

SEE SHEET 2 FOR INDEX OF SHEETS

# STATE OF TEXAS DEPARTMENT OF TRANSPORTATION

## PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

CCSJ: 0001-02-079, ETC.  
FEDERAL AID PROJECT No. F 2B24(194)

### SH20, ETC. EL PASO COUNTY

FEDERAL AID PROJECT No.			
F 2B24(194)			
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY		SHEET NO.
ELP	EL PASO		1

ATTACHMENT NO. 2-21 TO SPECIAL AGREEMENT FOR CONSTRUCTION, MAINTENANCE, AND OPERATIONS OF CONTINUOUS HIGHWAY ILLUMINATION SYSTEM DATED MARCH 16, 1993.  
THE CITY-STATE CONSTRUCTION, MAINTENANCE, AND OPERATION RESPONSIBILITIES SHALL BE AS HERETOFORE AGREED TO, ACCEPTED, AND SPECIFIED IN THE AGREEMENT TO WHICH THESE PLANS ARE MADE A PART.  
THE CITY HEREBY CONSENTS TO THE CONSTRUCTION OF CONTINUOUS HIGHWAY ILLUMINATION SYSTEM TO THE LOCATION AND MANNER OF CONSTRUCTION AS INDICATED ON THESE PLANS, SAID INSTALLATION BEING A PART OF AGREEMENT, DATED MARCH 16, 1993.

DocuSigned by:  
*Yvette Hernandez*  
F370AF18ACA4AD...  
CITY OF EL PASO  
Grant Funded Programs Director  
4/16/2024  
0924-06-645  
0167-02-088  
0001-02-079  
TITLE DATE CSJ

**FINAL PLANS**  
CONTRACTOR: \_\_\_\_\_  
LETTING DATE: \_\_\_\_\_  
TIME CHARGES BEGAN: \_\_\_\_\_  
DATE CONTRACTOR BEGAN WORK: \_\_\_\_\_  
DATE WORK WAS COMPLETED: \_\_\_\_\_  
DATE WORK WAS ACCEPTED: \_\_\_\_\_  
TOTAL DAYS CHARGED: \_\_\_\_\_  
ORIGINAL CONTRACT AMOUNT: \$ \_\_\_\_\_  
AMOUNT OF CONTRACT AMENDMENTS: \$ \_\_\_\_\_  
FINAL CONTRACT COST: \$ \_\_\_\_\_

DESIGN SPEED = VAR  
SH-20  
A.D.T. (2022) = 42,167  
A.D.T. (2042) = 59,034  
BU-54A  
A.D.T. (2022) = 5,646  
A.D.T. (2042) = 7,566  
Hercules Ave  
A.D.T. (2022) = 13,563  
A.D.T. (2042) = 18,988

LIMITS:

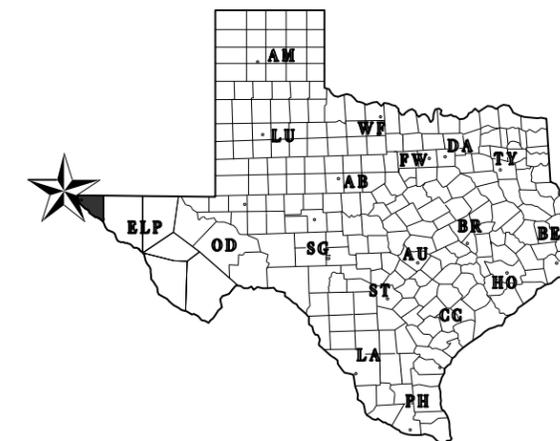
CSJ	HIGHWAY	LIMITS		LENGTH (MI)	LENGTH (FT)
		FROM	TO		
0924-06-645	HERCULES AVE.	BU 54A	DIANA DR.	1.260	6652.80
0167-02-088	BU 54A	ASHLEY RD.	RAILROAD DR.	2.168	11447.04
0001-02-079	SH 20 (MESA ST.)	IH-10	SUNLAND PARK DR.	2.670	14097.60
TOTAL LENGTH				6.098	32197.44

\_\_\_\_\_  
AREA ENGINEER 20

FOR THE CONSTRUCTION OF: SAFETY IMPROVEMENT PROJECT  
CONSISTING OF: SAFETY LIGHTING



SEE PROJECT LAYOUT MAPS  
ON PLAN SHEETS 3 - 5



KEY TO COUNTIES



3/29/2024

*Cesar R. Nevarez, P.E.*



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)

EXCEPTIONS: NONE TDLR NO. EABPRJ: NONE  
EQUATIONS: NONE  
RAILROAD CROSSINGS: DOT 741186L  
RAILROAD COMPANY: UNION PACIFIC RAILROAD COMPANY

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)- 21 THRU BC (12)- 21 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

DocuSigned by: 4/4/2024  
RECOMMENDED FOR LETTING:  
*Eduardo Perales, P.E.*  
2778C60AB5F7426  
SAFETY REVIEW COMMITTEE CHAIRMAN

DocuSigned by: 4/4/2024  
RECOMMENDED FOR LETTING:  
*L. Raul Ortega Jr., P.E.*  
0F1D885887C0707A  
DIRECTOR OF TRANSPORTATION  
PLANNING AND DEVELOPMENT

DocuSigned by: 4/5/2024  
APPROVED FOR LETTING:  
*[Signature]*  
7A68C5EA0D94496  
DISTRICT ENGINEER

# INDEX OF SHEETS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
<b><u>GENERAL</u></b>	
1	TITLE SHEET
2	INDEX OF SHEETS
3	SH 20 PROJECT LAYOUT
4	BU 54A PROJECT LAYOUT
5	HERCULES AVE PROJECT LAYOUT
6	SH 20 TYPICAL SECTION
7	BU 54A TYPICAL SECTIONS
8	HERCULES AVE TYPICAL SECTIONS
9A-9E	GENERAL NOTES
10	ESTIMATE AND QUANTITY SHEET
11 - 12	SUMMARY OF QUANTITIES
13	SH 20 ELECTRICAL SERVICE DATA
14	BU 54A ELECTRICAL SERVICE DATA
15	HERCULES AVE ELECTRICAL SERVICE DATA
16	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)
<b><u>TRAFFIC CONTROL PLAN</u></b>	
17 - 19	SH 20 TRAFFIC CONTROL PLAN
20	BU 54A TRAFFIC CONTROL PLAN
21	HERCULES AVE TRAFFIC CONTROL PLAN
<b><u>TRAFFIC CONTROL PLAN STANDARDS</u></b>	
22 - 33	BC (1) - 21 THRU BC (12) - 21 *
34	TCP (1-1) - 18 *
35	TCP (1-4) - 18 *
36	TCP (2-1) - 18 *
37	TCP (2-6) - 18 *
38 - 39	WZ (BTS-1-2) -13 *
40	WZ (TD) -17 *
<b><u>ROADWAY DETAILS</u></b>	
41	SH 20 HORIZONTAL ALIGNMENT DATA
42	BU 54A HORIZONTAL ALIGNMENT DATA
43	HERCULES AVE HORIZONTAL ALIGNMENT DATA
<b><u>ILLUMINATION SH 20</u></b>	
44	SH 20 ILLUMINATION NOTES AND DETAIL
45 - 56	SH 20 ILLUMINATION PLAN
57 - 58	SH 20 CIRCUIT DIAGRAM
<b><u>ILLUMINATION BU 54A</u></b>	
59 - 68	BU 54A ILLUMINATION PLAN
69 - 70	BU 54A CIRCUIT DIAGRAM
<b><u>ILLUMINATION HERCULES AVE</u></b>	
71 - 77	HERCULES AVE ILLUMINATION PLAN
78	HERCULES AVE ILLUMINATION POLES
79	HERCULES AVE CIRCUIT DIAGRAM
<b><u>ILLUMINATION STANDARDS</u></b>	
80	ED (1) -14 *
81	ED (2) -14 *
82	ED (3) -14 *
83	ED (4) -14 *
84	ED (5) -14 *
85	ED (6) -14 *
86	ED (7) -14 *
87	ED (10) -14 *
88	ED (11) -14 *
89	ED (12) -14 *

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
90 - 92	RID (1) - 20 THRU RID (3) - 20*
93 - 96	RIP (1) - 19 THRU RIP (4) - 19 *
<b><u>EROSION CONTROL / WATER QUALITY</u></b>	
97 - 98	STORM WATER POLLUTION PREVENTION PLAN (SWP3)
<b><u>EROSION CONTROL STANDARDS</u></b>	
99 - 101	EC (9)-16 *
<b><u>RAILROAD</u></b>	
102	RAILROAD SCOPE OF WORK PROJECT SPECIFIC DETAILS
<b><u>RAILROAD STANDARDS</u></b>	
103 - 104	RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS



THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THIS SHEET WITH A "\*" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

*Cesar R. Nevarez, P.E.*

NAME \_\_\_\_\_, P.E.

4/17/2024  
DATE



## INDEX OF SHEETS

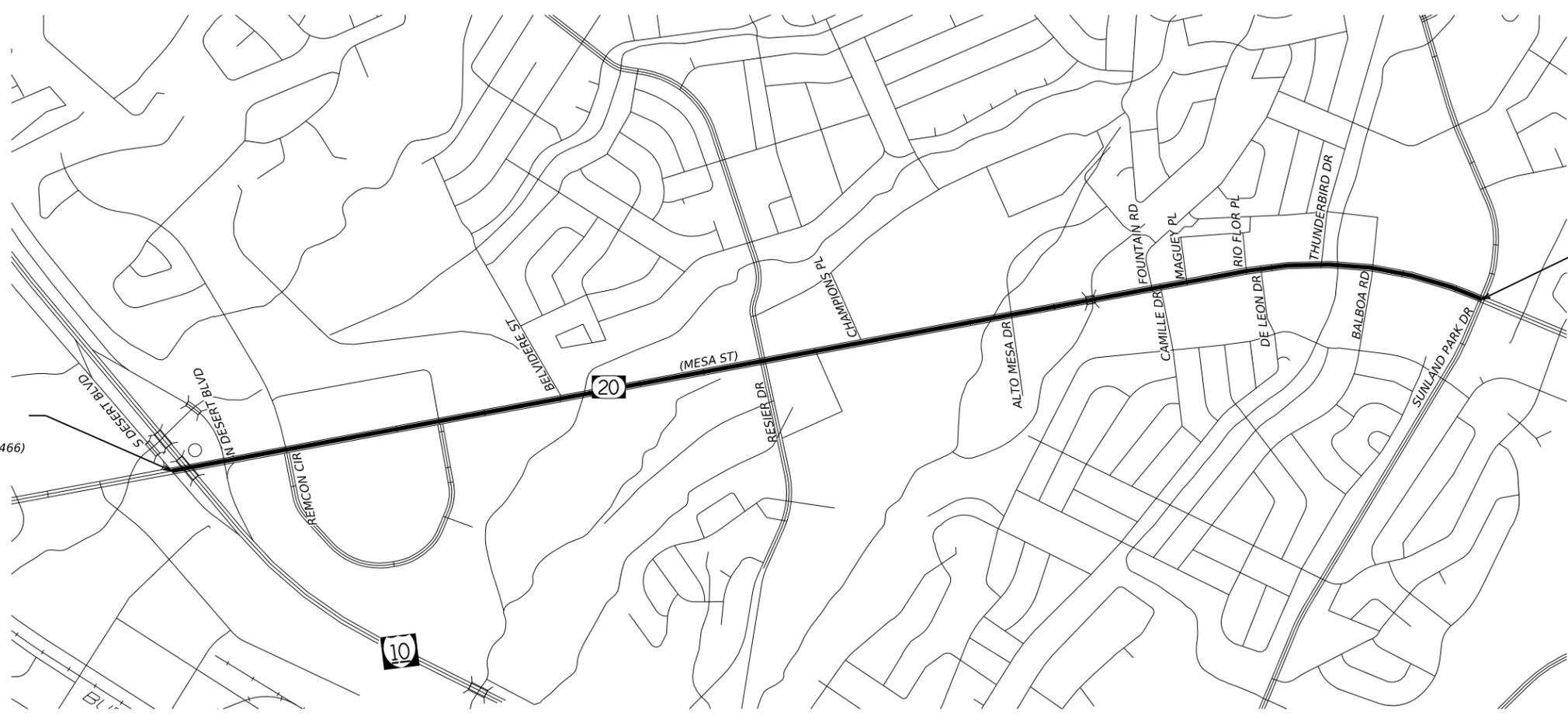
SHEET 01 OF 01

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	2	

CK: DW: CK: DW:



N.T.S.



BEGIN  
CSJ 0001-02-079  
AT IH-10  
(31.8395350, -106.5709466)

END  
CSJ 0001-02-079  
AT SUNLAND PARK DR  
(31.8286617, -106.5276600)



3/29/2024

*Cesar R. Nevarez, P.E.*



SH 20  
PROJECT LAYOUT  
0001-02-079

NOT TO SCALE SHEET 01 OF 01

CSJ	COUNTY	LIMITS		DFO		MP		HIGHWAY	LENGTH (MI)	LENGTH (FT)
		FROM	TO	FROM	TO	BEGIN	END			
0001-02-079	El Paso	IH-10	SUNLAND PARK DR	11.681	14.358	11.699	14.376	SH 20	2.670	14097.60

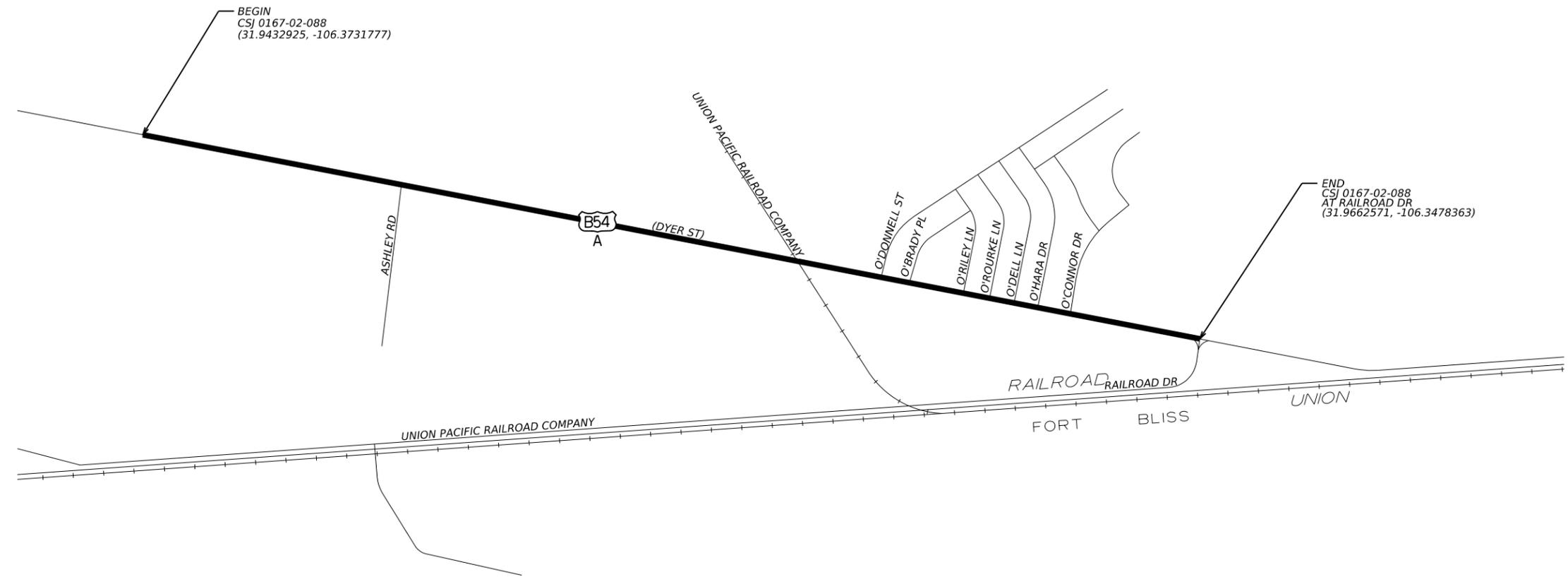
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	3	

DATE: 3/29/2024 1:27:57 AM  
FILE: WA4\_G-PROJECT LAYOUT.dgn

CK: DW: CK: DW:



N.T.S



3/29/2024

*Cesar R. Nevarez, P.E.*



**BU 54A  
PROJECT LAYOUT  
0167-02-088**

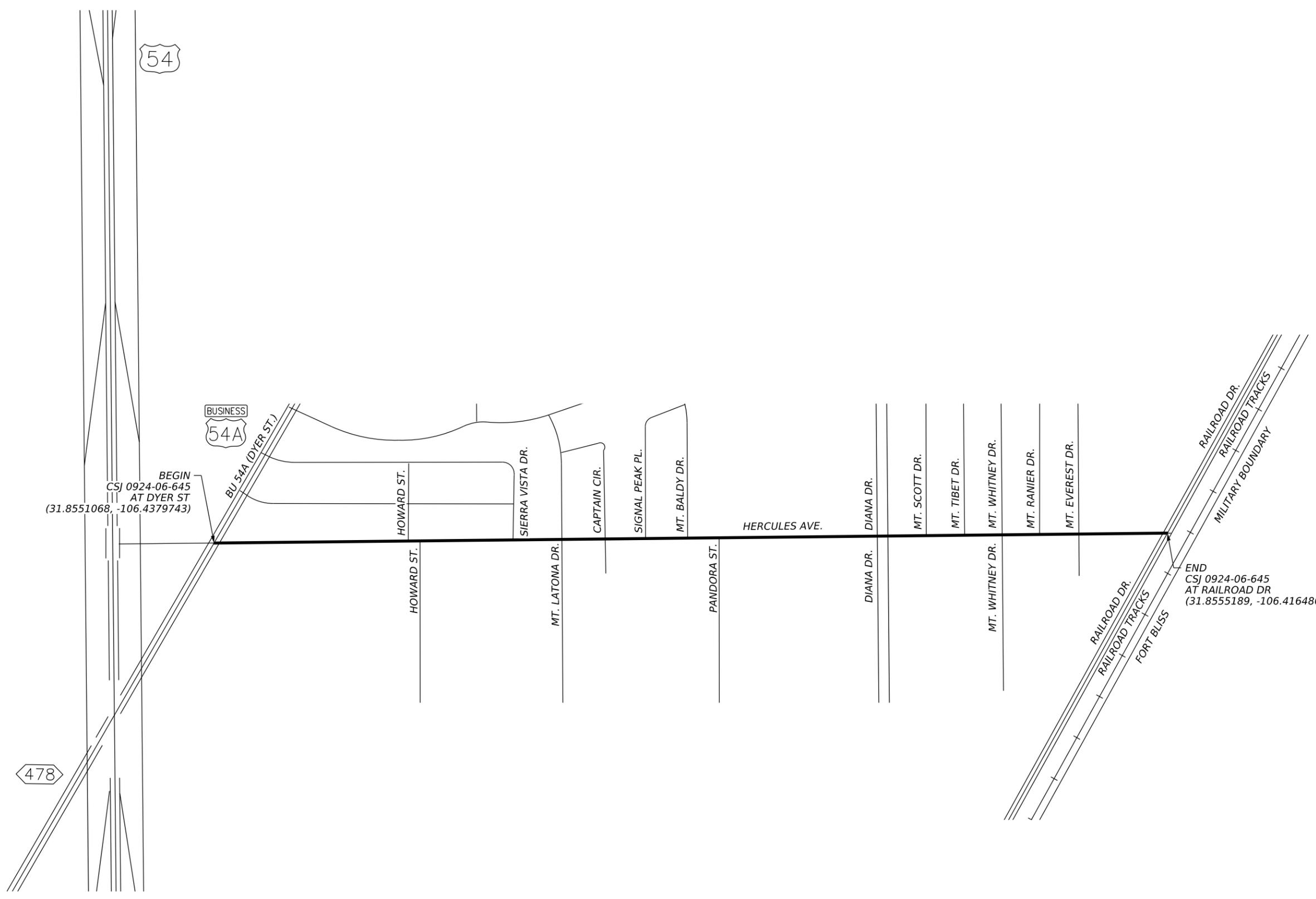
NOT TO SCALE SHEET 01 OF 01

CSJ	COUNTY	LIMITS		DFO		MP		HIGHWAY	LENGTH (MI)	LENGTH (FT)
		FROM	TO	FROM	TO	BEGIN	END			
0167-02-088	El Paso	ASHLEY RD	RAILROAD DR	7.54	9.708	17.241	19.409	BU 54A	2.168	11447.04

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	4	

DATE: 3/29/2024 1:28:00 AM  
FILE: WA4\_G-PROJECT\_LAYOUT.dgn

DATE: 3/21/2024 11:48:46 AM  
 FILE: S:\10101010-052-Hercules Safety Lighting\DWG\Construction Drawings\PS&E Plans\01\_General\05 Project Layout.dgn



478

54

BUSINESS 54A

BEGIN  
 CSJ 0924-06-645  
 AT DYER ST  
 (31.8551068, -106.4379743)

END  
 CSJ 0924-06-645  
 AT RAILROAD DR  
 (31.8555189, -106.4164863)



**cea** group  
 813 N. Kansas St., Suite 300  
 El Paso, TX 79902  
 915.544.5232  
 www.ceagroup.net  
 TEXAS REGISTERED ENGINEERING FIRM F-4564



**HERCULES AVENUE  
 PROJECT LAYOUT  
 0924-06-645**

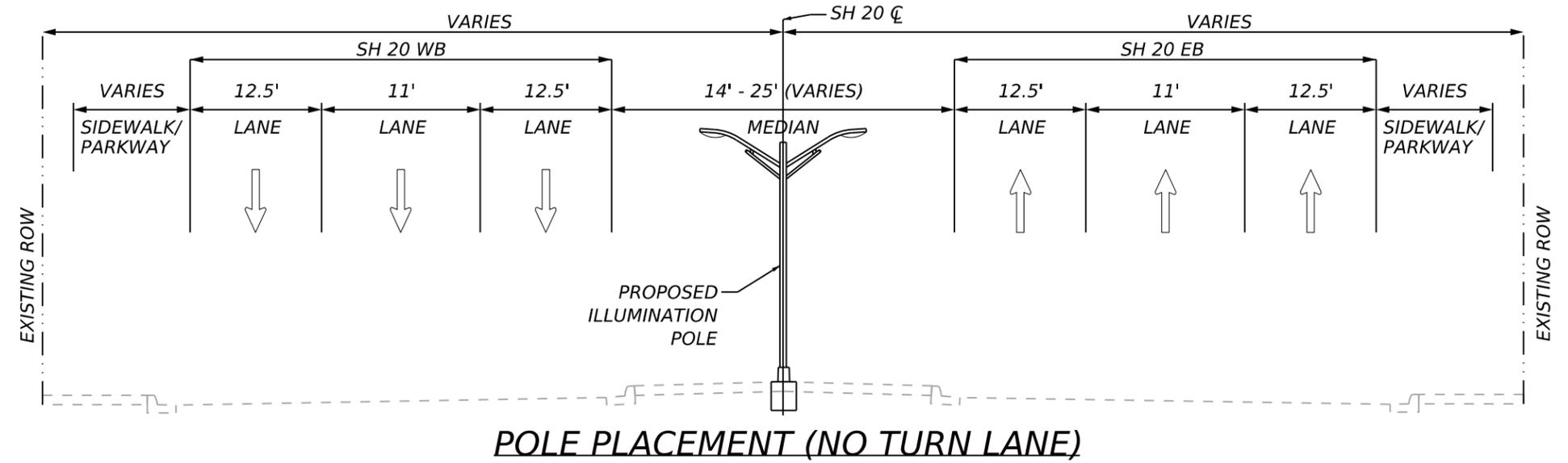
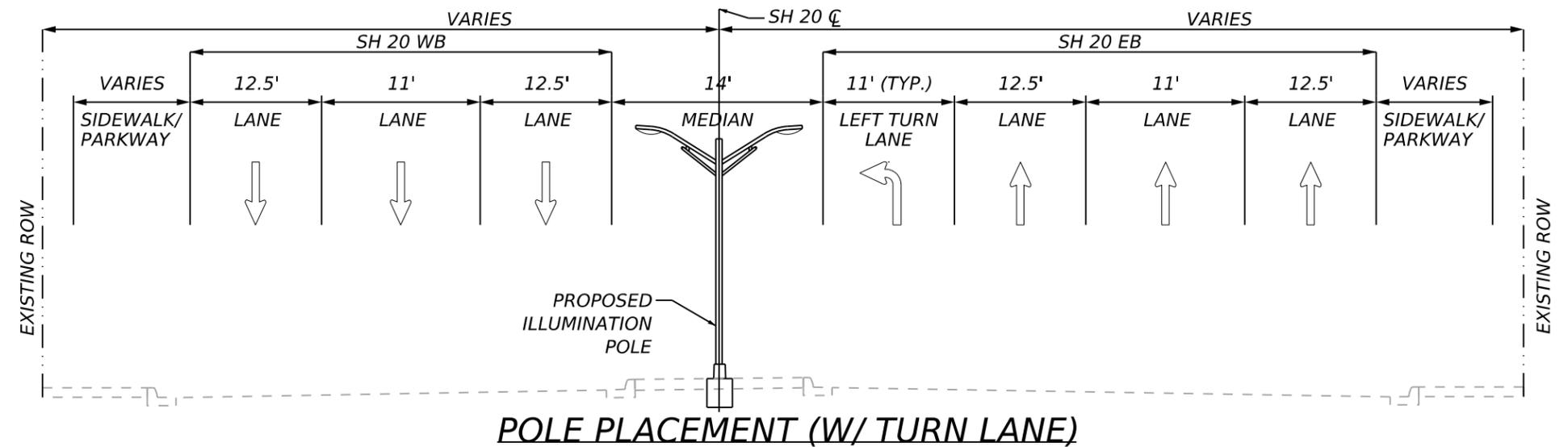
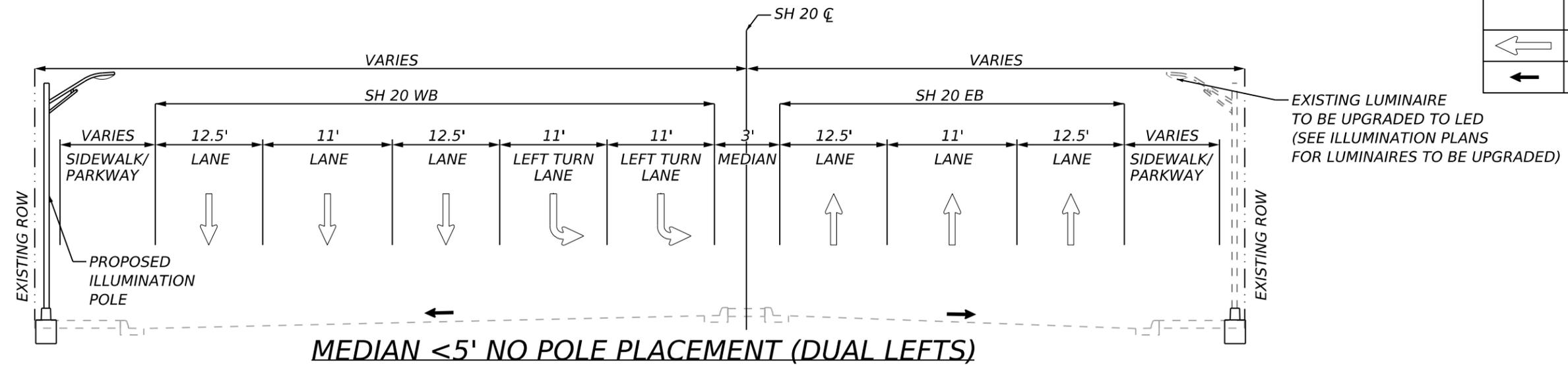
CSJ	COUNTY	LIMITS		DFO		MP		HIGHWAY	LENGTH(MI)	LENGTH (FT)
		FROM	TO	FROM	TO	BEGIN	END			
0924-06-645	EL PASO	DYER ST	RAILROAD DR	25.048	26.31	25.048	26.31	CS	1.26	6652.80

SHEET 1 OF 1

COUNT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	5	

CK:  
DW:  
CK:  
DW:

LEGEND	
	EXISTING TRAFFIC FLOW
	WATER FLOW



3/29/2024  
Cesar R. Nevarez, P.E.



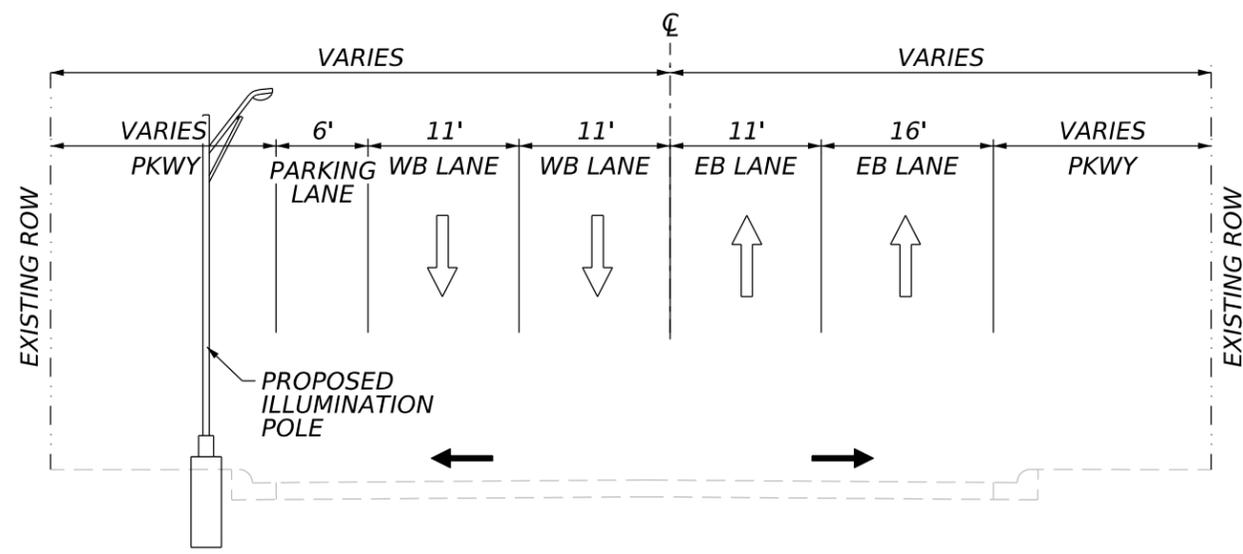
SH 20  
TYPICAL SECTION  
0001-02-079

NOT TO SCALE		SHEET 1 OF 1	
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	6	

DATE: 3/29/2024 1:28:58 AM  
FILE: WA4\_SH 20 TYP.dgn



CK: DW: CK: DW:



**PROPOSED HERCULES AVENUE - TYPICAL SECTION**

STA. 0+84.73 - STA. 66+00.00  
NOT TO SCALE

LEGEND	
	EXISTING TRAFFIC FLOW
	WATER FLOW

NOTE:  
1. 18" MIN. FROM BACK OF THE CURB TO THE FACE OF THE POLE BASE.



