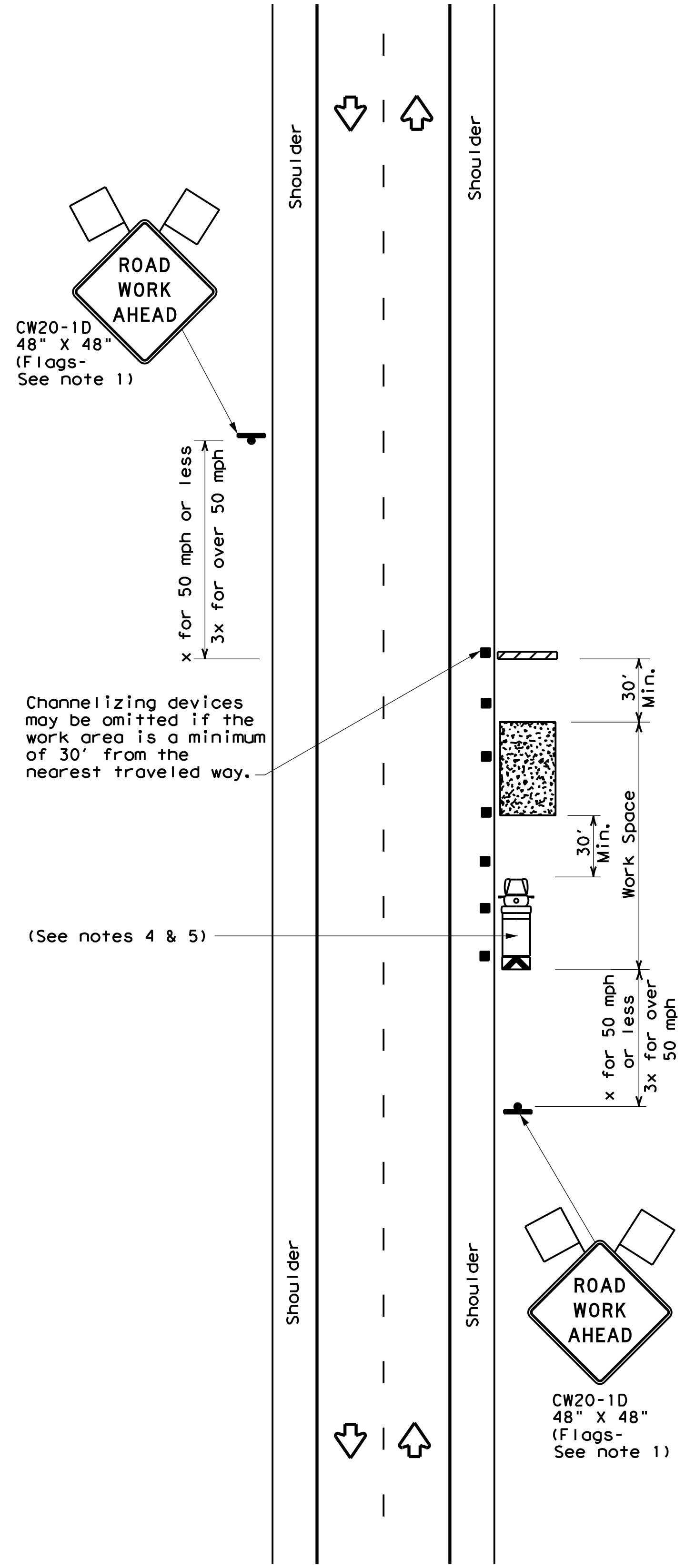
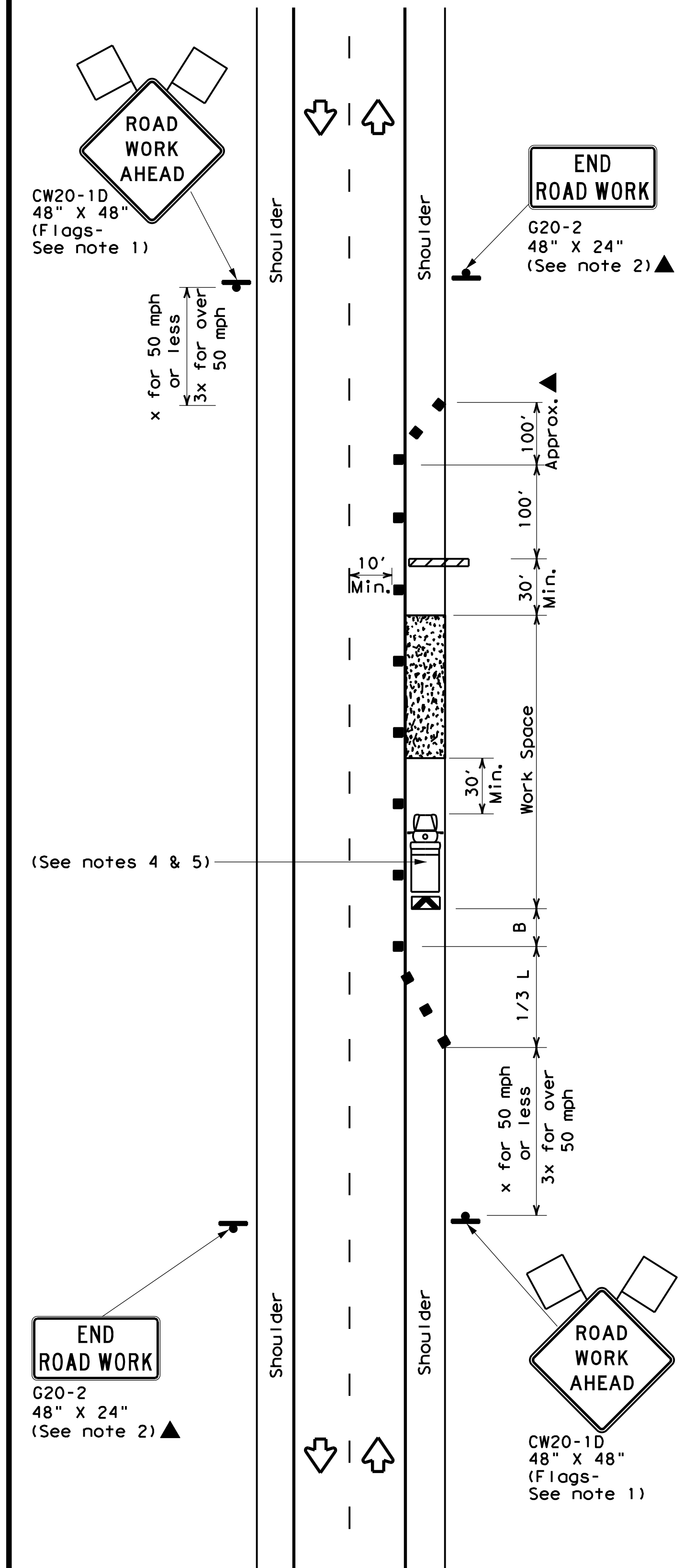


TCP (2-1a)

WORK SPACE NEAR SHOULDER

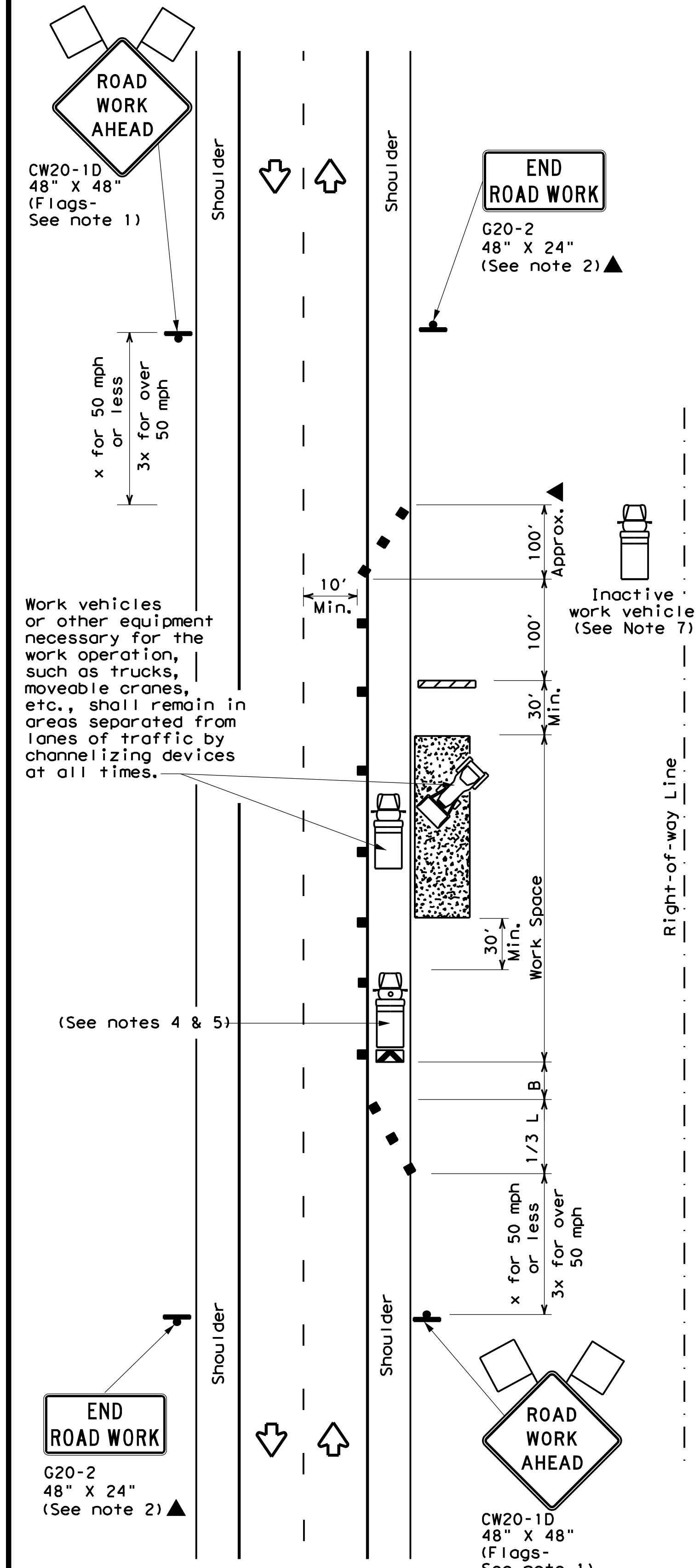
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER

Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER

Conventional Roads

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			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 in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

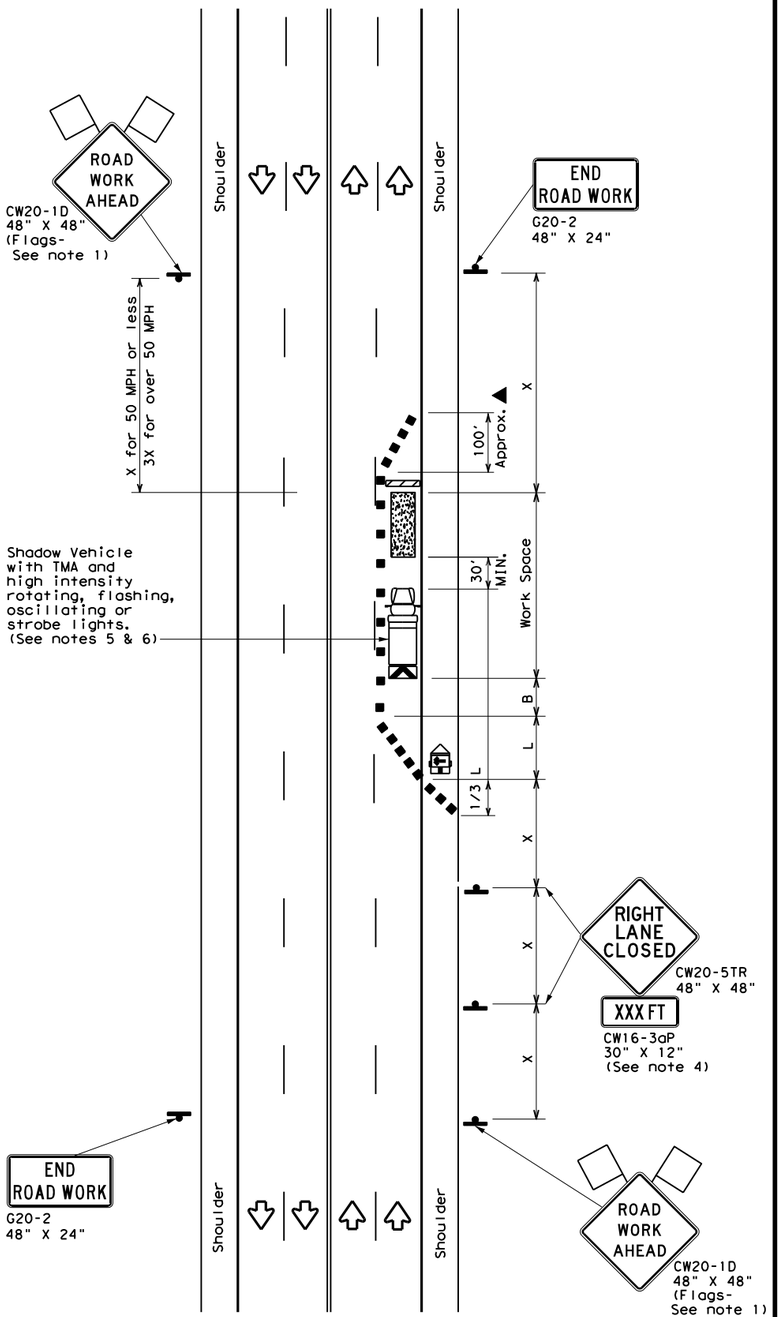
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

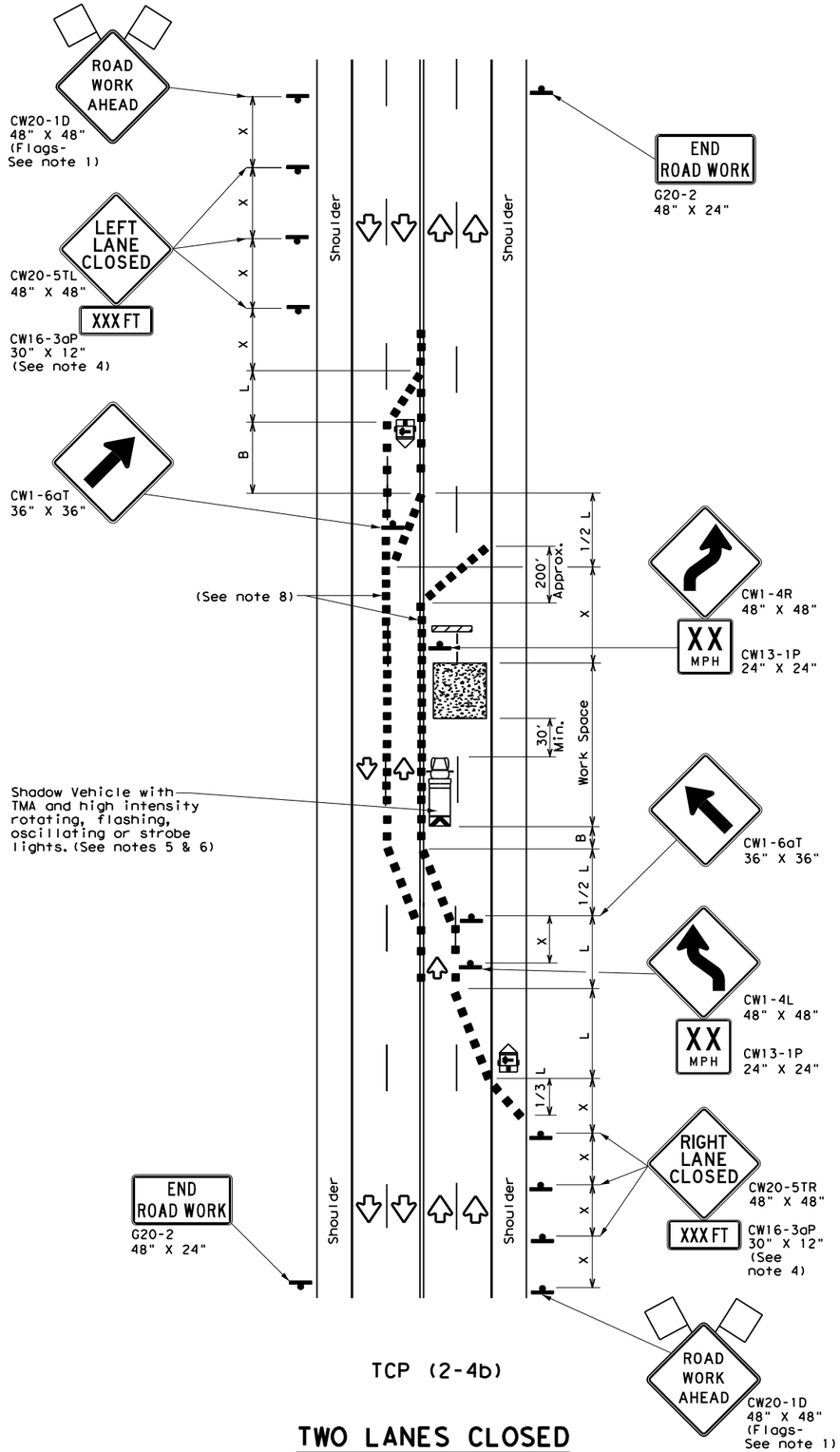
FILE: tcp2-1-18.dgn	DN:		CK:	DW:		CK:
© TxDOT December 1985	CONT	SECT	JOB		HIGHWAY	
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0025	03	105, ETC		UA 90, ETC	
	DIST	COUNTY			SHEET NO.	
	SAT	GUADALUPE			23	

DATE:
FILE:



TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0025	03	105, ETC	UA 90, ETC
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	SAT	GUADALUPE		24

DATE: 7/21/2023 5:15:07 PM
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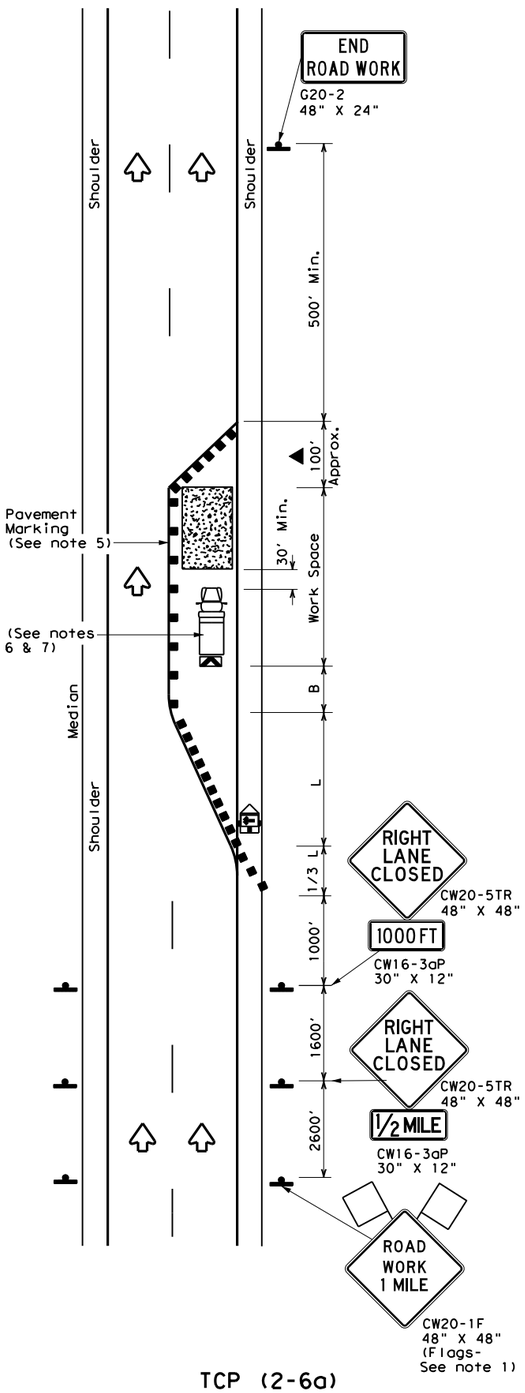
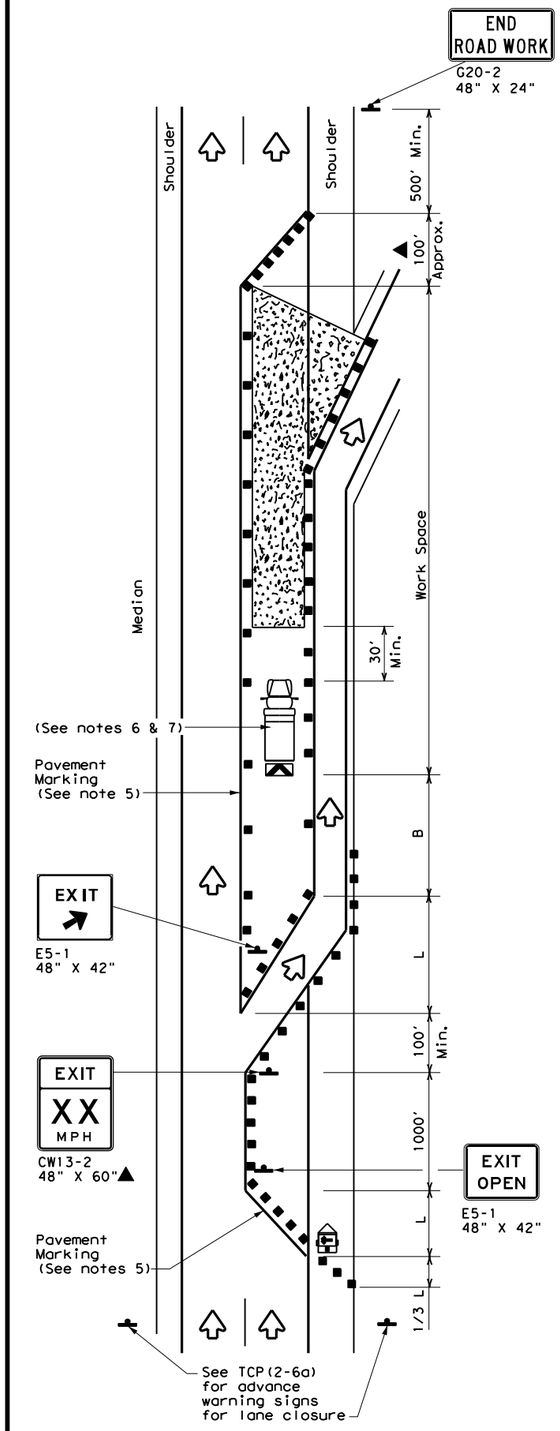


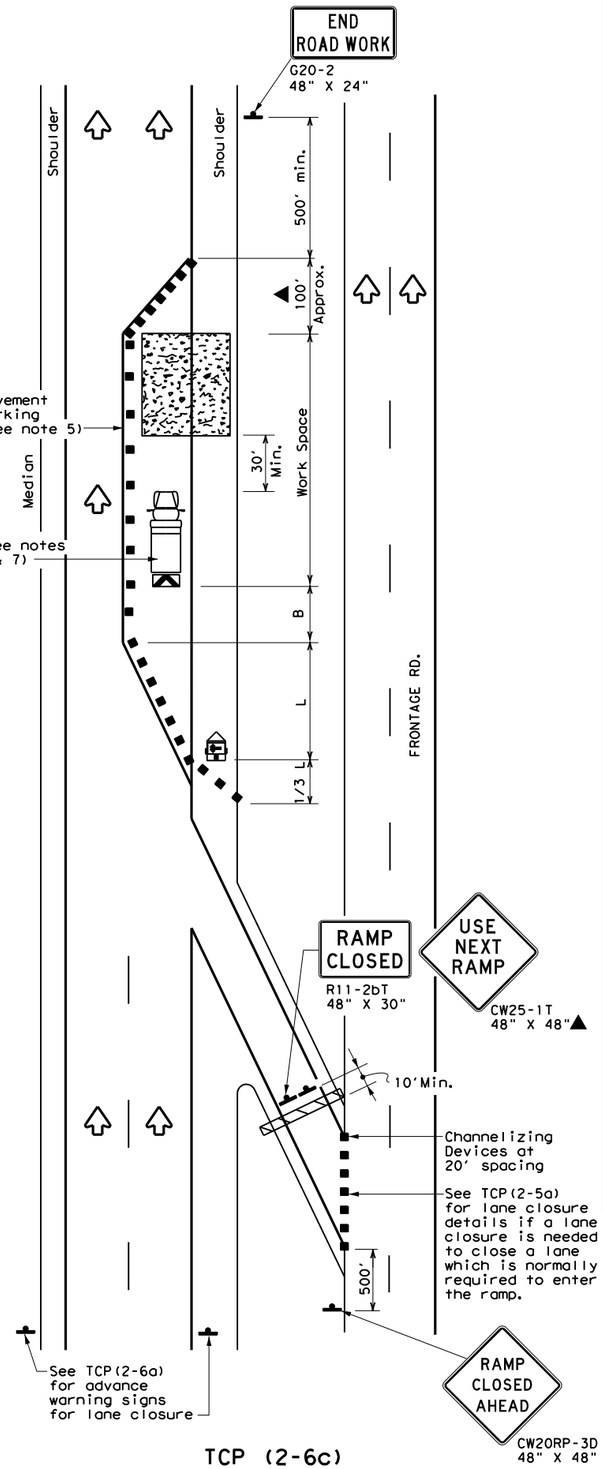
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

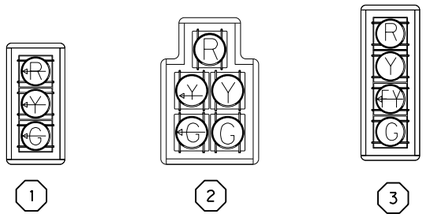
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

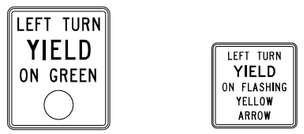
TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0025	03	105, ETC	UA 90, ETC
	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		25

EXISTING SIGNAL HEADS



EXISTING SIGNAL HEADS



NOTES:
1. ALL TRAFFIC SIGNAL EQUIPMENT LOCATIONS AND RIGHT-OF-WAY LINES ARE APPROXIMATE. VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
2. THE EXISTENCE AND LOCATION OF UTILITIES, EITHER UNDERGROUD OR OVERHEAD, INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES (PRIVATE/PUBLIC AND SHOWN/NOT SHOWN) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS BULLY RESPONSIBLE FOR ANY CAMAGES CAUSED BY HIS/HER FAILURE TO LOCATE, PRESERVE, AND PROTECT UTILITIES.
3. ALL ITEMS NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

EXISTING SIGNAL LAYOUT

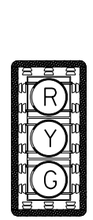
FM 3009 AT FOUR OAKS LN

CSJ 3107-02-038 SHEET 1 OF 5

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		26
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

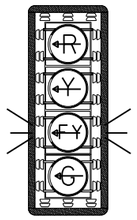
DN: DN

PROPOSED SIGNAL SCHEDULE



SIGNAL NO. 1

3 SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS W/ REFL BRDR
(VENT) ALUM

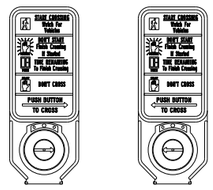


SIGNAL NO. 2

4 SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS W/ REFL BRDR
(VENT) ALUM

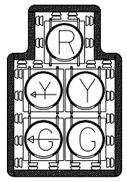
PEDESTRIAN SIGNAL NO. 3

LED PEDESTRIAN COUNTDOWN SIGNAL



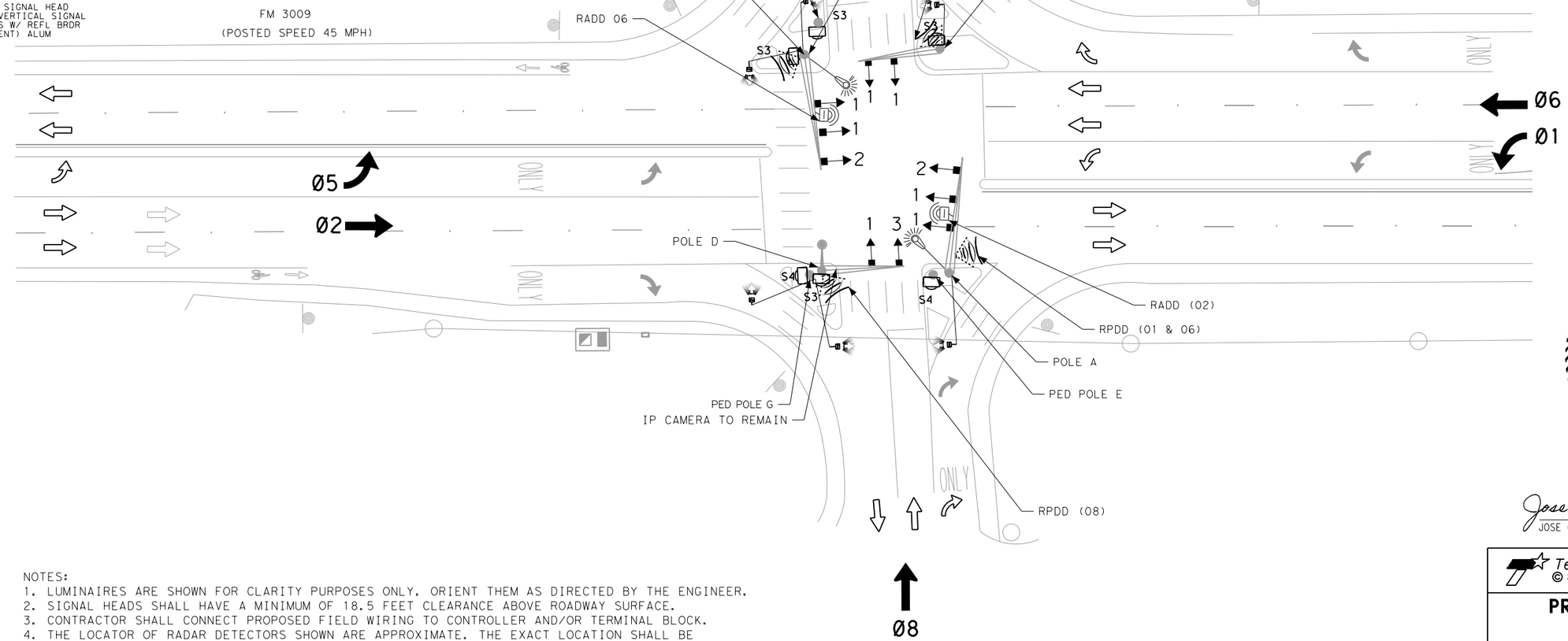
PEDESTRIAN PUSH BUTTON

ACCESSIBLE PEDESTRIAN SIGNAL PUSH BUTTON WITH PEDESTRIAN SIGN R10-3e(9"x15")



SIGNAL NO. 3

5 SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS W/ REFL BRDR
(VENT) ALUM



0 20 40

SCALE: 1"=40'

LEGEND

- EXISTING CONTROLLER CABINET
- EXISTING TRAFFIC SIGNAL POLE
- DIRECTION OF FLOW
- PROPOSED PED PUSH BUTTON
- PROPOSED PED SIGNAL
- PROPOSED RADAR PRESENCE (RVDS)
- PROPOSED RADAR ADVANCED DETECTOR (RVDS)
- REPLACE LUMINARIE WITH LED

NOTES:
1. LUMINAIRES ARE SHOWN FOR CLARITY PURPOSES ONLY. ORIENT THEM AS DIRECTED BY THE ENGINEER.
2. SIGNAL HEADS SHALL HAVE A MINIMUM OF 18.5 FEET CLEARANCE ABOVE ROADWAY SURFACE.
3. CONTRACTOR SHALL CONNECT PROPOSED FIELD WIRING TO CONTROLLER AND/OR TERMINAL BLOCK.
4. THE LOCATOR OF RADAR DETECTORS SHOWN ARE APPROXIMATE. THE EXACT LOCATION SHALL BE DETERMINED IN THE FIELD AND ADJUSTED TO PROVIDE PROPER DETECTION ZONES AND A COMPLETE OPERABLE SYSTEM.
3. CONTRACTOR SHALL CONTACT THE DISTRICT SIGNAL MAINTENANCE OFFICE AND AREA OFFICE A MINIMUM OF SEVEN (7) DAYS PRIOR TO BEGINNING CONSTRUCTION.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

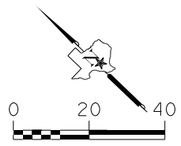
PROPOSED SIGNAL LAYOUT

FM 3009 AT FOUR OAKS LN

CSJ 3107-02-038 SHEET 2 OF 5

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		27
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

DW: DN



				QUANTITY SUMMARY CSJ: 0025
	ITEM NO.	ITEM	UNIT	QUANTITY
A	0666-6034	REFL P	LF	1185
B	0666-6046	REFL P	LF	410
C	0666-6052	REFL P	EA	8
D	0666-6076	REFL P	EA	6
E	0666-6105	REFL P	EA	2
F	0666-6111	REFL P	EA	2
G	0666-6298	RE P	LF	280
H	0666-6301	RE P	LF	290
I	0666-6304	RE P	LF	280
J	0666-6307	RE P	LF	290
K	0666-6310	RE P	LF	30
L	0666-6313	RE P	LF	1185
M	0672-6007	REFL P	EA	24
N	0672-6009	REFL P	EA	19
O	0672-6010	REFL P	EA	61

NOTES:
1. INSTALL NEW LANE LINES, CENTERLINE, CROSSWALKS, STOP BARS, AND YIELD TRIANGLE PAVEMENT MARKINGS A MINIMUM OF 200 LF ON EACH INTERSECTION APPROACH.
2. ALL GROUND MOUNTED SIGNS ARE TO REMAIN IN PLACE UNLESS OTHERWISE SHOWN IN THE PLANS.
3. ALL METERIAL SHALL BE AS PER TXDOT APPROVED MATERIALS LIST.
4. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATIONS.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

PROPOSED PAVEMENT MARKINGS

FM 3009 AT FOUR OAKS LN

CSJ 3107-02-038 SHEET 3 OF 5

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		28
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

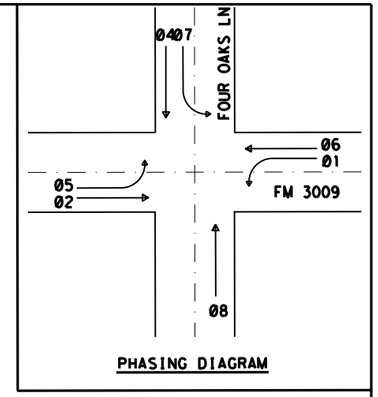
DN: DN

PROPOSED CONDUIT AND CONDUCTOR SCHEDULE

	RUN NUMBER		1	2		3		4	5	6		7	8		9		10	11		12	13	
	CONDUIT SIZE IN INCHES		3.0	2.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0
	NUMBER OF CONDUITS		2	1	2	1	2	2	2	1	2	2	1	2	1	2	2	1	2	2	2	2
	LENGTH OF RUN (FT)		10	25	25	60	60	10	10	60	60	10	10	10	85	85	15	55	55	15	20	20
	TRENCH (T)/BORE (B)/CONTROLLER (C)/EXISTING(E)		C	E	E	E	B	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
CABLE CIRCUIT			NUMBER OF CONDUCTORS																			
6 COND. #22	RPDD (PRESENCE DETECTION DEVICE)	PHASE 01 & 06	1		1		1				1						1	1				
		PHASE 02 & 05	1		1		1				1						1			1		1
		PHASE 04 & 07	1		1		1				1						1	1				
		PHASE 08	1		1		1	1														
6 COND. #22	RADD (ADVANCE DETECTION DEVICE)	PHASE 01 & 06	1		1		1				1						1			1		1
		PHASE 02 & 05	1		1		1		1													

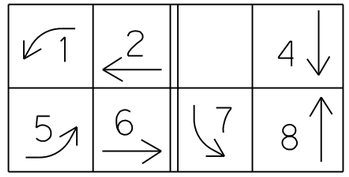
WIRING IN ARMS & POLES

INSIDED ARMS & POLES	#12 AWG 4/C	#12 AWG 7/C	RADAR (RADD)	PRESENCE (RPDD)	#12 AWG 4/C
POLE A					
SIGNAL 1		75			
SIGNAL 1		75			
SIGNAL 2		85			
RPDD 1			30		
RPDD 2			75		
RADD				75	
LUMINARE					30
POLE B					
SIGNAL 1		60			
SIGNAL 1		60			
POLE C					
SIGNAL 1		50			
SIGNAL 1		60			
SIGNAL 2		70			
RPDD			30		
RADD				60	
LUMINARE					30
POLE D					
SIGNAL 1		45			
SIGNAL 1		60			
SIGNAL 2		70			
RDDD				45	
TOTALS		710	135	180	60



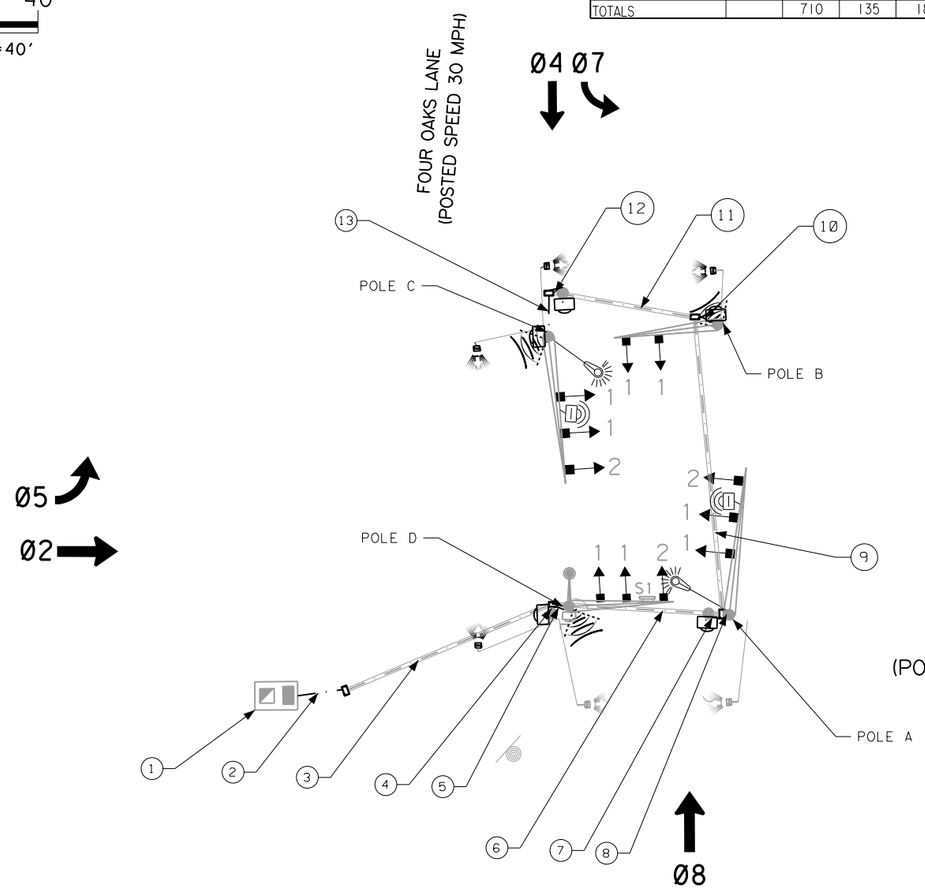
PHASING DIAGRAM

Normal Phasing



0 20 40

SCALE: 1"=40'



LEGEND

- EXISTING PED POLE
- EXISTING SIGN
- EXISTING CONTROLLER CABINET
- EXISTING SIGNAL FACE
- EXISTING TRAFFIC SIGNAL POLE
- DIRECTION OF FLOW
- EXISTING LUMINAIRE
- PROPOSED SIGNAL FACE
- PROPOSED PED PUSH BUTTON
- PROPOSED PED SIGNAL
- EXISTING CCTV CAMERA
- EXISTING TRENCH CONDUIT
- EXISTING GROUND BOX
- PROPOSED RADAR ADVANCED PRESENCE DETECTOR (RADD)
- PROPOSED RADAR PRESECNCE DETECTOR (RPDD)

NOTES:
1. TRAY CABLES SHALL BE RUN IN 2" CONDUIT SEPARATE FROM THE SIGNAL CABLE.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation
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CONDUIT & CONDUCTOR SCHEDULE

FM 3009 AT FOUR OAKS LN

CSJ 3107-02-038 SHEET 4 OF 5

FHWA TEXAS DIVISION	FEDERAL AID PROJECT	SHEET NO.
	SEE TITLE SHEET	29

STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

ITEM	DESCRIPTION	UNIT	QTY
0610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	2
0666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF	1185
0666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF	410
0666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA	8
0666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA	6
0666-6105	REFL PAV MRK TY I (W)(BIKE ARW)(100MIL)	EA	2
0666-6111	REFL PAV MRK TY I(W)(BIKE SYML)(100MIL)	EA	2
0666-6298	RE PM W/RET REQ TY I (W)4"(BRK)(060MIL)	LF	280
0666-6301	RE PM W/RET REQ TY I (W)4"(SLD)(060MIL)	LF	290
0666-6304	RE PM W/RET REQ TY I (W)6"(BRK)(060MIL)	LF	280
0666-6307	RE PM W/RET REQ TY I (W)6"(SLD)(060MIL)	LF	290
0666-6310	RE PM W/RET REQ TY I (Y)4"(BRK)(060MIL)	LF	30
0666-6313	RE PM W/RET REQ TY I (Y)4"(SLD)(060MIL)	LF	1185
0672-6007	REFL PAV MRKR TY I-C	EA	24
0672-6009	REFL PAV MRKR TY II-A-A	EA	19
0672-6010	REFL PAV MRKR TY II-C-R	EA	61
0680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA	1
0682-6001	VEH SIG SEC (12")LED(GRN)	EA	8
0682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	3
0682-6003	VEH SIG SEC (12")LED(YEL)	EA	8
0682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	5
0682-6005	VEH SIG SEC (12")LED(RED)	EA	8
0682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	2
0682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	6
0682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	7
0682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	2
0682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA	1
0684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	710
0688-6001	PED DETECT PUSH BUTTON (APS)	EA	6
0688-6003	PED DETECTOR CONTROLLER UNIT	EA	1
0690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA	17
0690-6030	REMOVAL OF PEDESTRIAN PUSH BUTTONS	EA	6
0690-6086	REMOVE VID IMAGE VEH DET SYS (VIVDS)	EA	6
6027-6003	CONDUIT (PREPARE)	LF	710
6027-6008	GROUND BOX (PREPARE)	EA	5
6185-6002	TMA (STATIONARY)	DAY	20
6292-6001	RVDS(PRESENCE DETECTION ONLY)	EA	4
6292-6002	RVDS(ADVANCE DETECTION ONLY)	EA	2

NOTES:
1. LUMINAIRES ARE SHOWN FOR CLARITY PURPOSES ONLY. ORIENT THEM AS DIRECTED BY THE ENGINEER.
2. SIGNAL HEADS SHALL HAVE A MINIMUM OF 18.5 FEET CLEARANCE ABOVE ROADWAY SURFACE.
3. CONTRACTOR SHALL CONNECT PROPOSED FIELD WIRING TO CONTROLLER AND/OR TERMINAL BLOCK.
4. THE LOCATOR OF RADAR DETECTORS SHOWN ARE APPROXIMATE. THE EXACT LOCATION SHALL BE DETERMINED IN THE FIELD AND ADJUSTED TO PROVIDE PROPER DETECTION ZONES AND A COMPLETE OPERABLE SYSTEM.
3. CONTRACTOR SHALL CONTACT THE DISTRICT SIGNAL MAINTENANCE OFFICE AND AREA OFFICE A MINIMUM OF SEVEN (7) DAYS PRIOR TO BEGINNING CONSTRUCTION.

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

TRAFFIC SIGNAL QUANTITIES & DETAILS

FM 3009 AT FOUR OAKS LN

CSJ 3107-02-038 SHEET 5 OF 5

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		30
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

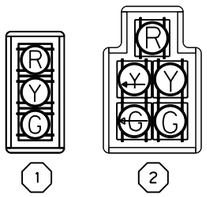
DN: DN

T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\FM 3009 at FOUR OAK LANE\FM 3009 at Four Oak Lane.dgn

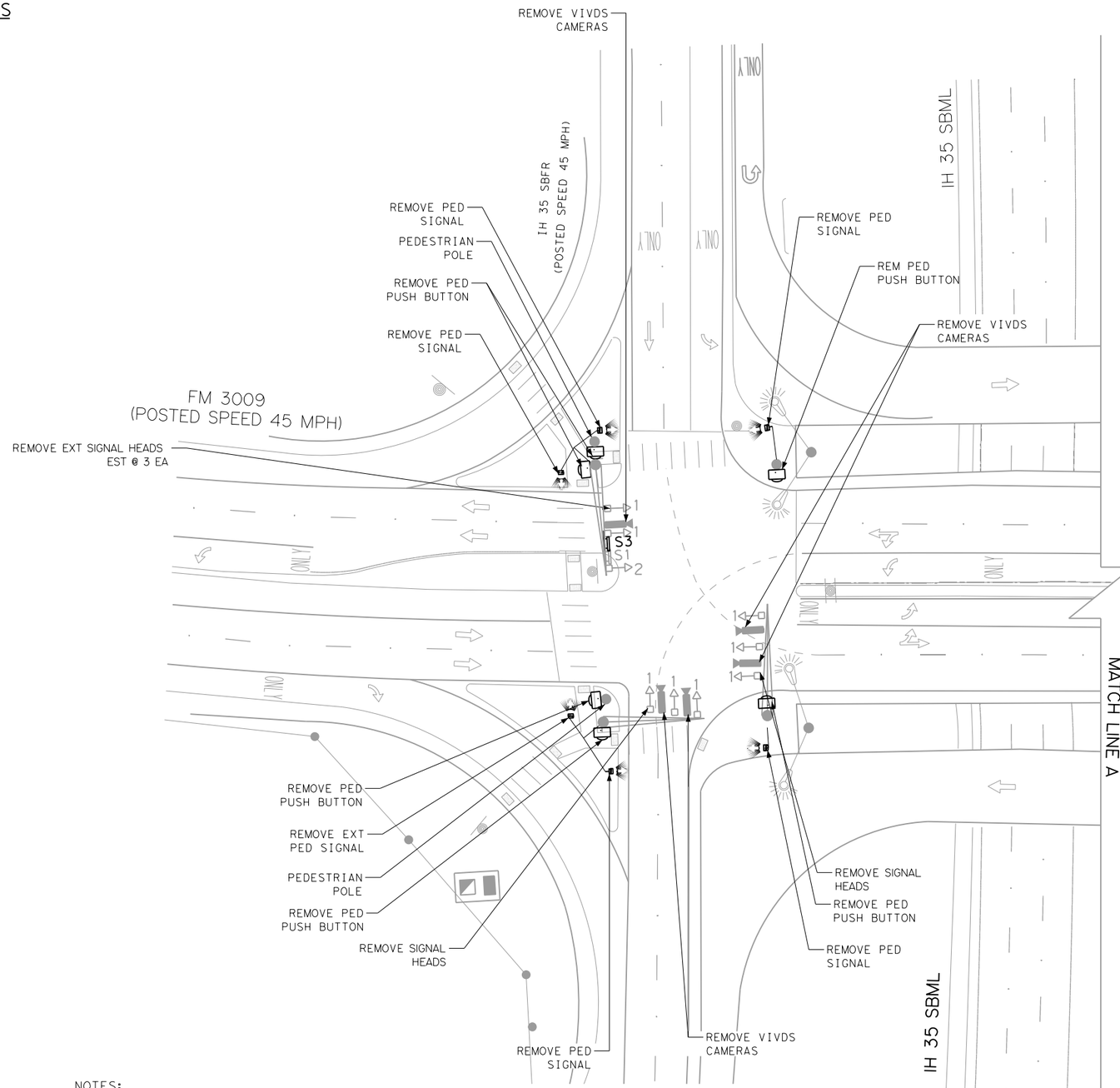
7/27/2023

NOTE:
1. ALL REMOVED RADARS, PEDESTRIAN PUSH BUTTONS, AND SIGNALS THAT ARE DEEMED SERVICABLE SHALL BE DELIVERED TO THE SAN ANTONIO DISTRICT SIGN SHOP.

EXISTING SIGNAL HEADS



EXISTING SIGN

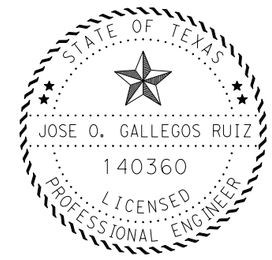


0 20 50
SCALE: 1"=50'

LEGEND

- EXISTING PED POLE
- EXISTING SIGN
- EXISTING CONTROLLER CABINET
- EXISTING SIGNAL FACE
- EXISTING TRAFFIC SIGNAL POLE
- EXISTING VIVIDS CAMERA
- DIRECTION OF FLOW
- EXISTING PED PUSH BUTTON
- EXISTING PED SIGNAL
- EXISTING LUMINAIRE

NOTES:
1. ALL TRAFFIC SIGNAL EQUIPMENT LOCATIONS AND RIGHT-OF-WAY LINES ARE APPROXIMATE. VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
2. THE EXISTENCE AND LOCATION OF UTILITIES, EITHER UNDERGROUD OR OVERHEAD, INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES (PRIVATE/PUBLIC AND SHOWN/NOT SHOWN) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS BULLY RESPONSIBLE FOR ANY CAMAGES CAUSED BY HIS/HER FAILURE TO LOCATE, PRESERVE, AND PROTECT UTILITIES.
3. ALL ITEMS NOR SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.



Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation
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EXISTING SIGNAL LAYOUT

FM 3009 AT IH 35

CSJ 3107-02-039 SHEET 1 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		31
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

DN: DN

7/27/2023
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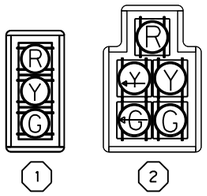
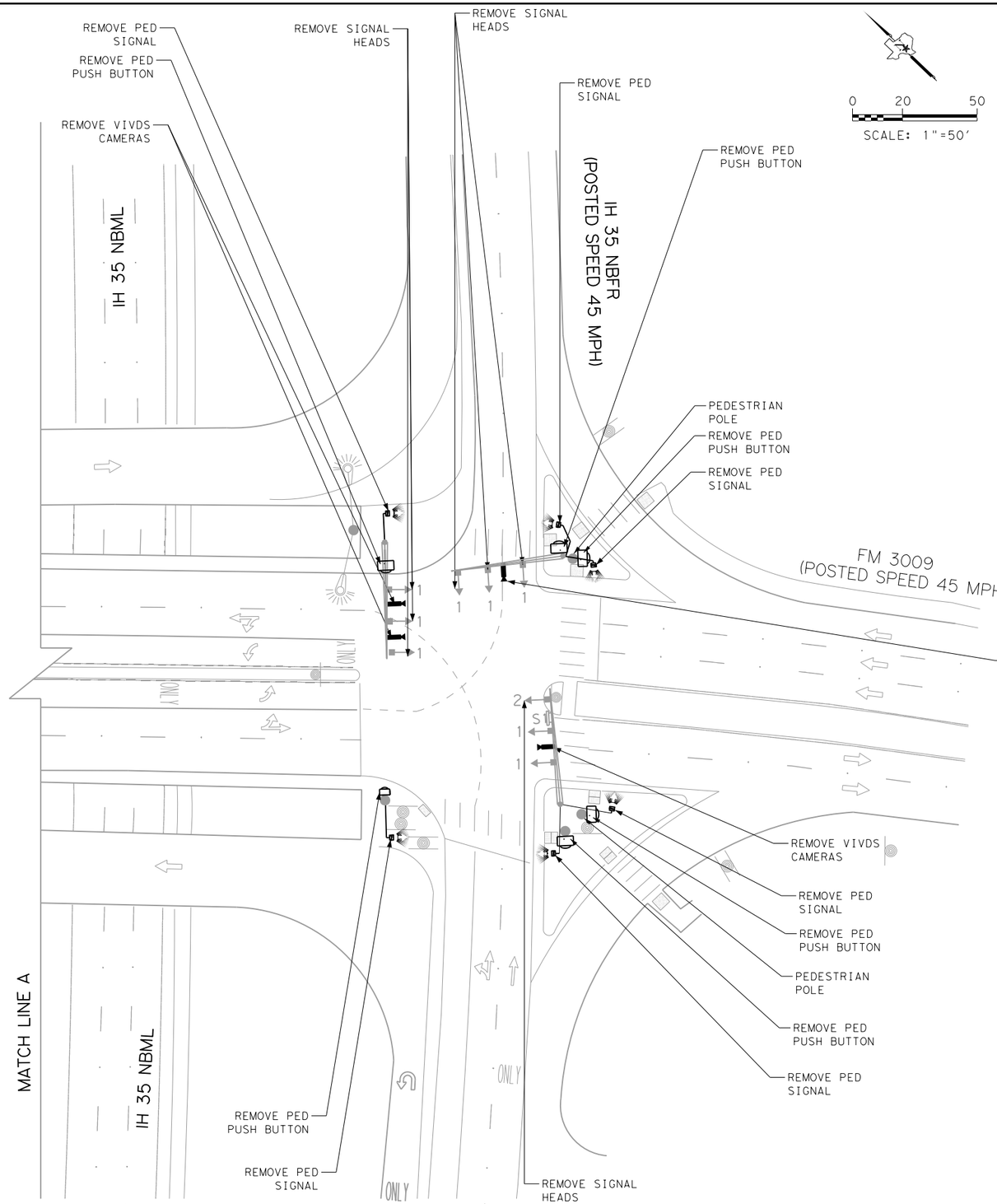
NOTE: ALL REMOVED RADARS, PEDESTRIAN PUSH BUTTONS, AND SIGNALS THAT ARE DEEMED SERVICABLE SHALL BE DELIVERED TO THE SAN ANTONIO DISTRICT SIGN SHOP. CALL MARK PEREZ FOR QUESTIONS. (210 - 615 - 6019)

EXISTING SIGNAL HEADS



EXISTING SIGN

S1
R10-12



LEGEND

- EXISTING PED POLE
- EXISTING SIGN
- EXISTING CONTROLLER CABINET
- EXISTING SIGNAL FACE
- EXISTING TRAFFIC SIGNAL POLE
- EXISTING VIVIDS CAMERA
- DIRECTION OF FLOW
- EXISTING PED PUSH BUTTON
- EXISTING PED SIGNAL
- EXISTING LUMINAIRE
- PROPOSED PED PUSH BUTTON
- PROPOSED PED SIGNAL
- PROPOSED RADAR PRESENCE
- PROPOSED RADAR ADVANCED PRESENCE DETECTOR (RVDS)

LEGEND

- EXIST. SIGN
- EXIST. CONTROLLER CABINET
- EXIST. SIGNAL FACE
- EXIST. LUMINAIRE
- EXIST. VIVIDS CAMERA
- DIRECTION OF FLOW
- EXIST. PED PUSH BUTTON
- EXIST. PED SIGNAL
- EXIST. TRAFFIC SIGNAL MAST ARM

NOTES:
1. ALL TRAFFIC SIGNAL EQUIPMENT LOCATIONS AND RIGHT-OF-WAY LINES ARE APPROXIMATE. VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
2. THE EXISTENCE AND LOCATION OF UTILITIES, EITHER UNDERGROUD OR OVERHEAD, INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES (PRIVATE/PUBLIC AND SHOWN/NOT SHOWN) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS BULLY RESPONSIBLE FOR ANY CAMAGES CAUSED BY HIS/HER FAILURE TO LOCATE, PRESERVE, AND PROTECT UTILITIES.
3. ALL ITEMS NOR SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

EXISTING SIGNAL LAYOUT

FM 3009 AT IH 35

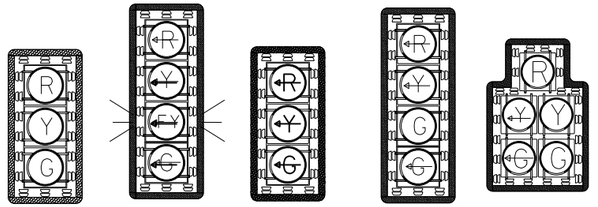
CSJ 3107-02-039 SHEET 2 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		32
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

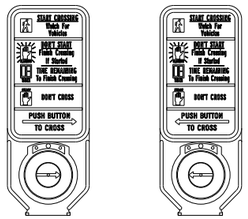
DN: DN

PROPOSED SIGNAL HEADS

12" LED VERTICAL SIGNAL SECTIONS
W/ VENTED BACKPLATES W/
RETROREFLECTIVE BORDER



SIGNAL NO. 1 — 3 SEC SIGNAL HEAD
SIGNAL NO. 2 — 4 SEC SIGNAL HEAD
SIGNAL NO. 3 — 3 SEC SIGNAL HEAD
SIGNAL NO. 4 — 4 SEC SIGNAL HEAD
SIGNAL NO. 5 — 5 SEC SIGNAL HEAD

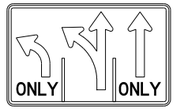


S1

S2

ACCESSIBLE
PEDESTRIAN SIGNAL
PUSH BUTTON
WITH PEDESTRIAN SIGN
R10-3e(9"x15")
S1 & S2

R10-17T
(30"x30")
S3
(2 EA)

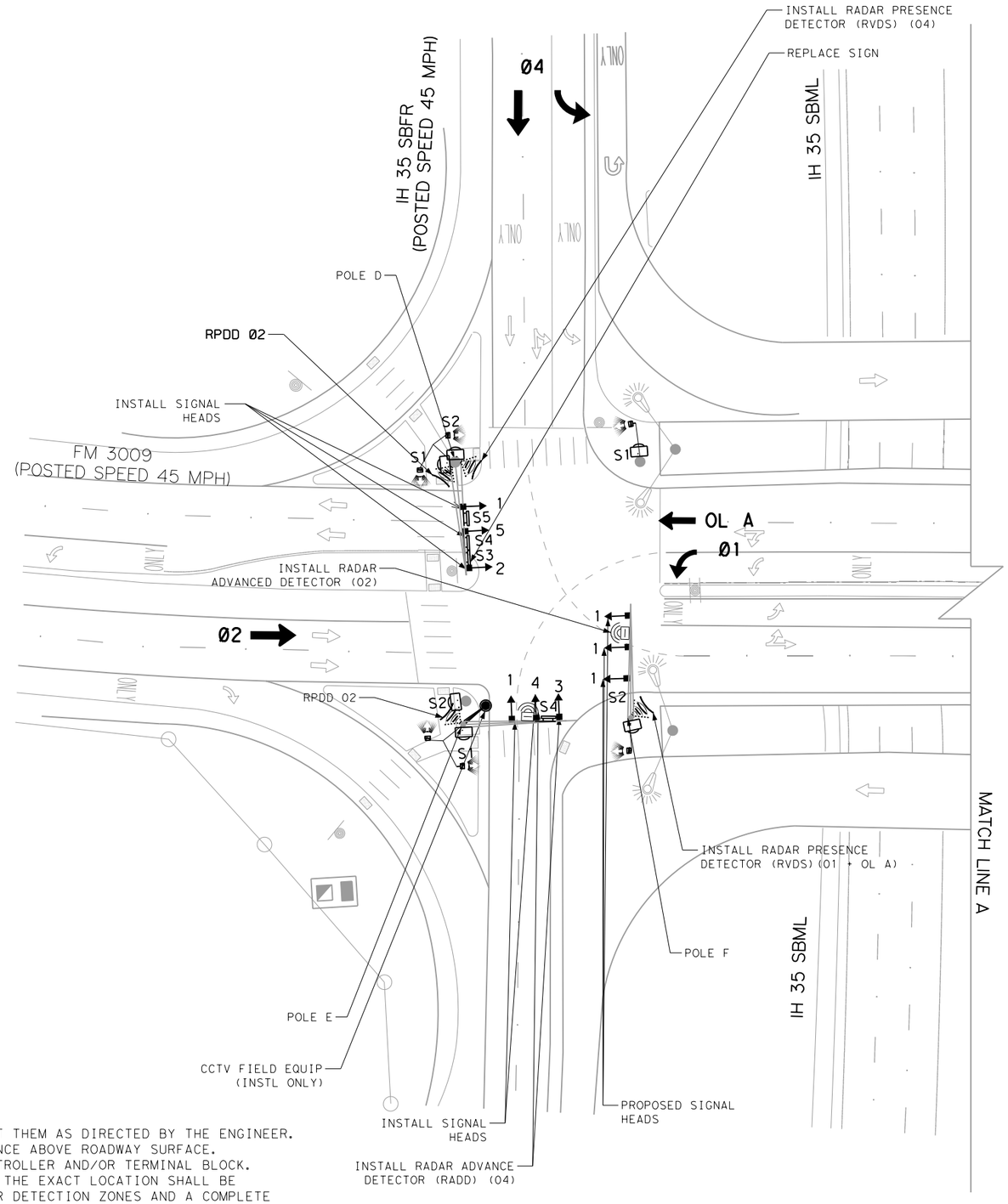


R3-8LMS
(48"x30")
S4
(2 EA)

R10-12
(30"x36")
S5
(2 EA)

PROPOSED SIGN SCHEDULE

PED. SIGNAL



LEGEND

- EXISTING CONTROLLER CABINET
- EXISTING TRAFFIC SIGNAL POLE
- DIRECTION OF FLOW
- PROPOSED PED PUSH BUTTON
- PROPOSED PED SIGNAL
- PROPOSED RADAR PRESENCE
- PROPOSED RADAR ADVANCED DETECTOR (RVDS)
- PROPOSED IP PTZ CAMERA

0 20 50
SCALE: 1"=50'

NOTES:
1. LUMINAIRES ARE SHOWN FOR CLARITY PURPOSES ONLY. ORIENT THEM AS DIRECTED BY THE ENGINEER.
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STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation
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PROPOSED SIGNAL LAYOUT

FM 3009 AT IH 35

CSJ 3107-02-039 SHEET 3 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
			33
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

7/27/2023
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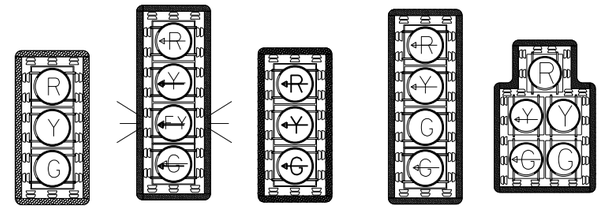
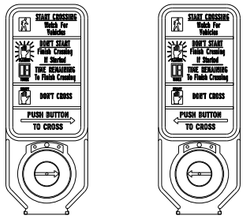
PROPOSED SIGNAL HEADS

12" LED VERTICAL SIGNAL SECTIONS
W/ VENTED BACKPLATES W/
RETROREFLECTIVE BORDER



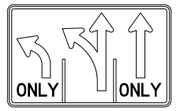
SIGNAL NO. 1	SIGNAL NO. 2	SIGNAL NO. 3	SIGNAL NO. 4	SIGNAL NO. 5
3 SEC SIGNAL HEAD	4 SEC SIGNAL HEAD	3 SEC SIGNAL HEAD	4 SEC SIGNAL HEAD	5 SEC SIGNAL HEAD



S1 S2

ACCESSIBLE
PEDESTRIAN SIGNAL
PUSH BUTTON
WITH PEDESTRIAN SIGN
R10-3e(9"x15")
S1 & S2

R10-17T
(30"x30")
S3
(2 EA)

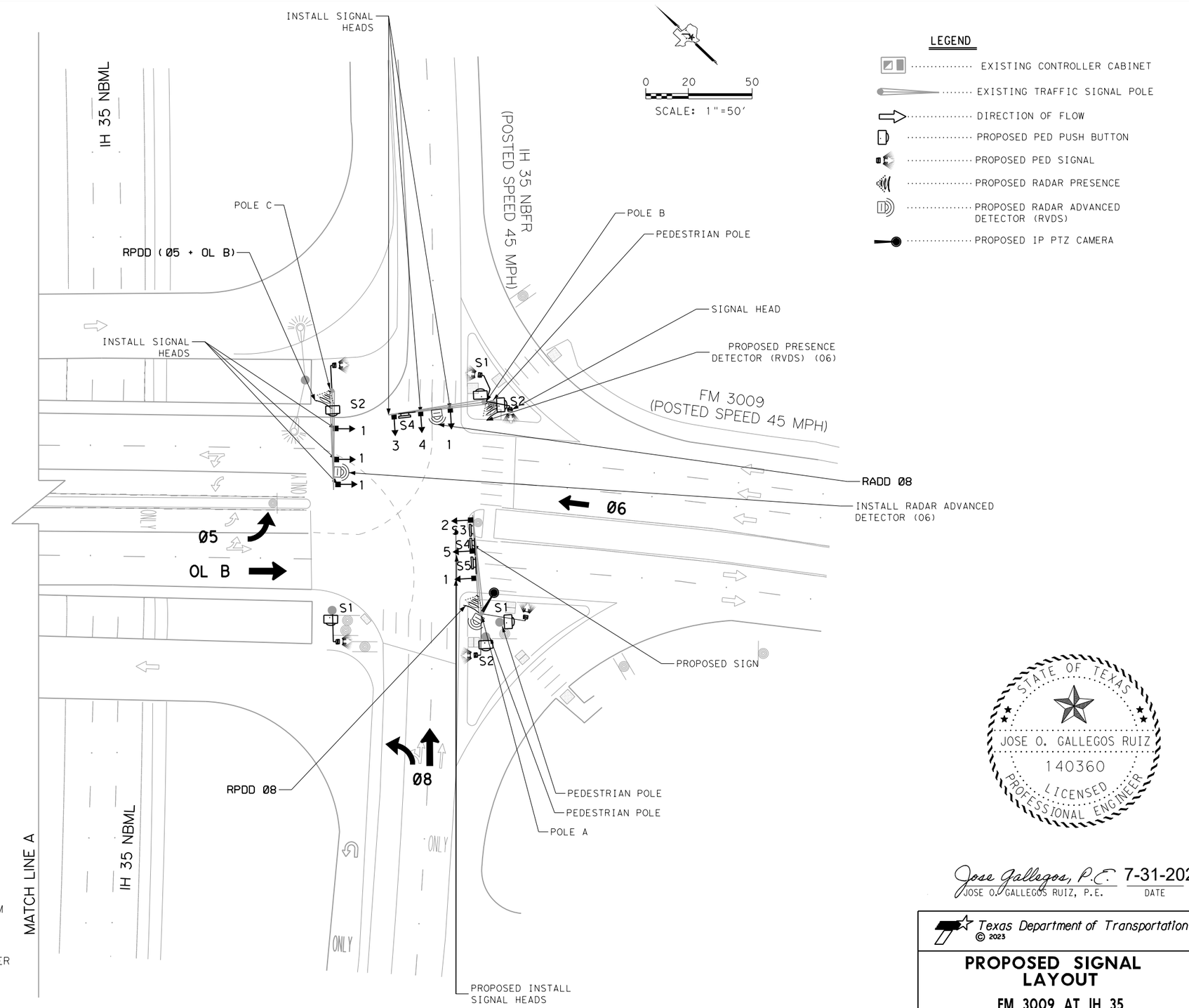


R3-8LMS
(48"x30")
S4
(2 EA)

PROPOSED SIGN SCHEDULE

R10-12
(30"x36")
S5
(2 EA)

PED. SIGNAL



0 20 50
SCALE: 1"=50'

LEGEND

- EXISTING CONTROLLER CABINET
- EXISTING TRAFFIC SIGNAL POLE
- DIRECTION OF FLOW
- PROPOSED PED PUSH BUTTON
- PROPOSED PED SIGNAL
- PROPOSED RADAR PRESENCE
- PROPOSED RADAR ADVANCED DETECTOR (RVDS)
- PROPOSED IP PTZ CAMERA

NOTES:
1. LUMINAIRES ARE SHOWN FOR CLARITY PURPOSES ONLY. ORIENT THEM AS DIRECTED BY THE ENGINEER.
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3. CONTRACTOR SHALL CONTACT THE DISTRICT SIGNAL MAINTENANCE OFFICE AND AREA OFFICE A MINIMUM OF SEVEN (7) DAYS PRIOR TO BEGINNING CONSTRUCTION.

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

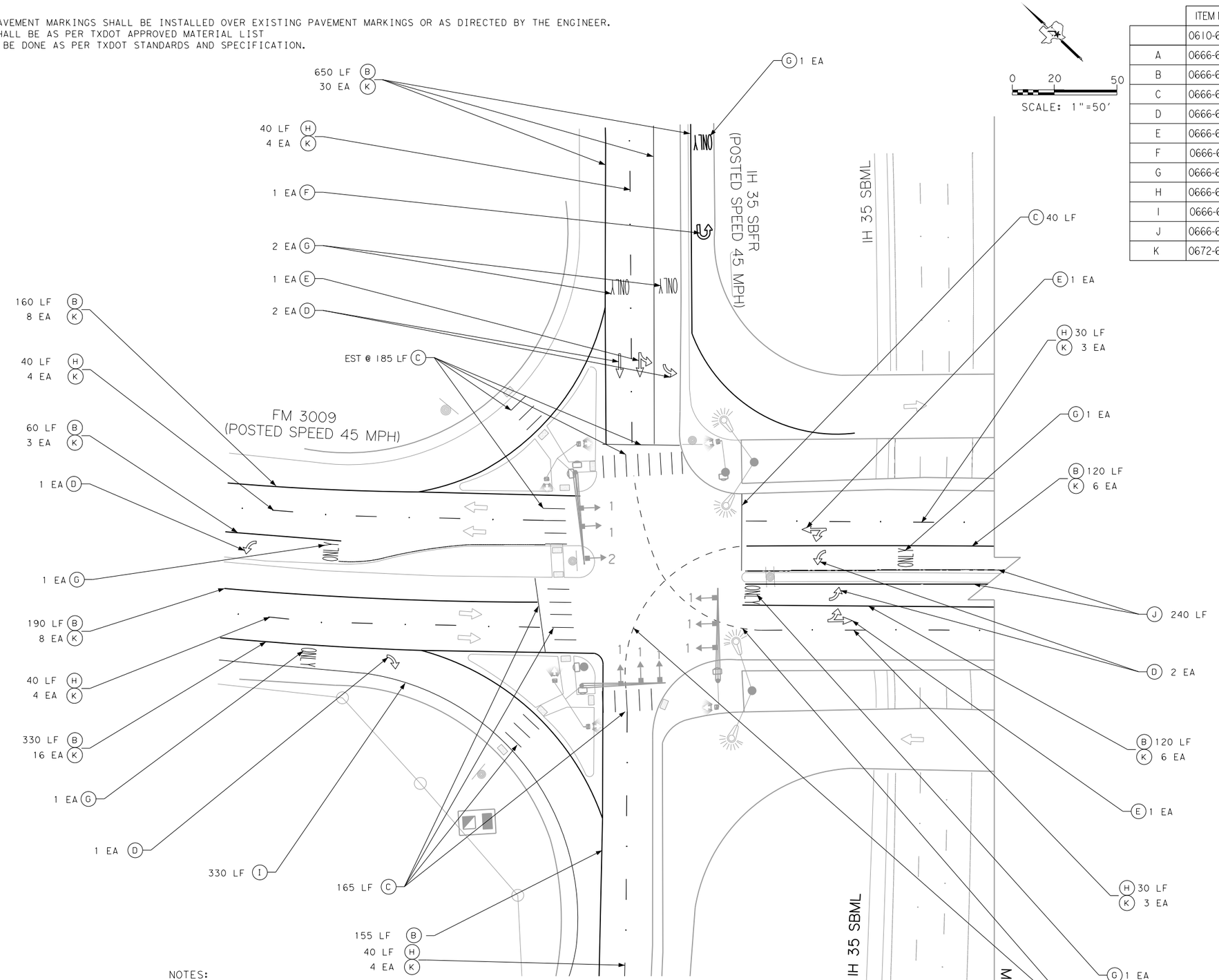
PROPOSED SIGNAL LAYOUT

FM 3009 AT IH 35

CSJ 3107-02-039 SHEET 4 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		34
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

NOTES:
1. ALL PROPOSED PAVEMENT MARKINGS SHALL BE INSTALLED OVER EXISTING PAVEMENT MARKINGS OR AS DIRECTED BY THE ENGINEER.
2. ALL MATERIAL SHALL BE AS PER TXDOT APPROVED MATERIAL LIST
3. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATION.



NOTES:
1. REMOVE AND INSTALL NEW LANE LINES, CENTERLINE, CROSSWALKS, STOP BARS, AND YIELD TRIANGLE PAVEMENT MARKINGS A MINIMUM OF 200 LF ON EACH INTERSECTION APPROACH.
2. ALL GROUND MOUNTED SIGNS ARE TO REMAIN IN PLACE UNLESS OTHERWISE SHOWN IN THE PLANS.
3. ALL METERIAL SHALL BE AS PER TXDOT APPROVED MATERIALS LIST.
4. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATIONS.

LEGEND

DIRECTION OF FLOW

QUANTITY SUMMARY CSJ: 0025-03-105

	ITEM NO.	ITEM	UNIT	QUANTITY
	0610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	2
A	0666-6016	REFL PAV MRK TY I (W)6"(DOT)(060MIL)	LF	300
B	0666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF	1785
C	0666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF	390
D	0666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA	6
E	0666-6055	REFL PAV MRK TY I(W)(DBL ARROW)(060MIL)	EA	3
F	0666-6061	REFL PAV MRK TY I(W)(UTURN ARW)(060MIL)	EA	1
G	0666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA	7
H	0666-6298	RE PM W/RET REQ TY I (W)4"(BRK)(060MIL)	LF	220
I	0666-6301	RE PM W/RET REQ TY I (W)4"(SLD)(060MIL)	LF	330
J	0666-6313	RE PM W/RET REQ TY I (Y)4"(SLD)(060MIL)	LF	240
K	0672-6007	REFL PAV MRKR TY I-C	EA	100

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

PROPOSED PAVEMENT MARKINGS

FM 3009 AT IH 35

CSJ 3107-02-039 SHEET 5 OF 10

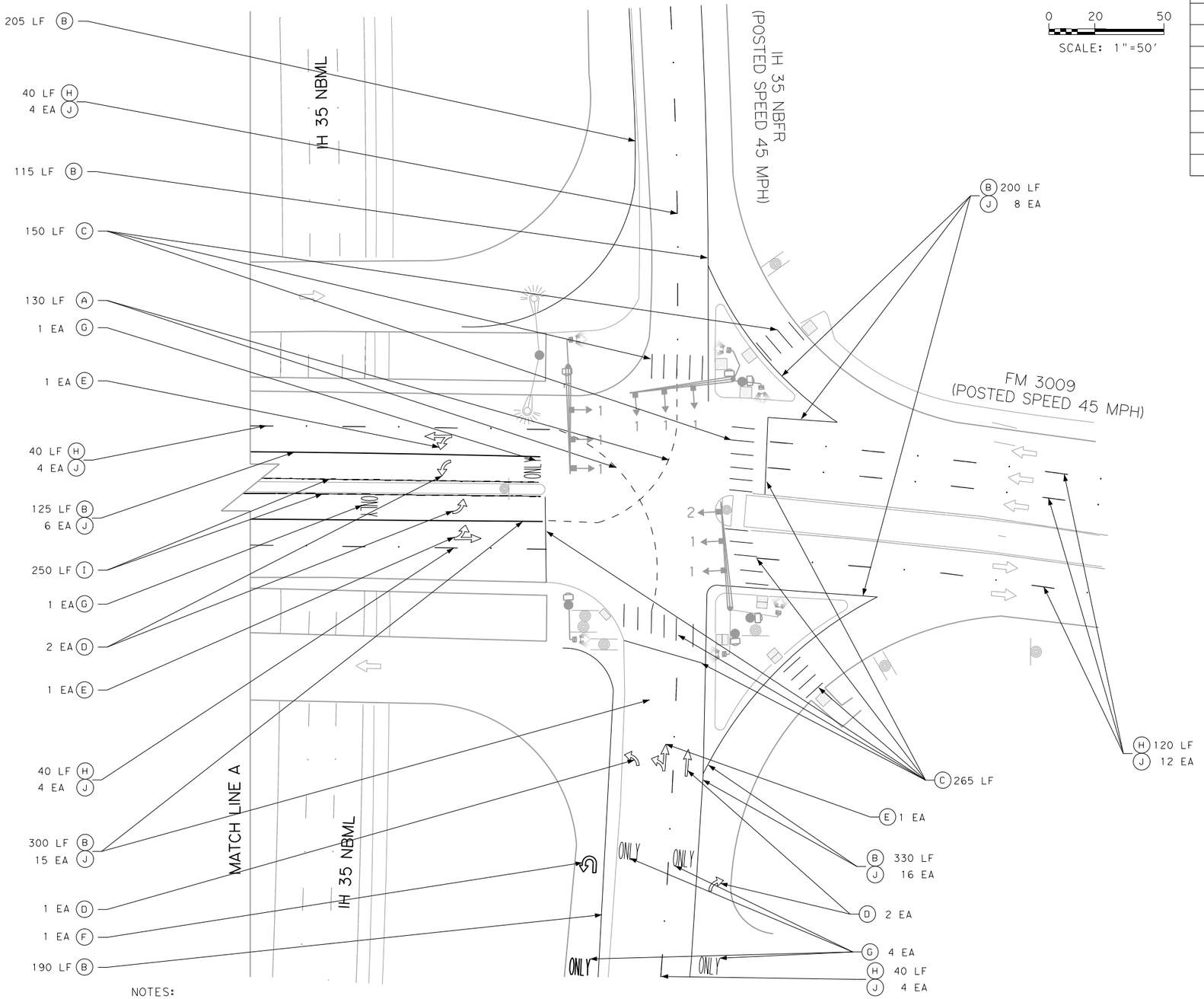
FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		35
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

DN: DN

7/27/2023
T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\FM 3009 at IH 35\FM 3009 at IH 35.dgn

DN: DN

NOTES:
1. ALL PROPOSED PAVEMENT MARKINGS SHALL BE INSTALLED OVER EXISTING PAVEMENT MARKINGS OR AS DIRECTED BY THE ENGINEER.
2. ALL MATERIAL SHALL BE AS PER TXDOT APPROVED MATERIAL LIST
3. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATION.



NOTES:
1. REMOVE AND INSTALL NEW LANE LINES, CENTERLINE, CROSSWALKS, STOP BARS, AND YIELD TRIANGLE PAVEMENT MARKINGS A MINIMUM OF 200 LF ON EACH INTERSECTION APPROACH.
2. ALL GROUND MOUNTED SIGNS ARE TO REMAIN IN PLACE UNLESS OTHERWISE SHOWN IN THE PLANS.
3. ALL METERIAL SHALL BE AS PER TXDOT APPROVED MATERIALS LIST.
4. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATIONS.

LEGEND

⇨ ..... DIRECTION OF FLOW

QUANTITY SUMMARY CSJ: 0025-03-105

	ITEM NO.	ITEM	UNIT	QUANTITY
A	0666-6016	REFL PAV MRK TY I (W)6"(DOT)(060MIL)	LF	260
B	0666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF	1465
C	0666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF	415
D	0666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA	6
E	0666-6055	REFL PAV MRK TY I(W)(DBL ARROW)(060MIL)	EA	3
F	0666-6061	REFL PAV MRK TY I(W)(UTURN ARW)(060MIL)	EA	1
G	0666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA	6
H	0666-6298	RE PM W/RET REQ TY I (W)4"(BRK)(060MIL)	LF	240
I	0666-6301	RE PM W/RET REQ TY I (W)4"(SLD)(060MIL)	LF	250
J	0666-6313	RE PM W/RET REQ TY I (Y)4"(SLD)(060MIL)	LF	250
K	0672-6007	REFL PAV MRKR TY I-C	EA	75

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation
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PROPOSED PAVEMENT MARKINGS

FM 3009 AT IH 35

CSJ 3107-02-039 SHEET 6 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		36
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

7/27/2023
T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\FM 3009 at IH 35\FM 3009 at IH 35.dgn

PROPOSED CONDUIT AND CONDUCTOR SCHEDULE

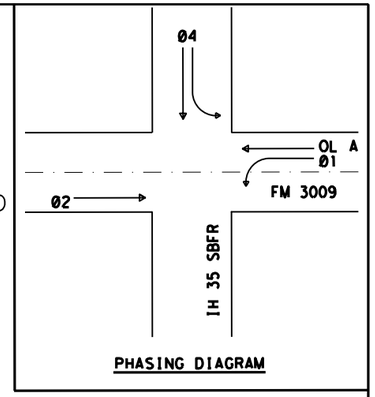
	RUN NUMBER		1	2	3	4	5	6	7	8	9	10	11	12
	CONDUIT SIZE IN INCHES			3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	NUMBER OF CONDUITS			2	2	2	2	2	2	2	2	2	2	2
	LENGTH OF RUN (FT)		10	25	55	15	15	75	15	120	15	90	10	140
	CONTROLLER (C)EXISTING (E)		E	E	E	E	E	E	E	E	E	E	E	E
CABLE	CIRCUIT		NUMBER OF CONDUCTORS											
6 COND. #22	RVDS (PRESENCE DETECTION DEVICE)	PHASE 01 & OL A	1	1	1			1	1					
		PHASE 02	1	1	1	1								
		PHASE 04	1	1	1					1	1			
		PHASE 05 & OL B	1	1	1			1						1
		PHASE 06	1	1	1	1		1						1
		PHASE 08	1	1	1			1						1
6 COND. #22	RVDS (ADVANCE DETECTION DEVICE)	PHASE 01 & OL A	1	1	1			1	1					
		PHASE 02	1	1	1			1	1					
		PHASE 04	1	1	1	1								
		PHASE 05 & OL B	1	1	1			1						1
		PHASE 06	1	1	1			1						1
		PHASE 08	1	1	1			1						1
CAT 5 ETHERNET CABLE & POWER	IP CAMERA		1	1	1			1						1

NOTES:
1. ALL MATERIAL SHALL BE AS PER TXDOT APPROVED MATERIAL LIST
2. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATION.
3. ALL PROPOSED CONDUCTORS SHALL BE RUN THROUGH EXISTING 3" CONDUIT AND GROUND BOXES
4. LOCATION OF OVERHEAD AND UNDERGROUND SIGNAL RELATED ITEMS AND UTILITIES ARE APPROXIMATE

WIRING IN ARMS & POLES

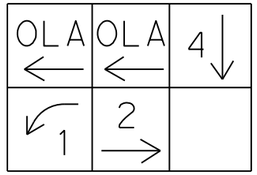
INSIDED ARMS & POLES	#12 AWG 4/C	#12 AWG 7/C	RADAR (RADD)	PRESENCE (RPDD)
POLE A				
SIGNAL I		40		
SIGNAL I		55		
SIGNAL 2		65		
RADD I			30	75
RADD 2			30	
RPDD			55	
POLE B				
SIGNAL I		40		
SIGNAL I		55		
SIGNAL I		70		
RPDD				50
RADD			50	
POLE C				
SIGNAL I		40		
SIGNAL I		55		
SIGNAL I		70		
RADD			50	
POLE D				
SIGNAL I		40		
SIGNAL I		50		
SIGNAL 2		50		
RADD			30	
RPDD				40
POLE E				
SIGNAL I		45		
SIGNAL I		55		
SIGNAL I		65		
RADD			25	
RPDD				60
POLE F				
SIGNAL I		45		
SIGNAL I		60		
RADD			60	
RPDD				50
				45
TOTALS		**845**	**350**	**275**

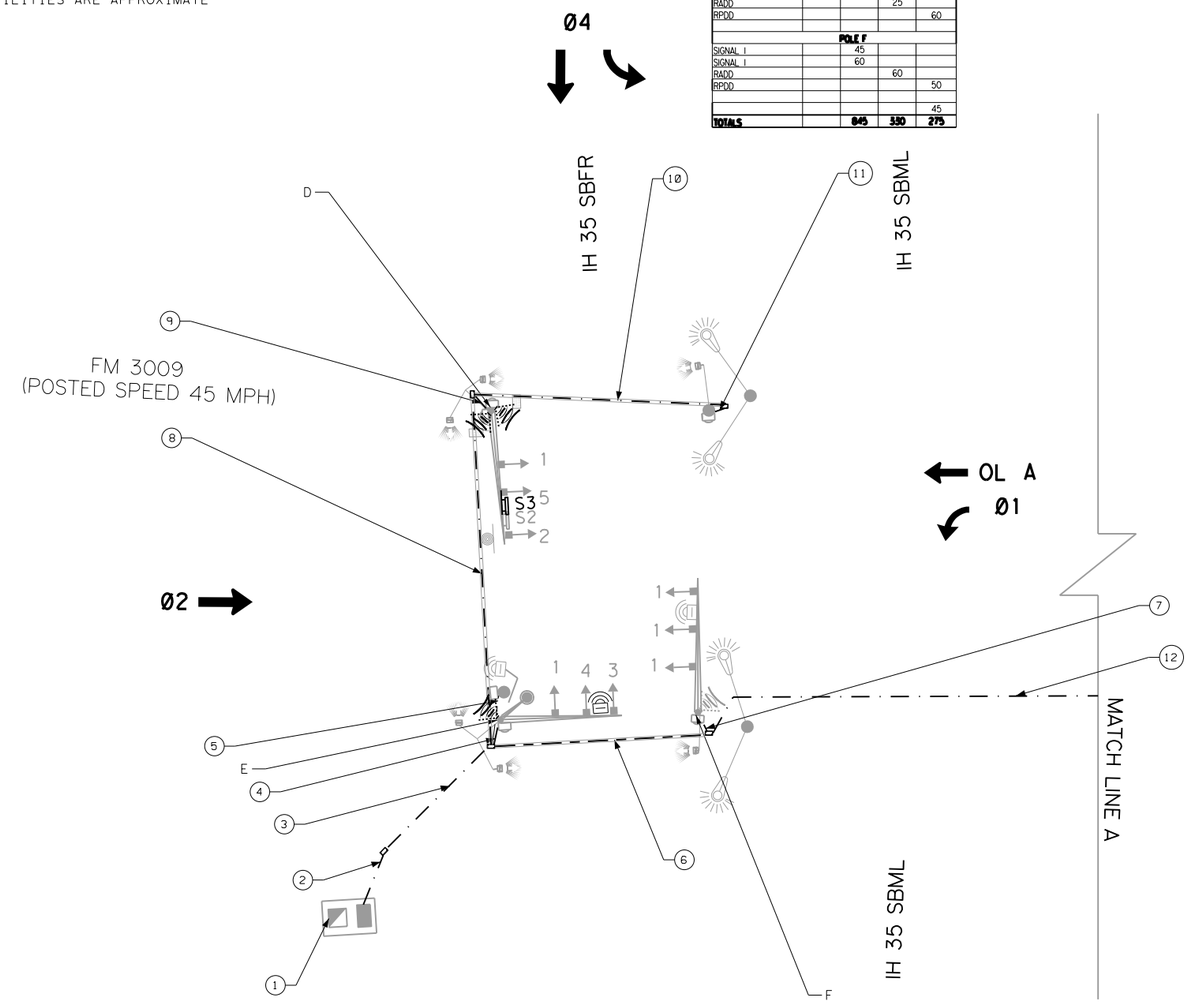
0 25 50
SCALE: 1"=50'



PHASING DIAGRAM

Normal Phasing





NOTES:
1. TRAY CABLES SHALL BE RUN IN 2" CONDUIT SEPARATE FROM THE SIGNAL CABLE.

LEGEND

- EXISTING PED POLE
- EXISTING SIGN
- EXISTING CONTROLLER CABINET
- EXISTING SIGNAL FACE
- EXISTING TRAFFIC SIGNAL POLE
- DIRECTION OF FLOW
- EXISTING LUMINAIRE
- PROPOSED SIGNAL FACE
- PROPOSED PED PUSH BUTTON
- PROPOSED PED SIGNAL
- EXISTING CCTV CAMERA
- EXISTING TRENCH CONDUIT
- EXISTING GROUND BOX
- PROPOSED RADAR ADVANCED DETECTOR (RADD)
- PROPOSED RADAR PRESECNCE DETECTOR (RPDD)

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

CONDUIT & CONDUCTOR SCHEDULE

FM 3009 AT IH 35

CSJ 3107-02-039 SHEET 7 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		37
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

7/27/2023
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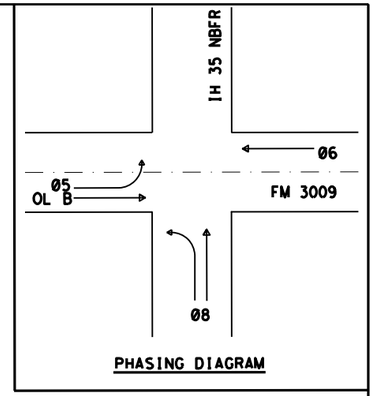
PROPOSED CONDUIT AND CONDUCTOR SCHEDULE

	RUN NUMBER		13	14	15	16	17	18	19	20	21	22	23
	CONDUIT SIZE IN INCHES		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	NUMBER OF CONDUITS		2	2	2	2	2	2	2	2	2	2	2
	LENGTH OF RUN (FT)		145	15	85	20	20	20	125	20	20	90	20
	CONTROLLER (C) EXISTING (E)												
CABLE	CIRCUIT		NUMBER OF CONDUCTORS										
6 COND. #22	RVDS (PRESENCE DETECTION DEVICE)	PHASE 05 & OL B	1		1				1			1	1
		PHASE 06	1		1				1		1		
		PHASE 08	1		1				1		1		
6 COND. #22	RVDS (ADVANCE DETECTION DEVICE)	PHASE 05 & OL B	1		1			1					
		PHASE 06	1		1				1		1		1
		PHASE 08	1		1			1					
CAT 5 ETHERNET CABLE & POWER	IP CAMERA		1		1	1							

WIRING IN ARMS & POLES

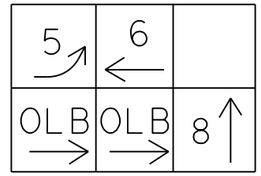
INSIDED ARMS & POLES		#12 AWG 4/C	#12 AWG 7/C	RADAR (RADD)	PRESENCE (RPDD)
POLE A					
SIGNAL 1			40		
SIGNAL 1			55		
SIGNAL 2			65		
RADD 1				30	75
RADD 2				30	
RPDD				55	
POLE B					
SIGNAL 1			40		
SIGNAL 1			55		
SIGNAL 1			70		
RPDD					50
RADD				50	
POLE C					
SIGNAL 1			40		
SIGNAL 1			55		
SIGNAL 1			70		
RADD				50	
POLE D					
SIGNAL 1			40		
SIGNAL 1			50		
SIGNAL 2			50		
RADD				30	
RPDD					40
POLE E					
SIGNAL 1			45		
SIGNAL 1			55		
SIGNAL 1			65		
RADD				25	
RPDD					60
POLE F					
SIGNAL 1			45		
SIGNAL 1			60		
RADD				60	
RPDD					50
					45
TOTALS		**845**	**330**	**275**	

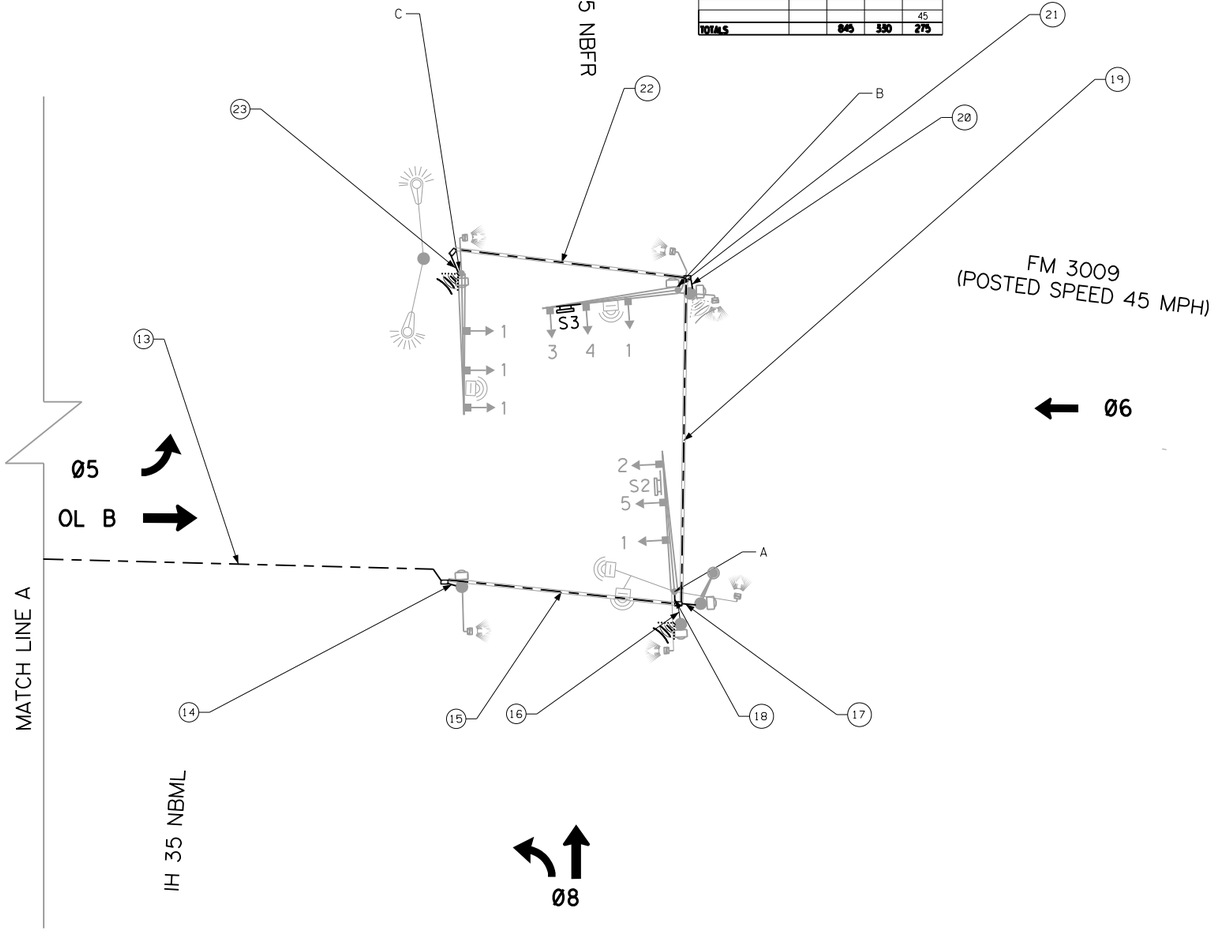
0 25 50
SCALE: 1"=50'



PHASING DIAGRAM

Normal Phasing





LEGEND

- EXISTING PED POLE
- EXISTING SIGN
- EXISTING CONTROLLER CABINET
- EXISTING SIGNAL FACE
- EXISTING TRAFFIC SIGNAL POLE
- DIRECTION OF FLOW
- EXISTING LUMINAIRE
- PROPOSED SIGNAL FACE
- PROPOSED PED PUSH BUTTON
- PROPOSED PED SIGNAL
- EXISTING CCTV CAMERA
- EXISTING TRENCH CONDUIT
- EXISTING GROUND BOX
- PROPOSED RADAR ADVANCED DETECTOR (RADD)
- PROPOSED RADAR PRESECNCE DETECTOR (RPDD)

NOTES:
1. TRAY CABLES SHALL BE RUN IN 2" CONDUIT SEPARATE FROM THE SIGNAL CABLE.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

CONDUIT & CONDUCTOR SCHEDULE

FM 3009 AT IH 35

CSJ 3107-02-039 SHEET 8 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		38
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

7/27/2023
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SUMMARY OF SMALL SIGNS

SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
31	S1	R10-12	LEFT TURN YIELD ON GREEN	REMOVE								
33	S2	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	30" X 30"	✓		THIS SIGN WILL REPLACE THE SIGNS NO. S1					
35	S3	R3-8LMS	ONLY ONLY	48"x30"								

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DATE: DATE TIME
FILE: DOCUMENT NAME

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

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

http://www.txdot.gov/

NOTE:

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

FM 3009 AT IH 35

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

FM 3009 AT IH 35

CSJ 3107-02-039

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0025	03	105, ETC	UA 90, ETC
4-16	DIST	COUNTY		SHEET NO.
8-16 CONT. SECT.	SAT	GUADALUPE		39

TB

ITEM	DESCRIPTION	UNIT	QTY
0610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	6
0620-6009	ELEC CONDR (NO.6) BARE	LF	1145
0621-6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	60
0636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	13
0666-6016	REFL PAV MRK TY I (W)6"(DOT)(060MIL)	LF	560
0666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF	3250
0666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF	805
0666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA	12
0666-6055	REFL PAV MRK TY I(W)(DBL ARROW)(060MIL)	EA	6
0666-6061	REFL PAV MRK TY I(W)(UTURN ARW)(060MIL)	EA	2
0666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA	13
0666-6298	RE PM W/RET REQ TY I (W)4"(BRK)(060MIL)	LF	460
0666-6301	RE PM W/RET REQ TY I (W)4"(SLD)(060MIL)	LF	580
0666-6313	RE PM W/RET REQ TY I (Y)4"(SLD)(060MIL)	LF	490
0672-6007	REFL PAV MRKR TY I-C	EA	175
0680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA	1
0682-6001	VEH SIG SEC (12")LED(GRN)	EA	16
0682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	8
0682-6003	VEH SIG SEC (12")LED(YEL)	EA	14
0682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	6
0682-6005	VEH SIG SEC (12")LED(RED)	EA	14
0682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	4
0682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	12
0682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	16
0682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	2
0682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA	2
0684-6009	TRF SIG CBL (TY A)(12 AWG)(4 CONDR)	LF	5060
0684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	845
0684-6028	TRF SIG CBL (TY A)(14 AWG)(2 CONDR)	LF	5060
0684-6080	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)	LF	400
0688-6001	PED DETECT PUSH BUTTON (APS)	EA	12
0688-6003	PED DETECTOR CONTROLLER UNIT	EA	1
0690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA	30
0690-6030	REMOVAL OF PEDESTRIAN PUSH BUTTONS	EA	12
0690-6086	REMOVE VID IMAGE VEH DET SYS (VIVDS)	EA	5
6004-6031	ITS COM CBL (ETHERNET)	LF	130
6010-6010	CCTV FIELD EQUIP (ANALOG) (INSTL ONLY)	EA	1
6027-6003	CONDUIT (PREPARE)	LF	845
6027-6008	GROUND BOX (PREPARE)	EA	8
6185-6002	TMA (STATIONARY)	DAY	20
6292-6001	RVDS(PRESENCE DETECTION ONLY)	EA	6
6292-6002	RVDS(ADVANCE DETECTION ONLY)	EA	6

NOTES:
* IS SUBSIDIARY TO ITEM 6292-6002

NOTES:
1. SIGNAL HEADS SHALL HAVE A MINIMUM OF 18.5 FEET CLEARANCE ABOVE ROADWAY SURFACE.
2. CONTRACTOR SHALL CONNECT PROPOSED FIELD WIRING TO CONTROLLER AND/OR TERMINAL BLOCK.
3. THE LOCATOR OF RADAR DETECTORS SHOWN ARE APPROXIMATE. THE EXACT LOCATION SHALL BE DETERMINED IN THE FIELD AND ADJUSTED TO PROVIDE PROPER DETECTION ZONES AND A COMPLETE OPERABLE SYSTEM.
4. CONTRACTOR SHALL CONTACT THE DISTRICT SIGNAL MAINTENANCE OFFICE AND AREA OFFICE A MINIMUM OF SEVEN (7) DAYS PRIOR TO BEGINNING CONSTRUCTION.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

TRAFFIC QUANTITIES & DETAILS

FM 3009 AT IH 35

CSJ 3107-02-039 SHEET 10 OF 10

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		40
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

EXISTING SIGNS ATTACHED TO SPANWIRE

R10-17T
(30"x30")

S1

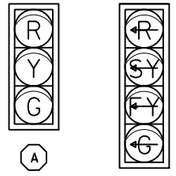
EXISTING PUSH BUTTON SIGNS

S2 S3

EXISTING SIGNS ON POST

S4 S5

EXISTING SIGNAL HEADS



A B

EXISTING PEDESTRIAN HEADS

W

SCALE: 1" = 40'
20 0 20

LEGEND

- EXISTING CONTROLLER CABINET
- EXISTING TRAFFIC SIGNAL POLE
- EXIST TRAFFIC SIGNAL SPAN WIRE
- EXIST SIGNAL HEAD VERTICAL
- EXIST SIGN MOUNTED ON MAST ARM
- EXISTING SIGNAL BOX
- EXISTING SIGNAL HEAD
- EXISTING ELECTRICAL SERVICE
- EXISTING UTILITY POLE
- EXISTING OVERHEAD POWER LINE
- EXISTING SPREAD SPECTRUM ANRENNA
- EXISTING GRIDSMATY BELL CAMERA
- DIRECTION OF TRAFFIC FLOW

NOTES:

1. ALL TRAFFIC SIGNAL EQUIPMENT (POLES , ARMS, SIGNAL HEADS, SIGNS, SPREAD SPECTRUM ANTENNA, GRIDSMART BELL CAMERA ETC.) SHALL BE REMOVED AND SALVAGED AND RETURNED TO TXDOT OR AS DIRECTED BY TXDOT ENGINNER, REMOVE EXISTING PAVEMENT MARKINGS RELATED TO THE TRAFFIC SIGNAL INTERSECTION IN ACCORDANCE TO TXDOT STANDARDS AND SPECIFICATIONS, DIRECTED BY TXDOT ENGINEER. ALL WORK IS SUBSIDIARY TO ITEM 680 "REMOVING TRAFFIC SIGNAL".
2. ALL RAMPS, CURBS, EXISTING FOUNDATIONS RELATED TO TXDOT SIGNS, EXISTING ABANDONED COMMERCIAL SIGNS, LIGHTING IS SUBSIDIARY TO ITEM 531"CURB RAMPS".

POSTED SPEED LIMITS:
FM 3009 = 45 MPH
WOODLAND OAKS RD = 30 MPH

PAVEMENT TYPE:
FM 3009 = ASPHALT
WOODLAND OAKS RD = ASPHALT

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

CHARLES R. STEVENS, JR., P.E. — 7/6/2023 DATE

NO.	REVISION	APPROV.

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

EXISTING INTERSECTION LAYOUT FM 3009 AT WOODLAND OAKS RD

SHEET 1 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	41

STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

7/6/2023 2:45:29 PM
...\W001-EXISTING INTERSECTION LAYOUT.dgn

PROPOSED SIGN SCHEDULE

Woodland Oaks Dr

5.4 | 70.8 | 6 | 33.2 | 7.5 | 9.7 | 5.4 — 138"

4 | 10 | 4 — 4 | 7 | 7 — 18"

1.5" Radius, 0.5" Border, White on Green;
"Woodland", ClearviewHwy-3-W; "Oaks", ClearviewHwy-3-W; "Dr", ClearviewHwy-3-W;

S1
(2 EA)

FM 3009

7.1 | 15.8 | 8.1 | 33.9 | 7.1 — 72"

4 | 10 | 4 — 18"

1.5" Radius, 0.5" Border, White on Green;
"FM 3009", ClearviewHwy-3-W;

S2
(2 EA)

LEFT TURN
YIELD
ON FLASHING
YELLOW
ARROW

R10-17T
(36"X42")
S3
(4 EA)

LED PEDESTRIAN
COUNTDOWN SIGNAL
SIGNAL NO. 3
(6 EA)

R10-3eL
(9"X15")
S4
(4 EA)

R10-3eR
(9"X15")
S5
(2 EA)

SCALE: 1" = 40'
20 0 20

LEGEND

- ADVANCE RADAR DETECTION
- CONTROLLER CABINET
- DIRECTION OF TRAFFIC FLOW
- ELECTRICAL SERVICE
- GROUND BOX
- LUMINAIRE AND ARM
- MAST ARM MOUNTED SIGN
- PEDESTRIAN POLE
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- PRESENCE RADAR DETECTION
- PROPOSED CONDUIT (TRENCH)
- PROPOSED CONDUIT (BORE)
- PROPOSED IP CAMERA
- SIGNAL HEAD VERTICAL
- SIGNAL MAST ARM
- 1 SIGNAL HEAD
- TRAFFIC SIGNAL POLE

DETAIL "A"

DETAIL "B"

DETAIL "C"

DETAIL "D"

PROPOSED SIGNAL HEADS

12" LED VERTICAL SIGNAL HEAD SECTIONS
VENTED ALUM. BACK PLATES
W/ REFLECTORIZED BORDER

SIGNAL NO.1
(8 EA)

SIGNAL NO.2
(4 EA)

NOTE:
SEE SHEET 8 OF 8 "INTERSECTION QUANTITIES & DETAILS" FOR TRAFFIC SIGNAL NOTES.

POSTED SPEED LIMITS:
FM 3009 = 45 MPH
WOODLAND OAKS RD = 30 MPH

PAVEMENT TYPE:
FM 3009 = ASPHALT
WOODLAND OAKS RD = ASPHALT

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

CHARLES R. STEVENS, JR., P.E. — 7/7/2023 DATE

NO.	REVISION	APPROV.

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

PROPOSED INTERSECTION LAYOUT FM 3009 AT WOODLAND OAKS RD

SHEET 2 OF 8

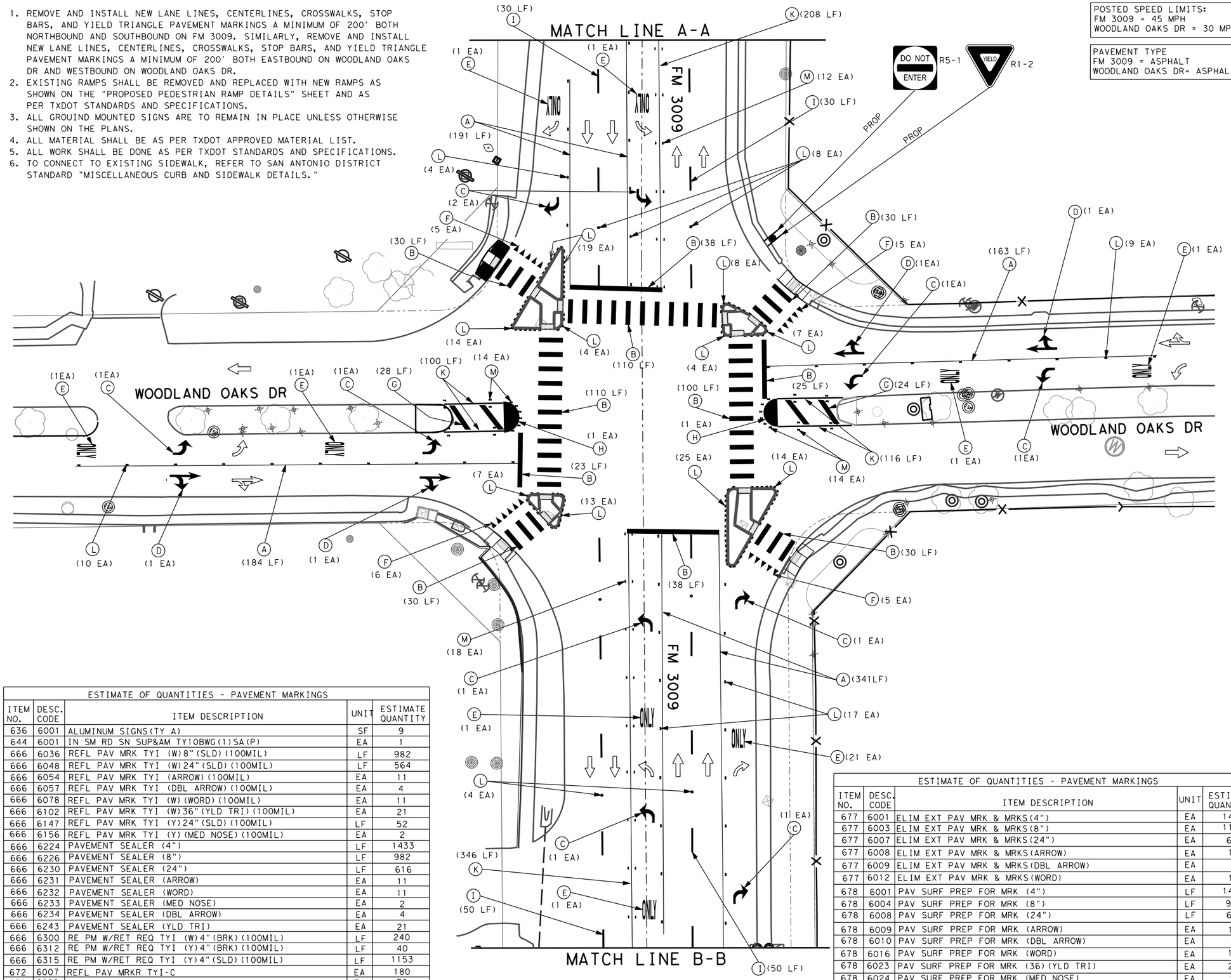
FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	42

STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

7/7/2023 10:05:54 AM ...\W002-PROPOSED INTERSECTION LAYOUT.dgn

NOTE:

1. REMOVE AND INSTALL NEW LANE LINES, CENTERLINES, CROSSWALKS, STOP BARS, AND YIELD TRIANGLE PAVEMENT MARKINGS A MINIMUM OF 200' BOTH NORTHBOUND AND SOUTHBOUND ON FM 3009. SIMILARLY, REMOVE AND INSTALL NEW LANE LINES, CENTERLINES, CROSSWALKS, STOP BARS, AND YIELD TRIANGLE PAVEMENT MARKINGS A MINIMUM OF 200' BOTH EASTBOUND ON WOODLAND OAKS DR AND WESTBOUND ON WOODLAND OAKS DR.
2. EXISTING RAMPS SHALL BE REMOVED AND REPLACED WITH NEW RAMPS AS SHOWN ON THE "PROPOSED PEDESTRIAN RAMP DETAILS" SHEET AND AS PER TXDOT STANDARDS AND SPECIFICATIONS.
3. ALL GROUIND MOUNTED SIGNS ARE TO REMAIN IN PLACE UNLESS OTHERWISE SHOWN ON THE PLANS.
4. ALL MATERIAL SHALL BE AS PER TXDOT APPROVED MATERIAL LIST.
5. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATIONS.
6. TO CONNECT TO EXISTING SIDEWALK, REFER TO SAN ANTONIO DISTRICT STANDARD "MISCELLANEOUS CURB AND SIDEWALK DETAILS."



POSTED SPEED LIMITS:
FM 3009 = 45 MPH
WOODLAND OAKS DR = 30 MPH

PAVEMENT TYPE
FM 3009 = ASPHALT
WOODLAND OAKS DR= ASPHALT

N

SCALE: 1" = 40'
20 0 20

LEGEND

- (A) REFL PAV MRK TYI (W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TYI (W)24"(SLD)(100MIL)
- (C) REFL PAV MRK TYI (W)(ARROW)(100MIL)
- (D) REFL PAV MRK TYI (W)(DBL ARROW)(100MIL)
- (E) REFL PAV MRK TYI (W)(WORD)(100MIL)
- (F) REF PAV MRK TYI(W)36"(YLD TRI)(100MIL)
- (G) REFL PAV MRK TYI (Y)24"(SLD)(100MIL)
- (H) REF PAV MRK TYI(Y)(MED NOSE)(100MIL)
- (I) RE PM W/RET REQ TYI(W)4"(BRK)(100MIL)
- (J) RE PM W/RET REQ TYI(Y)4"(BRK)(100MIL)
- (K) RE PM W/RET REQ TYI(Y)4"(SLD)(100MIL)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A
- PROPOSED SIGNS
- DIRECTION OF TRAFFIC FLOW

ESTIMATE OF QUANTITIES - PAVEMENT MARKINGS

ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	ESTIMATE QUANTITY
636	6001	ALUMINUM SIGNS(TY A)	SF	9
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	1
666	6036	REFL PAV MRK TYI (W)8"(SLD)(100MIL)	LF	982
666	6048	REFL PAV MRK TYI (W)24"(SLD)(100MIL)	LF	564
666	6054	REFL PAV MRK TYI (ARROW)(100MIL)	EA	11
666	6057	REFL PAV MRK TYI (DBL ARROW)(100MIL)	EA	4
666	6078	REFL PAV MRK TYI (W)(WORD)(100MIL)	EA	11
666	6102	REFL PAV MRK TYI (W)36"(YLD TRI)(100MIL)	EA	21
666	6147	REFL PAV MRK TYI (Y)24"(SLD)(100MIL)	LF	52
666	6156	REFL PAV MRK TYI (Y)(MED NOSE)(100MIL)	EA	2
666	6224	PAVEMENT SEALER (4")	LF	1433
666	6226	PAVEMENT SEALER (8")	LF	982
666	6230	PAVEMENT SEALER (24")	LF	616
666	6231	PAVEMENT SEALER (ARROW)	EA	11
666	6232	PAVEMENT SEALER (WORD)	EA	11
666	6233	PAVEMENT SEALER (MED NOSE)	EA	2
666	6234	PAVEMENT SEALER (DBL ARROW)	EA	4
666	6243	PAVEMENT SEALER (YLD TRI)	EA	21
666	6300	RE PM W/RET REQ TYI (W)4"(BRK)(100MIL)	LF	240
666	6312	RE PM W/RET REQ TYI (Y)4"(BRK)(100MIL)	LF	40
666	6315	RE PM W/RET REQ TYI (Y)4"(SLD)(100MIL)	LF	1153
672	6007	REFL PAV MRKR TYI-C	EA	180
672	6009	REFL PAV MRKR TYII-AA	EA	76

ESTIMATE OF QUANTITIES - PAVEMENT MARKINGS

ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	ESTIMATE QUANTITY
677	6001	ELIM EXT PAV MRK & MRKS(4")	EA	1406
677	6003	ELIM EXT PAV MRK & MRKS(8")	EA	1149
677	6007	ELIM EXT PAV MRK & MRKS(24")	EA	637
677	6008	ELIM EXT PAV MRK & MRKS(ARROW)	EA	10
677	6009	ELIM EXT PAV MRK & MRKS(DBL ARROW)	EA	5
677	6012	ELIM EXT PAV MRK & MRKS(WORD)	EA	10
678	6001	PAV SURF PREP FOR MRK (4")	LF	1433
678	6004	PAV SURF PREP FOR MRK (8")	LF	982
678	6008	PAV SURF PREP FOR MRK (24")	LF	616
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	11
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	4
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	11
678	6023	PAV SURF PREP FOR MRK (36)(YLD TRI)	EA	21
678	6024	PAV SURF PREP FOR MRK (MED NOSE)	EA	2

STATE OF TEXAS
GUILLERMO A. DOUGHERTY, JR.
93649
LICENSED
PROFESSIONAL ENGINEER

7-6-2023

NO.	DATE	REVISION	APPROV.

DOUGHERTY Engineering Group, PLLC
TBPE Firm No. F-18636

PROPOSED PAVEMENT MARKINGS LAYOUT FM 3009 AT WOODLAND OAKS DR

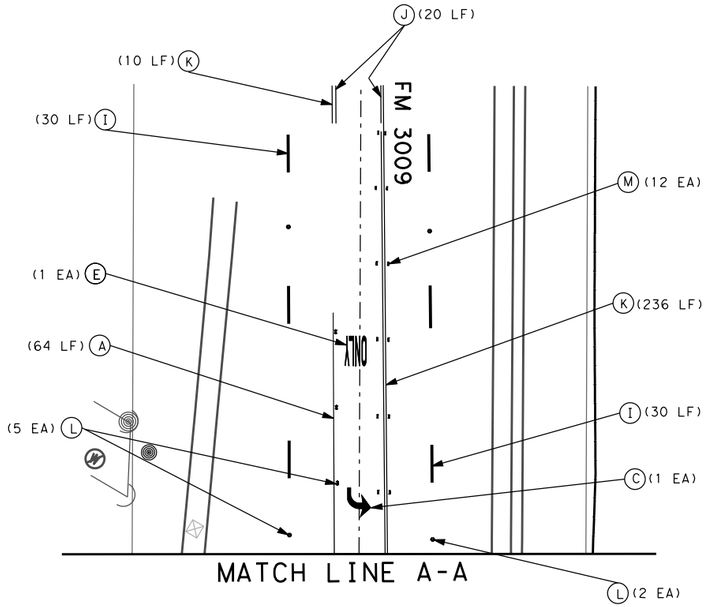
SHEET 4 OF 8

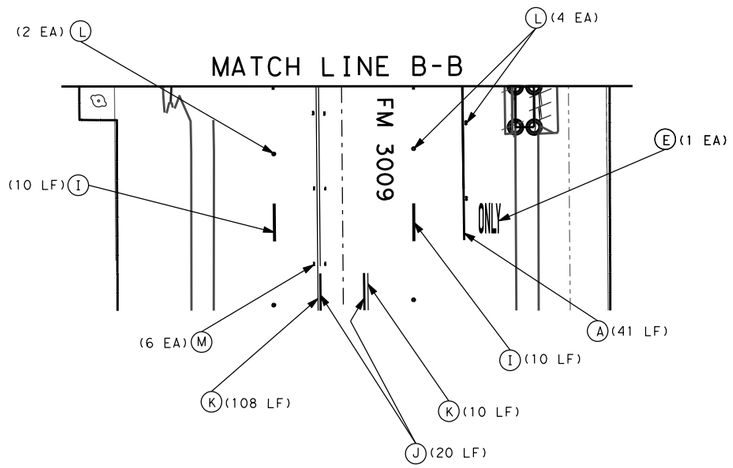
FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	43

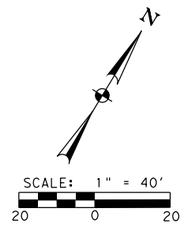
STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

7/7/2023 10:36:08 AM
...\FM 3009 @ Woodland Oaks Dr.dgn







LEGEND

- (A) REFL PAV MRK TYI (W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TYI (W)24"(SLD)(100MIL)
- (C) REFL PAV MRK TYI (W)(ARROW)(100MIL)
- (D) REFL PAV MRK TYI (W)(DBL ARROW)(100MIL)
- (E) REFL PAV MRK TYI (W)(WORD)(100MIL)
- (F) REF PAV MRK TYI(W)36"(YLD TRI)(100MIL)
- (G) REFL PAV MRK TYI (Y)24"(SLD)(100MIL)
- (H) REF PAV MRK TYI(Y)(MED NOSE)(100MIL)
- (I) RE PM W/RET REQ TYI(W)4"(BRK)(100MIL)
- (J) RE PM W/RET REQ TYI(Y)4"(BRK)(100MIL)
- (K) RE PM W/RET REQ TYI(Y)4"(SLD)(100MIL)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A

PROPOSED SIGNS

DIRECTION OF TRAFFIC FLOW

7-6-2023

NO.	DATE	REVISION	APPROV.

DOUGHERTY Engineering Group, PLLC
TBPE Firm No. F-18636

PROPOSED PAVEMENT MARKINGS LAYOUT FM 3009 AT WOODLAND OAKS DR

SHEET 5 OF 8

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		44
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

7/6/2023 3:42:11 PM

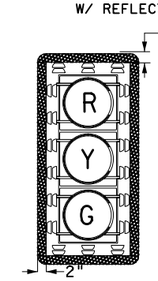
...\FM 3009 @ Woodland Oaks Dr.dgn

PROPOSED CONDUIT AND CONDUCTOR SCHEDULE

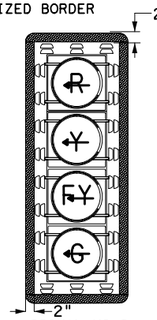
	RUN NUMBER		1		2	3		4		5		6	7		8		9		10		11		12	13
	CONDUIT SIZE IN INCHES		2.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0
	NUMBER OF CONDUITS		1	2	1	1	2	1	2	1	2	1	1	2	1	2	1	2	1	2	1	3	1	2
	LENGTH OF RUN (FT)		10	10	10	90	90	20	20	80	80	10	10	10	75	75	10	10	55	55	5	5	15	5
	TRENCH (T)/BORE (B)/ CONTROLLER (C)		T	T	T	B	B	T	T	B	B	T	T	T	B	B	T	T	B	B	C	C	T	T
CABLE	CIRCUIT		NUMBER OF CONDUCTORS																					
#6 XHHW	120 POWER HOT																							1
	120 POWER COMMON																							1
#6 BARE	BARE BOND GROUND		1	2	1	1	2	1	2	1	2	1	1	2	1	2	1	2	1	2	1	3	1	2
7 COND. #12 STRANDED TY A	SIGNALS	PHASE 01		1			1				1									1		1		
		PHASE 02																1		1		1		
		PHASE 03							1		1									1		1		
		PHASE 04												1		1				1		1		
		PHASE 05																1		1		1		
		PHASE 06		1			1				1									1		1		
		PHASE 07												1		1				1		1		
		PHASE 08							1		1									1		1		
4 COND. #12 STRANDED TY A	PED. SIGNALS	PHASE 02												1		1		1		2		2		
		PHASE 04		1			1				1	1				1				2		2		
		PHASE 06			1		1		1		2									2		2		
2 COND. #14 STRANDED TY C	PED. PUSH BUTTONS	PHASE 02												1		1		1		2		2		
		PHASE 04		1			1				1	1				1				2		2		
		PHASE 06			1		1		1		2									2		2		
6 COND. #22	RVDS (PRESENCE DETECTION DEVICE)	PHASE 01 & 06																1		1		1		
		PHASE 02 & 05		1			1				1									1		1		
		PHASE 03 & 08												1		1				1		1		
		PHASE 04 & 07							1		1									1		1		
6 COND. #22	RVDS (ADVANCE DETECTION DEVICE)	PHASE 02																1		1		1		
		PHASE 06		1			1				1									1		1		
TRAY CABLE (4 CONDR) (12 AWG)	LUMINAIRE		1			1		1		2			1		1		1		4				4	
CAT 5 ETHERNET CABLE & POWER	IP CAMERA																	1		1		1		

PROPOSED SIGNAL HEADS

12" LED VERTICAL SIGNAL HEAD SECTIONS
VENTED ALUM. BACK PLATES
W/ REFLECTORIZED BORDER



SIGNAL NO. 1
(8 EA)



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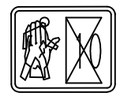
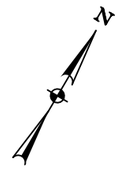
(4 EA)

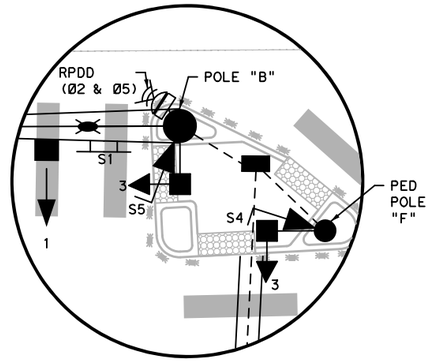


LED PEDESTRIAN
COUNTDOWN SIGNAL
SIGNAL NO. 4
(6 EA)

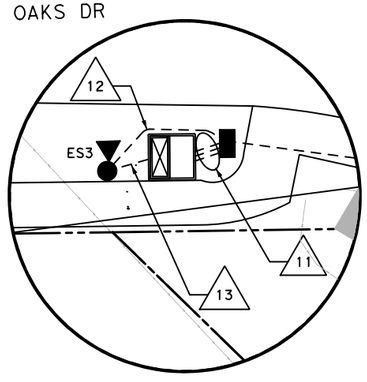


LEGEND

- ADVANCE RADAR DETECTION
- CONTROLLER CABINET
- DIRECTION OF TRAFFIC FLOW
- ELECTRICAL SERVICE
- GROUND BOX
- LUMINAIRE AND ARM
- MAST ARM MOUNTED SIGN
- PEDESTRIAN POLE
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- PRESENCE RADAR DETECTION
- PROPOSED CONDUIT (TRENCH)
- PROPOSED CONDUIT (BORE)
- PROPOSED IP CAMERA
- SIGNAL HEAD VERTICAL
- SIGNAL MAST ARM
- 1 SIGNAL HEAD
- TRAFFIC SIGNAL POLE



DETAIL "B"



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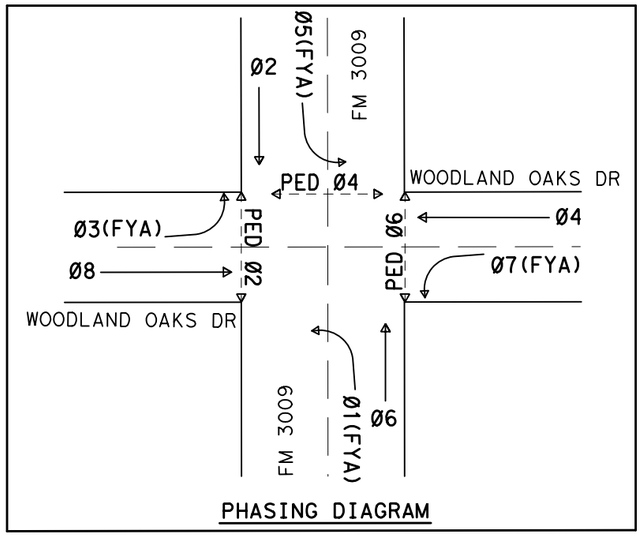


PHASING DIAGRAM

POSTED SPEED LIMITS:
FM 3009 = 45 MPH
WOODLAND OAKS RD = 30 MPH

PAVEMENT TYPE:
FM 3009 = ASPHALT
WOODLAND OAKS RD = ASPHALT

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

CHARLES R. STEVENS, JR., P.E. — 7/7/2023 DATE

NO.	REVISION	APPROV.

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

PROPOSED WIRING DIAGRAM FM 3009 AT WOODLAND OAKS RD

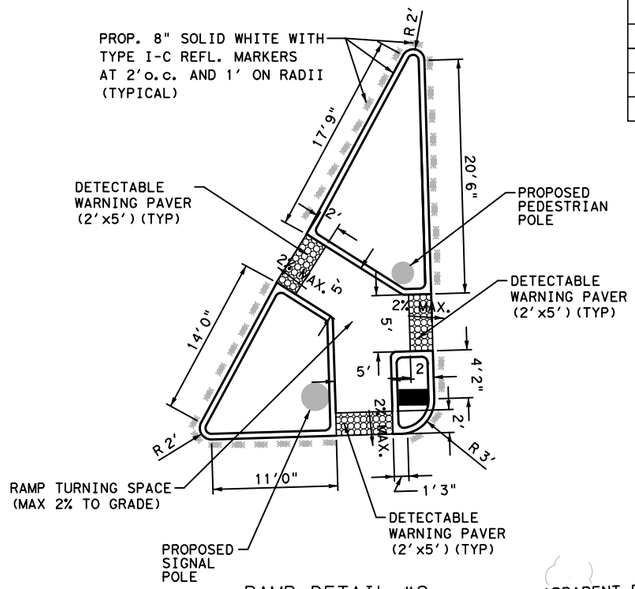
SHEET 3 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	45

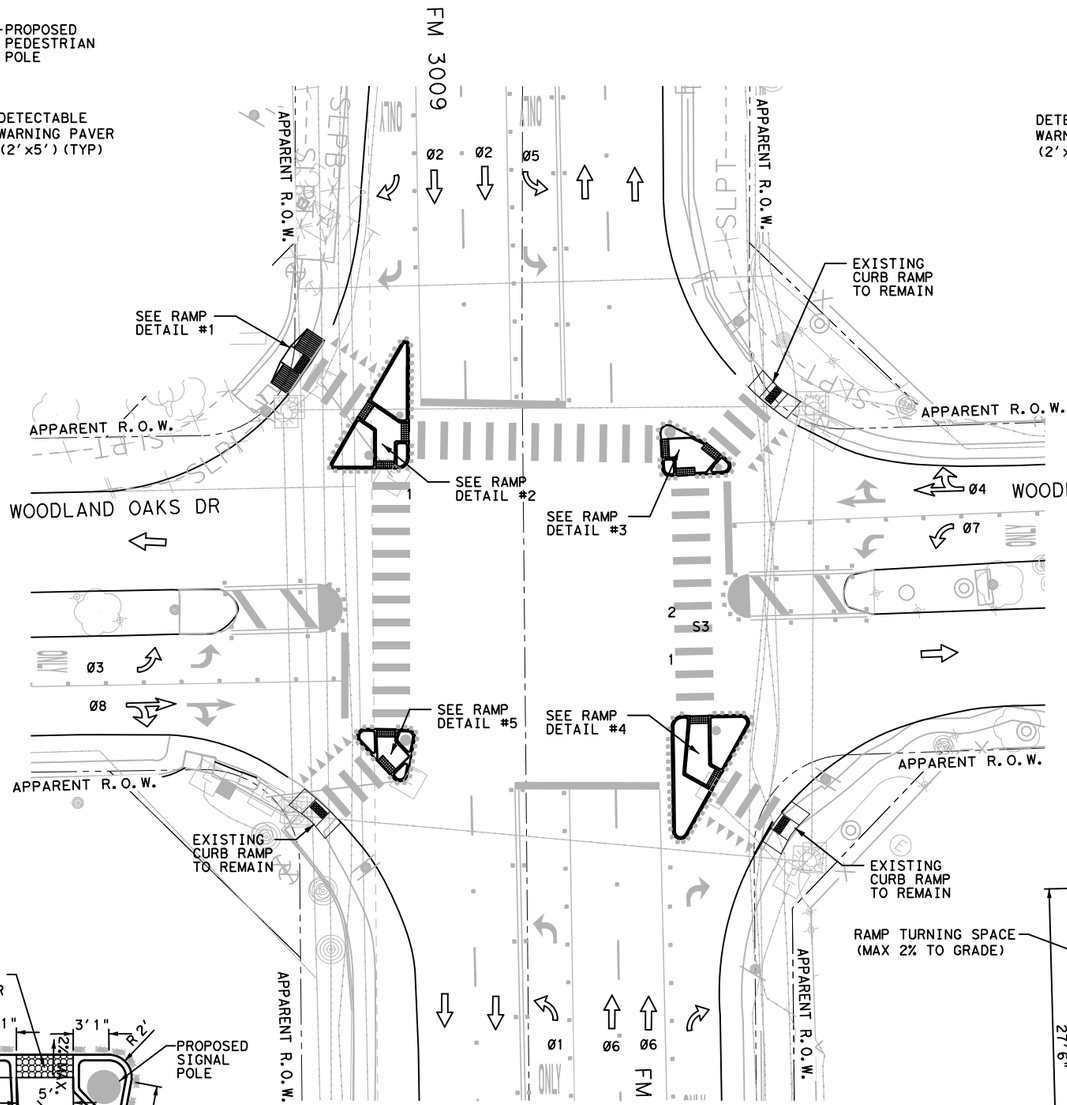
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

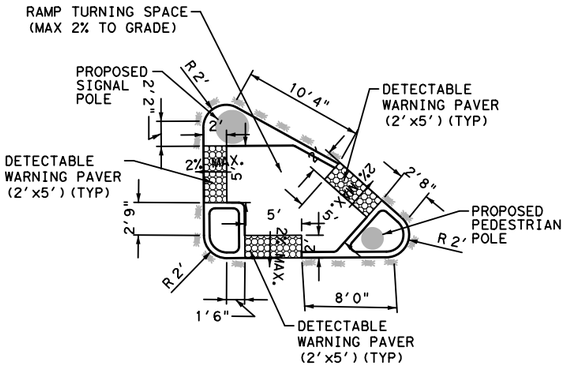
7/7/2023 11:54:50 AM
...\W003-PROPOSED WIRING DIAGRAM.dgn

ITEM NO.	DESC CODE	DESCRIPTION	UNIT	EST QUANTITY
104	6036	REMCVING CONC (SIDEWALK OR RAMP)	SY	120
531	6005	CURB RAMPS (TY 2)	EA	1
531	6017	CURB RAMPS (TY 22)	EA	4
536	6004	CONC DIRECTIONAL ISLAND	SY	71

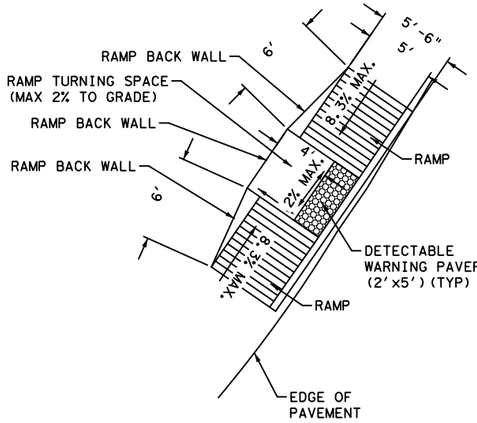


RAMP DETAIL #2
CURB RAMP TY 22
N.T.S.

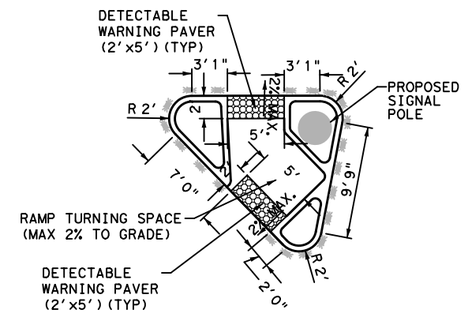




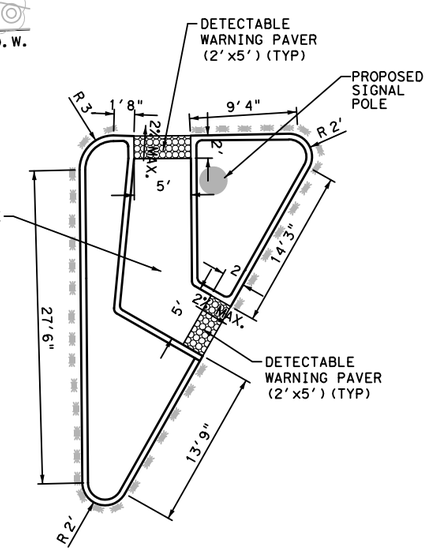
RAMP DETAIL #3
CURB RAMP TY 22
N.T.S.



RAMP DETAIL #1
CURB RAMP TY 2
N.T.S.



RAMP DETAIL #5
CURB RAMP TY 22
N.T.S.



RAMP DETAIL #4
CURB RAMP TY 22
N.T.S.

SCALE: 1" = 40'
20 0 20

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

CHARLES R. STEVENS, JR., P.E. — 7/7/2023 DATE

NO.	REVISION	APPROV.

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

PROPOSED PEDESTRIAN RAMPS DETAILS FM 3009 AT WOODLAND OAKS RD

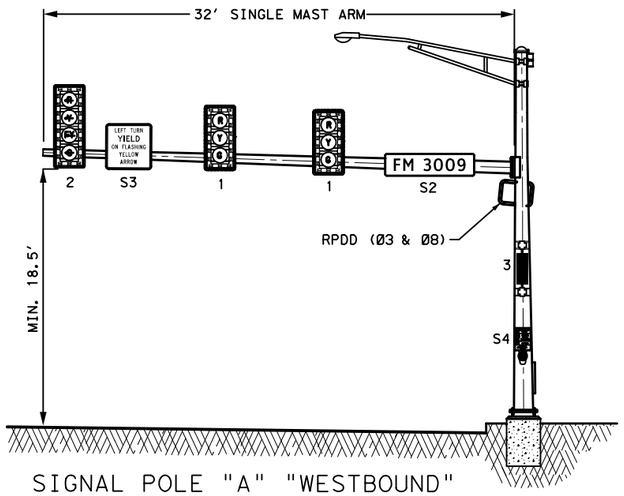
SHEET 6 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	46

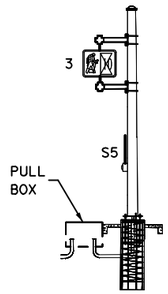
STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

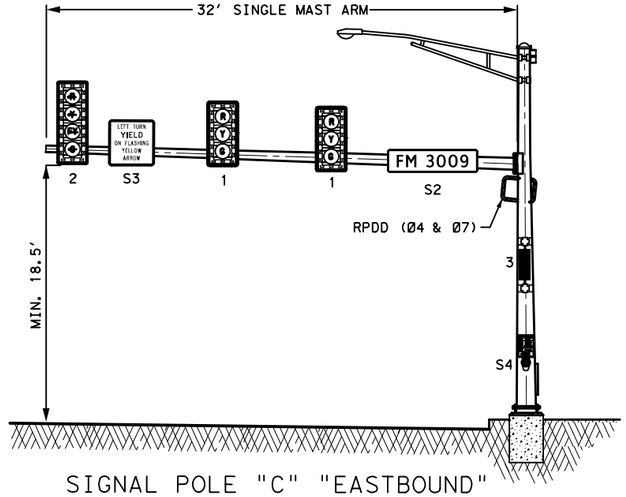
7/7/2023 10:07:45 AM
...\W006-PROPOSED CURB RAMPS.dgn



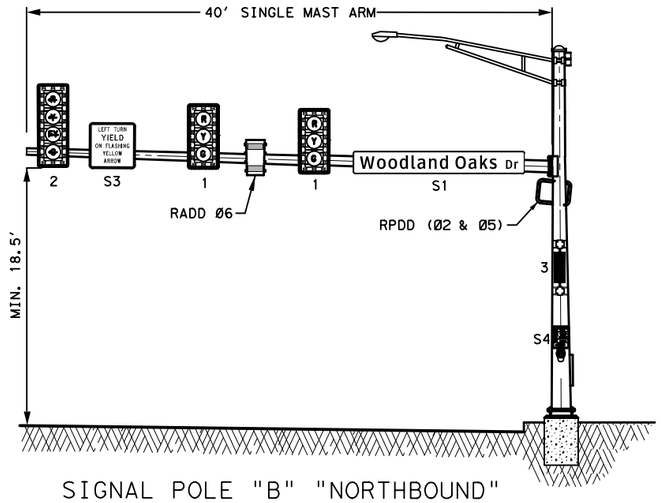
SIGNAL POLE "A" "WESTBOUND"



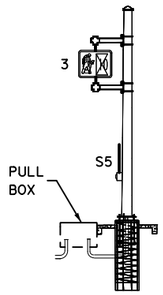
PED POLE "E" VIEW



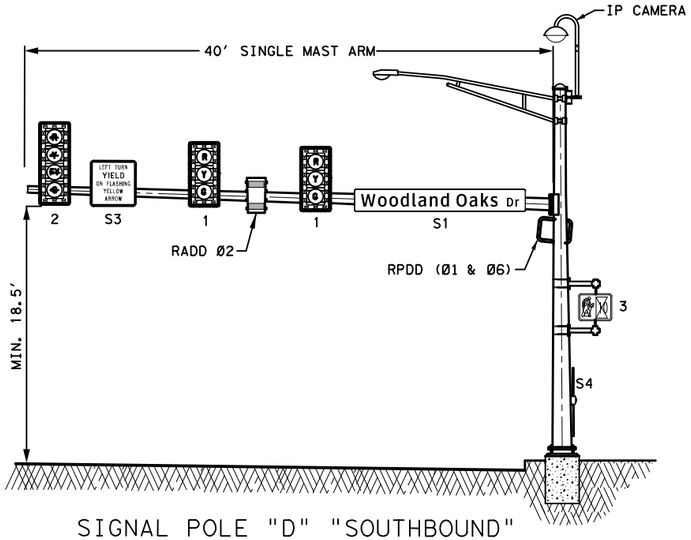
SIGNAL POLE "C" "EASTBOUND"



SIGNAL POLE "B" "NORTHBOUND"



PED POLE "F" VIEW



SIGNAL POLE "D" "SOUTHBOUND"

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

CHARLES R. STEVENS, JR., P.E.

7/6/2023
DATE

NO.	REVISION	APPROV.

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

PROPOSED ELEVATION VIEW FM 3009 AT WOODLAND OAKS RD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		47
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

ESTIMATE OF QUANTITIES - TRAFFIC SIGNAL				
ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	EST QUANTITY
104	6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	120
416	6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	23
416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	26
531	6005	CURB RAMP (TY 2)	EA	1
531	6017	CURB RAMP (TY 22)	EA	4
536	6004	CONC DIRECTIONAL ISLAND	SY	71
618	6046	CONDT (PVC) (SCH 80) (2")	LF	100
618	6047	CONDT (PVC) (SCH 80) (2")(BORE)	LF	300
618	6053	CONDT (PVC) (SCH 80) (3")	LF	115
618	6054	CONDT (PVC) (SCH 80) (3")(BORE)	LF	600
620	6009	ELEC CONDR (NO.6) BARE	LF	1115
620	6010	ELEC CONDR (NO.6) INSULATED	LF	10
621	6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	795
624	6010	GROUND BOX TY D (162922) W/APRON	EA	5
628	6002	REMOVE ELECTRICAL SERVICE	EA	1
628	6164	ELC SRV TY D 120/240 070(NS)AL(PS)(U)	EA	1
636	6001	ALUMINUM SIGNS (TY A)	SF	9
**		YIELD SIGN (R1-2)(18"x18")	EA	1
**		DO NOT ENTER SIGN (R5-1)(30"x30")	EA	1
644	6001	IN SM RD SN SUP&AM TY10BWG (1) SA(P)	EA	1
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	982
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	564
666	6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	11
666	6057	REFL PAV MRK TY I(W)(DBL ARROW)(100MIL)	EA	4
666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	11
666	6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	21
666	6147	REFL PAV MRK TY I (Y)24"(SLD)(100MIL)	LF	52
666	6156	REFL PAV MRK TY I(Y)(MED NOSE)(100MIL)	EA	2
666	6224	PAVEMENT SEALER 4"	LF	1433
666	6226	PAVEMENT SEALER 8"	LF	982
666	6230	PAVEMENT SEALER 24"	LF	616
666	6231	PAVEMENT SEALER (ARROW)	EA	11
666	6232	PAVEMENT SEALER (WORD)	EA	11
666	6233	PAVEMENT SEALER (MED NOSE)	EA	2
666	6234	PAVEMENT SEALER (DBL ARROW)	EA	4
666	6243	PAVEMENT SEALER (YLD TRI)	EA	21
666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	240
666	6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	40
666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	1153
672	6007	REFL PAV MRKR TY I-C	EA	231
672	6009	REFL PAV MRKR TY II-A-A	EA	76
677	6001	ELIM EXT PAV MRK & MRKS (4")	EA	1406
677	6003	ELIM EXT PAV MRK & MRKS (8")	EA	1149
677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	637
677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	10
677	6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	5
677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	10
678	6001	PAV SURF PREP FOR MRK (4")	EA	1433
678	6004	PAV SURF PREP FOR MRK (8")	EA	982
678	6008	PAV SURF PREP FOR MRK (24")	LF	616
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	11
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	4
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	11
678	6023	PAV SURF PREP FOR MRK (36")(YLD TRI)	EA	21
678	6024	PAV SURF PREP FOR MRK (MED NOSE)	EA	2
680	6002	INSTALL HWY TRF SIG (ISOLATED)	EA	1
**		TS 2 TYPE 2, BASE MOUNT CONTROLLER CABINET	EA	1
**		TRAFFIC SIGNAL CONTROLLER FOUNDATION	EA	1
**		R10-17T (36" X 42") "LEFT TURN YIELD ON FLASHING YELLOW ARROW"	EA	4
**		D3-1G - STREET NAME SIGN' "Woodland Oaks Dr" (18"x138")	EA	2
**		D3-1G - STREET NAME SIGN' "FM 3009" (18"x72")	EA	2
680	6004	REMOVING TRAFFIC SIGNALS	EA	1
682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
682	6002	VEH SIG SEC (12")LED(GRN ARW)	EA	4
682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
682	6004	VEH SIG SEC (12")LED(YEL ARW)	EA	6
682	6005	VEH SIG SEC (12")LED(RED)	EA	8
682	6006	VEH SIG SEC (12")LED(RED ARW)	EA	4
682	6018	PED SIG SEC (LED)(COUNTDOWN)	EA	6
682	6054	BACKPLATE W/REFL BRDR(3 SEC)(VENT)(ALUM	EA	8
682	6055	BACKPLATE W/REFL BRDR(4 SEC)(VENT)(ALUM	EA	4
684	6009	TRF SIG CBL(TY A)(12 AWG)(4 CONDR)	LF	555
684	6012	TRF SIG CBL(TY A)(12 AWG)(7 CONDR)	LF	1440
684	6080	TRF SIG CBL(TY C)(14 AWG)(2 CONDR)	LF	525
686	6035	INS TRF SIG PL AM(S)1 ARM(32')LUM	EA	2
686	6043	INS TRF SIG PL AM(S)1 ARM(40')LUM	EA	2
687	6001	PED POLE ASSEMBLY	EA	2
**		DRILL SHAFT (24 IN)	LF	12
688	6001	PED DETECT PUSH BUTTON (APS)	EA	6
**	**	R10-3e (L) (9" X 15") "PEDESTRIAN SIGN"	EA	4
**	**	R10-3e (R) (9" X 15") "PEDESTRIAN SIGN"	EA	2
688	6003	PED DETECTOR CONTROLLER UNIT	EA	1

ESTIMATE OF QUANTITIES - TRAFFIC SIGNAL				
ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	EST QUANTITY
6010	6010	CCTV FIELD EQUIP (ANALOG) (INSTL ONLY)	EA	1
6185	6002	TMA (STATIONARY)	DAY	10
6292	6001	RVDS(PRESENCE DETECTION ONLY)	EA	4
	**	RVDS (RADAR PRESENCE DETECTOR POWER AND COMMUNICATION CABLE)	LF	695
6292	6002	RVDS(ADVANCE DETECTION ONLY)	EA	2
	**	RVDS (RADAR ADVANCE DETECTOR POWER AND COMMUNICATION CABLE)	LF	390
****	****	CONTRACTOR FORCE ACCOUNT (COMM PACKAGE)	EA	1
		CELLULAR MODEM (CISCO MODEL IR1101)	EA	1
		ETHERNET SWITCH (MOXA MODEL EDR-810-VPN-2GSFP-T)	EA	1
		IP CAMERA (AXIS M5525-E)	EA	1
		IP CAMERA MOUNTING BRACKET (AXIS T94A01D PENDANT KIT)	EA	1
		POWER STRIP	EA	1
		SWITCH POWER SUPPLY	EA	1
		POE POWER SUPPLY - FOR CAMERA ONLY	EA	1
****	****	CONTRACTOR FORCE ACCOUNT (LAW ENFORCEMENT)	EA	1
****	****	CONTRACTOR FORCE ACCOUNT (EROSION CONTROL)	EA	1

** SUBSIDIARY TO PERTINENT ITEM

**** **** CONTRACTOR FORCE ACCOUNT

POLE ID.	POLE & EQUIPMENT DESCRIPTIONS WITH ATTACHMENTS
A	32' SINGLE MAST ARM ON A 30-A FOUNDATION AT 11 FT. WITH ONE LUMINAIRE, THREE VERTICAL VEHICLE SIGNAL HEADS AS ILLUSTRATED, ONE D3-1G STREET NAME SIGN, ONE R10-17T (36"X42") SIGN, ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT, R10-3eL PEDESTRIAN SIGN AND ONE RVDS PRESENCE DETECTION (RPDD 03 & 08).
B	40' SINGLE MAST ARM ON A 36-A FOUNDATION AT 13 FT. WITH ONE LUMINAIRE, THREE VERTICAL VEHICLE SIGNAL HEADS AS ILLUSTRATED, ONE D3-1G STREET NAME SIGN, ONE R10-17T (36"X42") SIGN, ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT, R10-3eL PEDESTRIAN SIGN, ONE RVDS PRESENCE DETECTION (RPDD 02 & 05) AND ONE RVDS ADVANCE DETECTION (RADD 06).
C	32' SINGLE MAST ARM ON A 30-A FOUNDATION AT 11 FT. WITH ONE LUMINAIRE, THREE VERTICAL VEHICLE SIGNAL HEADS AS ILLUSTRATED, ONE D3-1G STREET NAME SIGN, ONE R10-17T (36"X42") SIGN, ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT, R10-3eL PEDESTRIAN SIGN AND ONE RVDS PRESENCE DETECTION (RPDD 04 & 07).
D	40' SINGLE MAST ARM ON A 36-A FOUNDATION AT 13 FT. WITH ONE LUMINAIRE, THREE VERTICAL VEHICLE SIGNAL HEADS AS ILLUSTRATED, ONE D3-1G STREET NAME SIGN, ONE R10-17T (36"X42") SIGN, ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT, R10-3eL PEDESTRIAN SIGN, ONE RVDS PRESENCE DETECTION (RPDD 01 & 06) AND ONE RVDS ADVANCE DETECTION (RADD 02).
E	10' PEDESTRIAN SIGNAL POLE ASSEMBLY ON A 24-A FOUNDATION AT 6 FT. WITH ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT AND R10-3eR PEDESTRIAN SIGN.
F	10' PEDESTRIAN SIGNAL POLE ASSEMBLY ON A 24-A FOUNDATION AT 6 FT. WITH ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT AND R10-3eR PEDESTRIAN SIGN.

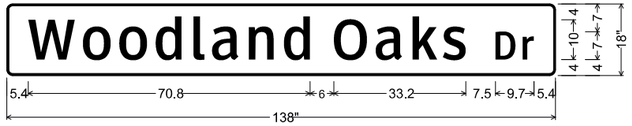
ELECTRICAL SERVICE DATA

C-S-J	PROJECT LOCATION	ELECTRIC SERVICE NO.	SHEET NO.	ELECTRICAL SERVICE DESCRIPTION (SEE ED (5)-14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE/AMP	TWO-POLE CONTACT OR AMPS ***	PANEL BD./ LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE/ AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
0025-03-105	FM 3009 AT WOODLAND OAKS DR	ES3	2 OF 8 & 3 OF 8	TY D (120/240)070 (NS)AL(E)PS(U)	2"	3/#4	N/A	2P/70	30	100	SIGNAL LIGHTING	1P/50 1P/20	40 2	<7.1

NOTES:

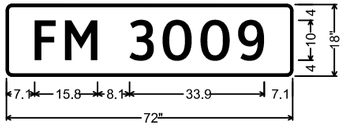
1. ALL TRAFFIC SIGNAL EQUIPMENT LOCATIONS ARE BASED ON A SURVEY. CONTRACTOR SHALL VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
2. APPARENT RIGHT-OF-WAY LINES ARE FROM TXDOT MAPS. VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
3. THE EXISTENCE AND LOCATION OF UTILITIES, EITHER UNDERGROUND OR OVERHEAD, INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE APPROXIMATE. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL UTILITIES (PRIVATE/PUBLIC AND SHOWN/NOT SHOWN) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS/HER FAILURE TO LOCATE, PRESERVE, AND PROTECT THESE UTILITIES.
4. CONTRACTOR SHALL REMOVE AND REPLACE EXISTING SIGNAL HEADS WITH NEW VERTICAL SIGNAL HEADS AS SHOWN ON THE PLANS AND SHALL HAVE A MINIMUM OF 18.5 FEET CLEARANCE ABOVE ROADWAY SURFACE. CONTRACTOR SHALL CONTACT THE TXDOT SIGNAL SHOP AND AREA OFFICE PRIOR TO STARTING THIS WORK TO ENSURE A SMOOTH TRAFFIC MOVEMENT FOR ALL MOTORISTS DURING THIS TRANSITION.
5. CONTRACTOR SHALL REMOVE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AND INSTALL NEW EQUIPMENT AS PER DESIGN LAYOUTS AND IN ACCORDANCE TO TXDOT STANDARDS AND SPECIFICATIONS AND IN ACCORDANCE TO THE ACCESSIBILITY REQUIREMENTS AND CONNECT PROPOSED FIELD WIRING TO CONTROLLER.
6. FOR PAVEMENT MARKINGS, SEE PROPOSED PAVEMENT MARKINGS & RAMPS LAYOUT SHEETS.
7. ALL EXISTING CURB RAMPS SHALL BE REMOVED AND NEW WHEELCHAIR RAMPS INSTALLED (IF ANY), NEW PROPOSED PAVEMENT MARKINGS SHALL BE PLACED AS PER DESIGN DETAILS ON THE PROPOSED PAVEMENT MARKINGS LAYOUT SHEET AND IN ACCORDANCE TO TXDOT STANDARDS AND SPECIFICATIONS AND IN ACCORDANCE TO THE ACCESSIBILITY REQUIREMENTS.
8. THE CONTRACTOR SHALL INSTALL NEW PRESENCE RADAR DETECTORS. THE LOCATION OF THE RADAR DETECTORS SHOWN ARE APPROXIMATE. THE EXACT LOCATION SHALL BE DETERMINED IN THE FIELD AND ADJUSTED TO PROVIDE PROPER DETECTION ZONES AND A COMPLETE OPERABLE SYSTEM.
9. CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT LOCATED AT 4615 NW LOOP 410, CONTACT MARK PEREZ AT 210-218-7430.
10. CONTRACTOR SHALL FURNISH AND DELIVER ONE (1) TS 2 TYPE 2 CONTROLLER CABINETS AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS IN ADVANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICKUP WITH MARK PEREZ AT 210-218-7430.
11. THE INSTALLATION OF ALL COMMUNICATION PACKAGE ITEMS (MODEM, POWER STRIP, ETC.) IS SUBSIDIARY TO ITEM 680.
12. TRAY CABLES SHALL BE RUN IN 2" CONDUIT SEPARATE FROM THE SIGNAL CABLE.
13. ADJUST EXISTING AND PROPOSED SIGNAL HEADS AS NECESSARY TO KEEP THEM VISIBLE AT ALL TIMES DURING CONSTRUCTION. ADJUSTING SIGNAL HEADS DURING CONSTRUCTION IS SUBSIDIARY TO ITEM 502.
14. CONTRACTOR SHALL CONTACT THE TXDOT SIGNAL SHOP AND AREA OFFICE A MINIMUM OF SEVEN (7) DAYS PRIOR TO BEGINNING CONSTRUCTION.
15. CONTRACTOR SHALL CONTACT THE TXDOT SIGNAL SHOP AND AREA OFFICE A MINIMUM OF FOURTEEN (14) DAYS PRIOR TO THE TRAFFIC SIGNAL TURN-ON.

PROPOSED SIGN ATTACHED TO MAST ARMS & POLES



1.5" Radius, 0.5" Border, White on Green;
"Woodland", ClearviewHwy-3-W; "Oaks", ClearviewHwy-3-W; "Dr", ClearviewHwy-3-W;

S1
(2 EA)



1.5" Radius, 0.5" Border, White on Green;
"FM 3009", ClearviewHwy-3-W;

S2
(2 EA)

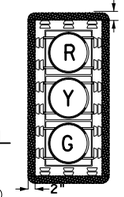
PROPOSED SIGN PANELS ON NEW POST (BACK TO BACK)

R10-17T
(36"x42")
S3
(4 EA)

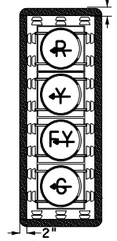
R5-1
30"x30"
(1 EA)

R1-2
18"x18"
(1 EA)

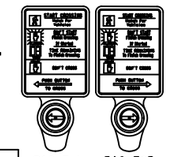
PROPOSED SIGNAL HEADS
12" LED VERTICAL SIGNAL HEAD SECTIONS
VENTED ALUM. BACK PLATES
W/ REFLECTORIZED BORDER



SIGNAL NO. 1
(8 EA)



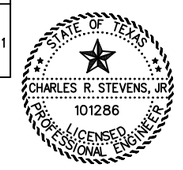
SIGNAL NO. 2
(4 EA)



R10-3eL
(9"x15")
S4
(4 EA)

R10-3eR
(9"x15")
S5
(2 EA)

LED PEDESTRIAN COUNTDOWN SIGNAL
SIGNAL NO. 3
(6 EA)



CHARLES R. STEVENS, JR., P.E.