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TEXAS REGISTERED ENGINEERING FIRM F-4564



**HERCULES AVENUE  
TYPICAL SECTIONS  
0924-06-645**

NOT TO SCALE		SHEET 1 OF 1	
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	8	

DATE: 3/21/2024 11:48:48 AM  
FILE: S:\10101010-052-Hercules Safety Lighting\DWG\Construction Drawings\PS&E Plans\01\_General\06\_Typical Sections.dgn

CONTROL: 0001-02-079, ETC

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

**General Requirements**

Contractor shall Anticipate rocky soil conditions.

Contractor shall field locate all existing underground utilities prior to any construction with all utility companies including within the center median.

Maintain the entire project area in a neat and orderly manner throughout the duration of the work. Remove all construction litter and undesirable vegetation within the right of way inside the project limits. This work will be subsidiary to the various bid items.

General Project Description – Project consists of Safety Lighting on:

HIGHWAY	LIMITS	CSJ	LENGTH (MI)
SH 20 (Mesa Street)	From IH-10 to Sunland Park Drive	0001-02-079	2.670
BU 54A	From Ashley Road to Railroad Drive	0167-02-088	2.168
Hercules Avenue	From BU-54ADyer Street to Railroad Drive	0924-06-645	1.260
TOTAL			6.098

**Traffic**

Contact the Engineer and 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. This work shall be completed at the Contractor's expense.

Inform the Engineer and the respective utility companies, when it becomes apparent that the utility lines will interfere with the work in progress.

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

*West Area Office:*

<b>Jonathan Concha, P.E.</b> West El Paso Area Engineer <a href="mailto:Jonathan.Concha@txdot.gov">Jonathan.Concha@txdot.gov</a>	<b>Aldo Madrid, P.E.</b> Director of Construction <a href="mailto:Aldo.Madrid@txdot.gov">Aldo.Madrid@txdot.gov</a>	<b>Monica Ruiz, P.E.</b> District Construction Engineer <a href="mailto:Monica.Ruiz@txdot.gov">Monica.Ruiz@txdot.gov</a>
--	--	--

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

CONTROL: 0001-02-079, ETC

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

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.

**General Safety Lighting**

Contact the Department's El Paso District Signal Shop at [txdotelplocates@txdot.gov](mailto:txdotelplocates@txdot.gov) to request all Department utility line locates within the project limits. The Signal Shop will locate one time only. Record locates for the purpose of refreshing and maintaining all markings throughout the duration of the project.

Contact City of El Paso Streets and Maintenance Department at [linespots@elpasotexas.gov](mailto:linespots@elpasotexas.gov) and [pavementcut@elpasotexas.gov](mailto:pavementcut@elpasotexas.gov) to request all City of El Paso utility line locates within project limits. Record locates for refreshing and maintaining all markings throughout the duration of the project.

SH 20 (Mesa St.): Contractor shall coordinate with El Paso Electric Co. (Jerry Ramirez Cell#: 915-525-6241 Email: [jerry.ramirez@epelectric.com](mailto:jerry.ramirez@epelectric.com) ) for existing fixture and luminaire arm salvaging only if item to remove and salvage is on summary and quantity shown.

BU 54A: Contractor shall coordinate with El Paso Electric Co. (Pending) Cell#: (Pending) Email: (Pending) for existing fixture and luminaire arm salvaging only if item to remove and salvage is on summary and quantity shown.

Hercules Avenue: Contractor shall coordinate with El Paso Electric Co. (Rafael Zaragoza Cell#: 915-521-4617 Email: [rafael.zaragoza@epelectric.com](mailto:rafael.zaragoza@epelectric.com) ) for existing fixture and luminaire arm salvaging only if item to remove and salvage is on summary and quantity shown.

Contractor shall coordinate with Sun Metro for any construction activities within bus stop locations.

**Item 4 – Scope of Work**

Schedule and perform all work to ensure proper drainage during the course of construction or maintenance operations. All labor, tools, equipment, and supervision required, to ensure drainage, removal, and handling of water shall be considered incidental work.

**Item 5 – Control of Work**

The Department will furnish horizontal and vertical reference points. Contractor must verify horizontal and vertical reference points with conventional survey methods before proceeding with construction activities. Verification must be submitted for review and approval to the Department's R.P.L.S. prior to start of construction. Any discrepancies not reported will be at no additional cost to the Department.

Keep traveled surfaces used in hauling operations clear and free of dirt or other material.

Existing pavement, utilities, structures, etc. damaged as a result of the operations will be repaired at no additional cost to the Department.

CONTROL: 0001-02-079, ETC

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

Protect from damage and destruction all areas of the right of way, which are not included in the actual limits of the proposed construction areas. Exercise care to prevent damage to trees, vegetation, and other natural features. Protect trees, shrubs, and other landscape features from abuse, marring, or damage within the actual construction and/or fenced protection areas designated for preservation.

Restore any area disturbed or damaged to a condition "as good as" or "better than" prior to start of construction operation. Replace dead plants, irrigation systems, etc. during construction efforts. This work will be at the Contractor's expense.

#### **City of El Paso**

The work will be considered complete when the City of El Paso accepts the constructed improvements for maintenance.

Repair any existing pavement, utilities, structures, etc., damaged as a result of construction operations, at no additional cost to the City of El Paso.

Maintain all Contract items until final acceptance of the project.

Submit copy of the final as-built plans to Capital Improvement Department Project Manager prior to final inspection/walkthroughs; additional comments may be generated upon review and follow up inspection(s) from As-Built Drawings.

#### **Item 6 – Control of Materials**

Furnish all materials on this project.

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

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

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

#### **Item 7 – Legal Relations and Responsibilities**

Comply with all requirements of the Environmental Permits Issues and Commitments (EPIC) Sheet.

CONTROL: 0001-02-079, ETC

SHEET 9A

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

Do not discharge any liquid pollutant from vehicles onto the roadside. Immediately clean spills and dispose in compliance with local, state, and federal regulations to the satisfaction of the Engineer at no additional cost to the Department.

Occupational Safety & Health Administration (OSHA) regulations prohibit operations that bring people or equipment within 10 ft. of an energized electrical line. Where workers and/or equipment may be close to an energized electrical line, notify the electrical power company and make all necessary adjustments to ensure the safety of workers near the energized line.

Provide notification two weeks prior to beginning of construction to the City of El Paso – Streets and Maintenance Department at [tcp@elpasotexas.gov](mailto:tcp@elpasotexas.gov) when traffic control devices encroach City ROW or traffic control setup impacts City streets.

No significant traffic generator events identified.

#### **Law Enforcement Personnel**

Coordinate with TxDOT Engineer for off-duty Law enforcement assistance when needed to direct traffic during significant closures and detours, as approved unless otherwise directed by the engineer. The officer shall monitor or direct traffic during the closure as directed by the Engineer. Patrol vehicles must be clearly marked to correspond with the officer's agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Lights will be high intensity and visible from all angles.

Contractor to submit a written request at least 72 hours prior to the need for law enforcement to the Engineer. The Engineer will make arrangements with the respective entity to formally request the services.

Fees resulting from contractor-initiated cancellations shall be the Contractor's responsibility.

The method used to direct traffic at signalized intersections shall be as approved. Additional officers and vehicles may be provided when approved or directed.

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

Complete the daily tracking form provided by the department and submit proof of payment such as cancelled checks for the approved invoices that have been billed to the project no later than 30 days from the invoice date.

No payment will be made for law enforcement personnel needed for moving equipment or payment for drive time to/from the event site.

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

CONTROL: 0001-02-079, ETC

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

### **Item 8 – Prosecution and Progress**

This project includes 120 days convenience delay start for acquisition of illumination poles.

Working days will be calculated in accordance with Section 8.3.1., “Standard Workweek.”  
Create and maintain a Bar Chart schedule.

Submit baseline schedule and obtain approval prior to beginning construction. The monthly progress payment will be held if the monthly update is not submitted.

Provide a Project Schedule Summary Report on a monthly basis along with the monthly progress schedule.

Lane closures are restricted to off-peak hours. Contractor to perform lane closures Monday through Friday 9:00 AM to 4:00 PM, nighttime work shall be from 9:00 PM to 6:00 AM Sunday through Thursday.

### **Item 9 – Measurement and Payment**

Monthly progress payments will be made for items of work completed by the 27<sup>th</sup> day of each month. Any work completed after the 27<sup>th</sup> will be included for payment in the subsequent monthly progress payment.

Submit Material on Hand (MOH) payment requests at least **two (2)** working days before the 27<sup>th</sup> of the month for payment consideration on that month’s estimate.

### **Item 110 – Excavation**

To eliminate all drop-off conditions, construct tapers as directed. This work will not be paid for directly but will be considered subsidiary to pertinent bid items.

### **Item 416 – Drilled Shaft Foundations**

Stake all foundations and locations prior to commencement of drilling operations for verification to ensure no conflicts with utility lines. Approval by Engineer will be required for all non-bridge foundations.

Cover drilled shafts with plywood and delineate them with pedestrian fence, to the satisfaction of the Engineer, when no work is being performed and after work hours. This work shall be considered subsidiary to this item.

Remove spoils, daily, out of the drainage areas or as directed.

Survey verify and provide the Engineer finished drilled shaft elevations.

CONTROL: 0001-02-079, ETC

SHEET 9B

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

### **Item 502 – Barricades, Signs, and Traffic Handling**

Prior to beginning construction, the Engineer will approve the routing of traffic and sequence of work.

Additional signs and barricades, placed as directed, will be considered subsidiary to this Item.

In accordance with Section 7.2.6.1, designate, in writing, a Contractor Responsible Person (CRP) and a CRP alternate to take full responsibility for the set-up, maintenance, and necessary corrective measures of the traffic control plan. The CRP or CRP alternate must be present at site and implement the initial set up of every traffic control phase/stage, at each location, and/or each call out, for the entire duration of the project.

At the written request of the Engineer, immediately remove the CRP or CRP alternate from the project if, in the opinion of the Engineer, is not competent, not present at initial TCP set-ups, or does not perform in a proper, skillful, or safe manner. These individuals shall not be reinstated without written consent of the Engineer.

CRP and CRP alternate must be trained using Department approved training. Provide a copy of the certificate of completion to the Engineer for project records.

All contractor workers involved with the traffic control implementation and maintenance must participate and complete a department approved training course. Provide a copy of the certificate of completion to the Engineer for project records. Refer to “Traffic Control Training” Material Producer List <https://ftp.txdot.gov/pub/txdot-info/cmd/mpl/tct.pdf> for Department approved training.

Contractor may choose to train workers involved with the traffic control implementation and maintenance with a contractor developed training in lieu of Department approved training. Contractor developed training must be equivalent to the Department approved training. Provide the Engineer a copy of the course curriculum for pre-approval, prior to conducting the contractor developed training. Provide the Engineer a copy of the log of attendees after training completion for project records.

Existing regulatory signs, route marker auxiliaries, guide signs, and warning signs that must be removed due to widening shall be relocated temporarily and erected on approved supports at locations shown in the plans, or as directed. This work will not be paid for directly but is considered subsidiary to this Item.

Notify the Department officials when major traffic changes are to be made, such as detours. Coordinate with the Department on all traffic changes. Advance notification for the following week’s work must be made by 5 P.M. on Wednesdays.

If Law Enforcement Personnel is required by the Engineer, coordinate with local law enforcement as directed or agreed. Complete the weekly tracking form provided by the Department and submit

CONTROL: 0001-02-079, ETC

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

invoices with 5% allowance for Law Enforcement payments by Contractor that agree with the tracking form for payment at the end of each month where approved services were provided.

Provide access to intersecting side roads and driveways at all times, unless otherwise directed.

Any approved change to the sequence of work or TCP, must be signed and sealed by a Contractor's Licensed Professional Engineer assuming full responsibility for any additional barricade signs and devices needed.

Use striping operations to channelize traffic into the newly completed roadway, as directed. Maintain shoulders and median areas in a condition capable of serving as emergency paths, as approved. This work will be subsidiary to this Item.

Use portable changeable message signs (PCMS) to alert public of construction two weeks prior to construction.

Use flaggers when directed. Provide two-way radio communication for all flaggers.

Place and maintain sufficient additional warning signs, beacons, delineators, and barricades to warn and guide the public of all hazards in the construction zone limits at all times, and as directed.

Use flashing arrow boards on all tapers for each lane closure.

Some signs, barricades, and channelization devices may not be shown at the precise or measured position. Place the barricades, devices, or signs, with approval, in positions to meet field conditions.

Use Type A flashing warning lights or delineators to mark open excavation, footings, foundations, or other obstructions near lanes that may be open to traffic, as directed.

Remove or cover signs that do not apply to current conditions at the end of each day's work.

Repair or replace all signs damaged by the public or due to weather events.

All project signs shall be maintained free of litter, debris, or sediment build up at the base supports. This work is subsidiary to this item of work.

All project limits signs shown on BC (2) or on the project line diagram shall be installed using ground mounted supports unless otherwise approved by the engineer. Fill any holes left by barricade or sign supports and restore the area to its original condition.

Contractor might encounter rock material when drilling and boring.

GENERAL NOTES

CONTROL: 0001-02-079, ETC

SHEET 9C

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

### Safety Contingency

The contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancement, to improve the effectiveness of the TCP 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.

### Item 506 – Temporary Erosion, Sedimentation, and Environmental Controls

Refer to SWP3 Sheets for total acres of disturbed area. Establish the authorization requirements for Storm Water Discharges for soil disturbed area in this project, all project locations in the Contract, and Contractor Project Specific Locations (PSLs), within one mile of the project limits. Both the Department and the Contractor shall obtain an authorization to discharge storm water from TCEQ for the construction activities shown on the plans. Obtain required authorization from the TCEQ for any Contractor PSLs for construction support activities on or off the right of way.

Best Method Practices (BMP's) may be adjusted to meet field conditions, or as directed. The Engineer will verify all locations prior to placement of BMPs. Keep all inlets functional within the project limits throughout the entire length of the project to accept storm water as part of the Storm Water Pollution Prevention Plan (SWP3), as directed.

Place rain gauge(s) at locations as designated.

Grading operations will be limited to the catch point of the proposed cross-section.

Preserve any vegetation outside these limits.

Review SWP3 plans prior to placement with Engineer.

### Item 610 – Roadway Illumination Assemblies

Conductor runs in Illumination Layouts must contain 5 ft. of slack.

All removed salvageable Roadway Illumination Assemblies shall be returned to the Department. Verify with the Engineer before delivery of any removed and salvaged equipment to the following location:

Texas Department of Transportation Signal Shop (915-790-4245)  
13301 Gateway West Blvd  
El Paso, TX 79928

### Item 618 – Conduit

The location of conduit is diagrammatic and may be varied to meet local conditions upon approval of the Engineer.

GENERAL NOTES

CONTROL: 0001-02-079, ETC

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

All bore items shall be directional.

**Item 620 – Electrical Conductors**

At every accessible point, bond together the grounding conductors that share the same conduit, junction box, ground box, or structure in accordance with the electrical detail sheets and the latest edition of the National Electrical Code.

For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holder as shown on the Department’s Materials Producers List under “Roadway Illumination and Electrical Supplies” category. Fuse holder is shown on the list under Item 610, “Roadway Illumination Assemblies,” and Item 620, “Electrical Conductors.” Provide 10-amp time delay fuses.

Bond metal junction boxes and metal conduit to the circuit grounding conductors in accordance with the National Electrical Code.

Refer to Article 7.18, “Electrical Requirements,” for electrical certification and electrical licensing requirements.

**Item 624 – Ground Boxes**

Remove all conductors in ground boxes as shown on the plans to be abandoned. Payment for removal of conductors will be subsidiary to this Item.

The location of all ground boxes is diagrammatic and may be shifted to accommodate field conditions only as approved by the Engineer.

Stake all foundations and locations approved by the Engineer prior to commencement of drilling operations in order to ensure no conflicts with utility lines. Coordinate with the Utility companies for utility location within the project limits.

Ground boxes should be placed outside the path of travel leaving a clear unobstructed walking surface of at least 36” whenever possible.

Install expansion joint material approved by the Engineer between the ground box and concrete riprap apron. This material and work will be subsidiary to this pay item.

Field verify all existing ground boxes, conduit, and conductors.

The Contractor shall remove all ground boxes and conductors that are connected to existing Illumination, Traffic Signal and Traffic Management poles or as shown on the plans.

**Item 628 – Electrical Services**

Meet at the service locations with representatives of the Department, electrical utility company, and City of El Paso (Traffic Section) at least twelve weeks before electric power is needed to finalize exact service pole placement and resolve any issues.

CONTROL: 0001-02-079, ETC

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

Coordinate with the utility company before placing multiple services within the same location.

**Item 6001 – Portable Changeable Message Sign**

Provide two Portable Changeable Message Sign (PCMS) as advanced notification for two weeks prior to beginning project and throughout duration of project as directed. PCMS units must be in accordance with Section 6F.60 of the TMUTCD, applicable standards and special provisions. Depending on conditions, one or both message boards may have to be relocated during daily operations. Messages will be in accordance with current BC standards. When not in use, remove PCMS units from the right of way. Measurement and payment for the PCMAS noted above will be in accordance with Item 6001. The term “operational” is defined as displaying a message in direct support of current project operations as approved and directed by the Engineer.

**Item 6185 – Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)**

All TMA Operators must participate in a TMA workshop to be conducted by the El Paso District Safety Office on the proper use of TMAs, prior to work. All TMA Operators must participate in a TMA workshop provided by the Department or equivalent approved by the Engineer. A truck mounted attenuator completion card will be issued to TMA Operators that successfully complete the TMA workshop. The workshop completion card must be carried by TMA Operators at all times while working on Department right of way.

Acquire the TCP and TMA Operator’s workshop completion prior to the authorization to begin work. No time suspension will be granted, and no traffic control work will be allowed without the workshop completion card.

Refer to the Basis of Estimate for the TMAs required for this type of work. TMAs will be used and positioned per the applicable Traffic Control Plan standard or as directed by the Engineer. Additional TMAs required due to changes in project phasing by contractor or the Engineer will be provided by the contractor.

The supporting vehicle for the TMA shall have a minimum gross (i.e., ballasted) vehicular weight of 19,000 pounds.

CONTROL: 0001-02-079, ETC

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

CONTROL: 0001-02-079, ETC

SHEET 9E

COUNTY: EL PASO

HIGHWAY: SH-20, ETC

LED Luminaire:

**General Requirements.** Provide a decorative LED luminaire with a minimum of 12,000 lumens, maximum 3000K CCT and “dark sky” compliant shielding. All luminaires to be installed on strut arm assemblies as detailed in the plans. Luminaire shall be dark-sky compliant, NEMA 3 photo-control lock-type receptacle. Lighting shall turn on and off automatically. Lighting shall meet AASHTO, FHWA, and IESNA design criteria. Light shall be 250W LE EQ.

**Electronic Driver and LED Lamp Modules.** Provide replaceable LED driver modules that will operate at the existing line voltage. Provide lugs with captive screws for wire sizes up to 10AWG. Identify each terminal position.

**Basis of Estimate for Mobile TMAs**

Basis of Estimate for Mobile TMAs			
TMA(Mobile)			
Standard	Required	Additional	TOTAL
TCP (2-6)-18	1 TMA per lane closure per location		
TCP (5-1)-18	1 TMA		
TCP (6-1)-12	1 TMA per lane closure per location		
TCP (6-8)-14	1 TMA		

**Item 6391 – LED Decorative Illumination Assembly**

Conductor runs in Illumination Layouts contain 5 ft. of slack.

**Submittals.** Submit fabrication drawings and calculations sealed by a licensed professional engineer. Follow the electronic shop drawing submittal process (see Guide Electronic Shop Drawing Submittal), to submit fabrication drawings and calculations for approval.

**Luminaire Structural Support Requirements.** Adhere to “Buy for America” guidelines. Lighting poles, arms, and anchor bolt assemblies shall have a 25-year design life to resist dead loads, ice loads, and the required basic wind speeds safely at the location of installation in accordance with the current edition of the AASHTO Design Specifications. For transformer base poles, the fabricator shall include transformer base and connecting hardware in calculations and shop drawing submittals. All transformer bases shall have been structurally tested to resist the theoretical plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with the shop drawings. Shop drawings shall show breakaway base model number, and manufacturer’s name and logo. Manufacturer’s shop drawings shall include the ASTM designations for all materials to be used.

Transformer breakaway base shall meet FHWA and AASHTO breakaway requirements and shall have an access door. All structural fasteners shall be galvanized high strength carbon steel. All non-structural fasteners shall be galvanized or zinc-plated carbon steel or stainless steel. Provide rectangular 3x5 steel hand hole frame with mounting provisions for grounding lug located behind gasketed cover. Provide a removable two-piece square aluminum base cover.



# Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0001-02-079

DISTRICT El Paso  
HIGHWAY BU 54A, HERCULES, SH 20

COUNTY El Paso

CONTROL SECTION JOB				0001-02-079		0167-02-088		0924-06-645		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00198195		A00193277		A00177500			
COUNTY				El Paso		El Paso		El Paso			
HIGHWAY				SH 20		BU 54A		HERCULES			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	110-6003	EXCAVATION (SPECIAL)	CY	3.000		1.500		1.050		5.550	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	636.000		448.000		160.000		1,244.000	
	500-6001	MOBILIZATION	LS	1.000						1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	14.000						14.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	70.000		50.000		30.000		150.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	70.000		50.000		30.000		150.000	
	531-6001	CONC SIDEWALKS (4")	SY	12.000				7.000		19.000	
	610-6009	REMOVE RD IL ASM (TRANS-BASE)	EA	51.000						51.000	
	610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	5.000						5.000	
	610-6103	REPLACE LUMINAIRE W/LED (400W EQ)	EA	13.000						13.000	
	610-6161	IN RD IL (TY SA) 30T-4-4 (250W EQ) LED	EA	62.000						62.000	
	610-6286	IN RD IL (TY SA) 50T-8 (400W EQ) LED	EA	14.000						14.000	
	610-6290	IN RD IL (TY SA) 50T-12 (400W EQ) LED	EA			56.000				56.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF	7,270.000		11,190.000		2,864.000		21,324.000	
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	9,170.000		630.000		3,188.000		12,988.000	
	618-6070	CONDT (RM) (2")	LF					25.000		25.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	50,825.000		40,290.000		19,861.000		110,976.000	
	620-6012	ELEC CONDR (NO.4) INSULATED	LF					150.000		150.000	
	624-6002	GROUND BOX TY A (122311)W/APRON	EA	24.000		10.000		24.000		58.000	
	628-6041	ELC SRV TY A 240/480 060(NS)SS(E)GC(O)	EA	3.000		3.000		2.000		8.000	
	751-6003	IRRIG SYS OPERATION AND REPAIR	MO	4.000						4.000	
	751-6010	PLANT BED MAINTENANCE	CYC	10.000						10.000	
	1005-6002	LOOSE AGGR FOR GROUNDCOVER (TYPE II)	CY	39.000				28.000		67.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	20.000		20.000		60.000		100.000	
	6084-6001	MODIFY EXISTING ELECTRICAL SERVICE	EA	1.000						1.000	
	6163-6002	REMOVE EXISTING CABLES (POWER)	LF	68,100.000						68,100.000	
	6185-6002	TMA (STATIONARY)	DAY	50.000		30.000		60.000		140.000	
	6391-6002	LED DECORATIVE ILLUM ASSEMB 8' ARM-100W	EA					20.000		20.000	
	14	PUBLIC UTILITY FORCE ACCT WORK (PARTICIPATING)	LS	1.000						1.000	
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000						1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000						1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000						1.000	

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SUMMARY OF ILLUMINATION QUANTITIES																	
ITEM NO. DESC. CODE (TXDOT)	0110 6003	0416 6029	0531 6001	0610 6009	0610 6103	0610 6161	0610 6286	0618 6023	0618 6024	0620 6008	0624 6002	0628 6041	0751 6003	0751 6010	1005 6002	6084 6001	6163 6002
LOCATION	EXCAVATION (SPECIAL)	DRILL SHAFT (RDWY ILL POLE) (30 IN)	CONC SIDEWALKS (4")	REMOVE RD ILL ASM (TRANS - BASE)	REPLACE LUMINAIRE W / LED (400W EQ)	IN RD ILL AM (TY SA) 30T - 4 - 4 (250W) LED	IN RD ILL (TY SA) 50T-8 (400W EQ) LED	CONDT (PVC) (SCH 40) (2")	CONDT (PVC) (SCH 40) (2") (BORE)	ELEC CONDR (NO.8) INSULATED	GROUND BOX TY A (122311) W / APRON	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	IRRIG SYS OPERATION AND REPAIR	PLANT BED MAINTENANCE	LOOSE AGGR FOR GROUND COVER (TYPE II)	MODIFYING EXISTING ELECTRICAL SERVICES	REMOVE EXISTING CABLES (POWER)
	CY	LF	SY	EA	EA	EA	EA	LF	LF	LF	EA	EA	MO	CYC	CY	EA	LF
CSJ 0001-02-079																	
1 OF 12	0.25	60	1		4		6	15	2440	7605	5	1			1		1800
2 OF 12	0.25	48	1	4	1	6		700	570	3930	1				4		3600
3 OF 12	0.25	58	1	5		6	1	1005	295	4210	4	1			5		3600
4 OF 12	0.25	56	1	6		7		680	525	3735					4		7200
5 OF 12	0.25	60	1	4	2	5	2	570	925	4665	3				3		7200
6 OF 12	0.25	54	1	3	3	3	3	400	1345	5710	5	1			2		7200
7 OF 12	0.25	64	1	6		8		1065	175	3855					5		6150
8 OF 12	0.25	56	1	6		7		810	425	3825					4		7200
9 OF 12	0.25	60	1	4	2	5	2	585	945	4755	2				3		7200
10 OF 12	0.25	56	1	6		7		695	510	3735					4		7200
11 OF 12	0.25	56	1	6		7		635	570	3735					3		7200
12 OF 12	0.25	8	1	1	1	1		110	445	1065	4				1	1	2550
TOTAL	3	636	12	51	13	62	14	7270	9170	50825	24	3	4	10	39	1	68100

SUMMARY OF TRAFFIC CONTROL QUANTITIES				
ITEM NO. DESC. CODE (TXDOT)	500 6001	502 6001	6001 6001	6185 6002
LOCATION	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)
	LS	MO	DAY	DAY
CSJ 0001-02-079	1	14	20	50
CSJ 0167-02-088			20	30
TOTAL	1	14	40	80

SUMMARY OF SW3P QUANTITIES		
ITEM NO. DESC. CODE (TXDOT)	506 6040	506 6043
LOCATION	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)
	LF	LF
CSJ 0001-02-079	70	70
CSJ 0167-02-088	50	50
TOTAL	120	120

SUMMARY OF ILLUMINATION QUANTITIES								
ITEM NO. DESC. CODE (TXDOT)	0110 6003	0416 6029	0610 6290	0618 6023	0618 6024	0620 6008	0624 6002	0628 6041
LOCATION	EXCAVATION (SPECIAL)	DRILL SHAFT (RDWY ILL POLE) (30 IN)	IN RD ILL (TY SA) 50T-12 (400W EQ) LED	CONDT (PVC) (SCH 40) (2")	CONDT (PVC) (SCH 40) (2") (BORE)	ELEC CONDR (NO.8) INSULATED	GROUND BOX TY A (122311) W / APRON	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)
	CY	LF	EA	LF	LF	LF	EA	EA
CSJ 0167-02-088								
1 OF 10	0.15	40	5	1115		3420		
2 OF 10	0.15	48	6	925	230	3675	1	1
3 OF 10	0.15	40	5	1065	50	3520	3	1
4 OF 10	0.15	48	6	1170		3615		
5 OF 10	0.15	40	5	1225		3765		
6 OF 10	0.15	48	6	1070		3300		
7 OF 10	0.15	48	6	1225	65	4005	2	
8 OF 10	0.15	48	6	1250	115	4735	2	1
9 OF 10	0.15	40	5	1225		6275		
10 OF 10	0.15	48	6	920	170	3980	2	
TOTAL	1.5	448	56	11190	630	40290	10	3



TBPE REG. # F-474



## SUMMARY OF QUANTITIES

### 0001-02-079

SHEET 01 OF 01

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST		COUNTY	SHEET NO.
ELP		EL PASO	11

DATE: 3/29/2024 1:30:34 AM  
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DATE: 3/28/2024 2:49:20 PM  
 FILE: S:\10101010-052-Hercules Safety Lighting\DWG\Construction Drawings\PS&E Plans\01\_General\04\_Summary Streets.dgn