7/7/2023
DATE

NO.	REVISION	APPROV.

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

INTERSECTION QUANTITIES & DETAILS FM 3009 AT WOODLAND OAKS DR

SHEET 8 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	48

STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

11:55:56 AM 7/7/2023 ...\W008-INTERSECTION QUANTITY & DETAILS.dgn

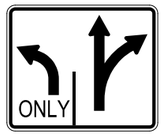
EXISTING SIGNS (TO REMAIN)

R1-2
S3
(4 EA)

R5-1
S4
(4 EA)

S1-1
W16-7P
S5
(2 EA)

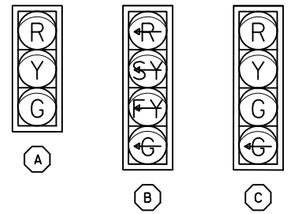
R3-7L
S6
(1 EA)



R3-8
S7
(1 EA)

R2-1
S8
(1 EA)

EXISTING SIGNAL HEADS



EXISTING PEDESTRIAN HEADS

W

EXISTING SIGNS (TO BE REMOVED)

R10-17T
S1
(2 EA)

R3-5L
S2
(1 EA)

EXISTING PUSH BUTTON SIGNS (TO BE REMOVED)

S9 S10

POSTED SPEED LIMITS:
FM 3009 = 45 MPH
ELBEL RD = 30 MPH
BORGFELD RD = 35 MPH

PAVEMENT TYPE:
FM 3009 = ASPHALT
ELBEL RD = ASPHALT
BORGFELD RD = ASPHALT

SCALE: 1" = 40'
20 0 20

LEGEND

- EXISTING CONTROLLER CABINET
- EXISTING TRAFFIC SIGNAL POLE
- EXISTING PEDESTRIAN SIGNAL POLE
- EXISTING TRAFFIC SIGNAL SPAN WIRE
- EXISTING LUMINAIRE
- (A) EXISTING SIGNAL HEAD VERTICAL
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING PEDESTRIAN PUSH BUTTON
- EXISTING RADAR DETECTION
- EXISTING SPREAD SPECTRUM ANTENNA
- EXISTING BELL CAMERA
- EXISTING SPAN WIRE MOUNTED SIGN
- EXISTING GROUND BOX
- EXISTING SIGN ON POST
- EXISTING UTILITY POLE
- EXISTING ELECTRICAL SERVICE
- EXISTING OVERHEAD POWER LINE
- DIRECTION OF TRAFFIC FLOW

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

CHARLES R. STEVENS, JR., P.E. — 7/5/2023 DATE

NO.	REVISION	APPROV.

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

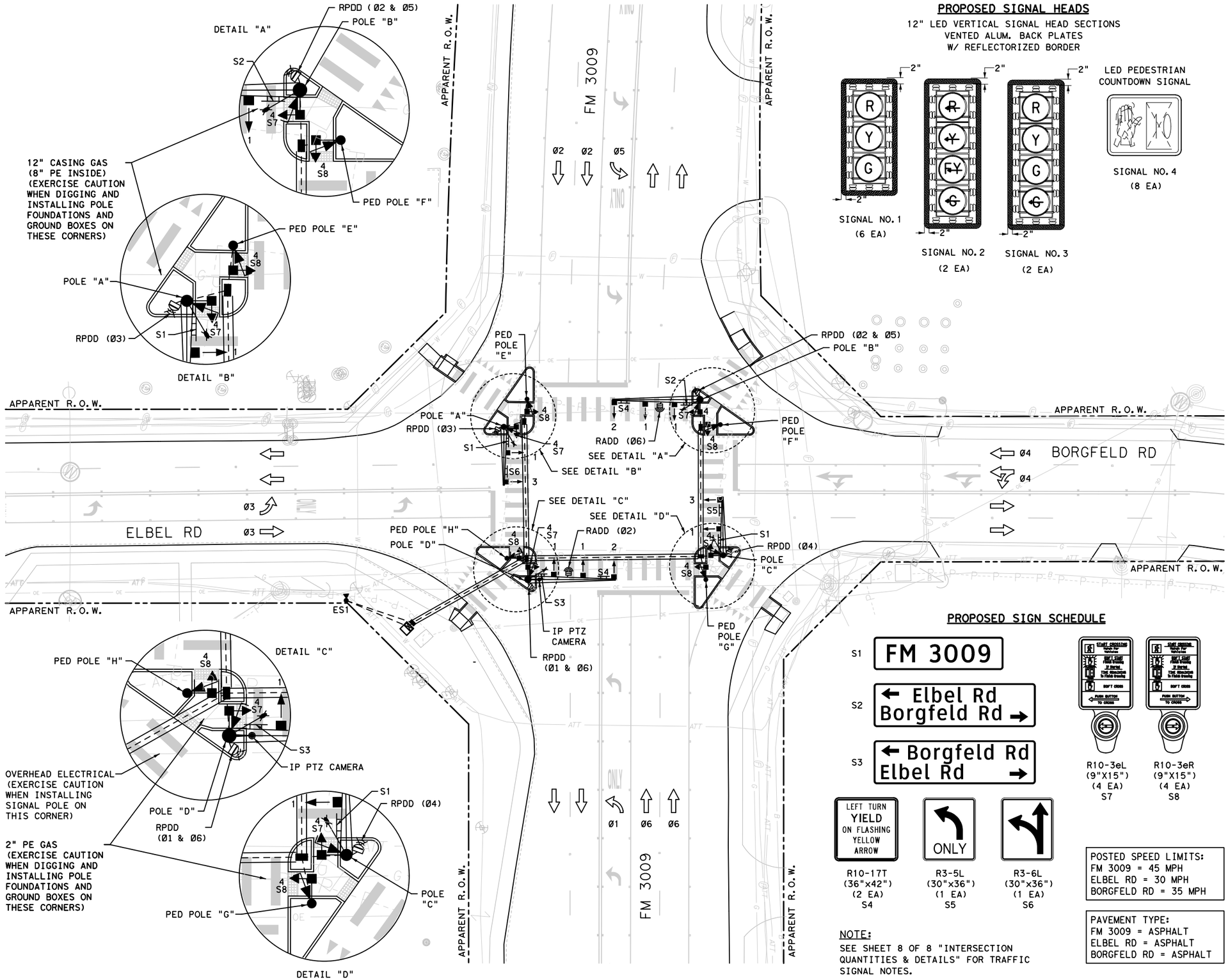
EXISTING INTERSECTION LAYOUT FM 3009 AT ELBEL RD/BORGFELD RD

SHEET 1 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	49

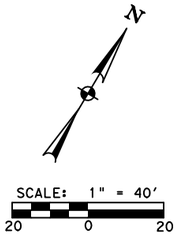
STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.



PROPOSED SIGNAL HEADS

12" LED VERTICAL SIGNAL HEAD SECTIONS
VENTED ALUM. BACK PLATES
W/ REFLECTORIZED BORDER



LEGEND

- CONTROLLER CABINET
- TRAFFIC SIGNAL POLE
- PEDESTRIAN SIGNAL POLE
- SIGNAL MAST ARM
- LUMINAIRE AND ARM
- 1 SIGNAL HEAD VERTICAL
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- ADVANCE RADAR DETECTION
- PRESENCE RADAR DETECTION
- MAST ARM MOUNTED SIGN
- GROUND BOX
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- ELECTRICAL SERVICE
- IP PTZ CAMERA
- DIRECTION OF TRAFFIC FLOW

PROPOSED SIGN SCHEDULE

S1 — FM 3009

S2 — ← Elbel Rd / Borgfeld Rd →

S3 — ← Borgfeld Rd / Elbel Rd →

R10-17T (36"x42") (2 EA) S4

R3-5L (30"x36") (1 EA) S5

R3-6L (30"x36") (1 EA) S6

R10-3eL (9"X15") (4 EA) S7

R10-3eR (9"X15") (4 EA) S8

POSTED SPEED LIMITS:
FM 3009 = 45 MPH
ELBEL RD = 30 MPH
BORGFELD RD = 35 MPH

PAVEMENT TYPE:
FM 3009 = ASPHALT
ELBEL RD = ASPHALT
BORGFELD RD = ASPHALT

NOTE:
SEE SHEET 8 OF 8 "INTERSECTION QUANTITIES & DETAILS" FOR TRAFFIC SIGNAL NOTES.

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

CHARLES R. STEVENS, JR., P.E. — 7/5/2023 DATE

NO.	REVISION	APPROV.

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

PROPOSED INTERSECTION LAYOUT FM 3009 AT ELBEL RD/BORGFELD RD

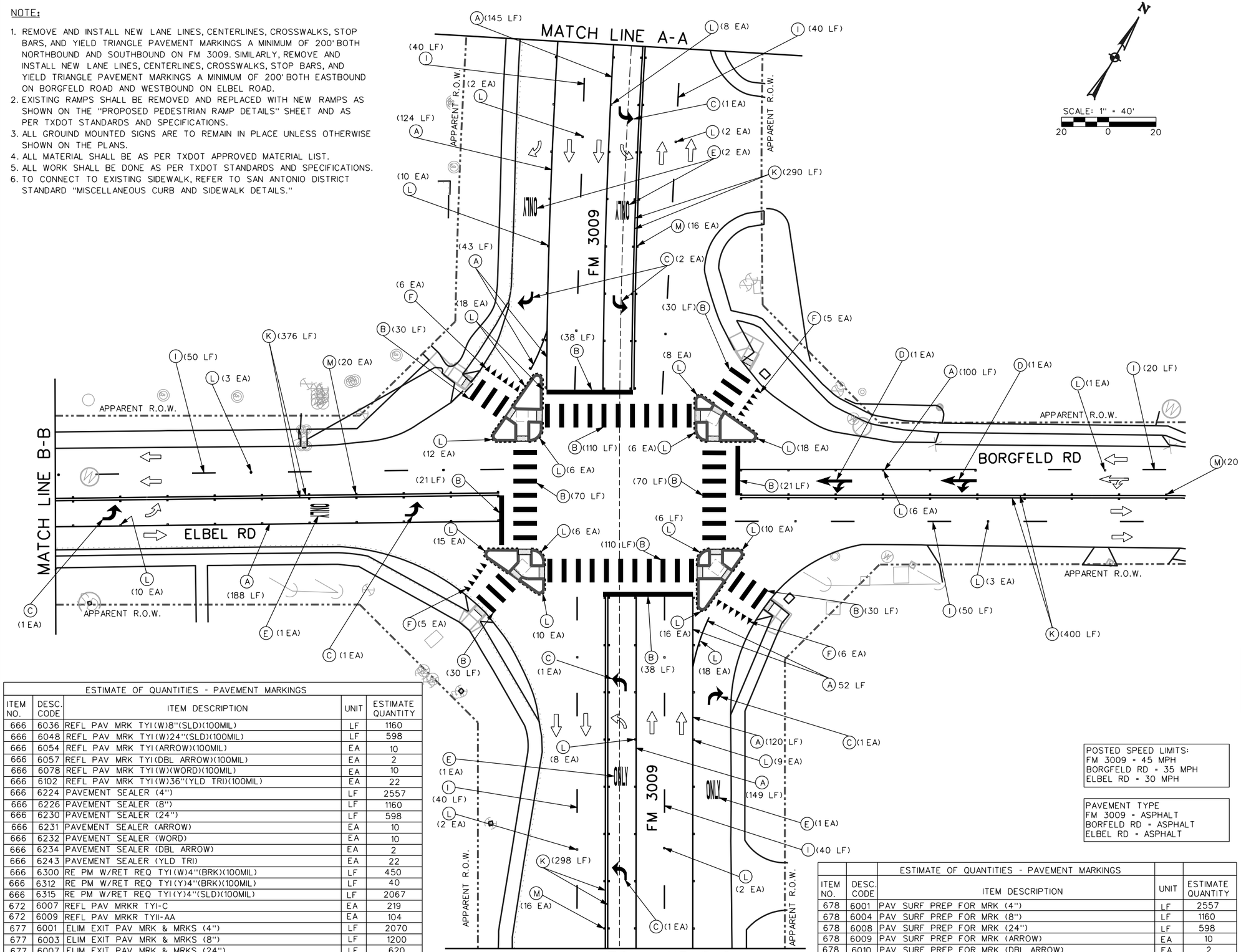
SHEET 2 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	50
STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE
CONT.	SECT.	JOB / HIGHWAY NO.
0025	03	105,ETC. / UA 90,ETC.

7/5/2023 11:28:00 PM
...\02-PROPOSED INTERSECTION LAYOUT-FM 3009 AT BORGFELD RD with blow ups-90%.dgn

NOTE:

1. REMOVE AND INSTALL NEW LANE LINES, CENTERLINES, CROSSWALKS, STOP BARS, AND YIELD TRIANGLE PAVEMENT MARKINGS A MINIMUM OF 200' BOTH NORTHBOUND AND SOUTHBOUND ON FM 3009. SIMILARLY, REMOVE AND INSTALL NEW LANE LINES, CENTERLINES, CROSSWALKS, STOP BARS, AND YIELD TRIANGLE PAVEMENT MARKINGS A MINIMUM OF 200' BOTH EASTBOUND ON BORGFELD ROAD AND WESTBOUND ON ELBEL ROAD.
2. EXISTING RAMPS SHALL BE REMOVED AND REPLACED WITH NEW RAMPS AS SHOWN ON THE "PROPOSED PEDESTRIAN RAMP DETAILS" SHEET AND AS PER TXDOT STANDARDS AND SPECIFICATIONS.
3. ALL GROUIND MOUNTED SIGNS ARE TO REMAIN IN PLACE UNLESS OTHERWISE SHOWN ON THE PLANS.
4. ALL MATERIAL SHALL BE AS PER TXDOT APPROVED MATERIAL LIST.
5. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATIONS.
6. TO CONNECT TO EXISTING SIDEWALK, REFER TO SAN ANTONIO DISTRICT STANDARD "MISCELLANEOUS CURB AND SIDEWALK DETAILS."



LEGEND

- (A) REFL PAV MRK TYI(W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TYI(W)24"(SLD)(100MIL)
- (C) REFL PAV MRK TYI(W)(ARROW)(100MIL)
- (D) REFL PAV MRK TYI(W)(DBL ARROW)(100MIL)
- (E) REFL PAV MRK TYI(W)(WORD)(100MIL)
- (F) REF PAV MRK TYI(W)36"(YLD TRI)(100MIL)
- (I) RE PM W/RET REQ TYI(W)4"(BRK)(100MIL)
- (J) RE PM W/RET REQ TYI(Y)4"(BRK)(100MIL)
- (K) RE PM W/RET REQ TYI(Y)4"(SLD)(100MIL)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A
- PROPOSED SIGNS
- DIRECTION OF TRAFFIC FLOW

ESTIMATE OF QUANTITIES - PAVEMENT MARKINGS

ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	ESTIMATE QUANTITY
666	6036	REFL PAV MRK TYI(W)8"(SLD)(100MIL)	LF	1160
666	6048	REFL PAV MRK TYI(W)24"(SLD)(100MIL)	LF	598
666	6054	REFL PAV MRK TYI(ARROW)(100MIL)	EA	10
666	6057	REFL PAV MRK TYI(DBL ARROW)(100MIL)	EA	2
666	6078	REFL PAV MRK TYI(W)(WORD)(100MIL)	EA	10
666	6102	REFL PAV MRK TYI(W)36"(YLD TRI)(100MIL)	EA	22
666	6224	PAVEMENT SEALER (4")	LF	2557
666	6226	PAVEMENT SEALER (8")	LF	1160
666	6230	PAVEMENT SEALER (24")	LF	598
666	6231	PAVEMENT SEALER (ARROW)	EA	10
666	6232	PAVEMENT SEALER (WORD)	EA	10
666	6234	PAVEMENT SEALER (DBL ARROW)	EA	2
666	6243	PAVEMENT SEALER (YLD TRI)	EA	22
666	6300	RE PM W/RET REQ TYI(W)4"(BRK)(100MIL)	LF	450
666	6312	RE PM W/RET REQ TYI(Y)4"(BRK)(100MIL)	LF	40
666	6315	RE PM W/RET REQ TYI(Y)4"(SLD)(100MIL)	LF	2067
672	6007	REFL PAV MRKR TYI-C	EA	219
672	6009	REFL PAV MRKR TYII-AA	EA	104
677	6001	ELIM EXIT PAV MRK & MRKS (4")	LF	2070
677	6003	ELIM EXIT PAV MRK & MRKS (8")	LF	1200
677	6007	ELIM EXIT PAV MRK & MRKS (24")	LF	620
677	6008	ELIM EXIT PAV MRK & MRKS (ARROW)	EA	5
677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	5

ESTIMATE OF QUANTITIES - PAVEMENT MARKINGS

ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	ESTIMATE QUANTITY
678	6001	PAV SURF PREP FOR MRK (4")	LF	2557
678	6004	PAV SURF PREP FOR MRK (8")	LF	1160
678	6008	PAV SURF PREP FOR MRK (24")	LF	598
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	10
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	2
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	10
678	6023	PAV SURF PREP FOR MRK (36)(YLD TRI)	EA	22

POSTED SPEED LIMITS:
FM 3009 - 45 MPH
BORGFELD RD - 35 MPH
ELBEL RD - 30 MPH

PAVEMENT TYPE
FM 3009 - ASPHALT
BORFELD RD - ASPHALT
ELBEL RD - ASPHALT

STATE OF TEXAS
GUILLERMO A. DOUGHERTY, JR.
93649
LICENSED
PROFESSIONAL ENGINEER

7-6-2023

NO.	DATE	REVISION	APPROV.

DOUGHERTY Engineering Group, PLLC
TBPE Firm No. F-18636

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PROPOSED PAVEMENT MARKINGS LAYOUT FM 3009 AT ELBEL RD/BORGFELD RD

SHEET 4 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	51

STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

7/6/2023 3:58:48 PM
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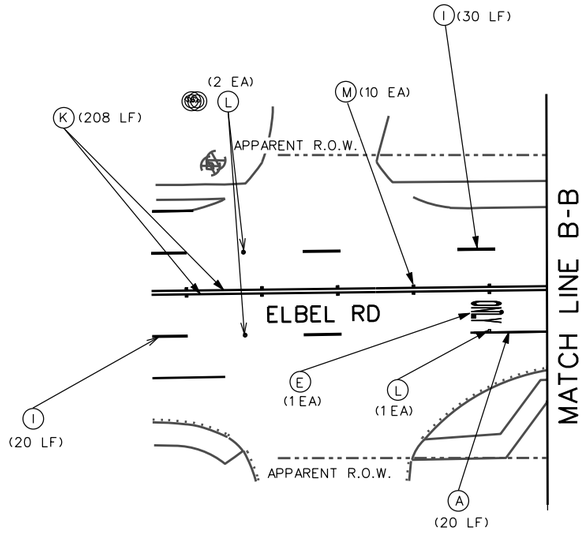

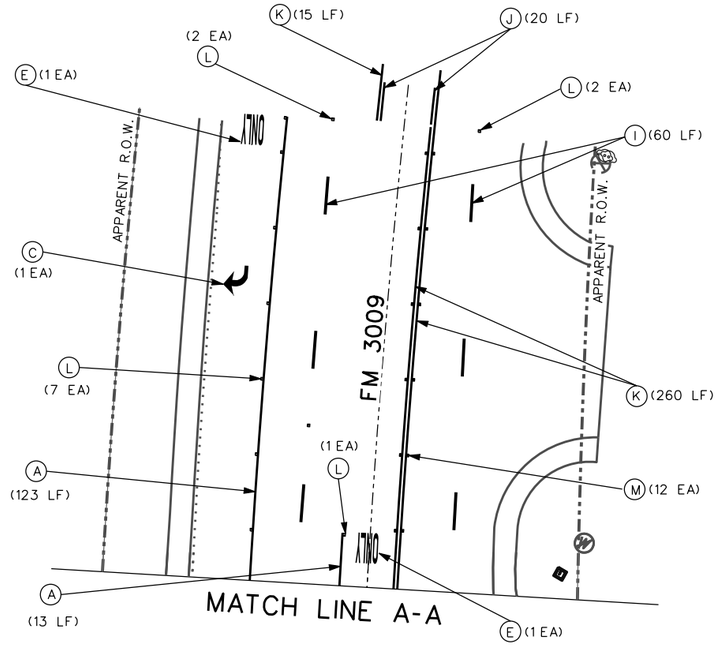

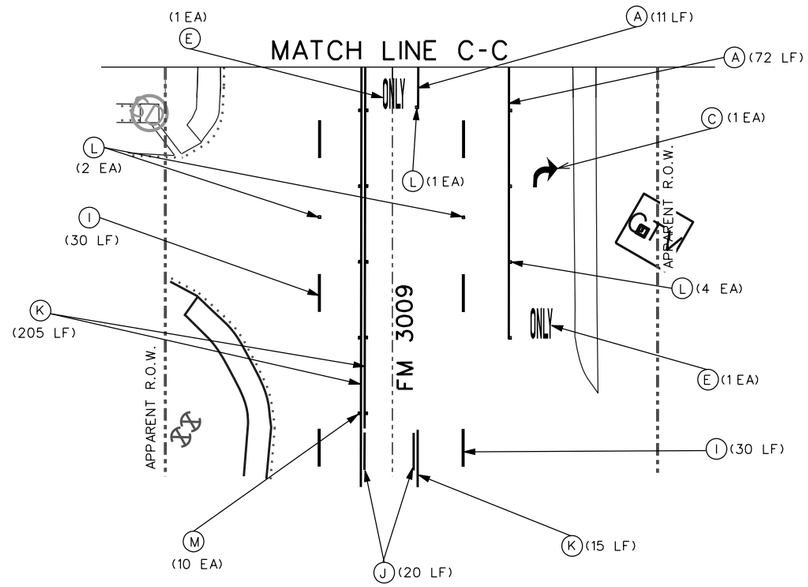

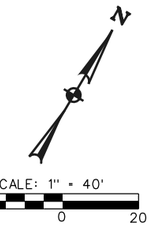

LEGEND

- (A) REFL PAV MRK TYI(W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TYI(W)24"(SLD)(100MIL)
- (C) REFL PAV MRK TYI(W)(ARROW)(100MIL)
- (D) REFL PAV MRK TYI(W)(DBL ARROW)(100MIL)
- (E) REFL PAV MRK TYI(W)(WORD)(100MIL)
- (F) REF PAV MRK TYI(W)36"(YLD TRI)(100MIL)
- (I) RE PM W/RET REQ TYI(W)4"(BRK)(100MIL)
- (J) RE PM W/RET REQ TYI(Y)4"(BRK)(100MIL)
- (K) RE PM W/RET REQ TYI(Y)4"(SLD)(100MIL)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A
- PROPOSED SIGNS
- DIRECTION OF TRAFFIC FLOW

STATE OF TEXAS
GUILLERMO A. DOUGHERTY, JR.
93649
LICENSED
PROFESSIONAL ENGINEER

7-6-2023

NO.	DATE	REVISION	APPROV.

DOUGHERTY
Engineering Group, PLLC
TBPE Firm No. F-18636

Texas Department of Transportation®

PROPOSED PAVEMENT MARKINGS LAYOUT
FM 3009 AT ELBEL RD/BORGFELD RD

SHEET 5 OF 8

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		52
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

7/6/2023 3:59:33 PM
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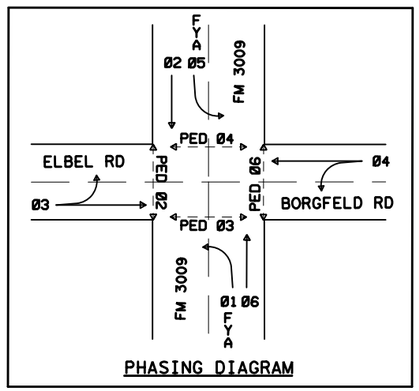
PROPOSED CONDUIT AND CONDUCTOR SCHEDULE

	RUN NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	CONDUIT SIZE IN INCHES		2.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0
	NUMBER OF CONDUITS		1	2	1	1	2	1	2	1	1	2	1	1	2	1	2	1	1	2	1	2	1	3	1	2
	LENGTH OF RUN (FT)		15	15	10	55	55	10	10	10	75	75	10	10	10	60	60	10	10	10	55	55	5	5	30	30
	TRENCH(T)/BORE(B)/CONTROLLER(C)		T	T	T	B	B	T	T	T	B	B	T	T	T	B	B	T	T	T	B	B	C	C	T	T
CABLE	CIRCUIT		NUMBER OF CONDUCTORS																							
#6 XHHW	120 POWER HOT																									1
	120 POWER COMMON																									1
#6 BARE	BARE BOND GROUND		1	2	1	1	2	1	2	1	1	2	1	1	2	1	2	1	1	2	1	2	1	3	1	2
7 COND. #12 STRANDED TY A	SIGNALS	PHASE 01		1			1					1								1		1		1		
		PHASE 02																		1		1		1		
		PHASE 03							1			1										1		1		
		PHASE 04													1		1					1		1		
		PHASE 05																		1		1		1		
		PHASE 06		1			1					1										1		1		
4 COND. #12 STRANDED TY A	PED. SIGNALS	PHASE 02													1		1	1				2		2		
		PHASE 03								1		1								1		2		2		
		PHASE 04		1			1					1	1				1					2		2		
		PHASE 06			1		1		1			2										2		2		
2 COND. #14 STRANDED TY C	PED. PUSH BUTTONS	PHASE 02													1		1	1				2		2		
		PHASE 03								1		1								1		2		2		
		PHASE 04		1			1					1	1				1					2		2		
		PHASE 06			1		1		1			2										2		2		
3 COND. #22	RVDS (PRESENCE DETECTION DEVICE)	PHASE 01 & 06																		1		1		1		
		PHASE 02 & 05		1			1					1										1		1		
		PHASE 03													1		1					1		1		
		PHASE 04							1			1										1		1		
3 COND. #22	RVDS (ADVANCE DETECTION DEVICE)	PHASE 02																		1		1		1		
		PHASE 06		1			1					1										1		1		
TRAY CABLE (4 CONDR) (12 AWG)	LUMINAIRE		1		1		1			2			1		1			1		4				4	
CAT 5 ETHERNET CABLE & POWER	IP PTZ CAMERA																			1		1		1		

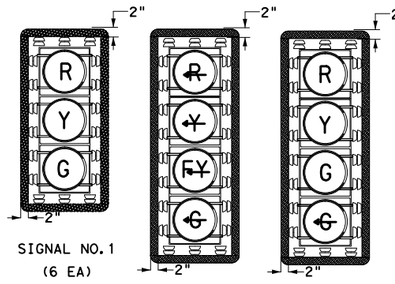


PHASING DIAGRAM

POLE ID.	POLE & EQUIPMENT DESCRIPTIONS WITH ATTACHMENTS
A	24' SINGLE MAST ARM ON A 30-A FOUNDATION AT 11.3 FT WITH TWO VERTICAL VEHICLE SIGNAL HEADS AS ILLUSTRATED, D3-1G STREET NAME SIGN, R3-6L (30"X36") SIGN, LUMINAIRE, LED COUNTDOWN PEDESTRIAN HEAD, ACCESSIBLE PEDESTRIAN SIGNAL UNIT, R10-3eL PEDESTRIAN SIGN, AND RVDS PRESENCE DETECTION (RPDD 03).
B	36' SINGLE MAST ARM ON A 36-A FOUNDATION AT 13.2 FT WITH THREE VERTICAL VEHICLE SIGNAL HEADS AS ILLUSTRATED, D3-1G STREET NAME SIGN, R10-17T (36"X42") SIGN, LUMINAIRE, LED COUNTDOWN PEDESTRIAN HEAD, ACCESSIBLE PEDESTRIAN SIGNAL UNIT, R10-3eL PEDESTRIAN SIGN, RVDS FRESENCE DETECTION (RPDD 02 & 05), AND RVDS ADVANCE DETECTION (RADD 06).
C	24' SINGLE MAST ARM ON A 30-A FOUNDATION AT 11.3 FT WITH TWO VERTICAL VEHICLE SIGNAL HEADS AS ILLUSTRATED, D3-1G STREET NAME SIGN, R3-5L (30"X36") SIGN, LUMINAIRE, LED COUNTDOWN PEDESTRIAN HEAD, ACCESSIBLE PEDESTRIAN SIGNAL UNIT, R10-3eL PEDESTRIAN SIGN, AND RVDS PRESENCE DETECTION (RPDD 04).
D	36' SINGLE MAST ARM ON A 36-A FOUNDATION AT 13.2 FT WITH THREE VERTICAL VEHICLE SIGNAL HEADS AS ILLUSTRATED, D3-1G STREET NAME SIGN, R10-17T (36"X42") SIGN, LUMINAIRE, LED COUNTDOWN PEDESTRIAN HEAD, ACCESSIBLE PEDESTRIAN SIGNAL UNIT, R10-3eL PEDESTRIAN SIGN, RVDS FRESENCE DETECTION (RPDD 01 & 06), RVDS ADVANCE DETECTION (RADD 02), AND IP PTZ CAMERA.
E	10' PEDESTRIAN SIGNAL POLE ASSEMBLY ON A 24-A FOUNDATION AT 6 FT WITH LED COUNTDOWN PEDESTRIAN HEAD, ACCESSIBLE PEDESTRIAN SIGNAL UNIT, AND R1C-3eR PEDESTRIAN SIGN.
F	10' PEDESTRIAN SIGNAL POLE ASSEMBLY ON A 24-A FOUNDATION AT 6 FT WITH LED COUNTDOWN PEDESTRIAN HEAD, ACCESSIBLE PEDESTRIAN SIGNAL UNIT, AND R1C-3eR PEDESTRIAN SIGN.
G	10' PEDESTRIAN SIGNAL POLE ASSEMBLY ON A 24-A FOUNDATION AT 6 FT WITH LED COUNTDOWN PEDESTRIAN HEAD, ACCESSIBLE PEDESTRIAN SIGNAL UNIT, AND R1C-3eR PEDESTRIAN SIGN.
H	10' PEDESTRIAN SIGNAL POLE ASSEMBLY ON A 24-A FOUNDATION AT 6 FT WITH LED COUNTDOWN PEDESTRIAN HEAD, ACCESSIBLE PEDESTRIAN SIGNAL UNIT, AND R1C-3eR PEDESTRIAN SIGN.

PROPOSED SIGNAL HEADS

12" LED VERTICAL SIGNAL HEAD SECTIONS
VENTED ALUM. BACK PLATES
W/ REFLECTORIZED BORDER

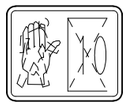


SIGNAL NO. 1
(6 EA)

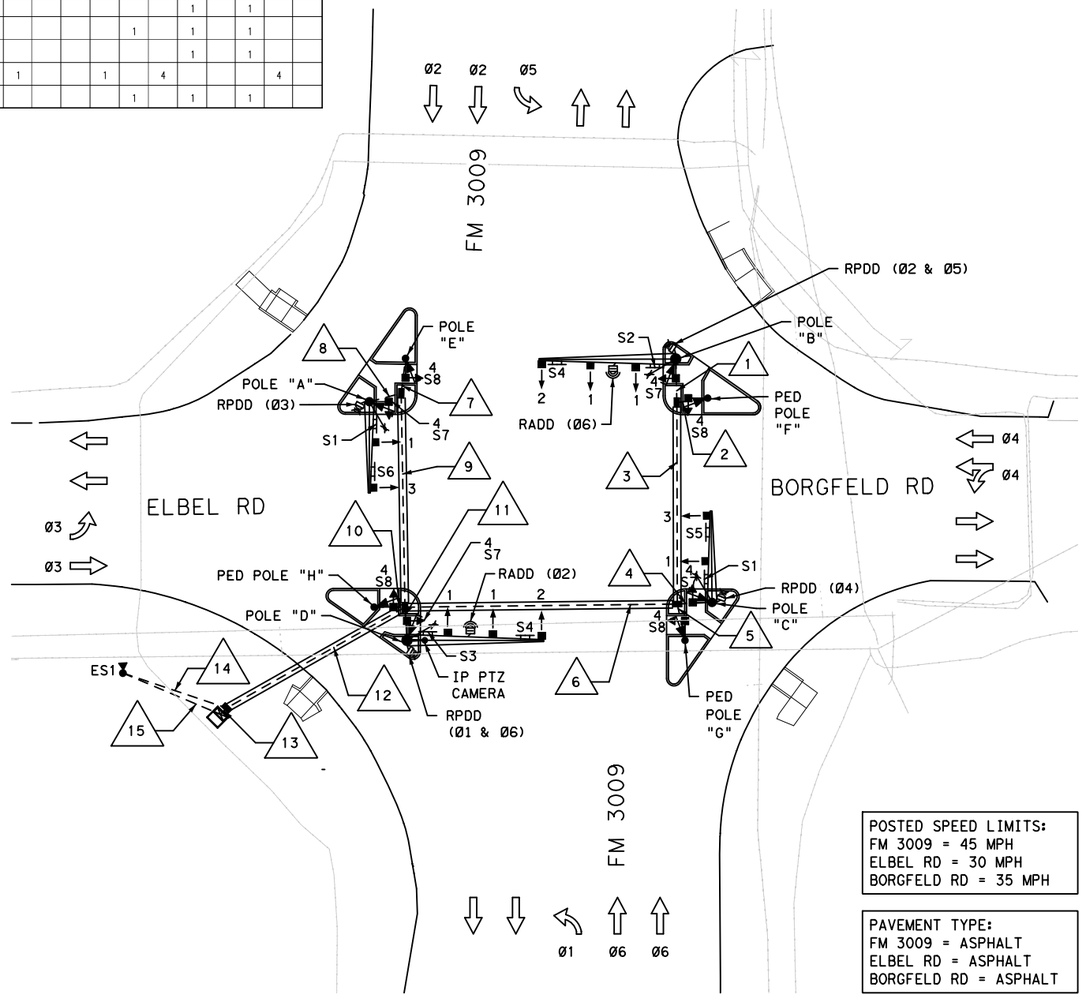
SIGNAL NO. 2
(2 EA)

SIGNAL NO. 3
(2 EA)

LED PEDESTRIAN COUNTDOWN SIGNAL

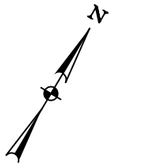


SIGNAL NO. 4
(8 EA)



POSTED SPEED LIMITS:
FM 3009 = 45 MPH
ELBEL RD = 30 MPH
BORGFELD RD = 35 MPH

PAVEMENT TYPE:
FM 3009 = ASPHALT
ELBEL RD = ASPHALT
BORGFELD RD = ASPHALT



LEGEND

- CONTROLLER CABINET
- TRAFFIC SIGNAL POLE
- PEDESTRIAN SIGNAL POLE
- SIGNAL MAST ARM
- LUMINAIRE AND ARM
- 1 SIGNAL HEAD VERTICAL
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- ADVANCE RADAR DETECTION
- PRESENCE RADAR DETECTION
- EXISTING SPREAD SPECTRUM ANTENNA
- EXISTING BELL CAMERA
- MAST ARM MOUNTED SIGN
- GROUND BOX
- CONDUIT (TRENCH)
- CONDUIT (BORE)
- EXISTING ELECTRICAL SERVICE
- DIRECTION OF TRAFFIC FLOW

CHARLES R. STEVENS, JR., P.E. — 7/5/2023 DATE

NO.	REVISION	APPROV.

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

PROPOSED WIRING DIAGRAM FM 3009 AT ELBEL RD/BORGFELD RD

SHEET 3 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	53

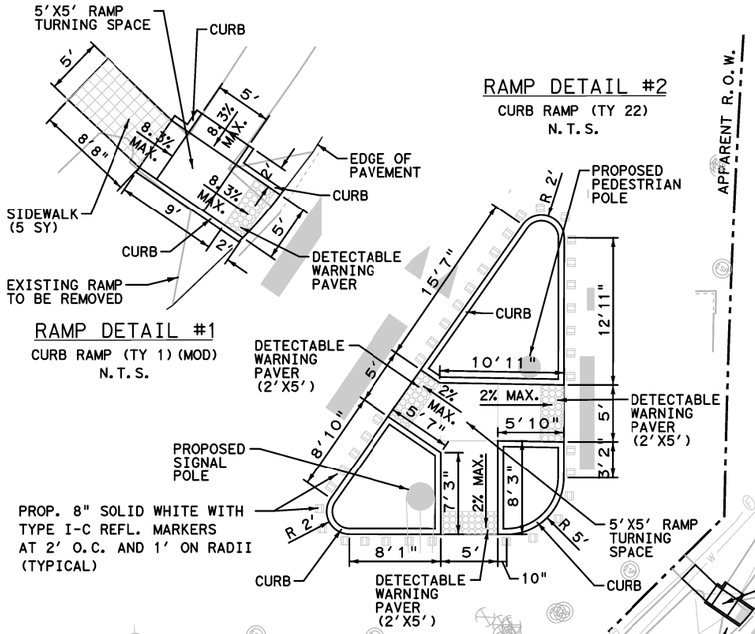
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

7/5/2023 11:28:16 PM
...\03*PROPOSED WIRING DIAGRAM-FM 3009 AT BORGFELD RD-90%.dgn

ESTIMATE OF QUANTITIES - CURB RAMPS				
ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	EST QUANTITY
104	6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	127
529	6002	CONC CURB (TY I)	LF	7
531	6001	CONC SIDEWALKS (4")	SY	15
531	6004	CURB RAMPS (TY 1)	EA	1
531	6008	CURB RAMPS (TY 5)	EA	1
531	6017	CURB RAMPS (TY 22)	EA	4
531	6037	CURB RAMPS (TY 1)(MOD)	EA	2
536	6004	CONC DIRECTIONAL ISLAND	SY	136

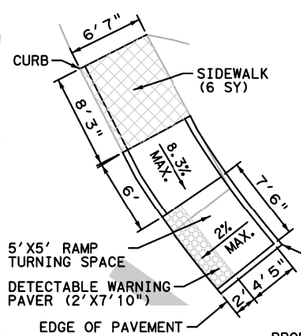
SCALE: 1" = 40'
20 0 20

RAMP DETAIL #1
CURB RAMP (TY 1)(MOD)
N.T.S.



RAMP DETAIL #2
CURB RAMP (TY 22)
N.T.S.

RAMP DETAIL #3
CURB RAMP (TY 1)
N.T.S.



RAMP DETAIL #4
CURB RAMP (TY 22)
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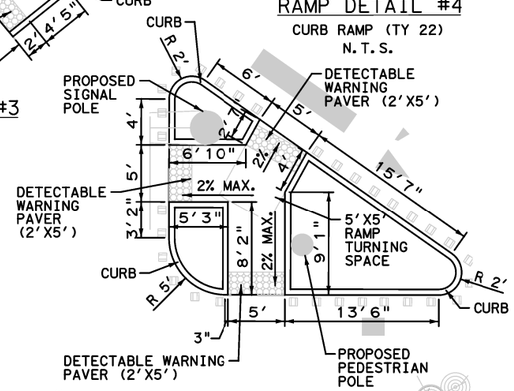
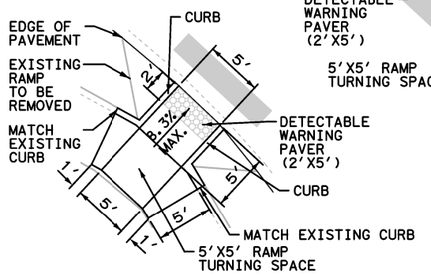
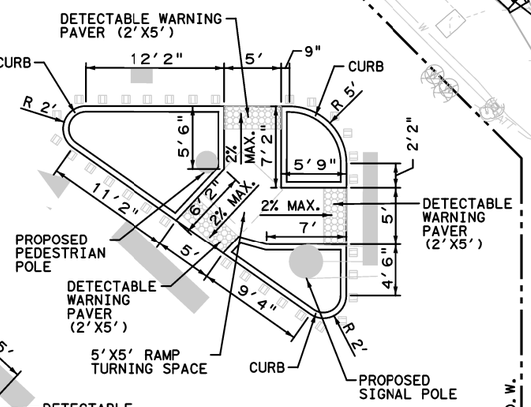


NOTES:
1. EXISTING RAMPS SHALL BE REMOVED AND REPLACED WITH NEW RAMPS AS SHOWN ON THIS SHEET AND AS PER TXDOT STANDARDS AND SPECIFICATIONS.
2. BACKFILL AREA TO PROVIDE LEVEL ACCESS PAD AND ELIMINATE OR REDUCE ADJACENT EDGE DROP-OFF END WHERE NO CURB IS PRESENT, PROVIDE BACKFILL ADJACENT TO LANDING PAD AT A SLOPE NO GREATER THAN 8.3%. BACKFILL MATERIALS AND LABOR ARE SUBSIDIARY TO ITEM 531 CONC SIDEWALKS.
3. ALL MATERIAL SHALL BE AS PER TXDOT APPROVED MATERIAL LIST.
4. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATIONS.
5. TO CONNECT TO EXISTING SIDEWALKS, REFER TO SAN ANTONIO DISTRICT STANDARD "MISCELLANEOUS CURB AND SIDEWALK DETAILS."

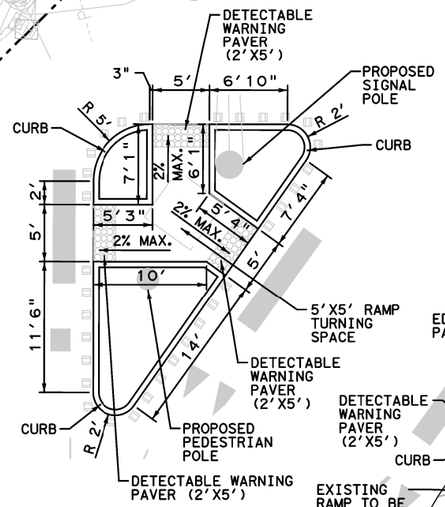
RAMP DETAIL #5
CURB RAMP (TY 1)(MOD)
N.T.S.



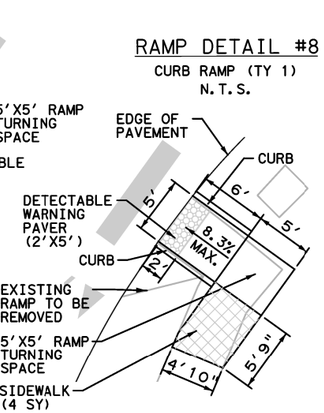
RAMP DETAIL #6
CURB RAMP (TY 22)
N.T.S.



RAMP DETAIL #7
CURB RAMP (TY 22)
N.T.S.



RAMP DETAIL #8
CURB RAMP (TY 1)
N.T.S.



CHARLES R. STEVENS, JR., P.E. — 7/5/2023 DATE

NO.	REVISION	APPROV.

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

PROPOSED PEDESTRIAN RAMP DETAILS FM 3009 AT ELBEL RD/BORGFELD RD

SHEET 6 OF 8

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		54
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

7/5/2023 11:28:48 PM
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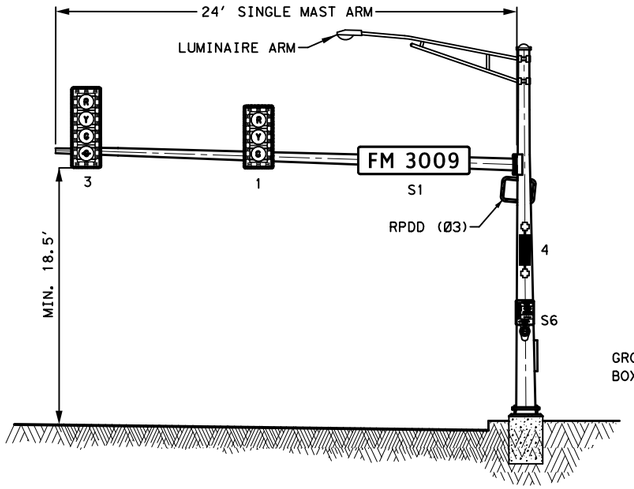
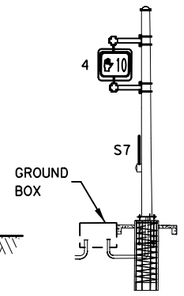
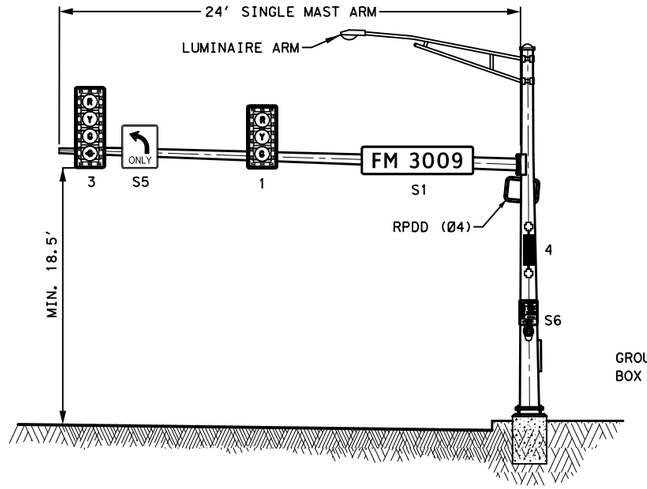


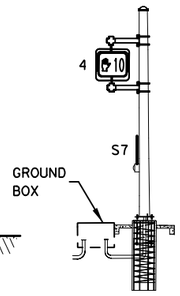
SIGNAL POLE "A" "WESTBOUND"



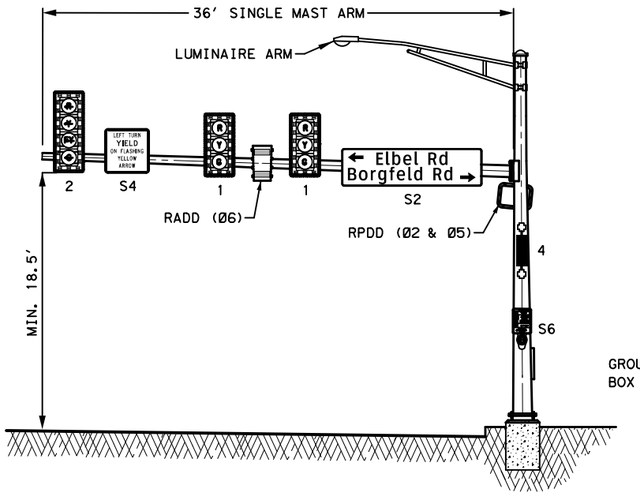
PED POLE "E"
VIEW



SIGNAL POLE "C" "EASTBOUND"



PED POLE "G"
VIEW



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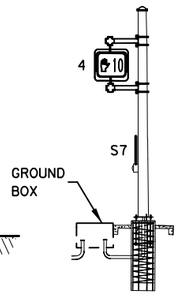
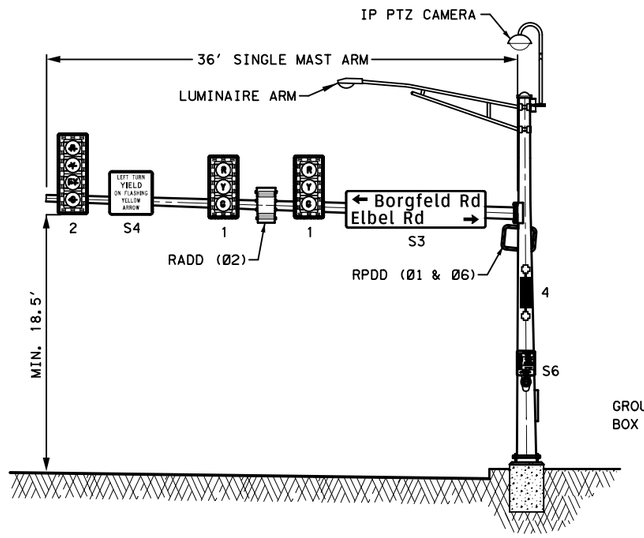
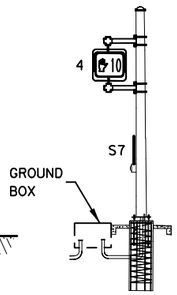


PED POLE "F"
VIEW



SIGNAL POLE "D" "SOUTHBOUND"



PED POLE "H"
VIEW

CHARLES R. STEVENS, JR., P.E. — 7/5/2023 DATE

NO.	REVISION	APPROV.

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

PROPOSED ELEVATION VIEW FM 3009 AT ELBEL RD/BORGFELD RD

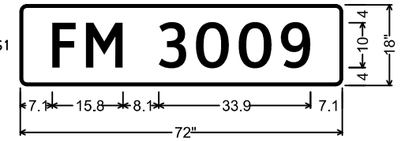
SHEET 7 OF 8

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		55
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

ESTIMATE OF QUANTITIES - TRAFFIC SIGNAL				
ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	EST. QUANTITY
104	6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	127
416	6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	23
416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	27
529	6001	CONC CURB (TY I)	LF	7
531	6001	CONC SIDEWALKS (4")	SY	15
531	6004	CURB RAMPS (TY 1)	EA	1
531	6008	CURB RAMPS (TY 5)	EA	1
531	6017	CURB RAMPS (TY 22)	EA	4
531	6037	CURB RAMP (TY 1) (MOD)	EA	2
536	6004	CONC DIRECTIONAL ISLAND	SY	136
618	6046	CONDT (PVC) (SCH 80) (2")	LF	180
618	6047	CONDT (PVC) (SCH 80) (2")(BORE)	LF	245
618	6053	CONDT (PVC) (SCH 80) (3")	LF	105
618	6054	CONDT (PVC) (SCH 80) (3")(BORE)	LF	490
620	6009	ELEC CONDR (NO.6) BARE	LF	1020
620	6010	ELEC CONDR (NO.6) INSULATED	LF	60
621	6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	810
624	6009	GROUND BOX TY D (162922)	EA	4
624	6010	GROUND BOX TY D (162922) W/APRON	EA	1
628	6002	REMOVE ELECTRICAL SERVICE	EA	1
628	6164	ELC SRV TY D 120/240 070(NS)AL(PS)(U)	EA	1
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1160
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	598
666	6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	10
666	6057	REFL PAV MRK TY I(W)(DBL ARROW)(100MIL)	EA	2
666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	10
666	6102	REF PAV MRK TY I(W)36"(YLD TRI)(100MIL)	EA	22
666	6224	PAVEMENT SEALER 4"	LF	2557
666	6226	PAVEMENT SEALER 8"	LF	1160
666	6230	PAVEMENT SEALER 24"	LF	598
666	6231	PAVEMENT SEALER (ARROW)	EA	10
666	6232	PAVEMENT SEALER (WORD)	EA	10
666	6234	PAVEMENT SEALER (DBL ARROW)	EA	2
666	6243	PAVEMENT SEALER (YLD TRI)	EA	22
666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	450
666	6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	40
666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	2067
672	6007	REFL PAV MRKR TY I-C	EA	219
672	6009	REFL PAV MRKR TY II-A-A	EA	104
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	2070
677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	1200
677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	620
677	6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	5
677	6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	5
678	6001	PAV SURF PREP FOR MRK (4")	LF	2557
678	6004	PAV SURF PREP FOR MRK (8")	LF	1160
678	6008	PAV SURF PREP FOR MRK (24")	LF	598
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	10
678	6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	2
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	10
678	6023	PAV SURF PREP FOR MRK (36")(YLD TRI)	EA	22
680	6002	INSTALL HWY TRF SIG (ISOLATED)	EA	1
**		TS 2 TYPE 2 CONTROLLER CABINET	EA	1
**		TRAFFIC SIGNAL CONTROLLER FOUNDATION	EA	1
**		R3-5L (30" X 36") LEFT TURN ONLY	EA	1
**		R3-6L (30" X 36") OPTIONAL MOVEMENT LANE CONTROL	EA	1
**		R10-17T (36" X 42") "LEFT TURN YIELD ON FLASHING YELLOW ARROW"	EA	2
**		D3-1G - STREET NAME SIGN "FM 3009"	EA	2
**		D3-1G - STREET NAME SIGN "< ELBEL RD/BORGFELD RD >"	EA	1
**		D3-1G - STREET NAME SIGN "< BORGFELD RD/ELBEL RD >"	EA	1
680	6004	REMOVING TRAFFIC SIGNALS	EA	1
682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
682	6002	VEH SIG SEC (12")LED(GRN ARW)	EA	4
682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
682	6004	VEH SIG SEC (12")LED(YEL ARW)	EA	4
682	6005	VEH SIG SEC (12")LED(RED)	EA	8
682	6006	VEH SIG SEC (12")LED(RED ARW)	EA	2
682	6018	PED SIG SEC (LED)(COUNTDOWN)	EA	8
682	6054	BACKPLATE W/REFL BRDR(3 SEC)(VENT)(ALUM)	EA	6
682	6055	BACKPLATE W/REFL BRDR(4 SEC)(VENT)(ALUM)	EA	4
684	6009	TRF SIG CBL(TY A)(12 AWG)(4 CONDR)	LF	1175
684	6012	TRF SIG CBL(TY A)(12 AWG)(7 CONDR)	LF	1110
684	6080	TRF SIG CBL(TY C)(14 AWG)(2 CONDR)	LF	1135
686	6027	INS TRF SIG PL AM(S)1 ARM(24')LUM	EA	2
686	6039	INS TRF SIG PL AM(S)1 ARM(36')LUM	EA	2
687	6001	PED POLE ASSEMBLY	EA	4
**		DRILL SHAFT (24 IN)	LF	24
688	6001	PED DETECT PUSH BUTTON (APS)	EA	8

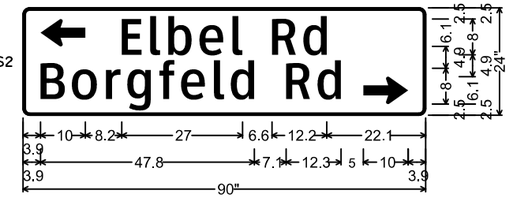
PROPOSED SIGN DETAILS

S1



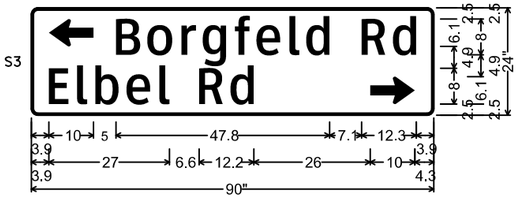
1.5" Radius, 0.5" Border, White on Green;
"FM 3009", ClearviewHwy-3-W;

S2



1.5" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 10.0" X 6.1" 180°; "Elbel Rd", ClearviewHwy-3-W;
"Borgfeld Rd", ClearviewHwy-3-W; Standard Arrow Custom 10.0" X 6.1" 0°;

S3



1.5" Radius, 0.5" Border, White on Green;
Standard Arrow Custom 10.0" X 6.1" 180°; "Borgfeld Rd", ClearviewHwy-3-W;
"Elbel Rd", ClearviewHwy-3-W; Standard Arrow Custom 10.0" X 6.1" 0°;

ELECTRICAL SERVICE DATA													
C-S-J	PROJECT LOCATION	ELECTRIC SERVICE NO.	SHEET NO.	ELECTRICAL SERVICE DESCRIPTION (SEE ED (5)-14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE/AMP	TWO-POLE CONTACT OR AMPS ***	PANEL BD./ LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE/ AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
0024-03-105	FM 3009 AT BORGFELD RD	ES1	2 OF 8 & 3 OF 8	TY D (120/240)070 (NS)AL(E)PS(U)	2"	3/#4	N/A	2P/70	30	100	SIGNAL LIGHTING	1P/50 1P/20	40 4	<7.1

NOTES:

1. ALL TRAFFIC SIGNAL EQUIPMENT LOCATIONS ARE BASED ON A SURVEY. CONTRACTOR SHALL VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
2. APPARENT RIGHT-OF-WAY LINES ARE FROM TXDOT MAPS. VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
3. THE EXISTENCE AND LOCATION OF UTILITIES, EITHER UNDERGROUND OR OVERHEAD, INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE APPROXIMATE. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL UTILITIES (PRIVATE/PUBLIC AND SHOWN/NOT SHOWN) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS/HER FAILURE TO LOCATE, PRESERVE, AND PROTECT THESE UTILITIES.
4. CONTRACTOR SHALL REMOVE AND REPLACE EXISTING SIGNAL HEADS WITH NEW VERTICAL SIGNAL HEADS AS SHOWN ON THE PLANS AND SHALL HAVE A MINIMUM OF 18.5 FEET CLEARANCE ABOVE ROADWAY SURFACE. CONTRACTOR SHALL CONTACT THE TXDOT SIGNAL SHOP AND AREA OFFICE PRIOR TO STARTING THIS WORK TO ENSURE A SMOOTH TRAFFIC MOVEMENT FOR ALL MOTORISTS DURING THIS TRANSITION.
5. CONTRACTOR SHALL REMOVE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AND INSTALL NEW EQUIPMENT AS PER DESIGN LAYOUTS AND IN ACCORDANCE TO TXDOT STANDARDS AND SPECIFICATIONS AND IN ACCORDANCE TO THE ACCESSIBILITY REQUIREMENTS AND CONNECT PROPOSED FIELD WIRING TO CONTROLLER.
6. FOR PAVEMENT MARKINGS, SEE PROPOSED PAVEMENT MARKINGS & RAMPS LAYOUT SHEET.
7. ALL EXISTING CURB RAMPS SHALL BE REMOVED AND NEW WHEELCHAIR RAMPS INSTALLED (IF ANY), AS PER DESIGN DETAILS ON THE PROPOSED PAVEMENT MARKINGS & RAMPS LAYOUT SHEET AND IN ACCORDANCE TO TXDOT STANDARDS AND SPECIFICATIONS AND IN ACCORDANCE TO THE ACCESSIBILITY REQUIREMENTS.
8. THE CONTRACTOR SHALL INSTALL NEW PRESENCE RADAR DETECTORS. THE LOCATION OF THE RADAR DETECTORS SHOWN ARE APPROXIMATE. THE EXACT LOCATION SHALL BE DETERMINED IN THE FIELD AND ADJUSTED TO PROVIDE PROPER DETECTION ZONES AND A COMPLETE OPERABLE SYSTEM.
9. CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT LOCATED AT 4615 NW LOOP 410, CONTACT MARK PEREZ AT 210-218-7430.
10. CONTRACTOR SHALL FURNISH AND DELIVER ONE (1) TS 2 TYPE 2 AND SEVEN (7) TX 2 TYPE 5 (12-POSITION) CONTROLLER CABINETS AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS IN ADVANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICKUP WITH MARK PEREZ AT 210-218-7430.
11. THE INSTALLATION OF ALL COMMUNICATION PACKAGE ITEMS (MODEM, POWER STRIP, ETC.) IS SUBSIDIARY TO ITEM 680.
12. TRAY CABLES SHALL BE RUN IN 2" CONDUIT SEPARATE FROM THE SIGNAL CABLE.
13. ADJUST EXISTING AND PROPOSED SIGNAL HEADS AS NECESSARY TO KEEP THEM VISIBLE AT ALL TIMES DURING CONSTRUCTION. ADJUSTING SIGNAL HEADS DURING CONSTRUCTION IS SUBSIDIARY TO ITEM 502.
14. CONTRACTOR SHALL CONTACT THE TXDOT SIGNAL SHOP AND AREA OFFICE A MINIMUM OF SEVEN (7) DAYS PRIOR TO BEGINNING CONSTRUCTION.
15. CONTRACTOR SHALL CONTACT THE TXDOT SIGNAL SHOP AND AREA OFFICE A MINIMUM OF FOURTEEN (14) DAYS PRIOR TO THE TRAFFIC SIGNAL TURN-ON.

ESTIMATE OF QUANTITIES - TRAFFIC SIGNAL				
ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	EST. QUANTITY
**	**	R10-3e (L) (9" X 15") "PEDESTRIAN SIGN"	EA	4
**	**	R10-3e (R) (9" X 15") "PEDESTRIAN SIGN"	EA	4
688	6003	PED DETECTOR CONTROLLER UNIT	EA	1
6004	6031	ITS COM CBL (ETHERNET)	LF	105
6010	6010	CCTV FIELD EQUIP (ANALOG) (INSTL ONLY)	EA	1
6185	6002	TMA (STATIONARY)	DAY	10
6292	6001	RVDS (PRESENCE DETECTION ONLY)	EA	4
	**	RVDS (RADAR PRESENCE DETECTOR POWER AND COMMUNICATION CABLE)	LF	630
6292	6002	RVDS (ADVANCE DETECTION ONLY)	EA	2
	**	RVDS (RADAR ADVANCE DETECTOR POWER AND COMMUNICATION CABLE)	LF	395
****	****	CONTRACTOR FORCE ACCOUNT (COMM PACKAGE)	EA	1
		CELLULAR MODEM (CISCO MODEL IR1101)	EA	1
		ETHERNET SWITCH (MOXA MODEL EDR-810-VPN-2GSFP-T)	EA	1
		IP CAMERA (AXIS M5525-E)	EA	1
		IP CAMERA MOUNTING BRACKET (AXIS T94A01D PENDANT KIT)	EA	1
		POWER STRIP	EA	1
		SWITCH POWER SUPPLY	EA	1
		POE POWER SUPPLY - FOR CAMERA ONLY	EA	1
****	****	CONTRACTOR FORCE ACCOUNT (LAW ENFORCEMENT)	EA	1
****	****	CONTRACTOR FORCE ACCOUNT (EROSION CONTROL)	EA	1
	**	SUBSIDIARY TO PERTINENT ITEM		
****	****	CONTRACTOR FORCE ACCOUNT		

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

CHARLES R. STEVENS, JR., P.E. — 7/7/2023 DATE

NO.	REVISION	APPROV.

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

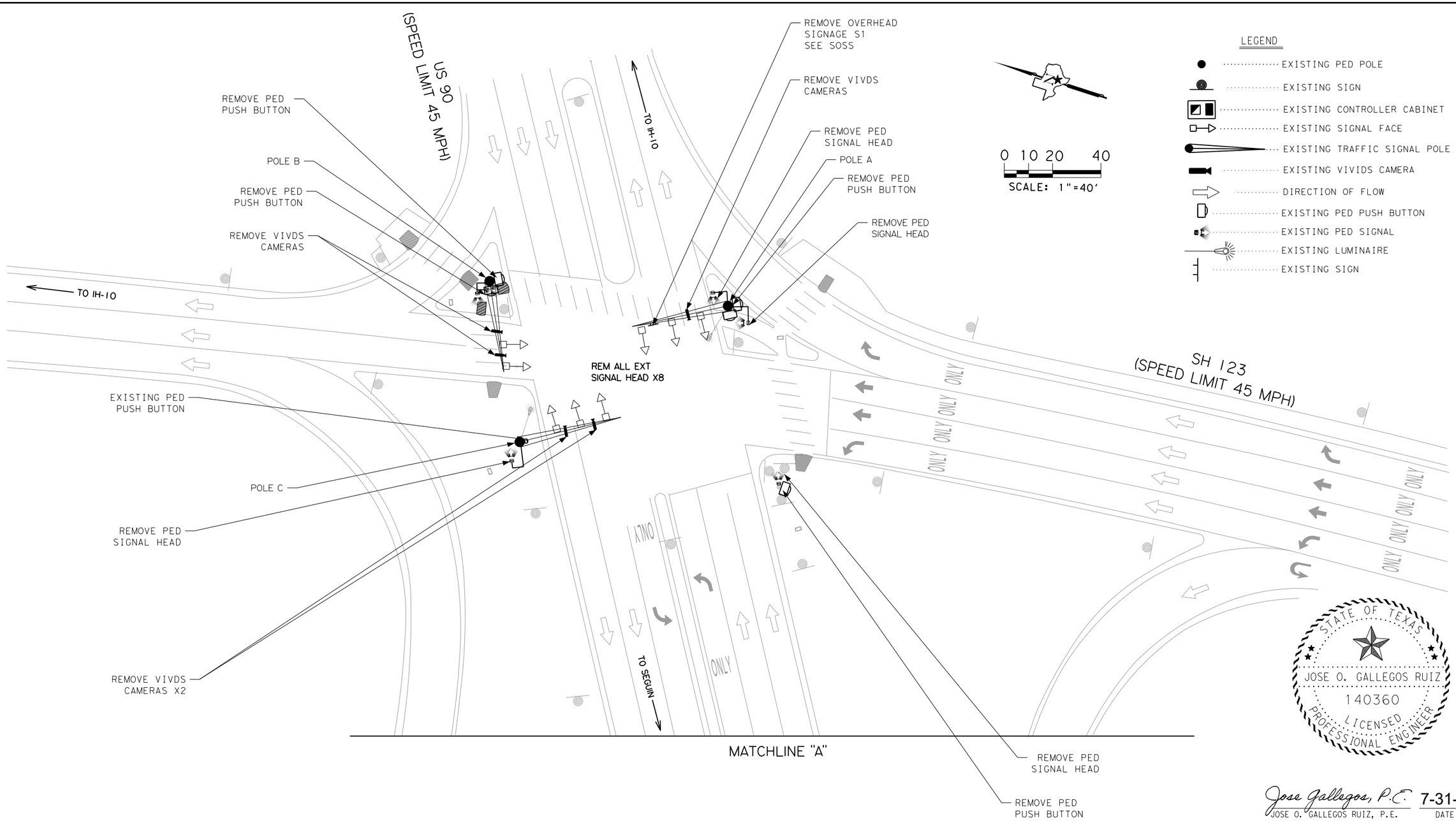
INTERSECTION QUANTITIES & DETAILS FM 3009 AT ELBEL RD/BORGFELD RD

SHEET 8 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	56

STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.



NOTES:
1. ALL TRAFFIC SIGNAL EQUIPMENT LOCATIONS AND RIGHT-OF-WAY LINES ARE APPROXIMATE. VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
2. THE EXISTENCE AND LOCATION OF UTILITIES, EITHER UNDERGROUD OR OVERHEAD, INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES (PRIVATE/PUBLIC AND SHOWN/NOT SHOWN) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS BULLY RESPONSIBLE FOR ANY CAMAGES CAUSED BY HIS/HER FAILURE TO LOCATE, PRESERVE, AND PROTECT UTILITIES.
3. ALL ITEMS NOR SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation
© 2023

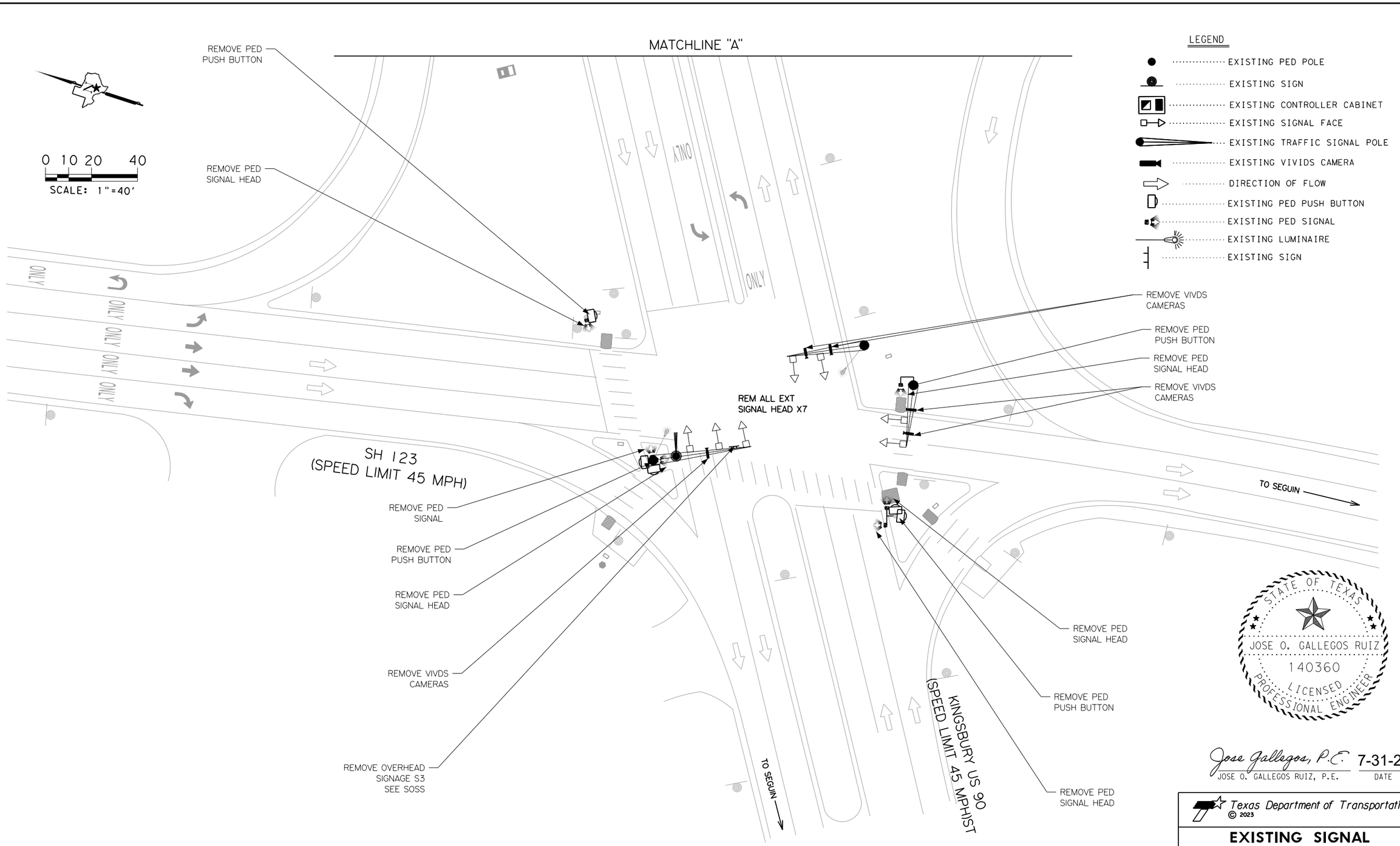
EXISTING SIGNAL LAYOUT
SH 123 AT US 90

CSJ 0366-03-071 SHEET 1 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		57
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

DN: DN

7/27/2023
T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\SH 123 at US 90\Seguin123-US90.dgn



NOTES:
1. ALL TRAFFIC SIGNAL EQUIPMENT LOCATIONS AND RIGHT-OF-WAY LINES ARE APPROXIMATE. VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
2. THE EXISTENCE AND LOCATION OF UTILITIES, EITHER UNDERGROUD OR OVERHEAD, INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES (PRIVATE/PUBLIC AND SHOWN/NOT SHOWN) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS BULLY RESPONSIBLE FOR ANY CAMAGES CAUSED BY HIS/HER FAILURE TO LOCATE, PRESERVE, AND PROTECT UTILITIES.
3. ALL ITEMS NOR SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

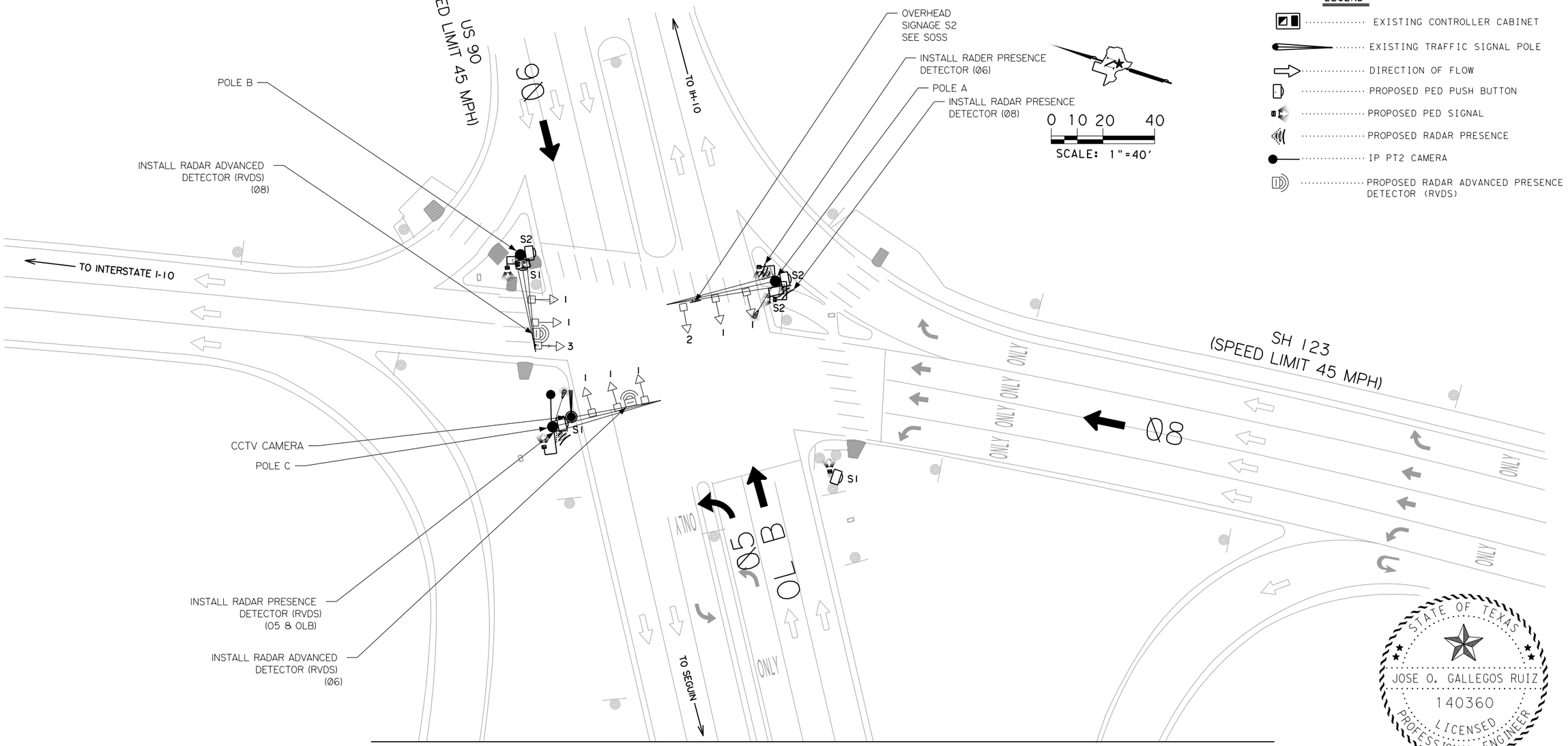
EXISTING SIGNAL LAYOUT
SH 123 AT US 90

CSJ 0366-03-071 SHEET 2 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		58
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

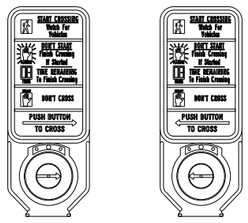
DN: DN

NOTES:
1. ALL PROPOSED CONDUCTOR SHALL BE RUN THROUGH PRE-EXISTING 3" CONDUIT AND GROUND BOXES.



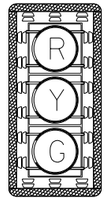
LEGEND

- EXISTING CONTROLLER CABINET
- EXISTING TRAFFIC SIGNAL POLE
- DIRECTION OF FLOW
- PROPOSED PED PUSH BUTTON
- PROPOSED PED SIGNAL
- PROPOSED RADAR PRESENCE
- IP PT2 CAMERA
- PROPOSED RADAR ADVANCED PRESENCE DETECTOR (RVDS)



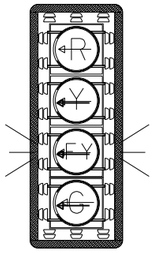
S1 S2

ACCESSIBLE PEDESTRIAN SIGNAL PUSH BUTTON WITH PEDESTRIAN SIGN R10-3e(9"x15") S1 & S2



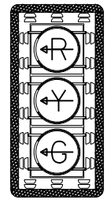
SIGNAL NO. 1

3 SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS
W/ REFLECTIVE BACK PLATES



SIGNAL NO. 2

4" SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS
W/ REFLECTIVE BACK PLATES



SIGNAL NO. 3

3 SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS
W/ REFLECTIVE BACK PLATES

PED SIGNAL HEAD

NOTES:
SEE SHEETS 3 FOR TRAFFIC SIGNAL NOTES

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

PROPOSED SIGNAL LAYOUT
SH 123 AT US 90

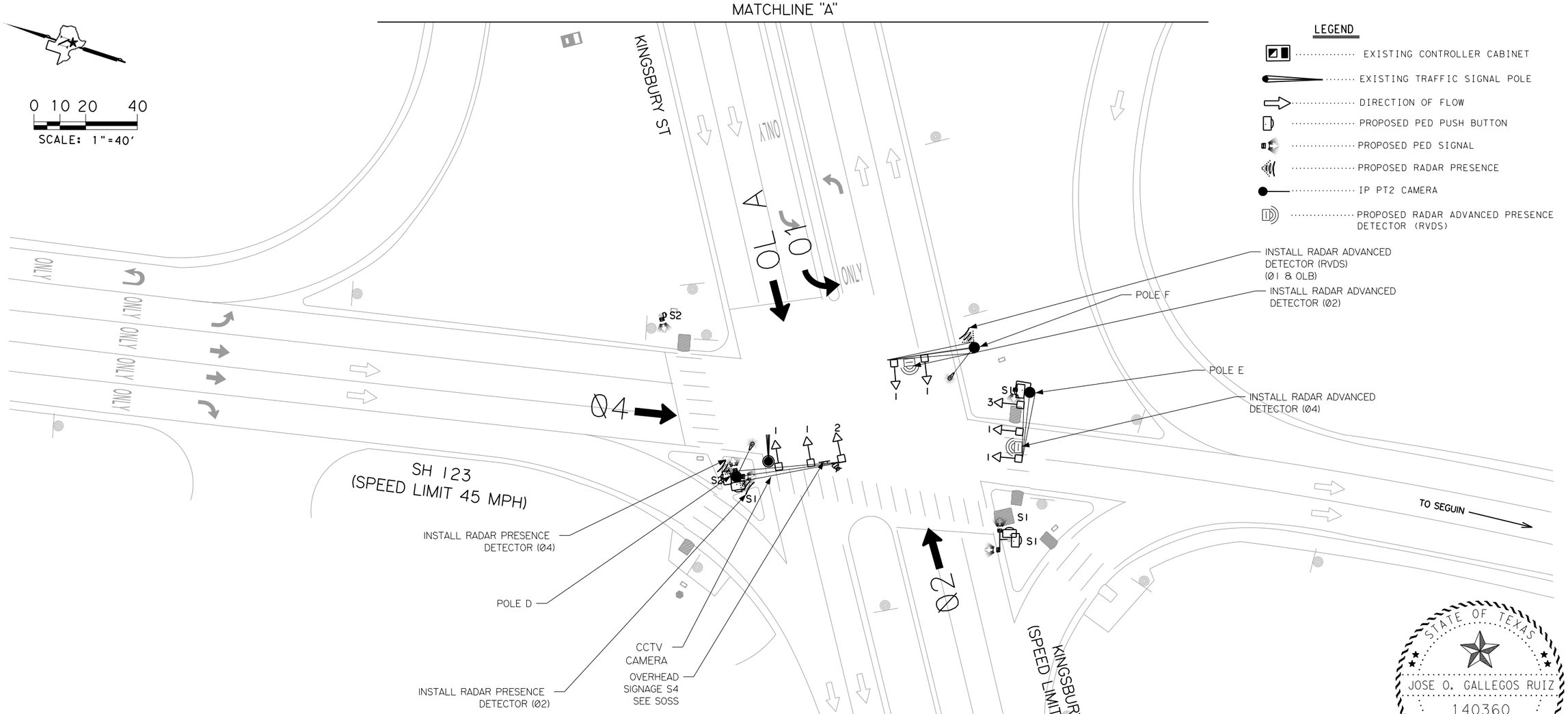
CSJ 0366-03-071 SHEET 3 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT	SHEET NO.
	SEE TITLE SHEET	59

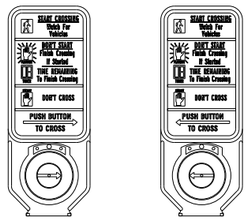
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

7/27/2023
T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\SH 123 at US 90\Seguin123-US90.dgn

NOTES:
1. ALL PROPOSED CONDUCTOR SHALL BE RUN THROUGH PRE-EXISTING 3" CONDUIT AND GROUND BOXES.