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ITEM NO. DESC. CODE (TXDOT)	SUMMARY OF ILLUMINATION QUANTITIES											
	110-6003	416-6029	531-6001	618-6023	618-6024	618-6070	620-6008	620-6012	624-6002	628-6041	1005-6002	6391-6002
LOCATION	EXCAVATION (SPECIAL)	DRILL SHAFT (RDWY ILL POLE) (30 IN)	CONC SIDEWALKS (4")	CONDT (PVC) (SCH 40) (2")	CONDT (PVC) (SCH 40) (2") (BORE)	CONDT (RM) (2")	ELEC CONDR (NO.8) INSULATED	ELEC CONDR (NO.4) INSULATED	GROUND BOX TY A (122311)W/APRON	ELC SRV TY A 240/480 060(NS)SS(E)GC(O)	LOOSE AGGR FOR GROUNDCOVER (TYPE II)	LED DECORATIVE ILLUM ASSEMB 8' ARM-100W
	CY	LF	SY	LF	LF	LF	LF	LF	EA	EA	CY	EA
CSJ 0924-06-645												
1 OF 7	0.15	24	1	468	278		2533		3		4	3
2 OF 7	0.15	24	1	531	509		3585		3		4	3
3 OF 7	0.15	16	1	317	670		3156	75	3	1	4	2
4 OF 7	0.15	16	1	448	517		3075		2		4	2
5 OF 7	0.15	40	1	453	545		3144		5		4	5
6 OF 7	0.15	32	1	427	572		3252	75	5	1	4	4
7 OF 7	0.15	8	1	220	97	25	1116		3		4	1
TOTAL	1.05	160	7	2864	3188	25	19861	150	24	2	28	20

ITEM NO. DESC. CODE (TXDOT)	SUMMARY OF TRAFFIC CONTROL ITEMS	
	6001-6001	6185-6002
LOCATION	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)
	DAY	DAY
CSJ 0924-06-645		
1 OF 1	58	58
TOTAL	58	58

ITEM NO. DESC. CODE (TXDOT)	SUMMARY OF EROSION CONTROL ITEMS	
	506-6040	506-6043
LOCATION	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)
	LF	LF
CSJ 0924-06-645		
1 OF 1	30	30
TOTAL	30	30



3/28/2024

**cea** group  
 813 N. Kansas St., Suite 300  
 El Paso, TX 79902  
 915.544.5232  
 www.ceagroup.net  
 TEXAS REGISTERED ENGINEERING FIRM F-4564



**HERCULES AVENUE  
 SUMMARY OF QUANTITIES  
 0924-06-645**

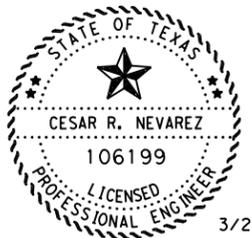
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	12	

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ELECTRICAL SERVICES DATA

Elec. Service Name	Sheet No.	LATITUDE	LONGITUDE	Electrical Service Description	Service Conduit Size	Service Conductor No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contractor Amps	Panelboard/ Loadcenter Amp Rating	Branch Circuit ID	Circuit No.	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
PROP. ELEC SRV NO. 1 SH 20 AT BARTLETT DR.	1 OF 12	31.839069	-106.567103	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	1 1/2"	3/#4	N/A	2P/60	60	N/A	PROPOSED RDWY ILLUM FROM N DESERT BLCD (I-10 NBFR) TO REMCON CIR	A	2P/20	10	4.8
PROP. ELEC SRV NO. 2 SH 20 AT BALVIDERE ST.	3 OF 12	31.837272	-106.558056	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	1 1/2"	3/#4	N/A	2P/60	60	N/A	PROPOSED RDWY ILLUM FROM REMCON CIR TO RESLER DR	A	2P/20	5	7.2
												B	2P/20	10	
PROP. ELEC SRV NO. 3 SH 20 AT CHAMPIONS PL.	6 OF 12	31.834794	-106.5471	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	1 1/2"	3/#4	N/A	2P/60	60	N/A	PROPOSED RDWY ILLUM FROM RESLER DR TO EAST OF FOUNTAIN RD	A	2P/20	5	9.1
												B	2P/20	14	
EXIST. ELEC SRV NO. 4 SH 20 AT SUNLAND PARK DR.	12 OF 12	31.828956	-106.527683	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O) EXISTING - REFER TO CSJ 0001-02-076, ETC FOR DETAILS DATED 04-24-2023	1 1/4"	3/#4	N/A	2P/60	60	N/A	PROPOSED RDWY ILLUM FROM EAST OF FOUNTAIN RD TO SUNDLAND PARK	A	2P/20	13	11
												B - EXIST ILLUM	2P/15	10	



3/29/2024

*Cesar R. Nevarez, P.E.*



SH 20  
ELECTRICAL SERVICE DATA  
0001-02-079

SHEET 1 OF 1

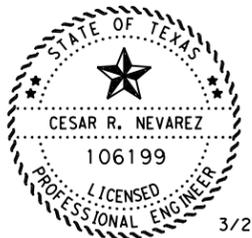
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	13	

DATE: 3/29/2024 1:31:12 AM  
FILE: WA4\_ES\_SH20.dgn

DW: CK: DW: CK: DW:

ELECTRICAL SERVICES DATA

Elec. Service Name	Sheet No.	LATITUDE	LONGITUDE	Electrical Service Description	Service Conduit Size	Service Conductor No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contractor Amps	Panelboard/ Loadcenter Amp Rating	Branch Circuit ID	Circuit No.	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
PROP ELEC SERV NO.1 BU 54A NB & MOCHA DUNE DR	2 OF 10	31.948231	-106.367394	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	1 1/2"	3/#4	N/A	2P/60	60	N/A	PROPOSED RDWY ILLUM FROM BEGINNING OF PROJECT TO MOCHA DUNE DR	A	2P/20	6	2.9
PROP ELEC SERV NO.2 BU 54A NB & ASHLEY RD	3 OF 10	31.950177	-106.365313	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	1 1/2"	3/#4	N/A	2P/60	60	N/A	PROPOSED RDWY ILLUM FROM ASHLEY RD TO UPRR TRACKS	A	2P/20	3	5.3
												B	2P/20	8	
PROP ELEC SERV NO.3 BU 54A NB & O'HARA DR	8 OF 10	31.962586	-106.352208	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	1 1/2"	3/#4	N/A	2P/60	60	N/A	PROPOSED RDWY ILLUM FROM UPRR TRACKS TO RAILROAD DR	A	2P/20	10	5.8
												B	2P/20	2	



*Cesar R. Nevarez, P.E.*



**BU 54A  
ELECTRICAL SERVICE DATA  
0167-02-088**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	14	

DATE: 3/29/2024 1:31:46 AM  
 FILE: WA4\_ES\_BU54A.dgn

DNE  
 GJK  
 DWK  
 GJK

ELECTRICAL SERVICE DATA

Electrical Service Name	Sheet No.	LATITUDE	LONGITUDE	Electrical Service Description	Service Conduit Size	Service Conductor No/Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contactor Amps	Panelboard/Load Center Amp Rating	Branch Circuit No.	Branch Ckt. Bkr. Pole/Amps
S1	E102	31.855376	-106.428793	**ELEC SERV TY A(240/480) 60 (NS) SS (E) GC (U)	2"	3#4	N/A	2P/60	60	N/A	1A	2P/20
											1B	2P/20
S2	E105	31.855558	-106.418789	**ELEC SERV TY A(240/480) 60 (NS) SS (E) GC (U)	2"	3#4	N/A	2P/60	60	N/A	2A	2P/20
											2B	2P/20

NOT METERED

\*\*SERVICE ENCLOSURES SHALL MEET ALL OF TEXAS DEPARTMENT OF TRANSPORTATION STANDARDS ED(5)-14



THIS SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY LORENZO L. DE SANTIAGO, P.E. #90120 ON MARCH 28, 2024. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

**IDSIE** ENGINEERING, INC.  
 2150 TRAWOOD Dr., Ste. B251, EL PASO, TX 79935  
 O:(915)444-8519 C:(915)867-4041 FIRM No: F-16861



**HERCULES AVENUE  
 ELECTRICAL SERVICE DATA  
 0924-06-645**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0001	02	079	SH 20, ETC
DIST	COUNTY	SHEET NO	
ELP	EL PASO	15	

DATE: \$DATE\$ \$TIMES  
 FILE: \$FILES

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DATE: 3/29/2024  
FILE: WA4\*G-EPIC.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.  
2.  
 No Action Required     Required Action

Action No.

- Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
- Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
- Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
- When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

- No Permit Required  
 Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)  
 Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)  
 Individual 404 Permit Required  
 Other Nationwide Permit Required: NWP# \_\_\_\_\_

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

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The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
<input type="checkbox"/> Temporary Vegetation	<input type="checkbox"/> Silt Fence	<input type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Blankets/Matting	<input type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input checked="" type="checkbox"/> Bio Deg Logs	<input type="checkbox"/> Mulch Filter Berm and Socks
<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks
<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input type="checkbox"/> Sediment Basins	<input type="checkbox"/> Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

- No Action Required     Required Action

Action No.

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IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical. Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

- No Action Required     Required Action

Action No.

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V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

- No Action Required     Required Action

Action No.

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If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP: Best Management Practice	SPCC: Spill Prevention Control and Countermeasure
CGP: Construction General Permit	SW3P: Storm Water Pollution Prevention Plan
DSHS: Texas Department of State Health Services	PCN: Pre-Construction Notification
FHWA: Federal Highway Administration	PSL: Project Specific Location
MOA: Memorandum of Agreement	TCEQ: Texas Commission on Environmental Quality
MOU: Memorandum of Understanding	TPDES: Texas Pollutant Discharge Elimination System
MS4: Municipal Separate Stormwater Sewer System	TPWD: Texas Parks and Wildlife Department
MBTA: Migratory Bird Treaty Act	TxDOT: Texas Department of Transportation
NOT: Notice of Termination	T&E: Threatened and Endangered Species
NMP: Nationwide Permit	USACE: U.S. Army Corps of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used. Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- \* Dead or distressed vegetation (not identified as normal)
- \* Trash piles, drums, canister, barrels, etc.
- \* Undesirable smells or odors
- \* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

- Yes     No

If "No", then no further action is required.

If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

- Yes     No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

- No Action Required     Required Action

Action No.

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- 

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

- No Action Required     Required Action

Action No.

- 
- 
- 

 Texas Department of Transportation		<b>Design Division Standard</b>	
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC			
FILE: G-EPIC.dgn	DN: TxDOT	CK:	DW:
© TxDOT: XXXXXXX XXXXXXX	0001	02	079, ETC. SH 20, ETC.
REVISIONS			
	DIST	COUNTY	SHEET NO.
ELP	EL PASO		16

DATE: 3/29/2024 1:32:45 AM  
 FILE: WA4\_SH20\_TCPI.dgn

**TCP SELECTION TABLE (CSJ: 0001-02-079)**

HIGHWAY	TYPE OF WORK	STANDARD SHEET	SHEET DESCRIPTION	SHEET DIAGRAM	SUGGESTED USE
MESA ST (SH 20)	ILLUMINATION INSTALLATION, TRENCHING, BORING, POLE INSTALLATION, AND POT HOLE (IF NEEDED)	TRAFFIC CONTROL PLAN SHEET 2 OF 3; TCP(2-6) - 18	WORK ZONE TYPICAL DETAILS; TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS	TCP 2-6a ADDITIONAL PROPOSED WORK ZONE TYPICAL SECTION/PROPOSED TRAFFIC CONTROL PLAN CROSSING CLOSURE; ONE LANE CLOSURE	INSIDE LANE CLOSURE IN BOTH DIRECTIONS WHEN INSTALLING LIGHTS ON MEDIAN, TRENCHING, AND BORING. CONTRACTOR TO PERFORM LANE CLOSURES DURING OFF PEAK HOURS: 9:00 AM TO 4:00 PM MONDAY THRU FRIDAY. NIGHT TIME WORK SHALL BE FROM SUNDAY THRU THURSDAY DURING: 9:00 PM TO 6:00 AM
MESA ST (SH 20)	ILLUMINATION INSTALLATION, TRENCHING, BORING, POLE INSTALLATION, REMOVAL OF EXISTING ILLUMINATION POLES, GROUND BOXES, CONDUCTORS, ETC., AND POT HOLE (IF NEEDED)	TRAFFIC CONTROL PLAN SHEET 3 OF 3; TCP(2-6) - 18	WORK ZONE TYPICAL DETAILS; TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS	TCP 2-6a ADDITIONAL PROPOSED WORK ZONE TYPICAL SECTION/PROPOSED TRAFFIC CONTROL PLAN CROSSING CLOSURE; ONE LANE CLOSURE	OUTSIDE LANE CLOSURE IN BOTH DIRECTIONS WHEN REMOVING LIGHTS FROM SIDEWALK, INSTALLING LIGHTS ON THE HOUSE SIDE OF THE ROADWAY, TRENCHING, AND BORING. CONTRACTOR TO PERFORM LANE CLOSURES DURING OFF PEAK HOURS: 9:00 AM TO 4:00 PM MONDAY THRU FRIDAY. NIGHT TIME WORK SHALL BE FROM SUNDAY THRU THURSDAY DURING: 9:00 PM TO 6:00 AM
MESA ST (SH 20)	ILLUMINATION INSTALLATION, TRENCHING, BORING, POLE INSTALLATION AND REMOVAL, AND POT HOLE (IF NEEDED)	WZ(BTS-2)-13	TRAFFIC SIGNAL WORK BARRICADES AND SIGNS	SIDEWALK DETOUR CROSSWALK CLOSURE	SIDEWALK CLOSURES WHEN REMOVING LIGHTS FROM SIDEWALK, INSTALLING LIGHTS ON THE HOUSE SIDE OF THE ROADWAY, TRENCHING, AND BORING
MESA ST (SH 20)	ALL AFFECTED PEDESTRIAN FACILITIES	WZ(BTS-2)-13	TRAFFIC SIGNAL WORK BARRICADES AND SIGNS	SIDEWALK DETOUR CROSSWALK CLOSURE	CROSSWALK CLOSURES WILL BE USED FOR ALL TYPES OF WORK WHEREVER NECESSARY. DURATION OF CLOSURES WILL BE DEPENDENT ON THE ACCESSIBILITY THROUGH THE WORK ZONE.

**TCP GENERAL NOTES:**

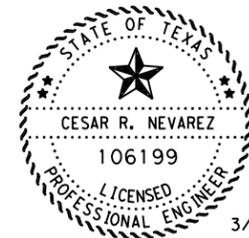
- CONTRACTOR MAY WORK IN MULTIPLE CSJs AT ANY GIVEN TIME.
- CSJ 001-02-079 (SH 20 FROM I-10 TO SUNLAND PARK DR) SHALL BE CONSTRUCTED FIRST.
- FIELD CONDITIONS MAY DICTATE ADJUSTMENT OF SIGN LOCATIONS. PLACE TRAFFIC CONTROL DEVICES AND ADVANCED WARNING SIGNS AS SHOWN IN THE STANDARDS AND IN ACCORDANCE WITH THE TMUTCD. CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO INSTALLATION OF ANY SIGNS.
- REFER TO TRAFFIC CONTROL STANDARD SHEETS FOR OTHER REGULATORY AND WARNING SIGNS.
- REGULATE ALL CONSTRUCTION TRAFFIC SO AS TO CAUSE A MINIMUM OF INCONVENIENCE TO THE TRAVELING PUBLIC. AT POINTS WHERE IT IS NECESSARY FOR TRUCKS TO STOP AND UNLOAD, PROVIDE WARNING SIGNS AND FLAGGERS AS NECESSARY TO ADEQUATELY PROTECT TRAVELING PUBLIC. IT MAY BE NECESSARY TO SET UP A LANE CLOSURE ON THE MAINLANES TO FACILITATE CONSTRUCTION TRAFFIC ENTRANCE AND EXIT.
- CONTRACTOR TO CONTACT ONE-CALL AND VERIFY LOCATION OF EXISTING UTILITIES PRIOR TO BEGINNING WORK.
- THE CONTRACTOR WILL ONLY BE ALLOWED TO WORK AT ONE CORNER OF THE INTERSECTION. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER FOR ANY EXCEPTIONS.
- CONTRACTOR TO PERFORM LANE CLOSURES DURING OFF PEAK HOURS: 9:00 AM TO 4:00 PM MONDAY THRU FRIDAY. NIGHT TIME WORK SHALL BE FROM SUNDAY THRU THURSDAY BETWEEN: 9:00 PM TO 6:00 AM.
- ADHERE AT ALL TIMES TO TXDOT STANDARDS BC(1)-21 THROUGH BC(12)-21, AND TMUTCD FOR SIGN DETAILS, DIMENSIONS AND PLACEMENT.
- COORDINATE WITH ONGOING CONSTRUCTION PROJECTS PRIOR TO SETTING UP CLOSURES AND BEGINNING WORK ON ANY ROADWAY.
- DO NOT STORE ANY EQUIPMENT OR STOCKPILE ANY MATERIAL ON THE OPPOSITE DIRECTION OF THE WORK OR ON THE LANE CLOSURE.
- COVER DRILL SHAFT HOLES DURING NON-WORKING/OVERNIGHT HOURS.

**TCP GENERAL NOTES (CONT.):**

- COVER CONFLICTING INTERMEDIATE SPEED LIMIT SIGNS.
- CONTRACTOR SHALL BE RESPONSIBLE OF COORDINATING WITH SUN METRO FOR BUS STOPS IMPACTED ALONG THE WORK ZONE.
- CONTRACTOR SHALL COORDINATE WITH TXDOT AREA OFFICE FOR SIGNAL TIMING DURING CONSTRUCTION.
- CONTRACTOR SHALL NOT CLOSE TWO MEDIAN OPENINGS BACK TO BACK.
- CONTRACTOR SHALL CLOSE ONE LANE PER DIRECTION OF TRAVEL AT A TIME NO INSIDE AND OUTSIDE LANE CLOSURES ALLOWED AT THE SAME TIME.
- OUTSIDE LANE CLOSURES NEAR SIGNALIZED INTERSECTIONS TO BE CLOSED IN A STAGGERED APPROACH TO ALLOW FOR PEDESTRIAN MOVEMENT.

**CONSTRUCTION:**

- SET UP CONSTRUCTION SIGNS IN ACCORDANCE WITH TXDOT STANDARDS.
- SET TRAFFIC CONTROL DEVICES.
- POT HOLE ALL NECESSARY LOCATIONS.
- PLACE SEDIMENT CONTROL DEVICES AS DIRECTED TO MEET FIELD CONDITIONS.
- CONSTRUCT PER PLAN.
- REMOVE SEDIMENT CONTROL DEVICES AS DIRECTED TO MEET FIELD CONDITIONS.
- REMOVE TRAFFIC CONTROL DEVICES AND CONSTRUCTION SIGNS.



3/29/2024

*Cesar R. Nevarez, P.E.*

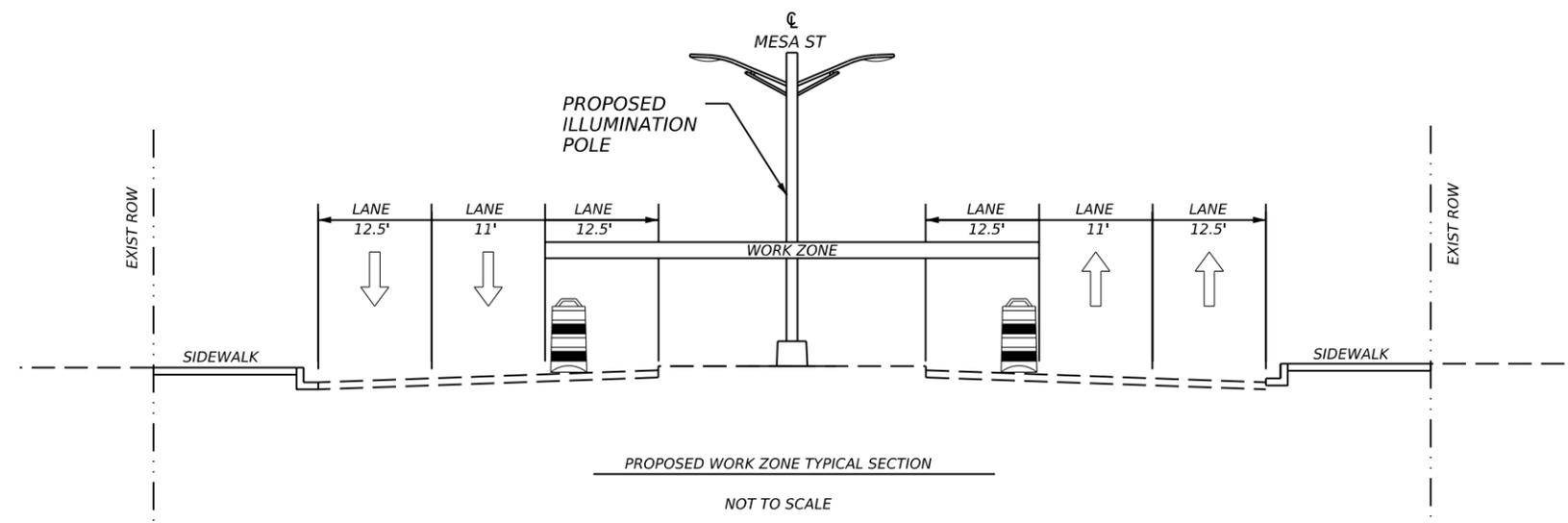


**SH 20  
TRAFFIC CONTROL PLAN  
0001-02-079**

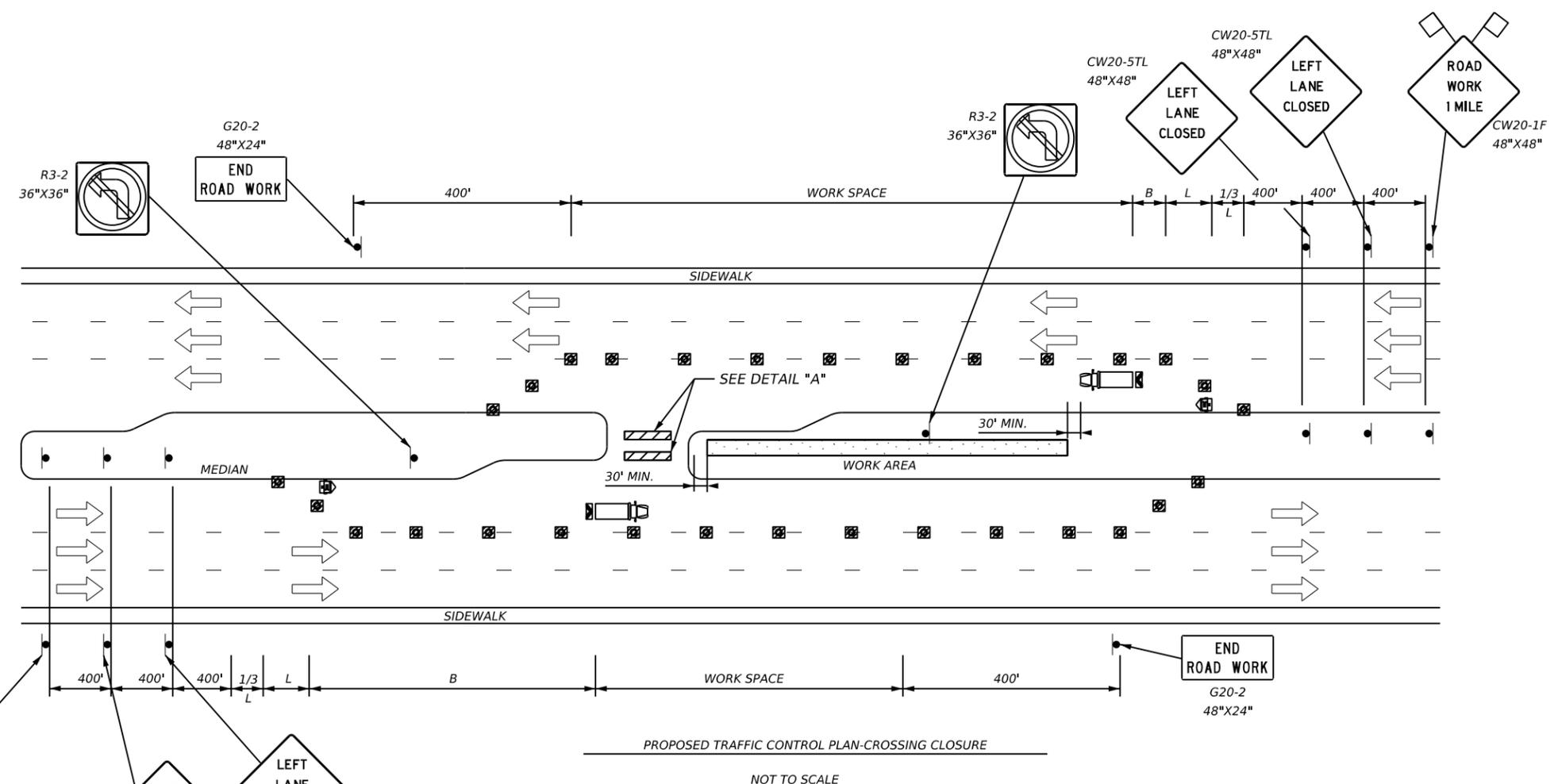
SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	17	

CK: DW: CK: DN:



- NOTES:
1. APPLY TRAFFIC CONTROL PLAN AS DESCRIBED IN THE TCP SELECTION TABLE FOR MESA ST (SH 20) UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
  2. COORDINATE WITH ONGOING CONSTRUCTION PROJECTS PRIOR TO SETTING UP LANE CLOSURES AND BEGINNING WORK ON ANY ROADWAY.
  3. LIMIT WORK ZONE TO ONE (1) MILE LENGTHS, UNLESS OTHERWISE DIRECTED.
  4. PERFORM WORK WITHIN EL PASO CITY LIMITS DURING NON- PEAK OR NIGHT TIME HOURS. NON- PEAK HOURS ARE DEFINED AS MONDAY - FRIDAY FROM 9 A.M. TO 4 P.M. NIGHT TIME HOURS ARE DEFINED AS SUNDAY - THURSDAY FROM 9 P.M. TO 6 A.M., UNLESS OTHERWISE DIRECTED.
  5. CONTRACTOR SHALL NOT STORE ANY EQUIPMENT OR STOCKPILE ANY MATERIAL ON THE OPPOSITE DIRECTION OF THE WORK OR ON THE LANE CLOSURE.
  6. NO CONSECUTIVE MEDIAN CLOSURES SHALL TAKE PLACE. CONTRACTOR SHALL CLOSE ONE MEDIAN AT A TIME.
  7. TCP DETAIL SHOWN TO BE APPLIED AT LEFT LANE ON MESA ST (SH 20).



LEGEND			
	TYPE 3 BARRICADE		CHANNELIZING DEVICES
	HEAVY WORK VEHICLE ATTENUATOR (TMA)		TRUCK MOUNTED
	TRAILER MOUNTED FLASHING ARROW BOARD		PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
	SIGN		TRAFFIC FLOW
	FLAG		FLAGGER

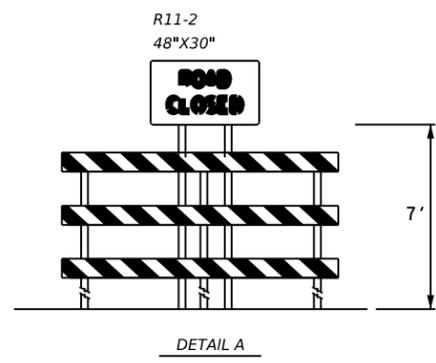


SH 20  
TRAFFIC CONTROL PLAN  
0001-02-079

SHEET 2 OF 3

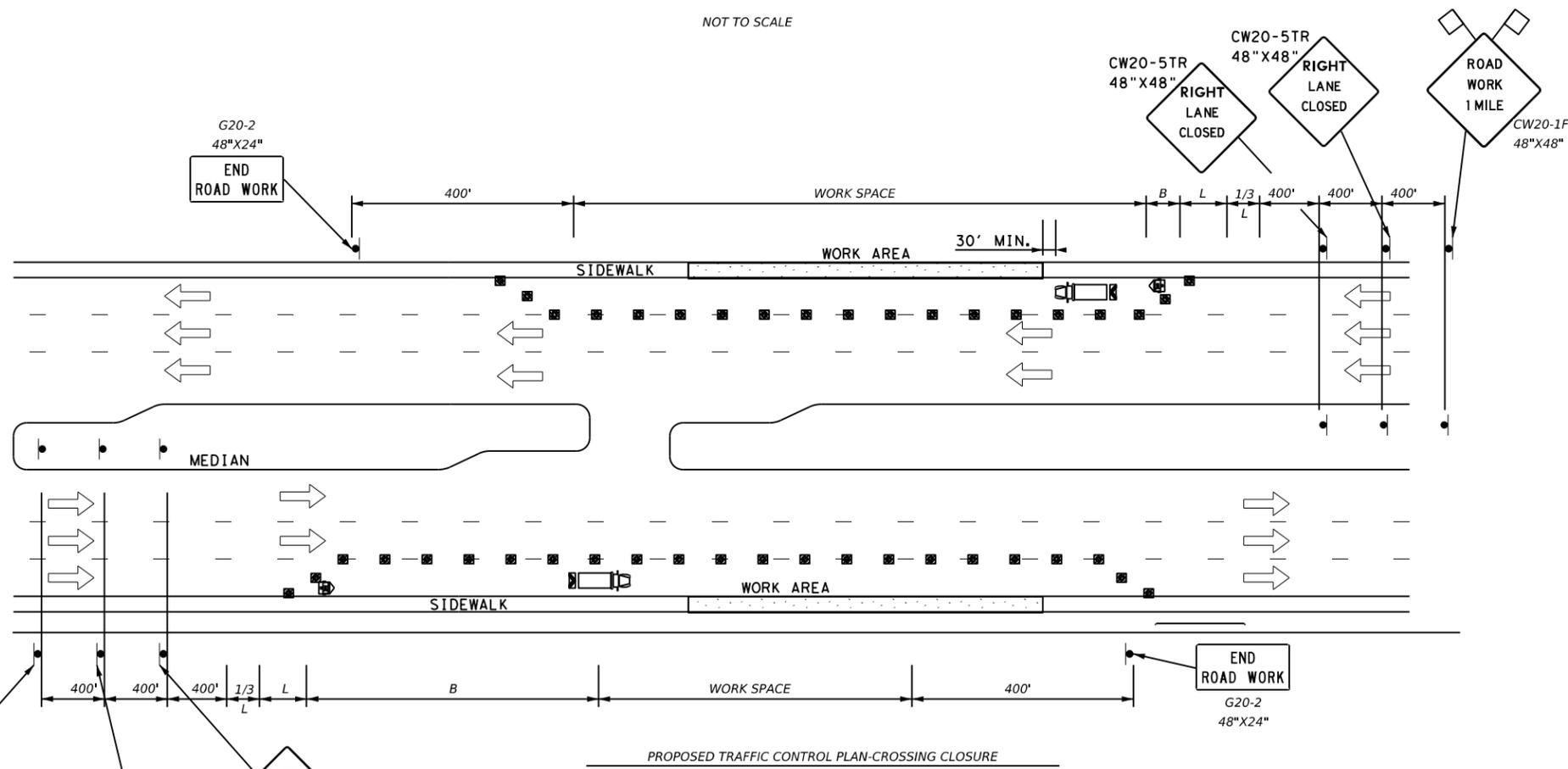
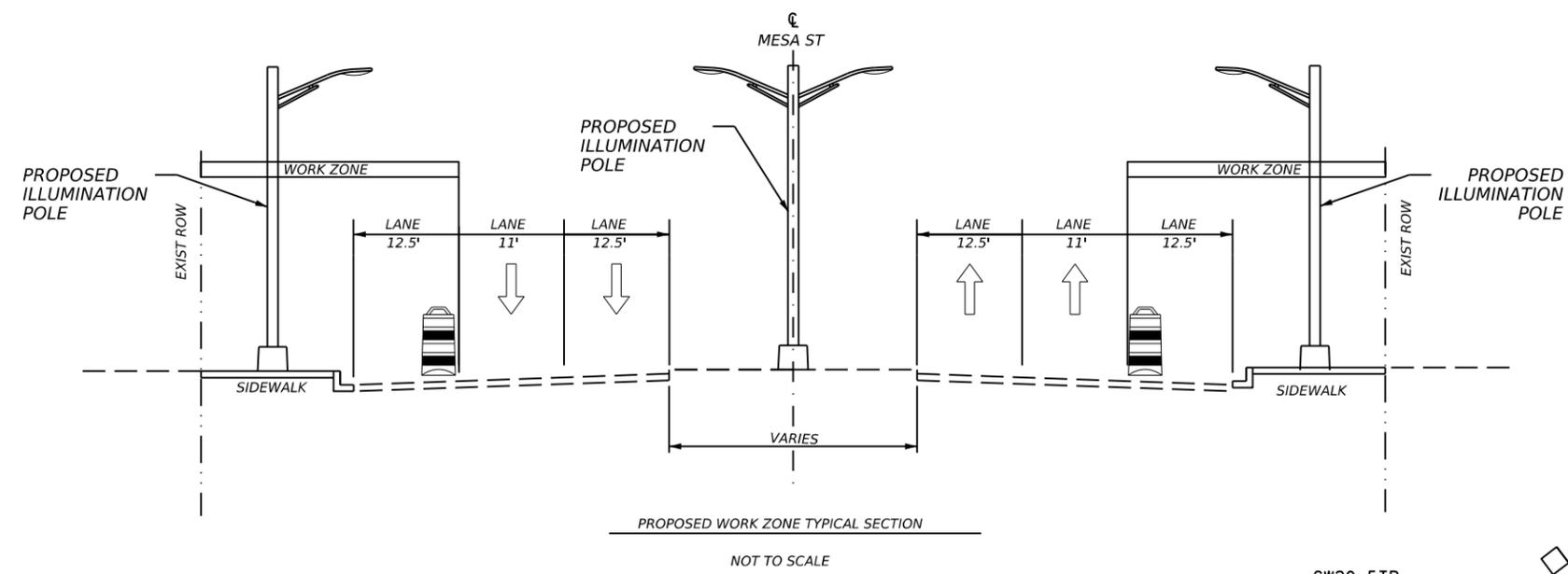
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	18	

	CONSTRUCTION POSTED SPEED	MINIMUM DESIRABLE TAPER LENGTHS *L* (12' OFFSET)	SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES		MINIMUM SIGN SPACING *X* DISTANCE	SUGGESTED LONGITUDINAL BUFFER SPACE *B*
			ON A TAPER	ON A TANGENT		
SH 20	40	320'	40'	80'	240'	155'
	45	540'	45'	90'	320'	195'



DATE: 3/29/2024 1:33:03 AM  
FILE: WA4\_SH20\_TCP2.dgn

CK:  
DW:  
CK:  
DN:



- NOTES:
1. APPLY TRAFFIC CONTROL PLAN AS DESCRIBED IN THE TCP SELECTION TABLE FOR MESA ST (SH 20) UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
  2. COORDINATE WITH ONGOING CONSTRUCTION PROJECTS PRIOR TO SETTING UP LANE CLOSURES AND BEGINNING WORK ON ANY ROADWAY.
  3. LIMIT WORK ZONE TO ONE (1) MILE LENGTHS, UNLESS OTHERWISE DIRECTED.
  4. PERFORM WORK WITHIN EL PASO CITY LIMITS DURING NON- PEAK OR NIGHT TIME HOURS. NON- PEAK HOURS ARE DEFINED AS MONDAY - FRIDAY FROM 9 A.M. TO 4 P.M. NIGHT TIME HOURS ARE DEFINED AS SUNDAY - THURSDAY FROM 9 P.M. TO 6 A.M., UNLESS OTHERWISE DIRECTED.
  5. CONTRACTOR SHALL NOT STORE ANY EQUIPMENT OR STOCKPILE ANY MATERIAL ON THE OPPOSITE DIRECTION OF THE WORK OR ON THE LANE CLOSURE.
  6. NO CONSECUTIVE MEDIAN CLOSURES SHALL TAKE PLACE. CONTRACTOR SHALL CLOSE ONE MEDIAN AT A TIME.
  7. TCP DETAIL SHOWN TO BE APPLIED AT LEFT LANE ON MESA ST (SH 20).

LEGEND			
	TYPE 3 BARRICADE		CHANNELIZING DEVICES
	HEAVY WORK VEHICLE ATTENUATOR (TMA)		TRUCK MOUNTED
	TRAILER MOUNTED FLASHING ARROW BOARD		PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
	SIGN		TRAFFIC FLOW
	FLAG		FLAGGER



3/29/2024



SH 20  
TRAFFIC CONTROL PLAN  
0001-02-079

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	19	

	CONSTRUCTION POSTED SPEED	MINIMUM DESIRABLE TAPER LENGTHS "L" (12' OFFSET)	SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES		MINIMUM SIGN SPACING "X" DISTANCE	SUGGESTED LONGITUDINAL BUFFER SPACE "B"
			ON A TAPER	ON A TANGENT		
SH 20	40	320'	40'	80'	240'	155'
	45	540'	45'	90'	320'	195'

DATE: 3/29/2024 1:33:23 AM  
FILE: WA4\_SH20\_TCP3.dgn

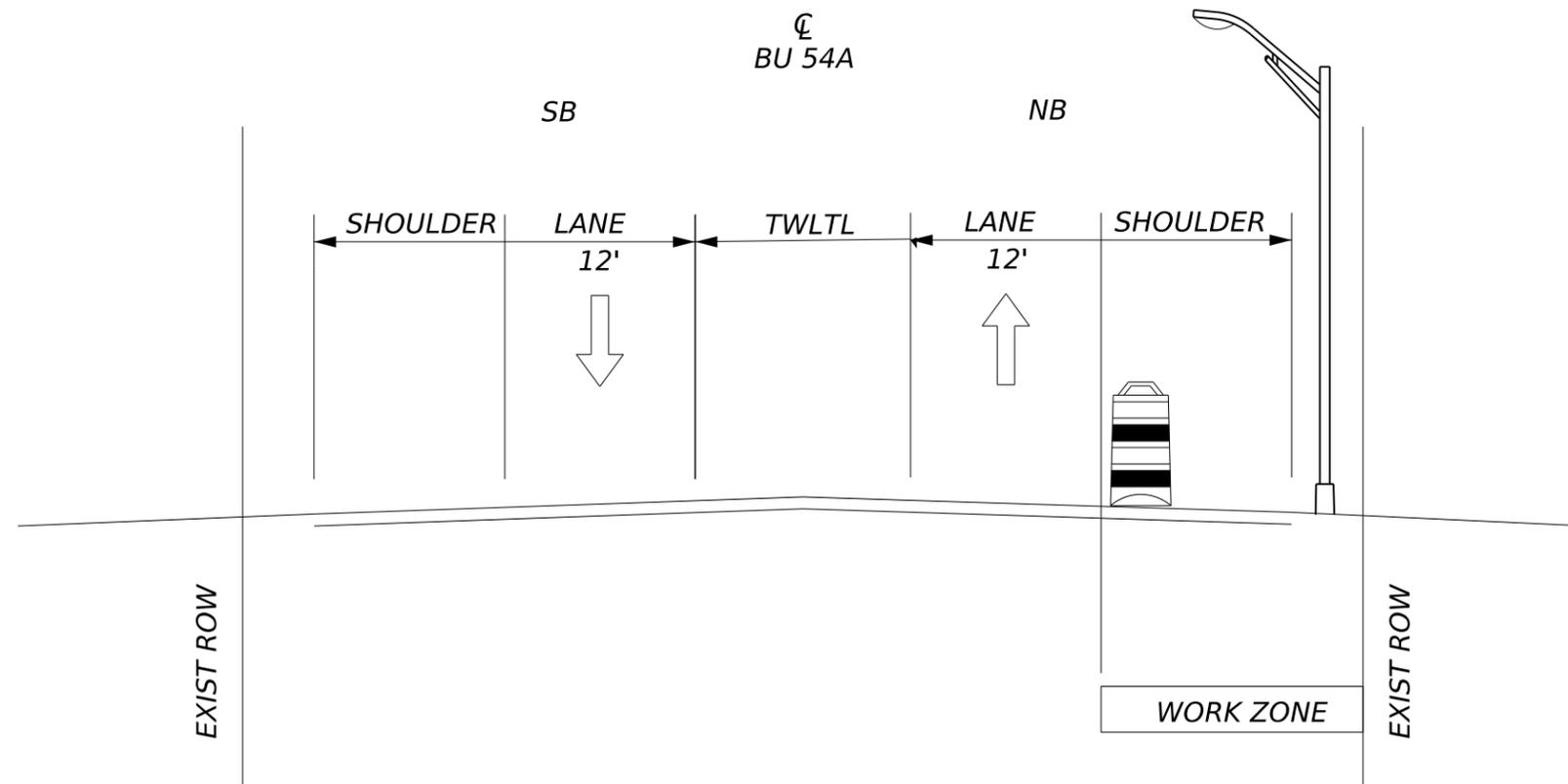
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TCP SELECTION TABLE (CSJ: 0167-02-088)

HIGHWAY	TYPE OF WORK	STANDARD SHEET	SHEET DESCRIPTION	SHEET	DIAGRAM DESCRIPTION	SUGGESTED USE
BU 54A	ILLUMINATION POLE SUPPORT & CONDUIT	TCP (1-1)-18	TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK	TCP (1-1a)	WORK AREA NEAR SHOULDER	APPLY CLOSURE DURING WORK HOURS. TMA REQUIRED.  CLOSURES ARE TO BE LIMITED TO NON-PEAK HOURS.
BU 54A	ILLUMINATION POLE INSTALLATION	TCP (1-4)-18	TRAFFIC CONTROL PLAN LANE CLOSURE ON MULTILANE CONVENTIONAL ROADS	TCP (1-4a)	ONE LANE CLOSURE	APPLY CLOSURE DURING WORK HOURS. TMA REQUIRED.  APPLY CLOSURE TO BU 54A EB FOR THE INSTALLATION OF POLES DURING WORK HOURS.  REMOVE CLOSURE DURING NON-WORKING HOURS.  CLOSURES ARE TO BE LIMITED TO NON-PEAK HOURS.
BU 54A	ELECTRICAL SERVICE	TCP (2-1)-18	TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK	TCP (2-1a)	WORK AREA NEAR SHOULDER	APPLY CLOSURE DURING WORK HOURS. TMA REQUIRED.  CLOSURES ARE TO BE LIMITED TO NON-PEAK HOURS.

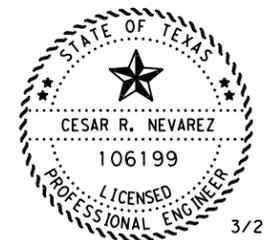
NOTES:

- REFER TO TRAFFIC CONTROL STANDARD SHEETS FOR OTHER REGULATORY AND WARNING SIGNS.
- ADHERE AT ALL TIMES TO TXDOT STANDARDS BC(1)-21 THROUGH BC(12)-21, AND TMUCTD FOR SIGN DETAILS, DIMENSIONS, AND PLACEMENT.
- APPLY TRAFFIC CONTROL PLAN AS DESCRIBED IN THE TCP SELECTION TABLE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- COORDINATE WITH ONGOING CONSTRUCTION PROJECTS PRIOR TO SETTING UP SHOULDER CLOSURES AND BEGINNING WORK ON ANY ROADWAY.
- DO NOT STORE ANY EQUIPMENT OR STOCKPILE ANY MATERIAL ON THE OPPOSITE DIRECTION OF THE WORK OR ON THE SHOULDER CLOSURE.
- COVER DRILL SHAFT HOLES DURING NON-WORKING/OVERNIGHT HOURS.
- THE CONTRACTOR SHALL COORDINATE WITH AREA OFFICE ON THE LOCATION AND QUANTITY OF THE PORTABLE CHANGEABLE MESSAGE SIGNS.



PROPOSED WORK ZONE TYPICAL SECTION

NOT TO SCALE



3/29/2024

*Cesar R. Nevarez, P.E.*



**BU 54A  
TRAFFIC CONTROL PLAN  
0167-02-088**

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	20	

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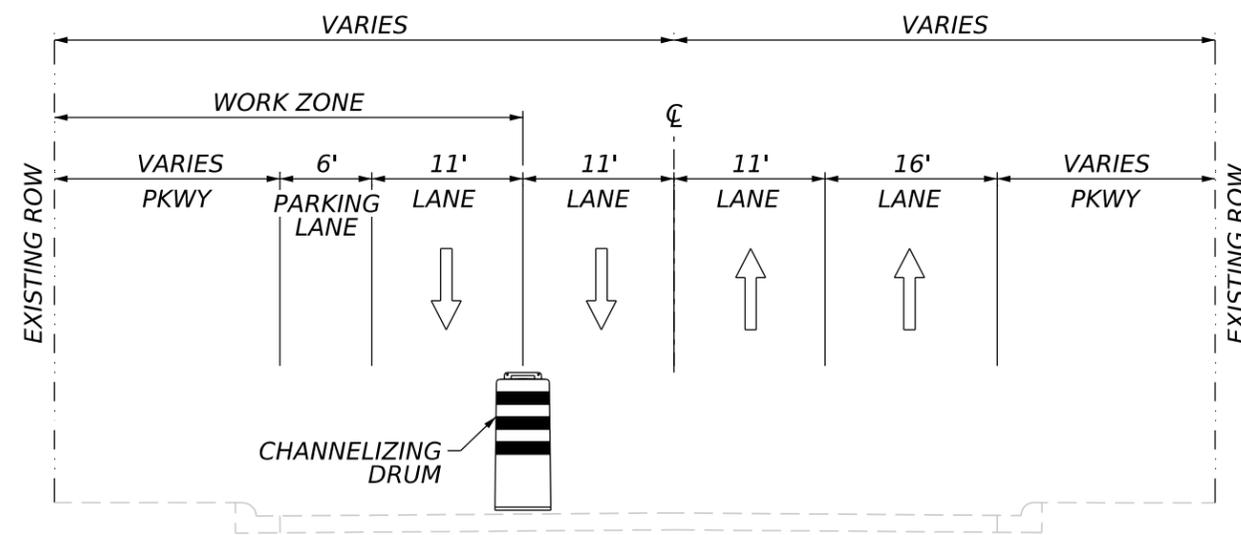
CK: DW: CK: DW:

- NOTES:
- REFER TO TRAFFIC CONTROL STANDARD SHEETS FOR OTHER REGULATORY AND WARNING SIGNS.
  - ADHERE AT ALL TIMES TO TXDOT STANDARDS BC(1)-21 THROUGH BC(12)-21, AND TMUTCD FOR SIGN DETAILS, DIMENSIONS, AND PLACEMENT.
  - THE CONTRACTOR SHALL PROVIDE SAFE ACCESS TO AND FROM ALL PRIVATE PROPERTY AND MAILBOXES AT ALL TIMES AND WEATHER CONDITIONS.
  - THE CONTRACTOR SHALL SUBMIT A DETAILED SCHEDULE OF WORK TO THE ENGINEER PRIOR TO THE BEGINNING OF CONSTRUCTION WHICH GENERALLY CONFORMS TO THE SEQUENCE PROPOSED.
  - ANY REQUEST TO ALTER THE SEQUENCE OF OPERATION SHALL BE SUBMITTED TO THE ENGINEER FOR WRITTEN APPROVAL.
  - NIGHT WORK IS ALLOWED, BUT THE CONTRACTOR IS REQUIRED TO SUBMIT A FORMAL REQUEST FOR REVIEW. NIGHT WORK STANDARDS FOR SAFETY, EQUIPMENT, AND ILLUMINATION FROM TXDOT MUST BE FOLLOWED.
  - APPLY TRAFFIC CONTROL PLAN AS DESCRIBED IN THE TCP SELECTION TABLE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
  - COORDINATE WITH ONGOING CONSTRUCTION PROJECTS PRIOR TO SETTING UP SHOULDER CLOSURES AND BEGINNING WORK ON ANY ROADWAY.
  - COVER DRILL SHAFT HOLES DURING NON-WORKING/OVERNIGHT HOURS.
  - CONTRACTOR SHALL BE RESPONSIBLE TO ATTAIN A TRAFFIC CONTROL PERMIT FROM THE CITY OF EL PASO STREETS AND MAINTENANCE DEPARTMENT AT LEAST 2 WEEKS PRIOR TO CONSTRUCTION.

TCP SELECTION TABLE (CSJ 0924-06-645)

HIGHWAY	TYPE OF WORK	STANDARD SHEET	SHEET DESCRIPTION	SHEET	DIAGRAM DESCRIPTION	SUGGESTED USE
HERCULES AVE	ILLUMINATION IMPROVEMENTS ALONG WESTBOUND PARKWAY	TCP(1-4) -18	TCP LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS	TCP(1-4a)	ONE LANE CLOSURE	<p>APPLY CLOSURE DURING WORK HOURS.</p> <p>APPLY RIGHT LANE CLOSURE ON WESTBOUND SHOULDER.</p> <p>DRUMS AND WARNING SIGNS TO BE USED ACCORDING TO TCP(2-1b).</p> <p>REMOVE CLOSURE DURING NON-WORKING HOURS.</p>

SPEED LIMIT = 35 MPH



**TCP HERCULES AVENUE - TYPICAL SECTION**

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NOT TO SCALE

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DIANA SOFIA GUERRERO  
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PROFESSIONAL ENGINEER  
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TEXAS REGISTERED ENGINEERING FIRM F-4564

TEXAS DEPARTMENT OF TRANSPORTATION

**HERCULES AVENUE  
TRAFFIC CONTROL PLAN  
0924-06-645**

SHEET 1 OF 1			
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC
DIST		COUNTY	SHEET NO.
ELP		EL PASO	21

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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).

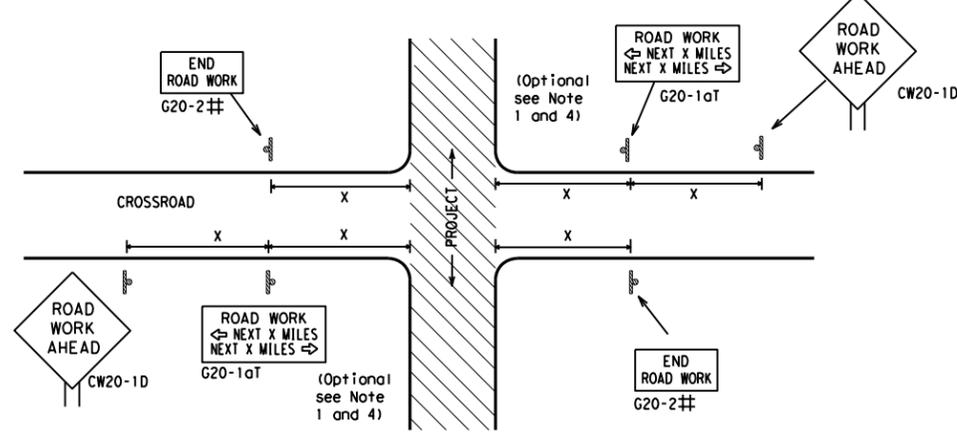
<b>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT</b> <a href="http://www.txdot.gov">http://www.txdot.gov</a>
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD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

SHEET 1 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard	
<b>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</b>			
<b>BC (1) - 21</b>			
FILE:	bc-21.dgn	DN:	TxDOT
© TxDOT	November 2002	CK:	TxDOT
		DW:	TxDOT
		CR:	TxDOT
REVISIONS	CONT	SECT	JOB
4-03 7-13	0001	02	079, ETC. SH 20, ETC.
9-07 8-14			
5-10 5-21			
	DIST	COUNTY	SHEET NO.
	ELP	EL PASO	22

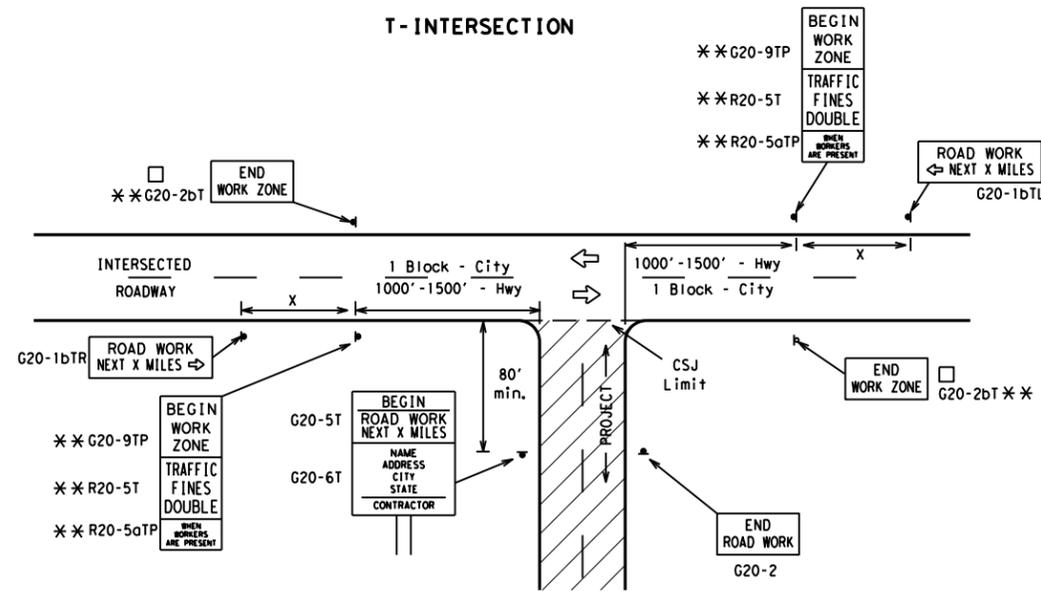
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**TYPICAL LOCATION OF CROSSROAD SIGNS**



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

**T-INTERSECTION**



**CSJ LIMITS AT T-INTERSECTION**

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

**TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING<sup>1,5,6</sup>**

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

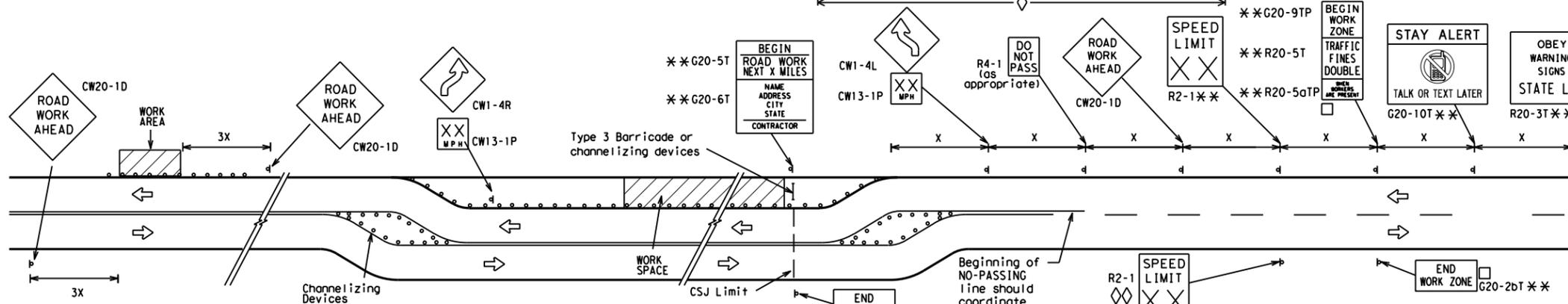
\* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

**GENERAL NOTES**

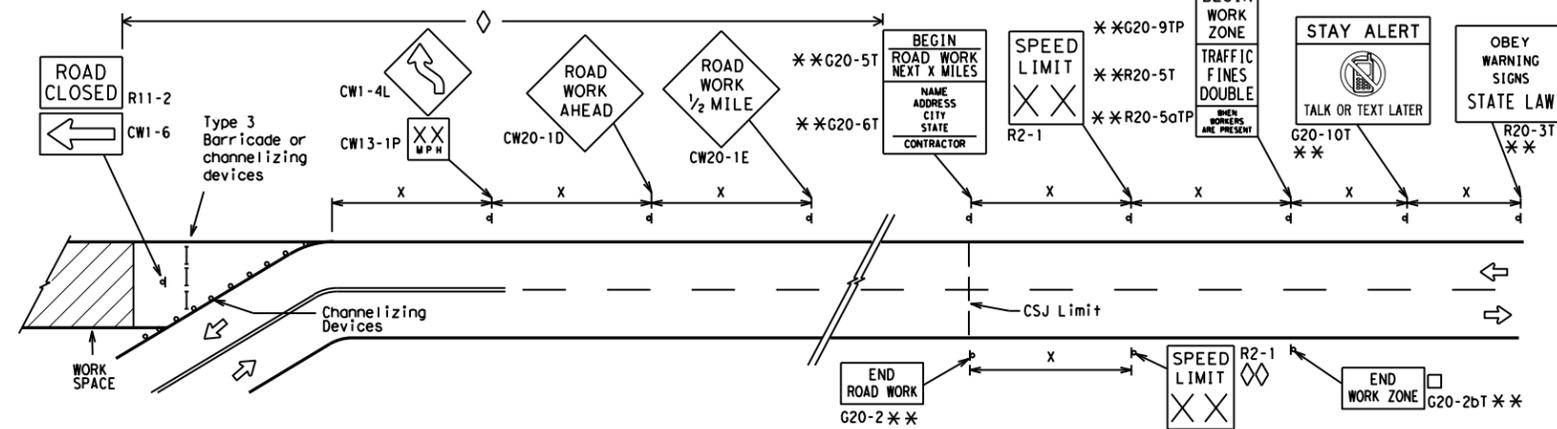
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

**WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS**



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

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



**NOTES**

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

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

SHEET 2 OF 12



**BARRICADE AND CONSTRUCTION PROJECT LIMIT**

**BC (2) - 21**

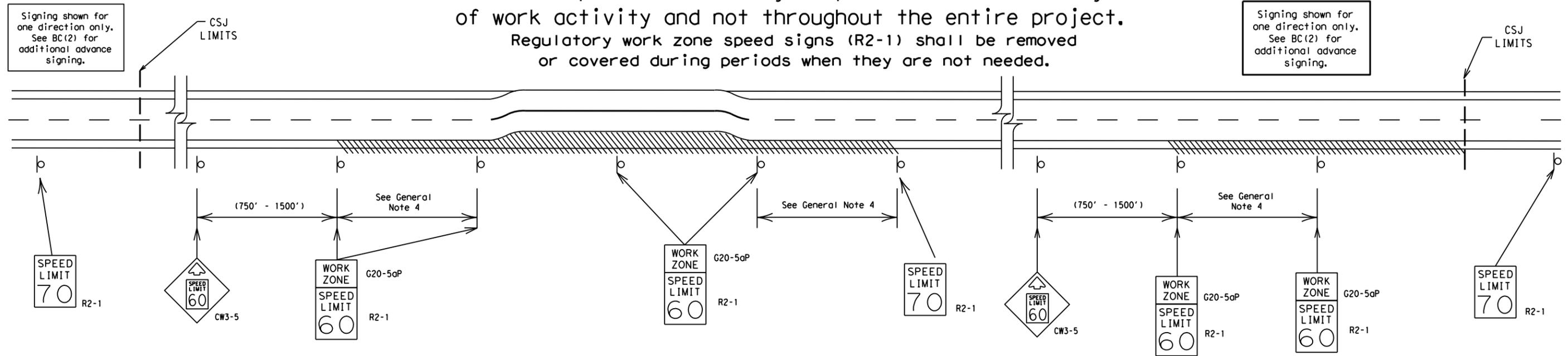
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0001	02	079, ETC.	SH 20, ETC.
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	ELP	EL PASO	23	

DATE: 3/29/2024 1:34:24 AM  
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# TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



## GUIDANCE FOR USE:

### LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- other conditions readily apparent to the driver

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

### SHORT TERM WORK ZONE SPEED LIMITS

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

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

## GENERAL NOTES

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- Frequency of work zone speed limit signs should be:
 