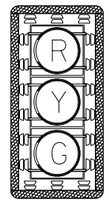


NOTES:
SEE SHEETS 3 FOR TRAFFIC SIGNAL NOTES

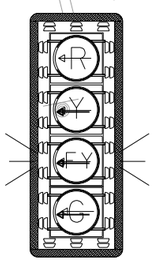


S1 S2

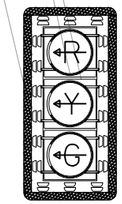
ACCESSIBLE PEDESTRIAN SIGNAL
PUSH BUTTON
WITH PEDESTRIAN SIGN
R10-3e(9"x15")
S1 & S2



SIGNAL NO. 1
3 SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS
W/ REFLECTIVE BACK PLATES



SIGNAL NO. 2
4" SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS
W/ REFLECTIVE BACK PLATES



SIGNAL NO. 3
3 SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS
W/ REFLECTIVE BACK PLATES

PED SIGNAL HEAD

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation
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PROPOSED SIGNAL LAYOUT
SH 123 AT US 90

CSJ 0366-03-071 SHEET 4 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		60
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

7/27/2023
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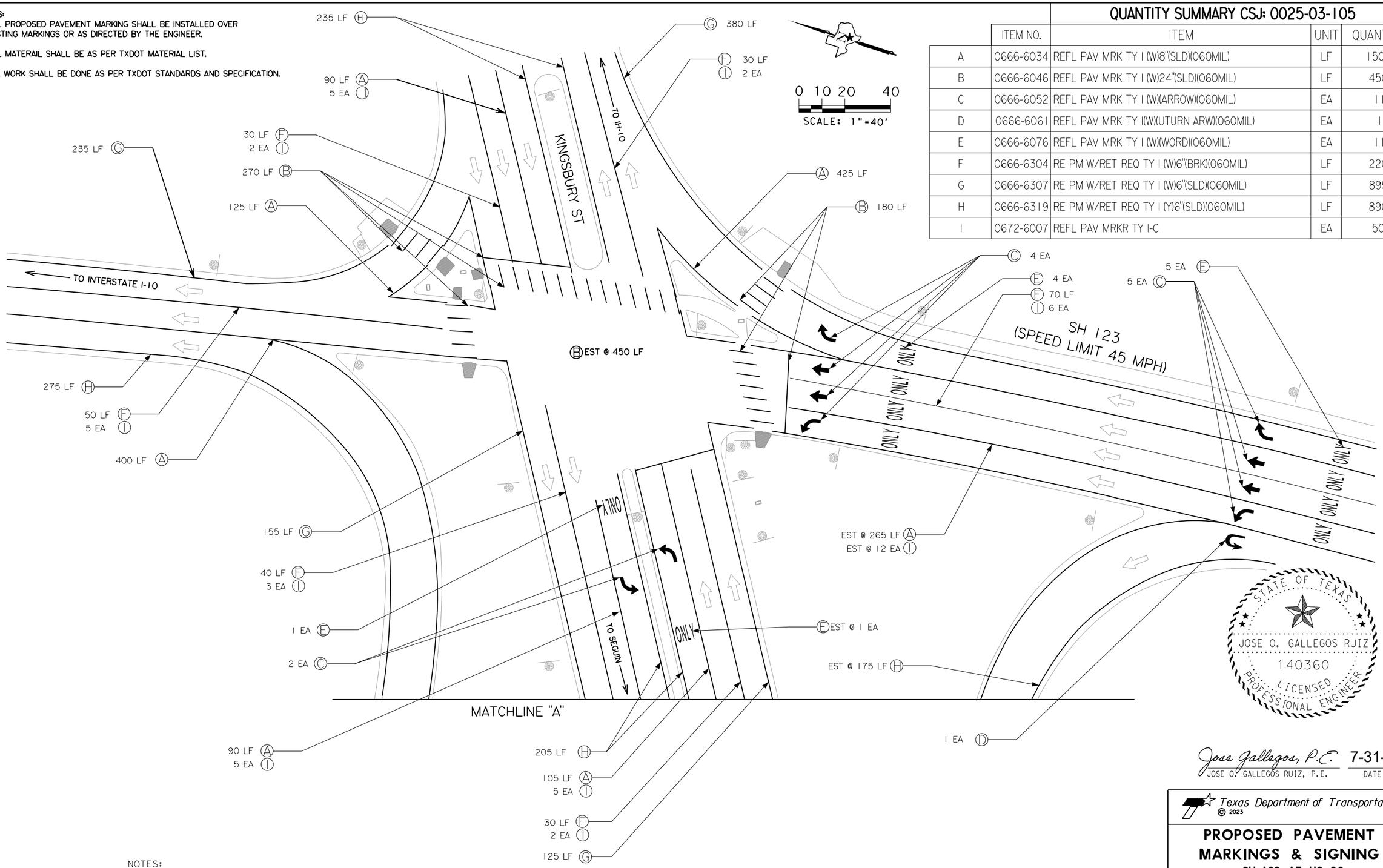
DN: DN

DN: DN

NOTES:
1. ALL PROPOSED PAVEMENT MARKING SHALL BE INSTALLED OVER EXISTING MARKINGS OR AS DIRECTED BY THE ENGINEER.

2. ALL MATERAIL SHALL BE AS PER TXDOT MATERIAL LIST.

3 ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATION.



QUANTITY SUMMARY CSJ: 0025-03-105

	ITEM NO.	ITEM	UNIT	QUANTITY
A	0666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF	1500
B	0666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF	450
C	0666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA	11
D	0666-6061	REFL PAV MRK TY I(W)(UTURN ARW)(060MIL)	EA	1
E	0666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA	11
F	0666-6304	RE PM W/RET REQ TY I (W)6"(BRK)(060MIL)	LF	220
G	0666-6307	RE PM W/RET REQ TY I (W)6"(SLD)(060MIL)	LF	895
H	0666-6319	RE PM W/RET REQ TY I (Y)6"(SLD)(060MIL)	LF	890
I	0672-6007	REFL PAV MRKR TY I-C	EA	50

NOTES:
1. REMOVE AND INSTALL NEW LANE LINES, CENTERLINE, CROSSWALKS, STOP BARS, AND YIELD TRIANGLE PAVEMENT MARKINGS A MINIMUM OF 200 LF ON EACH INTERSECTION APPROACH.
2. ALL GROUND MOUNTED SIGNS ARE TO REMAIN IN PLACE UNLESS OTHERWISE SHOWN IN THE PLANS.
3. ALL METERIAL SHALL BE AS PER TXDOT APPROVED MATERIALS LIST.
4. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATIONS.

LEGEND

⇦ ..... DIRECTION OF TRAFFIC FLOW

◉ ..... EXIST. SIGNAGE

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

PROPOSED PAVEMENT MARKINGS & SIGNING
SH 123 AT US 90

CSJ 0366-03-071 SHEET 5 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT	SHEET NO.
	SEE TITLE SHEET	61

STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

7/27/2023
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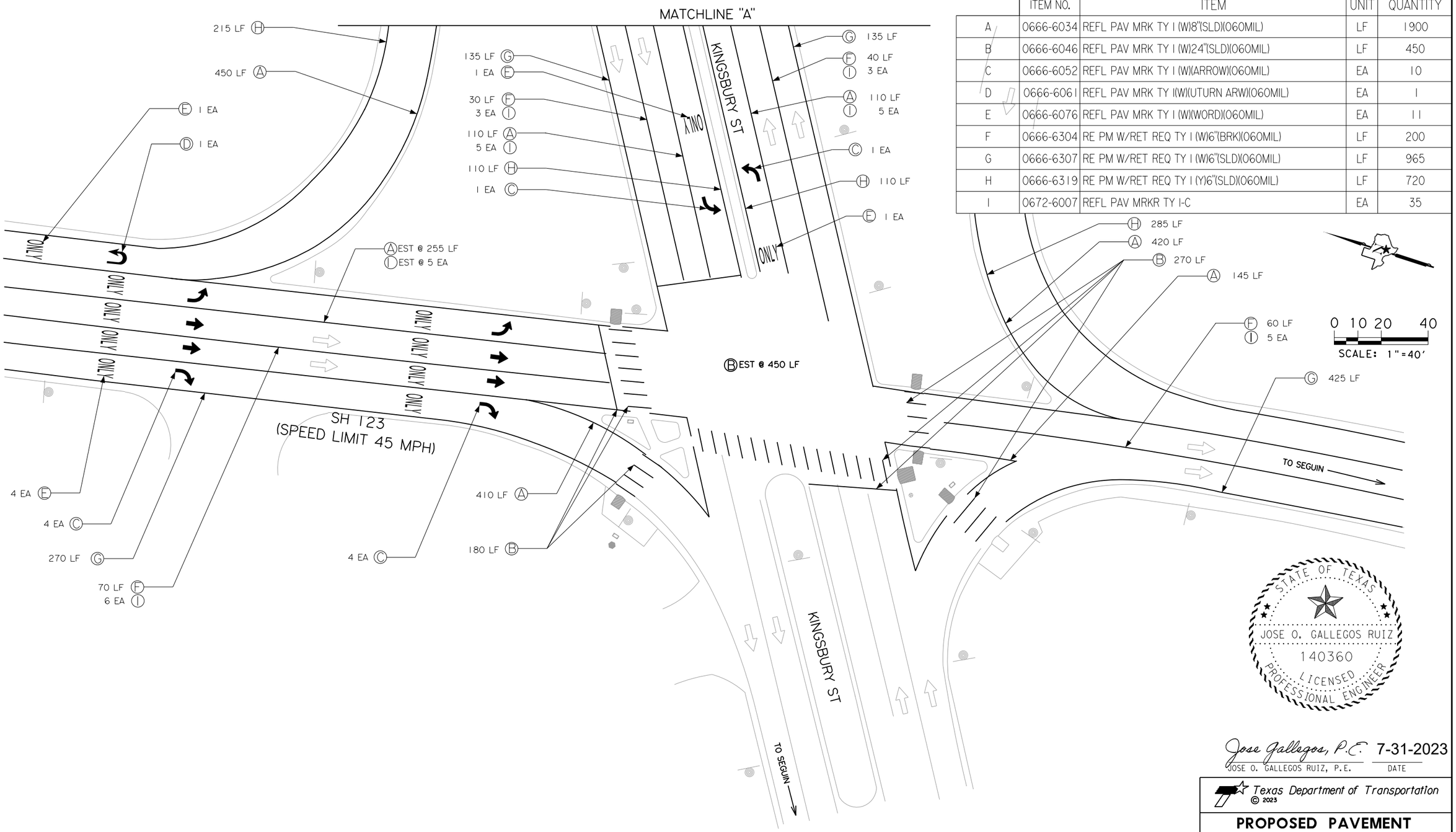
QUANTITY SUMMARY CSJ: 0025-03-105

	ITEM NO.	ITEM	UNIT	QUANTITY
A	0666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF	1900
B	0666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF	450
C	0666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA	10
D	0666-6061	REFL PAV MRK TY I(W)(UTURN ARW)(060MIL)	EA	1
E	0666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA	11
F	0666-6304	RE PM W/RET REQ TY I (W)6"(BRK)(060MIL)	LF	200
G	0666-6307	RE PM W/RET REQ TY I (W)6"(SLD)(060MIL)	LF	965
H	0666-6319	RE PM W/RET REQ TY I (Y)6"(SLD)(060MIL)	LF	720
I	0672-6007	REFL PAV MRKR TY I-C	EA	35



NOTES:
1. REMOVE AND INSTALL NEW LANE LINES, CENTERLINE, CROSSWALKS, STOP BARS, AND YIELD TRIANGLE PAVEMENT MARKINGS A MINIMUM OF 200 LF ON EACH INTERSECTION APPROACH.
2. ALL GROUND MOUNTED SIGNS ARE TO REMAIN IN PLACE UNLESS OTHERWISE SHOWN IN THE PLANS.
3. ALL METERIAL SHALL BE AS PER TXDOT APPROVED MATERIALS LIST.
4. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATIONS.

LEGEND

⇦ ..... DIRECTION OF TRAFFIC FLOW

EXIST. SIGNAGE

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

PROPOSED PAVEMENT MARKINGS & SIGNING
SH 123 AT US 90

CSJ 0366-03-071 SHEET 6 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		62
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

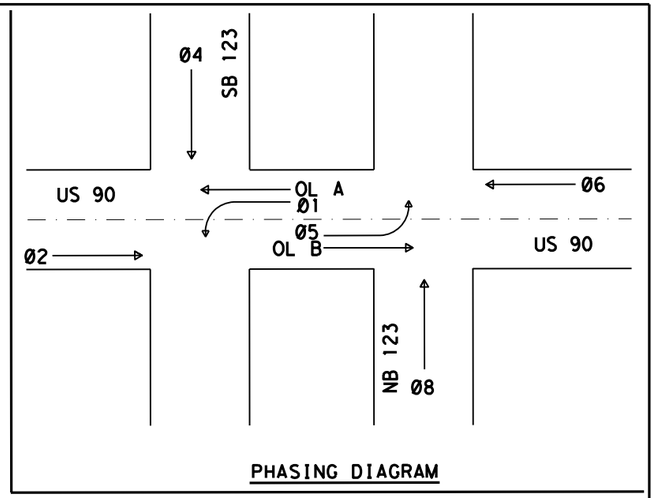
DN: DN

PROPOSED CONDUIT AND CONDUCTOR SCHEDULE

	RUN NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	CONDUIT SIZE IN INCHES			2.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0
	NUMBER OF CONDUITS			1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
	LENGTH OF RUN (FT)		10	10	15	15	15	60	60	5	5	130	130	15	15	20	20	70	70	20	20	90	90	20	20	20	20	70	70	20	20	80	80	20	20	80	80	25	25	80	80	25	25	80	80
	CONTROLLER (C) EXISTING(E)		E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
CABLE	CIRCUIT		NUMBER OF CONDUCTORS																																										
6 COND. #22	RPDD (PRESENCE DETECTION DEVICE)	PHASE 01	1								1		1									1																						
		PHASE 02	1			1		1														1																						
		PHASE 04	1					1		1												1																						
		PHASE 05	1																					1		1																		
		PHASE 06	1																					1				1		1													
		PHASE 08	1																					1								1				1						
6 COND. #22	RADD (ADVANCE DETECTION DEVICE)	PHASE 02	1								1		1									1																						
		PHASE 04	1								1					1						1																						
4-COND. #12		PHASE 08	1																					1				1		1													
	IP CAMERA		1			1		1														1																						
	IP CAMERA		1																					1		1																		

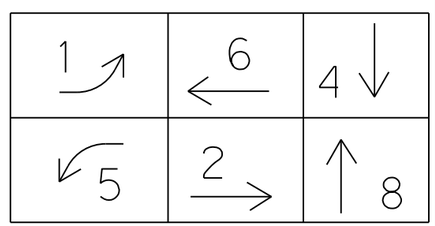
WIRING IN ARMS & POLES

INSIDED ARMS & POLES	#12 AWG 4/C	#12 AWG 7/C	RADAR (RADD)	PRESENCE (RPDD)	#12 AWG 3/C
POLE A					
SIGNAL 1		40			
SIGNAL 1		55			
SIGNAL 2		65			
RPDD 2					
POLE B					
SIGNAL 1		40			
SIGNAL 1		55			
SIGNAL 1		70			
RPDD				50	
RADD			50		
POLE C					
SIGNAL 1		40			
SIGNAL 1		55			
SIGNAL 1		70			
RADD			50		
RADD			50		
POLE D					
SIGNAL 1		40			
SIGNAL 1		50			
SIGNAL 2		50			
RADD			30		
RPDD				40	
POLE E					
SIGNAL 1		45			
SIGNAL 1		55			
SIGNAL 1		65			
RADD			25		
POLE F					
SIGNAL 1		45			
SIGNAL 1		60			
RADD			60		
RPDD				50	
				45	
TOTALS		845	265	215	0



PHASING DIAGRAM

Normal Phasing



0 25 50
SCALE: 1"=50'

NOTES:
1. TRAY CABLES SHALL BE RUN IN 2" CONDUIT SEPARATE FROM THE SIGNAL CABLE.

LEGEND

EXISTING CONDUIT

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation © 2023

CONDUIT & CONDUCTOR SCHEDULE

SH 123 AT US 90

CSJ 0366-03-071 SHEET 7 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT	SHEET NO.
	SEE TITLE SHEET	63

STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

7/27/2023
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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
57	S1	R10-12	LEFT TURN YIELD ON GREEN	REMOVE								
59	S2	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	30" x 30"	✓			THIS SIGN WILL REPLACE EXISTING SIGN NO. S1				
58	S3	R10-12	LEFT TURN YIELD ON GREEN	REMOVE								
60	S4	R10-17T	LEFT TURN YIELD ON FLASHING YELLOW ARROW	30" x 30"	✓			THIS SIGN WILL REPLACE EXISTING SIGN NO. S3				

ALUMINUM SIGN BLANKS THICKNESS	

http://www.txdot.gov/

NOTE:

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

SH 123 AND US 90

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SH 123 AT US 90

CSJ 0366-03-071

SHEET 8 OF 9

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0025	03	105, ETC	UA 90, ETC
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	GUADALUPE		64

ITEM	DESCRIPTION	UNIT	QTY
0610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	4
0620-6009	ELEC CONDR (NO.6) BARE	LF	845
0621-6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	180
0636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	21
0666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF	3440
0666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF	900
0666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA	21
0666-6061	REFL PAV MRK TY I(W)(UTURN ARW)(060MIL)	EA	2
0666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA	22
0666-6304	RE PM W/RET REQ TY I (W)6"(BRK)(060MIL)	LF	420
0666-6307	RE PM W/RET REQ TY I (W)6"(SLD)(060MIL)	LF	1860
0666-6319	RE PM W/RET REQ TY I (Y)6"(SLD)(060MIL)	LF	1610
0672-6007	REFL PAV MRKR TY I-C	EA	85
0680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA	1
0682-6001	VEH SIG SEC (12")LED(GRN)	EA	13
0682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	4
0682-6003	VEH SIG SEC (12")LED(YEL)	EA	13
0682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	6
0682-6005	VEH SIG SEC (12")LED(RED)	EA	13
0682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	4
0682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	12
0682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	15
0682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	2
0684-6009	TRF SIG CBL (TY A)(12 AWG)(4 CONDR)	LF	300
0684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	845
0684-6028	TRF SIG CBL (TY A)(14 AWG)(2 CONDR)	LF	2445
0684-6080	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)	LF	300
0688-6002	PED DETECT PUSH BUTTON (STANDARD)	EA	12
0688-6003	PED DETECTOR CONTROLLER UNIT	EA	1
0690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA	13
0690-6030	REMOVAL OF PEDESTRIAN PUSH BUTTONS	EA	10
0690-6086	REMOVE VID IMAGE VEH DET SYS (VIVDS)	EA	8
6004-6031	ITS COM CBL (ETHERNET)	LF	420
6010-6010	CCTV FIELD EQUIP (ANALOG) (INSTL ONLY)	EA	2
6027-6003	CONDUIT (PREPARE)	LF	845
6027-6008	GROUND BOX (PREPARE)	EA	9
6185-6002	TMA (STATIONARY)	DAY	40
6292-6001	RVDS(PRESENCE DETECTION ONLY)	EA	6
6292-6002	RVDS(ADVANCE DETECTION ONLY)	EA	4
**** - ****	CONTRACTOR FORCE ACCOUNT (COMM PACKAGE)	EA	1
	IP CAMERA (AXIS M5525-E)	EA	2
	IP CAMERA MOUNTING BRACKET(AXIS T94A01D) PENDANT KIT	EA	2
	POE POWER SUPPLY - FOR CAMERA ONLY	EA	2

NOTES:
1. LUMINAIRES ARE SHOWN FOR CLARITY PURPOSES ONLY. ORIENT THEM AS DIRECTED BY THE ENGINEER.
2. SIGNAL HEADS SHALL HAVE A MINIMUM OF 18.5 FEET CLEARANCE ABOVE ROADWAY SURFACE.
3. CONTRACTOR SHALL CONNECT PROPOSED FIELD WIRING TO CONTROLLER AND/OR TERMINAL BLOCK.
4. THE LOCATOR OF RADAR DETECTORS SHOWN ARE APPROXIMATE. THE EXACT LOCATION SHALL BE DETERMINED IN THE FIELD AND ADJUSTED TO PROVIDE PROPER DETECTION ZONES AND A COMPLETE OPERABLE SYSTEM.
3. CONTRACTOR SHALL CONTACT THE DISTRICT SIGNAL MAINTENANCE OFFICE AND AREA OFFICE A MINIMUM OF SEVEN (7) DAYS PRIOR TO BEGINNING CONSTRUCTION.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED PROFESSIONAL ENGINEER

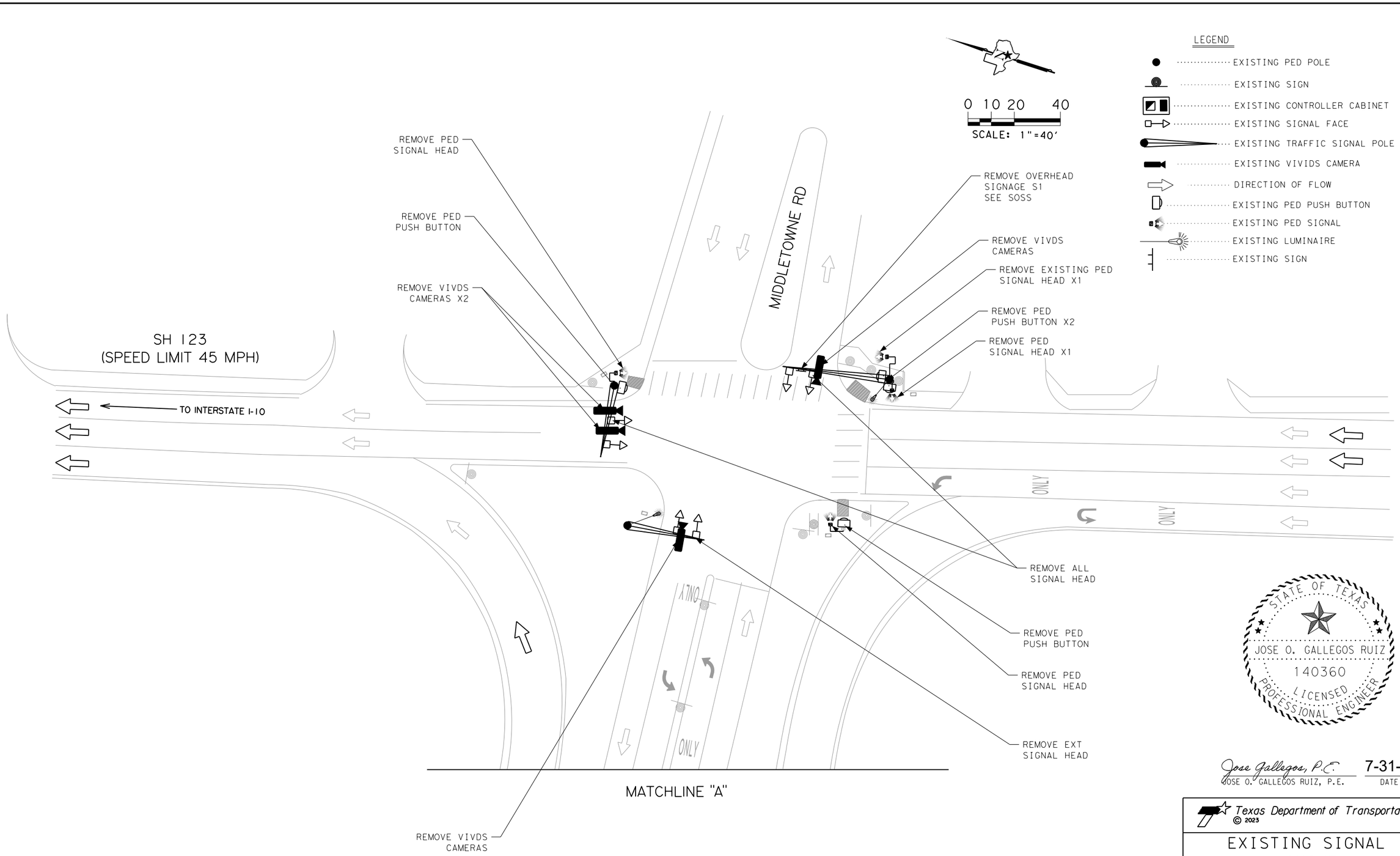
Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

TRAFFIC SIGNAL DETAIL SUMMARY

SH 123 AT US 90

CSJ 0366-03-071 SHEET 9 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		65
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC



NOTES:
1. ALL TRAFFIC SIGNAL EQUIPMENT LOCATIONS AND RIGHT-OF-WAY LINES ARE APPROXIMATE. VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
2. THE EXISTENCE AND LOCATION OF UTILITIES, EITHER UNDERGROUD OR OVERHEAD, INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES (PRIVATE/PUBLIC AND SHOWN/NOT SHOWN) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS BULLY RESPONSIBLE FOR ANY CAMAGES CAUSED BY HIS/HER FAILURE TO LOCATE, PRESERVE, AND PROTECT UTILITIES.
3. ALL ITEMS NOT SPECIFICALLY CALLED OUT IN THESE PLANS TO BE REMOVED, SHALL REMAIN.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

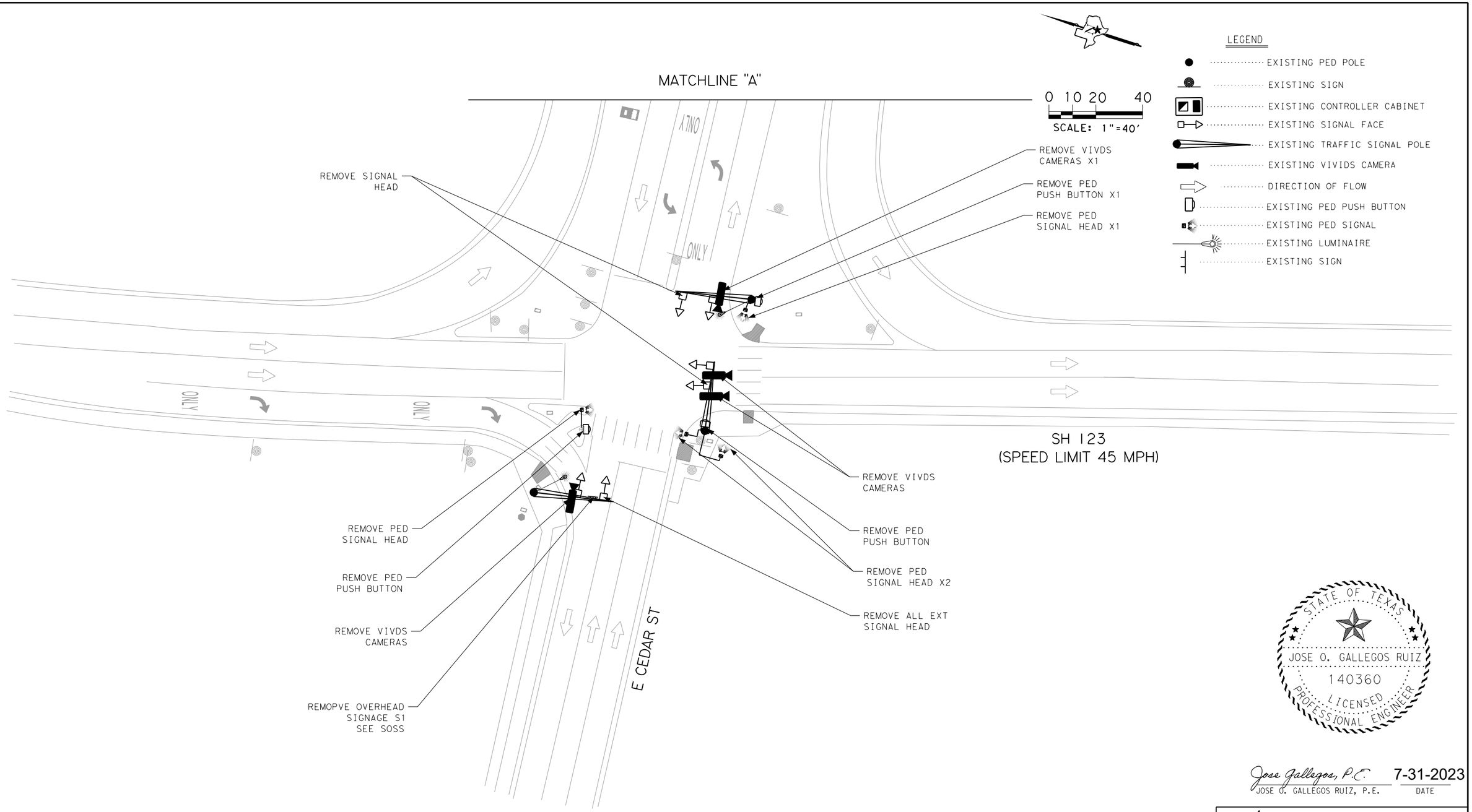
EXISTING SIGNAL LAYOUT

SH 123 AND E CEDAR STREET/MIDDLETOWNE RD

CSJ 0366-02-097 SHEET 1 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT	SHEET NO.
	SEE TITLE SHEET	66

STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC



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STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

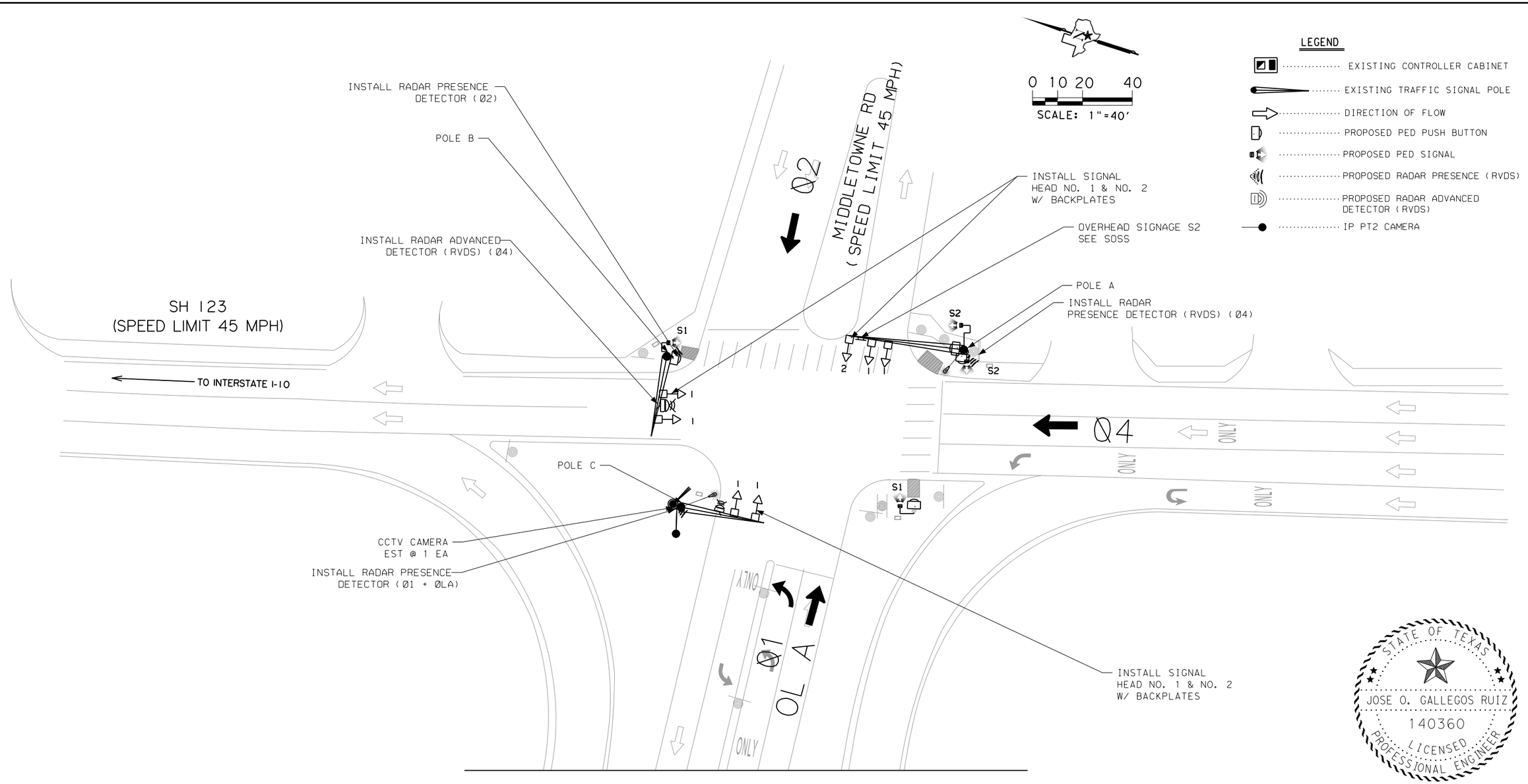
Texas Department of Transportation

EXISTING SIGNAL LAYOUT

SH 123 AND E CEDAR STREET/MIDDLETOWNE RD

CSJ 0366-02-097 SHEET 2 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		67
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC



NOTES:
1. LUMINAIRES ARE SHOWN FOR CLARITY PURPOSES ONLY. ORIENT THEM AS DIRECTED BY THE ENGINEER.
2. SIGNAL HEADS SHALL HAVE A MINIMUM OF 18.5 FEET CLEARANCE ABOVE ROADWAY SURFACE.
3. CONTRACTOR SHALL CONNECT PROPOSED FIELD WIRING TO CONTROLLER AND/OR TERMINAL BLOCK.
4. THE LOCATOR OF RADAR DETECTORS SHOWN ARE APPROXIMATE. THE EXACT LOCATION SHALL BE DETERMINED IN THE FIELD AND ADJUSTED TO PROVIDE PROPER DETECTION ZONES AND A COMPLETE OPERABLE SYSTEM.
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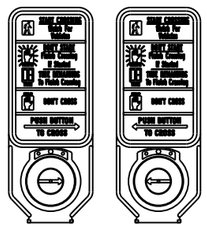
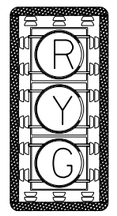
PED SIGNAL HEAD



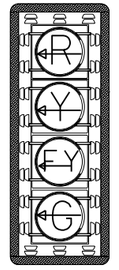
ACCESSIBLE PED PUSH BUTTON

W/ PEDESTRIAN SIGN (R10-3e) 9" x 15"



SIGNAL NO. 1

3 SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS
W/ REFLECTIVE BACK PLATES



SIGNAL NO. 2

4" SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS
W/ REFLECTIVE BACK PLATES

Jose Gallegos, P.E.
JOSE O. GALLEGOS RUIZ, P.E.

7-31-2023
DATE

Texas Department of Transportation
© 2023

PROPOSED SIGNAL LAYOUT

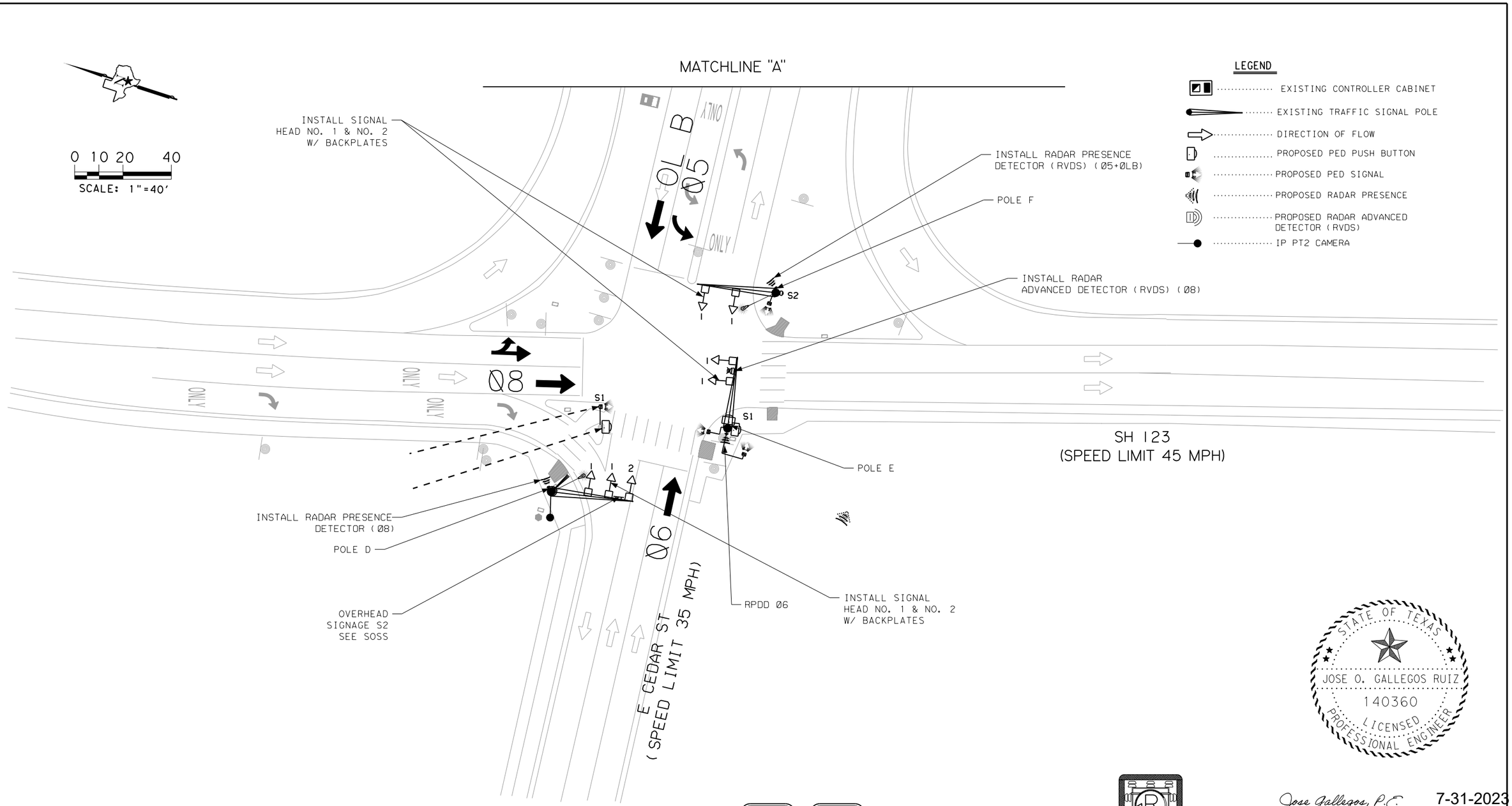
SH 123 AND E CEDAR STREET/MIDDLETOWNE RD

CSJ 0366-02-097

SHEET 3 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		68
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

7/27/2023
T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\SH 123 at Cedar St*Middletowne Rd\Seguin123-East Cedar St--Middleton.dgn
DN: DN



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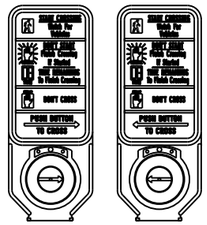
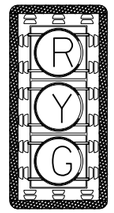
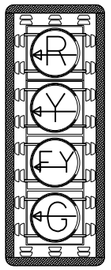
23
PED SIGNAL HEAD



PPED PUSH BUTTON
W/ PEDESTRIAN SIGN (R10-3e) 9" x 15"



SIGNAL NO. 1
3 SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS
W/ REFLECTIVE BACK PLATES



SIGNAL NO. 2
4" SEC SIGNAL HEAD
12" LED VERTICAL SIGNAL SECTIONS
W/ REFLECTIVE BACK PLATES

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

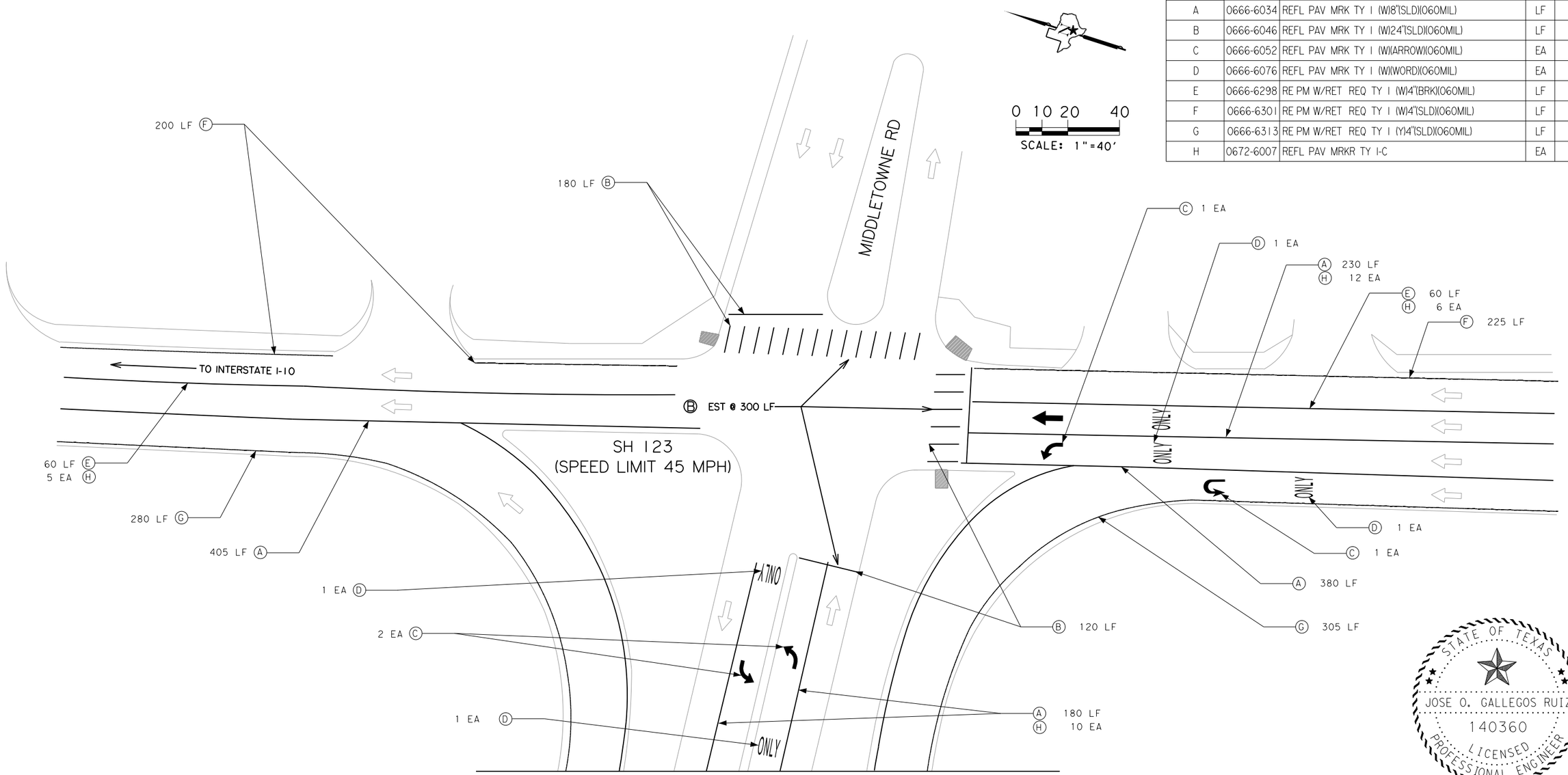
PROPOSED SIGNAL LAYOUT

SH 123 AND E CEDAR STREET/MIDDLETOWNE RD

CSJ 0366-02-097 SHEET 4 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		69
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

	ITEM NO.	ITEM	UNIT	QUANTITY
A	0666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF	1195
B	0666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF	300
C	0666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA	4
D	0666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA	4
E	0666-6298	RE PM W/RET REQ TY I (W)4"(BRK)(060MIL)	LF	120
F	0666-6301	RE PM W/RET REQ TY I (W)4"(SLD)(060MIL)	LF	425
G	0666-6313	RE PM W/RET REQ TY I (Y)4"(SLD)(060MIL)	LF	585
H	0672-6007	REFL PAV MRKR TY I-C	EA	27



LEGEND

⇦ ..... DIRECTION OF TRAFFIC FLOW

NOTES:
1. INSTALL NEW LANE LINES, CENTERLINE, CROSSWALKS, STOP BARS, AND YIELD TRIANGLE PAVEMENT MARKINGS A MINIMUM OF 200 LF ON EACH INTERSECTION APPROACH.
2. ALL GROUND MOUNTED SIGNS ARE TO REMAIN IN PLACE UNLESS OTHERWISE SHOWN IN THE PLANS.
3. ALL METERIAL SHALL BE AS PER TXDOT APPROVED MATERIALS LIST.
4. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATIONS.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

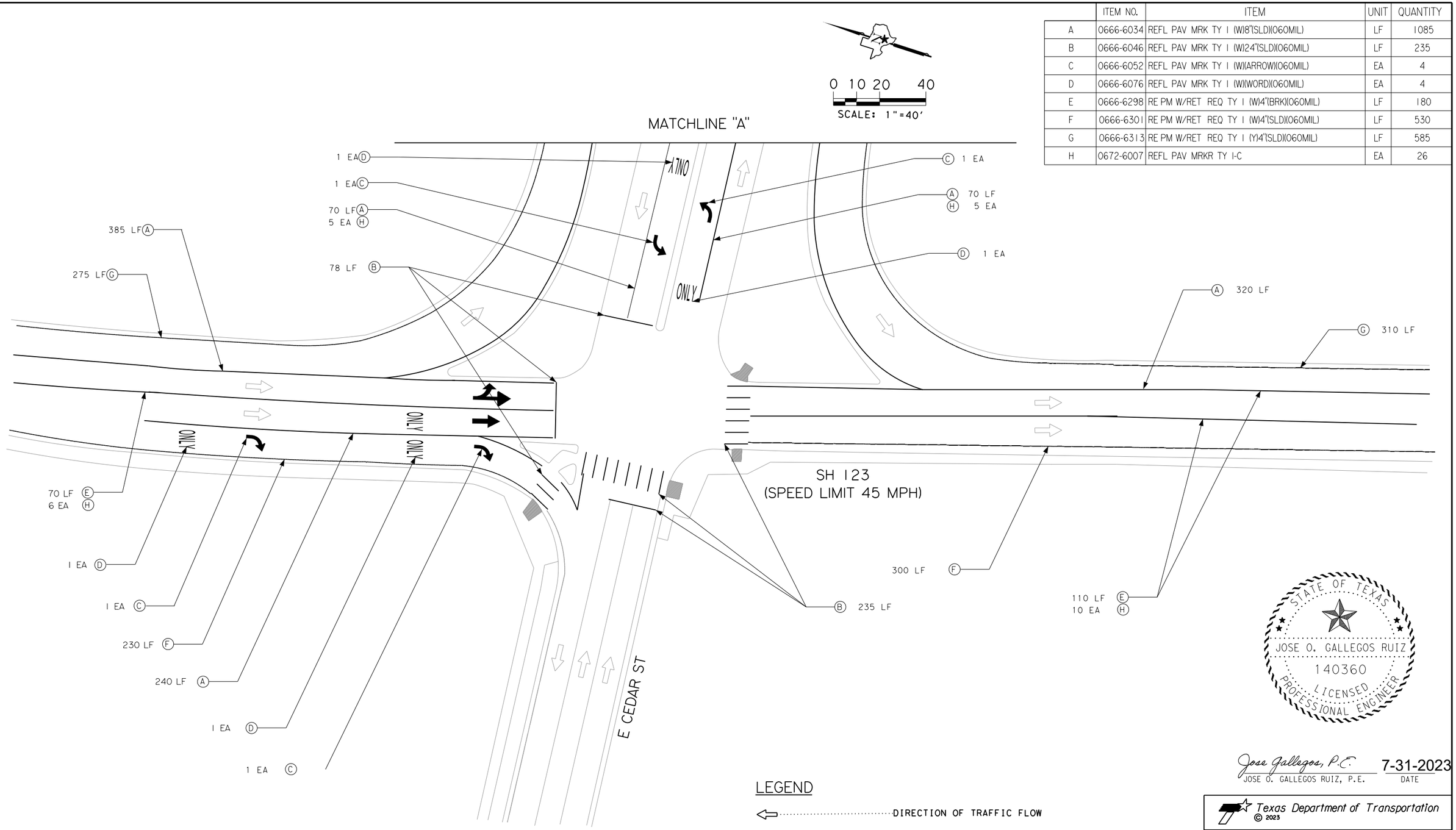
PROPOSED PAVEMENT MARKINGS & SIGNING

SH 123 AND E CEDAR STREET/MIDDLETOWNE RD

CSJ 0366-02-097 SHEET 5 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		70
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

	ITEM NO.	ITEM	UNIT	QUANTITY
A	0666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF	1085
B	0666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF	235
C	0666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA	4
D	0666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA	4
E	0666-6298	RE PM W/RET REQ TY I (W)4"(BRK)(060MIL)	LF	180
F	0666-6301	RE PM W/RET REQ TY I (W)4"(SLD)(060MIL)	LF	530
G	0666-6313	RE PM W/RET REQ TY I (Y)4"(SLD)(060MIL)	LF	585
H	0672-6007	REFL PAV MRKR TY I-C	EA	26



LEGEND

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STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
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Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

PROPOSED PAVEMENT MARKINGS & SIGNING

SH 123 AND E CEDAR STREET/MIDDLETOWNE RD

CSJ 0366-02-097 SHEET 6 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		71
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

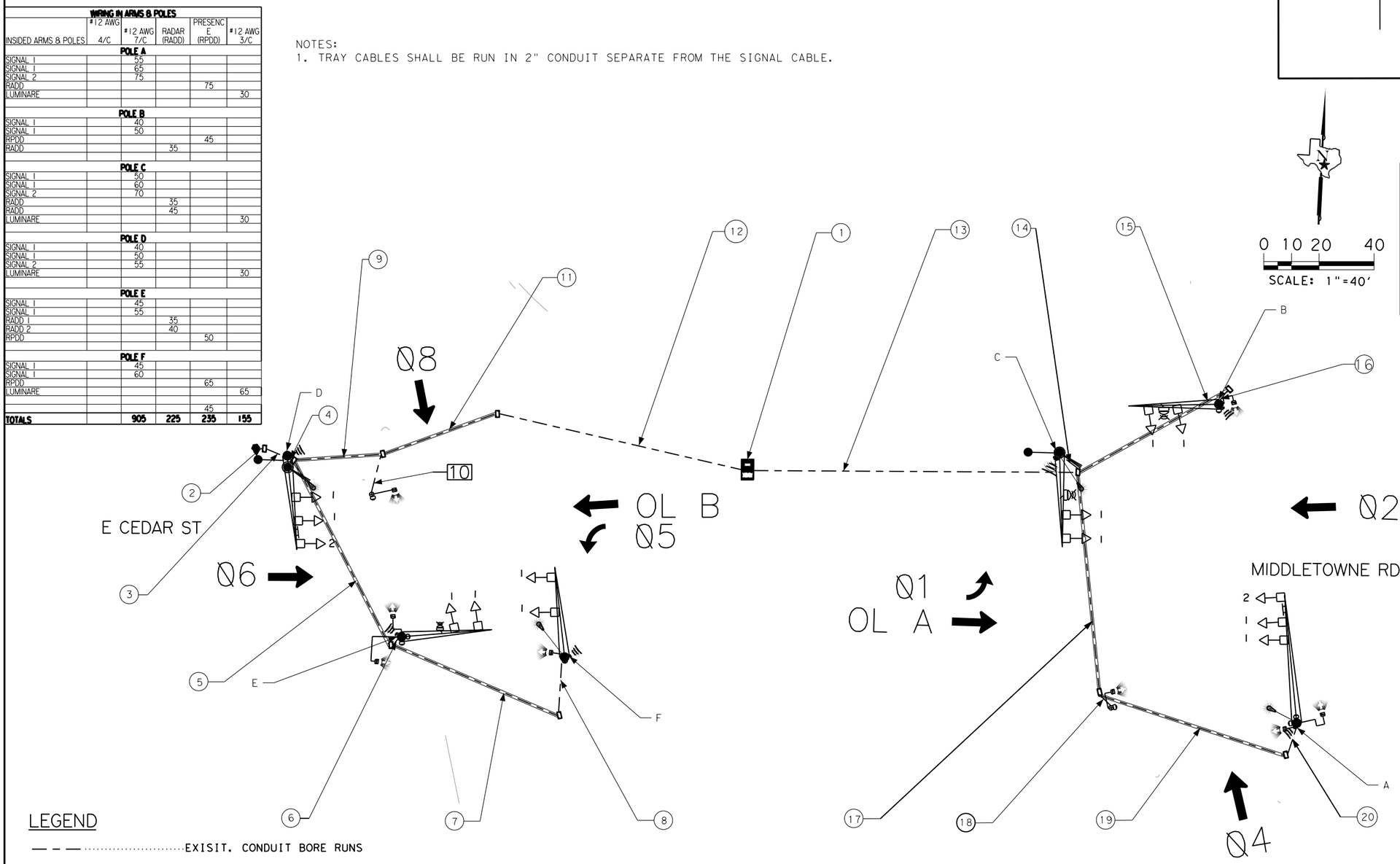
PROPOSED CONDUIT AND CONDUCTOR SCHEDULE

	RUN NUMBER		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	CONDUIT SIZE IN INCHES			2.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0
	NUMBER OF CONDUITS			1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1
	LENGTH OF RUN (FT)		10	10	15	10	10	75	75	15	15	70	70	25	25	40	40	15	15	45	45	90	90	120	120	10	10	65	65	10	10	80	80	15	15	75	75	75	75
	CONTROLLER (C)EXISTING (E)		C	T	T	T	T	B	B	T	T	B	B	T	T	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
CABLE	CIRCUIT		NUMBER OF CONDUCTORS																																				
6 COND. #22	RVDS (PRESENCE DETECTION DEVICE)	PHASE 01	1																					1														
		PHASE 02	1																					1														
		PHASE 04	1																					1								1				1		1
		PHASE 05	1					1				1		1		1				1		1																
		PHASE 06	1						1	1						1				1		1																
		PHASE 08	1						1	1						1				1		1																
6 COND. #22	RVDS (ADVANCE DETECTION DEVICE)	PHASE 04	1																					1				1										
		PHASE 08	1													1				1		1																
CAT 5 ETHERNET CABLE & POWER	IP CAMERA																																						

WIRING IN ARMS & POLES

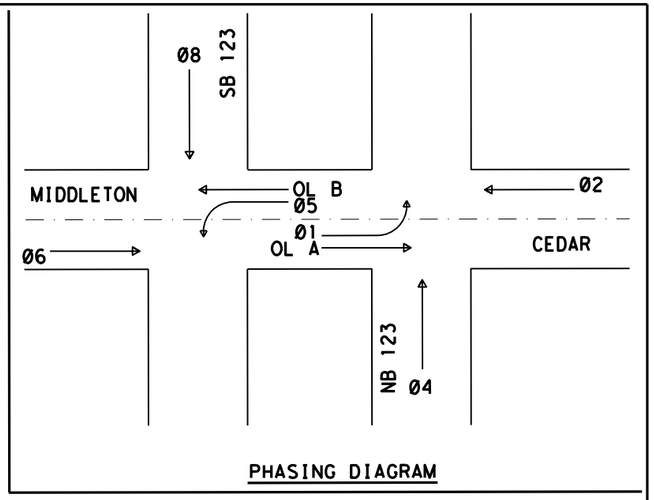
INSIDED ARMS & POLES	#12 AWG 4/C	#12 AWG 7/C	RADAR (RADD)	PRESENCE (RPDD)	#12 AWG 3/C
POLE A					
SIGNAL 1		55			
SIGNAL 1		65			
SIGNAL 2		75			
RADD				75	
LUMINARE					30
POLE B					
SIGNAL 1		40			
SIGNAL 1		50			
RPDD				45	
RADD			35		
POLE C					
SIGNAL 1		50			
SIGNAL 1		60			
SIGNAL 2		70			
RADD			35		
RADD			45		
LUMINARE					30
POLE D					
SIGNAL 1		40			
SIGNAL 1		50			
SIGNAL 2		55			
LUMINARE					30
POLE E					
SIGNAL 1		45			
SIGNAL 1		55			
RADD 1			35		
RADD 2			40		
RPDD				50	
POLE F					
SIGNAL 1		45			
SIGNAL 1		60			
RPDD				65	
LUMINARE					65
				45	
TOTALS		**905**	**225**	**235**	**155**

NOTES:
1. TRAY CABLES SHALL BE RUN IN 2" CONDUIT SEPARATE FROM THE SIGNAL CABLE.



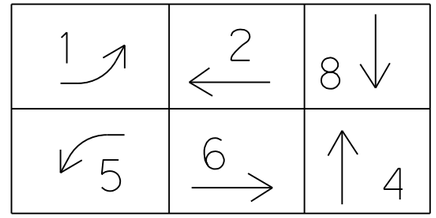
LEGEND

EXISIT. CONDUIT BORE RUNS



PHASING DIAGRAM

Normal Phasing



Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation
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CONDUIT & CONDUCTOR SCHEDULE

SH 123 AND E CEDAR STREET/MIDDLETOWNE RD

CSJ 0366-02-097 SHEET 7 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT	SHEET NO.
	SEE TITLE SHEET	72

STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

DN: DN

7/27/2023
T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\SH 123 at Cedar St*Middletowne Rd\Seguin123-East Cedar St--Middleton.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
66	S1	R10-12		REMOVE								
67												
68	S2	R10-17T		30" x 36"	✓			THIS SIGN WILL REPLACE EXISTING SIGN NO. 1				
69												

ALUMINUM SIGN BLANKS THICKNESS	

http://www.txdot.gov/

NOTE:

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

SH 123
AND CEDAR ST/MIDDLETOWN RD

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SH 123 AT CEDAR/MIDDLETOWNE

CSJ 0366-02-097

SHEET 8 OF 9

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0025	03	105, ETC	UA 90, ETC
4-16	DIST	COUNTY		SHEET NO.
8-16	SAT	GUADALUPE		73

NOTES:
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ITEM	DESCRIPTION	UNIT	QTY
0610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	4
0620-6009	ELEC CONDR (NO.6) BARE	LF	905
0621-6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	210
0636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	15
0666-6034	REFL PAV MRK TY I (W)8"(SLD)(060MIL)	LF	2280
0666-6046	REFL PAV MRK TY I (W)24"(SLD)(060MIL)	LF	535
0666-6052	REFL PAV MRK TY I (W)(ARROW)(060MIL)	EA	8
0666-6076	REFL PAV MRK TY I (W)(WORD)(060MIL)	EA	8
0666-6298	RE PM W/RET REQ TY I (W)4"(BRK)(060MIL)	LF	300
0666-6301	RE PM W/RET REQ TY I (W)4"(SLD)(060MIL)	LF	955
0666-6313	RE PM W/RET REQ TY I (Y)4"(SLD)(060MIL)	LF	1170
0672-6007	REFL PAV MRKR TY I-C	EA	53
0680-6011	INSTALL HWY TRF SIG (UPGRADE)	EA	1
0682-6001	VEH SIG SEC (12")LED(GRN)	EA	12
0682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	2
0682-6003	VEH SIG SEC (12")LED(YEL)	EA	12
0682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	4
0682-6005	VEH SIG SEC (12")LED(RED)	EA	12
0682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	2
0682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	8
0682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	12
0682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	2
0684-6009	TRF SIG CBL (TY A)(12 AWG)(4 CONDR)	LF	350
0684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF	905
0684-6028	TRF SIG CBL (TY A)(14 AWG)(2 CONDR)	LF	8
0684-6080	TRF SIG CBL (TY C)(14 AWG)(2 CONDR)	LF	350
0688-6001	PED DETECT PUSH BUTTON (APS)	EA	8
0688-6003	PED DETECTOR CONTROLLER UNIT	EA	1
0690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA	20
0690-6030	REMOVAL OF PEDESTRIAN PUSH BUTTONS	EA	8
0690-6086	REMOVE VID IMAGE VEH DET SYS (VIVDS)	EA	8
6004-6031	ITS COM CBL (ETHERNET)	LF	400
6010-6010	CCTV FIELD EQUIP (ANALOG) (INSTL ONLY)	EA	1
6027-6003	CONDUIT (PREPARE)	LF	905
6027-6008	GROUND BOX (PREPARE)	EA	10
6185-6002	TMA (STATIONARY)	DAY	20
6292-6001	RVDS(PRESENCE DETECTION ONLY)	EA	6
6292-6002	RVDS(ADVANCE DETECTION ONLY)	EA	2
****-****	CONTRACTOR FORCE ACCOUNT	EA	1

Texas Department of Transportation

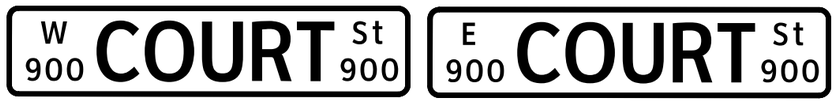
TRAFFIC SIGNAL QUANTITIES

SH 123 AND E CEDAR STREET/MIDDLETOWNE RD

CSJ 0366-02-097 SHEET 9 OF 9

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		74
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

EXISTING SIGNS ATTACHED TO MAST ARMS



S2
(1 EA)

S4
(1 EA)

R10-12
S5
(2 EA)

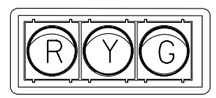
S1
(1 EA)

S3
(1 EA)

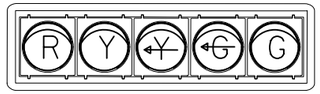
EXISTING SIGNS

S6 S7

EXISTING SIGNAL HEADS ATTACHED TO MAST ARMS



(A)



(B)

EXISTING PEDESTRIAN HEADS

W

N

SCALE: 1" = 40'
20 0 20

LEGEND

- EXISTING CONTROLLER CABINET
- EXISTING TRAFFIC SIGNAL POLE
- EXISTING TRAFFIC SIGNAL MAST ARM
- EXISTING TRAFFIC SIGNAL POLE & MAST ARM TO REMAIN
- EXISTING SIGNAL HEAD HORIZONTAL
- EXIST SIGN MOUNTED ON MAST ARM
- EXISTING SIGNAL BOX
- EXISTING SIGNAL HEAD
- EXISTING ELECTRICAL SERVICE
- EXISTING UTILITY POLE
- DIRECTION OF TRAFFIC FLOW

NOTES:

1. ALL TRAFFIC SIGNAL EQUIPMENT (CONTROLLER CABINET, POLES, MAST ARMS, SIGNAL HEADS, SIGNS, ELECTRICAL SERVICE,ETC.) SHALL BE REMOVED, SALVAGED AND RETURNED TO TXDOT, OR AS DIRECTED BY TXDOT ENGINEER, EXCEPT AS NOTED ON THE PLAN SHEET. REMOVE EXISTING PAVEMENT MARKINGS RELATED TO THE TRAFFIC SIGNAL IN ACCORDANCE TO TXDOT STANDARDS AND SPECIFICATIONS,OR AS DIRECTED BY TXDOT ENGINEER. ALL WORK IS SUBSIDIARY TO ITEM 680 "REMOVING TRAFFIC SIGNAL".

2. ALL RAMPS, CURBS, EXISTING FOUNDATIONS RELATED TO TXDOT SIGNS, EXISTING ABANDONED COMMERCIAL SIGNS, AND LIGHTING IS SUBSIDIARY TO ITEM 531 "CURB RAMPS".

POSTED SPEED LIMITS:
US 90 A = 35 MPH
VAUGHAN ST = 30 MPH

PAVEMENT TYPE:
US 90 A = ASPHALT
VAUGHAN ST = ASPHALT

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

CHARLES R. STEVENS, JR., P.E. — 7/6/2023 DATE

NO.	REVISION	APPROV.

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

EXISTING INTERSECTION & REMOVAL LAYOUT US 90 A (COURT ST) AT VAUGHAN ST

SHEET 1 OF 8

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		75
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

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PROPOSED SIGN SCHEDULE

S2
(1 EA)

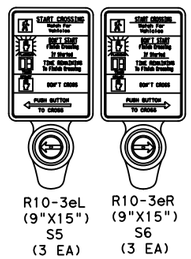
S4
(1 EA)

S1
(1 EA)

R10-17T
(36"X42")
S8
(2 EA)

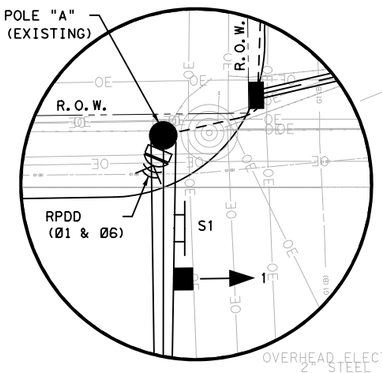
R10-12
(30"X36")
S7
(2 EA)

S3
(1 EA)

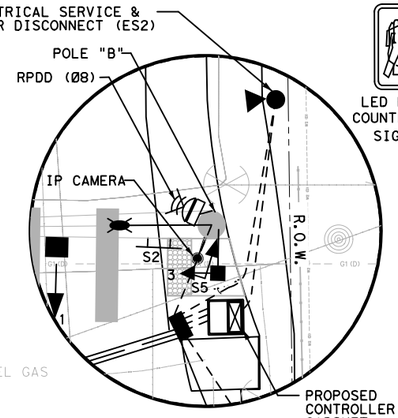


R10-3eL
(9"X15")
S5
(3 EA)

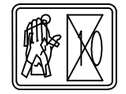
R10-3eR
(9"X15")
S6
(3 EA)



DETAIL "A"



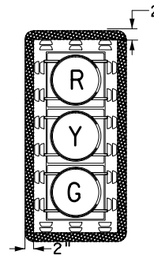
DETAIL "B"



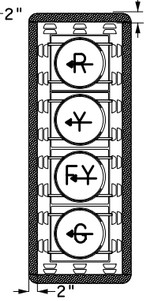
LED PEDESTRIAN
COUNTDOWN SIGNAL
SIGNAL NO.3
(6 EA)

PROPOSED SIGNAL HEADS

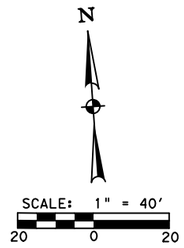
12" LED VERTICAL SIGNAL HEAD SECTIONS
VENTED ALUM. BACK PLATES
W/ REFLECTORIZED BORDER



SIGNAL NO.1
(8 EA)



SIGNAL NO.2
(2 EA)



LEGEND

- ADVANCE RADAR DETECTION
- CONTROLLER CABINET
- DIRECTION OF TRAFFIC FLOW
- ELECTRICAL SERVICE
- EXISTING TRAFFIC SIGNAL POLE & MAST ARM TO REMAIN
- GROUND BOX
- IP CAMERA
- LUMINAIRE AND ARM
- MAST ARM MOUNTED SIGN
- PEDESTRIAN POLE
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- PRESENCE RADAR DETECTION
- PROPOSED CONDUIT (TRENCH)
- PROPOSED CONDUIT (BORE)
- SIGNAL HEAD VERTICAL
- SIGNAL MAST ARM
- 1 SIGNAL HEAD
- TRAFFIC SIGNAL POLE

DETAIL "C"

POSTED SPEED LIMITS:
US 90 A = 35 MPH
VAUGHAN ST = 30 MPH

PAVEMENT TYPE:
US 90 A = ASPHALT
VAUGHAN ST = ASPHALT

NOTES:

1. SEE SHEET 8 OF 8 "INTERSECTION QUANTITIES & DETAILS" FOR TRAFFIC SIGNAL NOTES.
2. WATCH SIGNAL POLE "B" FOR POTENTIAL CONFLICT WITH UNDERGROUND GAS LINE WHILE DRILLING SIGNAL FOUNDATION.
3. POTENTIAL CONFLICT SIGNAL POLE "C" WITH OVERHEAD POWER LINES AND COMMUNICATION LINES.

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

CHARLES R. STEVENS, JR., P.E. — 7/6/2023 DATE

NO.	REVISION	APPROV.

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

PROPOSED INTERSECTION LAYOUT US 90 A (COURT ST) AT VAUGHAN ST

SHEET 2 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	76

STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

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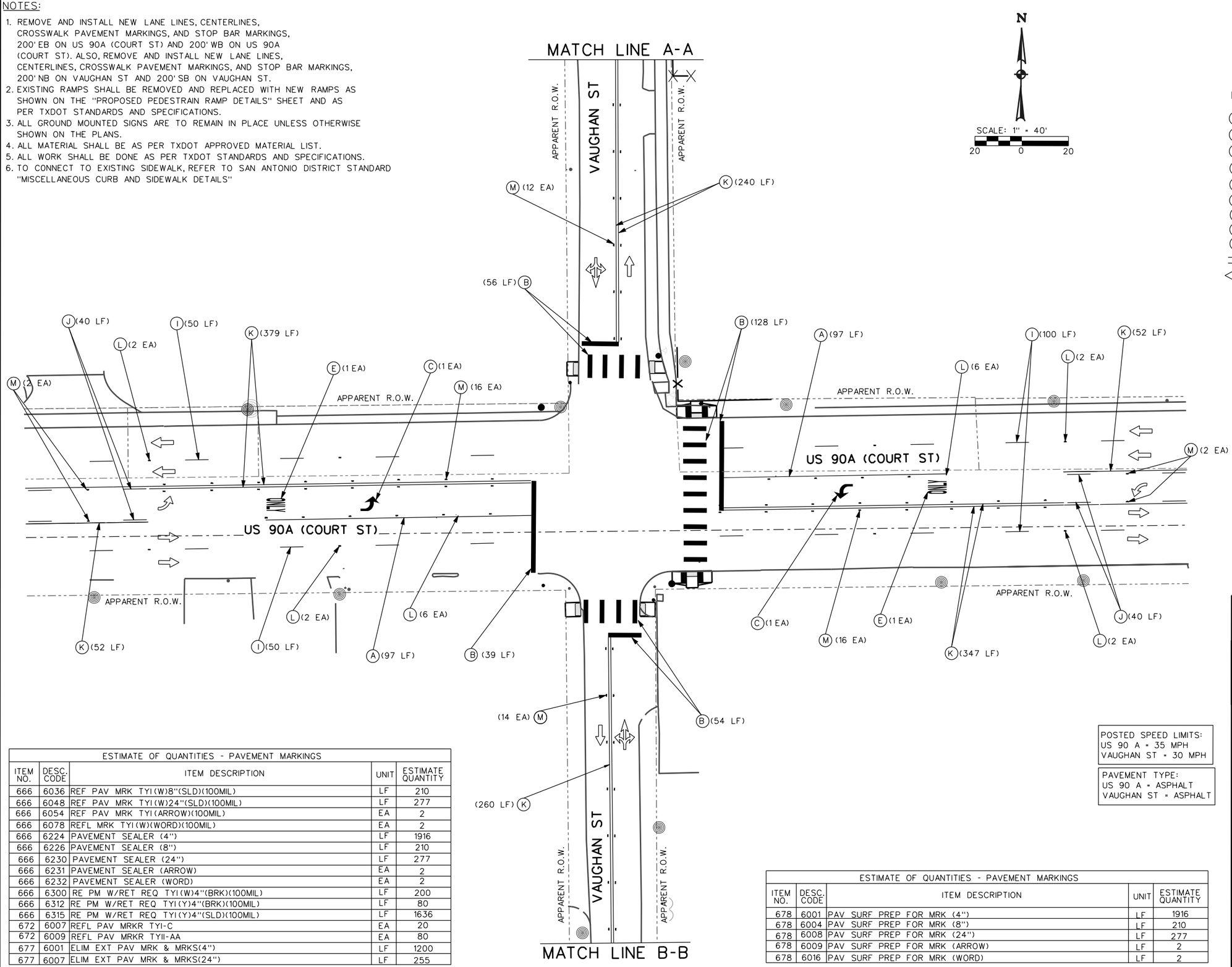
NOTES:

1. REMOVE AND INSTALL NEW LANE LINES, CENTERLINES, CROSSWALK PAVEMENT MARKINGS, AND STOP BAR MARKINGS, 200' EB ON US 90A (COURT ST) AND 200' WB ON US 90A (COURT ST). ALSO, REMOVE AND INSTALL NEW LANE LINES, CENTERLINES, CROSSWALK PAVEMENT MARKINGS, AND STOP BAR MARKINGS, 200' NB ON VAUGHAN ST AND 200' SB ON VAUGHAN ST.
2. EXISTING RAMPS SHALL BE REMOVED AND REPLACED WITH NEW RAMPS AS SHOWN ON THE "PROPOSED PEDESTRAIN RAMP DETAILS" SHEET AND AS PER TXDOT STANDARDS AND SPECIFICATIONS.
3. ALL GROUND MOUNTED SIGNS ARE TO REMAIN IN PLACE UNLESS OTHERWISE SHOWN ON THE PLANS.
4. ALL MATERIAL SHALL BE AS PER TXDOT APPROVED MATERIAL LIST.
5. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATIONS.
6. TO CONNECT TO EXISTING SIDEWALK, REFER TO SAN ANTONIO DISTRICT STANDARD "MISCELLANEOUS CURB AND SIDEWALK DETAILS"



LEGEND

- (A) REFL PAV MRK TYI(W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TYI(W)24"(SLD)(100MIL)
- (C) REFL PAV MRK TYI(W)(ARROW)(100MIL)
- (E) REFL PAV MRK TYI(W)(WORD)(100MIL)
- (I) RE PM W/RET REQ TYI(W)4"(BRK)(100MIL)
- (J) RE PM W/RET REQ TYI(Y)4"(BRK)(100MIL)
- (K) RE PM W/RET REQ TYI(Y)4"(SLD)(100MIL)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A
- PROPOSED SIGNS
- DIRECTION OF TRAFFIC FLOW

ESTIMATE OF QUANTITIES - PAVEMENT MARKINGS

ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	ESTIMATE QUANTITY
666	6036	REF PAV MRK TYI(W)8"(SLD)(100MIL)	LF	210
666	6048	REF PAV MRK TYI(W)24"(SLD)(100MIL)	LF	277
666	6054	REF PAV MRK TYI(ARROW)(100MIL)	EA	2
666	6078	REFL MRK TYI(W)(WORD)(100MIL)	EA	2
666	6224	PAVEMENT SEALER (4")	LF	1916
666	6226	PAVEMENT SEALER (8")	LF	210
666	6230	PAVEMENT SEALER (24")	LF	277
666	6231	PAVEMENT SEALER (ARROW)	EA	2
666	6232	PAVEMENT SEALER (WORD)	EA	2
666	6300	RE PM W/RET REQ TYI(W)4"(BRK)(100MIL)	LF	200
666	6312	RE PM W/RET REQ TYI(Y)4"(BRK)(100MIL)	LF	80
666	6315	RE PM W/RET REQ TYI(Y)4"(SLD)(100MIL)	LF	1636
672	6007	REFL PAV MRKR TYI-C	EA	20
672	6009	REFL PAV MRKR TYII-AA	EA	80
677	6001	ELIM EXT PAV MRK & MRKS(4")	LF	1200
677	6007	ELIM EXT PAV MRK & MRKS(24")	LF	255

ESTIMATE OF QUANTITIES - PAVEMENT MARKINGS

ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	ESTIMATE QUANTITY
678	6001	PAV SURF PREP FOR MRK (4")	LF	1916
678	6004	PAV SURF PREP FOR MRK (8")	LF	210
678	6008	PAV SURF PREP FOR MRK (24")	LF	277
678	6009	PAV SURF PREP FOR MRK (ARROW)	LF	2
678	6016	PAV SURF PREP FOR MRK (WORD)	LF	2

POSTED SPEED LIMITS:
US 90 A = 35 MPH
VAUGHAN ST = 30 MPH

PAVEMENT TYPE:
US 90 A = ASPHALT
VAUGHAN ST = ASPHALT

STATE OF TEXAS
GUILLERMO A. DOUGHERTY, JR.
93649
LICENSED
PROFESSIONAL ENGINEER

7-6-2023

NO.	DATE	REVISION	APPROV.

DOUGHERTY Engineering Group, PLLC
TBPE Firm No. F-18636

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PROPOSED PAVEMENT MARKING LAYOUT US 90A (COURT ST) AT VAUGHAN ST

SHEET 4 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	77

STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

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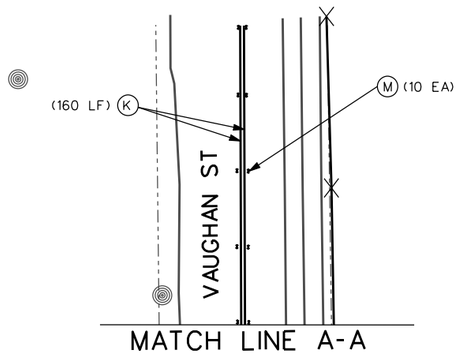
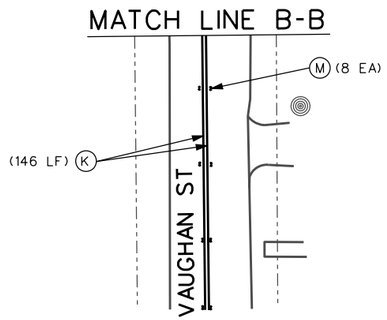
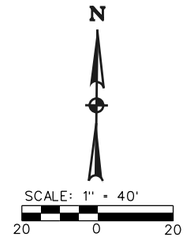
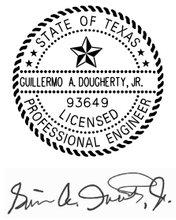






LEGEND

- (A) REFL PAV MRK TYI(W)8"(SLD)(100MIL)
- (B) REFL PAV MRK TYI(W)24"(SLD)(100MIL)
- (C) REFL PAV MRK TYI(W)(ARROW)(100MIL)
- (E) REFL PAV MRK TYI(W)(WORD)(100MIL)
- (I) RE PM W/RET REQ TYI(W)4"(BRK)(100MIL)
- (J) RE PM W/RET REQ TYI(Y)4"(BRK)(100MIL)
- (K) RE PM W/RET REQ TYI(Y)4"(SLD)(100MIL)
- (L) REFL PAV MRKR TY I-C
- (M) REFL PAV MRKR TY II-A-A
- PROPOSED SIGNS
- DIRECTION OF TRAFFIC FLOW



7-6-2023

NO.	DATE	REVISION	APPROV.

DOUGHERTY Engineering Group, PLLC
TBPE Firm No. F-18636

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PROPOSED PAVEMENT MARKING LAYOUT
US 90A (COURT ST) AT VAUGHAN ST

SHEET 5 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	78

STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

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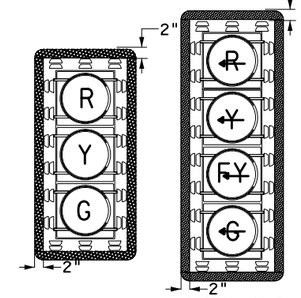
PROPOSED CONDUIT AND CONDUCTOR SCHEDULE

	RUN NUMBER		1	2	3	4	5		6		7	8		9		10	11		12		13		14	15
	CONDUIT SIZE IN INCHES		2.0	2.0	2.0	2.0	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	3.0	2.0	2.0
	NUMBER OF CONDUITS		1	1	1	1	1	2	1	2	1	1	2	1	2	1	1	2	1	2	1	3	1	2
	LENGTH OF RUN (FT)		5	30	5	10	5	5	75	75	10	15	15	10	10	25	50	50	10	10	5	5	25	20
	TRENCH (T)/BORE (B)/ CONTROLLER (C)		T	B	T	T	T	T	B	B	T	T	T	T	T	T	B	B	T	T	C	C	T	T
CABLE	CIRCUIT																							
#6 XHHW	120 POWER HOT																							1
	120 POWER COMMON																							1
#6 BARE	BARE BOND GROUND		1	1	1	1	1	2	1	2	1	1	2	1	2	1	1	2	1	2	1	3	1	2
7 COND. #12 STRANDED TY A	SIGNALS	PHASE 01						1		1			1									1		
		PHASE 02													1			1				1		
		PHASE 03																						
		PHASE 04																		1		1		
		PHASE 05													1			1				1		
		PHASE 06						1		1			1									1		
		PHASE 07																						
		PHASE 08						1		1			1									1		
4 COND. #12 STRANDED TY A	PED. SIGNALS	PHASE 02														1		1		1		2		
		PHASE 04						1		1	1		2									2		
		PHASE 06	1	1	1	2				2			2									2		
		PHASE 08																						
2 COND. #14 STRANDED TY C	PED. PUSH BUTTONS	PHASE 02														1		1		1		2		
		PHASE 04						1		1	1		2									2		
		PHASE 06	1	1	1	2				2			2									2		
		PHASE 08																						
6 COND. #22	RVDS (PRESENCE DETECTION DEVICE)	PHASE 01 & 06													1			1				1		
		PHASE 02 & 05						1		1			1									1		
		PHASE 04						1		1			1									1		
		PHASE 08																				1		
TRAY CABLE (4 CONDR) (12 AWG)	LUMINAIRE																		1				1	
CAT 5 ETHERNET CABLE & POWER	IP CAMERA																				1		1	

PROPOSED SIGNAL HEADS

12" LED VERTICAL SIGNAL HEAD SECTIONS
VENTED ALUM. BACK PLATES
W/ REFLECTORIZED BORDER



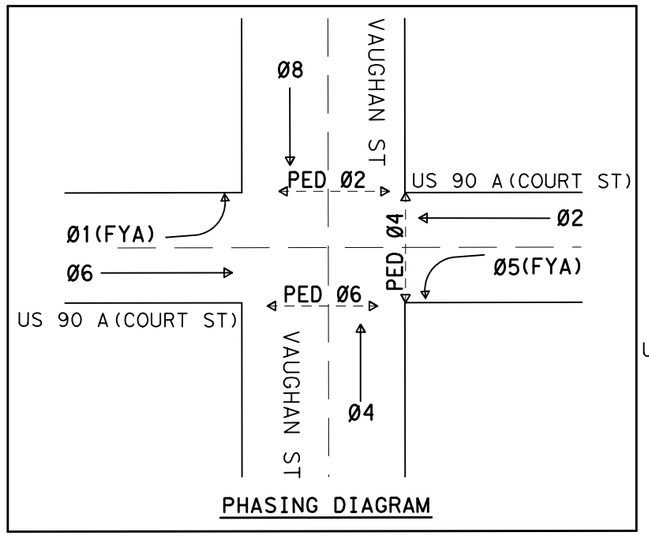
SIGNAL NO. 1 (8 EA) — SIGNAL NO. 2 (2 EA)

LED PEDESTRIAN COUNTDOWN SIGNAL
SIGNAL NO. 3
(6 EA)

SCALE: 1" = 40'
20 0 20

LEGEND

- ADVANCE RADAR DETECTION
- CONTROLLER CABINET
- DIRECTION OF TRAFFIC FLOW
- ELECTRICAL SERVICE
- EXISTING TRAFFIC SIGNAL POLE & MAST ARM TO REMAIN
- GROUND BOX
- IP CAMERA
- LUMINAIRE AND ARM
- MAST ARM MOUNTED SIGN
- PEDESTRIAN POLE
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON
- PRESENCE RADAR DETECTION
- PROPOSED CONDUIT (TRENCH)
- PROPOSED CONDUIT (BORE)
- SIGNAL HEAD VERTICAL
- SIGNAL MAST ARM
- 1 SIGNAL HEAD
- TRAFFIC SIGNAL POLE



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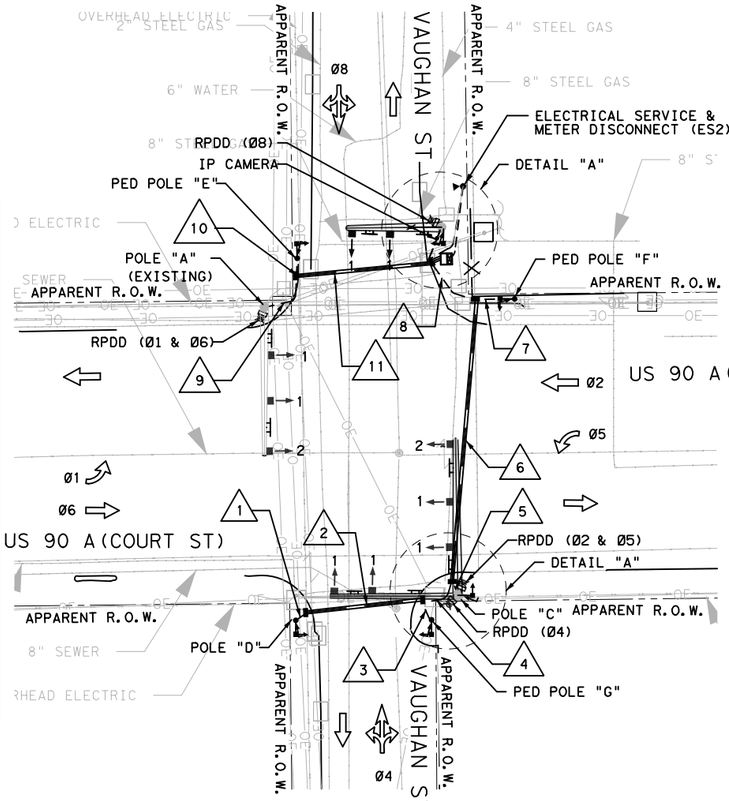
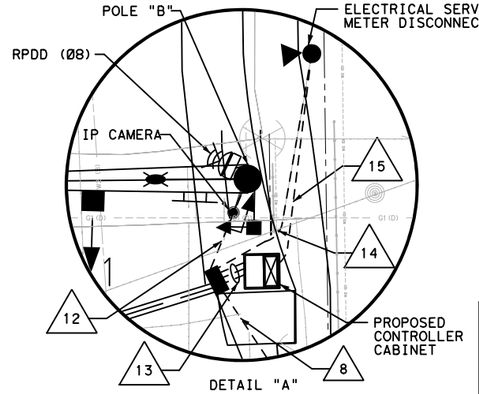
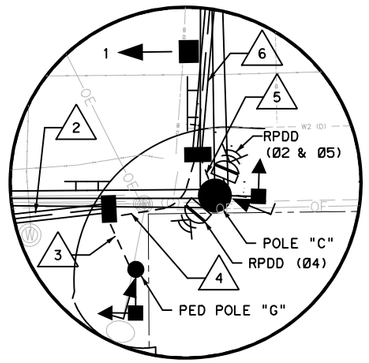






DETAIL "B"

POSTED SPEED LIMITS:
US 90 A = 35 MPH
VAUGHAN ST = 30 MPH

PAVEMENT TYPE:
US 90 A = ASPHALT
VAUGHAN ST = ASPHALT

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

CHARLES R. STEVENS, JR., P.E. — 7/7/2023 DATE

NO.	REVISION	APPROV.

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

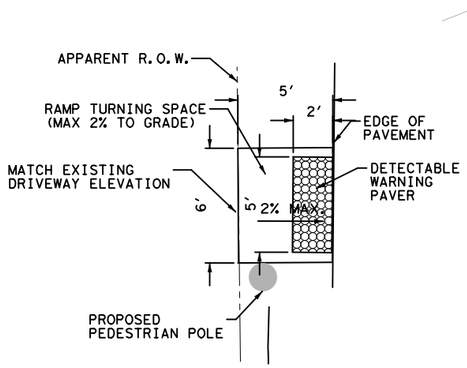
PROPOSED WIRING DIAGRAM US 90 A (COURT ST) AT VAUGHAN ST

SHEET 3 OF 8

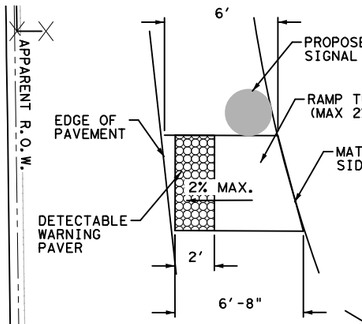
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		79
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

7/7/2023 11:57:48 AM ...\V003-PROPOSED WIRING DIAGRAM.dgn

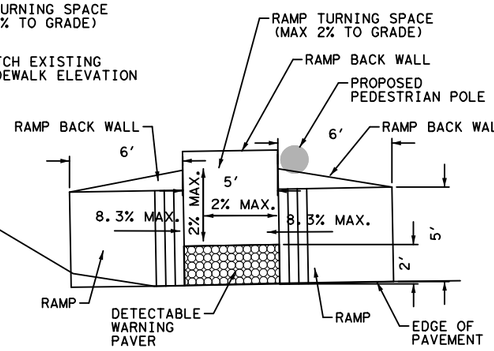
ESTIMATE OF QUANTITIES-CURB RAMPS				
ITEM NO.	DESC CODE	DESCRIPTION	UNIT	EST QUANTITY
531	6005	CURB RAMPS (TY 2)	EA	2
531	6037	CURB RAMP (TY 1) (MOD)	EA	4



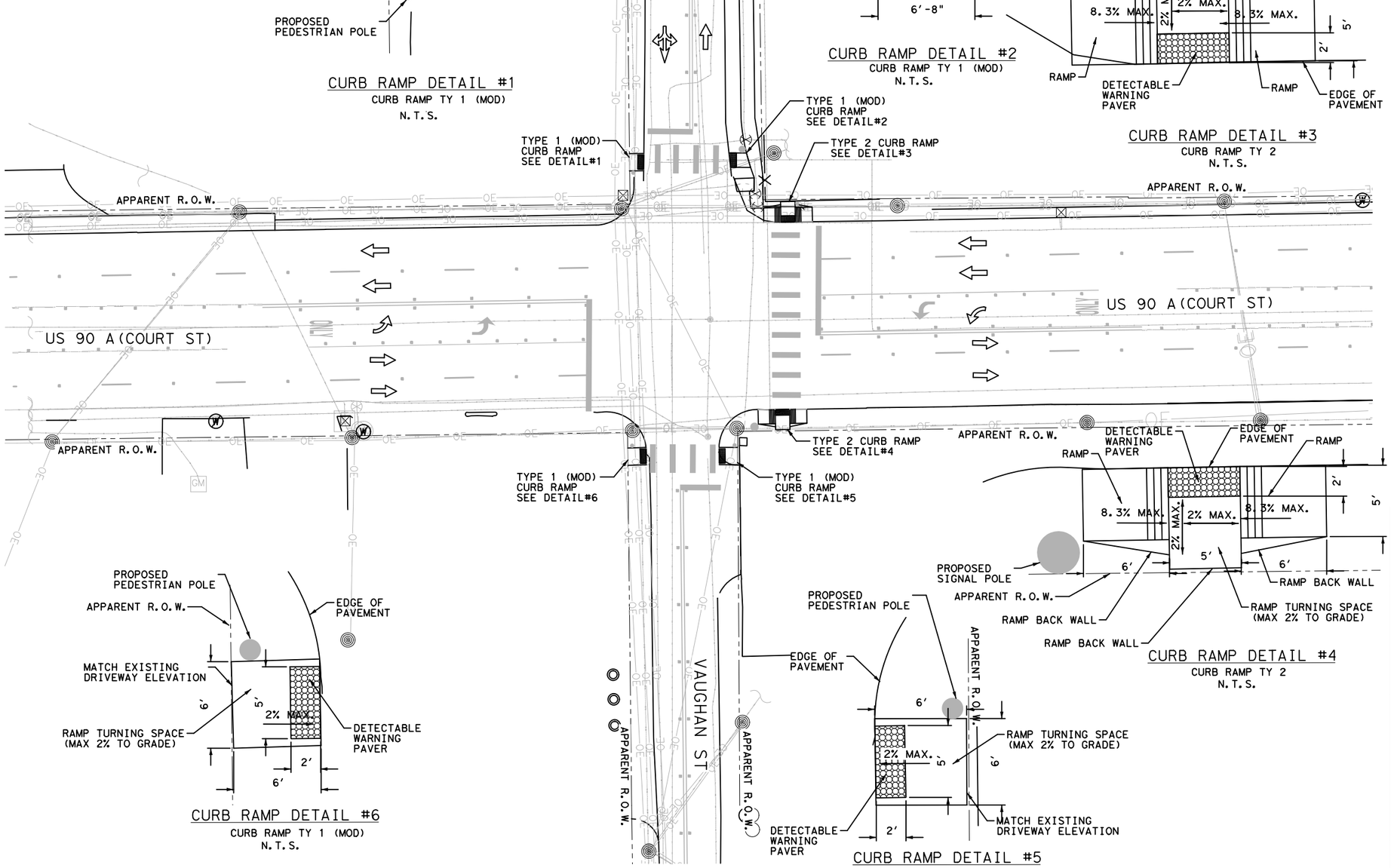
CURB RAMP DETAIL #1
CURB RAMP TY 1 (MOD)
N.T.S.



CURB RAMP DETAIL #2
CURB RAMP TY 1 (MOD)
N.T.S.



CURB RAMP DETAIL #3
CURB RAMP TY 2
N.T.S.



CURB RAMP DETAIL #6
CURB RAMP TY 1 (MOD)
N.T.S.

CURB RAMP DETAIL #4
CURB RAMP TY 2
N.T.S.

CURB RAMP DETAIL #5
CURB RAMP TY 1 (MOD)
N.T.S.

NOTES:

1. EXISTING RAMPS SHALL BE REMOVED AND REPLACED WITH NEW RAMPS AS SHOWN ON THIS SHEET AND AS PER TXDOT STANDARDS AND SPECIFICATIONS.
2. BACKFILL AREA TO PROVIDE LEVEL ACCESS PAD AND ELIMINATE OR REDUCE ADJACENT EDGE DROP-OFF END WHERE NO CURB IS PRESENT, PROVIDE BACKFILL ADJACENT TO LANDING PAD AT A SLOPE NO GREATER THAN 8.3%. BACKFILL MATERIALS AND LABOR ARE SUBSIDIARY TO ITEM 531 CONC SIDEWALKS.
3. ALL MATERIAL SHALL BE AS PER TXDOT APPROVED MATERIAL LIST.
4. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATIONS.
5. TO CONNECT TO EXISTING SIDEWALKS, REFER TO SAN ANTONIO DISTRICT STANDARD "MISCELLANEOUS CURB AND SIDEWALK DETAILS."

N

SCALE: 1" = 40'
20 0 20

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

CHARLES R. STEVENS, JR., P.E. — 7/6/2023 DATE

NO.	REVISION	APPROV.

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

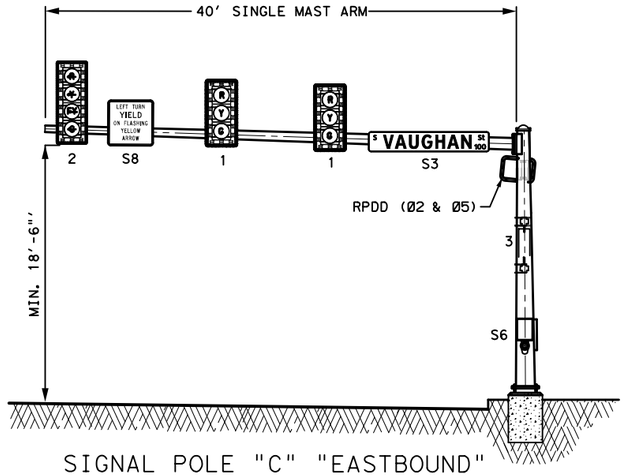
PROPOSED PEDESTRIAN RAMP DETAILS US 90 A (COURT ST) AT VAUGHAN ST

SHEET 6 OF 8

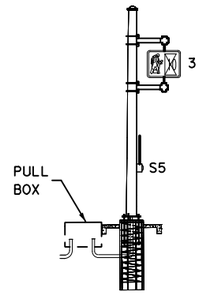
FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	80

STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

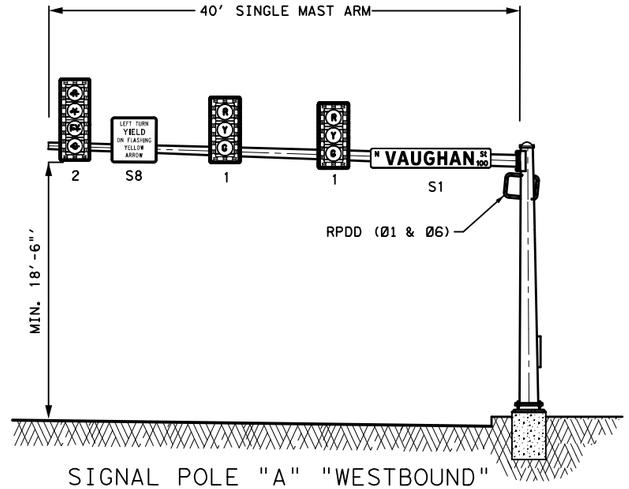
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.



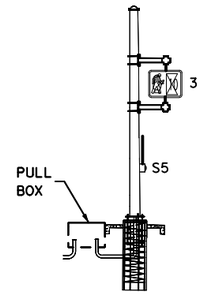
SIGNAL POLE "C" "EASTBOUND"
"DUAL MAST ARM POLE"



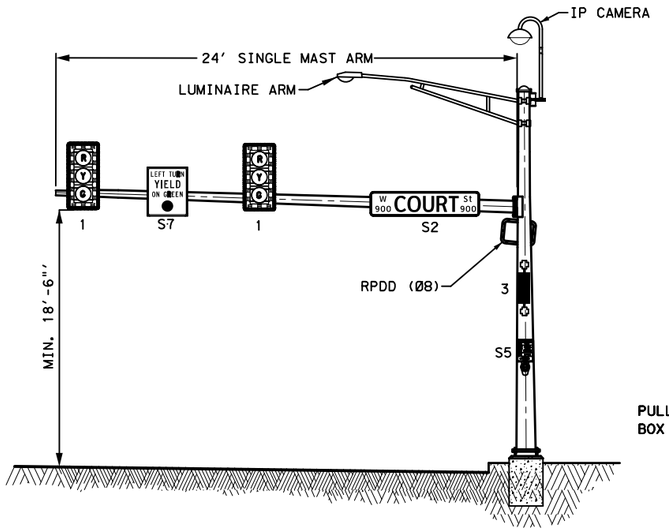
PED POLE "G"
EASTBOUND VIEW



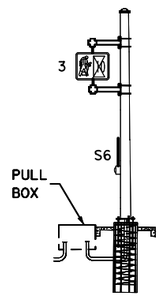
SIGNAL POLE "A" "WESTBOUND"
SIGNAL POLE & ARM ARE EXISTING
ATTACHED ELEMENTS ARE PROPOSED NEW



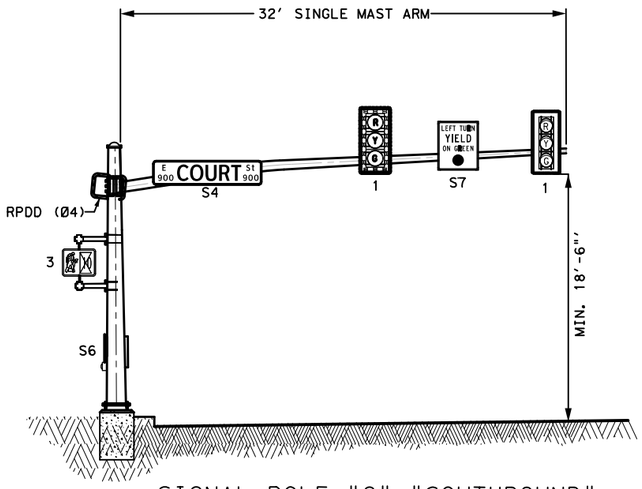
PED POLE "E"
WESTBOUND VIEW



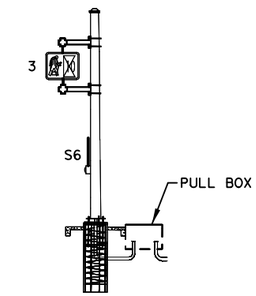
SIGNAL POLE "B" "NORTHBOUND"



PED POLE "F"
NORTHBOUND VIEW



SIGNAL POLE "C" "SOUTHBOUND"
"DUAL MAST ARM POLE"



PED POLE "D"
WESTBOUND VIEW

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

CHARLES R. STEVENS, JR., P.E. — 7/6/2023 DATE

NO.	REVISION	APPROV.

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

PROPOSED ELEVATION VIEW
US 90 A (COURT ST) AT VAUGHAN ST

SHEET 7 OF 8

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		81
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

7/6/2023 2:42:49 PM
...\SHEETS\V007-ELEVATION VIEW.dgn

ESTIMATE OF QUANTITIES - TRAFFIC SIGNAL

ITEM NO.	DESC. CODE	ITEM DESCRIPTION	UNIT	EST QUANTITY
104	6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	100
416	6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF	11.3
416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	13.2
529	6001	CONC CURB (TY I)	LF	65
531	6005	CURB RAMP (TY 2)	EA	2
531	6037	CURB RAMP (TY 1) (MOD)	EA	4
618	6046	CONDT (PVC) (SCH 80) (2")	LF	165
618	6047	CONDT (PVC) (SCH 80) (2")(BORE)	LF	155
618	6053	CONDT (PVC) (SCH 80) (3")	LF	95
618	6054	CONDT (PVC) (SCH 80) (3")(BORE)	LF	250
620	6009	ELEC CONDR (NO.6) BARE	LF	665
620	6010	ELEC CONDR (NO.6) INSULATED	LF	40
621	6005	TRAY CABLE (4 CONDR) (12 AWG)	LF	95
624	6010	GROUND BOX TY D (162922) W/APRON	EA	6
628	6002	REMOVE ELECTRICAL SERVICE	EA	1
628	6164	ELC SRV TY D 120/240 070(NS)AL(PS)(U)	EA	1
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	210
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	277
666	6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	2
666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2
666	6224	PAVEMENT SEALER 4"	LF	1916
666	6226	PAVEMENT SEALER 8"	LF	210
666	6230	PAVEMENT SEALER 24"	LF	277
666	6231	PAVEMENT SEALER (ARROW)	EA	2
666	6232	PAVEMENT SEALER (WORD)	EA	2
666	6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	200
666	6312	RE PM W/RET REQ TY I (Y)4"(BRK)(100MIL)	LF	80
666	6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	1636
672	6007	REFL PAV MRKR TY I-C	EA	20
672	6009	REFL PAV MRKR TY II-A-A	EA	80
677	6001	ELIM EXT PAV MRK & MRKS (4")	EA	1200
677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	255
678	6001	PAV SURF PREP FOR MRK (4")	EA	1916
678	6004	PAV SURF PREP FOR MRK (8")	EA	210
678	6008	PAV SURF PREP FOR MRK (24")	LF	277
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	2
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	2
680	6002	INSTALL HWY TRF SIG (ISOLATED)	EA	1
**		NEMA TX 2 TYPE 5, 12 POSITION, BASE MOUNT CONTROLLER CABINET	EA	1
**		TRAFFIC CONTROLLER FOUNDATION	EA	1
**		R10-12 (30" X 36") "LEFT TURN YIELD ON GREEN BALL"	EA	2
**		R10-17T (36" X 42") "LEFT TURN YIELD ON FLASHING YELLOW ARROW"	EA	2
CITY SUPPLIED		D3-1G - STREET NAME SIGN "N VAUGHAN ST" (INSTALLED BY CONTRACTOR)	EA	1
CITY SUPPLIED		D3-1G - STREET NAME SIGN "S VAUGHAN ST" (INSTALLED BY CONTRACTOR)	EA	1
CITY SUPPLIED		D3-1G - STREET NAME SIGN "E COURT ST" (INSTALLED BY CONTRACTOR)	EA	1
CITY SUPPLIED		D3-1G - STREET NAME SIGN "W COURT ST" (INSTALLED BY CONTRACTOR)	EA	1
680	6004	REMOVING TRAFFIC SIGNALS	EA	1
682	6001	VEH SIG SEC (12")LED(GRN)	EA	8
682	6002	VEH SIG SEC (12")LED(GRN ARW)	EA	2
682	6003	VEH SIG SEC (12")LED(YEL)	EA	8
682	6004	VEH SIG SEC (12")LED(YEL ARW)	EA	4
682	6005	VEH SIG SEC (12")LED(RED)	EA	8
682	6006	VEH SIG SEC (12")LED(RED ARW)	EA	2
682	6018	PED SIG SEC (LED)(COUNTDOWN)	EA	6
682	6054	BACKPLATE W/REFL BRDR(3 SEC)(VENT)ALUM	EA	8
682	6055	BACKPLATE W/REFL BRDR(4 SEC)(VENT)ALUM	EA	2
684	6009	TRF SIG CBL(TY A)(12 AWG)(4 CONDR)	LF	535
684	6012	TRF SIG CBL(TY A)(12 AWG)(7 CONDR)	LF	695
684	6080	TRF SIG CBL(TY C)(14 AWG)(2 CONDR)	LF	500
686	6027	INS TRF SIG PL AM(S)1 ARM(24')LUM	EA	1
686	****	INS TRF SIG PL AM(S)2 ARM(40'x32')	EA	1
687	****	PED POLE ASSEMBLY	EA	4
**		DRILL SHAFT (24 IN x 24 IN) "DISTRICT SPECIAL"	LF	8
688	6001	PED DETECT PUSH BUTTON (APS)	EA	6
**	**	R10-3e (L) (9" X 15") "PEDESTRIAN SIGN"	EA	3
**	**	R10-3e (R) (9" X 15") "PEDESTRIAN SIGN"	EA	3
688	6003	PED DETECTOR CONTROLLER UNIT	EA	1
6004	6031	ITS COM CBL (ETHERNET)	LF	150
6010	6010	CCTV FIELD EQUIP (ANALOG) (INSTL ONLY)	EA	1
6185	6002	TMA (STATIONARY)	DAY	10
6292	6001	RVDS(PRESENCE DETECTION ONLY)	EA	4
**		RVDS (RADAR PRESENCE DETECTOR POWER AND COMMUNICATION CABLE)	LF	360
****	****	CONTRACTOR FORCE ACCOUNT (COMM PACKAGE)	EA	1
		CELLULAR MODEM (CISCO MODEL IR1101)	EA	1
		ETHERNET SWITCH (MOXA MODEL EDR-810-VPN-2GSFP-T)	EA	1
		IP CAMERA (AXIS M5525-E)	EA	1
		IP CAMERA MOUNTING BRACKET (AXIS T94AC1D PENDANT KIT)	EA	1
		POWER STRIP	EA	1
		SWITCH POWER SUPPLY	EA	1
		POE POWER SUPPLY - FOR CAMERA ONLY	EA	1
****	****	CONTRACTOR FORCE ACCOUNT (LAW ENFORCEMENT)	EA	1
****	****	CONTRACTOR FORCE ACCOUNT (EROSION CONTROL)	EA	1
**		SUBSIDIARY TO PERTINENT ITEM		
****	****	CONTRACTOR FORCE ACCOUNT		

POLE ID.	POLE & EQUIPMENT DESCRIPTIONS WITH ATTACHMENTS
A	EXISTING SIGNAL POLE AND MAST ARM WITH THREE VERTICAL VEHICLE SIGNAL HEADS WITH LOUVERS AS ILLUSTRATED, ONE D3-1G STREET NAME SIGN, ONE R10-17T (36"X42") SIGN AND ONE RVDS PRESENCE DETECTION (RPDD 01 & 06).
B	24' SINGLE MAST ARM ON A 30-A FOUNDATION AT 11 FT. WITH ONE LUMINAIRE, TWO VERTICAL VEHICLE SIGNAL HEADS WITH LOUVERS AS ILLUSTRATED, ONE D3-1G STREET NAME SIGN, ONE R10-12 (30"X36") SIGN, ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT, R10-3eL PEDESTRIAN SIGN, ONE RVDS PRESENCE DETECTION (RPDD 08) AND ONE IP CAMERA.
C	40' x 32' DUAL MAST ARM ON A 36-A FOUNDATION AT 13 FT. A 40' MAST ARM WITH THREE VERTICAL VEHICLE SIGNAL HEADS WITH LOUVERS AS ILLUSTRATED, ONE D3-1G STREET NAME SIGN, ONE R10-17T (36"X42") SIGN, ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT, R10-3eR PEDESTRIAN SIGN AND ONE RVDS PRESENCE DETECTION (RPDD 02 & 05) AND A 32' MAST ARM WITH TWO VERTICAL VEHICLE SIGNAL HEADS AS ILLUSTRATED, ONE D3-1G STREET NAME SIGN, ONE R10-12 (30"X36") SIGN, AND ONE RVDS PRESENCE DETECTION (RPDD 04). .
D	10' PEDESTRIAN SIGNAL POLE ASSEMBLY ON A 24" x 24" SPECIAL DISTRICT FOUNDATION AT 2 FT. WITH ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT AND R10-3eR PEDESTRIAN SIGN.
E	10' PEDESTRIAN SIGNAL POLE ASSEMBLY ON A 24" x 24" SPECIAL DISTRICT FOUNDATION AT 2 FT. WITH ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT AND R10-3eL PEDESTRIAN SIGN.
F	10' PEDESTRIAN SIGNAL POLE ASSEMBLY ON A 24" x 24" SPECIAL DISTRICT FOUNDATION AT 2 FT. WITH ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT AND R10-3eR PEDESTRIAN SIGN.
G	10' PEDESTRIAN SIGNAL POLE ASSEMBLY ON A 24" x 24" SPECIAL DISTRICT FOUNDATION AT 2 FT. WITH ONE LED COUNTDOWN PEDESTRIAN HEAD, ONE ACCESSIBLE PEDESTRIAN SIGNAL UNIT AND R10-3eL PEDESTRIAN SIGN.

PROPOSED SIGN SCHEDULE

S2
(1 EA)

S4
(1 EA)

S1
(1 EA)

S3
(1 EA)

R10-3eL (9"X15") S5 (3 EA)

R10-3eR (9"X15") S6 (3 EA)

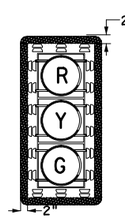
R10-12 (30"x36") S7

(2 EA)

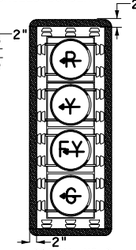
R10-17T (36"x42") S8 (2 EA)

PROPOSED SIGNAL HEADS

12" LED VERTICAL SIGNAL HEAD SECTIONS
VENTED ALUM. BACK PLATES
W/ REFLECTORIZED BORDER



SIGNAL NO.1 (8 EA)



SIGNAL NO.2 (2 EA)

LED PEDESTRIAN COUNTDOWN SIGNAL
SIGNAL NO.3
(6 EA)

ELECTRICAL SERVICE DATA

C-S-J	PROJECT LOCATION	ELECTRIC SERVICE NO.	SHEET NO.	ELECTRICAL SERVICE DESCRIPTION(SEE ED (5)-14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE/AMP	TWO-POLE CONTACTOR AMPS ***	PANEL BD./ LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE/ AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
0025-03-105	(COURT ST) AT VAUGHAN ST	ES2	2 OF 8 & 3 OF 8	TY D (120/240)070 (NS)AL(E)PS(U)	2"	3/#4	N/A	2P/70	30	100	SIGNAL	1P/50	40	<7.1
											LIGHTING	1P/20	2	

NOTES:

1. ALL TRAFFIC SIGNAL EQUIPMENT LOCATIONS ARE BASED ON A SURVEY. CONTRACTOR SHALL VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
2. APPARENT RIGHT-OF-WAY LINES ARE FROM TXDOT MAPS. VERIFY LOCATIONS IN THE FIELD AS NECESSARY.
3. THE EXISTENCE AND LOCATION OF UTILITIES, EITHER UNDERGROUND OR OVERHEAD, INDICATED ON THE PLANS ARE TAKEN FROM THE BEST RECORDS AVAILABLE AND ARE APPROXIMATE. IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE ALL UTILITIES (PRIVATE/PUBLIC AND SHOWN/NOT SHOWN) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS/HER FAILURE TO LOCATE, PRESERVE, AND PROTECT THESE UTILITIES.
4. CONTRACTOR SHALL REMOVE AND REPLACE EXISTING SIGNAL HEADS WITH NEW LOUVERED VERTICAL SIGNAL HEADS AS SHOWN ON THE PLANS AND SHALL HAVE A MINIMUM OF 18.5 FEET CLEARANCE ABOVE ROADWAY SURFACE. CONTRACTOR SHALL CONTACT THE TXDOT SIGNAL SHOP AND AREA OFFICE PRIOR TO STARTING THIS WORK TO ENSURE A SMOOTH TRAFFIC MOVEMENT FOR ALL MOTORISTS DURING THIS TRANSITION.
5. CONTRACTOR SHALL REMOVE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT AND INSTALL NEW EQUIPMENT AS PER DESIGN LAYOUTS AND IN ACCORDANCE TO TXDOT STANDARDS AND SPECIFICATIONS AND IN ACCORDANCE TO THE ACCESSIBILITY REQUIREMENTS AND CONNECT PROPOSED FIELD WIRING TO CONTROLLER.
6. FOR PAVEMENT MARKINGS, SEE PROPOSED PAVEMENT MARKINGS & RAMPS LAYOUT SHEET.
7. ALL EXISTING CURB RAMPS SHALL BE REMOVED AND NEW WHEELCHAIR RAMPS INSTALLED (IF ANY), AS PER DESIGN DETAILS ON THE PROPOSED PAVEMENT MARKINGS & RAMPS LAYOUT SHEET AND IN ACCORDANCE TO TXDOT STANDARDS AND SPECIFICATIONS AND IN ACCORDANCE TO THE ACCESSIBILITY REQUIREMENTS.
8. THE CONTRACTOR SHALL INSTALL NEW PRESENCE RADAR DETECTORS. THE LOCATION OF THE RADAR DETECTORS SHOWN ARE APPROXIMATE. THE EXACT LOCATION SHALL BE DETERMINED IN THE FIELD AND ADJUSTED TO PROVIDE PROPER DETECTION ZONES AND A COMPLETE OPERABLE SYSTEM.
9. CONTRACTOR SHALL REMOVE AND DELIVER ANY EQUIPMENT DEEMED SALVAGEABLE TO TXDOT LOCATED AT 4615 NW LOOP 410, CONTACT MARK PEREZ AT 210-218-7430.
10. CONTRACTOR SHALL FURNISH AND DELIVER ONE (1) TX 2 TYPE 5 (12-POSITION) CONTROLLER CABINET AND ASSEMBLY TO TXDOT SIGNAL SHOP FOR PROGRAMMING AND TESTING TWO WEEKS IN ADVANCE PRIOR TO CONTRACTOR INSTALLING EQUIPMENT IN THE FIELD. COORDINATE DROP OFF AND PICKUP WITH MARK PEREZ AT 210-218-7430.
11. THE INSTALLATION OF ALL COMMUNICATION PACKAGE ITEMS (MODEM, POWER STRIP, ETC.) IS SUBSIDIARY TO ITEM 680.
12. TRAY CABLES SHALL BE RUN IN 2" CONDUIT SEPARATE FROM THE SIGNAL CABLE.
13. ADJUST EXISTING AND PROPOSED SIGNAL HEADS AS NECESSARY TO KEEP THEM VISIBLE AT ALL TIMES DURING CONSTRUCTION. ADJUSTING SIGNAL HEADS DURING CONSTRUCTION IS SUBSIDIARY TO ITEM 502.
14. CONTRACTOR SHALL CONTACT THE TXDOT SIGNAL SHOP AND AREA OFFICE A MINIMUM OF SEVEN (7) DAYS PRIOR TO BEGINNING CONSTRUCTION.
15. CONTRACTOR SHALL CONTACT THE TXDOT SIGNAL SHOP AND AREA OFFICE A MINIMUM OF FOURTEEN (14) DAYS PRIOR TO THE TRAFFIC SIGNAL TURN-ON.
16. THE CITY OF SEGUIN SHALL PROVIDE THE STREET NAME SIGNS AND THE CONTRACTOR SHALL INSTALL THEM AS SHOWN ON THE PLANS. INSTALLATION OF THESE SIGNS SHALL BE SUBSIDIARY TO ITEM 680.

CHARLES R. STEVENS, JR., P.E.

7/7/2023
DATE

NO.	REVISION	APPROV.

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

INTERSECTION QUANTITIES & DETAILS US 90 A (COURT ST) AT VAUGHAN ST

SHEET 8 OF 8

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	82

STATE	DIST.	COUNTY
TEXAS	SAT	GUADALUPE

CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105,ETC.	UA 90,ETC.

7/7/2023 11:58:43 AM
...\V008-INTERSECTION QUANTITY & DETAILS.dgn

NOTES:

1. TXDOT HAS THE AUTHORITY TO STOP CONSTRUCTION OF TRAFFIC SIGNAL, IF THE STATE SPECIFICATIONS ARE NOT BEING FOLLOWED.

2. ALL MATERIAL SHALL BE AS PER TXDOT APPROVED MATERIAL LIST.

3. ALL WORK SHALL BE DONE AS PER TXDOT STANDARDS AND SPECIFICATION.

4. THE CONTRACTOR SHALL LOCATE UTILITIES PRIOR TO THE INSTALLATION OF ANY TRAFFIC SIGNAL ELEMENTS AND BEFORE TRENCHING FOR CONDUIT PLACEMENT.

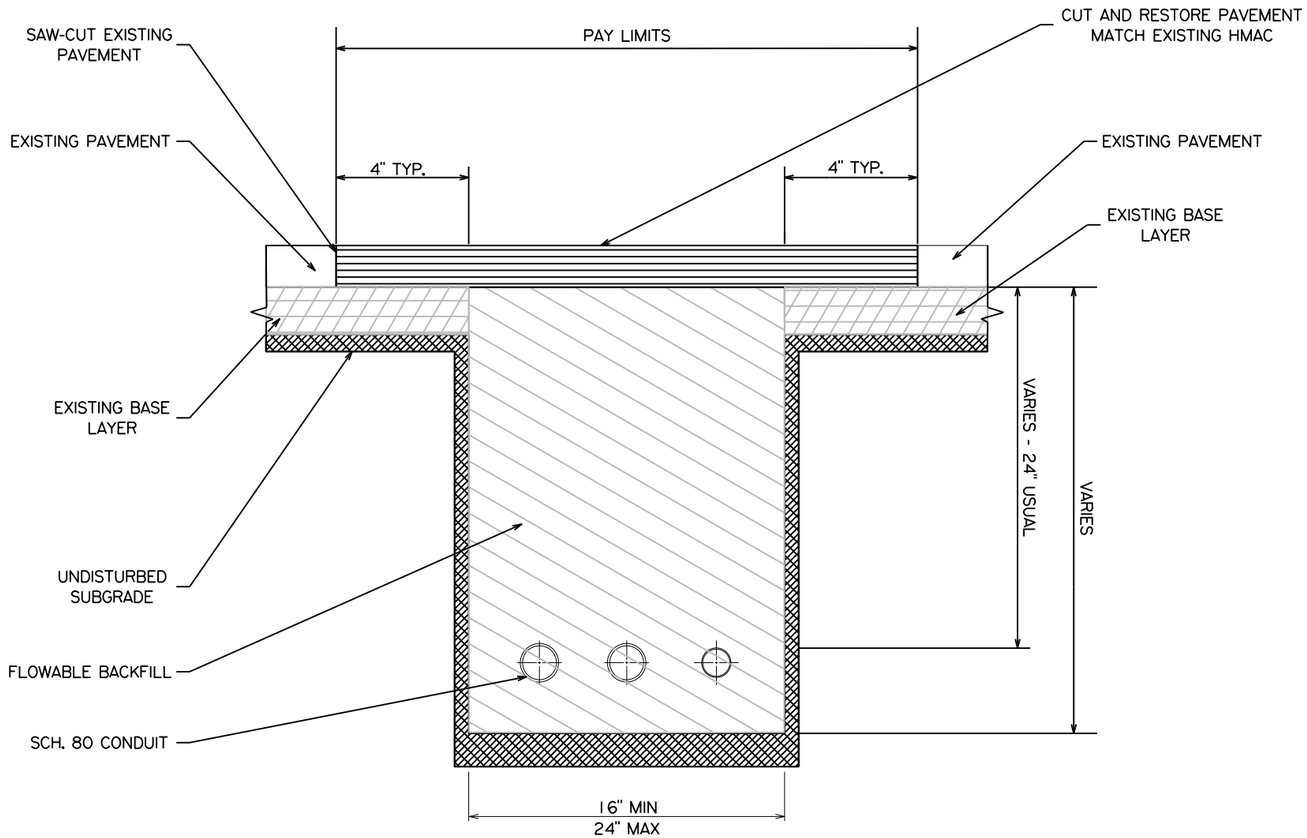
5. THE CONTRACTOR IS TO PLACE THE NEW CONDUIT UNDER THE ROADWAY BY THE OPEN CUT (TRENCH). BACKFILL THE TRENCH WITH FLOWABLE CONCRETE BACKFILL. COMPLETE BACKFILL WITH A MAX OF 6" OF HMAC AND PROVIDE A SMOOTH DRIVING SURFACE. RESTRIPE PAVEMENT MARKINGS THAT ARE DAMAGED IN TRENCHING OPERATIONS

6. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES (PUBLIC AND PRIVATE) PRIOR TO COMMENCING WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY THE CONTRACTORS FAILURE TO LOCATE, PRESERVE AND PROTECT THESE UTILITIES, WHETER UNDERGROUND, ABOVE GROUND OR OVER HEAD.

7. CONTRACTOR WILL EXERCISE CAUTIONWHEN EXCAVATING IN THE VICINITY OF UNDERGROUND UTILITIES.

8. ALL CONDUITS UNDER ROADWAYS AND PAVED SHOULDERS WILL BE TRENCHED.

9. ALL PVC CONDUIT WILL BE SCHEDULE 80.



OPEN TRENCH/
CUT AND RESTORE PAVEMENT DETAIL

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation

PAVEMENT CUT AND RESTORE DETAIL

FHWA TEXAS DIVISION	FEDERAL AID PROJECT		SHEET NO.
	SEE TITLE SHEET		83
STATE	DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC

GENERAL NOTES FOR ALL ELECTRICAL WORK

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

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

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

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

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

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

CONDUIT

A. MATERIALS

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

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

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

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

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

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

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

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

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

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

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

B. CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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		DIST	COUNTY		SHEET NO.
		SAT	GUADALUPE		84

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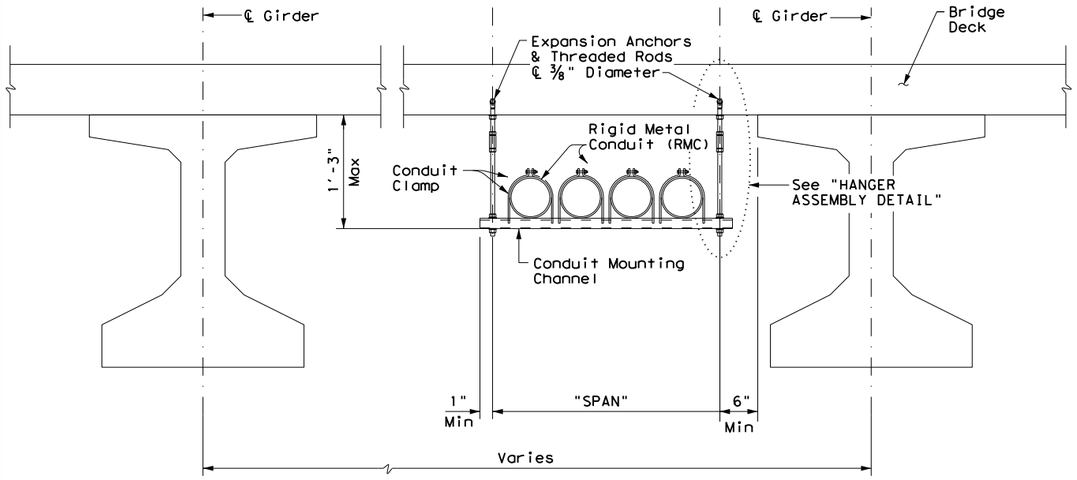
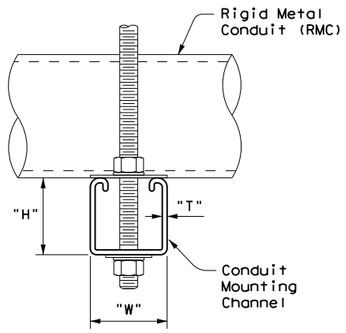
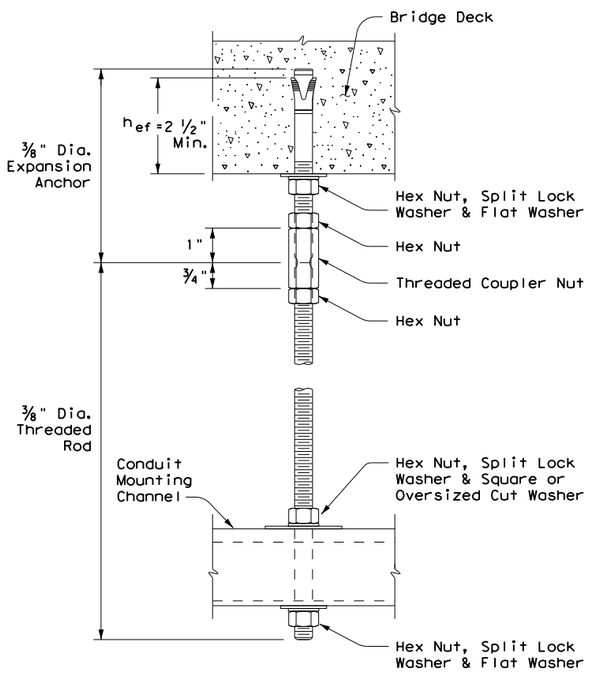


CONDUIT HANGING DETAIL

CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

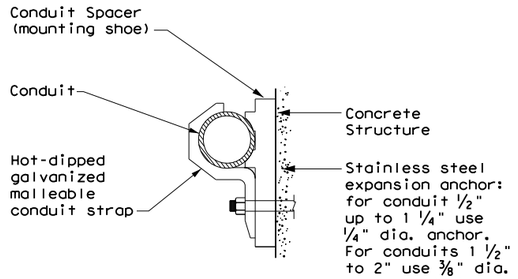
Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.

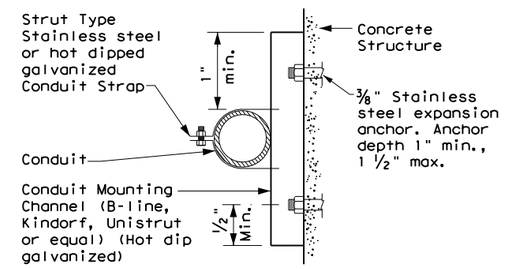




HANGER ASSEMBLY DETAIL

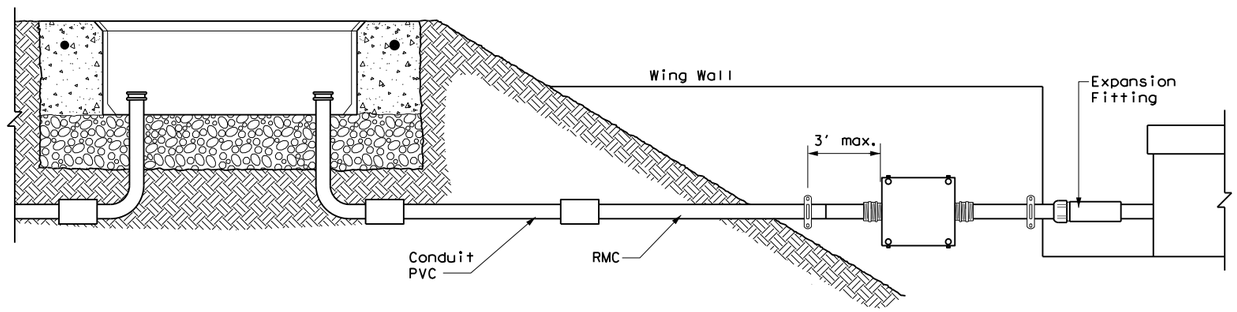
ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT





CONDUIT MOUNTING OPTIONS

Attachment to concrete surfaces
See ED(1)B.2



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.

2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.

3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.

4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.

5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef})as needed to ensure sufficient thread length for proper torqueing and tightening of anchors.

6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
CONDUIT SUPPORTS

ED(2)-14

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REVISIONS	0025	03	105, ETC	UA 90, ETC
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	SAT	GUADALUPE		85

71B

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

1. Provide Type XHHW insulated conductors in accordance with Departmental Material Specification (DMS)11040 "Conductors" and Item 620 "Electrical Conductors." Provide conductors as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 620. Color code insulated conductors in conformance with the NEC. Identify grounded (neutral) conductors with white insulation. Identify grounding conductors (ground wires) with green insulation or bare conductors. Identify ungrounded (hot) conductors with any color insulation except green, white, or gray. Keep color scheme consistent throughout the wiring system. Identify conductors 6 American Wire Gauge (AWG) and smaller by continuous color jacket. Identify electrical conductors 4 AWG and larger by continuous color jacket or by colored tape. When identifying conductors with colored tape, mark at least 6 in. of the conductor's insulation with half laps of tape.

2. Provide a solid copper 6 AWG grounding electrode conductor to bond the electrical service equipment to the concrete encased grounding electrode or the ground rod at the service location. Connect the grounding electrode conductor to the ground rod with a UL listed connector in accordance with DMS 11040. Connect the grounding electrode conductor to the concrete encased grounding electrode as shown in the plans.

3. Where two or more circuits are present in one conduit or enclosure, permanently identify the conductors of each branch circuit by attaching a non-metallic tag around both circuit conductors at each accessible location. Provide tags with two straps, large enough to indicate circuit number, letter, or other identification as shown in the plans. Print circuit identification on the tag with a permanent marker.

4. Use listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors for splicing as specified in DMS 11040. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Provide UL listed gel-filled insulating splice covers. Splicing materials, insulating materials, breakaway disconnects, splice covers, and fuse holders are subsidiary to various bid items.

B. CONSTRUCTION METHODS

1. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the conduit system. After installing conductors in conduit, perform conductor pull test. If a conductor cannot be freely pulled, make any needed alterations or repairs at no additional cost to the department. Perform insulation resistance tests in accordance with Item 620. Coordinate with the Engineer to witness the tests.

2. Leave 2 ft. minimum, 3 ft. maximum length for each conductor up to the splice in ground boxes. Leave 3 ft. minimum, 4 ft. maximum length of conductor in ground boxes when pulled through with no splice. Leave 1 ft. minimum, 1.5 ft. maximum length of conductor at enclosures, weatherheads and pole bases.

3. Make splices only in junction boxes, ground boxes, pole bases, or electrical enclosures and use only listed compression or screw type pressure connectors, terminal blocks, or split bolt connectors. Insulate splices with heavy wall heat shrink tubing or gel-filled insulating splice covers to provide a watertight splice. Overlap conductor insulation with heat shrink tubing a minimum of 2 in. past both sides of the splice. Where heat shrink tubing may not shrink sufficiently to provide a watertight seal around the individual conductors, prior to heating the tubing, increase the diameter of the conductor insulation using hot melt adhesive tape to provide a watertight seal between the individual conductors and the heat shrink tubing. Ensure the tape extends past the heat shrink tubing. Use hot melt adhesive tape to fill the gap and seal the ends of heat shrink tubing. Heat shrink tubing that appears to have been burned, or overheated, is considered defective and must be replaced.

4. Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.

5. Wire nuts with factory applied waterproof sealant may be used for 8 AWG or smaller conductors in above ground junction boxes, but not in pole bases or ground boxes. Install wire nuts in an upright position to prevent the accumulation of water.

6. Support conductors in illumination poles with a J-hook at the top of the pole.

7. When terminating conductors, remove the insulation and jacketing material without nicking the individual strands of the conductor. Conductors with nicked individual conductor strands or removed strands will be considered damaged.

8. Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.

9. Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.

10. Do not terminate more than one conductor under a single connector, unless the connector is rated for multiple conductors. Do not exceed the pressure connector's listing for maximum number and size of conductors allowed.

11. Install breakaway connectors on conductors bid under Item 620 whenever those conductors pass through a breakaway support device. Follow manufacturer's instructions when terminating conductors to breakaway connectors. Properly torque threaded connections. Proper terminations are critical to the safe operation of breakaway devices. Trim waterproofing boots on breakaway connectors to fit snugly around the conductor to ensure waterproof connection. Only one conductor may enter a single opening in a boot. Provide waterproof boots with the correct number of openings. Leave unused openings factory sealed. Use prequalified breakaway connectors as shown on the MPL.

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.

2. Provide a ground fault circuit interrupter (GFCI) for power outlets for portable electrical equipment, power tools, ice machines, ice storage bins and refrigerators located outdoors at grade. GFCI may be any one of the following: molded cord and plug set, receptacle, or circuit breaker type.

3. Use listed wire nuts with factory applied sealant for temporary wiring where approved.

4. Enclose conductor splices within a listed enclosure or ground box, or ensure the splices are more than 10 ft. above grade vertically and more than 5 ft. horizontally from any metal structure. Where installing temporary conductors in areas subject to vehicle traffic or mobile construction equipment, ensure the vertical clearance to ground is at least 18 ft. when measured at the lowest point. Ground messenger wires that support power conductors in conformance with the NEC.

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

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

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.

2. Do not place ground rods in the same drilled hole as a timber pole.

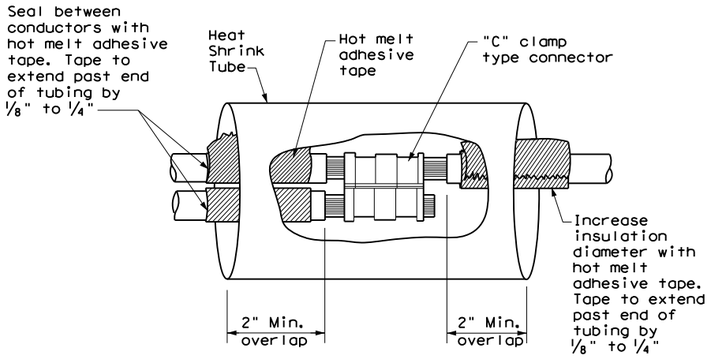
3. Install ground rods so the imprinted part number is at the upper end of the rod.

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

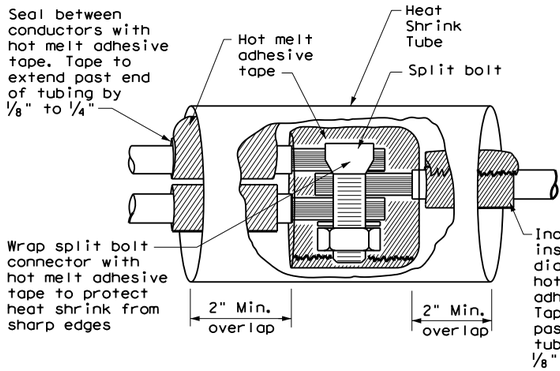
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding electrode conductors with non-metallic conduit. When protecting grounding electrode conductors with metal conduit, provide and install a grounding type bushing and properly sized bonding jumper on each end of the metal conduit.

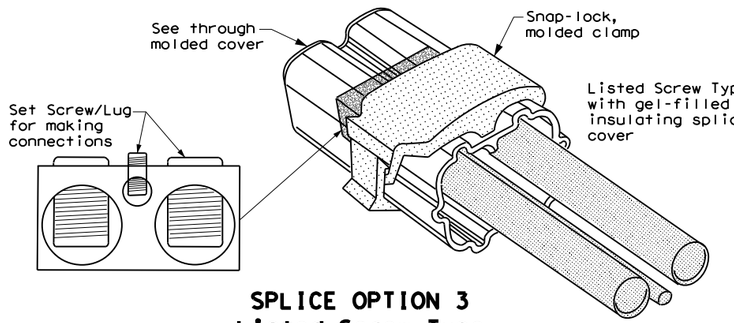
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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		SAT	GUADALUPE				86

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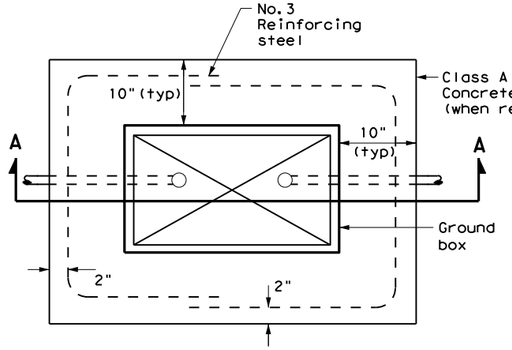
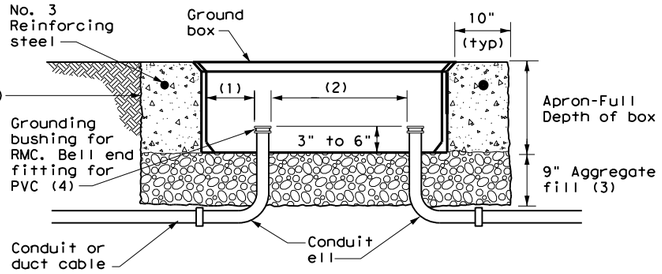


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

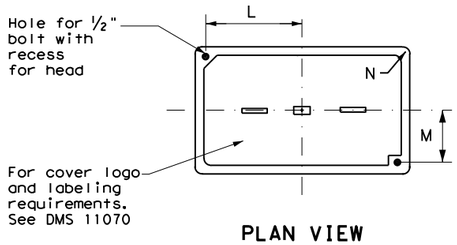
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

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

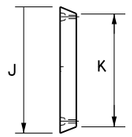
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

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



PLAN VIEW



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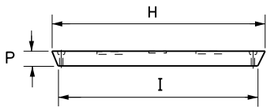

SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

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

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

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

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS GROUND BOXES

ED(4)-14

FILE: ed4-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	SAT	GUADALUPE		87

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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

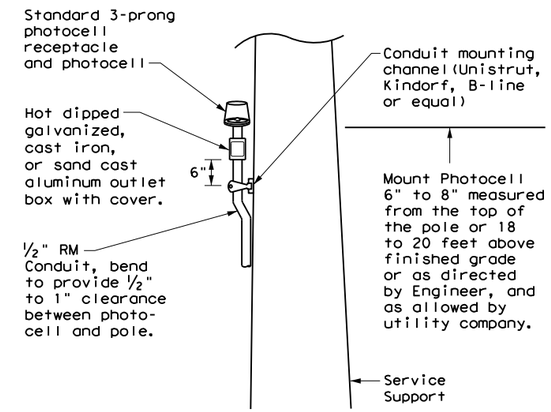
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

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

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DATE:
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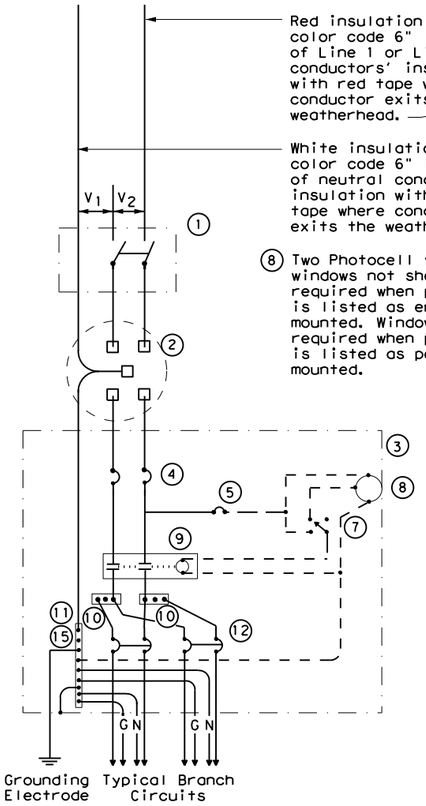
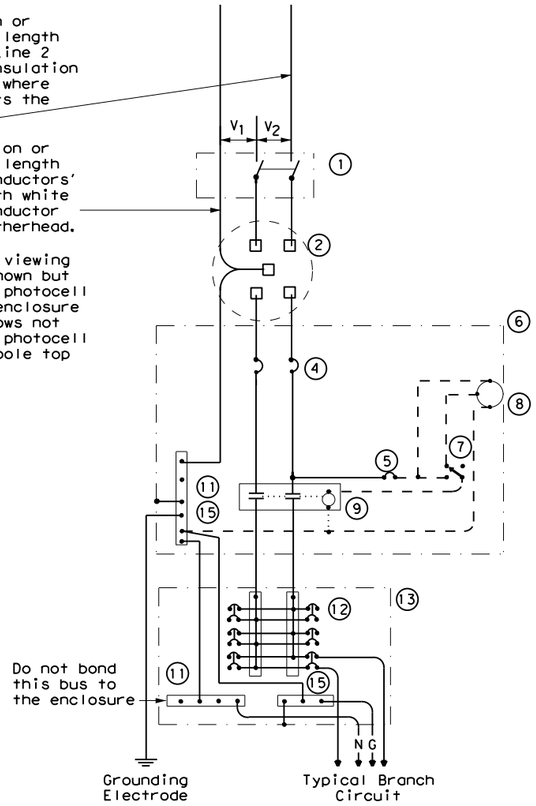
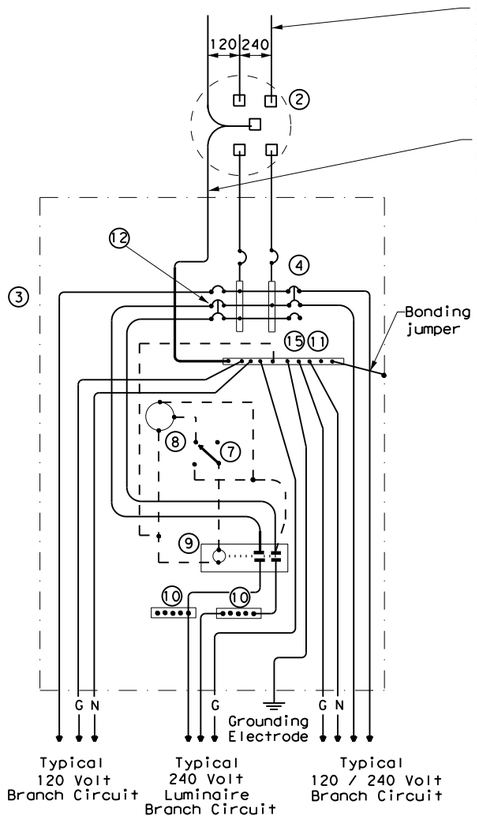


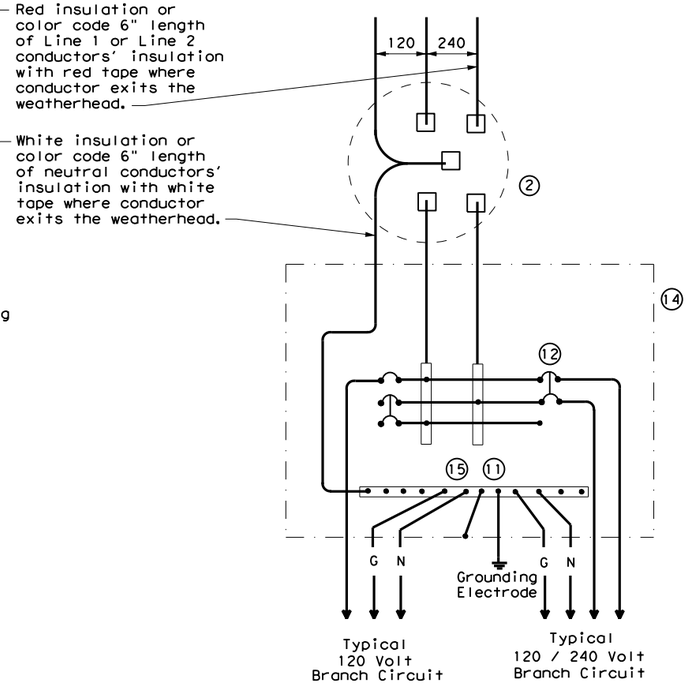
SCHEMATIC TYPE A
THREE WIRE



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

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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.

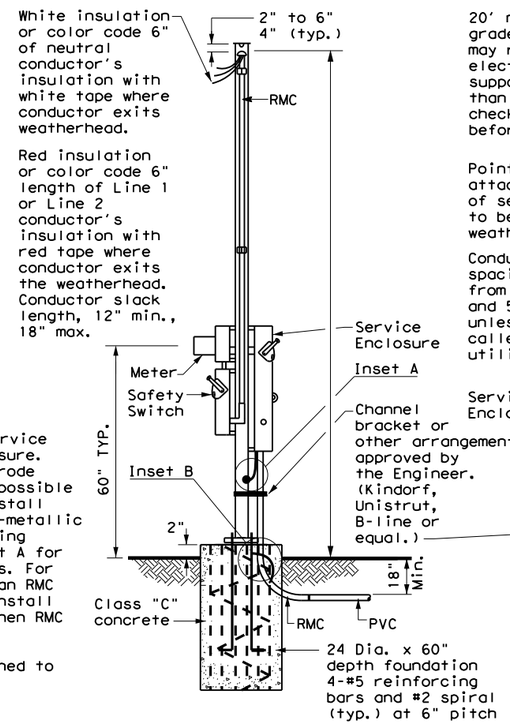
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode 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.

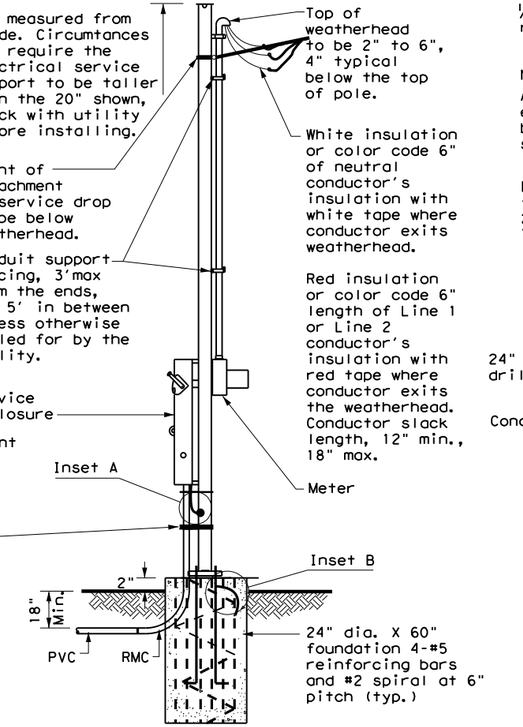
9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.

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.

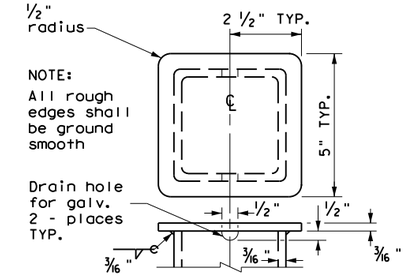


WITH SAFETY SWITCH

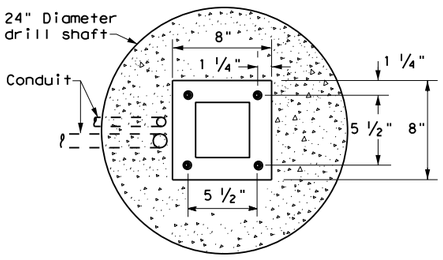


WITHOUT SAFETY SWITCH

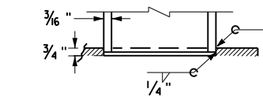
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE



POLE TOP PLATE

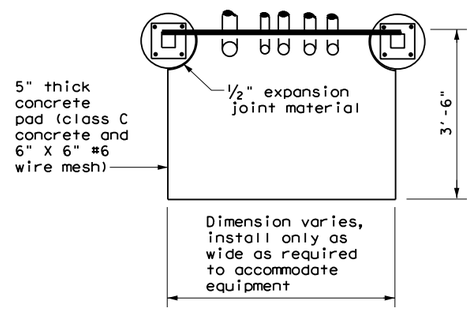


BASE PLATE DETAIL



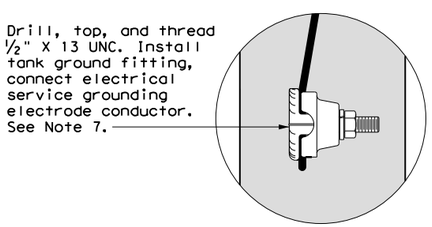
BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



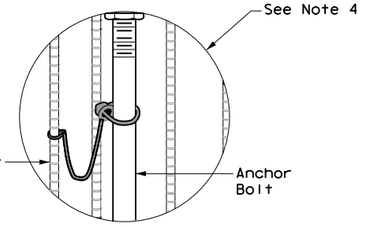
TOP VIEW

SERVICE SUPPORT TY SF (O) & SF (U)

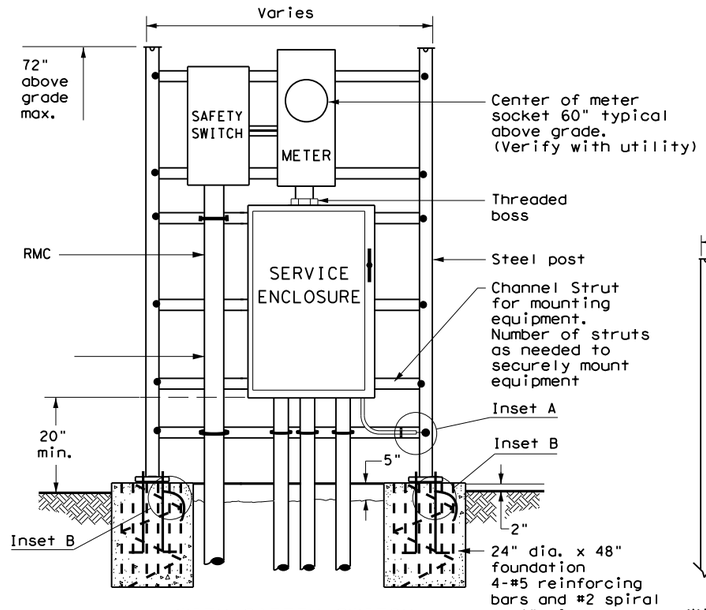


FRONT VIEW

INSET A

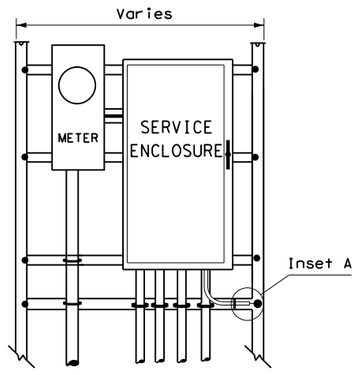


INSET B

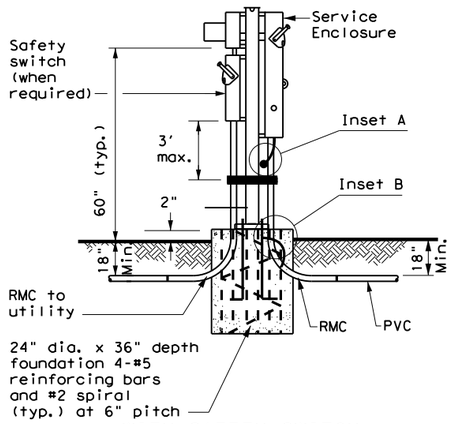


WITH SAFETY SWITCH

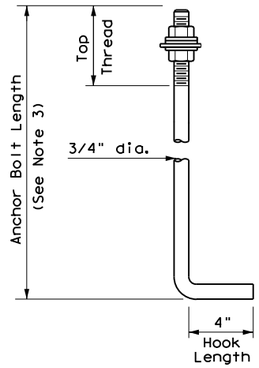
FRONT VIEW



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

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	SAT	GUADALUPE		90

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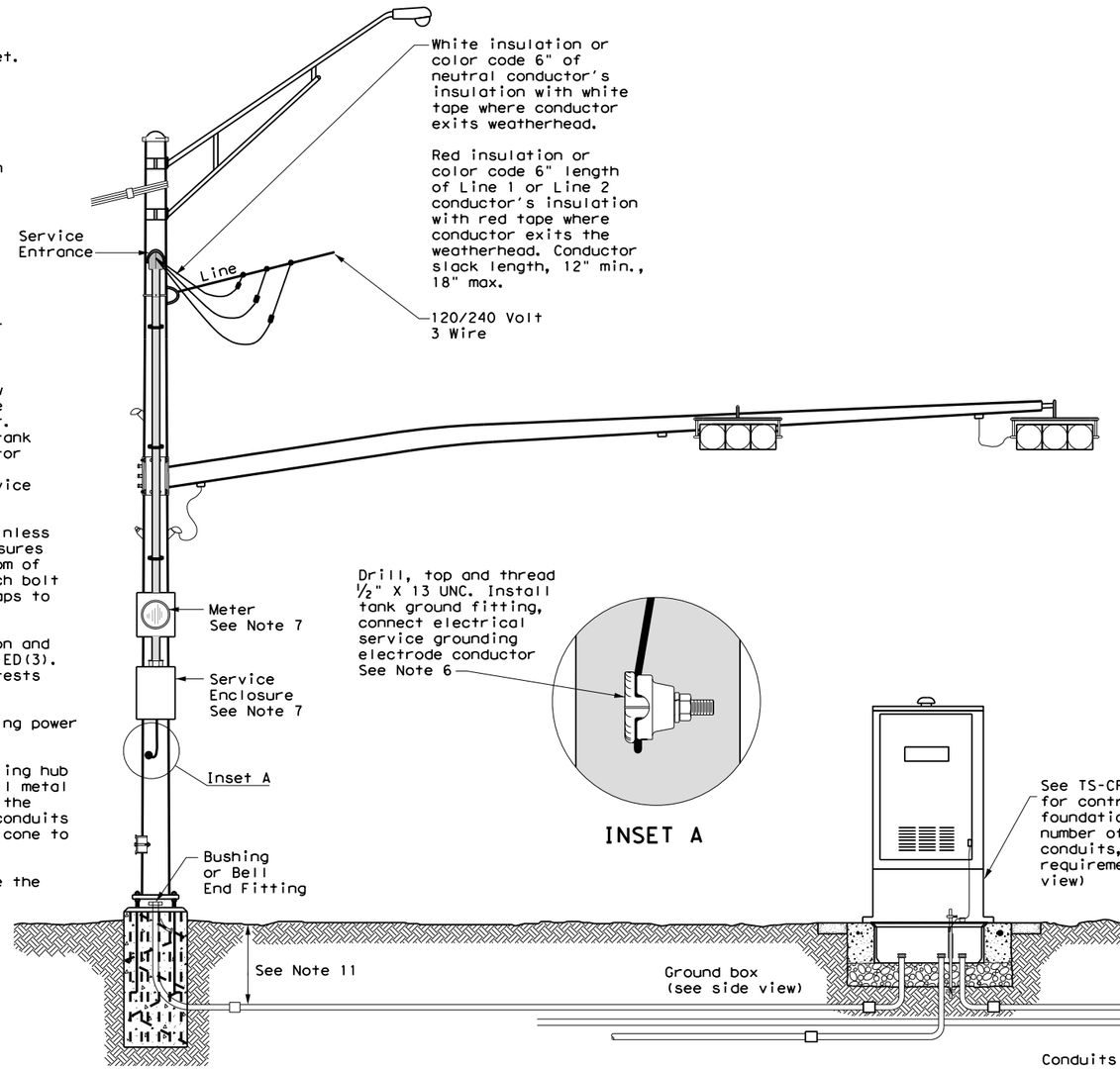
TRAFFIC SIGNAL NOTES

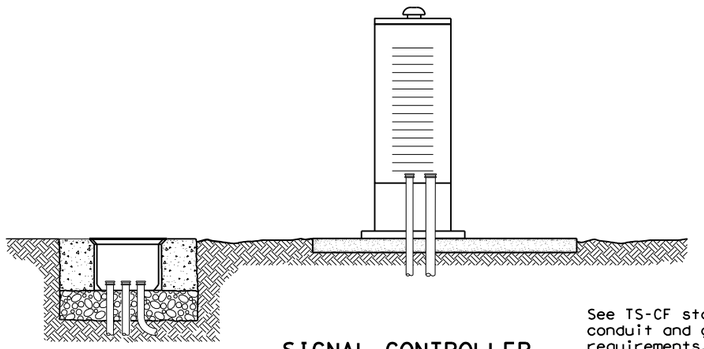
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material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



SIGNAL POLE WITH SERVICE

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

INSET A



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

FILE: ed8-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0025	03	105, ETC	UA 90, ETC
	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		91

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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.