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

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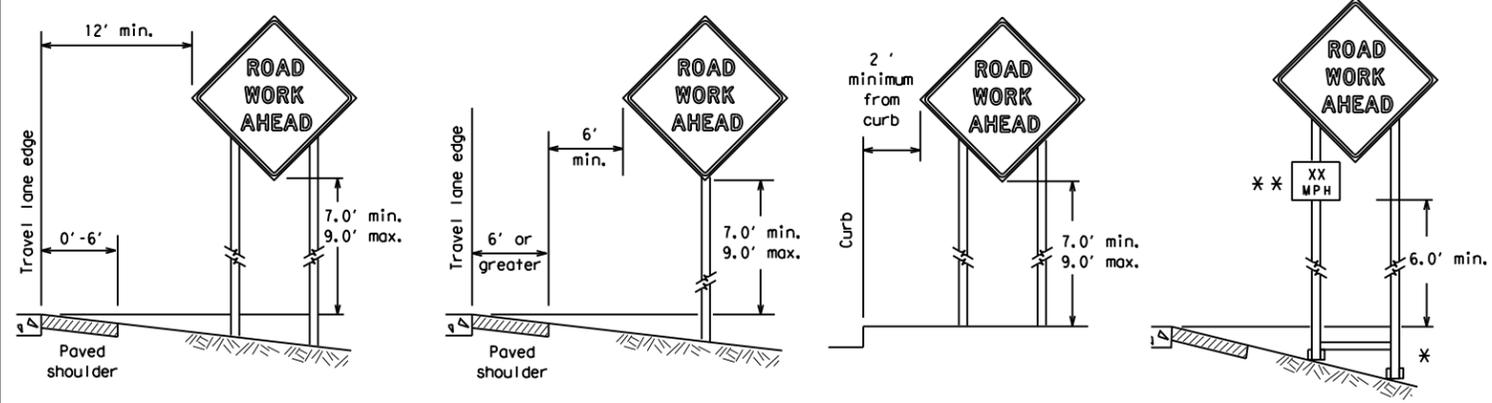
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SHEET 3 OF 12

		Traffic Safety Division Standard	
<h2>BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT</h2>			
<h3>BC (3) - 21</h3>			
FILE:	bc-21.dgn	DW:	TxDOT
© TxDOT	November 2002	CONT:	02
REVISIONS		SECT:	079, ETC.
9-07	8-14	JOB:	SH 20, ETC.
7-13	5-21	DIST:	EL PASO
		COUNTY:	
		SHEET NO.:	24

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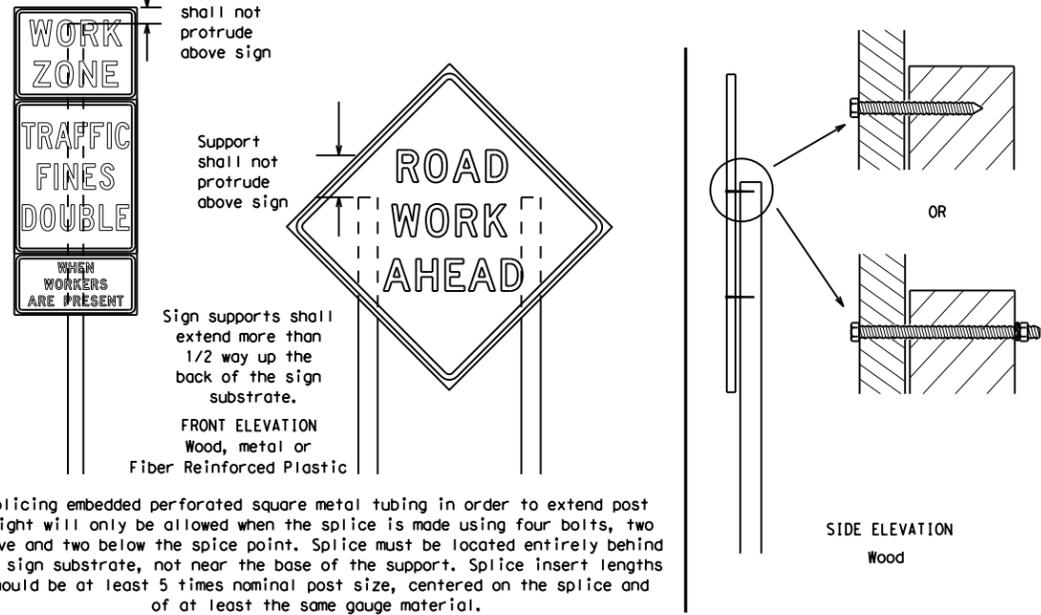
**TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS**



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

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

**ATTACHMENT FOR SIGN SUPPORTS**



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

**GENERAL NOTES FOR WORK ZONE SIGNS**

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

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

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

**SIGN MOUNTING HEIGHT**

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

**SIZE OF SIGNS**

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

**SIGN SUBSTRATES**

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

**REFLECTIVE SHEETING**

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

**SIGN LETTERS**

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

**REMOVING OR COVERING**

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

**SIGN SUPPORT WEIGHTS**

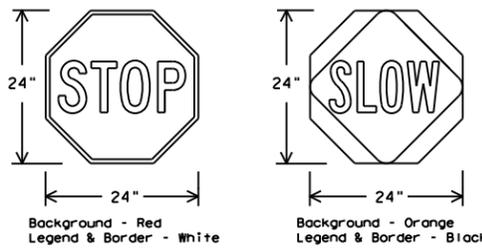
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not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

**FLAGS ON SIGNS**

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

**STOP/SLOW PADDLES**

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



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

**CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS**

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

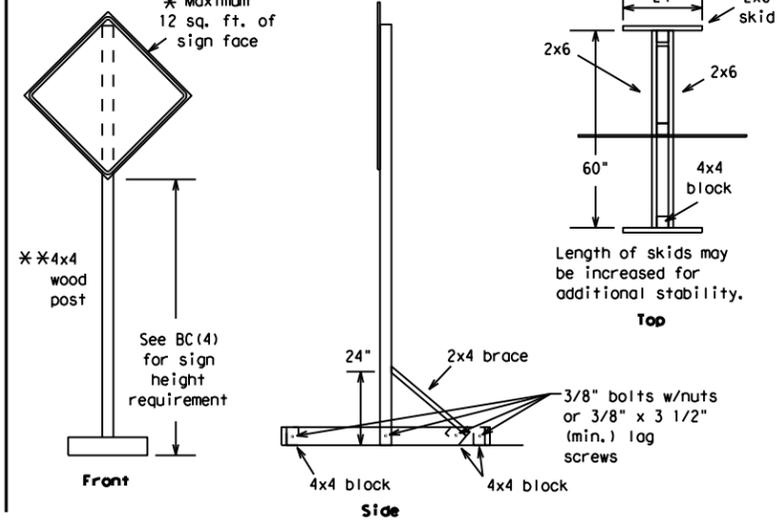
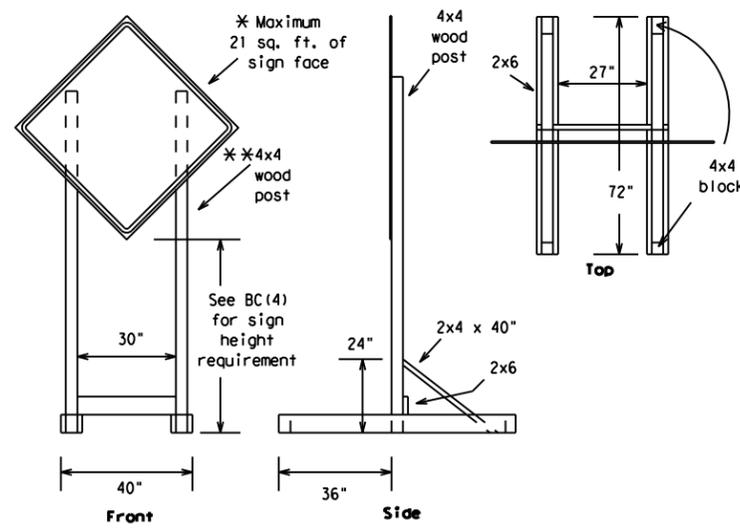


**BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES**

**BC (4) - 21**

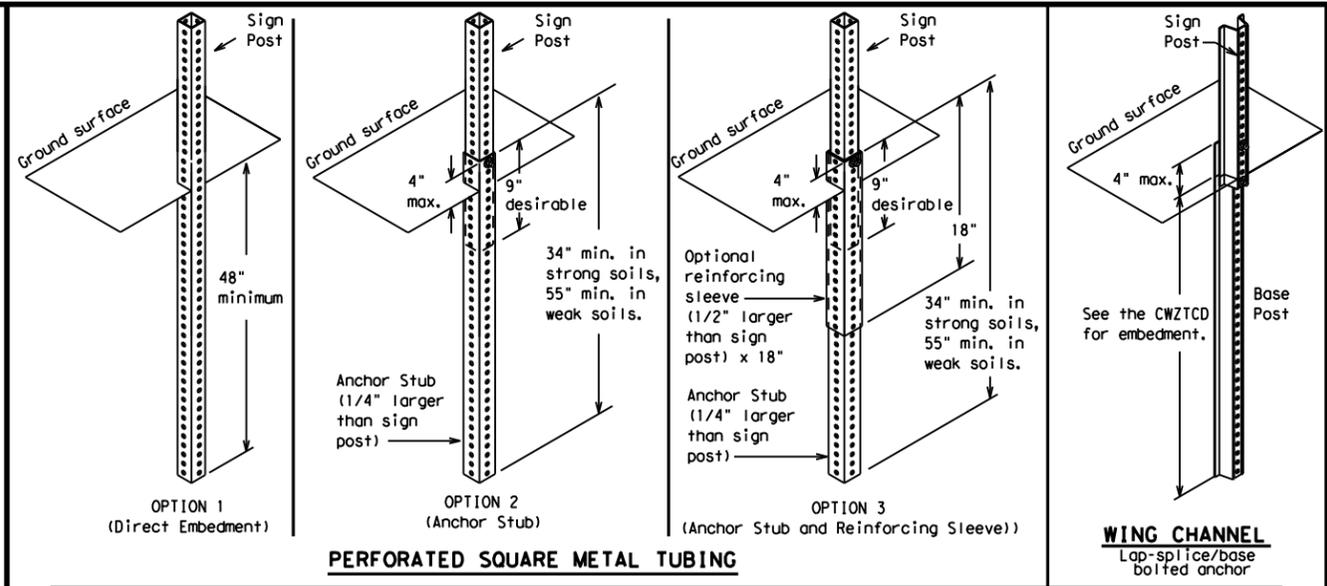
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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0001	02	079, ETC.		SH 20, ETC.			
9-07	8-14	DIST	COUNTY		SHEET NO.				
7-13	5-21	ELP	EL PASO		25				

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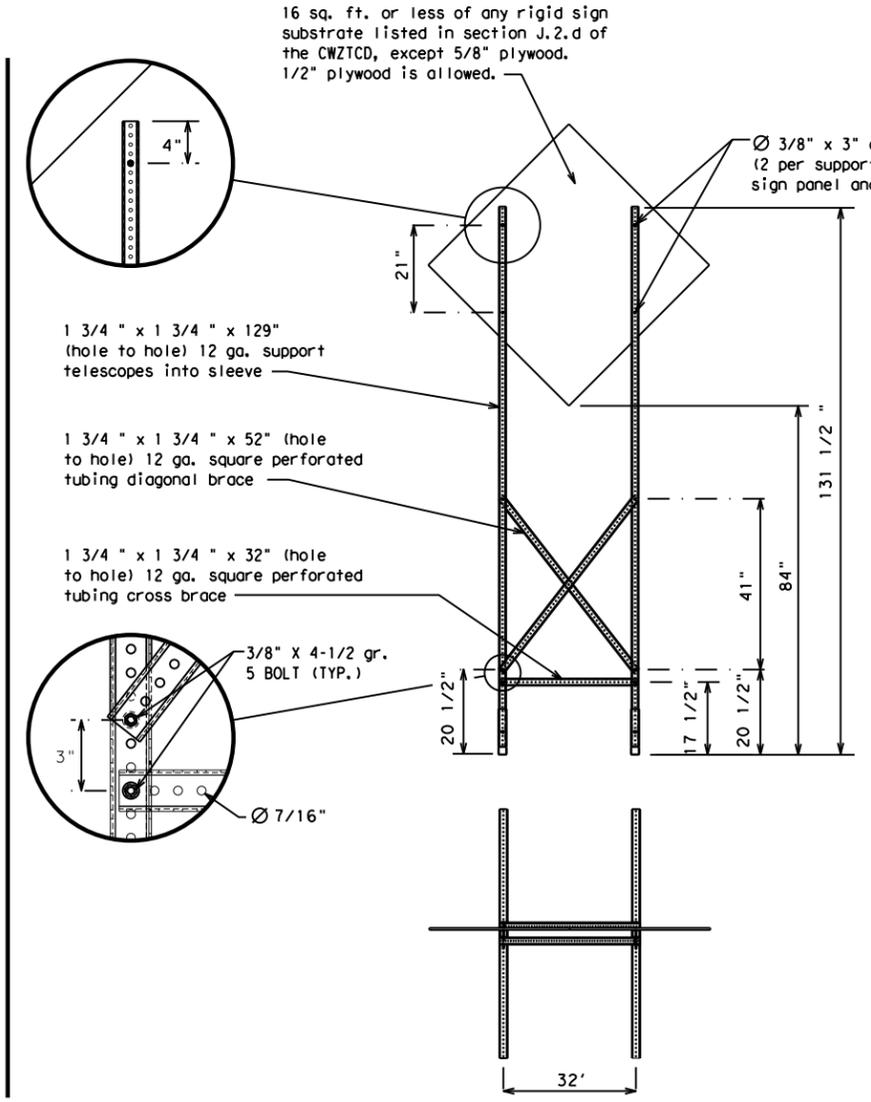
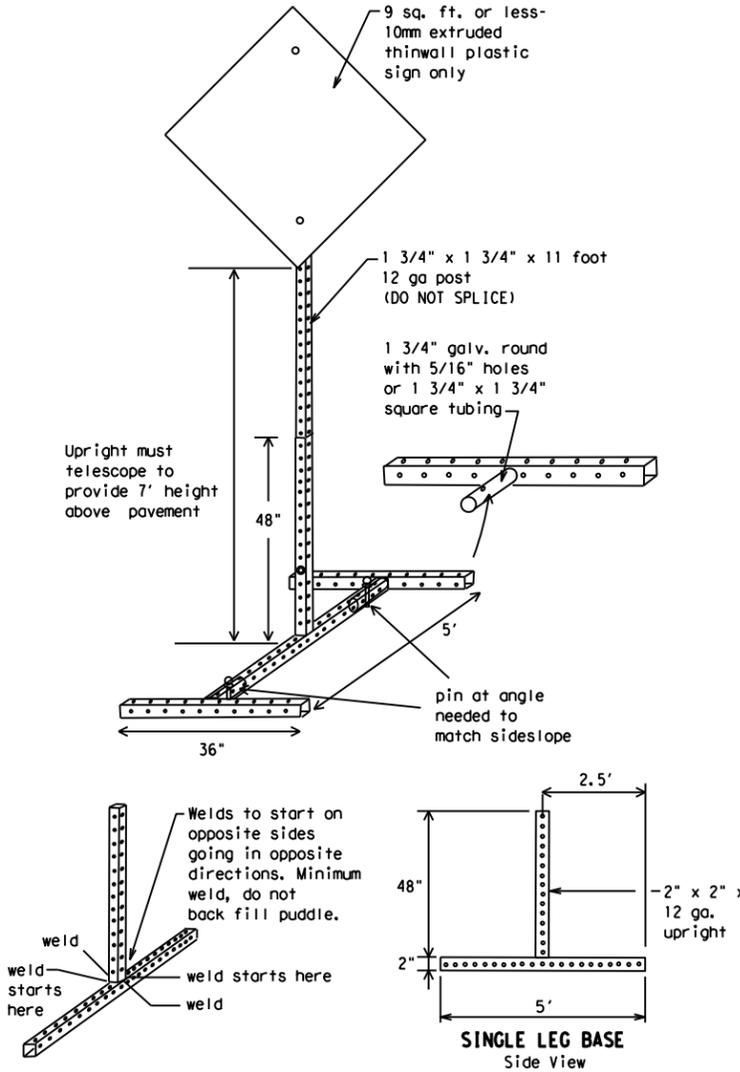
### SKID MOUNTED WOOD SIGN SUPPORTS

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



### GROUND MOUNTED SIGN SUPPORTS

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



### SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

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

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

- GENERAL NOTES**
- Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
  - No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
  - When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.
- \* See BC(4) for definition of "Work Duration."
  - \*\* Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
  - See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

SHEET 5 OF 12



## BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

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9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	ELP	EL PASO	26					

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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

# RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

## PORTABLE CHANGEABLE MESSAGE SIGNS

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

## Phase 1: Condition Lists

### Road/Lane/Ramp Closure List

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

### Other Condition List

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

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

## Phase 2: Possible Component Lists

### Action to Take/Effect on Travel List

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

### Location List

AT FM XXXX
BEFORE RAILROAD CROSSING
NEXT X MILES
PAST US XXX EXIT
XXXXXXXX TO XXXXXX
US XXX TO FM XXXX

### Warning List

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

### \*\* Advance Notice List

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

\*\* See Application Guidelines Note 6.

## APPLICATION GUIDELINES

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

## WORDING ALTERNATIVES

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

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

## FULL MATRIX PCMS SIGNS

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

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

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

Traffic Safety Division Standard

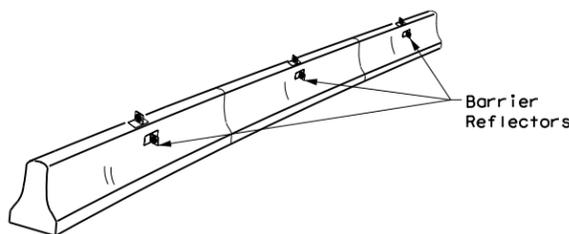
**BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)**

**BC (6) - 21**

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	ELP	EL PASO	<b>27</b>	

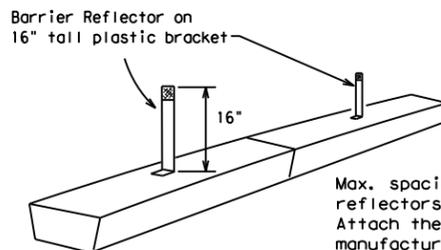
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



**CONCRETE TRAFFIC BARRIER (CTB)**

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

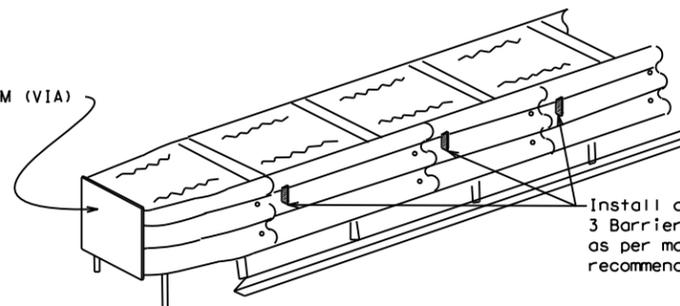


**LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES**

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

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

**LOW PROFILE CONCRETE BARRIER (LPCB)**



**DELINEATION OF END TREATMENTS**

**END TREATMENTS FOR CTB'S USED IN WORK ZONES**

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

**BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS**

**WARNING LIGHTS**

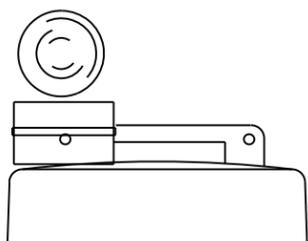
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

**WARNING LIGHTS MOUNTED ON PLASTIC DRUMS**

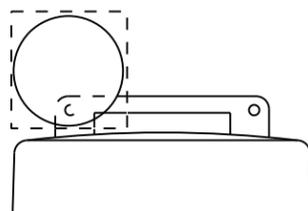
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



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

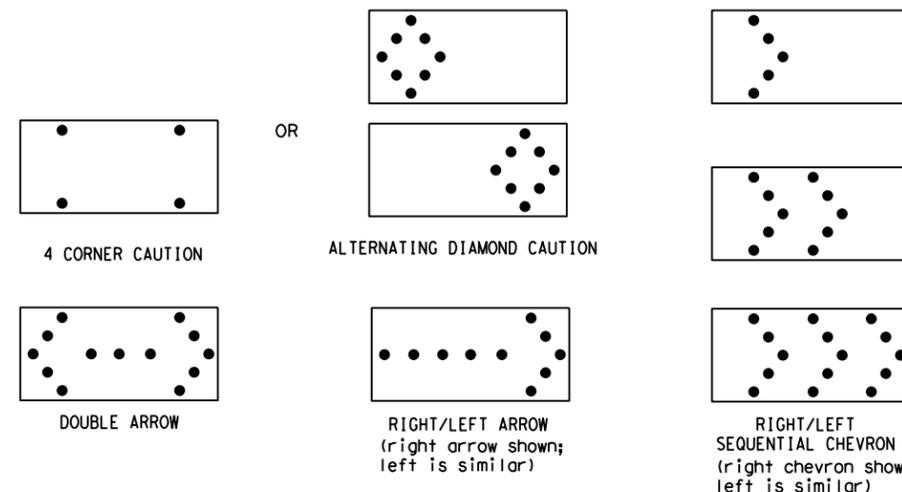


Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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

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



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

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

**ATTENTION**  
 Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

**FLASHING ARROW BOARDS**

SHEET 7 OF 12

**TRUCK-MOUNTED ATTENUATORS**

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



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

**BC (7) -21**

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REVISIONS	0001	02	079, ETC.	SH 20, ETC.
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	ELP	EL PASO	28	

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**GENERAL NOTES**

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

**GENERAL DESIGN REQUIREMENTS**

Pre-qualified plastic drums shall meet the following requirements:

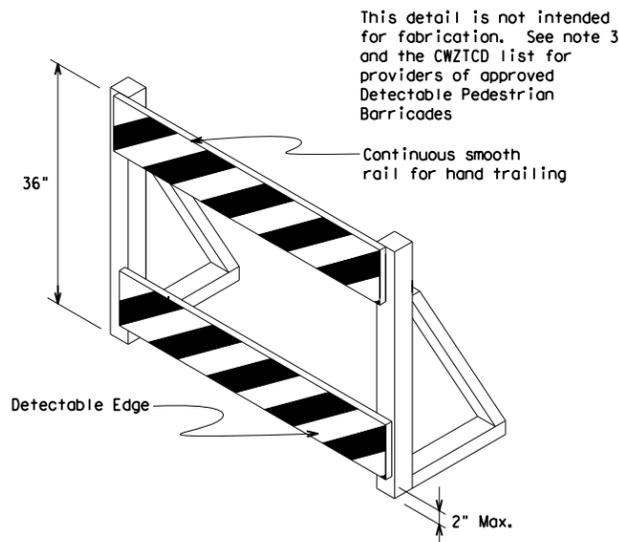
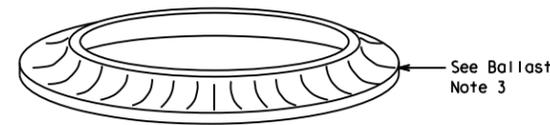
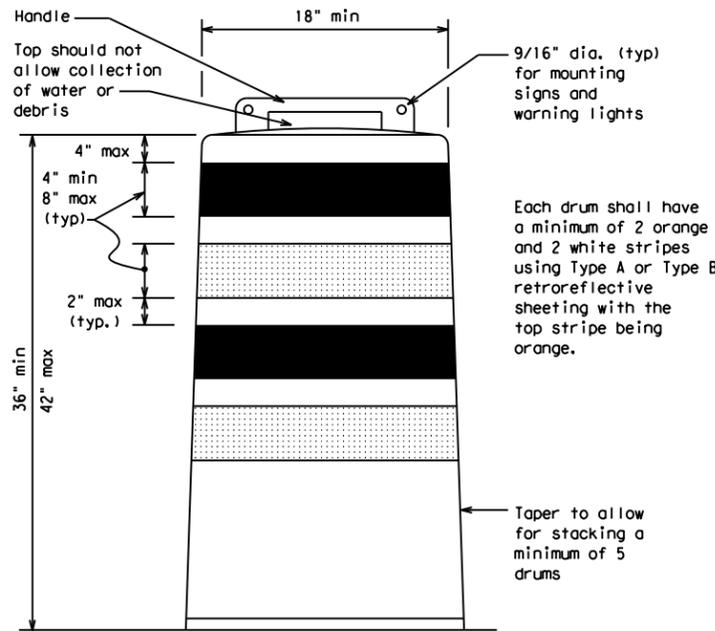
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

**RETROREFLECTIVE SHEETING**

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

**BALLAST**

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



**DETECTABLE PEDESTRIAN BARRICADES**

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



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



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

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

**SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS**

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

SHEET 8 OF 12

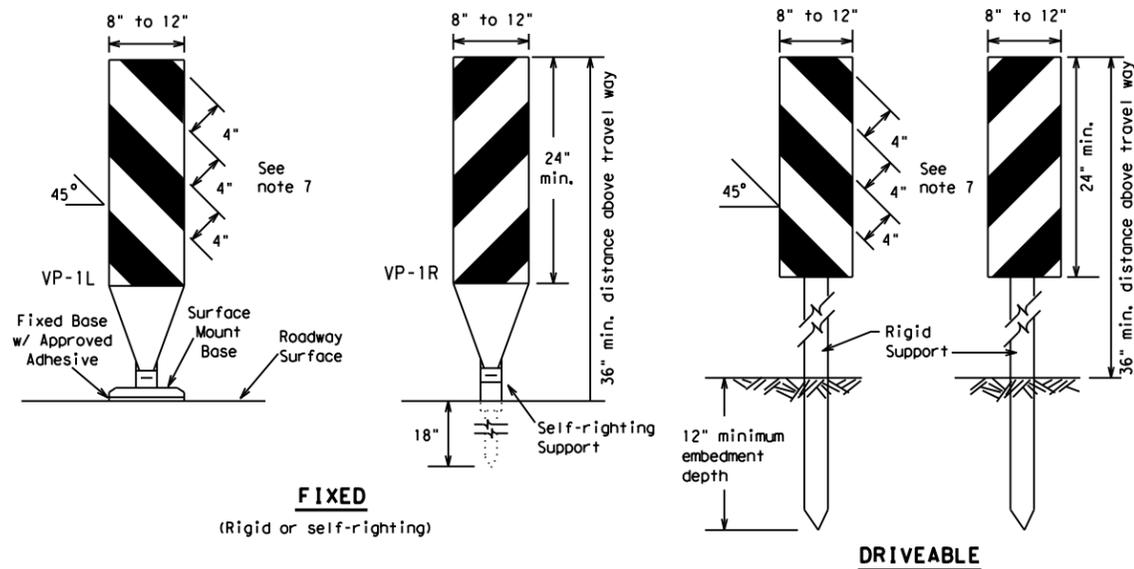


**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (8) - 21**

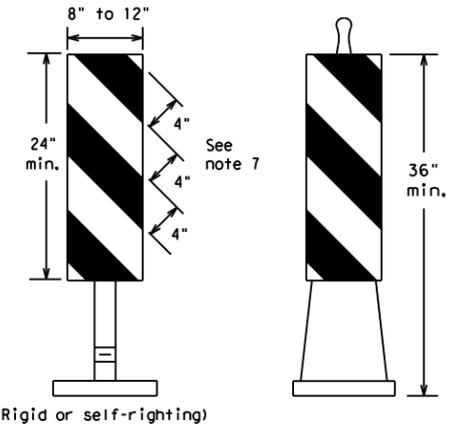
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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
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**FIXED**  
(Rigid or self-righting)

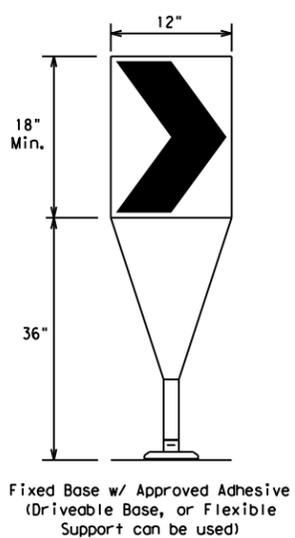
**DRIVEABLE**



**PORTABLE**

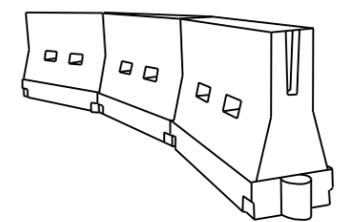
**VERTICAL PANELS (VPs)**

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



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

**CHEVRONS**



**LONGITUDINAL CHANNELIZING DEVICES (LCD)**

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

**WATER BALLASTED SYSTEMS USED AS BARRIERS**

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

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

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

**GENERAL NOTES**

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

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

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

**SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS**

SHEET 9 OF 12



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (9) - 21**

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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	ELP	EL PASO	30	

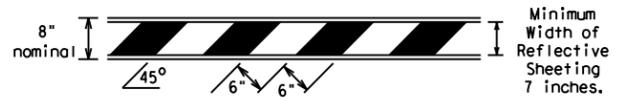
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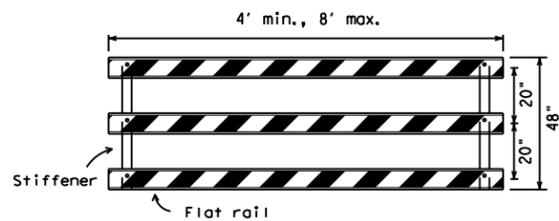
**TYPE 3 BARRICADES**

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.



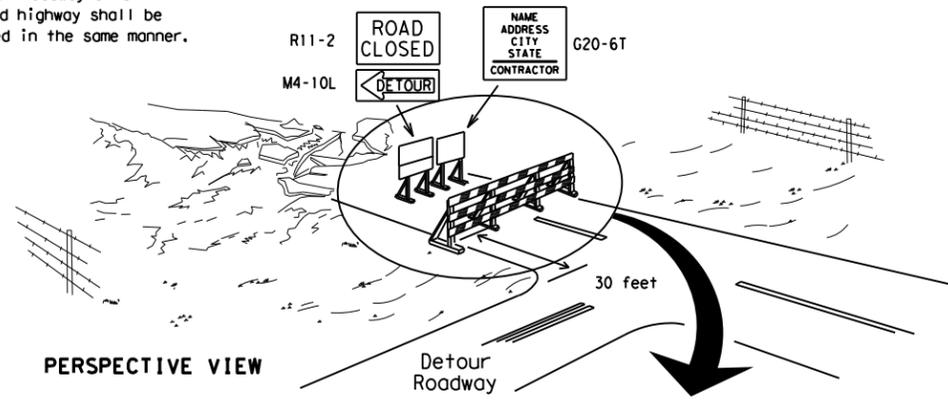
**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**



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

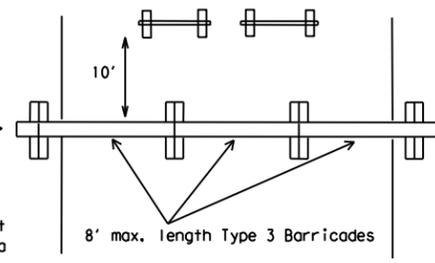
**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**

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



PERSPECTIVE VIEW

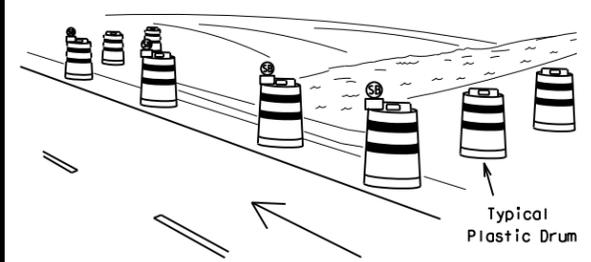
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



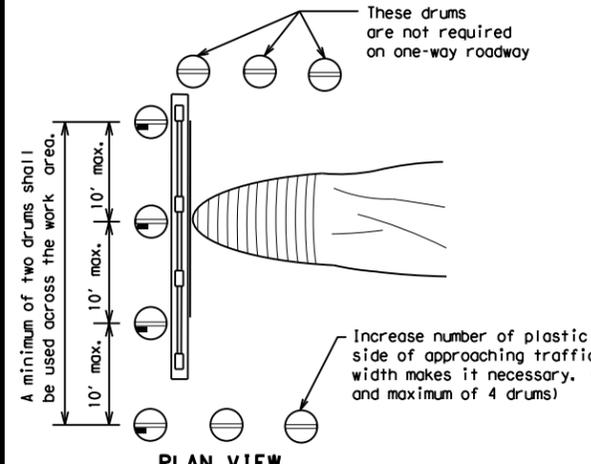
PLAN VIEW

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

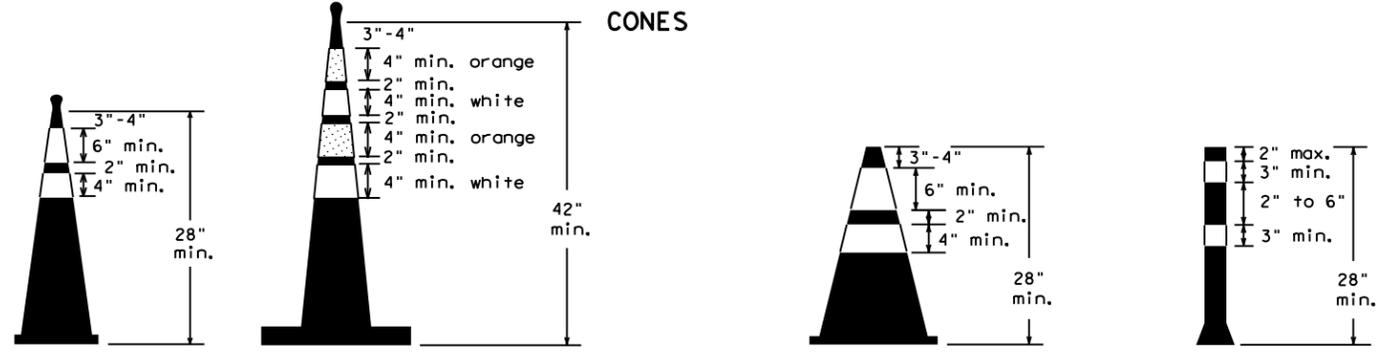


PLAN VIEW

**CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS**

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

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

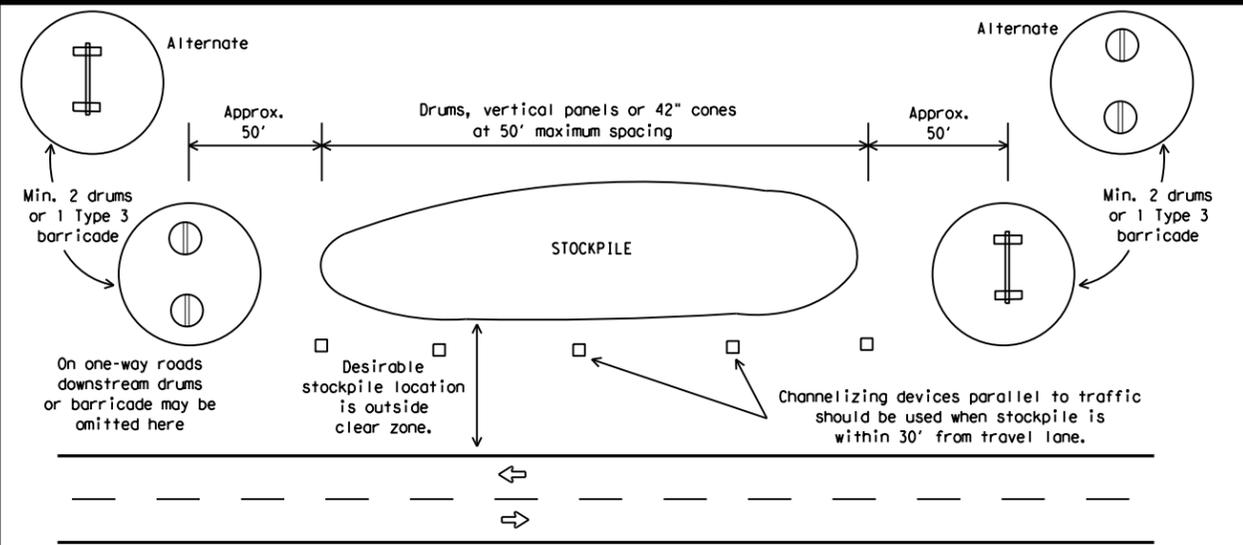


Two-Piece cones

One-Piece cones

Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.  
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.



**TRAFFIC CONTROL FOR MATERIAL STOCKPILES**

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.



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (10) -21**

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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	ELP	EL PASO	31	

## WORK ZONE PAVEMENT MARKINGS

### GENERAL

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

### RAISED PAVEMENT MARKERS

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

### PREFABRICATED PAVEMENT MARKINGS

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

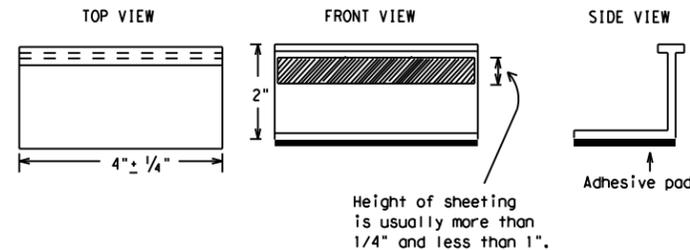
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

### REMOVAL OF PAVEMENT MARKINGS

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

## Temporary Flexible-Reflective Roadway Marker Tabs



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

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

### RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

SHEET 11 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

**BC(11)-21**

FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS		0001	02	079, ETC. SH 20, ETC.
2-98	9-07	5-21		
1-02	7-13			
11-02	8-14			
	DIST	COUNTY	SHEET NO.	
	ELP	EL PASO	32	

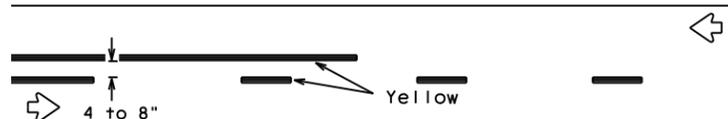
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 3/29/2024 1:34:59 AM  
FILE: bc-21.dgn

## PAVEMENT MARKING PATTERNS

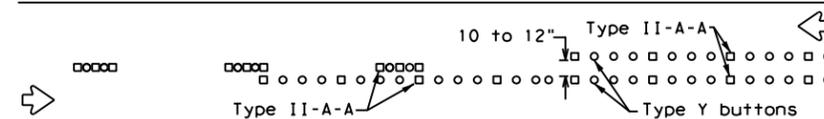


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

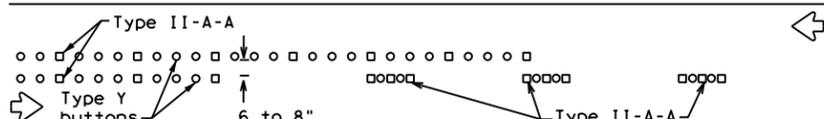


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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

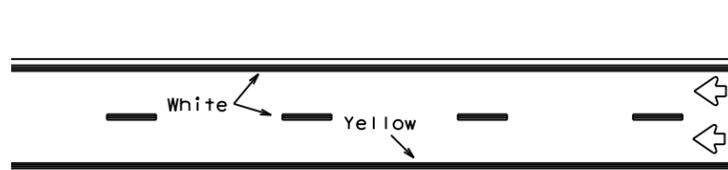


RAISED PAVEMENT MARKERS - PATTERN A



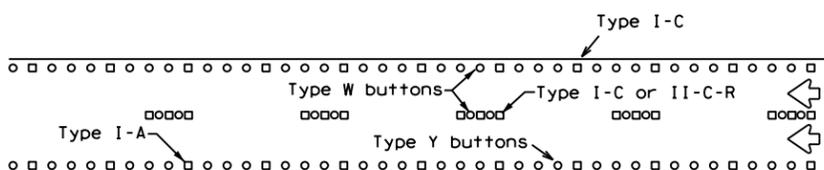
RAISED PAVEMENT MARKERS - PATTERN B

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



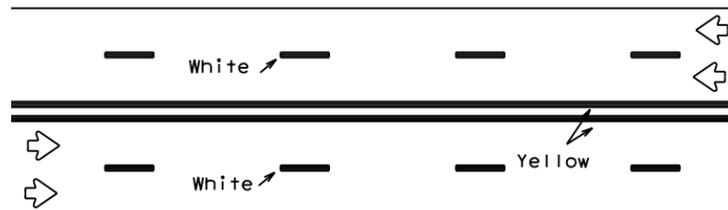
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



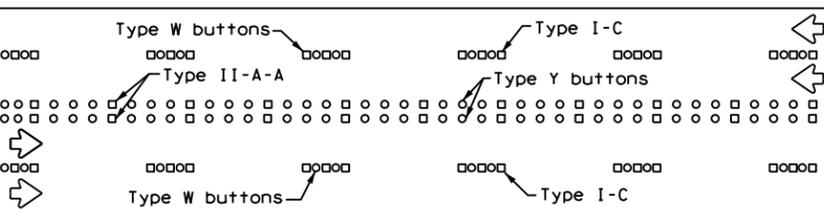
RAISED PAVEMENT MARKERS

## EDGE & LANE LINES FOR DIVIDED HIGHWAY



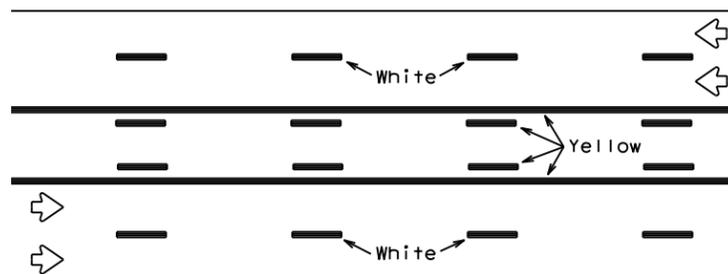
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



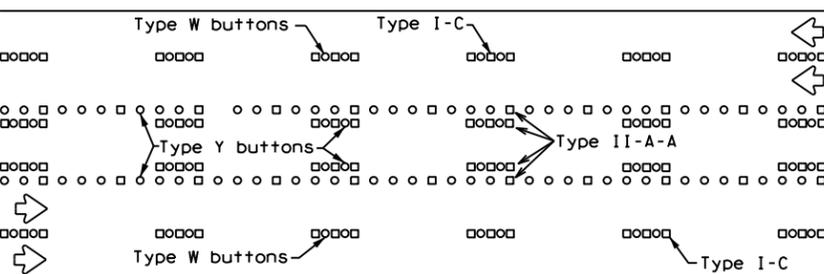
RAISED PAVEMENT MARKERS

## LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

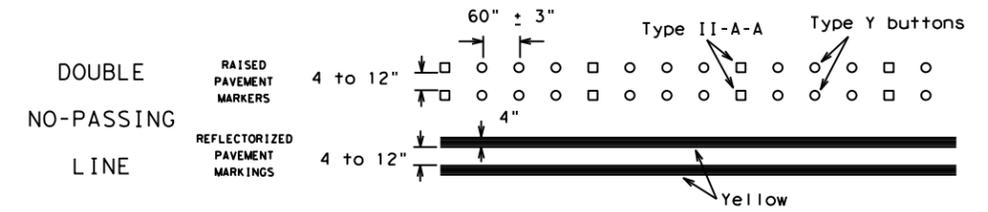
Prefabricated markings may be substituted for reflectORIZED pavement markings.



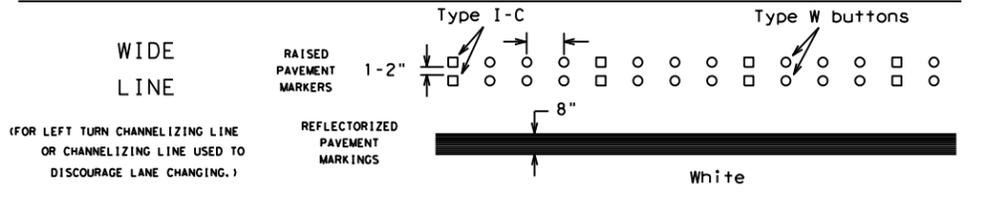
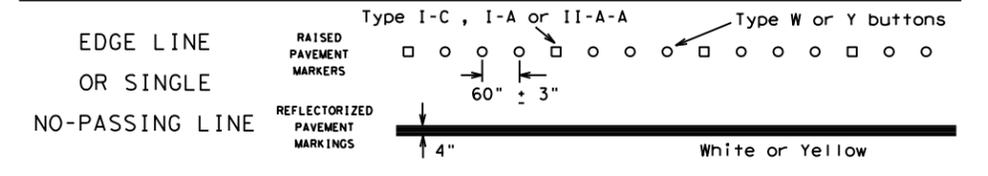
RAISED PAVEMENT MARKERS

## TWO-WAY LEFT TURN LANE

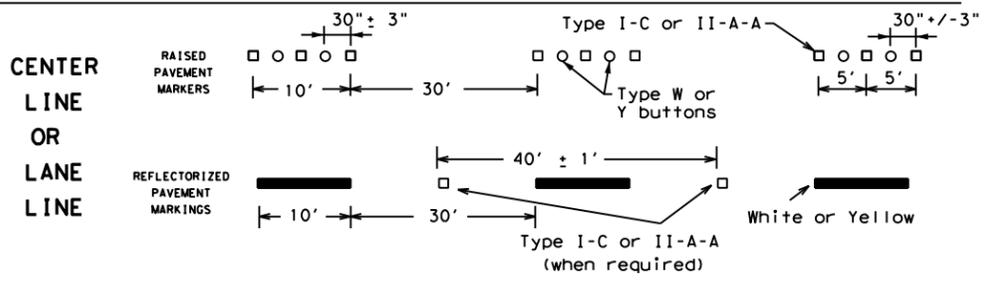
## STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



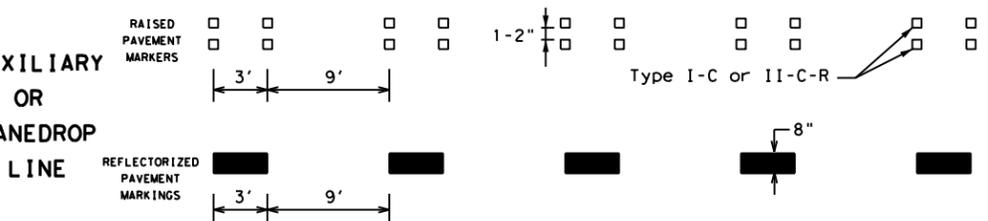
### SOLID LINES



### BROKEN LINES

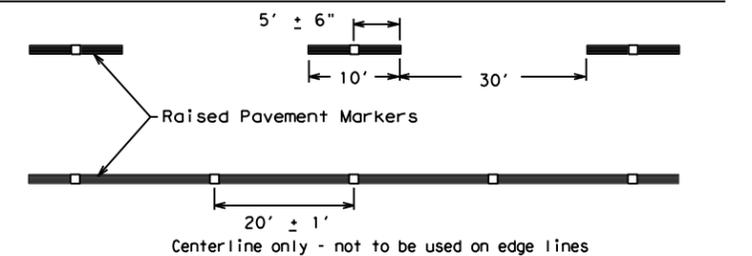


### AUXILIARY OR LANEDROP LINE



### 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.



SHEET 12 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CR: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0001	02	079, ETC. SH 20, ETC.	
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	ELP	EL PASO	33	
11-02 8-14				

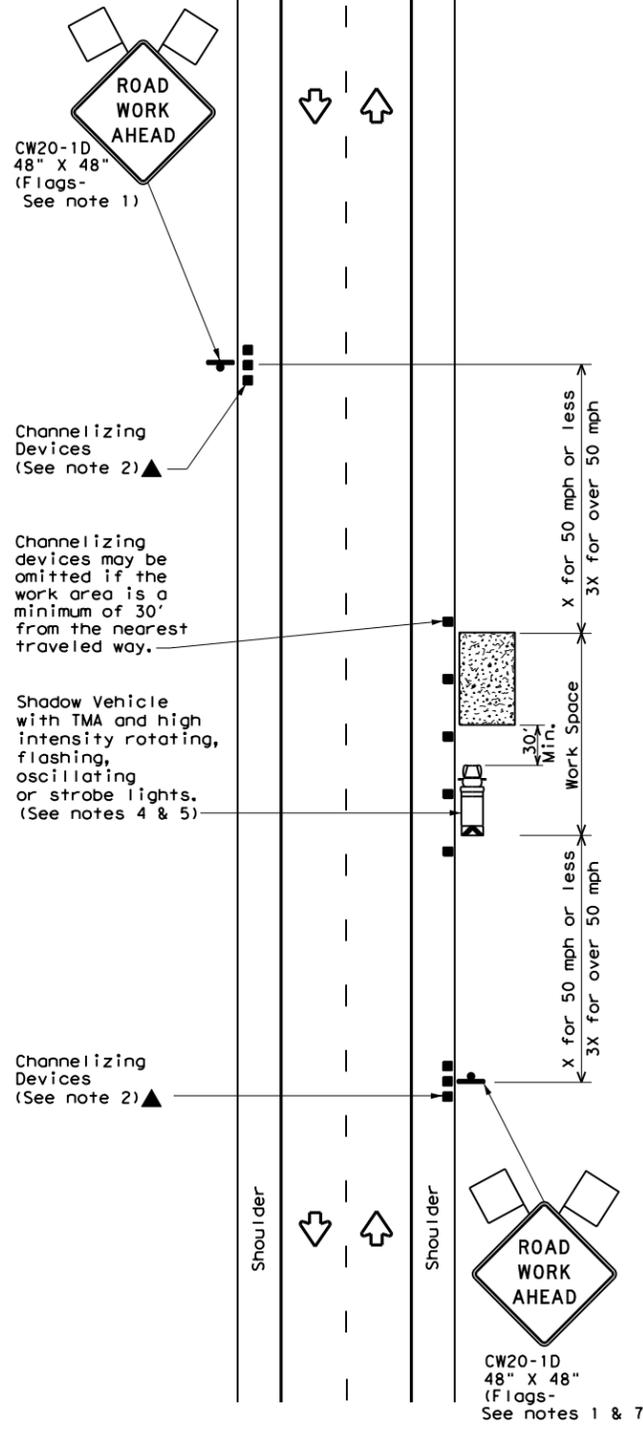
Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

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DATE: 3/29/2024 1:35:02 AM  
FILE: bc-21.dgn

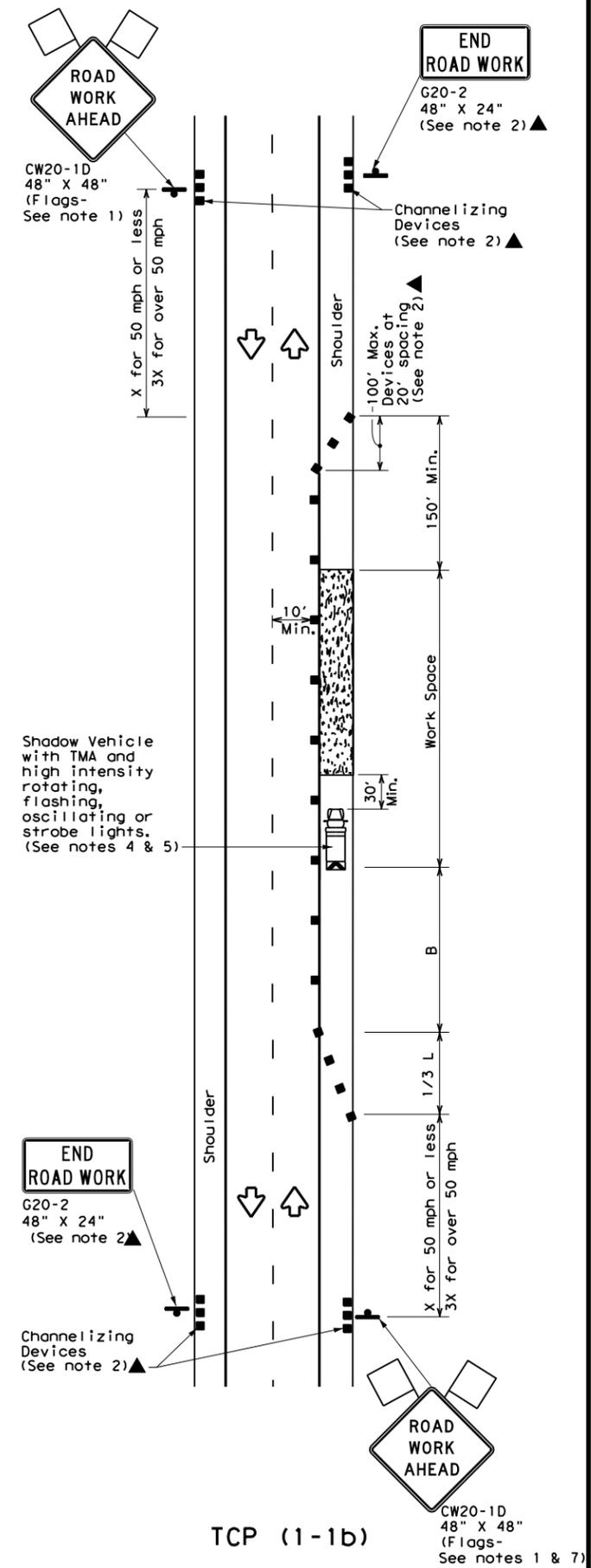
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 3/29/2024 1:35:22 AM  
FILE: tcp1-1-18.dgn



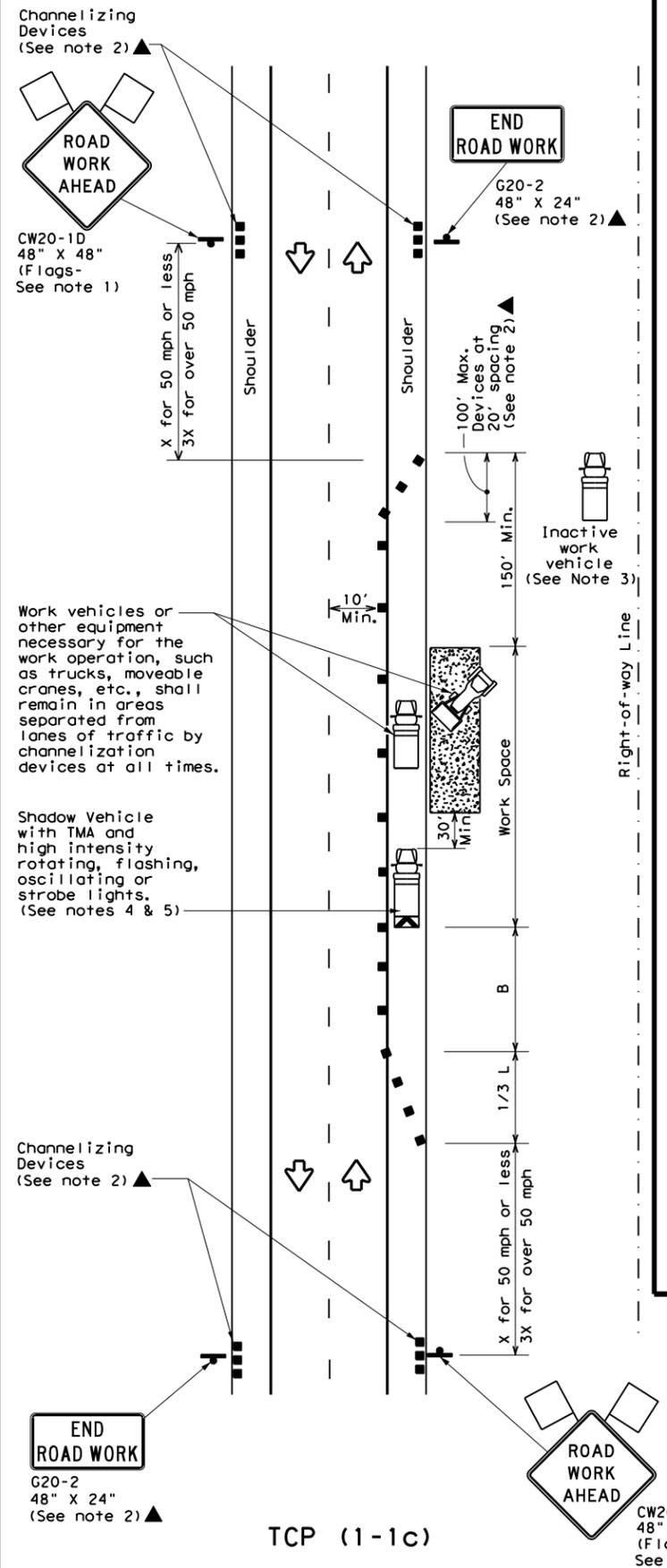
TCP (1-1a)

**WORK SPACE NEAR SHOULDER**  
Conventional Roads



TCP (1-1b)

**WORK SPACE ON SHOULDER**  
Conventional Roads



TCP (1-1c)

**WORK VEHICLES ON SHOULDER**  
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board		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**
- Flags attached to signs where shown are REQUIRED.
  - 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.
  - Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
  - 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.
  - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
  - See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
  - CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