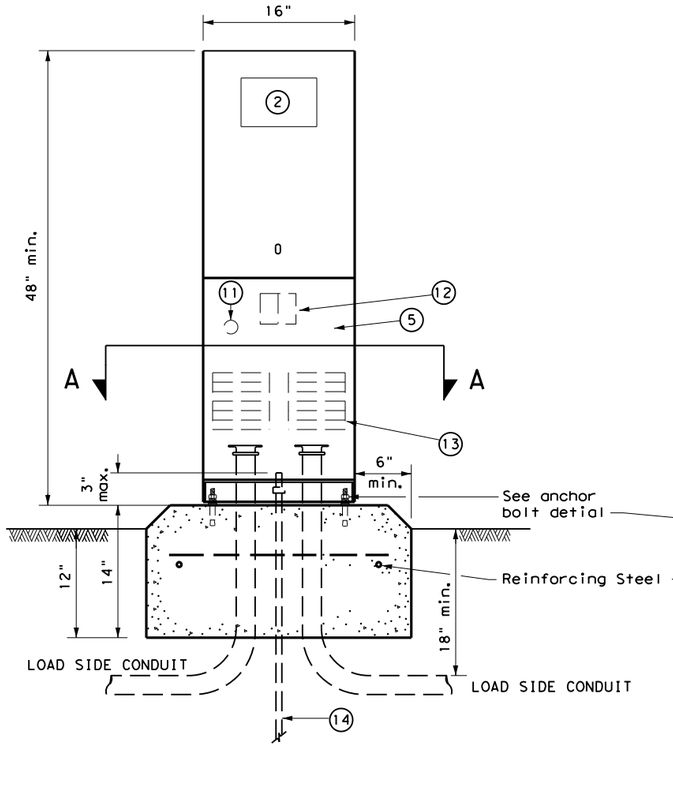
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."

5. Install ½ in. X 2 ⅛ in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a ½ in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.

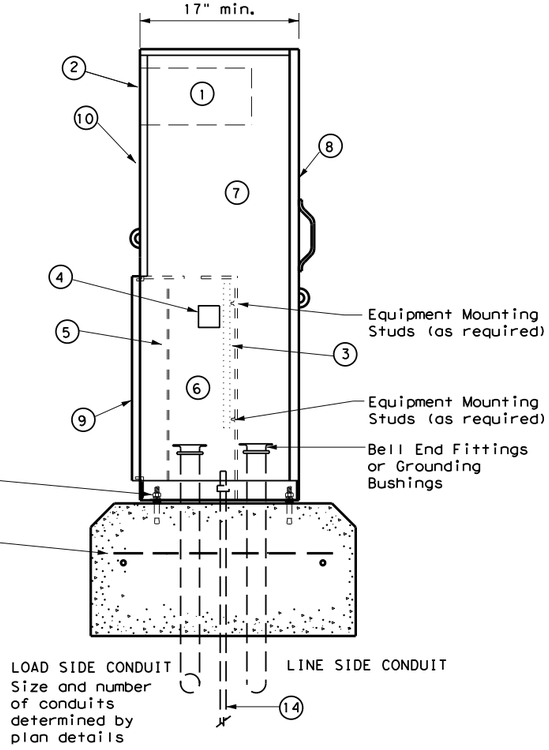
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than ⅛ in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of ⅛ in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within ¼ in. Repair rocking or movement of the service enclosure at no additional cost to the department.

7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.

8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.

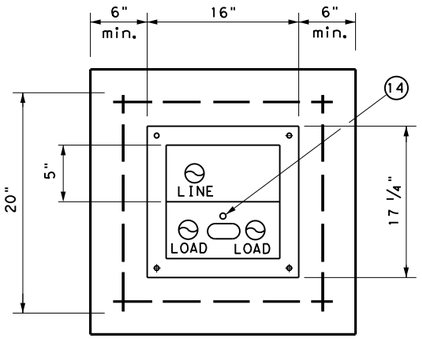


FRONT VIEW

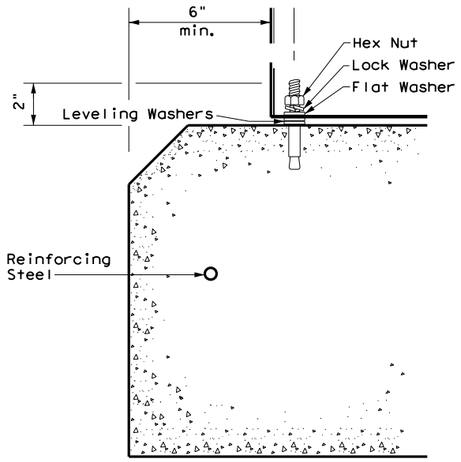


SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A



ANCHOR BOLT DETAIL

LEGEND	
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
ELECTRICAL SERVICE SUPPORT
PEDESTAL SERVICE TYPE PS

ED(9)-14

FILE: ed9-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT			
	CONT	SECT	JOB	HIGHWAY			
REVISIONS	0025	03	105, ETC	UA 90, ETC			
	DIST	COUNTY		SHEET NO.			
	SAT	GUADALUPE		92			

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TIMBER POLE (TP) SERVICE SUPPORT NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627 "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Conduit and electrical conductors attached to the electrical service pole and underground within 12 in. of service pole are not paid for directly but are subsidiary to the electrial service.
3. Install pole-top mounted photocell (T) on north side of pole, or in service enclosure (E) as required. See Electrical Service Data chart in plan set.
4. Gain pole as required to provide flat surface for each channel. Gain timber pole to 5/8 in. max. depth and 1 7/8 in. max. height. Gain pole in a neat and workmanlike manner.
5. Mount meter and service equipment on stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Provide channel sized 1 in. to 3 3/4 in. maximum depth, and 1 1/2 in. to 1 5/8 in. maximum width. File smooth the cut ends of galvanized channel and paint with zinc rich paint before installing on pole. Secure each channel section to timber pole with two galvanized or SS lag bolts, 1/4 in. minimum diameter by 1 1/2 in. minimum length. Use a galvanized or SS flat washer on each lag bolt. Do not stack channel.
6. When excess length must be trimmed from poles, trim from the top end only.

(1) Class 5 pole, height as required

(2) Service drop from utility company (attached below weatherhead)

(3) Service conduit (RMC) and service entrance conductors - One Red, One Black, One White (See Electrical Service Data)

(4) Safety switch (when required)

(5) Meter (when required)

(6) Service enclosure

(7) 6 AWG bare grounding electrode conductor in 1/2 in. PVC to ground rod - extend 1/2 in. PVC 6 in. underground.

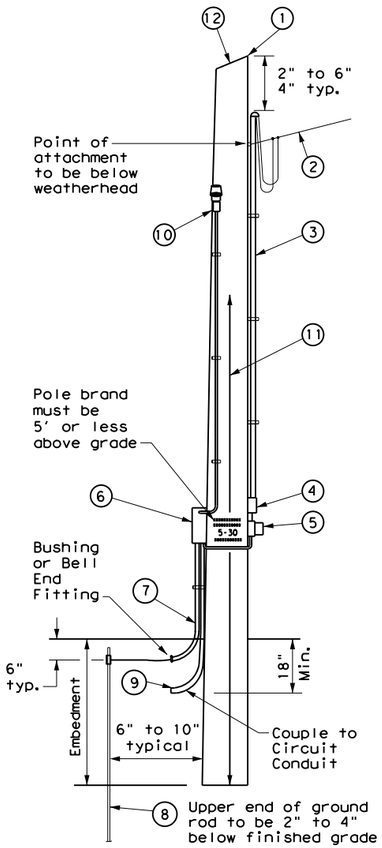
(8) 5/8 in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.

(9) RMC same size as branch circuit conduit.

(10) See pole-top mounted photocell detail on ED(5).

(11) When required by the serving utility provide bare 6 AWG copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor with non-conductive material to a height of 8 ft. above finished grade.

(12) When required by utility, cut top of pole at an angle to enhance rain run off.

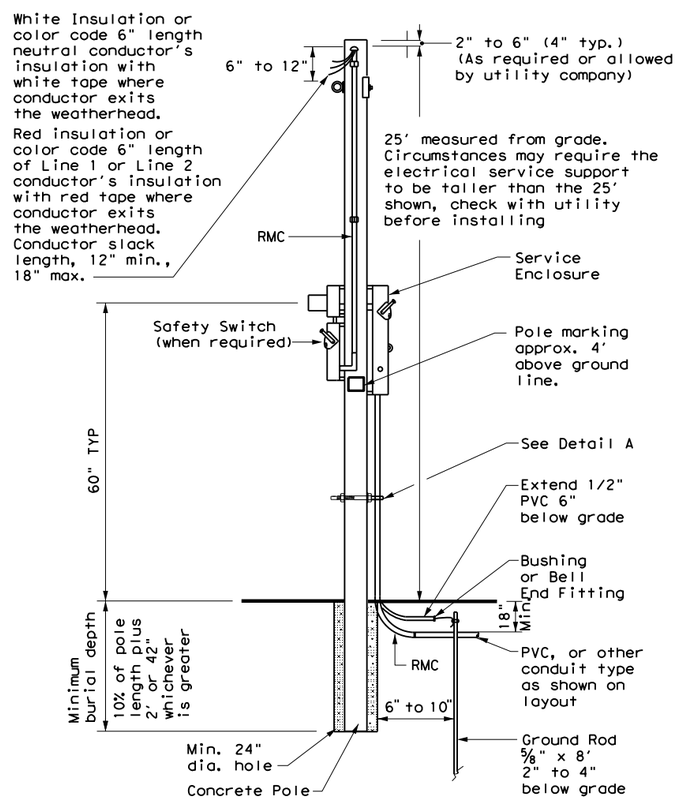


SERVICE SUPPORT TYPE TP (O)

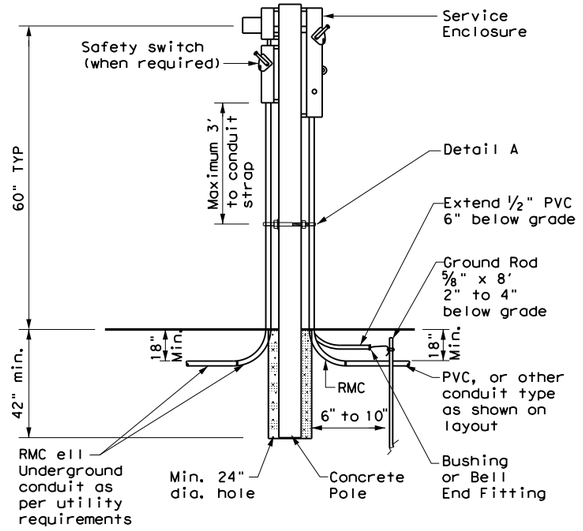
GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

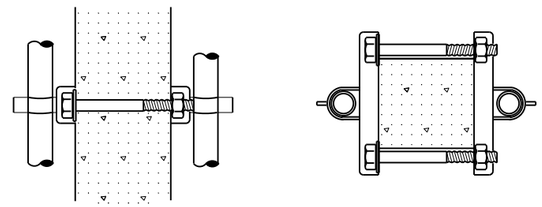
1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' above final grade. Use the two-point pickup locations when handling pole in horizontal position, and one-point pickup location for use in raising the pole to a vertical position. These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., whichever is greater.
5. Ensure all installation details of services are in accordance with utility company specifications.
6. Install a one point rack or eye bolt bracket 6 inches to 12 inches below the weatherhead as an overhead service drop anchoring point for the electric utility.
7. Furnish and install galvanized or stainless steel channel strut 1 1/2 in. or 1 5/8 in. wide by 1 in. up to 3 3/4 in. deep (Unistrut, Kindorf, B-line or equal). Attach channel strut with stainless steel concrete anchors (max. 1" depth), square U-bolts or back to back channel strut with long bolts, or other secure mounting as approved by the Engineer. Ensure bolts are galvanized in accordance with ASTM A153. Do not stack channel struts.
8. Backfill the holes thoroughly by tamping in 6 in. lifts. After tamping to grade, place additional backfill material in a 6 inch high cone around the pole to allow for settling. Use material equal in composition and density to the surrounding area. Backfilling will not be paid for directly but is subsidiary to various bid items.



CONCRETE SERVICE SUPPORT
Overhead (O)



CONCRETE SERVICE SUPPORT
Underground (U)



DETAIL A

See Note 7. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP

ED(10)-14

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DUCT CABLE & HDPE CONDUIT NOTES

1. Provide duct cable in accordance with Departmental Material Specification (DMS) 11060 "Duct Cable" and Item 622 "Duct Cable." Provide duct cable as listed on the Material Producer List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 622.

2. Provide High-Density Polyethylene (HDPE) conduit in accordance with DMS 11060 and Item 618, "Conduit." Provide HDPE as listed on the MPL on the Department web site under "Roadway Illumination and Electrical Supplies," Item 618.

3. Supply duct cable with a minimum 2 in. diameter, unless otherwise shown in the plans. Provide duct cable and HDPE conduit as shown by descriptive code or on the plans. Bend duct cable and HDPE conduit as recommended by the manufacturer, with a minimum bending radius of 26 in. for 2 in. duct. Follow manufacturers' recommendations when handling duct cable and HDPE conduit reels and during installation of duct cable and HDPE conduit.

4. Do not splice conductors within duct cable or HDPE conduit. Couple duct cable and HDPE entering a ground box or foundation to a PVC elbow. When galvanized steel RMC elbows are called for in the plans and any portion of the RMC elbow is buried less than 18" from possible contact, ground the RMC elbow.

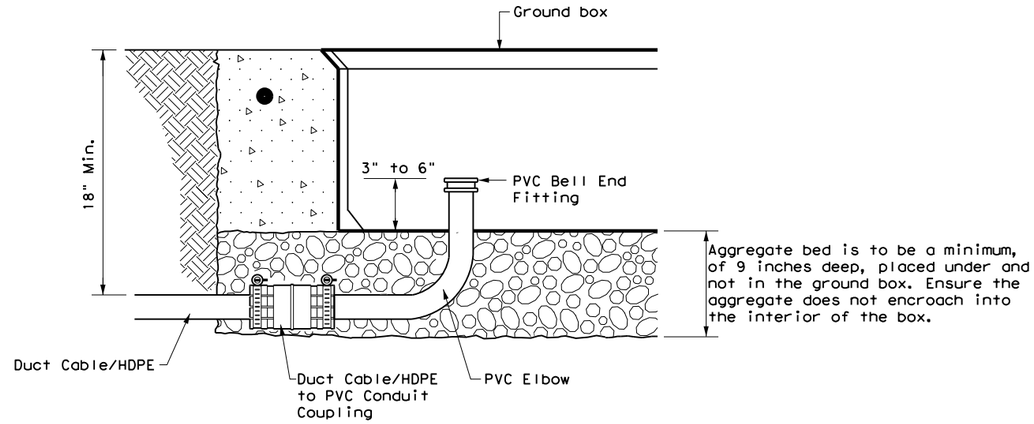
5. Furnish and install duct cable with factory installed conductors, sized as shown in the plans and as required by the National Electrical Code (NEC). The NEC contains specific requirements for duct cable in Article, "Nonmetallic Underground Conduit with Conductors: Type NUCC."

6. When conduit casing is called for in the plans, extend duct cable or HDPE conduit through the conduit casing in one continuous length without connection to the casing.

7. Seal the ends of duct cable or HDPE conduit with duct seal, expandable foam, or other approved method after completing the pull tests required by Item 622.

8. Provide minimum cover of 24 in. under roadways, 18 in. in other locations, or as shown on the plans.

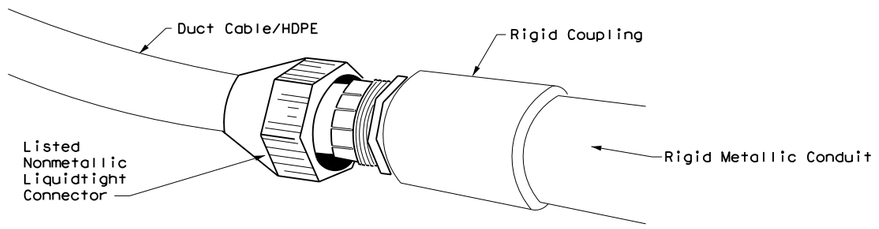
9. Furnish and install listed fittings to couple duct cable or HDPE conduit to other types of conduit. Duct cable and HDPE conduit may be field-threaded and spliced with PVC or RMC threaded couplings; connected with listed tie-wrap fittings; connected using listed coupling made of HDPE with stainless steel external banding clamps and locking rings; connected with approved electrofusion conduit couplings; or connected using an approved chemical fusion method using an epoxy or adhesive specifically designed for HDPE couplings and connectors all installed in accordance with their manufacturer's instructions. Do not use PVC glue on HDPE. Do not use water pipe fittings, or connect conduit with heat shrink tubing.



DUCT CABLE/HDPE AT GROUND BOX

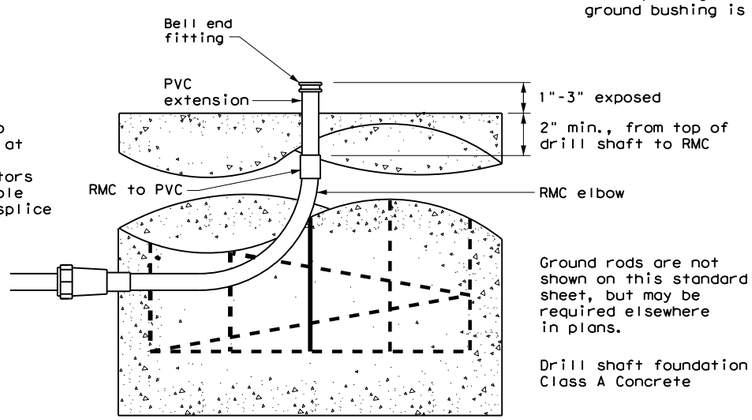
When the upper end of an RMC Ell does not enter the ground box, it may be extended with a SCH-40 PVC conduit nipple and bell end, provided there is a minimum of 18" of cover over all parts of the elbow. If not, a rigid extension and ground bushing is required.

DUCT CABLE/HDPE TO PVC

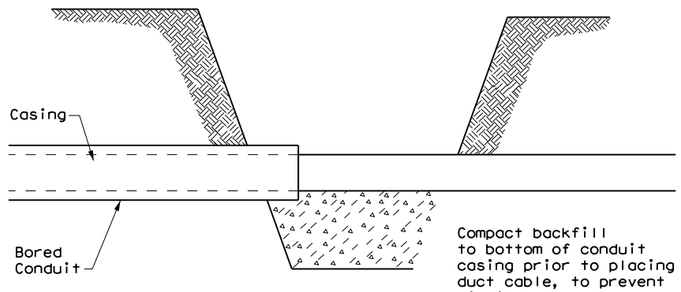


DUCT CABLE/HDPE TO RMC

Couple duct to conduit elbow at foundations. Ensure conductors extend into pole base. Do not splice conductors in conduit.



DUCT CABLE / HDPE AT FOUNDATION



BORE PIT DETAIL

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
DUCT CABLE/ HDPE CONDUIT

ED(11)-14

FILE: ed11-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	SAT	GUADALUPE		94

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BATTERY BOX GROUND BOXES NOTES

A. MATERIALS

1. Provide polymer concrete or fiberglass reinforced plastic (FRP) battery box ground box and cover in accordance with Departmental Material Specification (DMS) 11071 "Battery Box Ground Boxes." Battery box will accommodate up to 4 batteries, each measuring 8 in. x 13.5 in. x 10 in. (W x L x D). Label battery box ground box cover in accordance with DMS 11071.

2. Supply a marine grade batteries with covers. Secure the marine grade batteries with covers to the stainless steel rack in the bottom of the ground box with tie down straps.

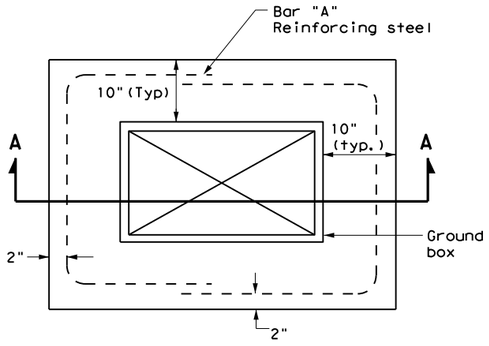
B. CONSTRUCTION METHODS

1. Ensure conduit entry will not interfere with placement of the batteries in the battery box ground box.

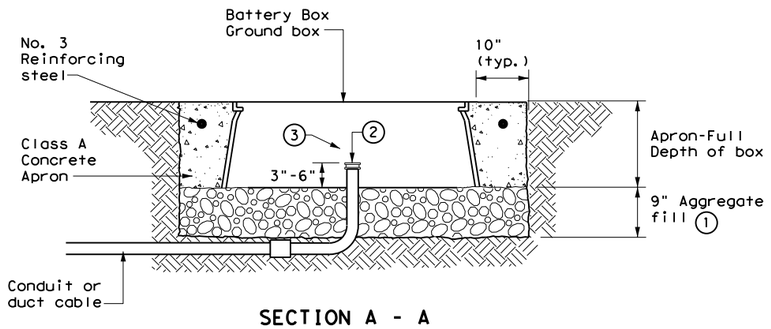
2. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting battery box ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure the aggregate bed is in place and is a minimum of 9 in. deep prior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

3. Cast battery 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. Battery box ground box aprons, including concrete and reinforcing steel, are subsidiary to battery box ground boxes when called for by descriptive code.

4. Bolt covers down when not working in battery box ground boxes. Keep bolt holes in the box clear of dirt.



PLAN VIEW



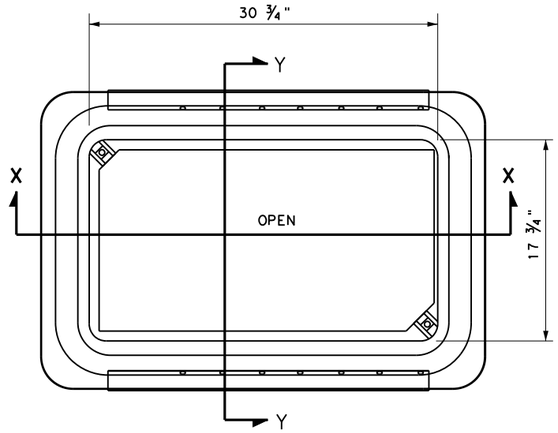
SECTION A - A

APRON FOR BATTERY BOX GROUND BOXES

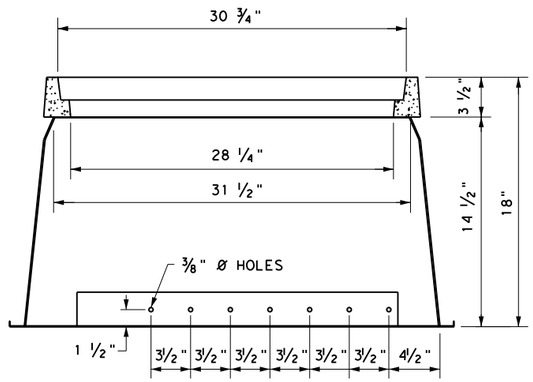
(1) Place aggregate under the box and not in the box. Aggregate should not encroach on the interior volume of the box.

(2) Install bushing or bell end fitting on the upper end of all ells.

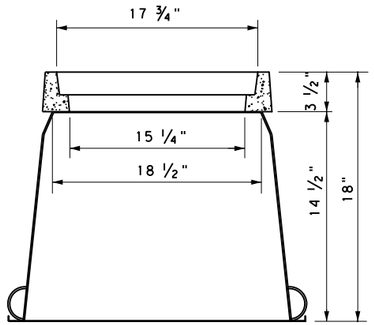
(3) Install all conduits in a neat and workmanlike manner.



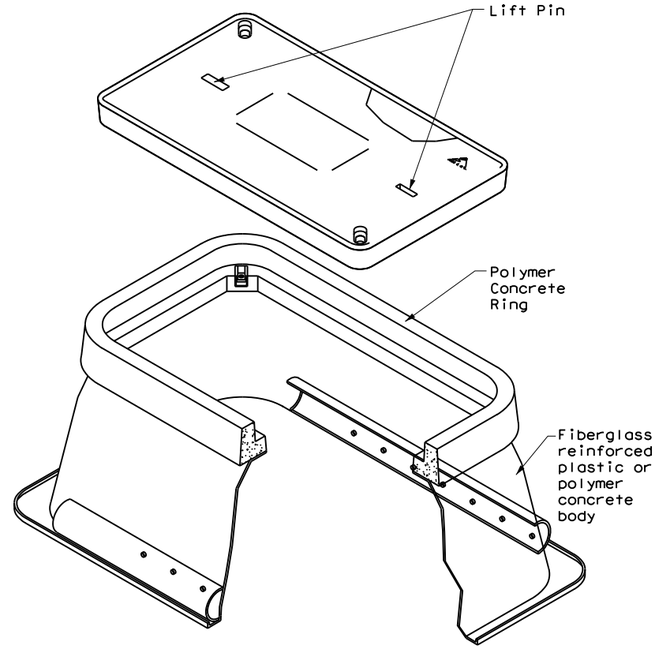
BATTERY BOX TOP VIEW



SECTION X-X



SECTION Y-Y



Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS BATTERY BOX GROUND BOXES

ED(12)-14

FILE: ed12-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	SAT	GUADALUPE		95

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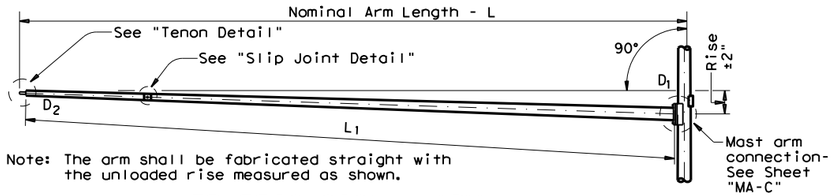
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179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

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

D_B = Pole Base O.D.
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)

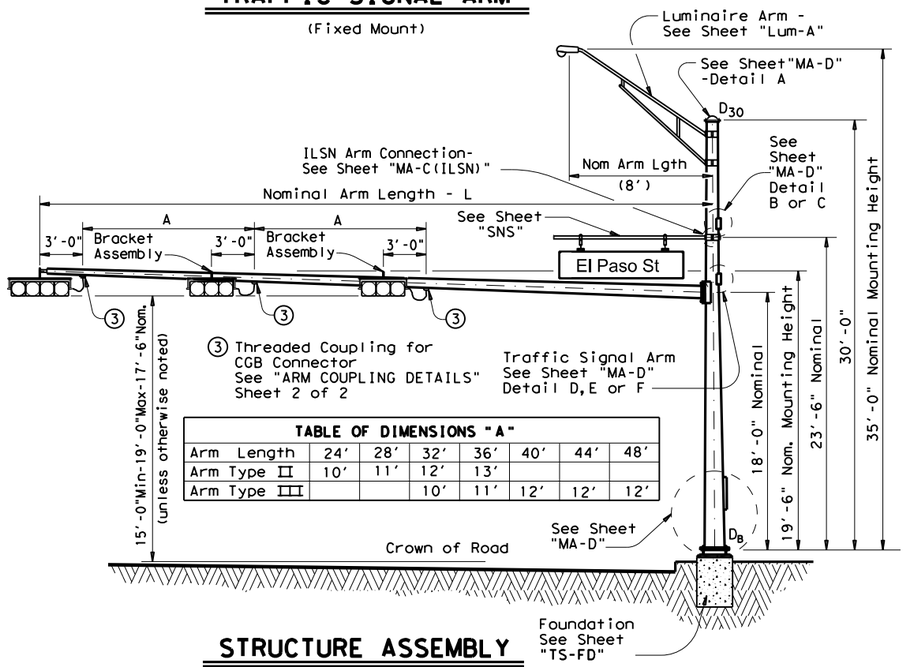


TABLE OF DIMENSIONS "A"							
Arm Length	24'	28'	32'	36'	40'	44'	48'
Arm Type II	10'	11'	12'	13'			
Arm Type III			10'	11'	12'	12'	12'

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	2	24S-80		24-80	
28	28L-80		28S-80		28-80	
32	32L-80		32S-80		32-80	
36	36L-80		36S-80		36-80	
40	40L-80	1	40S-80		40-80	4
44	44L-80	3	44S-80		44-80	2
48	48L-80		48S-80		48-80	

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	2		
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	5
44					44III-80	5
48					48III-80	

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

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

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ½"	3'-4"	
1 ¾"	3'-10"	12

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

REVISIONS
5-96
11-99
1-12

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

CONT	SECT	JOB	HIGHWAY
0025	03	105, ETC	UA 90, ETC

DIST	COUNTY	SHEET NO.
SAT	GUADALUPE	96

122A

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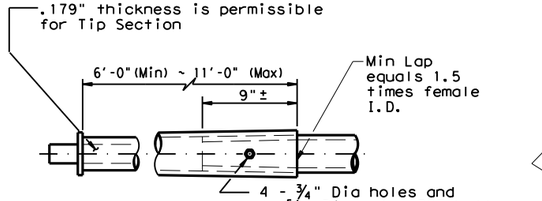
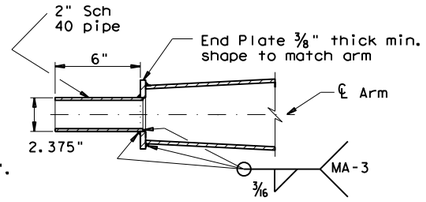


Note: A slip joint is permissible for arms 40' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

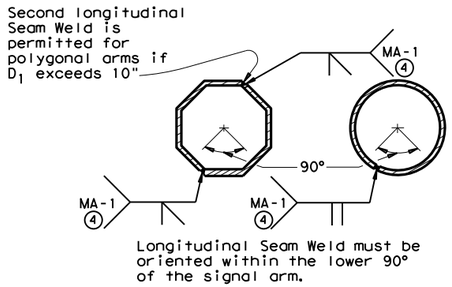
SLIP JOINT DETAIL



TENON DETAIL

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

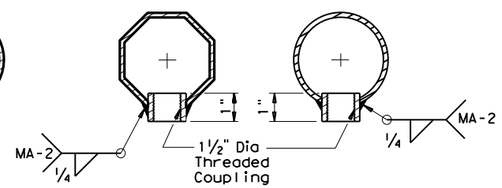
BRACKET ASSEMBLY



Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm.

ARM WELD DETAIL

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



ARM COUPLING DETAILS

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.

GENERAL NOTES:

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

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

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

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

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

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(2)-12

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

REVISIONS
5-96
1-12

CONT	SECT	JOB	HIGHWAY
0025	03	105, ETC	UA 90, ETC
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		97

122B

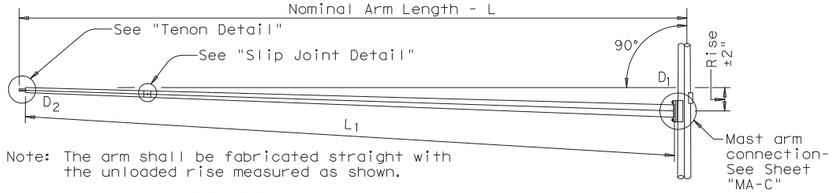
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179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

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

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

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

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



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

TRAFFIC SIGNAL ARM

(Fixed Mount)

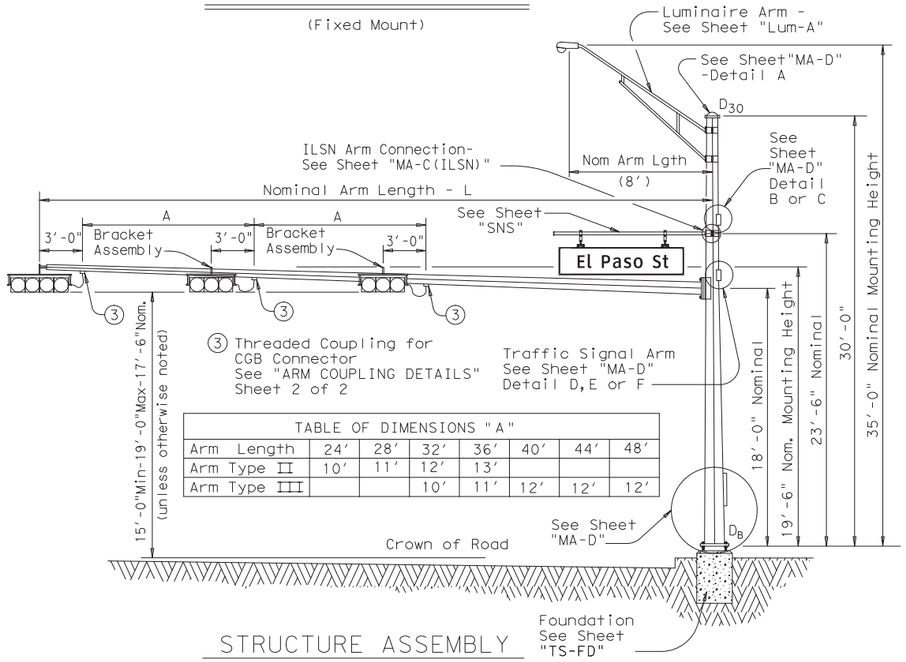


TABLE OF DIMENSIONS "A"

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

STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

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

Nominal Arm Length	30′ Poles With Luminaire		24′ Poles With ILSN		19′ Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-80		20S-80		20-80	
24	24L-80		24S-80		24-80	
28	28L-80		28S-80		28-80	
32	32L-80	2	32S-80		32-80	
36	36L-80		36S-80		36-80	
40	40L-80	2	40S-80		40-80	
44	44L-80		44S-80		44-80	
48	48L-80		48S-80		48-80	

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

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

Luminaire Arms (1 per 30′ pole)

Nominal Arm Length	Quantity
8′ Arm	4

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

Nominal Arm Length	Quantity
7′ Arm	
9′ Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ½"	3′-4"	2
1 ¾"	3′-10"	2

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.

FM 3009 AT WOODLAND OAKS DR

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(1)-12

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

REVISIONS
5-96
11-99
1-12

CONT	SECT	JOB	HIGHWAY
0025	03	105,ETC.	UA 90,ETC.
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		98

122A

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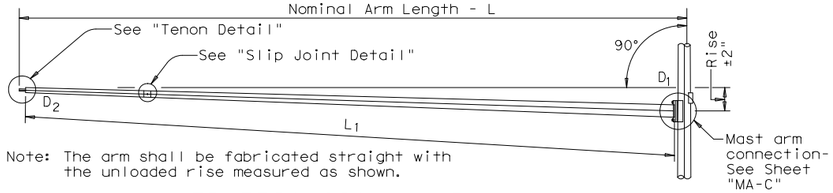
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179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

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

D_B = Pole Base O.D.
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)

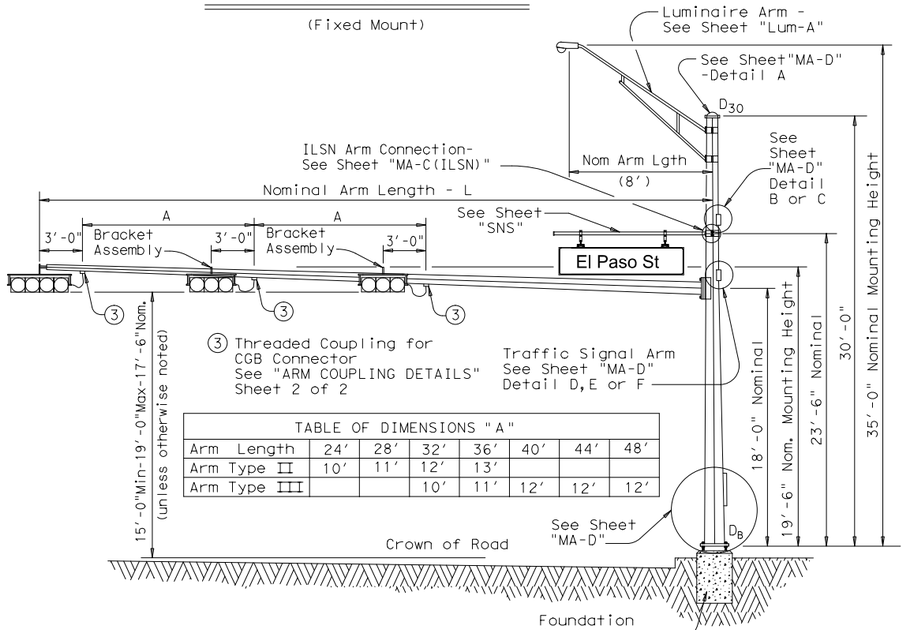


TABLE OF DIMENSIONS "A"

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	2	24S-80		24-80	
28	28L-80		28S-80		28-80	
32	32L-80		32S-80		32-80	
36	36L-80	2	36S-80		36-80	
40	40L-80		40S-80		40-80	
44	44L-80		44S-80		44-80	
48	48L-80		48S-80		48-80	

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	2		
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	2
40					40III-80	
44					44III-80	
48					48III-80	

Luminaire Arms (1 per 30′ pole)

Nominal Arm Length	Quantity
8′ Arm	4

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

Nominal Arm Length	Quantity
7′ Arm	
9′ Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ½"	3′-4"	2
1 ¾"	3′-10"	2

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.

FM 3009 AT BORGFELD RD

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(80 MPH WIND ZONE)

SMA-80(1)-12

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

REVISIONS
5-96
11-99
1-12

CONT	SECT	JOB	HIGHWAY
0025	03	105,ETC.	UA 90,ETC.
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		99

122A

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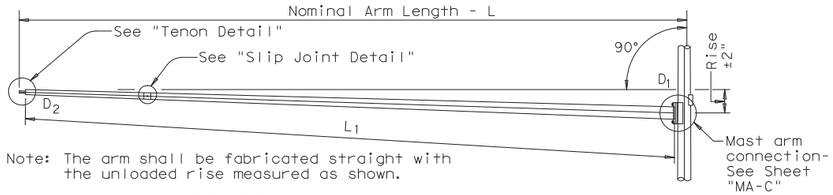
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	10.5	7.8	7.1	6.3	.179	11.5	8.5	7.7	6.8	.179	30-A
24	11.0	8.3	7.6	6.8	.179	12.0	9.0	8.2	7.3	.179	30-A
28	11.5	8.8	8.1	7.3	.179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

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

D_B = Pole Base O.D.
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)

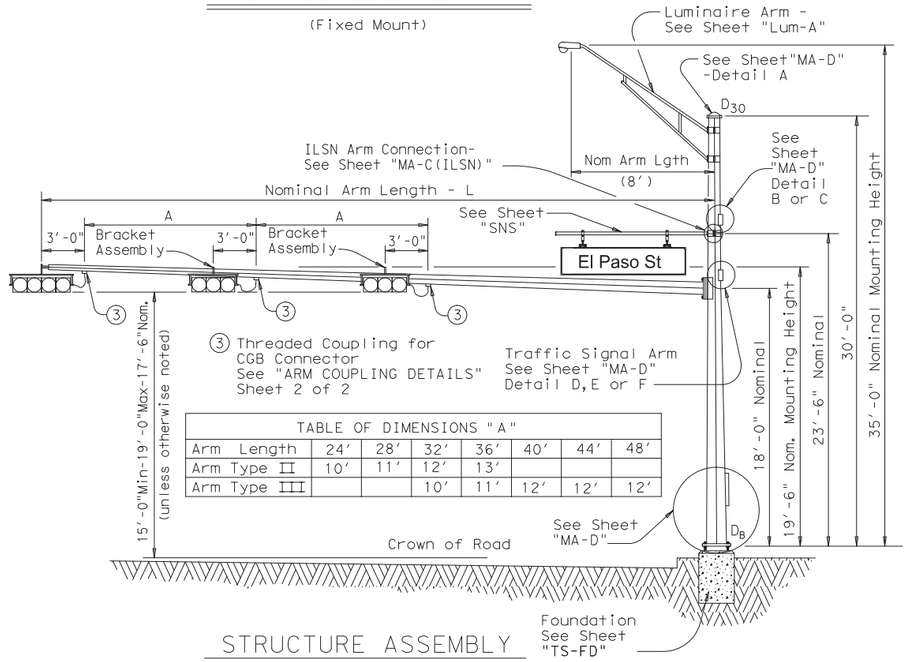


TABLE OF DIMENSIONS "A"

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	2	24S-80		24-80	
28	28L-80		28S-80		28-80	
32	32L-80		32S-80		32-80	
36	36L-80	2	36S-80		36-80	
40	40L-80		40S-80		40-80	
44	44L-80		44S-80		44-80	
48	48L-80		48S-80		48-80	

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	2		
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	2
40					40III-80	
44					44III-80	
48					48III-80	

Luminaire Arms (1 per 30′ pole)

Nominal Arm Length	Quantity
8′ Arm	4

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

Nominal Arm Length	Quantity
7′ Arm	
9′ Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 ½"	3′-4"	2
1 ¾"	3′-10"	2

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.

FM 3009 AT BORGFELD RD

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
0025	03	105,ETC.	UA 90,ETC.
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		100

122A

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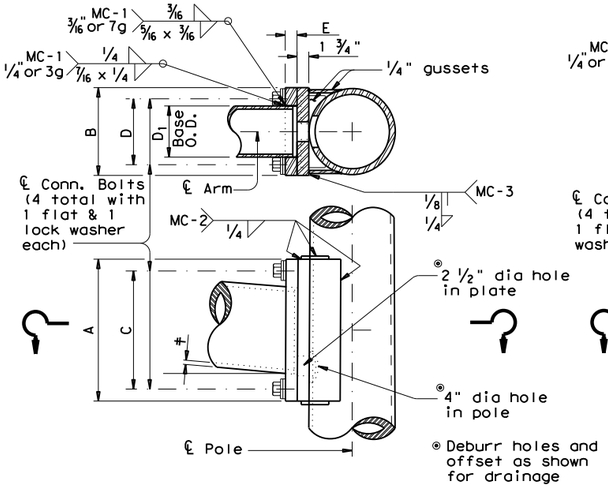
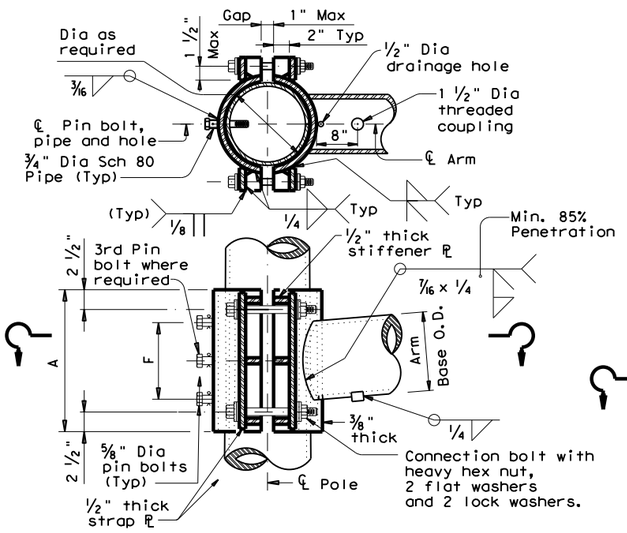
ARM SIZE D_1 in.	ARM SIZE ϕ in.	A in.	B in.	C in.	D in.	E in.	CONN BOLT DIA in.
6.5	.179	12	9	9	6	1 ¾	1
7.5	.179	13	9	10	6	1 ¾	1
8.0	.179	14	10	11	7	2	1 ¼
9.0	.179	16	11	13	8	2	1 ¼
9.5	.179	17	12	14	9	2	1 ¼
9.5	.239	18	12	15	9	2	1 ¼
10.0	.239	18	12	15	9	2	1 ¼
10.5	.239	18	13	15	10	3	1 ½
11.0	.239	18	13	15	10	3	1 ½



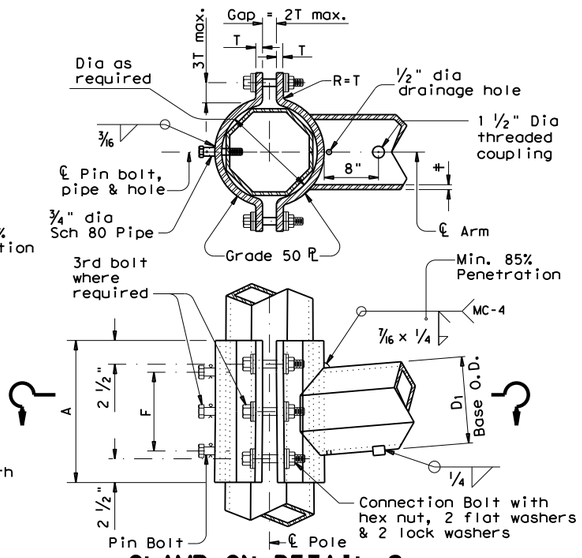
FIXED MOUNT DETAIL 1

ARM SIZE D_1 in.	ARM SIZE ϕ in.	A in.	F in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
6.5	.179	12	6	4	1	2	5/8
7.5	.179	14	8	4	1	2	5/8
8.0	.179	14	8	4	1	2	5/8
9.0	.179	16	10	4	1	2	5/8
9.5	.179	18	12	4	1 ¼	3	5/8
9.5	.239	18	12	4	1 ¼	3	5/8
10.0	.239	18	12	4	1 ¼	3	5/8

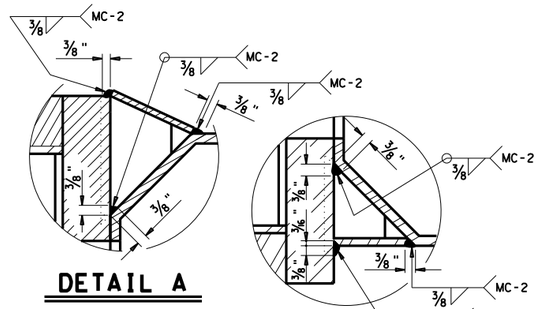


CLAMP-ON DETAIL 1

ARM SIZE D_1 in.	ARM SIZE ϕ in.	A in.	F in.	T in.	CONN. BOLTS No. ea.	CONN. BOLTS Dia in.	PIN BOLTS No. ea.	PIN BOLTS Dia in.
7.0	.179	12	6	¾	4	¾	2	5/8
7.5	.179	14	8	¾	4	¾	2	5/8
8.0	.179	14	8	¾	4	¾	2	5/8
9.0	.179	16	10	⅞	4	1	2	5/8
10.0	.179	18	10	⅞	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

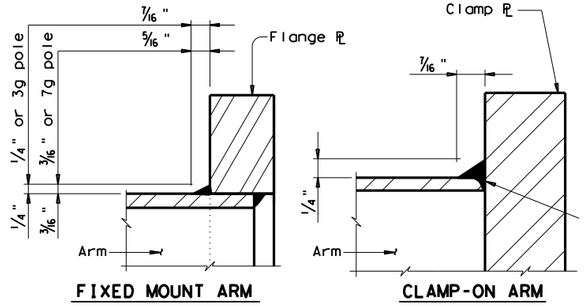


CLAMP-ON DETAIL 2



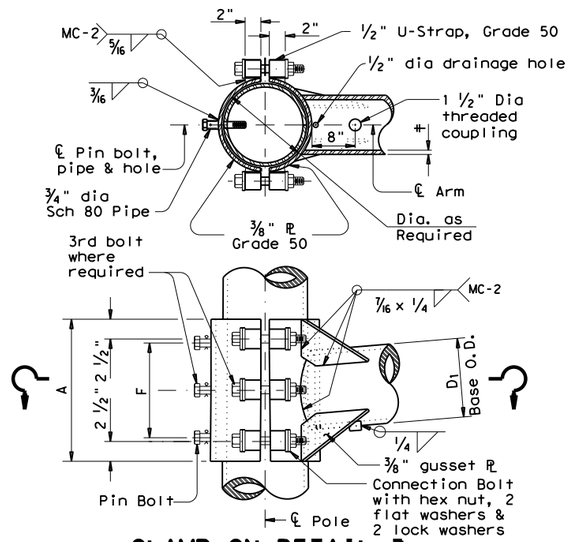
DETAIL A

DETAIL B



ARM BASE WELD DETAILS

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



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 ½" 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 ¾" dia pipe shall have 3/16" dia holes for a 1/8" dia galvanized cotter pin. Back clamp plate shall be furnished with a ¾" 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
0025	03	105, ETC	UA 90, ETC
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		101

126A

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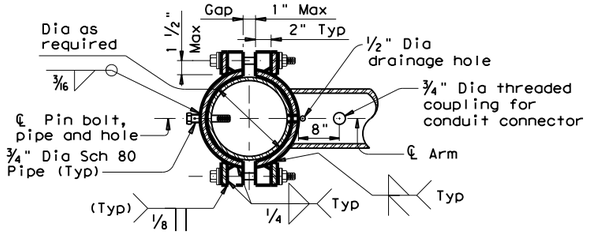
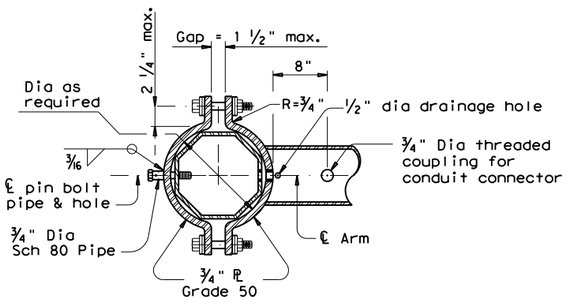
TABLE OF DIMENSIONS
for ILSN Support Arm Clamp-on
Details 1, 2 and 3

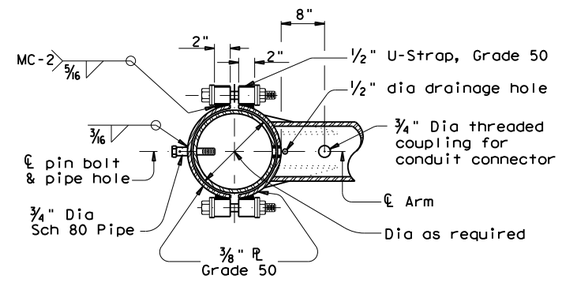
ILSN ARM SIZE	A	F	CONN. BOLTS		PIN BOLTS	
			No.	Dia	No.	Dia
	in.	in.	ea.	in.	ea.	in.
3 in. dia Schedule 40 Pipe	10	4	4	¾	2	⅝



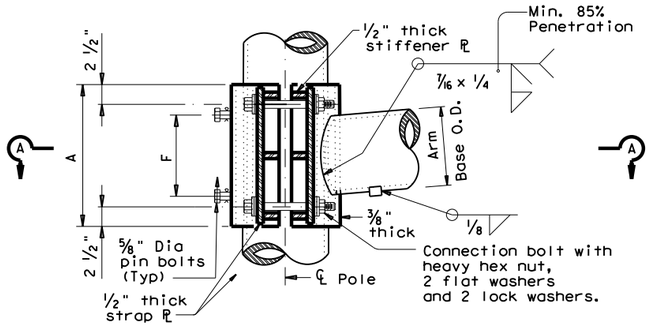
SECTION A-A



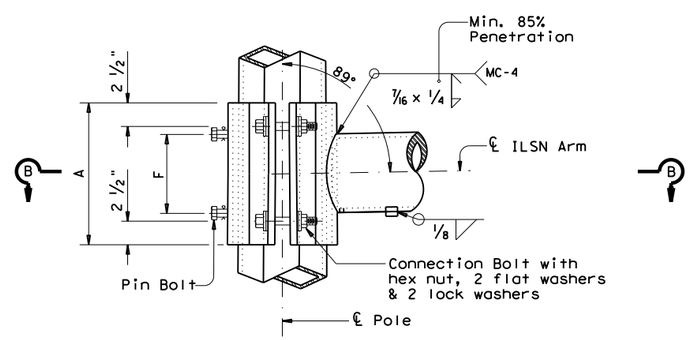
SECTION B-B



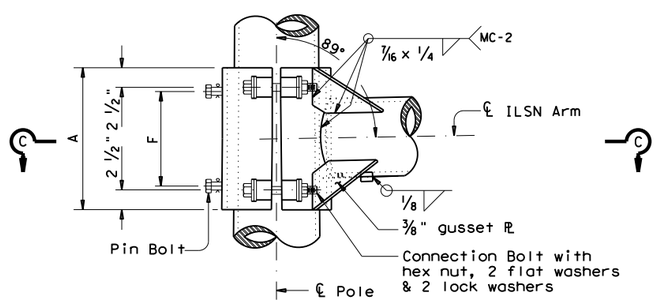
SECTION C-C



ILSN CLAMP-ON DETAIL 1



ILSN CLAMP-ON DETAIL 2



ILSN CLAMP-ON DETAIL 3

GENERAL NOTES:

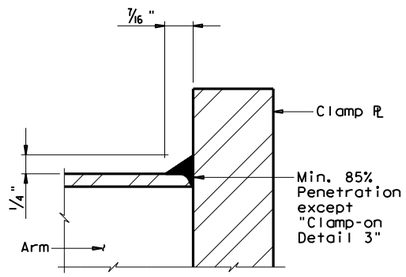
Clamp-on details shall be used for ILSN support arm assemblies. A 1 ½" inch diameter hole shall be cut in the front clamp plate for wiring access. A matched hole shall be field drilled through the pole to provide wire access after arm is oriented. Deburr both holes.

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

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

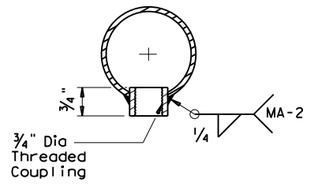
NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and ¾" dia pipe shall have 7/16" dia holes for a ⅛" dia galvanized cotter pin. Back clamp plate shall be furnished with a ¾" 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.



CLAMP-ON ARM

ARM BASE WELD DETAILS



ILSN ARM COUPLING DETAIL

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

MAST-ARM CONNECTIONS

MA-C(ILSN)-12

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

REVISIONS
5-96
1-12

CONT	SECT	JOB	HIGHWAY
0025	03	105, ETC	UA 90, ETC

DIST	COUNTY	SHEET NO.
SAT	GUADALUPE	102

126B

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Zinc die cast or Alum. or Galv. Metal Cap with min. of 3 set screws

See Detail F for alternate Pole Cap

D_{30}

⅜" dia Hook for hanging wire

6"

4" ±

℄ Clamp

Luminaire Arm

⅜

DETAIL A

(for pole with luminaire)

45°

2" dia threaded Coupling ~ NPSL threads

Pipe Plug

Pole

POLE COUPLING DETAIL

Pole

Handhole Frame

¼"

¼ x 7/16 ①

MD-4

7/16"

DETAIL G

⅜" dia Hook for hanging wire

See Detail G for Handhole Weld

℄ of 4"x 6" I.D. Handhole

4" ±

⅜

9"

11"

⅜" Dia. Bolt or Screw

Clamp-on arm for ILSN

Handhole Frame ⅜"x 2" Min.

DETAIL B

(If ILSN applied)

Zinc die cast or Alum. or Galv. Metal Cap with min. of 3 set screws

See Detail F for alternate Pole Cap

⅜" dia Hook for hanging wire

6"

11"

⅜

DETAIL C

D_{19}

See Detail A for regular Pole Cap

¼" dia J-Bolt & Nut

SECTION Y-Y

⅛

5/16" 1 3/16"

Slot ⅜"

1¼"

⅝"

See Detail J

Tab ¼" dia x ⅜" out

¼ x 7/16 ①

MD-4

SECTION X-X

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

Back plate

Access Compartment

¼"

7/16"

Round Pole

Back plate

Access Compartment

¼"

7/16"

Polygonal Pole

DETAIL J

Burndy #KC22J12T13, Blackburn TTC, or approved equal. Will accept 4-#8, 2-#6 or 1-#4 max.

Split lockwasher, ½" stainless

Hex. nut, ½" - 13NC stainless

COPPER GROUND CONNECTOR

Tab and slot

Ring, ⅜" x 2 ½" ASTM A572 Gr 50

Back plate ⅛" x 4½" x 1'-6 ⅜" steel strip M-1020 or sheet A-569

MD-5

1⅞"

12 circuit 600 volt compression Type HD terminal block (2 req'd)

#8-32 mtg. holes for optional 6 circuit terminal block

Phil. Pan HD. scres, #8-32 x 1¼" self-tap Type "F", stainless steel (4 req'd)

27"

X

X

½" clearance hole for copper ground connector

6"

#10-32 mtg. holes for luminaire double fuse block (see notes 3 & 4)

4¾"

4" x 6" hand hole opening

Tab and slot

ACCESS COMPARTMENT

30'-0" ±1"

23'-6" ±1"

18'-0" ±1"

℄ of 4"x 6" I.D. Handhole

See Detail G for Handhole Weld

Handhole cover 12g min.

⅜" dia bolt or screw

Handhole Frame - PL ⅜" x 2 min

Threaded Strap ⅜" x 1" PL Min

9"

1'-6"

2'-6"

Fixed mount arm for single mast arm assemblies or first arm on dual mast arm assemblies

Clamp-on arm for second arm on dual mast arm assemblies

2" dia threaded coupling - 2 per dual mast arm assembly

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)

⅛" to ½"

¼" PL

½" dia Bar for hanging wire and J-Bolt attachment

4" ±

1'-0"

¼

MD-2

pole thickness

MD-1

②

2" dia threaded coupling - 2 per dual mast arm assembly

SECTION V-V

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

L

R = 3" ±1"

D_B +1/16"

Bolt Hole Diameter

Bolt Circle Diameter

L

Slot Length

Adjustment Range

BASE PLATE PLAN

2'-3"

Access Compartment

12" ± ¼"

Base Plate

T

D_B

¼

7/16 x ¼

MD-3 at ¼" or 3g pole

⅜

5/16 x ⅜

MD-3 at ⅜" or 7g pole

See Detail H

POLE ELEVATION

¼" or 3g pole

⅜" or 7g pole

¼"

⅜"

3/16"

5/16"

DETAIL H

① 85% Min. penetration

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

NOTES:

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

MA-D-12

REVISIONS
8-99
1-12

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

CONT	SECT	JOB	HIGHWAY
0025	03	105, ETC	UA 90, ETC

DIST	COUNTY	SHEET NO.
SAT	GUADALUPE	103

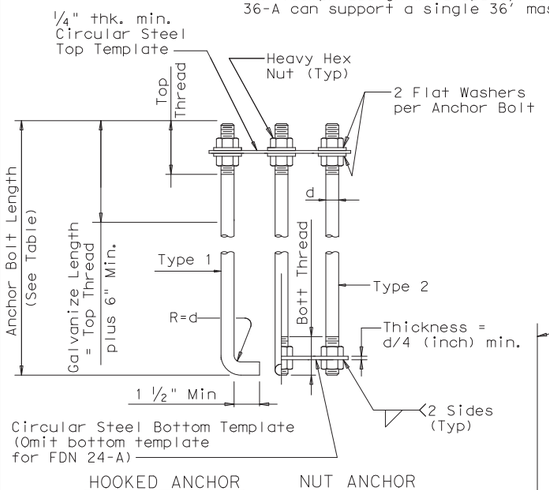
FOUNDATION DESIGN TABLE

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

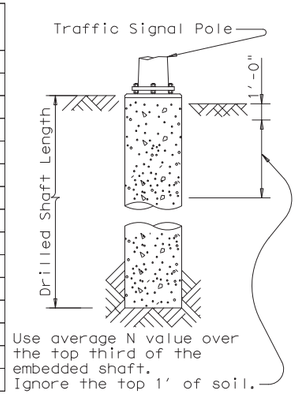
FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

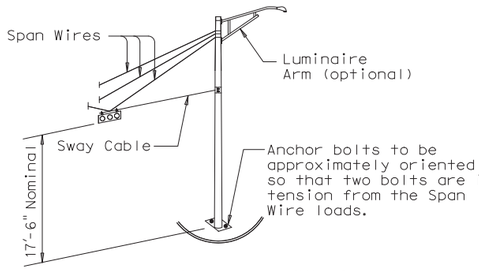
		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM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

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.

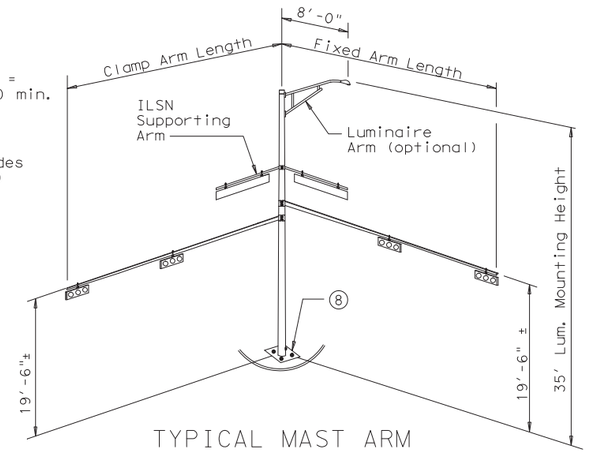


ANCHOR BOLT ASSEMBLY





TYPICAL STRAIN POLE ASSEMBLY



TYPICAL MAST ARM ASSEMBLY

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

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.

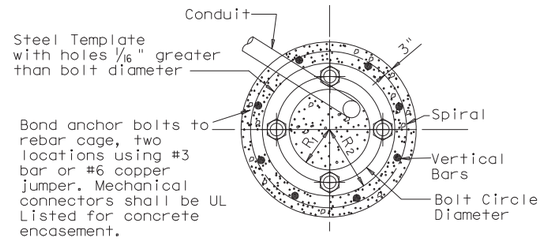
⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

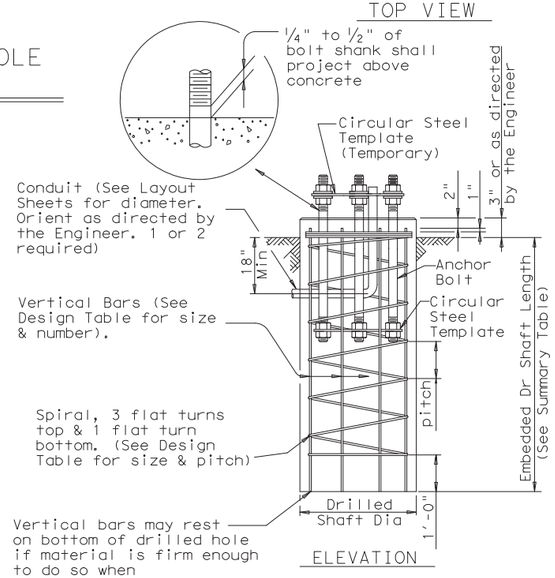
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

ANCHOR BOLT & TEMPLATE SIZES

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

⑦ Min dimensions given, longer bolts are acceptable.





FOUNDATION DETAILS

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
FM 3009 AT WOODLAND OAKS DR								
POLE A	10	30-A	1		11.3			
POLE B	10	36-A	1			13.2		
POLE C	10	30-A	1		11.3			
POLE D	10	36-A	1			13.2		
TOTAL DRILLED SHAFT LENGTHS					22.6	26.4		

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".

FM 3009 AT WOODLAND OAKS DR

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB

REVISIONS: 5-96, 11-98, 1-12

CONT	SECT	JOB	HIGHWAY
0025	03	105,ETC.	UA 90,ETC.

DIST	COUNTY	SHEET NO.
SAT	GUADALUPE	104

11/14/2013

128

6/21/2023
...\SHEETS\W010-TS-FD-12.DGN

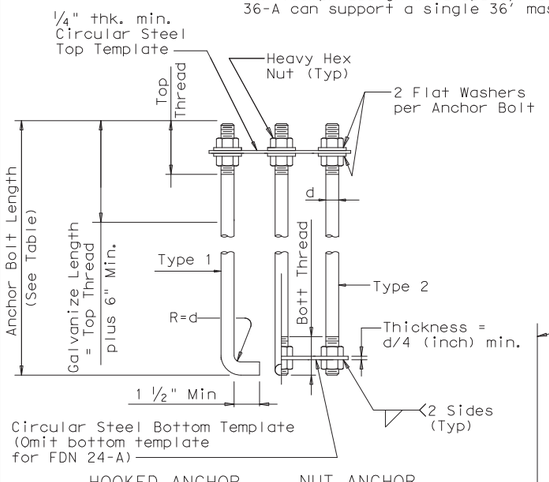
FOUNDATION DESIGN TABLE

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

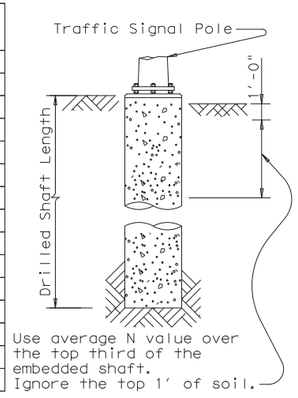
FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

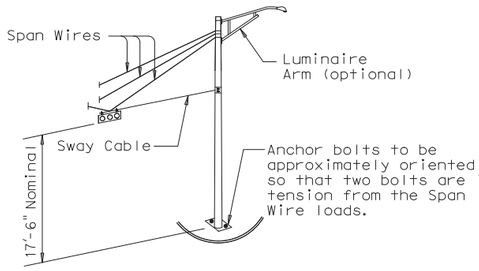
		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM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

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.

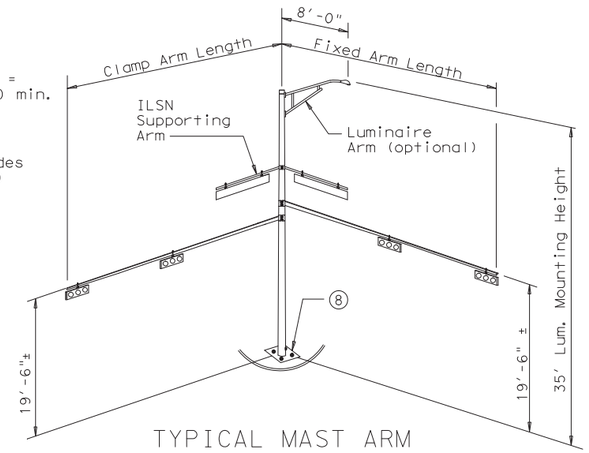


ANCHOR BOLT ASSEMBLY





TYPICAL STRAIN POLE ASSEMBLY



TYPICAL MAST ARM ASSEMBLY

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

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.

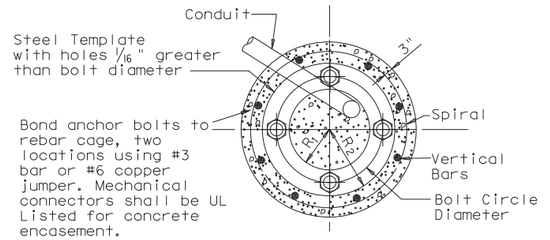
⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

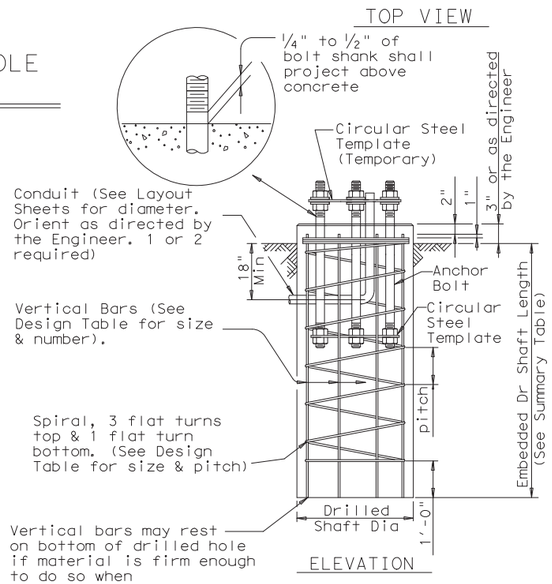
⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

ANCHOR BOLT & TEMPLATE SIZES

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

⑦ Min dimensions given, longer bolts are acceptable.





FOUNDATION DETAILS

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
FM 3009 AT BORGFELD RD								
POLE A	10	30-A	1		11.3			
POLE B	10	36-A	1			13.2		
POLE C	10	30-A	1		11.3			
POLE D	10	36-A	1			13.2		
TOTAL DRILLED SHAFT LENGTHS					22.6	26.4		

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".

FM 3009 AT BORGFELD RD

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB

REVISIONS: 5-96, 11-98, 1-12

CONT	SECT	JOB	HIGHWAY
0025	03	105,ETC.	UA 90,ETC.
DIST	COUNTY		SHEET NO.
SAT	GUADALUPE		105

6/22/2023
...\SHEETS\08#TS-FD-12.DGN

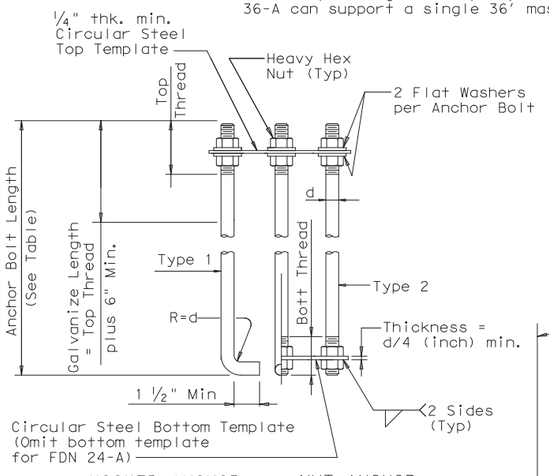
FOUNDATION DESIGN TABLE

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

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

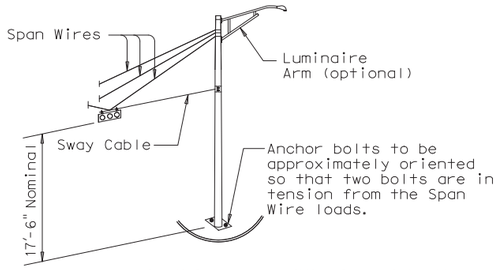
		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'	32' X 32'		
		32' X 28'	36' X 36'		
			40' X 32'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'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

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.

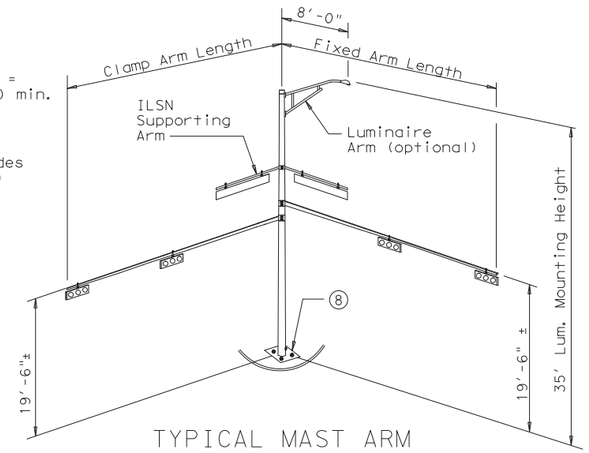


HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

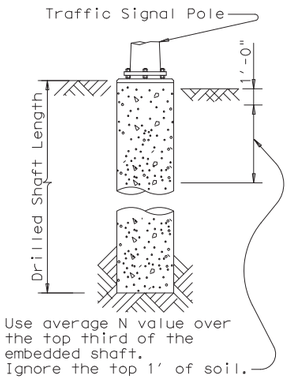


TYPICAL STRAIN POLE ASSEMBLY



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



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

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.

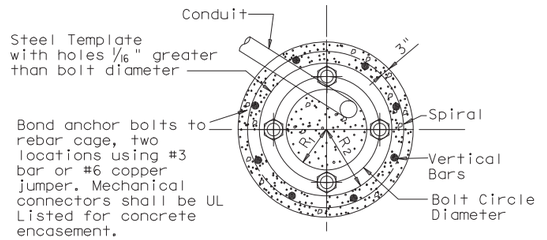
⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

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

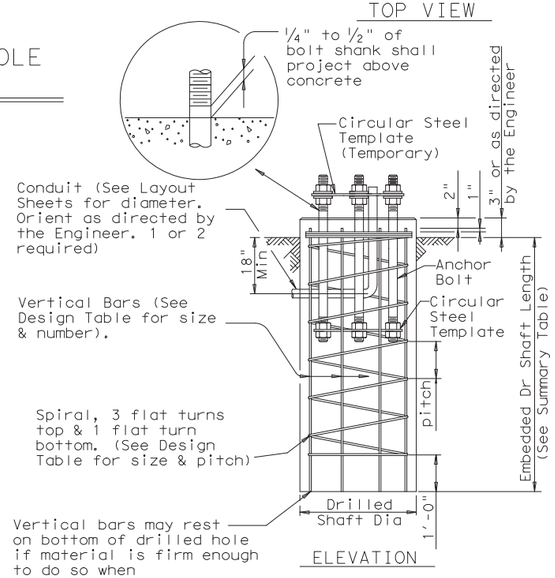
ANCHOR BOLT & TEMPLATE SIZES

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

⑦ Min dimensions given, longer bolts are acceptable.



TOP VIEW



ELEVATION

FOUNDATION DETAILS

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
US 90A (COURT ST) AT VAUGHAN ST								
POLE B	10	30-A	1		11.3			
POLE C	10	36-A	1			13.2		
TOTAL DRILLED SHAFT LENGTHS					11.3	13.2		

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".

US 90A (COURT ST) AT VAUGHAN ST

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB

REVISIONS
5-96
11-99
1-12

CONT	SECT	JOB	HIGHWAY
0025	03	105,ETC.	UA 90,ETC.

DIST	COUNTY	SHEET NO.
SAT	GUADALUPE	106

11/14/2013

6/21/2023
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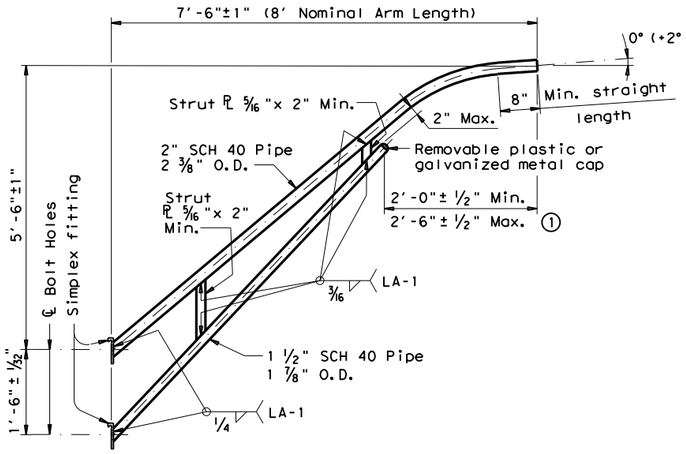
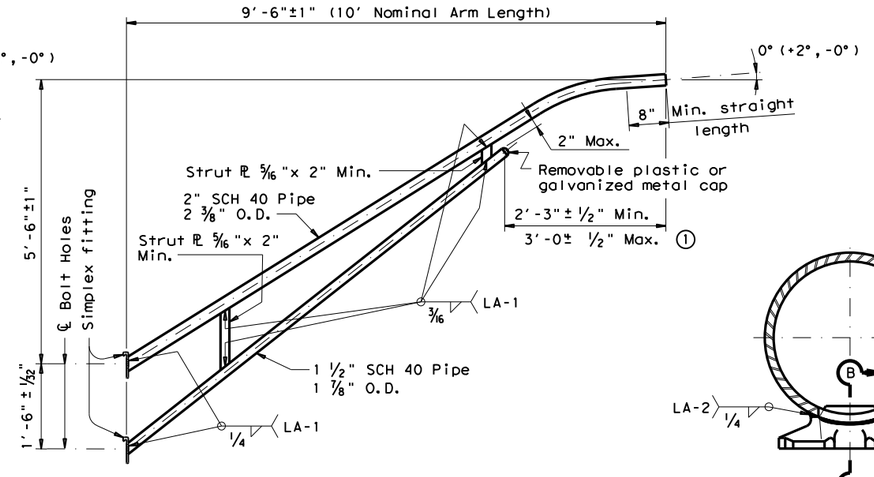


8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM

DIRECT ATTACHMENT DETAIL

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

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

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

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

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

GENERAL NOTES:

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

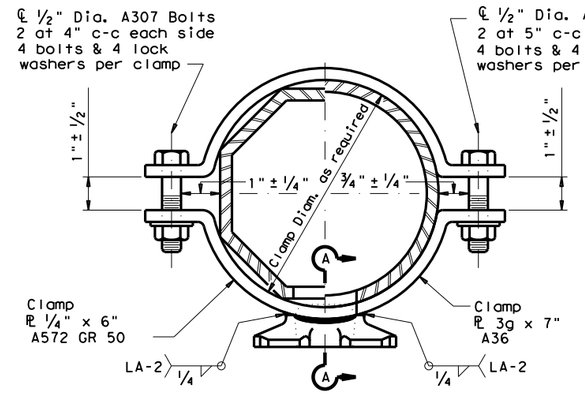
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absense of specified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

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

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

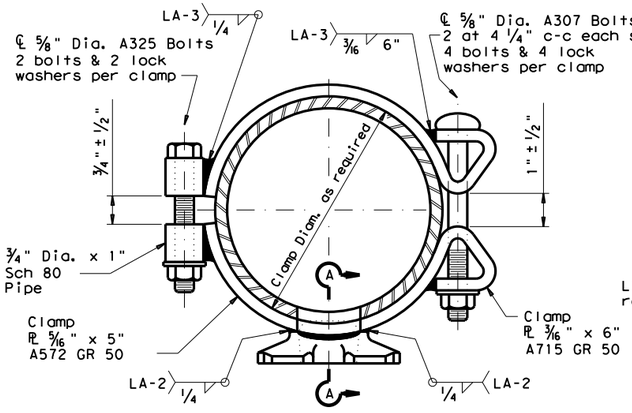
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly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

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



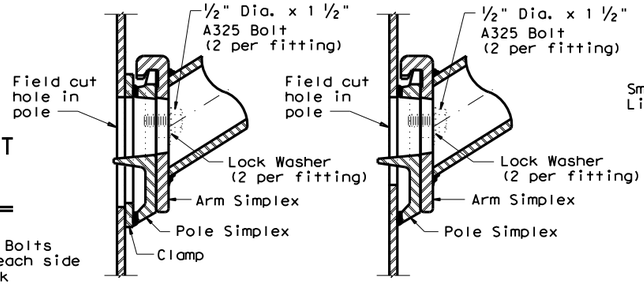
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



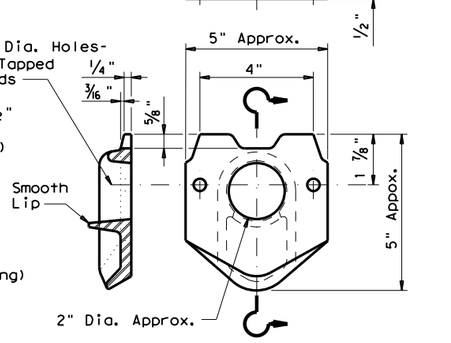
CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)

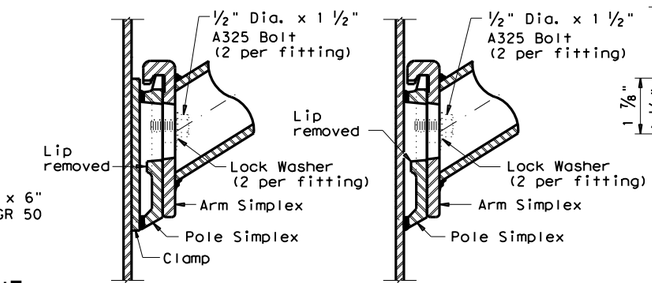


UPPER SIMPLEX FITTING

UPPER SIMPLEX FITTING



POLE SIMPLEX DETAIL

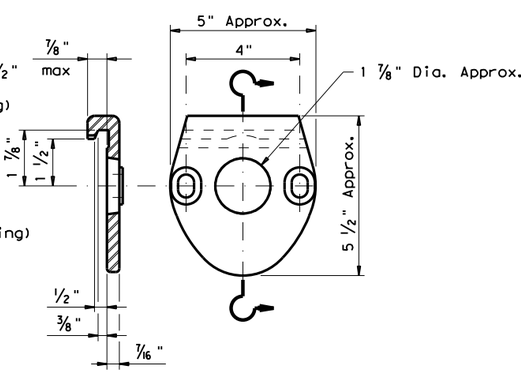


LOWER SIMPLEX FITTING

LOWER SIMPLEX FITTING

SECTON A-A

SECTON B-B



ARM SIMPLEX DETAIL

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

ARM DETAILS

LUM-A-12

DN: LEH	CK: JSY	DW: LTT	CK: TEB

REVISIONS
5-96
1-99
1-12

CONT	SECT	JOB	HIGHWAY
0025	03	105, ETC	UA 90, ETC
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SAT	GUADALUPE		107

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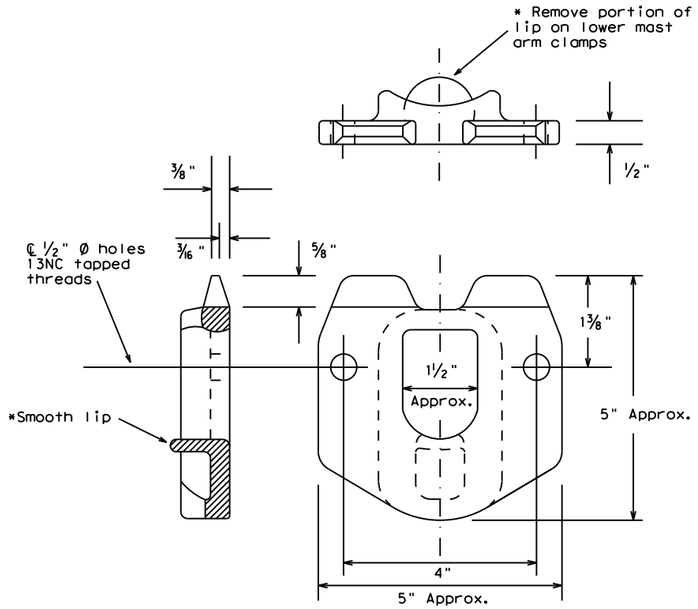
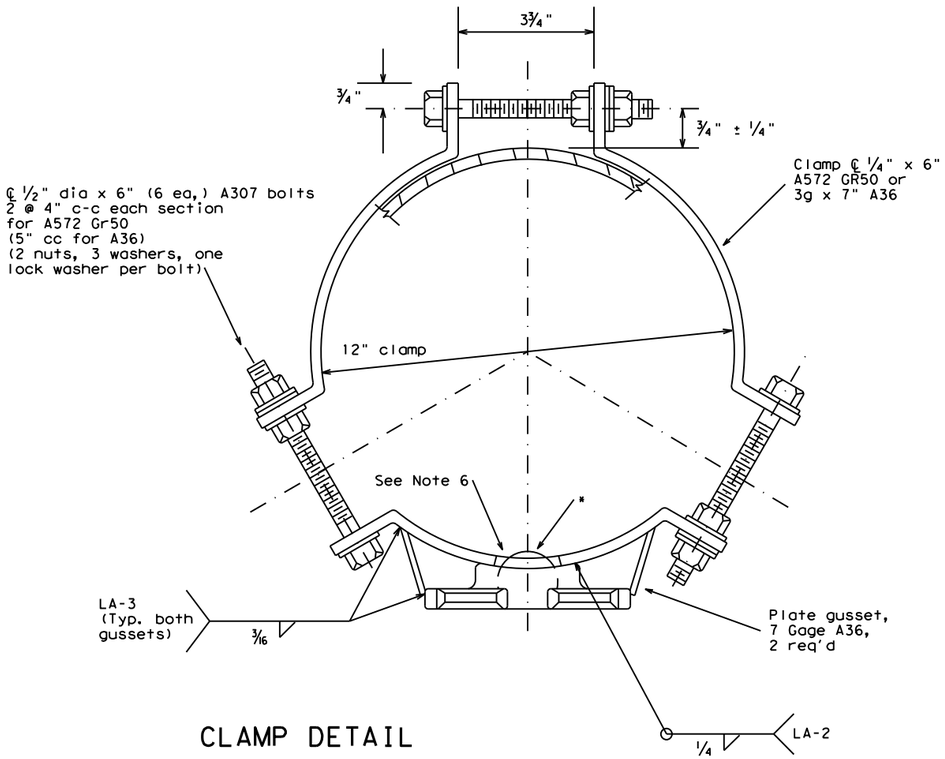
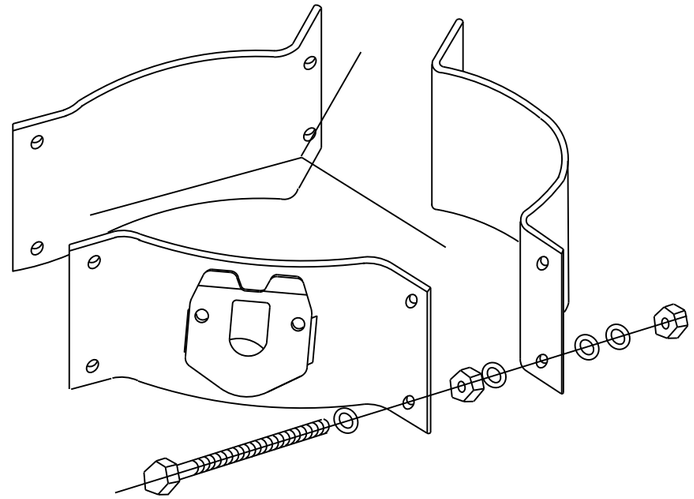


POLE SIMPLEX DETAILS



CLAMP DETAIL



PROJECTION

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.

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

DN: KAB	CK: RES	DW: FDN	CK: CAL

REVISIONS
11-99
1-12

CONT	SECT	JOB	HIGHWAY
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SAT	GUADALUPE	108

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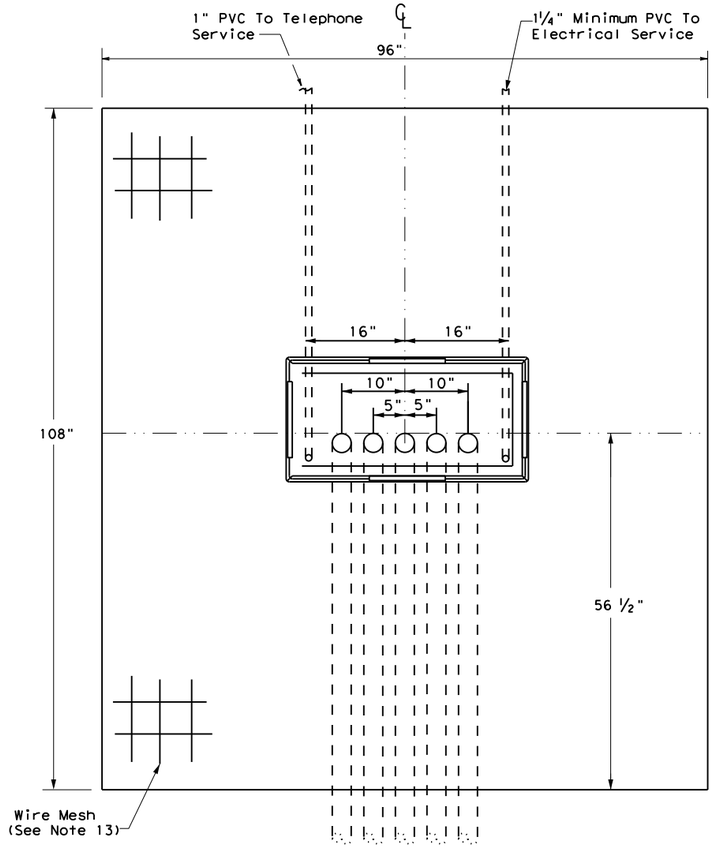
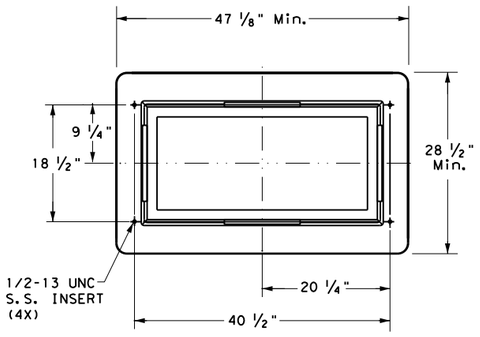
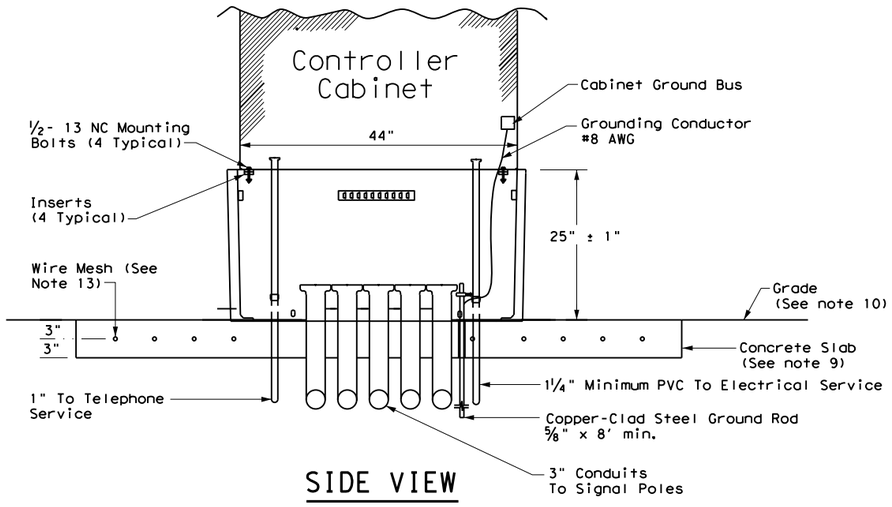


TOP VIEW



CABINET BASE



SIDE VIEW

TRAFFIC SIGNAL CONTROLLER BASE:

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

CONCRETE SLAB:

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

CONDUITS:

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

CONTROLLER CABINET:

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

PAYMENT:

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

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD
TS-CF-21

FILE: ts-cf-21.dgn	DN:	CK:	DW:	CK:
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2-21	SAT	GUADALUPE		109

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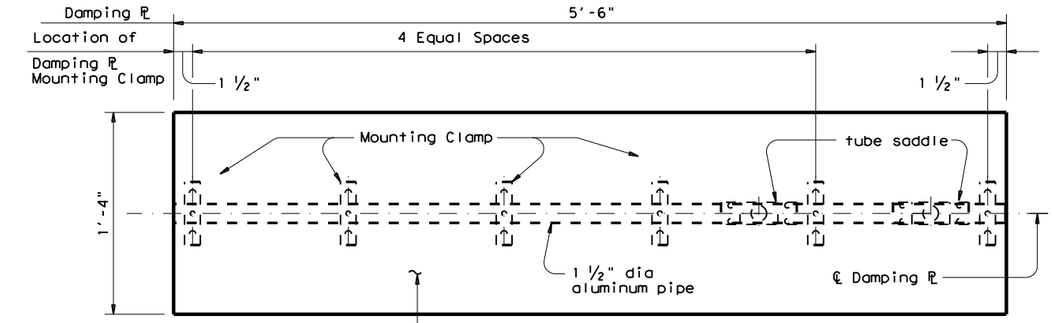
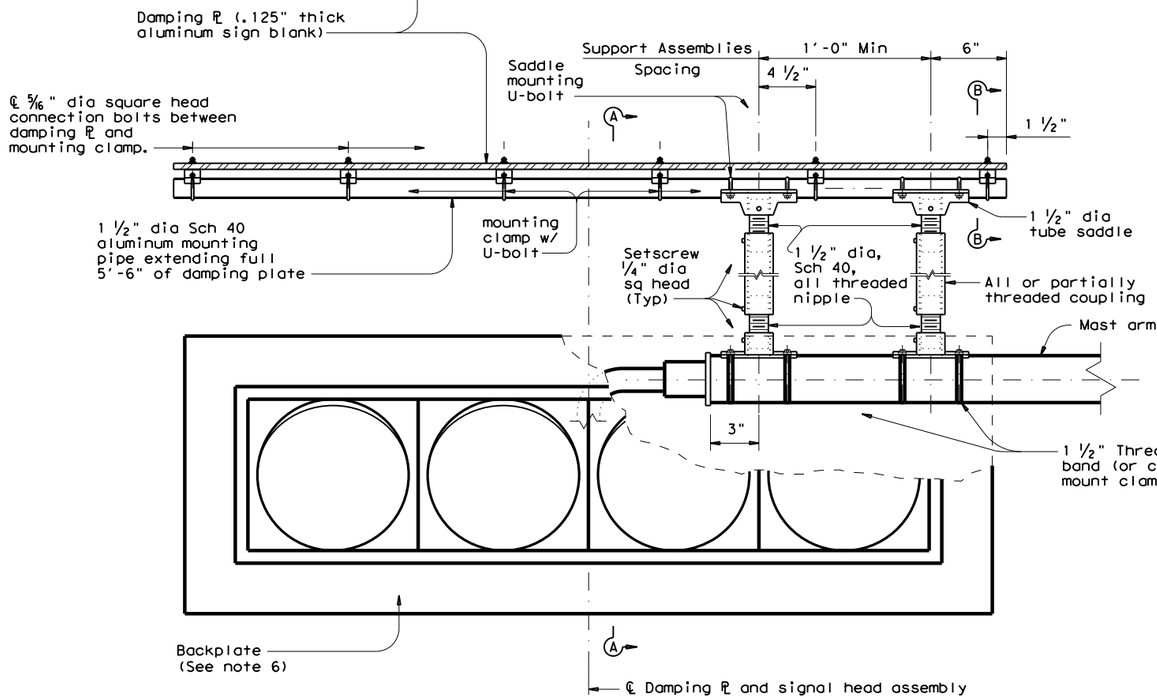


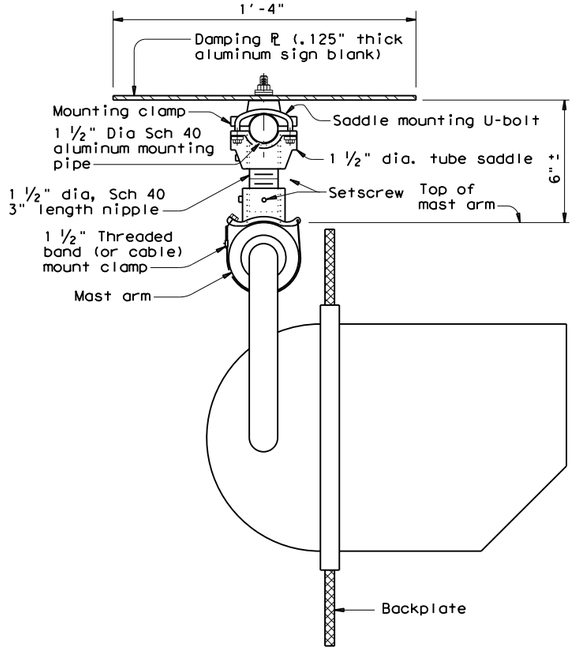
PLAN



ELEVATION

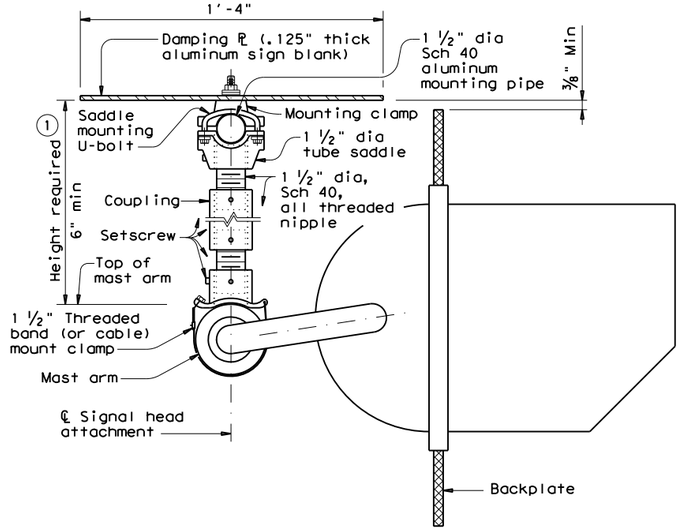
DAMPING PLATE MOUNTING DETAILS

(Showing alternate placement of signal head)



SECTION A-A

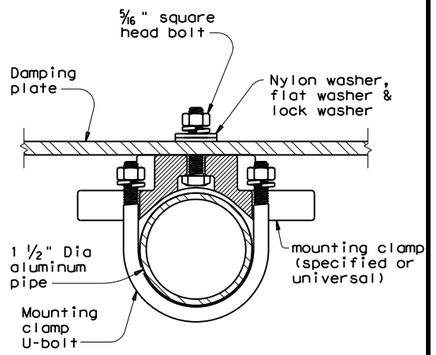
(Showing standard placement of signal head)
(Mounting clamp U-bolt is not shown for clarity)



SECTION A-A

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

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



SECTION B-B

(Showing damping plate attachment)

GENERAL NOTES:

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

Texas Department of Transportation

Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

FILE: ma-dpd-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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6-20	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		110

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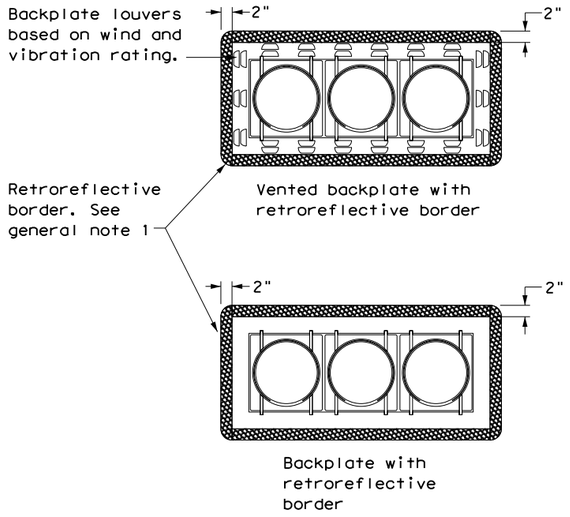
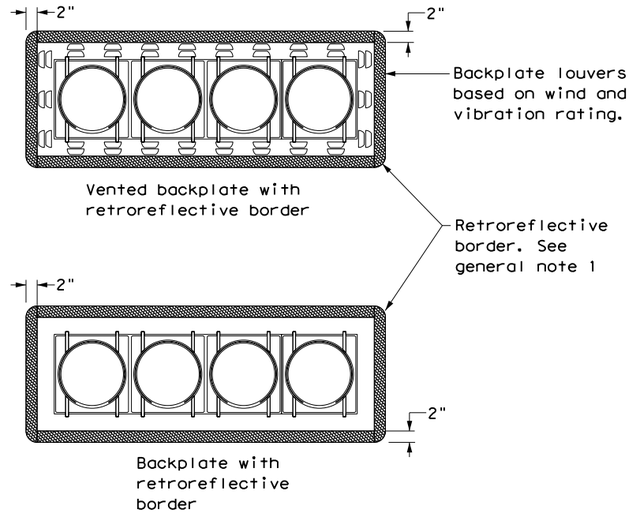
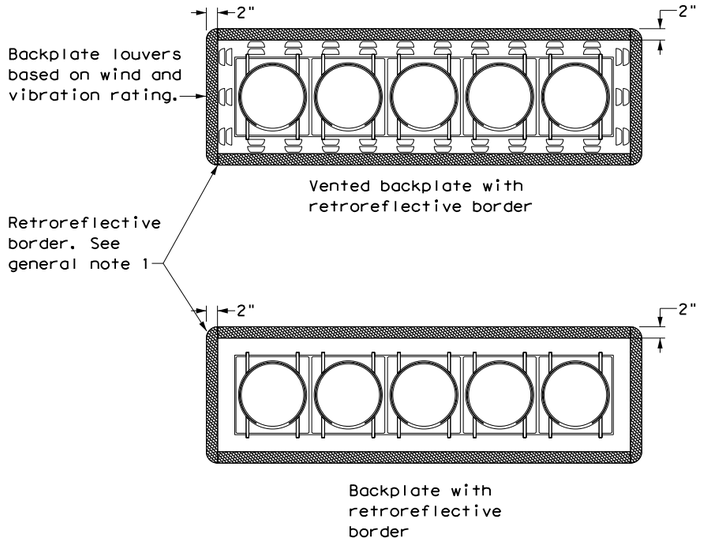


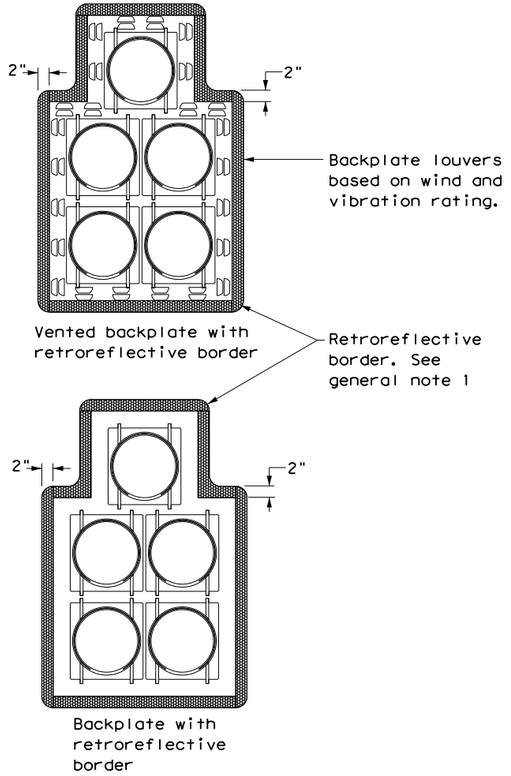
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



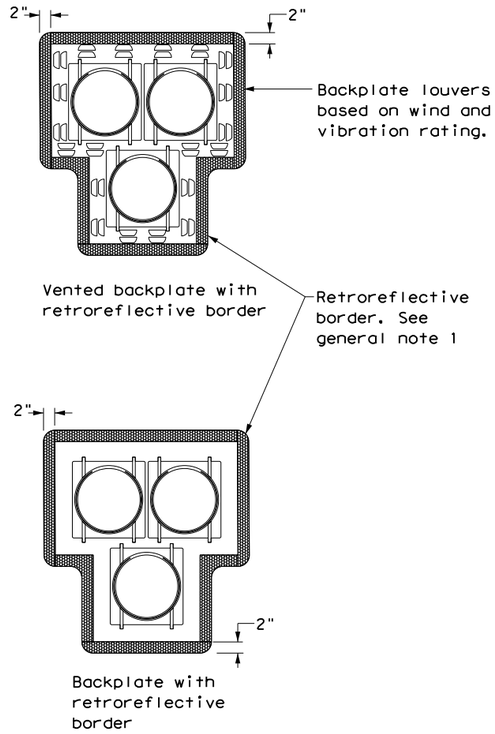
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

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

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE
TS-BP-20

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
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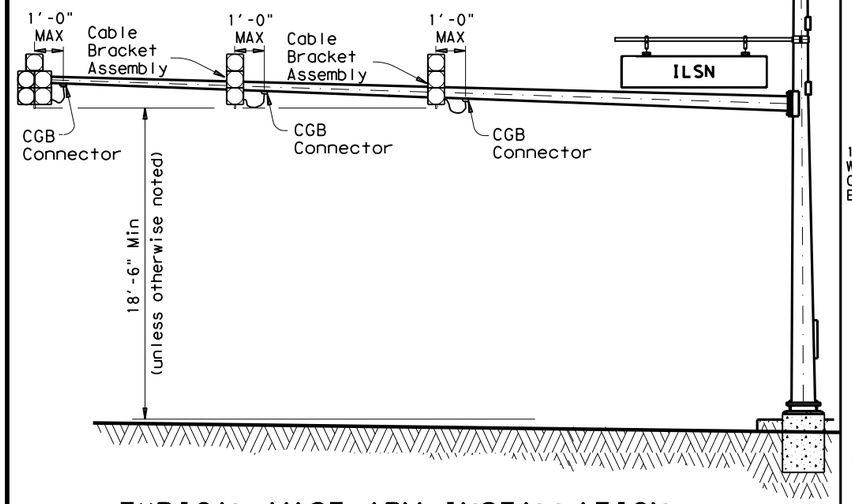
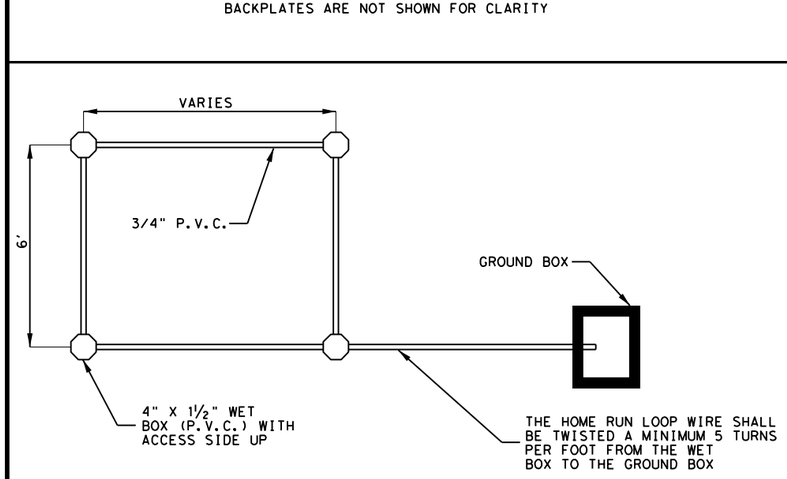
	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		111



TYPICAL MAST ARM INSTALLATION

BACKPLATES ARE NOT SHOWN FOR CLARITY



NOTES:

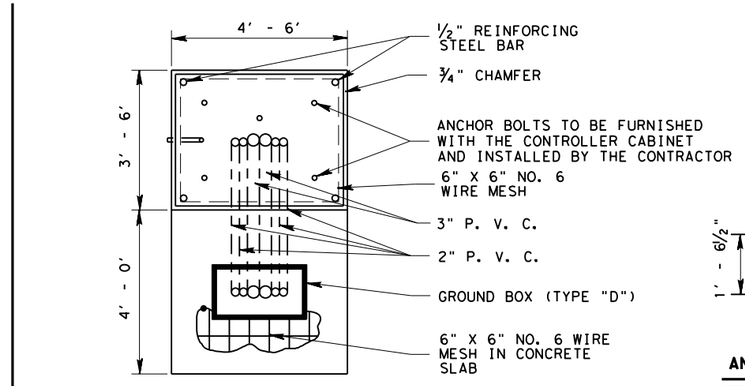
SHALL INSTALL CONDUIT ENCASED LOOPS AT THE LOCATIONS SHOWN ON THE PLANS USING 3/4 " DIAMETER PVC SCHEDULE 40 OR AT NO ADDITIONAL COST 1" DIAMETER PVC SCHEDULE 80.

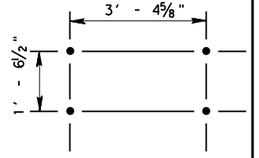
LOOP LOCATIONS MAY BE STAGGERED SLIGHTLY (6") TO ACCOMMODATE HOME RUN PLACEMENT.

INDIVIDUAL HOME RUN CONDUITS SHALL BE EXTENDED TO THE GROUND BOX SHOWN ON THE PLANS FOR EACH LOOP INSTALLED.

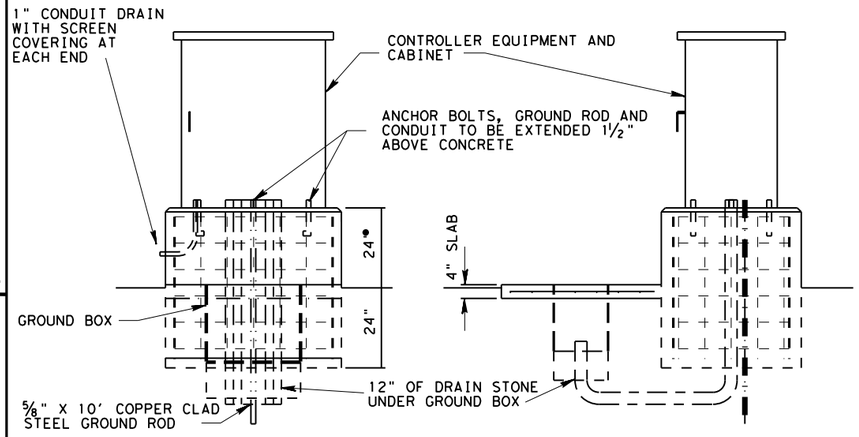
THE NUMBER OF LOOP WIRE TURNS SHALL BE AS SHOWN ON THE TYPICAL LOOP DETECTOR DETAILS.

CONDUIT ENCASED LOOPS





ANCHOR BOLT PATTERN



CONTROLLER MOUNT NOTES :

ALL WIRING TERMINATING IN THE CONTROLLER SHALL BE LABELED IN A MANNER THAT CAN BE IDENTIFIED WHEN THE CONTROLLER IS INSTALLED THE CONTRACTOR SHALL CONNECT THE FIELD WIRING TO THE CONTROLLER

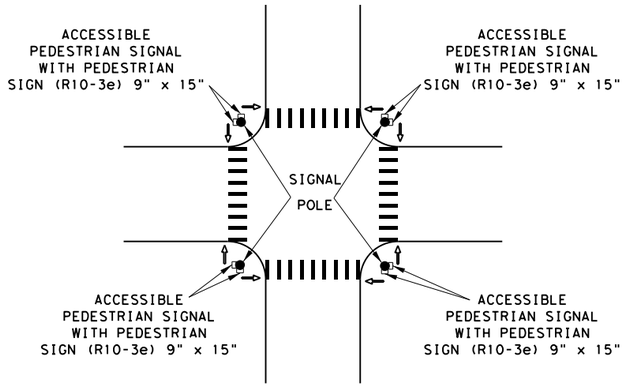
ONE 2" PVC SHALL REMAIN EMPTY FOR FUTURE USE

CONCRETE SHALL BE TESTED AS MISCELLANEOUS CONCRETE

ALL MATERIALS SHOWN AND LABOR TO INSTALL THE CONTROLLER FOUNDATION SHALL BE CONSIDERED SUBSIDIARY TO PERTINENT ITEMS

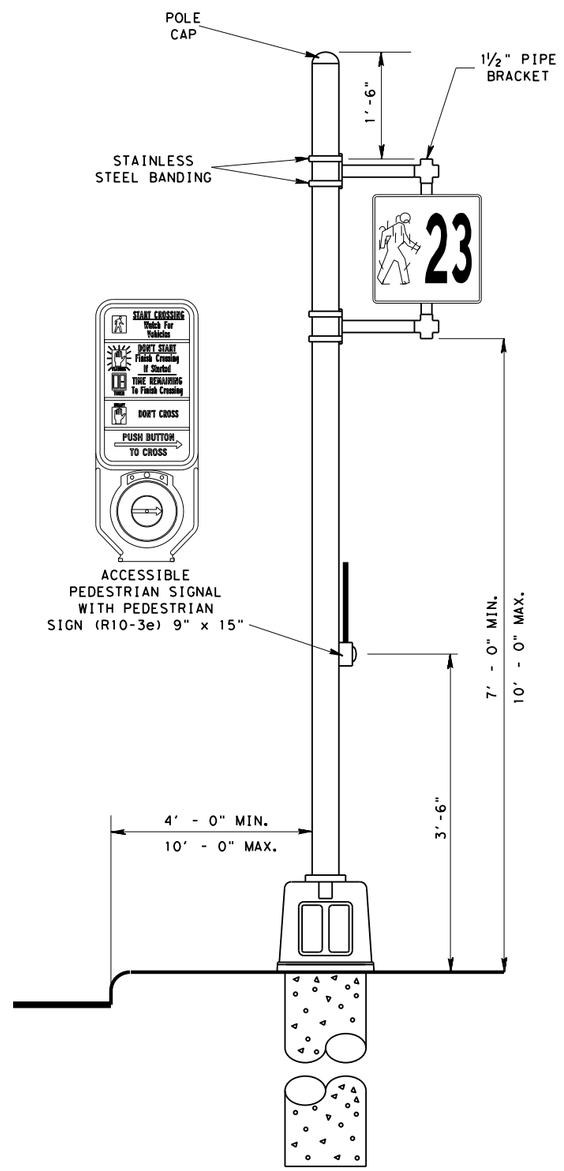
CONTROLLER FOUNDATION SHALL BE AS SHOWN ON THE PLANS, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

TYPICAL CONTROLLER MOUNT DETAILS



TYPICAL PED PUSH BUTTON LOCATION

THE ENGINEER SHALL VERIFY ALL PEDESTRIAN SIGNAL AND PEDESTRIAN PUSH BUTTON LOCATIONS PRIOR TO INSTALLATION.



TYPICAL PEDESTAL POLE ASSEMBLY

San Antonio District Standard

MISCELLANEOUS TRAFFIC SIGNAL DETAILS

SCALE: NS

MTS-18

REVISIONS	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
FEB 2006		SEE TITLE SHEET	112
OCT 2007	STATE	DIST.	COUNTY
MAR 2017	TX	SAT	GUADALUPE
MAY 2018	CONT.	SECT.	JOB / HIGHWAY NO.
	0025	03	105, ETC UA 90, ETC

MOUNTING LOCATIONS

PRESENCE (RPDD)

① PREFERRED PLACEMENT FOR MAST ARMS, STRAIN POLES AND TIMBER POLES. ON MAST ARM POLES, MOUNT BELOW CONNECTION OF MAST ARM TO A MINIMUM OF 15 FT., MOUNT AS HIGH AS POSSIBLE TO A MAXIMUM OF 30 FT ON STRAIN AND TIMBER POLES.

② PREFERRED PLACEMENT FOR MAST ARMS. MOUNT ON AND BELOW MAST ARM ON NEAR SIDE OF ARM.

③ ALTERNATE PLACEMENT LOCATION. MOUNT AS HIGH AS POSSIBLE TO A MAXIMUM OF 30 FT TO PREVENT OCCLUSION OF THE LEFT TURN LANES. THIS PLACEMENT TO BE USED ONLY IF RPDD CANNOT BE MOUNTED IN THE PREFERRED PLACEMENT LOCATIONS.

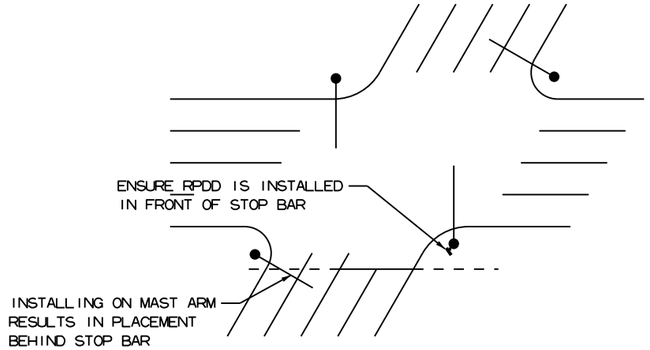
ADVANCE (RADD)

Ⓐ PREFERRED PLACEMENT FOR MAST ARMS. ALIGN RADD WITH CENTER OF TRAVEL LANES.

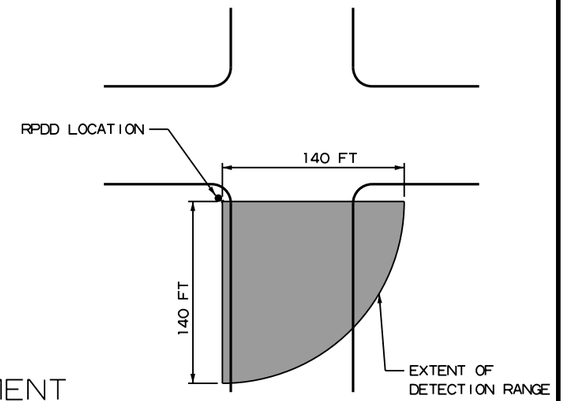
Ⓑ ALTERNATE PLACEMENT FOR MAST ARMS. MOUNT ON BACK SIDE OF OPPOSING MAST ARM.

Ⓒ STRAIN OR TIMBER POLE PLACEMENT. MOUNT ON NEAR SIDE POLE.

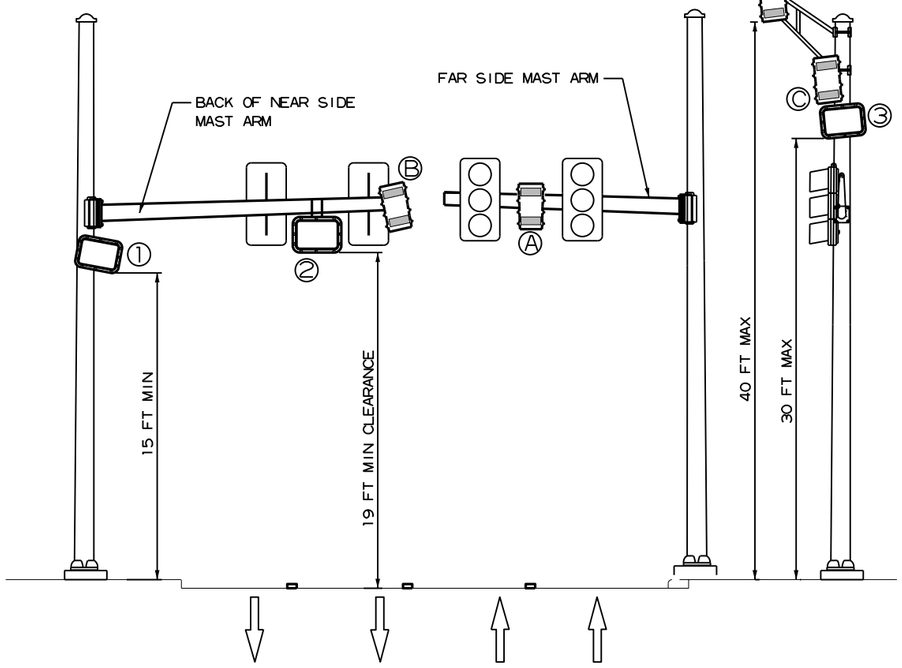
Ⓓ ALTERNATE STRAIN OR TIMBER POLE PLACEMENT. MOUNT LUMINAIRE ARM ON NEAR SIDE POLE WITH A MAXIMUM 40 FT MOUNTING HEIGHT.



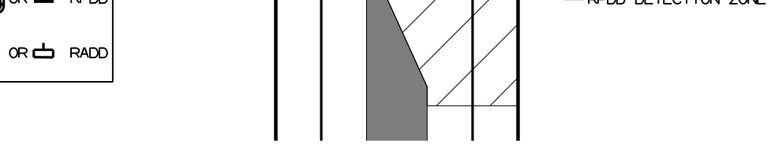
SKEWED INTERSECTION RPDD PLACEMENT
NTS



TYPICAL RPDD DETECTION RANGE
NTS



ELEVATION VIEW
NTS



PLAN VIEW
NTS

NOTES:

1) A MINIMUM 6 FT HORIZONTAL OFFSET MUST BE MAINTAINED BETWEEN THE RPDD AND THE DETECTION ZONE

2) THE RPDD SHALL BE MOUNTED SUCH THAT AT LEAST 20 FT ALONG THE FARTHEST LANE TO BE MONITORED IS WITHIN THE FIELD OF VIEW OF THE RPDD

3) AIM RPDD AT THE CENTER OF THE LANES TO BE MONITORED, APPROXIMATELY 50 FT FROM THE RPDD UNIT

4) MOUNT RPDD SO THAT ITS FIELD OF VIEW IS NOT OCCLUDED BY POLES, SIGNS, OR OTHER STRUCTURES

5) RADD MOUNTING HEIGHT SHALL NOT BE LESS THAN 17 FT OR GREATER THAN 40 FT. RADD MOUNTING LOCATION SHALL HAVE A MAXIMUM 50 FT LATERAL OFFSET FROM CENTER OF TRAVEL LANES TO BE MONITORED

San Antonio District Standard

RADAR PRESENCE DETECTOR (RPDD)
RADAR ADVANCED DETECTION DEVICE (RADD)
PLACEMENT

SCALE: NS

RPDD-RADD-20

REVISIONS	FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
MAR 2020	6	SEE TITLE SHEET		113
	STATE	DIST.	COUNTY	
	TEXAS	SAT	GUADALUPE	
	CONT.	SECT.	JOB	HIGHWAY NO.
	0025	03	105, ETC	UA 90, ETC

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DATE:
FILE:

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

ZONE 2
(90 MPH WIND)

ZONE 3
(80 MPH WIND)

ZONE 4
(70 MPH WIND)

ICE LINE

ZONE 4
(70 MPH WIND)

ICE LINE

ZONE 3
(80 MPH WIND)

ZONE 1
(100 MPH WIND)

LEGEND

ZONE 1 - = (100 MPH WIND)
ZONE 2 - = (90 MPH WIND)
ZONE 3 - = (80 MPH WIND)
ZONE 4 - = (70 MPH WIND)
= (ICE LINE)
= (DISTRICT LINES)

APPLICABLE STANDARDS SHEETS

OVERHEAD SIGN BRIDGE STANDARDS:

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

CANTILEVER OVERHEAD SIGN SUPPORT STANDARDS:

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

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

HIGH MAST ILLUMINATION POLE STANDARDS:

HMIP-98
HMIF-98

WALKWAYS AND BRACKETS STANDARDS:

SWW
SB(SWL-1)

TRAFFIC SIGNAL POLE STANDARDS:

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

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

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

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

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

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

Texas Department of Transportation

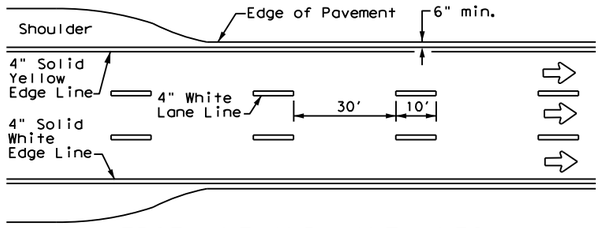
Traffic Operations Division Standard

WIND VELOCITY AND ICE ZONES

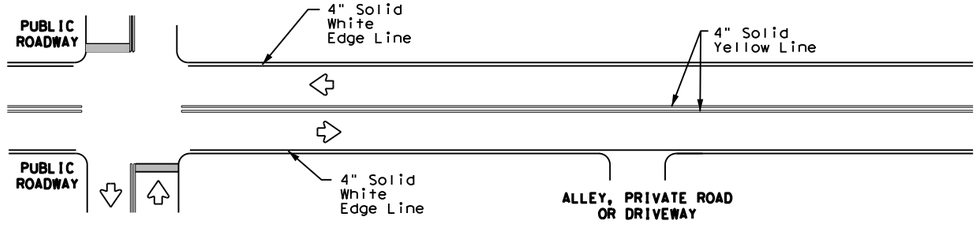
WV & IZ-14

FILE: windice.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1996	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-14-Added list of applicable standards, restricting use to structures designed for Fastest Mile wind speeds.	0025	03	105, ETC	UA 90, ETC
	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		114

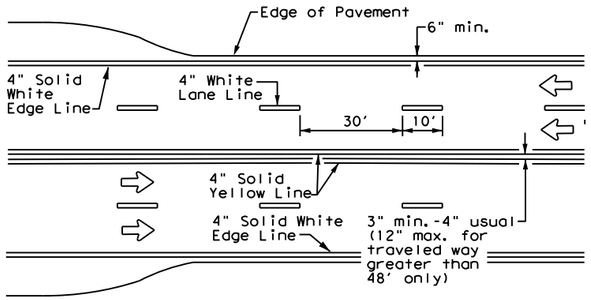
DATE: 7/27/2023 5:18:18 PM
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 &UA 90 etc\pm1-20.dgn



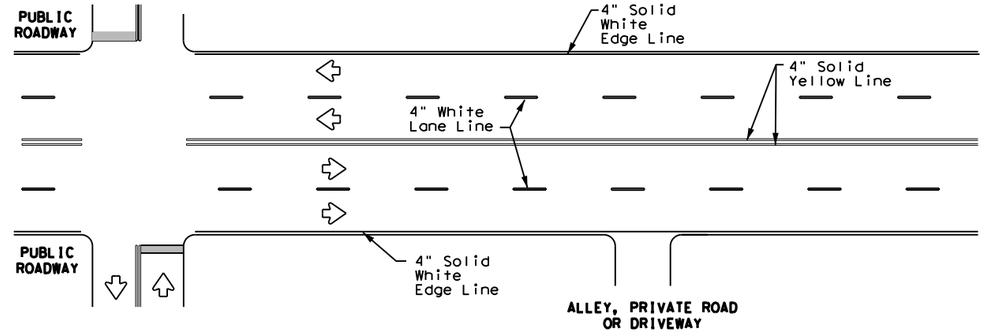
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



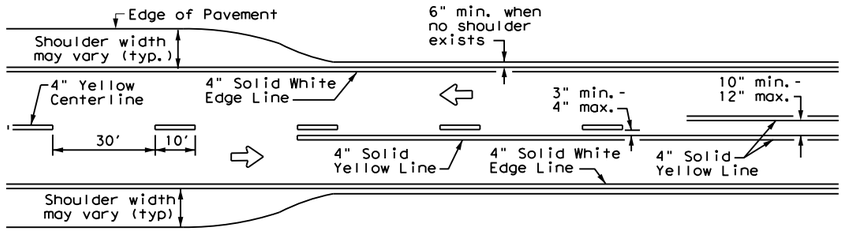
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



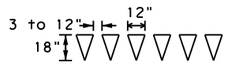
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



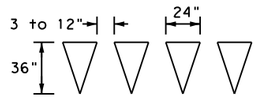
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

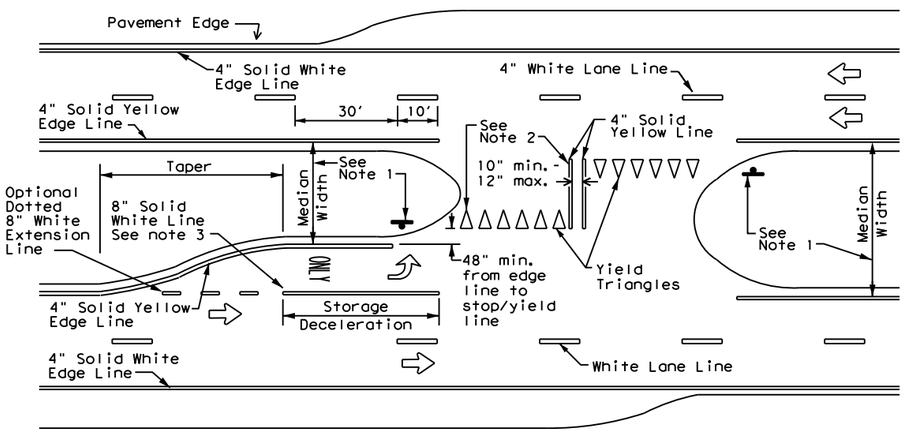


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

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

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

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

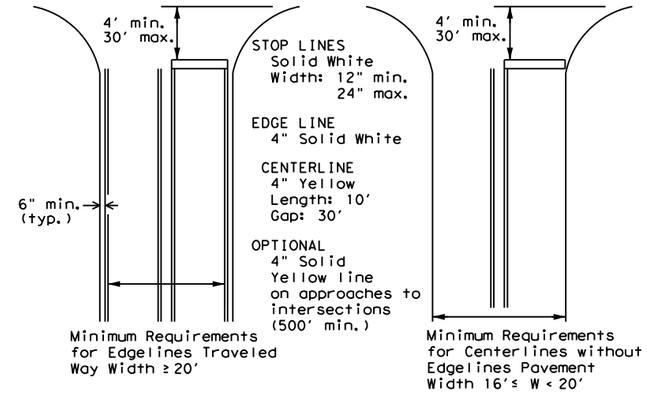
GENERAL NOTES

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

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

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

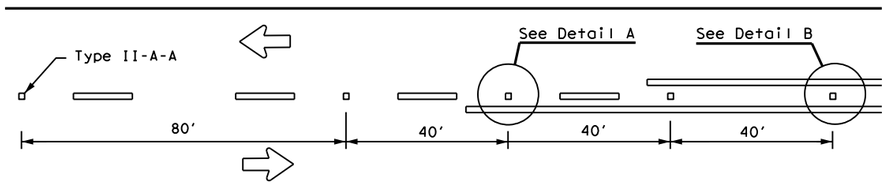
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

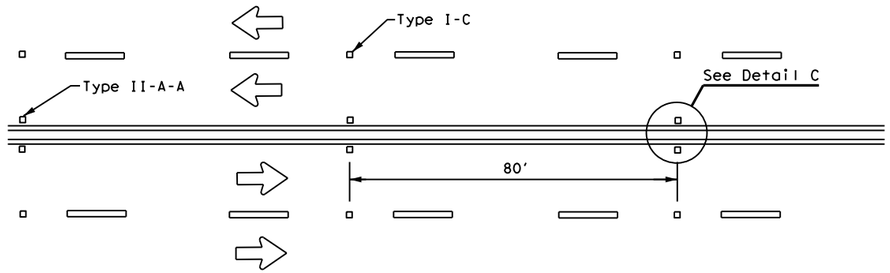
FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0025	03	105, ETC	UA 90, ETC
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	SAT	GUADALUPE		115

22A

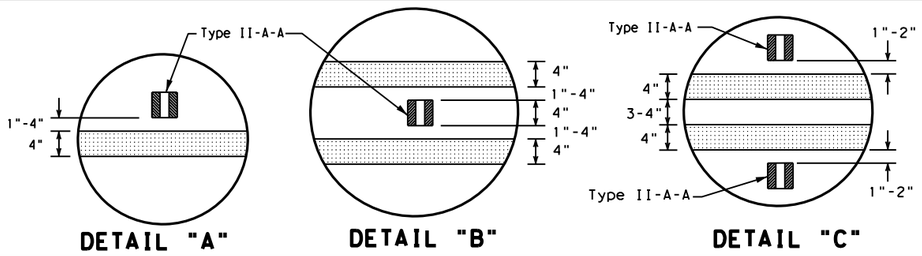
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



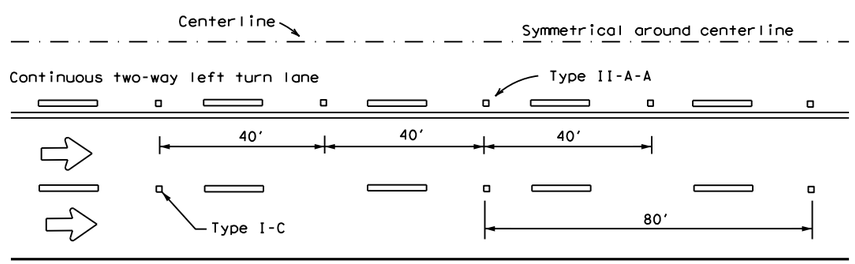
CENTERLINE FOR ALL TWO LANE ROADWAYS



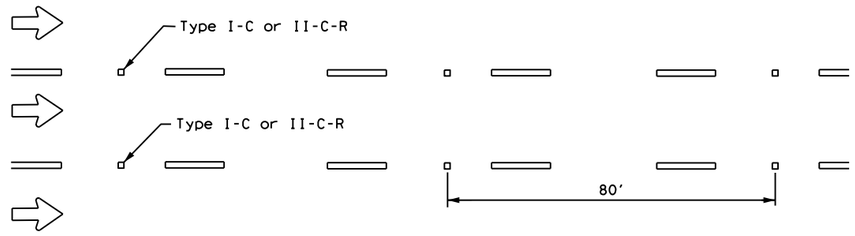
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTE

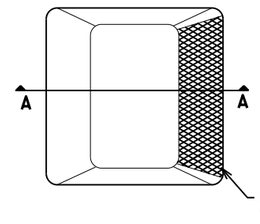
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

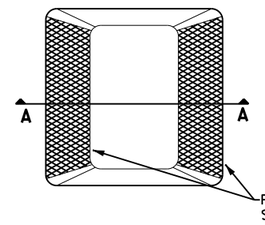
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

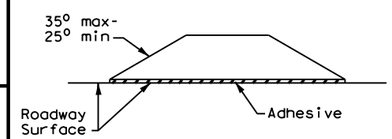
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

Traffic Safety Division Standard

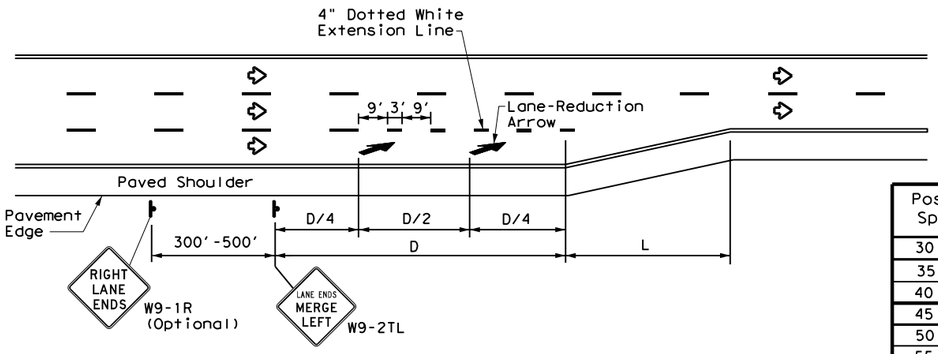
POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	0025	03	105, ETC	UA 90, ETC
	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		116

22B

DATE: 7/27/2023
FILE: t:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 sht 116)

DATE: 7/21/2023
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90) sht of PM3-20.dgn

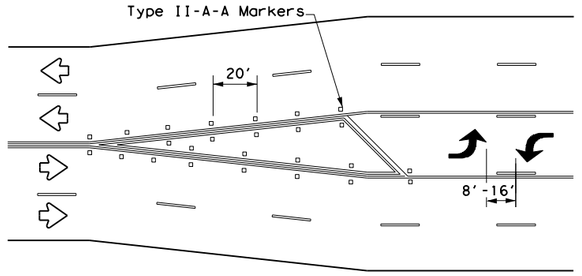


LANE REDUCTION

Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.



A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

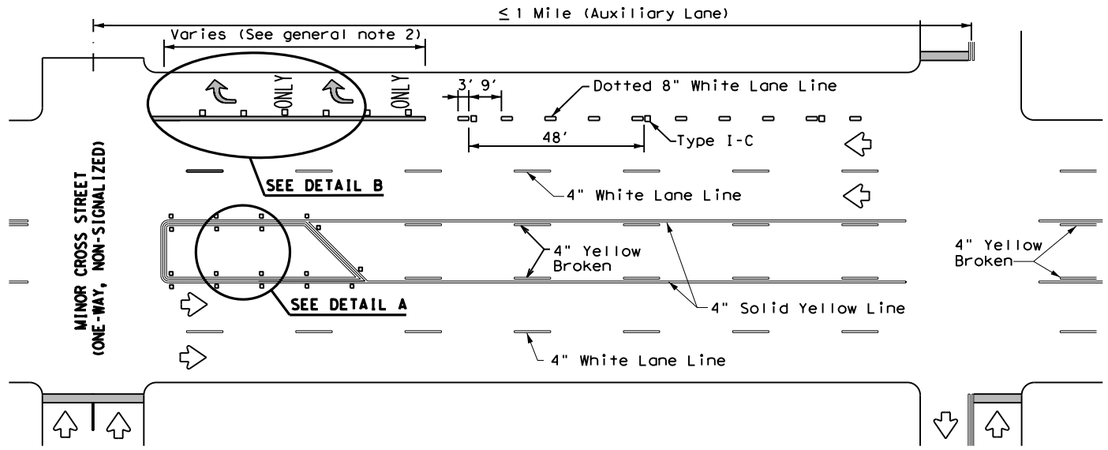
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

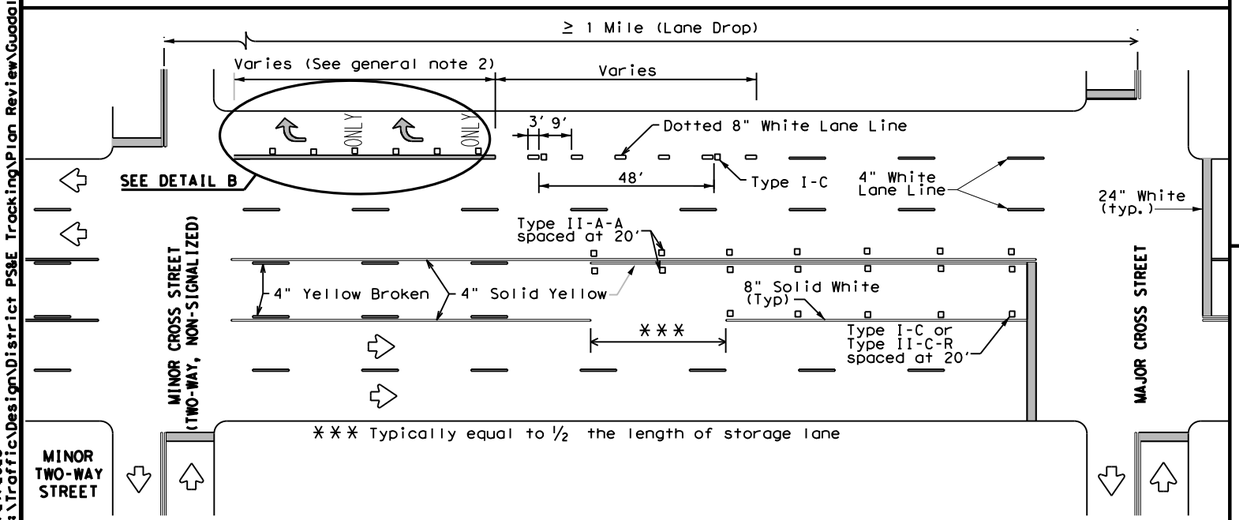
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

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

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



TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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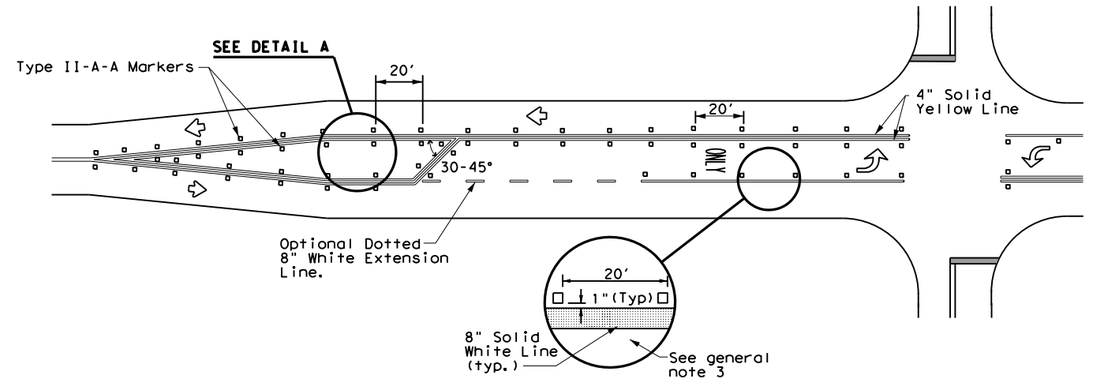
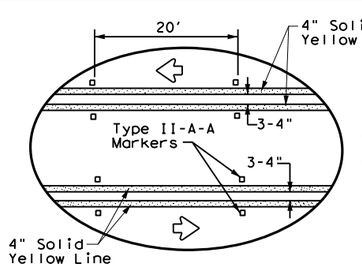
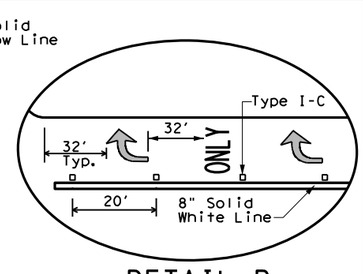


TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

Texas Department of Transportation

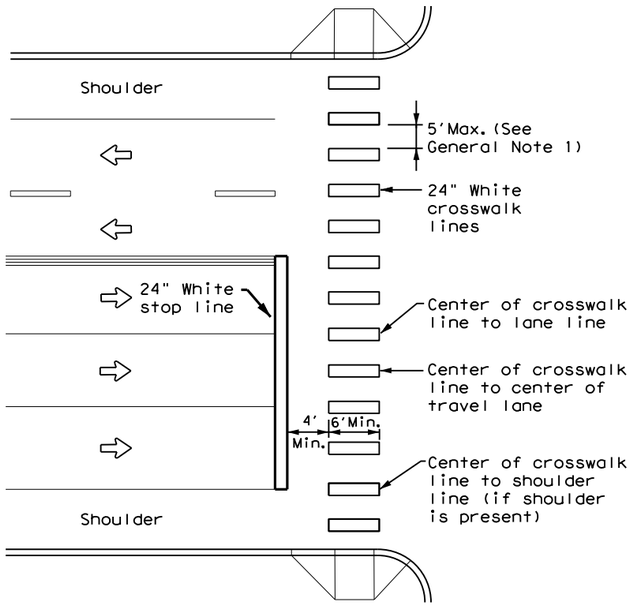
Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0025	03	105, ETC	UA 90, ETC
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	SAT	GUADALUPE		117
3-03 6-20				

220

DATE:
FILE:



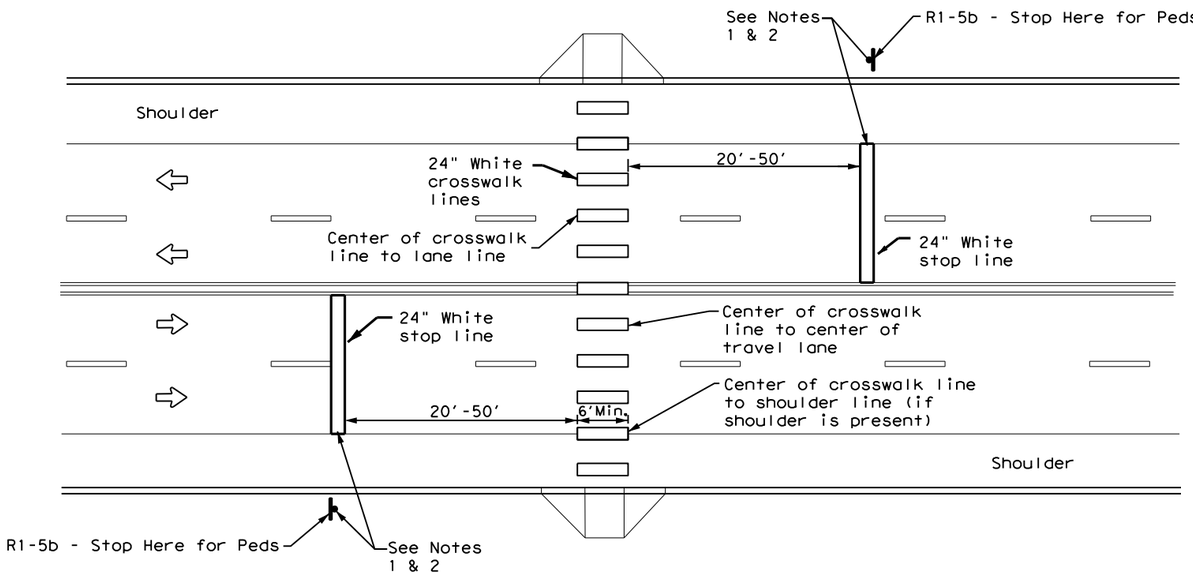
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

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

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



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with "Stop Here for Pedestrians" signs at unsignalized mid block cross walks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

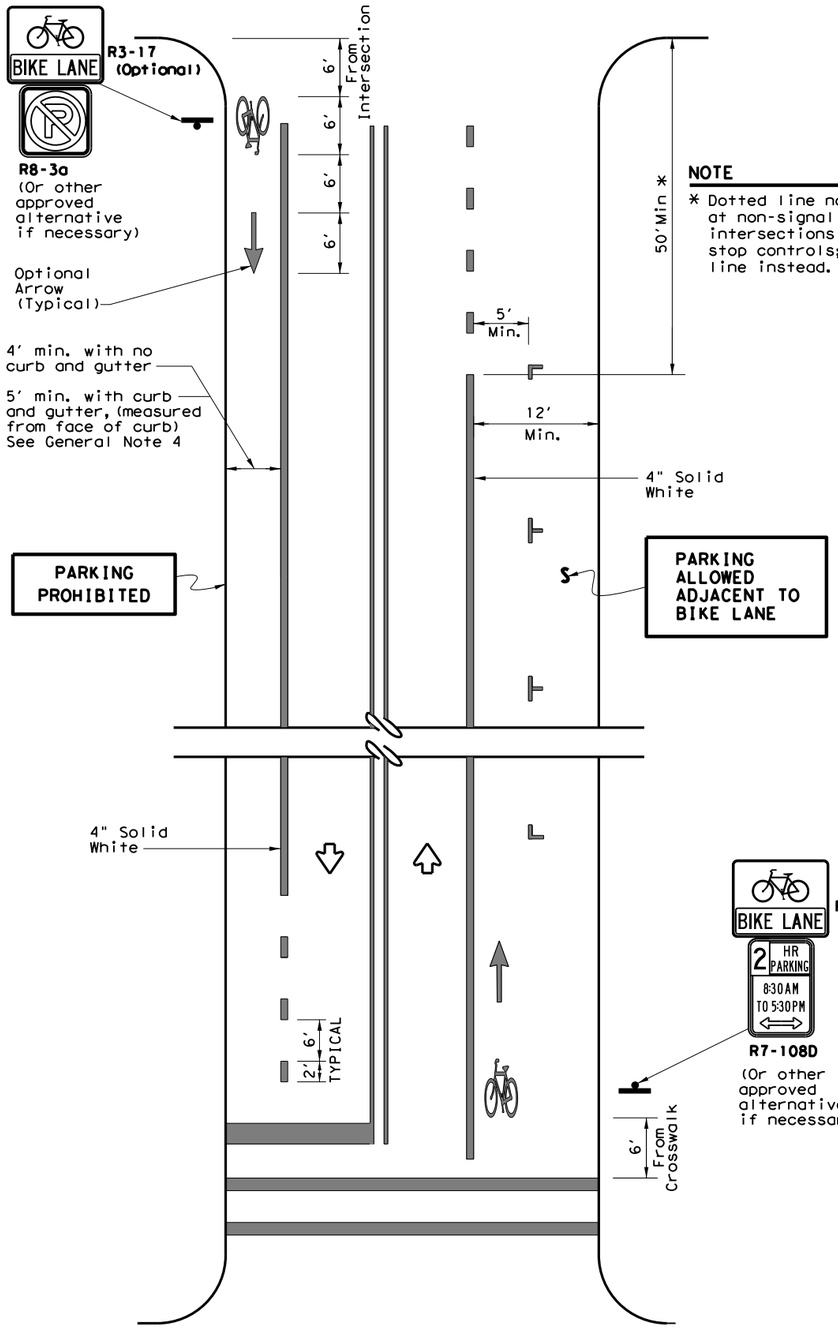
CROSSWALK PAVEMENT MARKINGS

PM(4)-22

FILE: pm4-22.dgn	DN:	CK:	DW:	CK:
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 3-22	0025	03	105, ETC	UA 90, ETC
	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		118

22D

DATE:
FILE:



NOTES

1. Bicycle lane pavement markings typically repeated after each intersection or signalized driveway.
2. On uninterrupted sections of roadway, bicycle lane pavement markings typically repeated as follows:

   -1200' for 45 MPH or less roads
   -2500' for 50 MPH and greater roads.

TWO-WAY STREET

NOTE

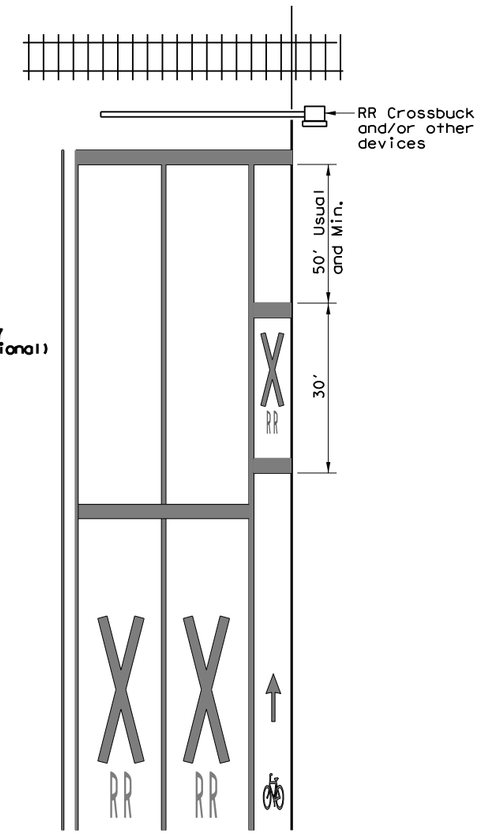
* Dotted line not necessary at non-signalized minor intersections with no stop controls; Use solid line instead.

GENERAL NOTES

1. All bicycle lane pavement markings shall be white unless otherwise noted.
2. All pavement marking materials shall meet the required Department Material Specifications as specified by the plans.
3. Exact sign placement and details are shown elsewhere in the plans.
4. The current edition of AASHTO'S Guide for the Development of Bicycle Facilities should be referenced for variations in design, other geometric conditions, and lane width options.
5. Other bicycle lane symbol or word markings as shown in the Texas Manual on Uniform Traffic Control Devices may be used. Details for words, arrows and symbols as shown in the Standard Highway Sign Designs for Texas.
6. The "BIKE LANE" (R3-17) sign with the "AHEAD" (R3-17a) sign mounted directly below should be installed in advance of the beginning of a marked bike lane.
7. The "BIKE LANE" (R3-17) sign with the "END" (R3-17b) sign mounted directly below should be installed at the end of marked bicycle lane.

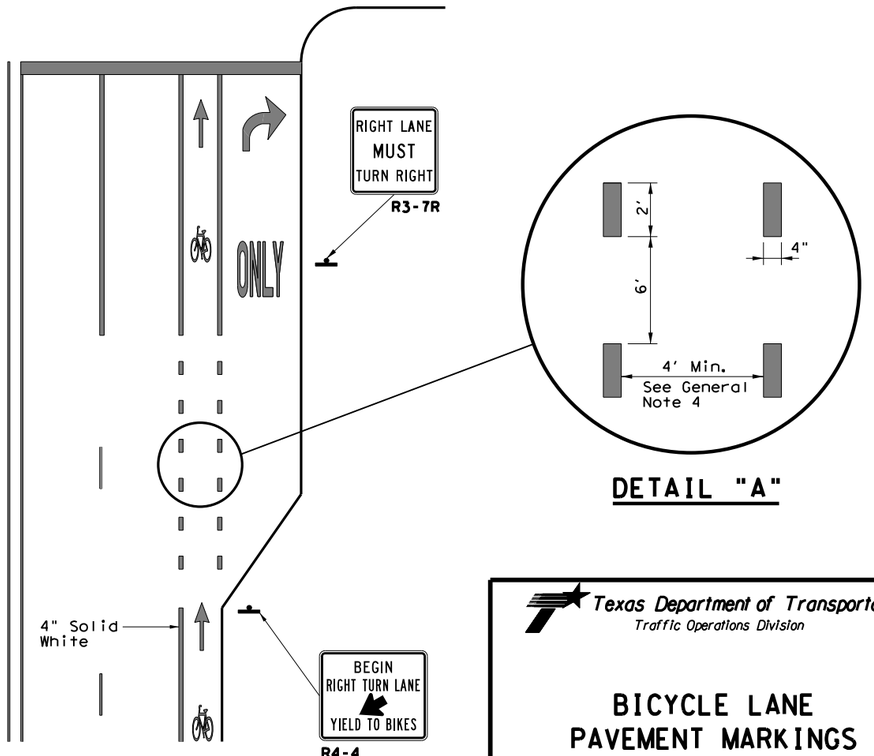
LEGEND	
	Sign
	Traffic Flow

SPECIFICATION REFERENCE TABLE	
Traffic Paint	DMS-8200
Hot Applied Thermoplastic	DMS-8220
Permanent Prefabricated Pavement Markings	DMS-8240
Glass Traffic Beads	DMS-8290



(See RCPM Standard for travel lane details)

RAILROAD CROSSING APPROACH



RIGHT TURN ONLY LANE

DETAIL "A"

Texas Department of Transportation
Traffic Operations Division

BICYCLE LANE PAVEMENT MARKINGS

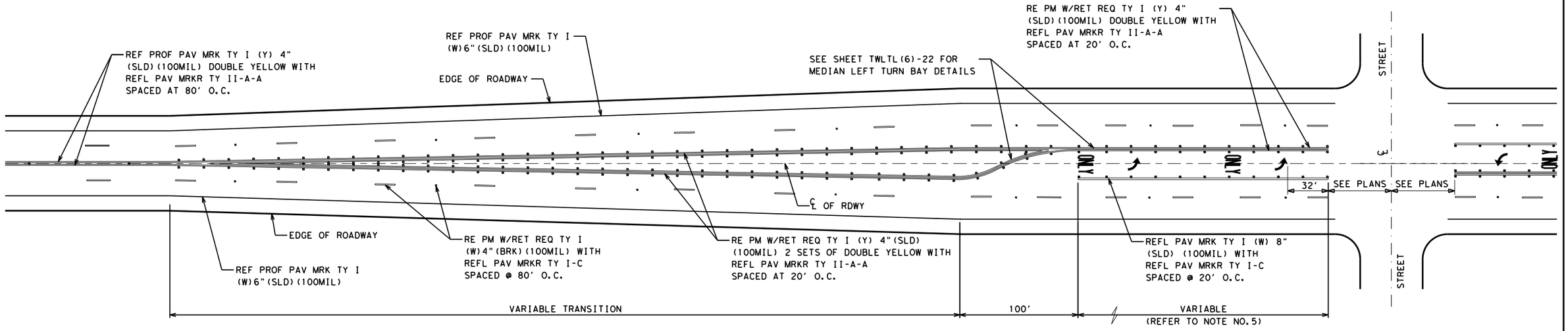
BLPM-10

REVISIONS

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

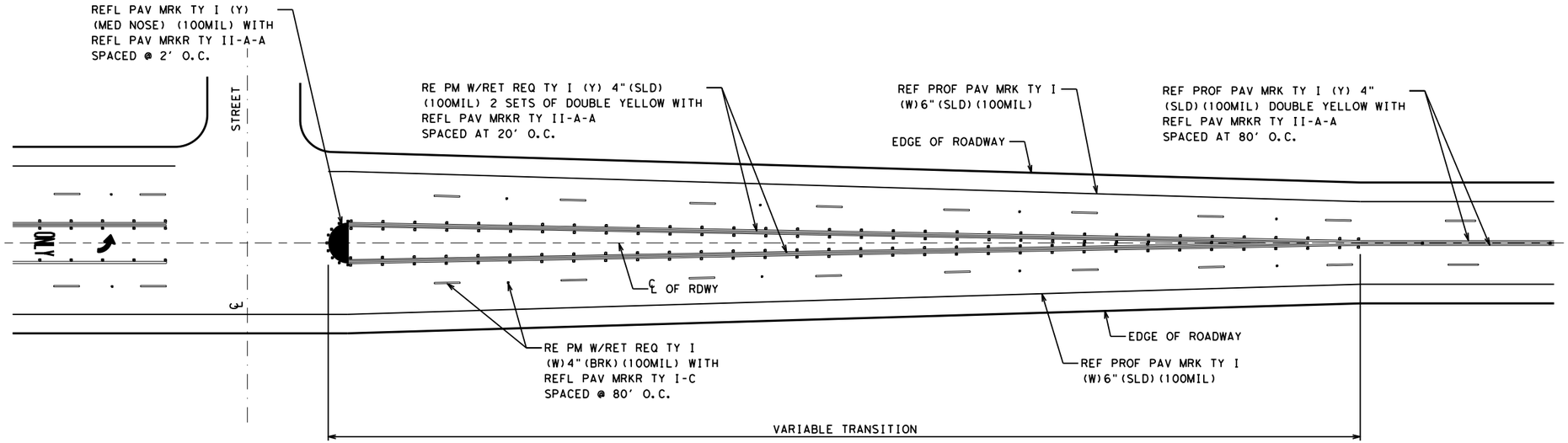
CONT	SECT	JOB	HIGHWAY
0025	03	105, ETC	UA 90, ETC

DIST	COUNTY	SHEET NO.
SAT	GUADALUPE	119



TYPICAL MEDIAN LEFT TURN BAY (FOR USE ON RURAL ROADS)

SIGNALIZED AND NON-SIGNALIZED CROSS STREETS
WITH LEFT TURN BAY

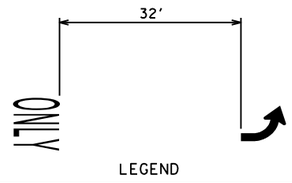


TYPICAL TRANSITION

LEFT TURN BAY END CONDITION AND ROADWAY TRANSITION

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-20 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE.
4. REFER TO TXDOT STANDARD PM(3)-20 FOR MORE TURN LANE DETAILS.
5. REFER TO TXDOT ROADWAY DESIGN MANUAL FOR DECELERATION AND STORAGE LENGTH.