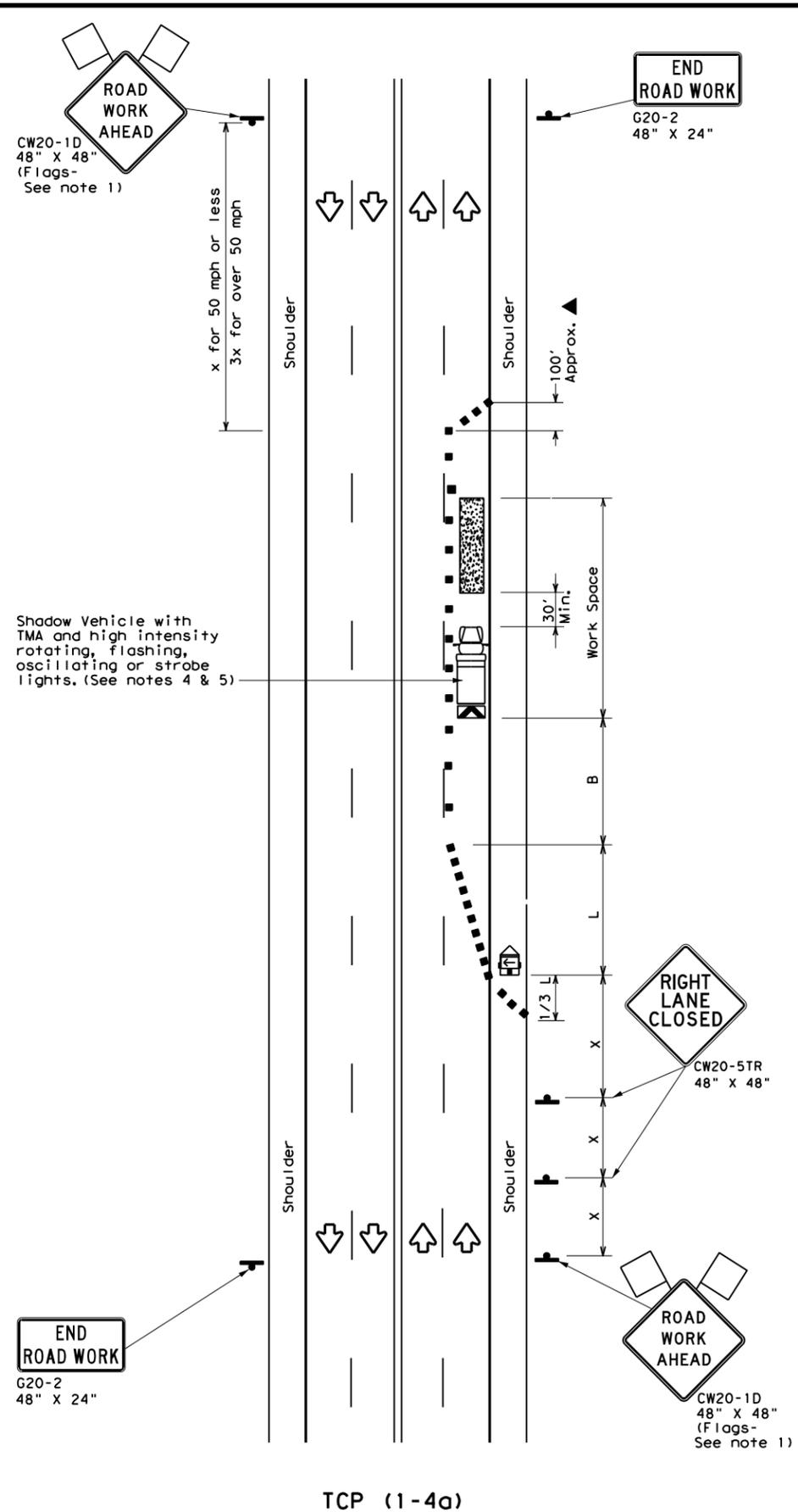
**TRAFFIC CONTROL PLAN**  
**CONVENTIONAL ROAD**  
**SHOULDER WORK**

**TCP (1-1) - 18**

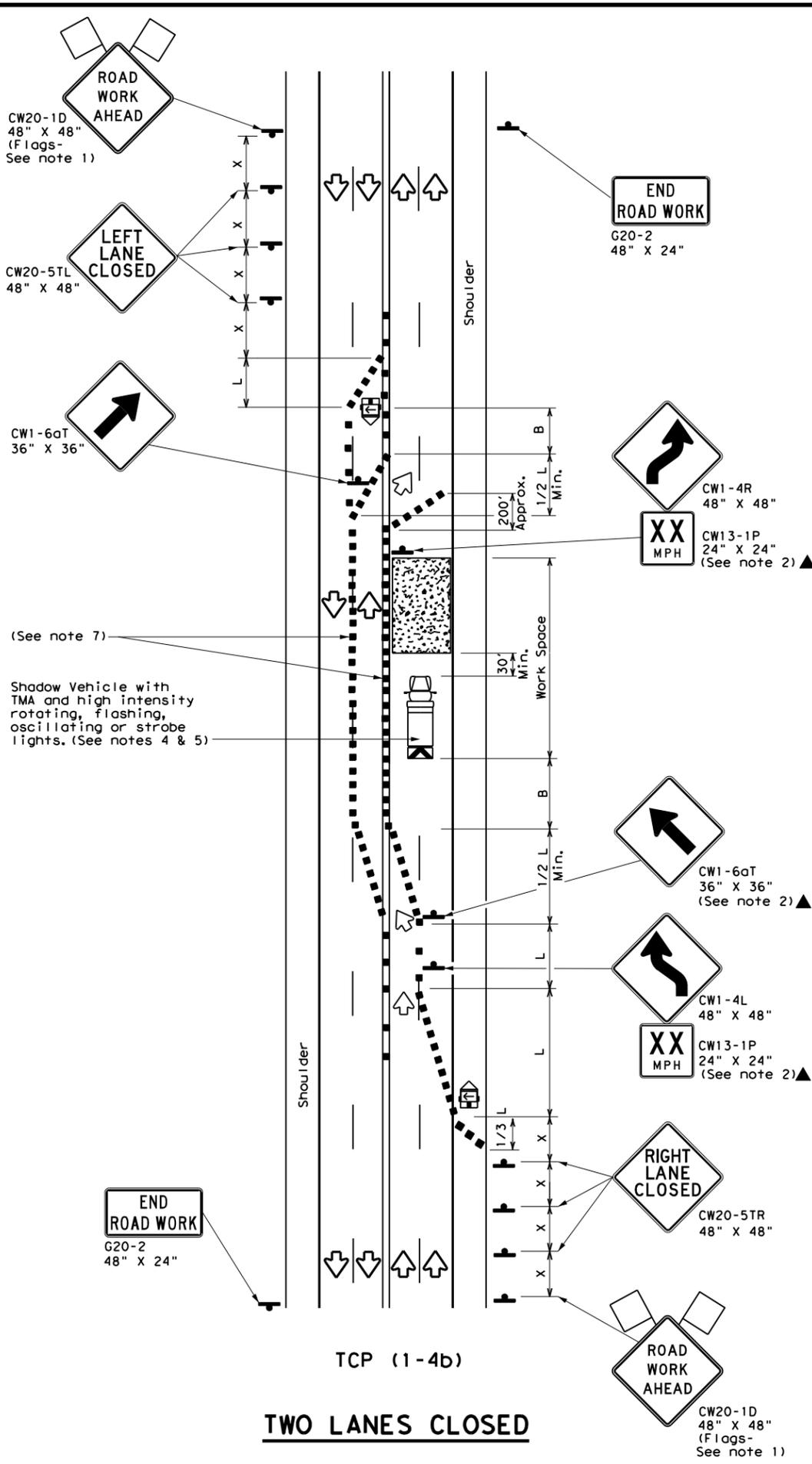
FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0001	02	079, ETC.	SH 20, ETC.
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	ELP	EL PASO	34	
1-97 2-18				

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DATE: 3/29/2024 1:35:43 AM  
FILE: tcp1-4-18.dgn



TCP (1-4a)  
**ONE LANE CLOSED**



TCP (1-4b)  
**TWO LANES CLOSED**

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			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**
- Flags attached to signs where shown are REQUIRED.
  - 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.
  - The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
  - 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.
  - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

**TCP (1-4a)**

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

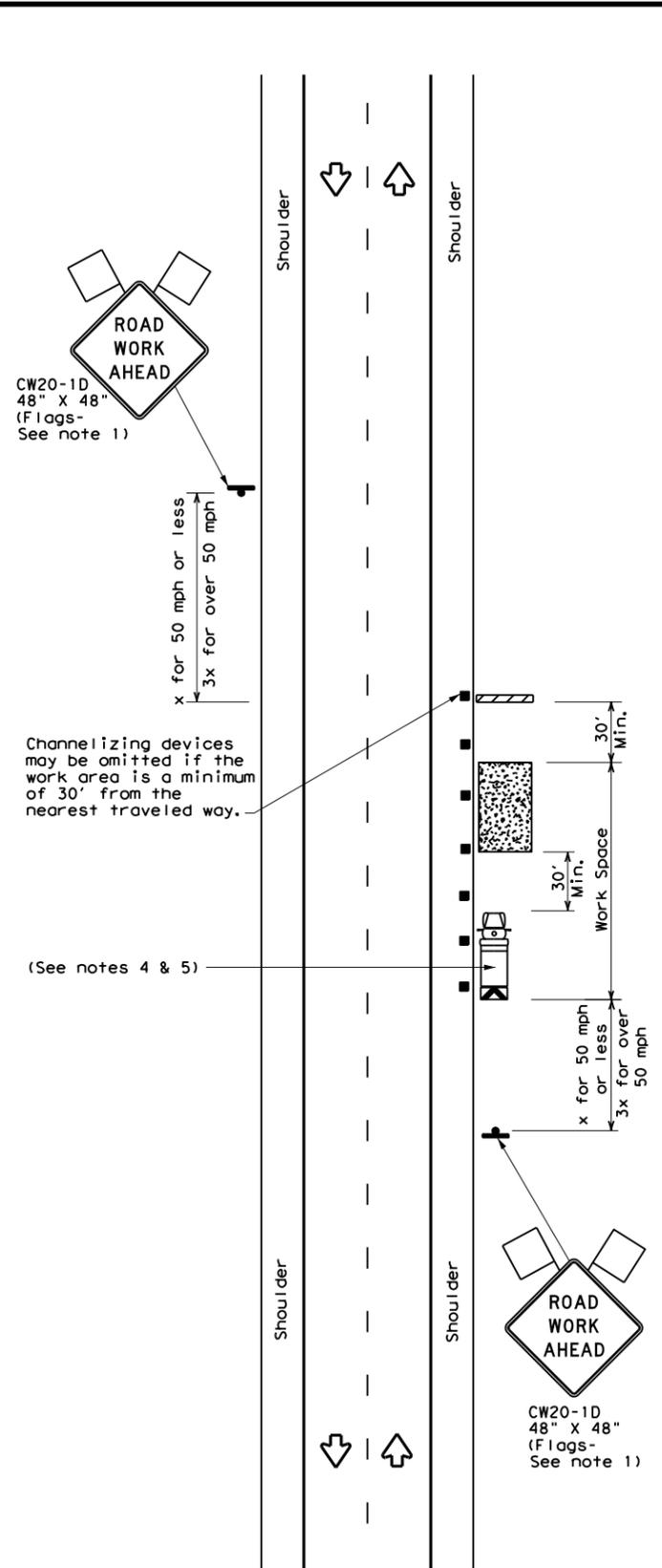
**TCP (1-4b)**

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

		Traffic Operations Division Standard	
<b>TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS</b>			
<b>TCP (1-4) - 18</b>			
FILE:	tcp1-4-18.dgn	DN:	CK:
© TxDOT	December 1985	CONT	SECT
2-94	4-98	0001	02
8-95	2-12	DIST	COUNTY
1-97	2-18	ELP	EL PASO
		JOB	HIGHWAY
			SH 20, ETC.
		SHEET NO.	35

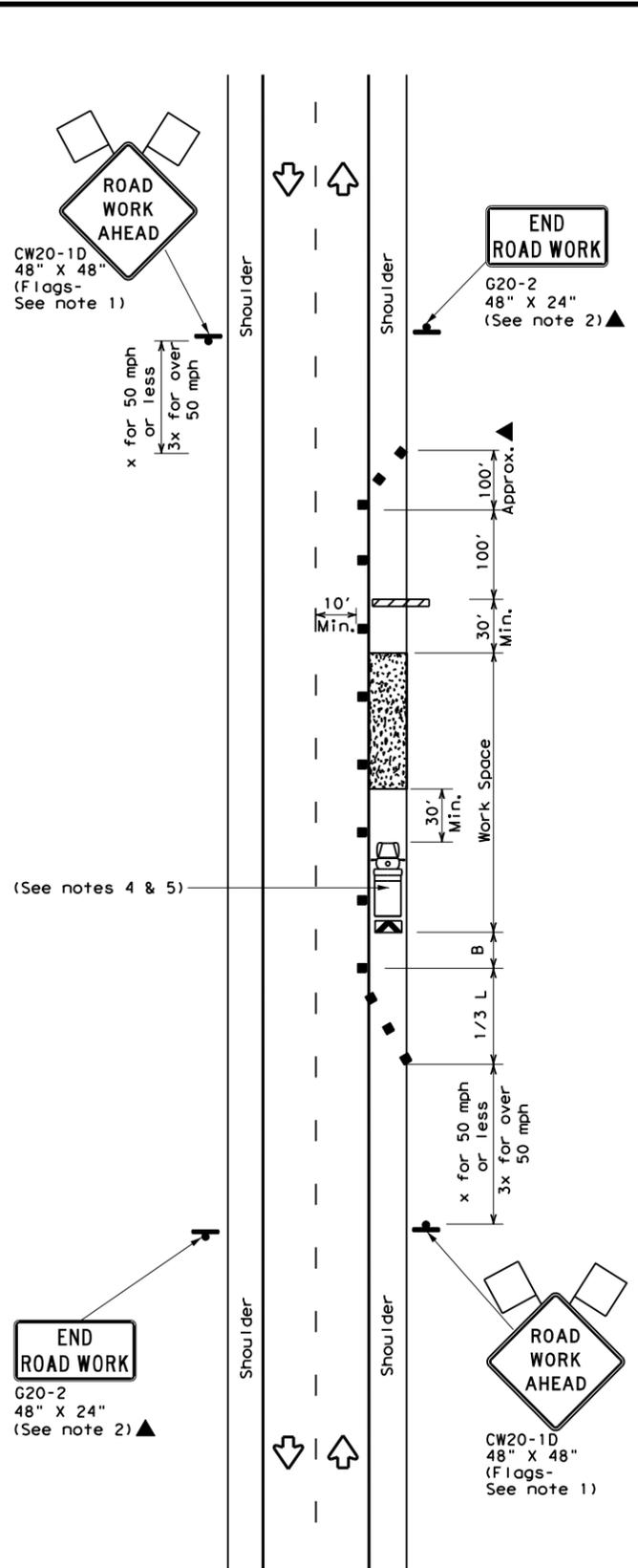
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DATE: 3/29/2024 1:36:01 AM  
FILE: tcp2-1-18.dgn



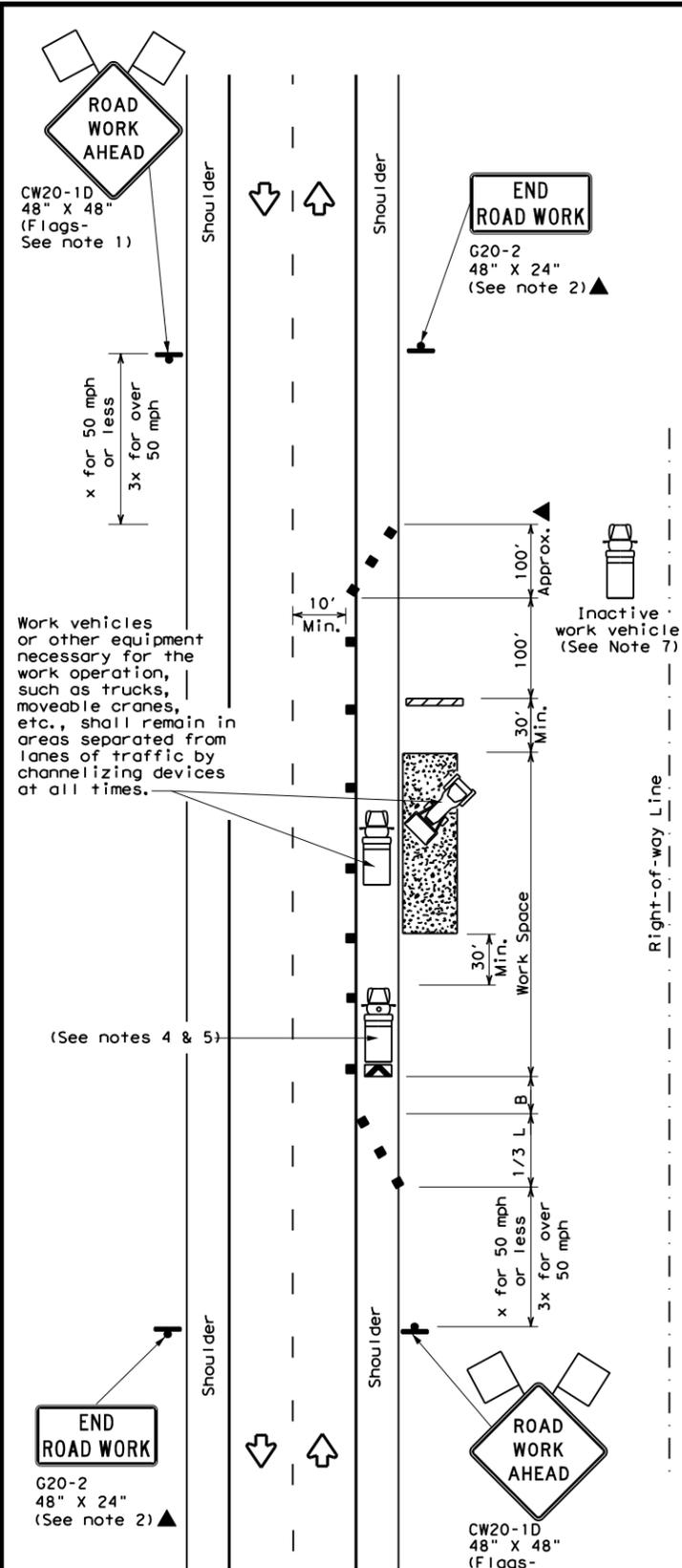
TCP (2-1a)

**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**

- Flags attached to signs where shown, are REQUIRED.
- 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.
- Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
- 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.
- Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
- See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
- Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
- CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.



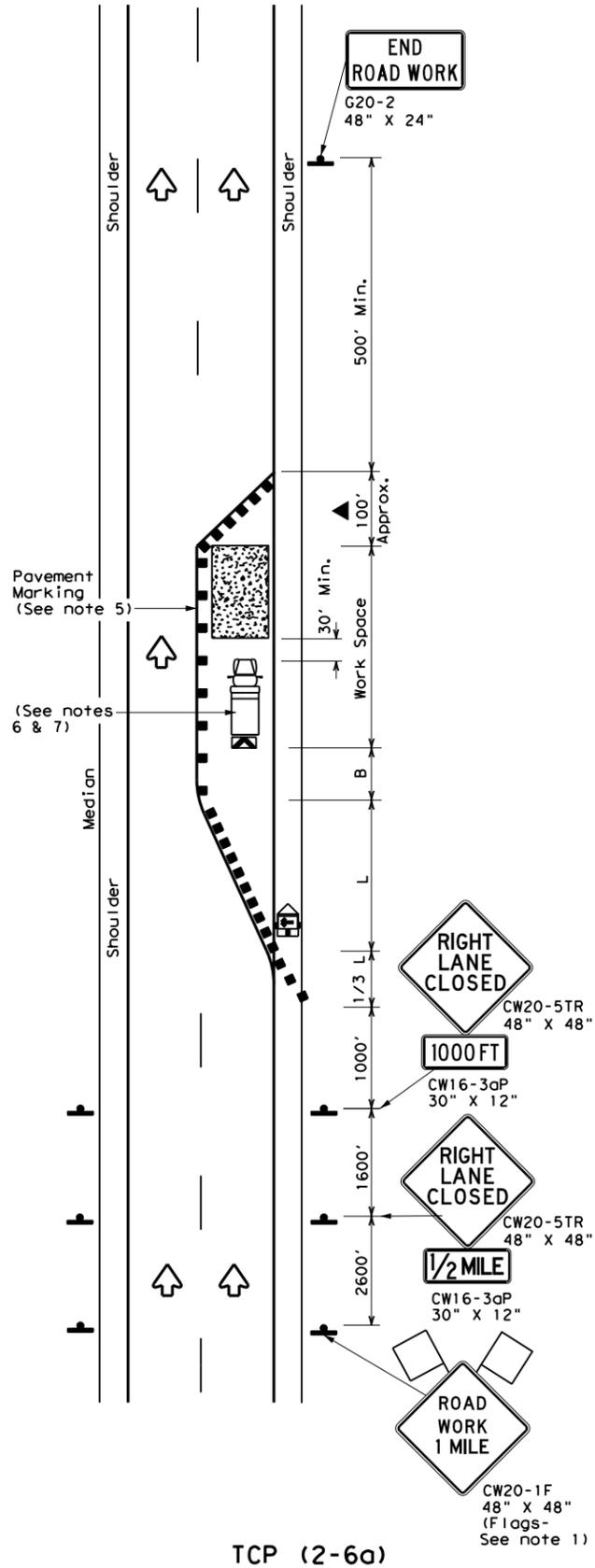
**TRAFFIC CONTROL PLAN**  
**CONVENTIONAL ROAD**  
**SHOULDER WORK**

**TCP (2-1) - 18**

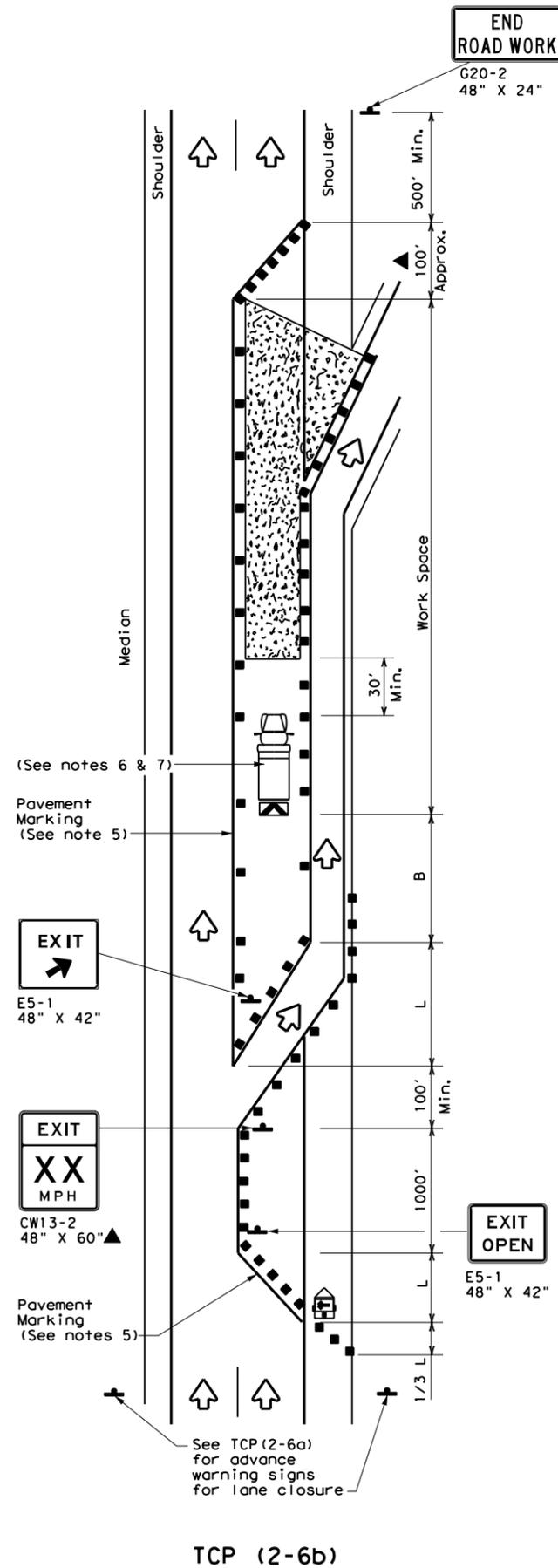
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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0001	02	079, ETC.	SH 20, ETC.
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	ELP	EL PASO	36	
1-97 2-18				

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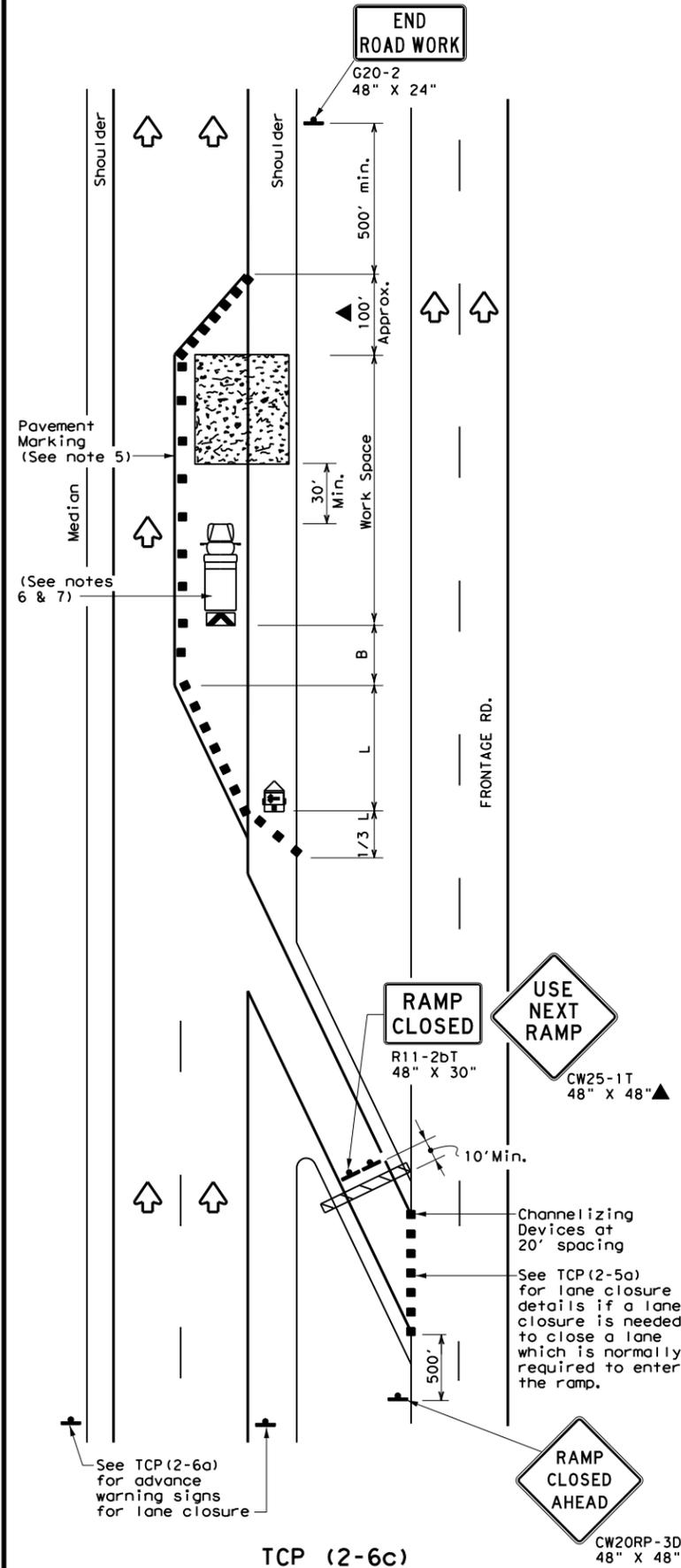
DATE: 3/29/2024 1:36:19 AM  
FILE: tcp2-6-18.dgn



TCP (2-6a)  
**ONE LANE CLOSURE**



TCP (2-6b)  
**LANE CLOSURE NEAR EXIT RAMP**



TCP (2-6c)  
**LANE CLOSURE NEAR ENTRANCE RAMP**

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**
- Flags attached to signs where shown, are REQUIRED.
  - 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.
  - 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.
  - Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on every other channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
  - The placement of pavement markings may be omitted on intermediate-term stationary work zones with the approval of the Engineer.
  - 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.
  - 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

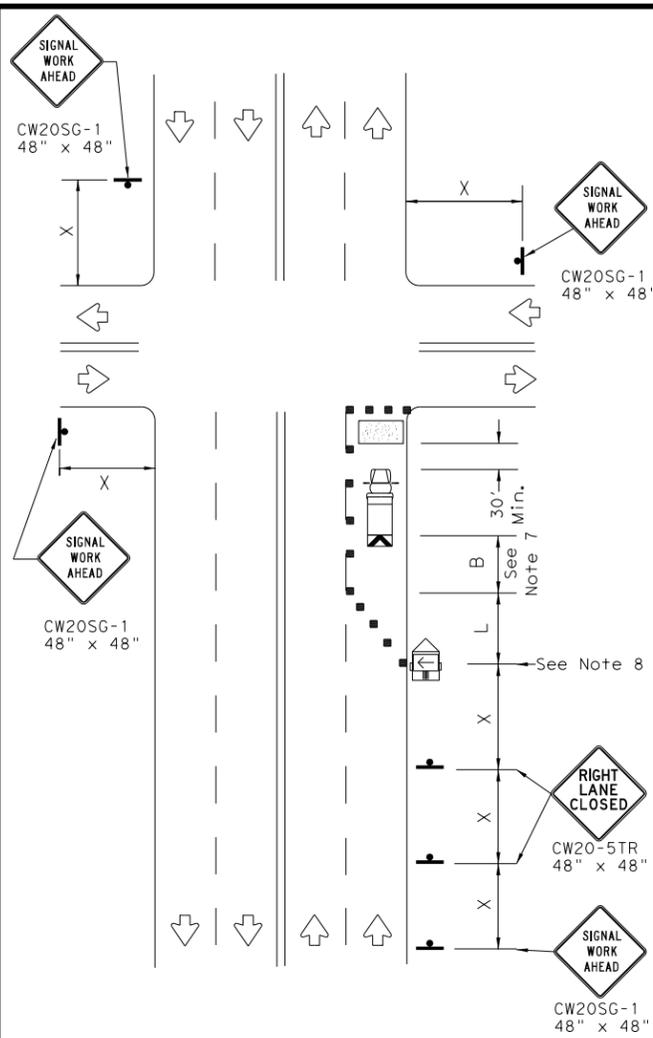
**TRAFFIC CONTROL PLAN  
LANE CLOSURES ON  
DIVIDED HIGHWAYS**

**TCP (2-6) - 18**

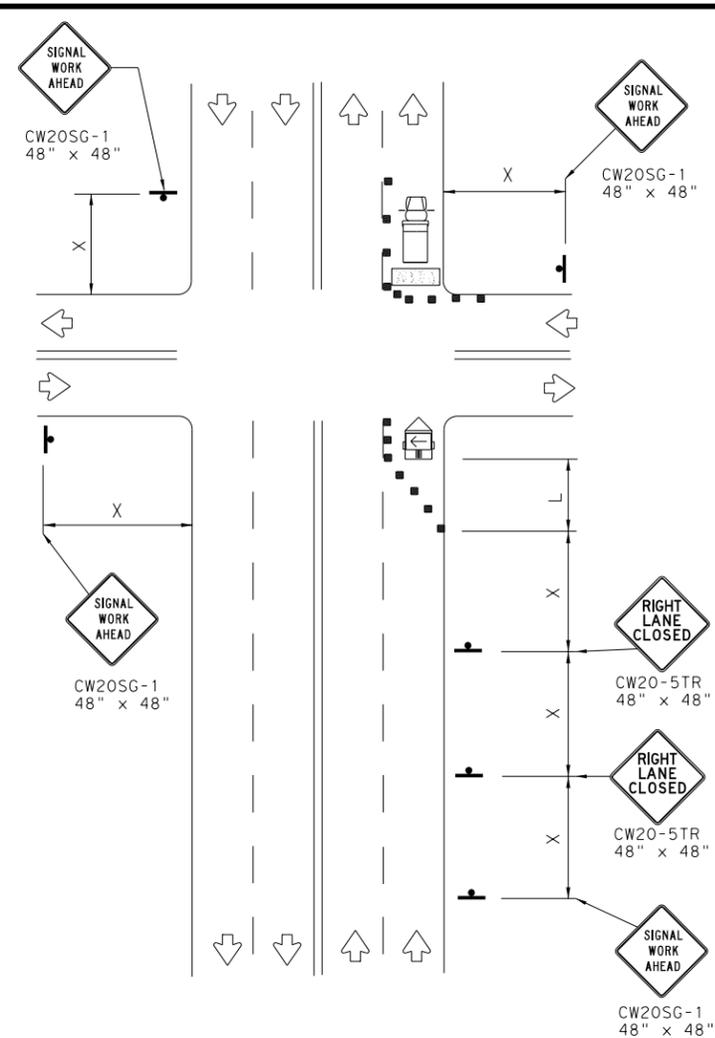
FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0001	02	079, ETC.	SH 20, ETC.
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	ELP	EL PASO	37	
1-97 2-18				