LEGEND

TYPICAL DETAIL
(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-20)

Texas Department of Transportation
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San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - RURAL ROADS

SCALE: NS

TWLTL(1)-22

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.			SHEET NO.
MAY 2010 MAY 2018 MAY 2022		SEE TITLE SHEET			120
	STATE	DIST.	COUNTY		
	TEXAS	SAT	GUADALUPE		
	CONT.	SECT.	JOB	HIGHWAY NO.	
	0025	03	105, ETC	UA 90, ETC	

REVISED ON: 5-18 | CHECKED BY: G.G./OMG | REVISED BY: JCO3 | DRAWN BY: TED

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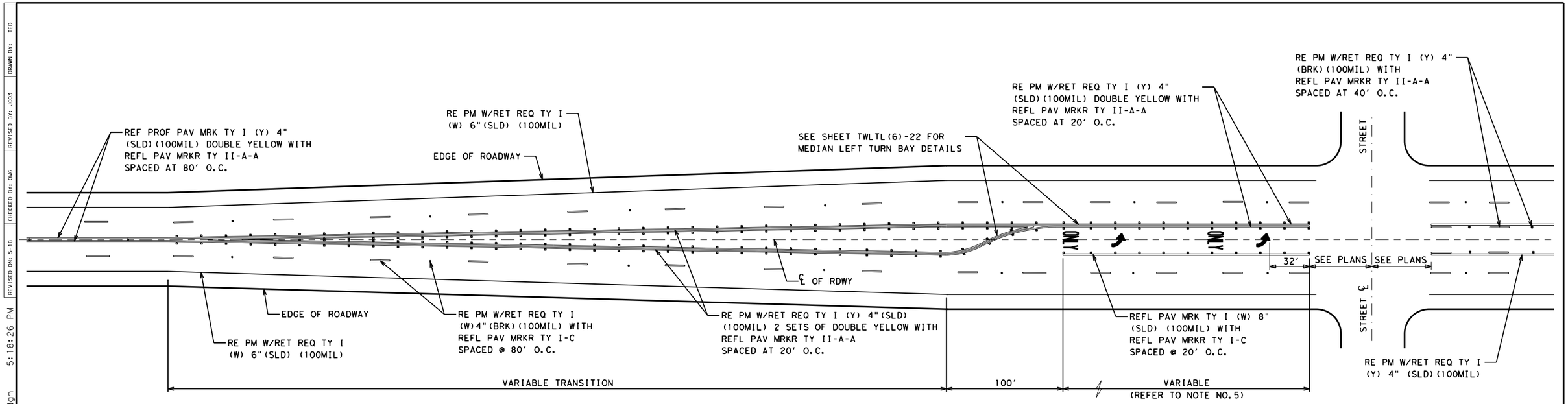
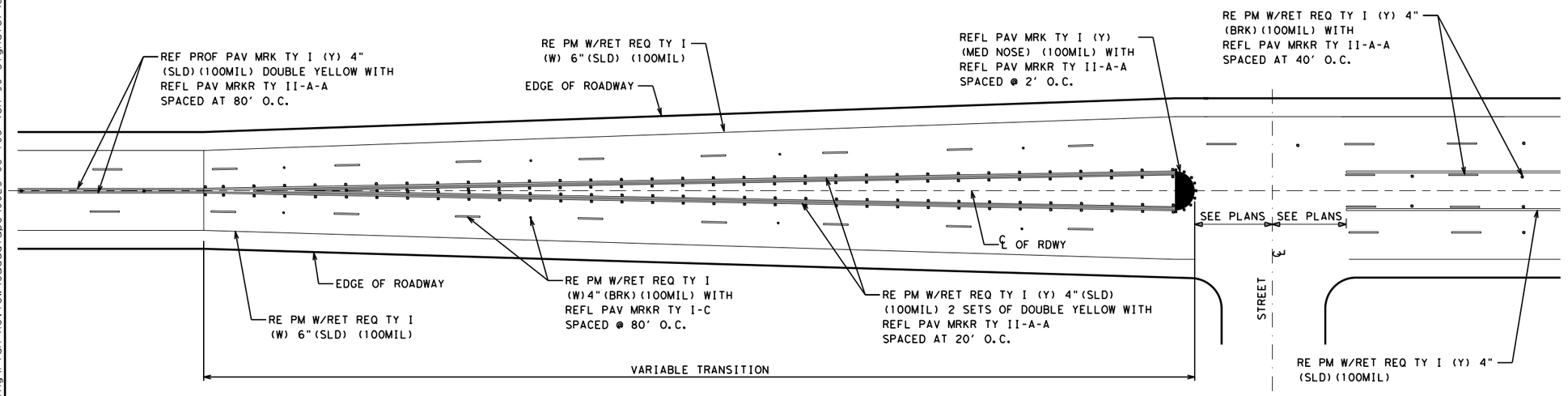


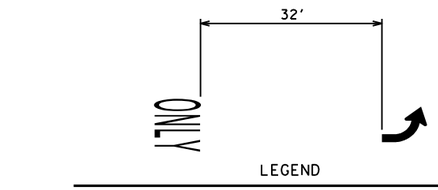
TYPICAL MEDIAN LEFT TURN BAY

SIGNALIZED AND NON-SIGNALIZED CROSS STREETS
AT BEGINNING AND END OF TWO WAY CENTER LEFT TURN LANE



TYPICAL TRANSITION

AT BEGINNING AND END OF TWO WAY CENTER LEFT TURN LANE



LEGEND

TYPICAL DETAIL
(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-20)

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-20 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE.
4. REFER TO TXDOT STANDARD PM(3)-20 FOR MORE TURN LANE DETAILS.
5. REFER TO TXDOT ROADWAY DESIGN MANUAL FOR DECELERATION AND STORAGE LENGTH.

Texas Department of Transportation

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS

TWLTL(2)-22

REVISIONS	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
MAY 2010 MAY 2018 MAY 2022		SEE TITLE SHEET		121
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	TEXAS	SAT	GUADALUPE	
	CONT.	SECT.	JOB	HIGHWAY NO.
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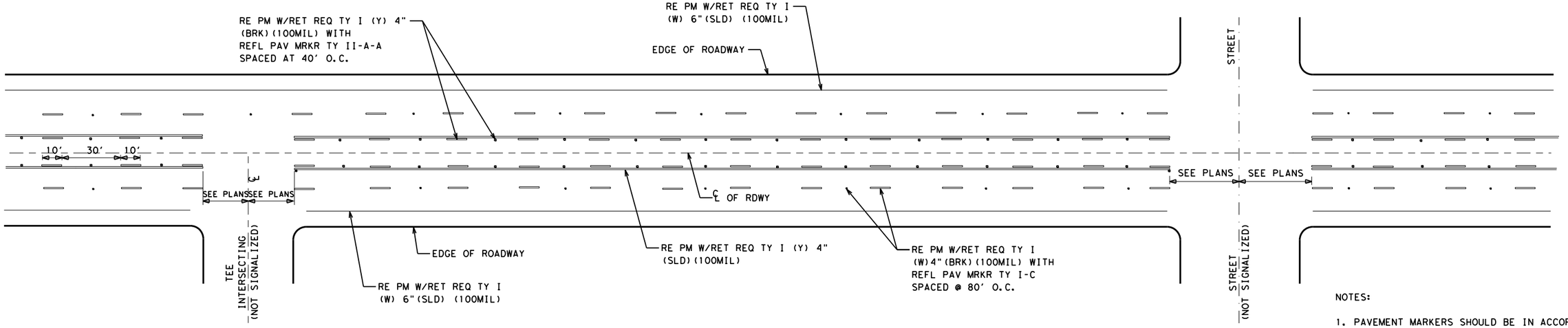

TWO WAY LEFT TURN LANE DETAILS
NON-SIGNALIZED INTERSECTIONS

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-20 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE.
4. REFER TO TXDOT STANDARD PM(3)-20 FOR MORE TURN LANE DETAILS.
5. REFER TO TXDOT ROADWAY DESIGN MANUAL FOR DECELERATION AND STORAGE LENGTH.

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS — **TWLTL(3)-21**

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MAY 2022	TEXAS	SAT	GUADALUPE		
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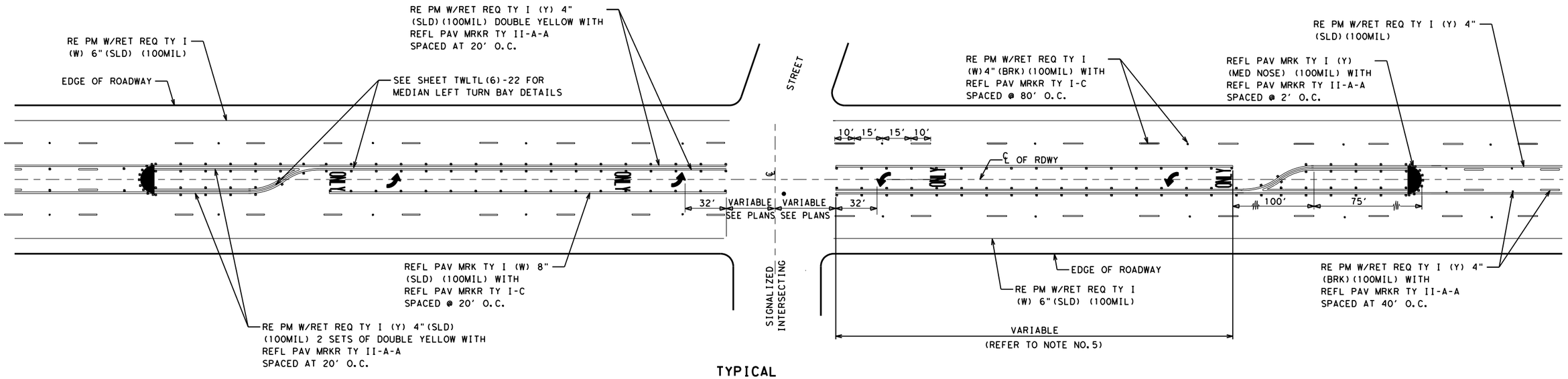
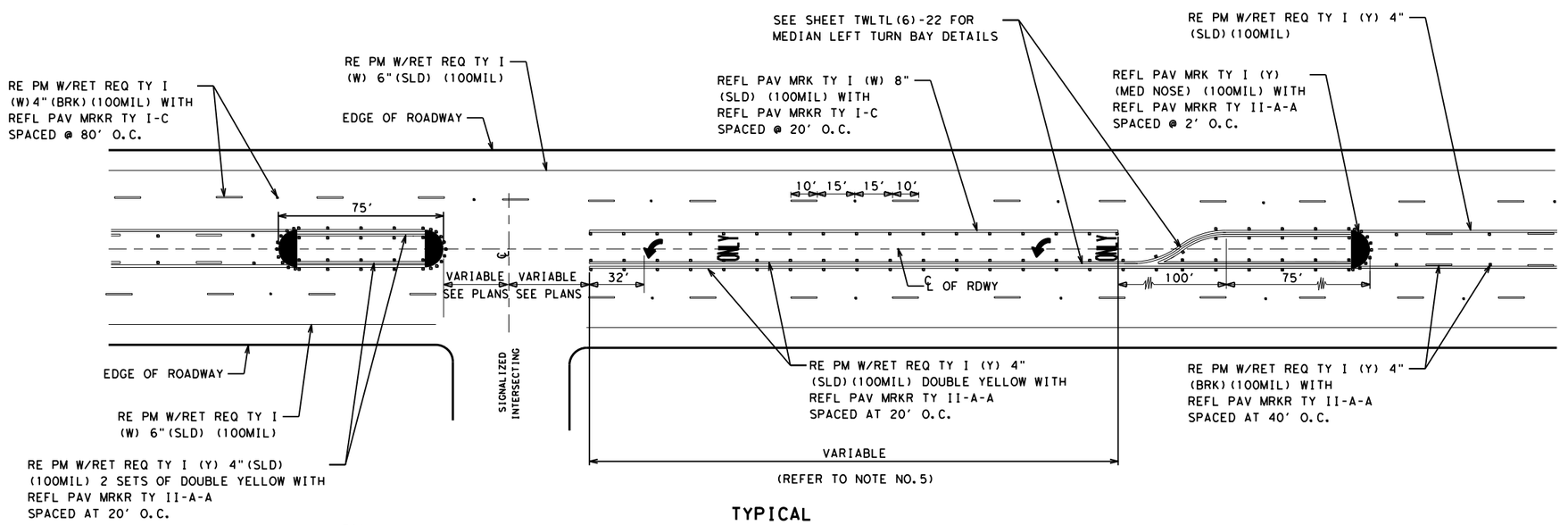
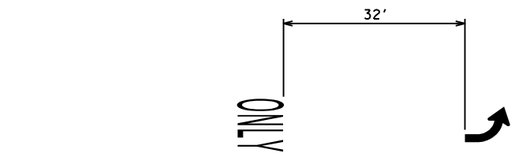


TYPICAL
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED INTERSECTION



TYPICAL
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED TEE INTERSECTION



LEGEND

TYPICAL DETAIL

(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-20)

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-20 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE.
4. REFER TO TXDOT STANDARD PM(3)-20 FOR MORE TURN LANE DETAILS.
5. REFER TO TXDOT ROADWAY DESIGN MANUAL FOR DECELERATION AND STORAGE LENGTH.

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS

TWLTL(4)-21

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
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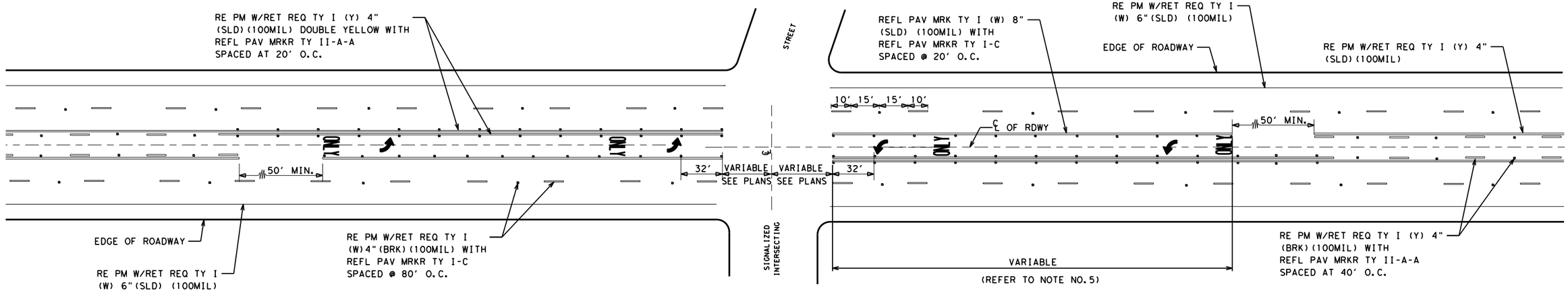

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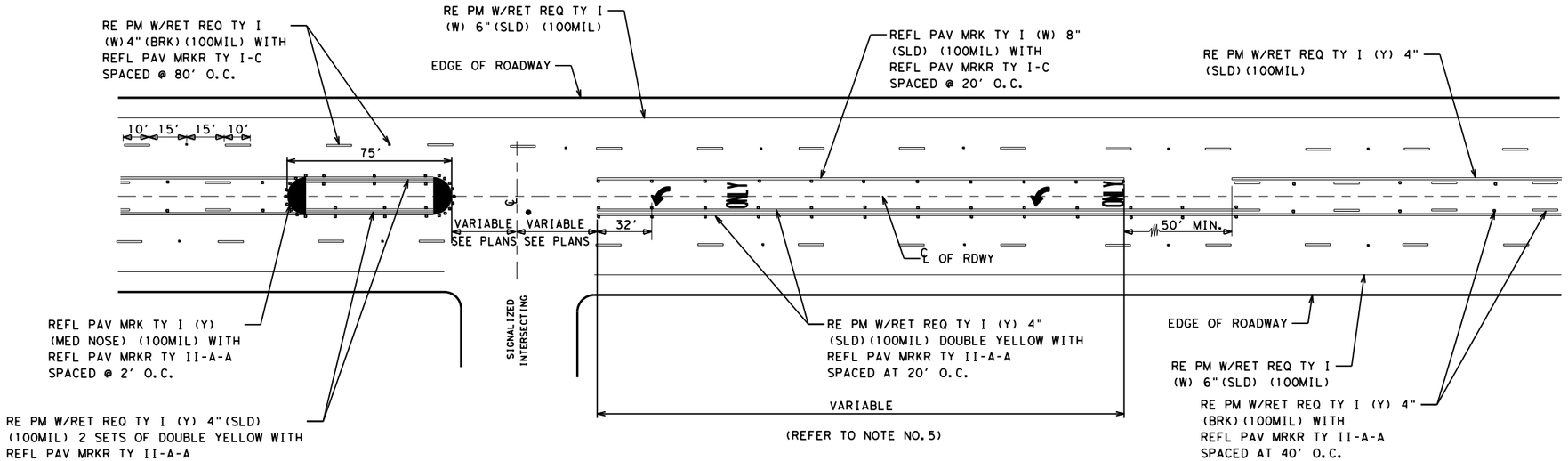
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED INTERSECTION



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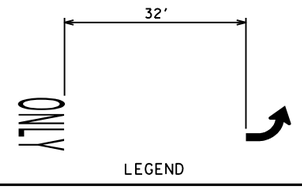
TWO WAY LEFT TURN LANE DETAILS
SIGNALIZED TEE INTERSECTION



LEGEND

TYPICAL DETAIL
(PLACE LEGENDS IN ACCORDANCE TO STATE STANDARD PM(3)-20)

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-20 (POSITIONING GUIDANCE).
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4. REFER TO TXDOT STANDARD PM(3)-20 FOR MORE TURN LANE DETAILS.
5. REFER TO TXDOT ROADWAY DESIGN MANUAL FOR DECELERATION AND STORAGE LENGTH.

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS

TWLTL(5)-22

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
MAY 2010 MAY 2018 MAY 2022		SEE TITLE SHEET		124
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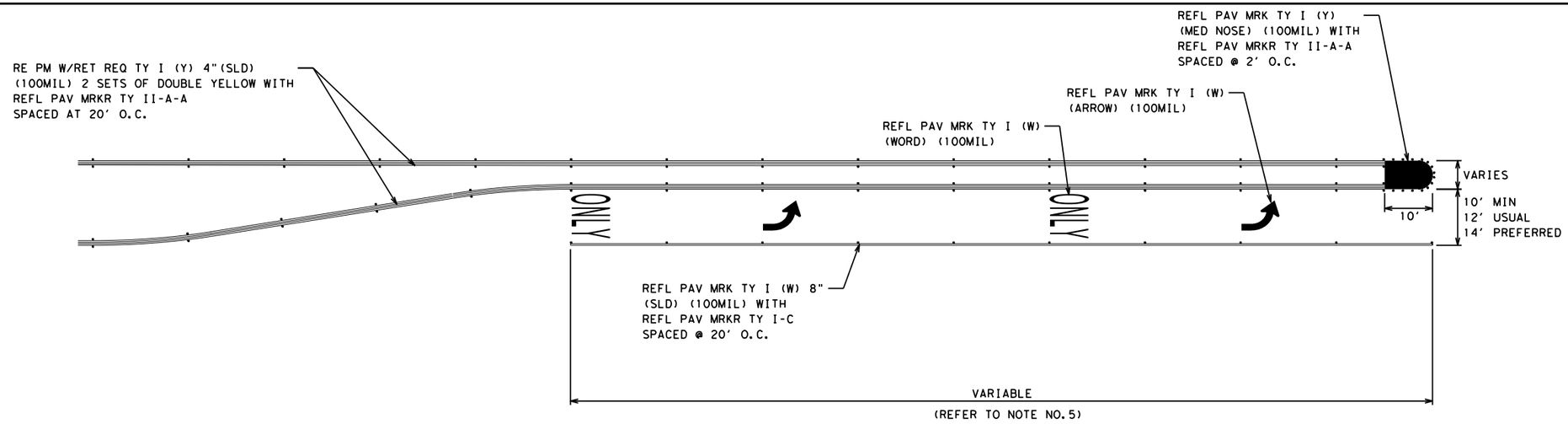

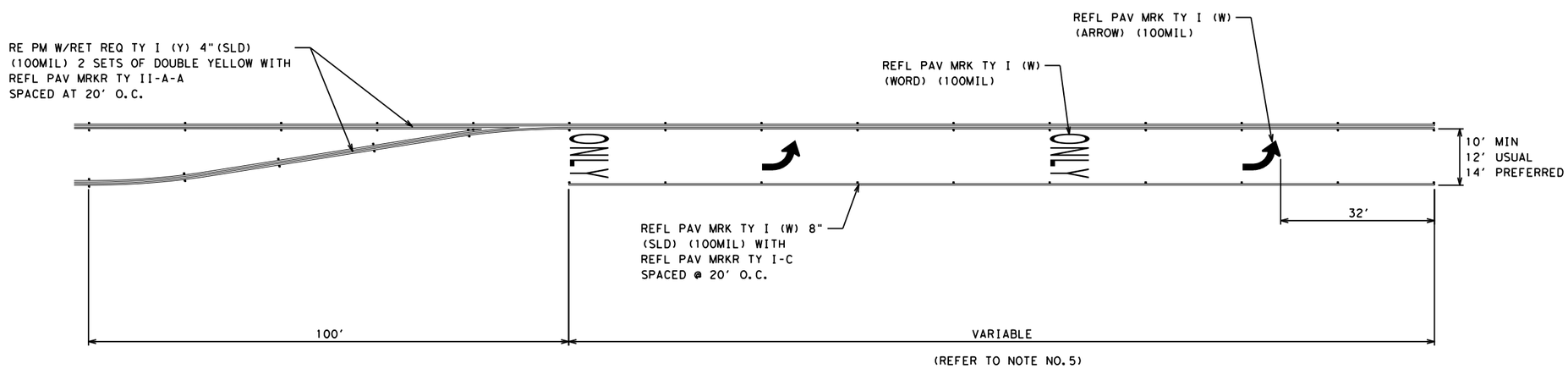

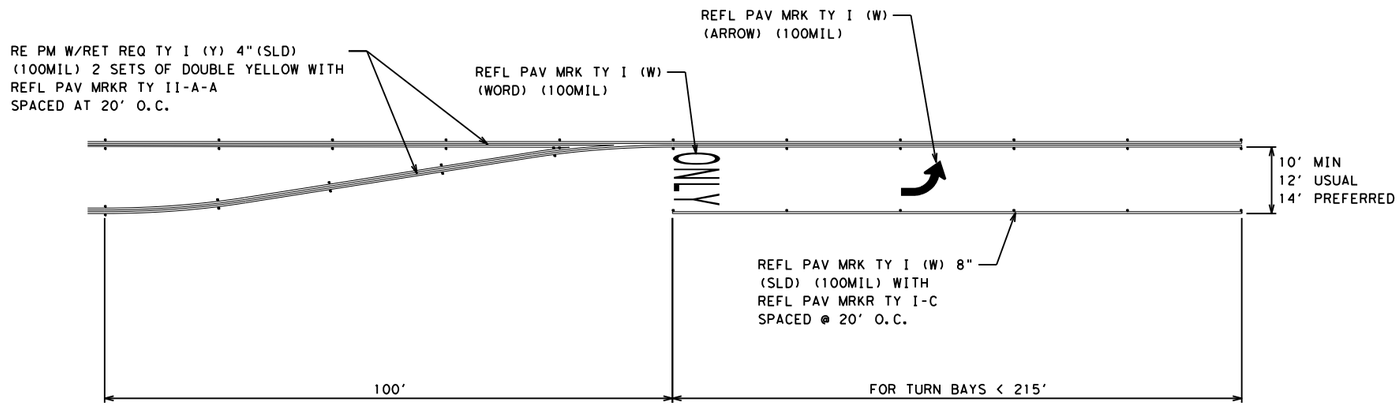

MEDIAN LEFT TURN BAY DETAILS

NOTES:

1. PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STATE STANDARDS PM(2)-20 (POSITIONING GUIDANCE).
2. PAVEMENT MARKING ARROWS SHALL COMPLY TO TEXAS MUTCD
3. LEFT TURN BAY LAYOUT, TWO SETS OF "WORDS" AND "ARROWS" SHALL BE USED IF THE LENGTH OF THE BAY IS EQUAL TO OR GREATER THAN 180 FEET. THE BOTTOM OF THE FIRST "ONLY" SHALL BE PLACED AT THE BEGINNING OF THE TURN BAY LANE LINE AS SHOWN ABOVE.
4. REFER TO TXDOT STANDARD PM(3)-20 FOR MORE TURN LANE DETAILS.
5. REFER TO TXDOT ROADWAY DESIGN MANUAL FOR DECELERATION AND STORAGE LENGTH.

San Antonio District Standard

TWO WAY LEFT TURN LANE AND LEFT TURN BAYS - URBAN ROADS

SCALE: NS **TWLTL(6)-22**

REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.			SHEET NO.
MAY 2010 MAY 2018 MAY 2022		SEE TITLE SHEET			125
	STATE	DIST.	COUNTY		
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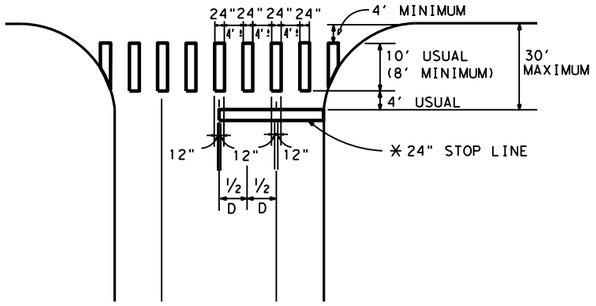
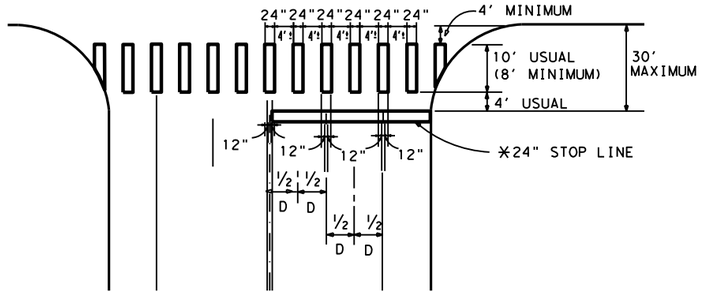
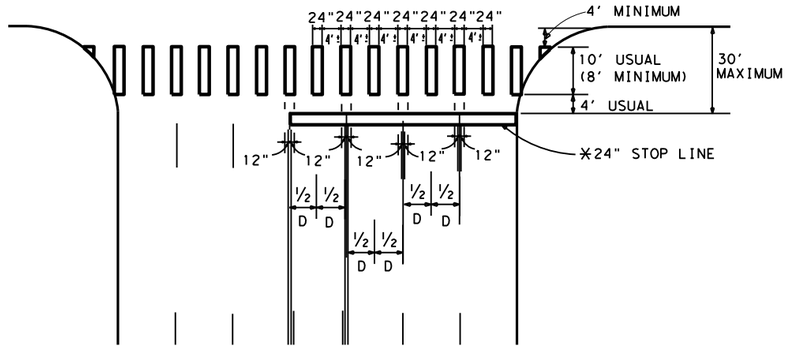


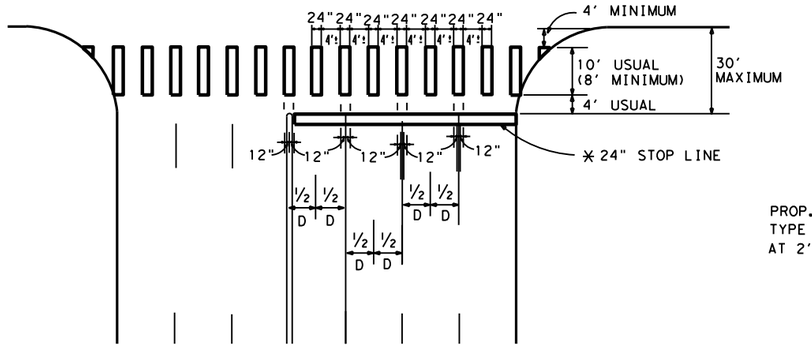
TWO LANES WITH SHOULDERS



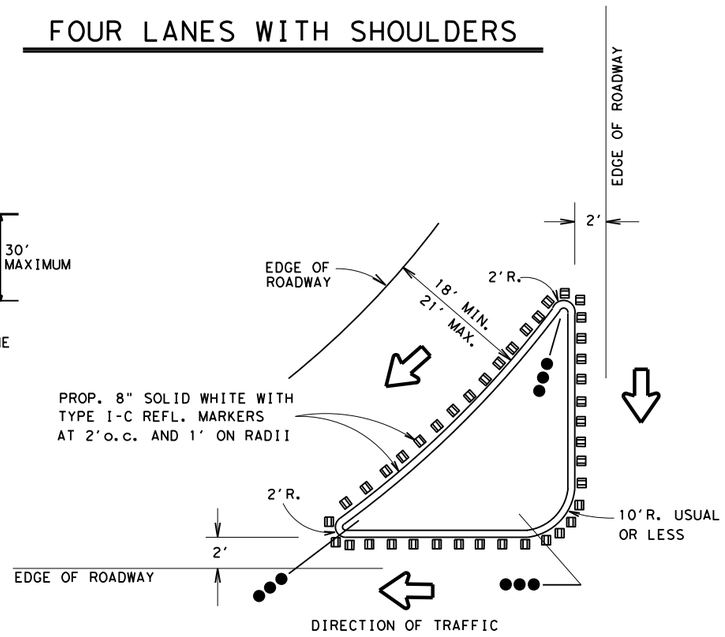
FOUR LANES WITH SHOULDERS



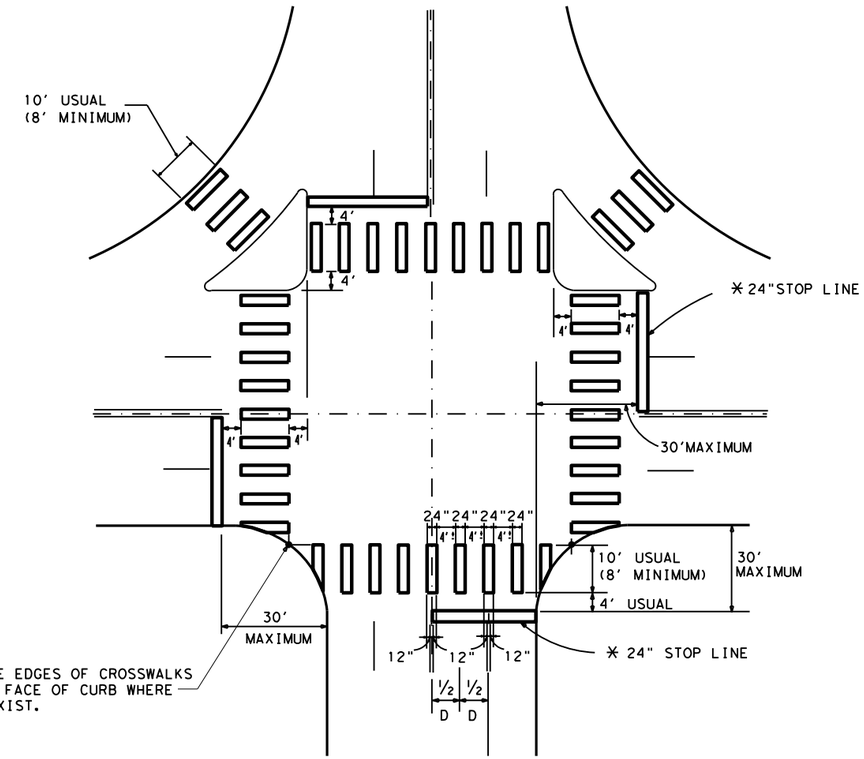
MULTI - LANES



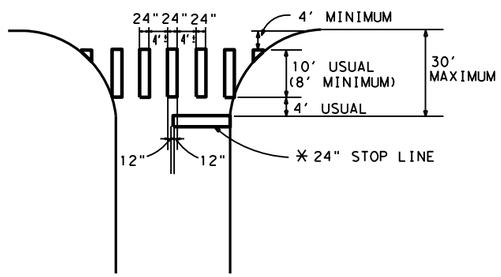
MULTI - LANE WITH MEDIAN



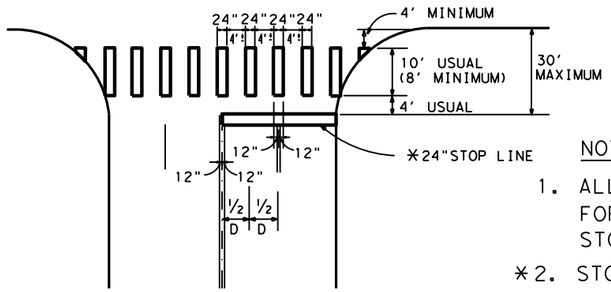
TYPICAL RIGHT TURN ISLAND
WITH DELINEATION



INTERSECTION WITH RIGHT - TURN ISLANDS



TWO LANES



FOUR LANES

NOTES:

1. ALL LONGITUDINAL LINES FORMING CROSSWALK AND STOP LINES SHALL BE WHITE
* 2. STOP LINES AS REQUIRED ON DETAILED PAVEMENT MARKING PLANS.
3. "D" IS EQUAL TO ONE HALF THE DISTANCE.

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 31

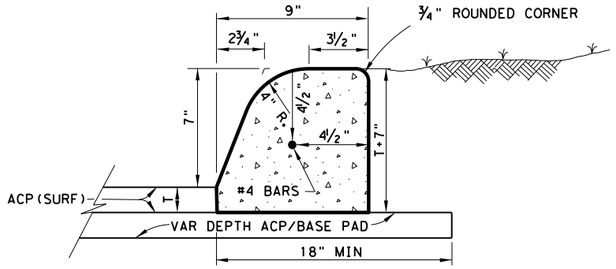
San Antonio District Standard

TYPICAL CROSSWALK DETAILS

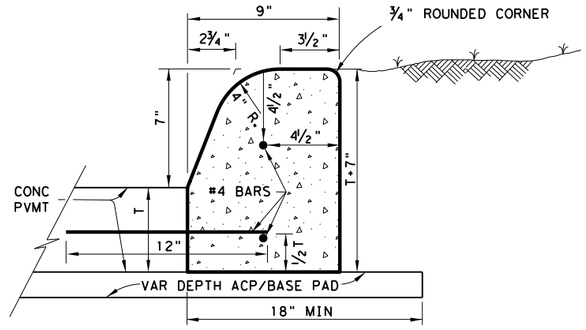
TCD-05

 Texas Department of Transportation

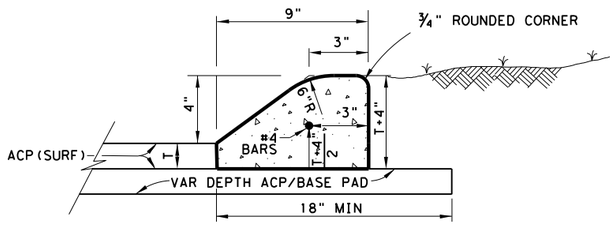
REVISIONS	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
DEC 1999	6	SEE TITLE SHEET		126
AUG 2005	STATE	DIST.	COUNTY	
	TEXAS	SAT	GUADALUPE	
	CONT.	SECT.	JOB	HIGHWAY NO.
	0025	03	0025	UA 90, ETC



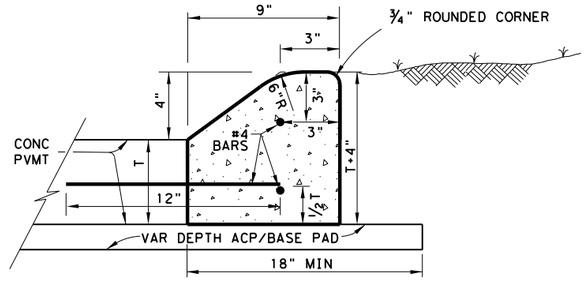
CONCRETE CURB (TYPE 1)
W/ ACP



CONCRETE CURB (TYPE 1)
W/ CONC PAVEMENT



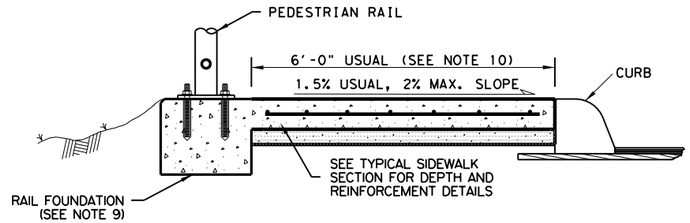
CONCRETE CURB (TYPE 2)
W/ ACP



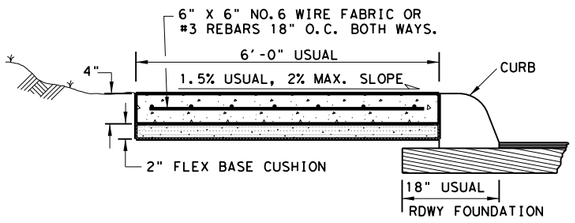
CONCRETE CURB (TYPE 2)
W/ CONC PAVEMENT

GENERAL NOTES:

1. CONCRETE CURB TYPE 1 AND 2 SHOWN SHALL MEET THE MINIMUM SPECIFICATION REQUIREMENTS OF CLASS "A" CONCRETE PER ITEM 529 AND 421.
2. ALL REINFORCING STEEL SHALL BE GRADE 60
3. WHERE CONCRETE CURB IS PLACED ON EXISTING CONCRETE PAVEMENT, THE PAVEMENT SHALL BE DRILLED AND THE REINFORCING BARS GROUTED IN PLACE.
4. 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.
5. VERTICAL AND HORIZONTAL DOWEL BARS AND TRANSVERSE REINFORCING BARS SHALL BE PLACED AT 4 FEET C-C, UNLESS OTHERWISE SHOWN.
6. ONE-HALF INCH EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB OR CURB AND GUTTER IS ADJACENT TO SIDEWALK OR RIPRAP. THIS IS SUBSIDIARY TO THE CURB, ITEM 529.
7. LAYDOWN CURB AT DRIVEWAYS WILL BE PAID AS SUBSIDIARY TO ITEM 530.
8. FOR SIDEWALK DETAILS AT DRIVEWAYS, SEE SAN ANTONIO DISTRICT STANDARD "DRIVEWAY DETAILS".
9. SEE PEDESTRIAN HANDRAIL DETAILS STANDARD "PRD" FOR MORE INFORMATION. CONCRETE RAIL FOUNDATION TO BE POURED WITH THE SIDEWALK BUT PAYMENT IS SUBSIDIARY TO ITEM 450 "RAILING".
10. CLEAR SIDEWALK WIDTH EXCLUDING THE PEDESTRIAN RAIL FOUNDATION SHALL BE 6' UNLESS OTHERWISE SPECIFIED IN THE PLANS

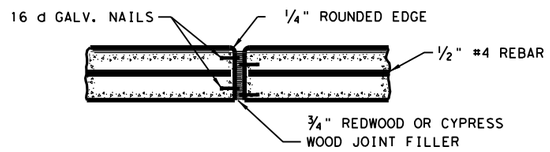


TYPICAL SIDEWALK SECTION WITH PEDESTRIAN RAIL



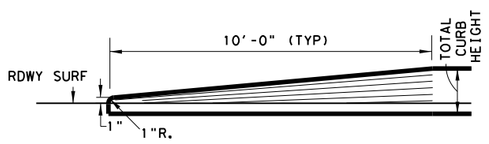
TYPICAL SIDEWALK SECTION

GROOVED JOINTS IN THE SIDE WALK SHALL BE AT A MAX. SPACING OF 10 FT. AND SHALL HAVE ¾" EXPANSION JOINTS AT A MAX. SPACING OF 60' AND TO COINSIDE WITH THE CURB EXP. JOINTS.



TYPICAL CURB EXPANSION JOINT DETAIL

EXPANSION JOINTS TO BE PLACED AT BEGINNING AND END OF CURVES, DRIVEWAYS WHEELCHAIR RAMPS, INLETS, ILLUMINATION/ SIGNAL FOUNDATIONS AND OTHER FIXED OBJECTS.



TRANSITION FOR CONCRETE CURB ENDS

SEE CURB DETAIL FOR REINFORCEMENT

Texas Department of Transportation
San Antonio District

MISCELLANEOUS CURB AND SIDEWALK DETAILS

San Antonio District Standard
Sheet (1 of 2)

T:\Engdata\Standards\MiscCurbdetails.dgn

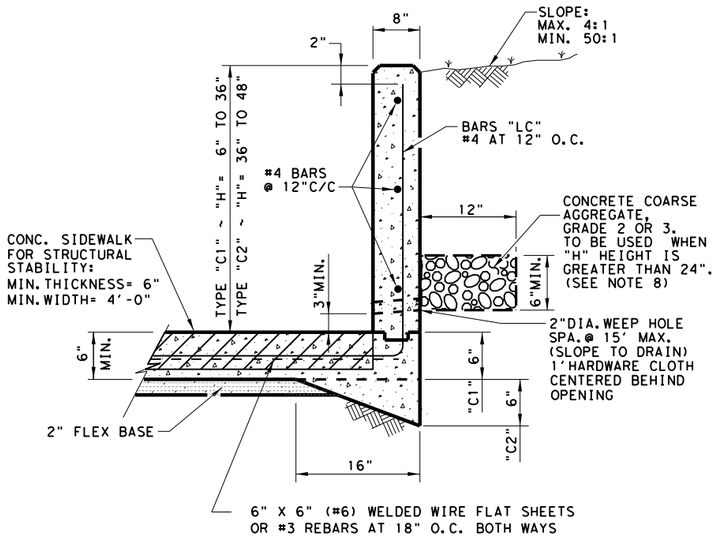
ORIGINAL DRAWING DATE:

REVISIONS
09-01-08
10-10-17 sidewalk width equals 6' usual
07-22-20 9" curb + curb w/ conc pvmt det.
- -

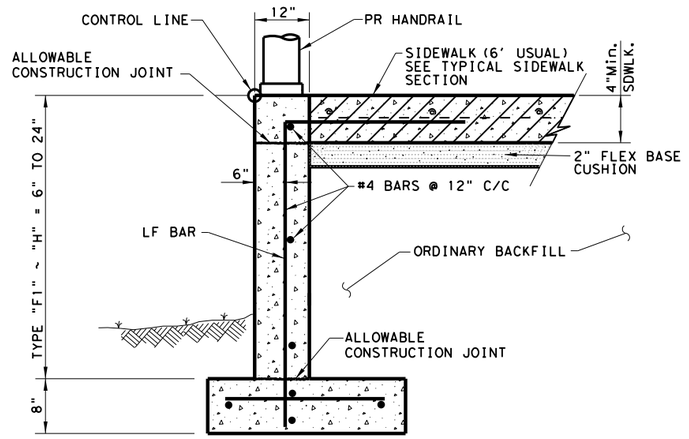
PREPARED BY AND FOR USE OF TxDoT.

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT #	SHEET
TX	6	SEE TITLE SHEET	127

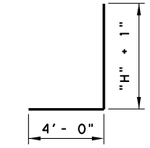
COUNTY	CONTROL	SECTION	JOB	HIGHWAY
GUADALUPE	0025	03	105, ETC	UA90, ETC



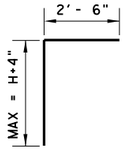
TYPE "C1" & "C2" CURB



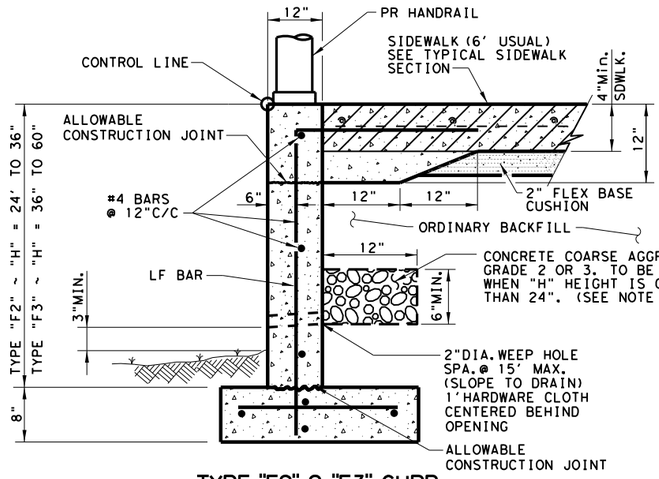
TYPE "F1" CURB



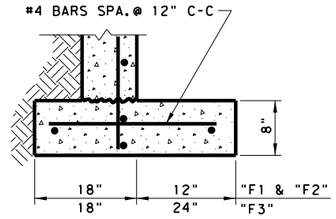
BAR "LC"



BAR "LF"



TYPE "F2" & "F3" CURB



FOOTING DETAIL

GENERAL NOTES:

1. CONCRETE FOR CURB TYPE F AND C SHOWN SHALL MEET THE MINIMUM SPECIFICATION REQUIREMENTS OF CLASS "C" CONCRETE PER ITEM 421
2. ALL REINFORCING STEEL SHALL BE GRADE 60
3. EXPANSION AND CONTRACTION JOINTS SHALL BE CONSTRUCTED TO MATCH PAVEMENT JOINITS 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.
4. VERTICAL AND HORIZONTAL DOWEL BARS AND TRANSVERSE REINFORCING BARS SHALL BE PLACED AT 4 FEET C-C, UNLESS OTHERWISE SHOWN.
5. UNTIL THE SIDEWALK IS COMPLETE, LATERAL SUPPORT FOR THE "F" CURBS WILL BE REQUIRED.
6. IF AGGREGATE IS REQUIRED PER THE DETAIL, IT IS PAID AS SUBSIDIARY TO THE CURB, ITEM 529.

DESIGN SOIL PARAMETERS:
Soil Unit Wt. = 120 pcf
Phi = 30 Degrees
Cohesion = 50 psf
Min. PI = 15
Max. PI = 30
SURCHARGE:
TYPE F CURB q = 2' Adjacent to sidewalk
Max. slope behind TYPE C Curb = 4:1
Min. Factor of Safety against sliding is 1.5.
Designed in accordance with current AASHTO Standards and Interim Specifications.

CLASS C CONCRETE PAID UNDER ITEM 531, SIDEWALK. (NOTE. ADDITIONAL CONCRETE TO MEET THE THICKENED SECTIONS REQUIRED BY THESE DETAILS IS SUBSIDIARY TO ITEM 531, CURB.)

Texas Department of Transportation
San Antonio District

MISCELLANEOUS CURB AND SIDEWALK DETAILS

San Antonio District Standard
Sheet (2 of 2)

T:Engdata/Standards/MiscCurbdetails.dgn
ORIGINAL DRAWING DATE:
REVISIONS
09-01-08
10-10-17 sidewalk width equals 6' usual
07-22-20 9" curb + curb w/ conc pvmt det.
- -

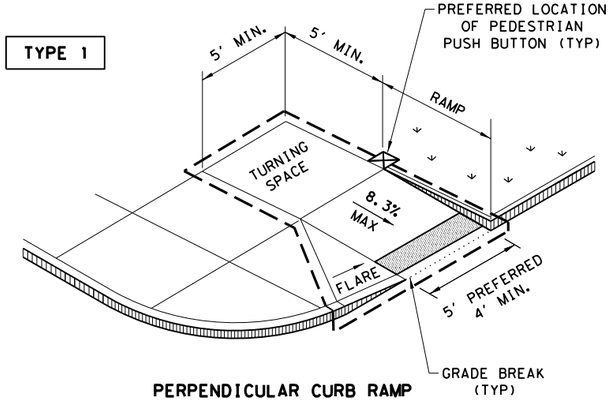
PREPARED BY AND FOR USE OF TxDoT.

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT #	SHEET
TX	6	SEE TITLE SHEET	128

COUNTY	CONTROL	SECTION	JOB	HIGHWAY
GUADALUPE	0025	03	105, ETC	UA90, ETC

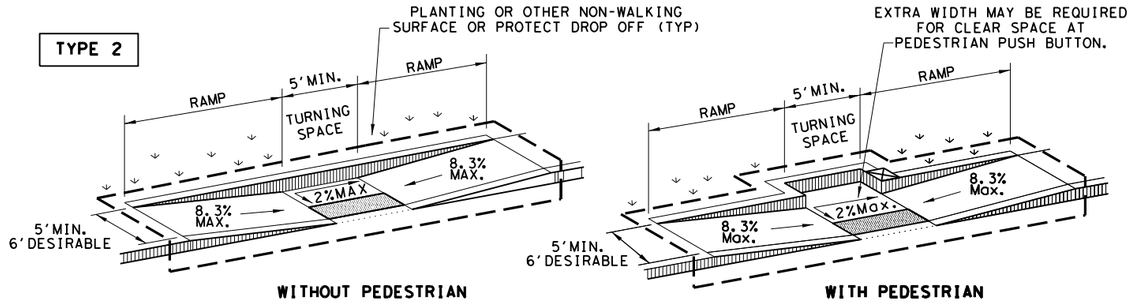
DATE: 7/27/2023
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\Standards\ped18.dgn

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

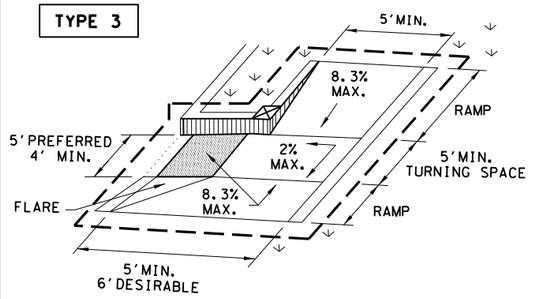


WITHOUT PEDESTRIAN PUSH BUTTON

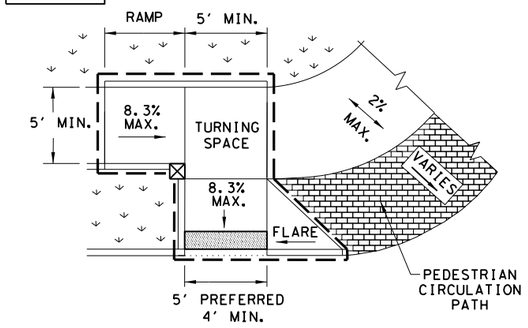
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

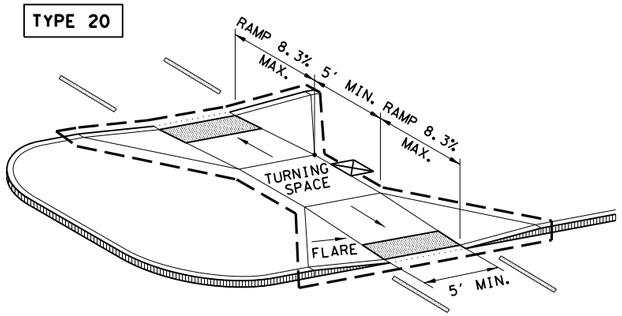


TYPE 6



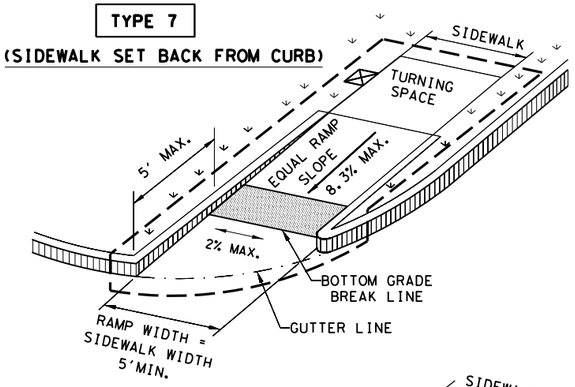
COMBINATION CURB RAMPS

TYPE 20

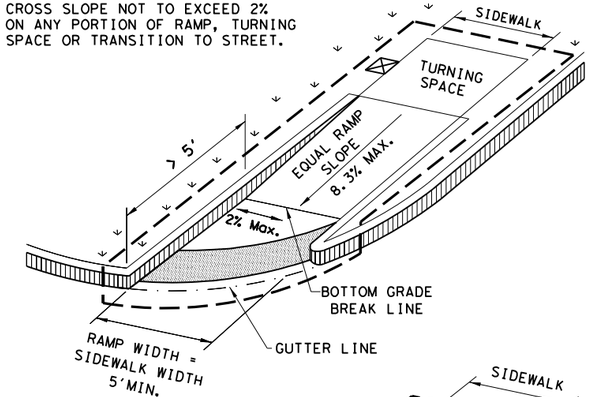


CURB RAMPS AT MEDIAN ISLANDS

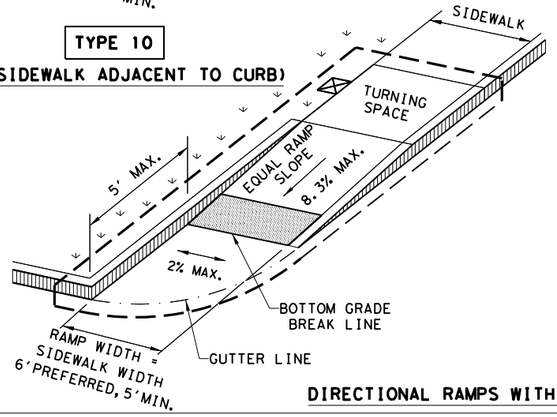
TYPE 7
(SIDEWALK SET BACK FROM CURB)



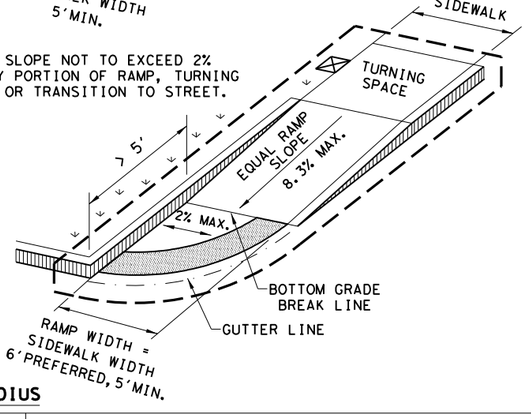
CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



TYPE 10
(SIDEWALK ADJACENT TO CURB)

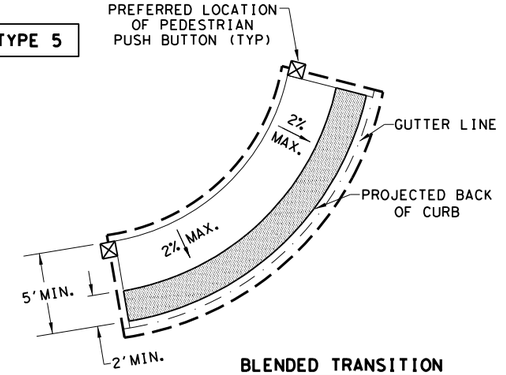


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

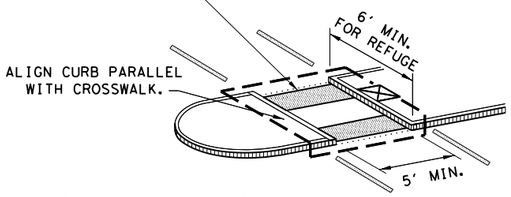
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

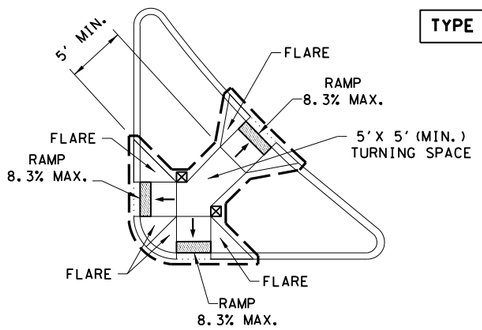
TYPE 21

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.



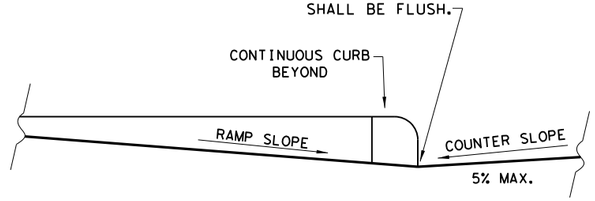
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

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	0025	03	105, ETC	UA 90, ETC
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		129

DATE: 7/27/2023
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\Standards\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 applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

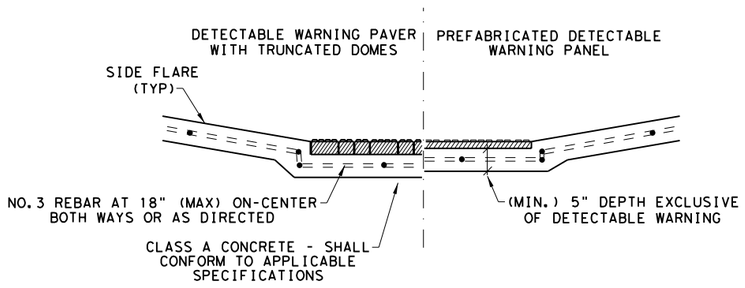
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material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

DETECTABLE WARNING PAVERS (IF USED)

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

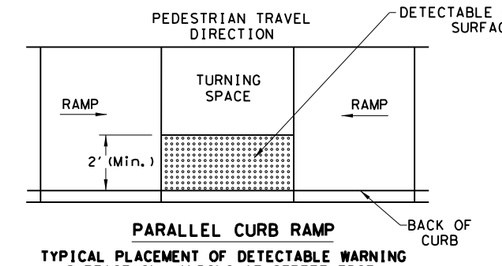
SIDEWALKS

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

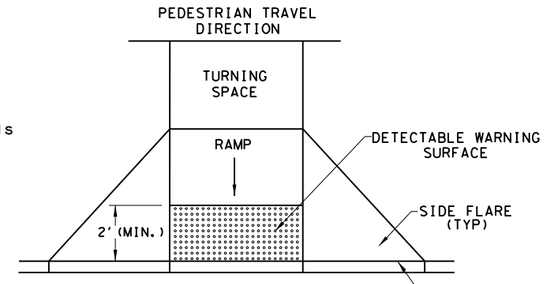


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

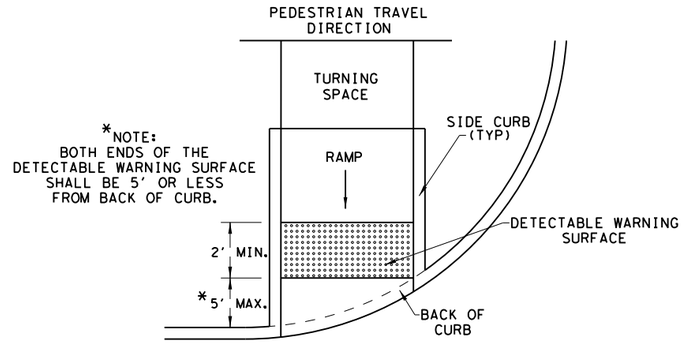
DETECTABLE WARNING SURFACE DETAILS



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



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



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

SHEET 2 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

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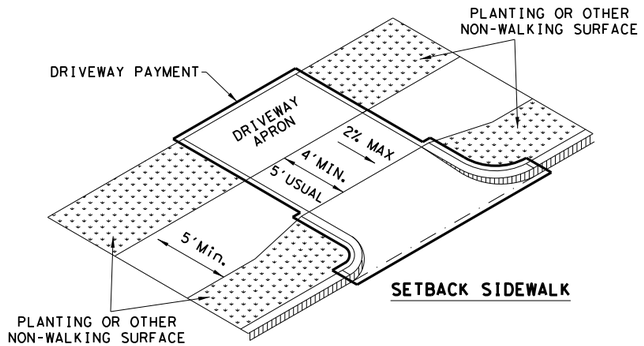
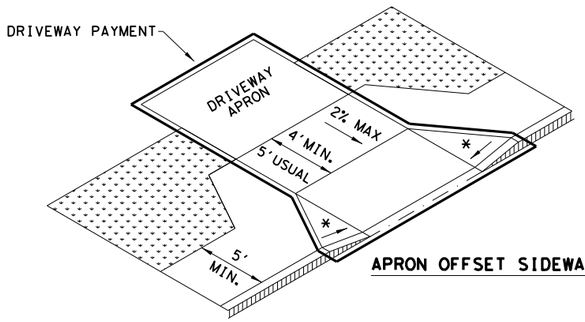
REVISIONS	0025	03	105, ETC		UA 90, ETC
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	SAT	GUADALUPE			130

DATE: 7/27/2023
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\Standards\ped18.dgn

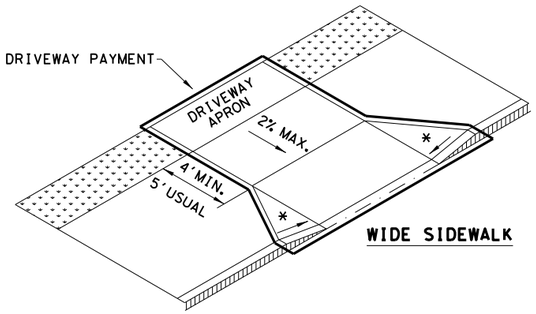
SIDEWALK TREATMENT AT DRIVEWAYS



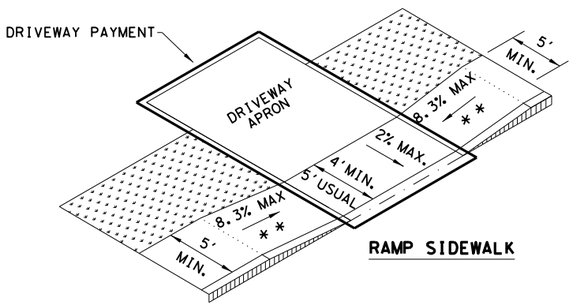
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

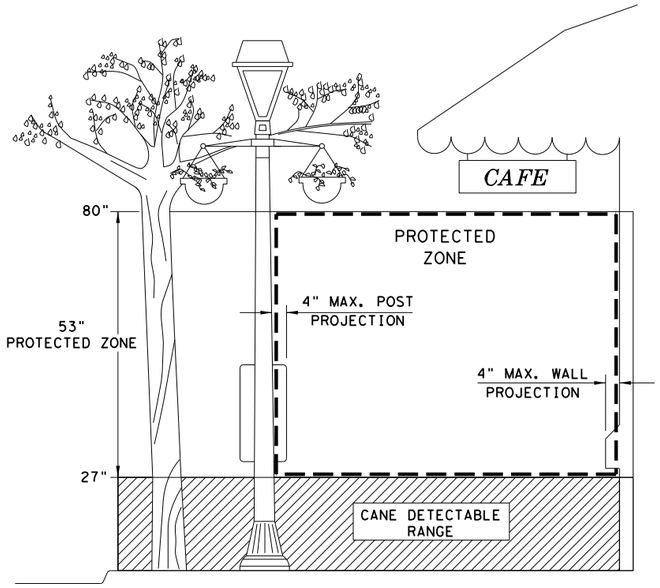


RAMP SIDEWALK

NOTES:

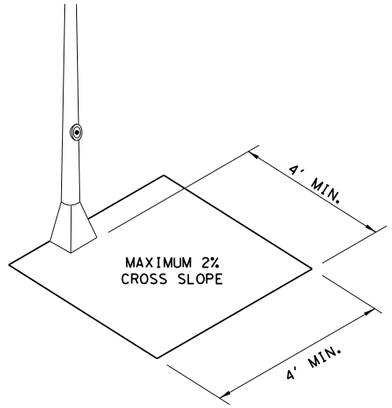
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

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

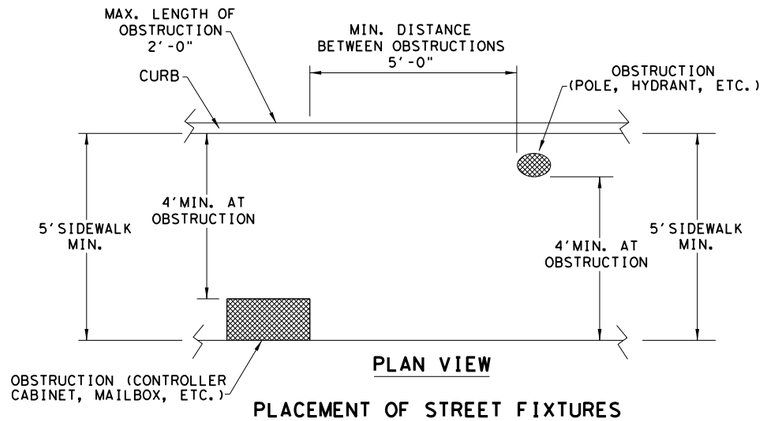


PROTECTED ZONE

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



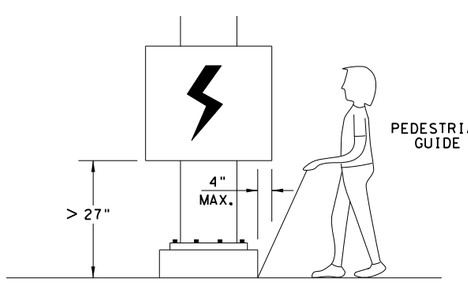
CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



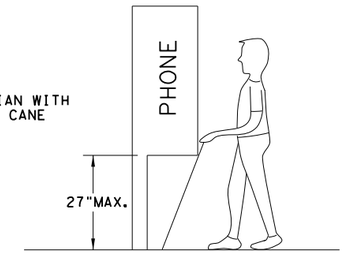
PLAN VIEW

PLACEMENT OF STREET FIXTURES

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



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



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

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
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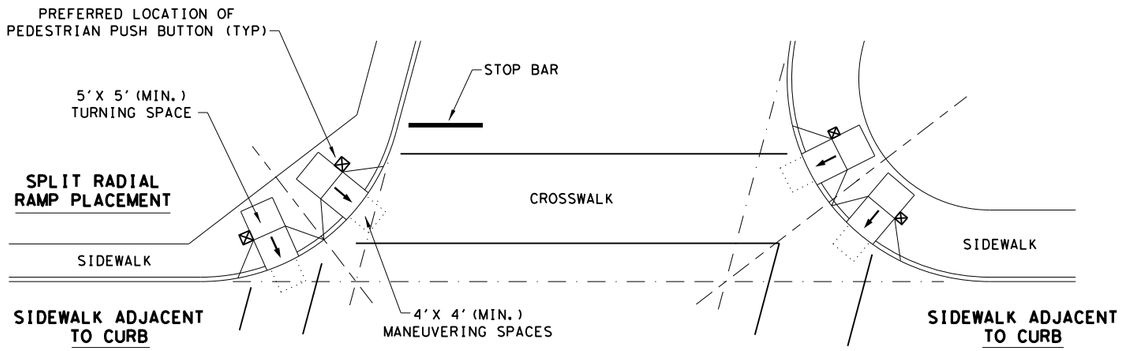
REVISIONS	0025	03	105, ETC	UA 90, ETC
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		131

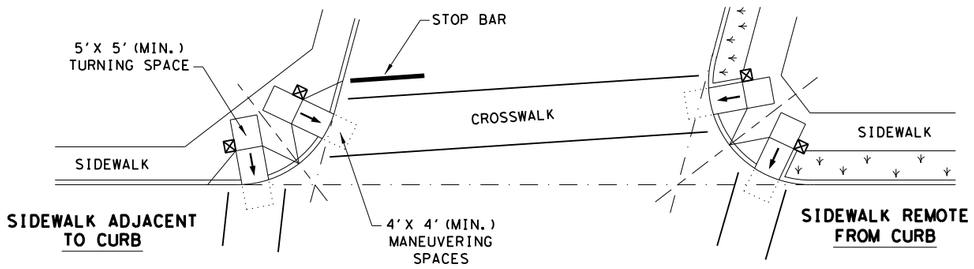
DATE: 7/27/2023
FILE: T:\Traffic\Design\District PS&E Tracking\Plan Review\Guadalupe\0025-03-105 (UA 90 Signals)\Standards\ped18.dgn

TYPICAL CROSSING LAYOUTS

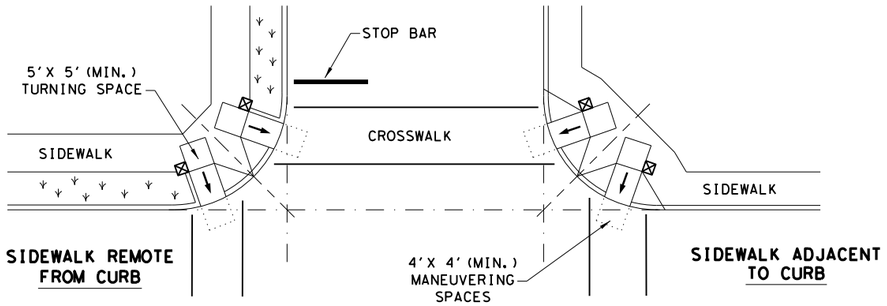
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



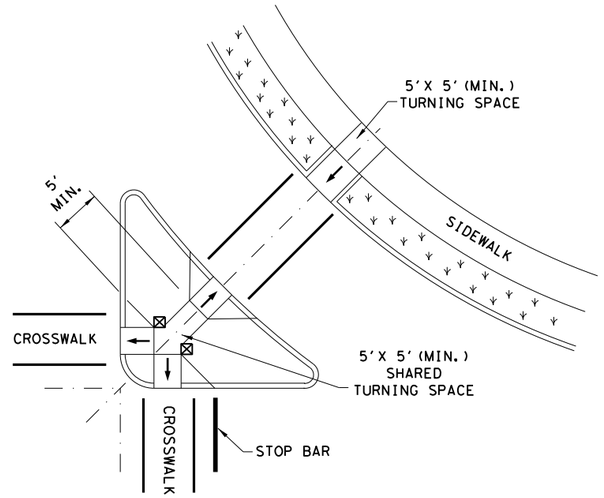
SKEWED INTERSECTION WITH "LARGE" RADIUS



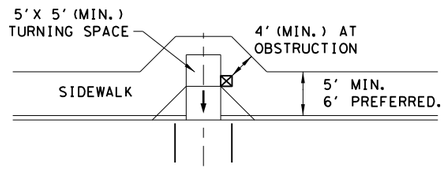
SKEWED INTERSECTION WITH "SMALL" RADIUS

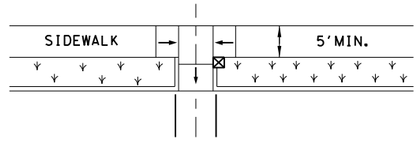


NORMAL INTERSECTION WITH "SMALL" RADIUS



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.

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	0025	03	105, ETC	UA 90, ETC
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		132

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 damages resulting from its use.

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit (CGP) required for projects with 1 or more acres distrubed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

[X] No Action Required [ ] Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
2. Comply with the Storm Water Pollution Prevention Plan (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 Texas Commission on Environmental Quality (TCEQ), Environmental Protection Agency (EPA) or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, Contractor shall submit Notice of Intent (NOI) to TCEQ and the Engineer.
5. NOI required: [ ]Yes [X]No

Note: If amount of soil disturbance changes, permit requirements may change.

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

US Army Corps of Engineers (USACE) Permit required for filling, dredging, excavating or other work in any potential USACE jurisdictional water, such as, rivers, creeks, streams, or wetlands.

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

[X] No Permit Required
[ ] Nationwide Permit (NWP) 14 - Pre-construction Notice (PCN) not Required
[ ] Nationwide Permit 14 - PCN Required
[ ] Individual 404 Permit Required
[ ] Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

401 Best Management Practices: (Not applicable if no USACE permit)

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	[ ] Sedimentation Chambers
		[ ] Grassy Swales

$DATE TIME$
DOCUMENT NAME

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.

[X] No Action Required [ ] Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

[X] No Action Required [ ] Required Action

Action No.

1.

2.

3.

4.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

[ ] No Action Required [X] Required Action

Action No.

1. MIGRATORY BIRD NESTS: Schedule construction activities as needed to meet the following requirements:

   A. Do not remove or destroy any active migratory bird nests (nests containing eggs and/or flightless birds) at any time of year. If there are any active nests, they shall not be removed until the nests become inactive.

   B. On/in structures, if there are any active nests, they shall not be removed until all nests become inactive. After inactive nests are removed and/or before nest activity begins, deterrent materials may be applied to the structures to prevent future nest building.

2. See Item 5 in General Notes.

3.

4.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediated area, and contact the Engineer immediately.

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

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

Hazardous Materials or Contamination Issues Specific to this Project:

[X] No Action Required [ ] Required Action

Action No.

1.

2.

3.

Does the project involve the demolition of a span bridge?

[ ] Yes [X] No (No further action required)

If "Yes", a pre- demolition notification must be submitted to the Texas Department of State Health Services. The contractor shall contact TxDOT's Project Engineer 25 calendar days prior to the demolition of the bridges(s) on the project to assist with the notification.

VII. OTHER ENVIRONMENTAL ISSUES

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

[X] No Action Required [ ] Required Action

Action No.

1.

2.

3.

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 7-31-2023
JOSE O. GALLEGOS RUIZ, P.E. DATE

Texas Department of Transportation
San Antonio District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK: TxDOT	DW: BW	CK: GAG
©TxDOT OCTOBER 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0025	03	105, ETC	UA 90, ETC
	DIST	COUNTY		SHEET NO.
	SAT	GUADALUPE		133

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

0025-03-105

1.2 PROJECT LIMITS:

From: Vaughn

To:

1.3 PROJECT COORDINATES:

BEGIN: (Lat) **N/A** ,(Long) **N/A**

END: (Lat) **N/A** ,(Long) **N/A**

1.4 TOTAL PROJECT AREA (Acres): **N/A**

1.5 TOTAL AREA TO BE DISTURBED (Acres): **N/A**

1.6 NATURE OF CONSTRUCTION ACTIVITY:

IMPROVE/REBUILD TRAFFIC SIGNAL

1.7 MAJOR SOIL TYPES:

Soil Type	Description
N/A	N/A

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: **IMPROVE/REBUILD TRAFFIC SIGNAL**
- ☐ Other:
- ☐ Other:

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

1.11 RECEIVING WATERS:

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

Tributaries	Classified Waterbody
N/A	N/A

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 9-15-23

JOSE O. GALLEGOS RUIZ, P.E. DATE

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

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	134

STATE	STATE DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, 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

- [X] [ ] 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
N/A	N/A	N/A

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

- [ ] Chemical Management
- [X] Concrete and Materials Waste Management
- [X] Debris and Trash Management
- [ ] Dust Control
- [X] 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
N/A	N/A	N/A

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 INSPECTIONS:

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

2.9 MAINTENANCE:

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

STATE OF TEXAS
JOSE O. GALLEGOS RUIZ
140360
LICENSED
PROFESSIONAL ENGINEER

Jose Gallegos, P.E. 9-15-23

JOSE O. GALLEGOS RUIZ, P.E. DATE

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

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		135
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	GUADALUPE	
CONT.	SECT.	JOB	HIGHWAY NO.
0025	03	105, ETC	UA 90, ETC