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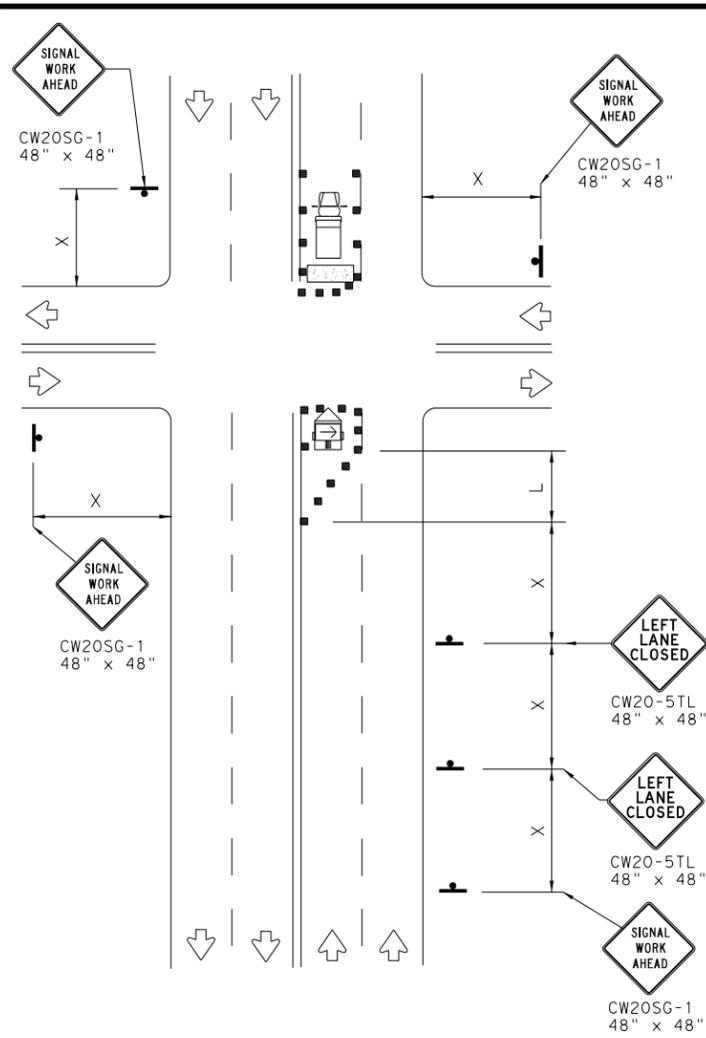
DATE: 3/29/2024 1:36:39 AM  
FILE: wzbt-13.dgn



NEAR SIDE LANE CLOSURE  
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE RIGHT LANE CLOSURE  
SHORT DURATION OR SHORT TERM STATIONARY



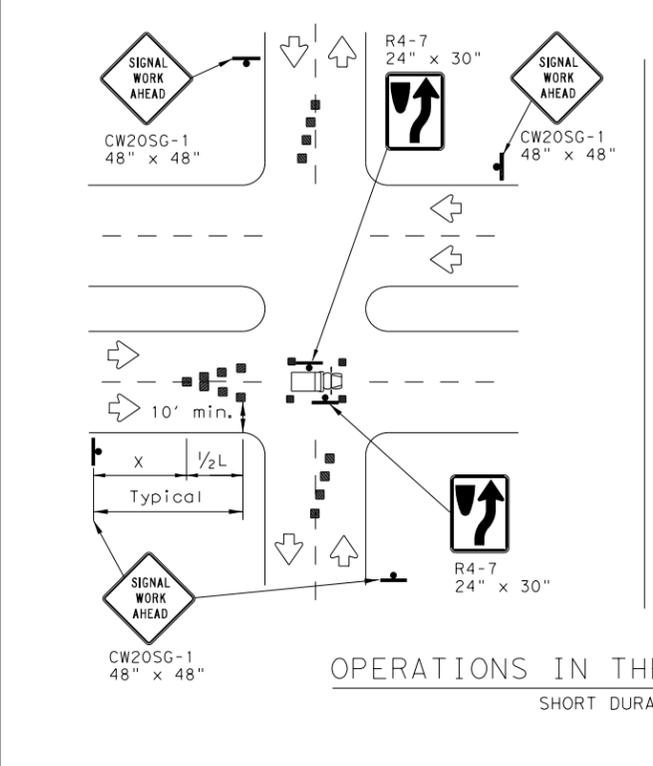
FAR SIDE LEFT LANE CLOSURE  
SHORT DURATION OR SHORT TERM STATIONARY

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

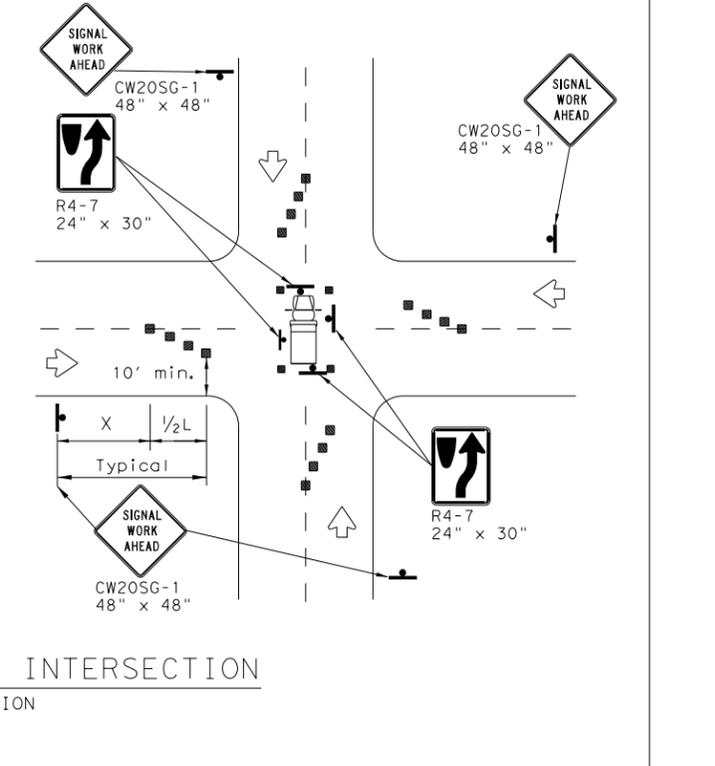
Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'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

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

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



OPERATIONS IN THE INTERSECTION  
SHORT DURATION



GENERAL NOTES

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

SHEET 1 OF 2



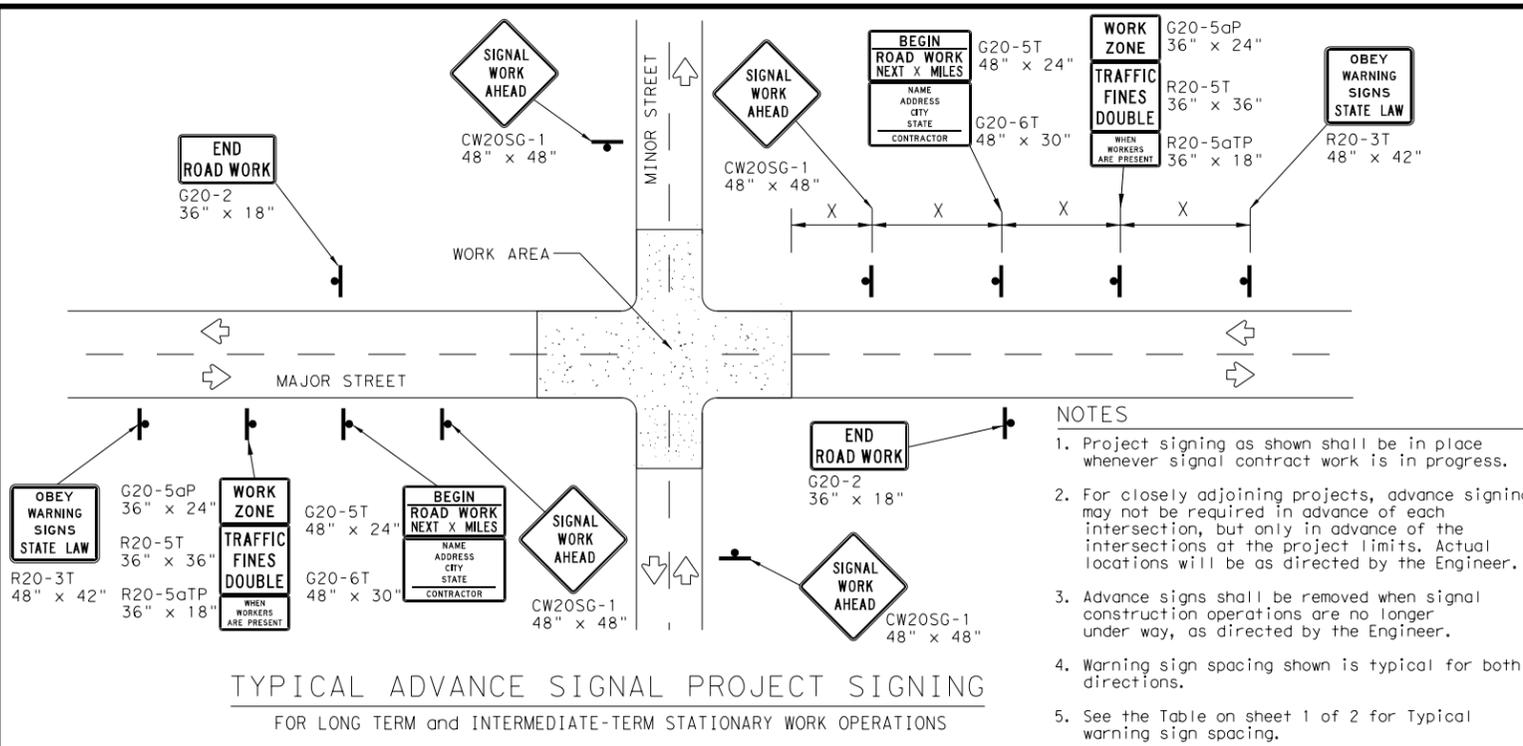
TRAFFIC SIGNAL WORK  
TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbt-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0001	02	079, ETC.	SH 20, ETC.
2-98 10-99 7-13	DIST	COUNTY	SHEET NO.	
4-98 3-03	ELP	EL PASO	38	

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

**GENERAL NOTES FOR WORK ZONE SIGNS**

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

**DURATION OF WORK**

- Work zone durations are defined in Part 6, Section 66.02 of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

**SIGN MOUNTING HEIGHT**

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

**REMOVING OR COVERING**

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

**REFLECTIVE SHEETING**

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

**SIGN SUPPORT WEIGHTS**

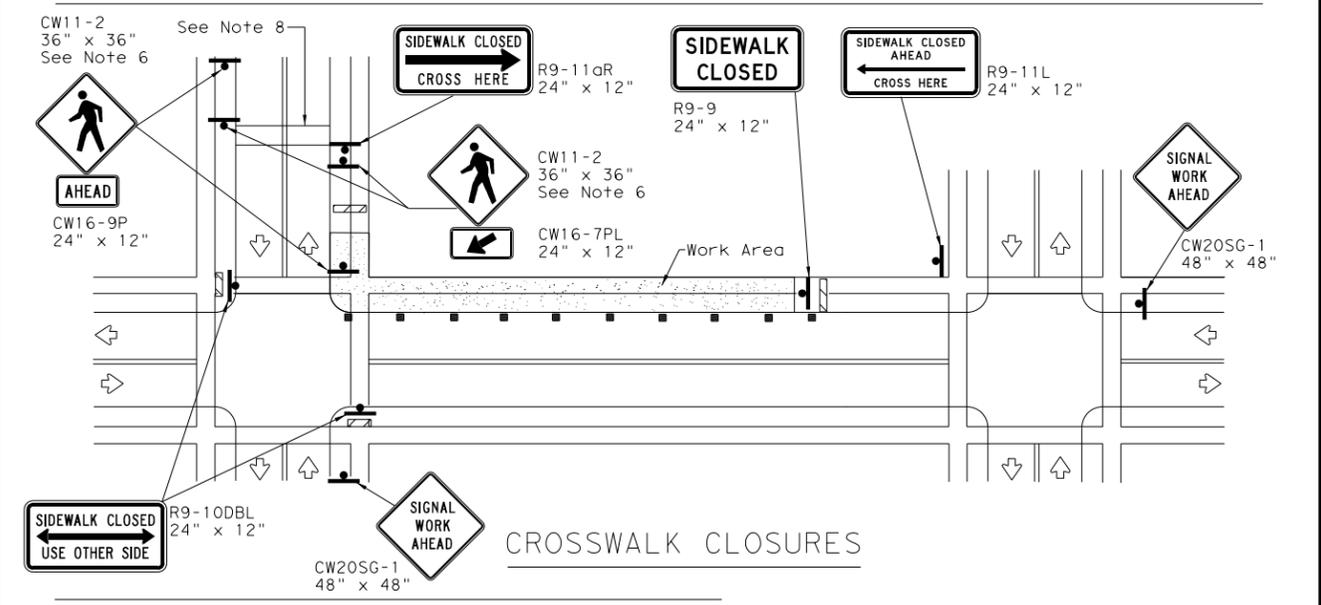
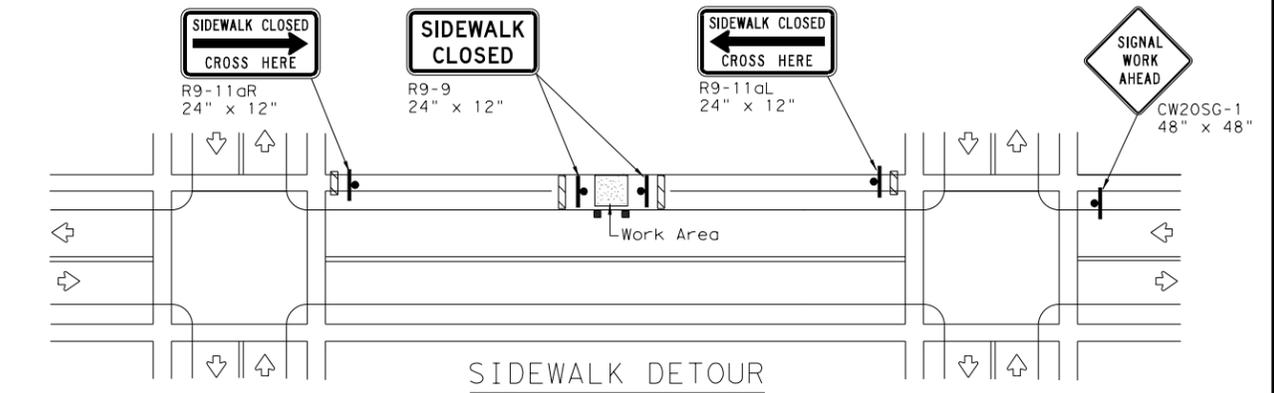
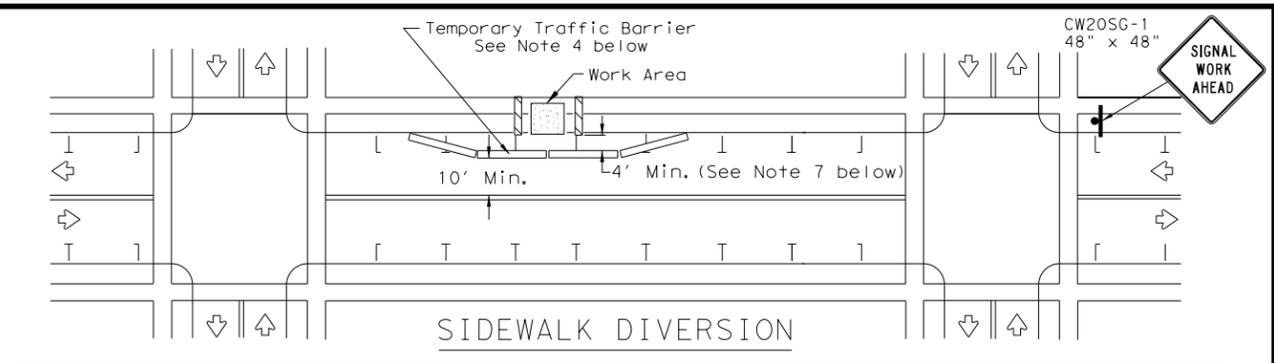
- Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

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

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B <sub>FL</sub> OR TYPE C <sub>FL</sub> 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](http://www.txdot.gov/txdot_library/publications/construction.htm)



**PEDESTRIAN CONTROL**

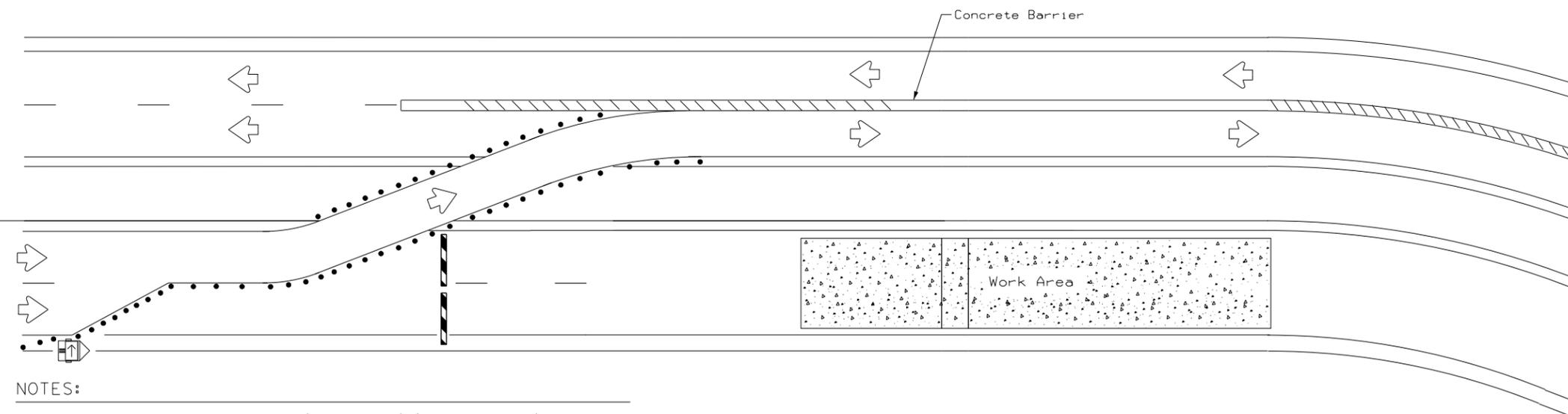
- Holes, trenches or other hazards shall be adequately protected by covering, delineating or surrounding the hazard with orange plastic pedestrian fencing or longitudinal channelizing devices, or as directed by the Engineer.
- "CROSSWALK CLOSURES" as detailed above will require the Engineer's approval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

SHEET 2 OF 2

		<b>Traffic Operations Division Standard</b>	
<b>TRAFFIC SIGNAL WORK BARRICADES AND SIGNS</b>			
<b>WZ (BTS-2) - 13</b>			
FILE: wzbt-13.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT
©TxDOT April 1992	CONT	SECT	JOB
REVISIONS	0001	02	079, ETC. SH 20, ETC.
2-98 10-99 7-13	DIST	COUNTY	SHEET NO.
4-98 3-03	ELP	EL PASO	39

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FILE: wztd-17.dgn



NOTES:

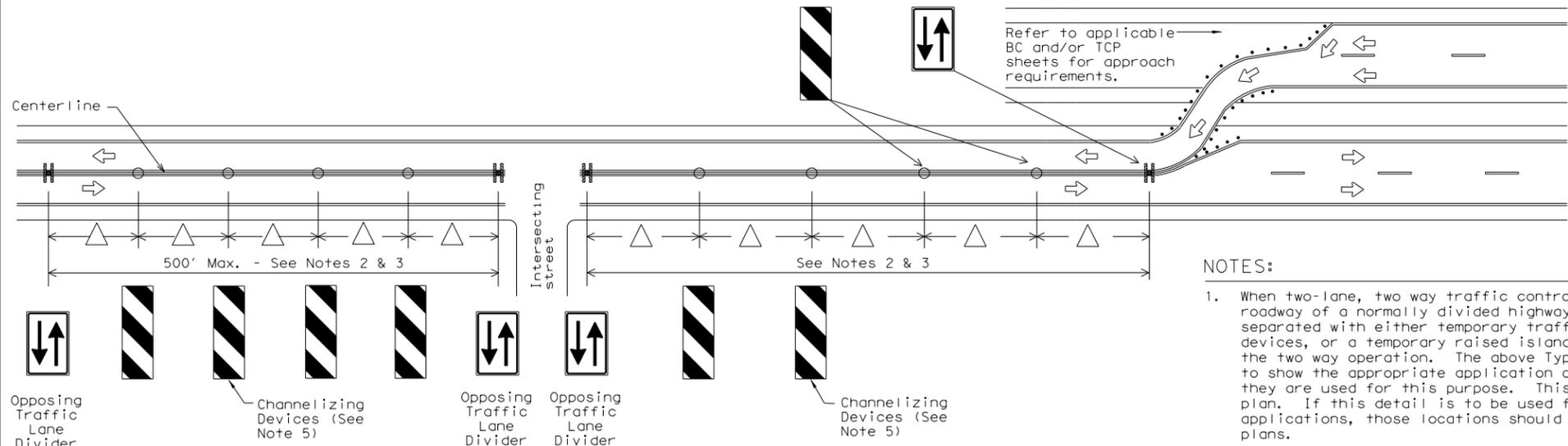
1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

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/business/resources/producer-list.html>



NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.
2. Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.
3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

		<b>Traffic Operations Division Standard</b>	
<h2>TRAFFIC CONTROL PLAN</h2> <h3>TYPICAL DETAILS</h3> <h1>WZ(TD) - 17</h1>			
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© TxDOT	February 1998	CONT:	SECT
4-98	2-17	0001	02
3-03		DIST:	COUNTY
7-13		ELP	EL PASO
		JOB:	HIGHWAY
		079, ETC.	SH 20, ETC.
			SHEET NO.
			40

# Horizontal Alignment Review Report

Report Created: Friday, February 2, 2024  
Time: 4:04:07 PM

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Description:  
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N.dgn  
Last Revised: 1/29/2024 14:30:19

Note: All units in this report are in feet unless specified otherwise.

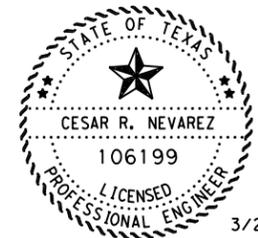
Alignment Name: BL CL-SH20

Alignment Description:

Alignment Style: Alignment\Baseline

Element:	Station	Northing	Easting
Element: Linear			
POT ( )	25768.430 R1	10680470.181	377560.185
PC ( )	31817.650 R1	10685059.113	373618.768
Tangential Direction:	N40.659°W		
Tangential Length:	6049.220		
Element: Circular			
PC ( )	31817.649 R1	10685059.112	373618.768
PI ( )	32020.720 R1	10685213.161	373486.456
CC ( )		10683138.528	371382.662
PCC ( )	32223.150 R1	10685347.610	373334.269
Radius:	2947.680		
Delta:	7.882° Left		
Degree of Curvature (Arc):	1.944°		
Length:	405.500		
Tangent:	203.070		
Chord:	405.180		
Middle Ordinate:	6.970		
External:	6.987		
Back Tangent Direction:	N40.659°W		
Back Radial Direction:	N49.341°E		
Chord Direction:	N44.600°W		
Ahead Radial Direction:	N41.459°E		
Ahead Tangent Direction:	N48.541°W		
Element: Circular			
PCC ( )	32223.150 R1	10685347.610	373334.269
PI ( )	33314.165 R1	10686069.952	372516.628
CC ( )		10681106.850	369587.782
PCC ( )	34378.730 R1	10686436.525	371489.039
Radius:	5658.640		
Delta:	21.826° Left		
Degree of Curvature (Arc):	1.013°		
Length:	2155.580		
Tangent:	1091.015		
Chord:	2142.570		
Middle Ordinate:	102.332		
External:	104.217		
Back Tangent Direction:	N48.541°W		
Back Radial Direction:	N41.459°E		
Chord Direction:	N59.454°W		
Ahead Radial Direction:	N19.633°E		
Ahead Tangent Direction:	N70.367°W		
Element: Circular			
PCC ( )	34378.730 R1	10686436.525	371489.039
PI ( )	34986.926 R1	10686640.874	370916.201
CC ( )		10668692.572	365159.231
PT ( )	35594.700 R1	10686807.849	370331.375
Radius:	18839.170		
Delta:	3.698° Left		
Degree of Curvature (Arc):	0.304°		

Length:	1215.970		
Tangent:	608.196		
Chord:	1215.759		
Middle Ordinate:	9.810		
External:	9.815		
Back Tangent Direction:	N70.367°W		
Back Radial Direction:	N19.633°E		
Chord Direction:	N72.216°W		
Ahead Radial Direction:	N15.935°E		
Ahead Tangent Direction:	N74.065°W		
Element: Linear			
PT ( )	35594.700 R1	10686807.850	370331.373
PC ( )	43585.717 R1	10689001.719	362647.410
Tangential Direction:	N74.065°W		
Tangential Length:	7991.017		
Element: Circular			
PC ( )	43585.717 R1	10689001.719	362647.410
PI ( )	43681.380 R1	10689027.983	362555.422
CC ( )		10683492.231	361074.380
PT ( )	43777.025 R1	10689051.161	362462.610
Radius:	5729.650		
Delta:	1.913° Left		
Degree of Curvature (Arc):	1.000°		
Length:	191.308		
Tangent:	95.663		
Chord:	191.299		
Middle Ordinate:	0.798		
External:	0.799		
Back Tangent Direction:	N74.065°W		
Back Radial Direction:	N15.935°E		
Chord Direction:	N75.022°W		
Ahead Radial Direction:	N14.022°E		
Ahead Tangent Direction:	N75.978°W		
Element: Linear			
PT ( )	43777.025 R1	10689051.161	362462.610
PC ( )	44295.465 R1	10689176.773	361959.617
Tangential Direction:	N75.978°W		
Tangential Length:	518.440		
Element: Circular			
PC ( )	44295.465 R1	10689176.773	361959.617
PI ( )	44388.002 R1	10689199.194	361869.837
CC ( )		10694735.703	363347.847
PT ( )	44480.523 R1	10689224.502	361780.828
Radius:	5729.650		
Delta:	1.851° Right		
Degree of Curvature (Arc):	1.000°		
Length:	185.058		
Tangent:	92.537		
Chord:	185.050		
Middle Ordinate:	0.747		
External:	0.747		
Back Tangent Direction:	N75.978°W		
Back Radial Direction:	N14.022°E		
Chord Direction:	N75.053°W		
Ahead Radial Direction:	N15.872°E		
Ahead Tangent Direction:	N74.128°W		
Element: Linear			
PT ( )	44480.523 R1	10689224.502	361780.828
POT ( )	48800.006 R1	10690405.850	357626.030
Tangential Direction:	N74.128°W		
Tangential Length:	4319.483		



Cesar R. Nevarez, P.E.



SH 20  
HORIZONTAL  
ALIGNMENT DATA  
0001-02-079

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	41	

DATE: 3/29/2024 1:37:22 AM  
FILE: WA4\_G-HAD.dgn

# Horizontal Alignment Review Report

Report Created: Friday, February 2, 2024  
Time: 3:56:37 PM

Project: Default

Description:

File Name: c:\pw\_work\atknatx01\wsatkins\_oyer3616\d0127445\BU54\_HAL  
N.dgn

Last Revised: 2/2/2024 15:54:37

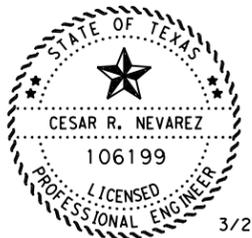
Note: All units in this report are in feet unless specified otherwise.

Alignment Name: BL CL-BU54

Alignment Description:

Alignment Style: Alignment\Baseline

Element:			Station	Northing	Easting
Linear	POT	( )	26773.558 R1	10723760.442	423852.292
	PI	( )	29245.997 R1	10725465.796	425642.465
	Tangential Direction:		N46.390°E		
	Tangential Length:		2472.439		
Linear	PI	( )	29245.997 R1	10725465.796	425642.465
	PI	( )	32184.076 R1	10727494.279	427767.922
	Tangential Direction:		N46.337°E		
	Tangential Length:		2938.080		
Linear	PI	( )	32184.076 R1	10727494.279	427767.922
	PI	( )	34286.468 R1	10728939.428	429294.878
	Tangential Direction:		N46.577°E		
	Tangential Length:		2102.392		
Linear	PI	( )	34286.468 R1	10728939.428	429294.878
	PI	( )	38276.745 R1	10731693.697	432182.146
	Tangential Direction:		N46.350°E		
	Tangential Length:		3990.277		
Linear	PI	( )	38276.745 R1	10731693.697	432182.146
	PI	( )	39091.218 R1	10732258.884	432768.600
	Tangential Direction:		N46.058°E		
	Tangential Length:		814.472		
Linear	PI	( )	39091.218 R1	10732258.884	432768.600
	POT	( )	39831.337 R1	10732769.653	433304.223
	Tangential Direction:		N46.361°E		
	Tangential Length:		740.120		



*Cesar R. Nevarez, P.E.*



BU 54A  
HORIZONTAL  
ALIGNMENT DATA  
0167-02-088

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	42	

Horizontal Alignment Report

\*\*\*\*\*  
 File: S:\1010\1010-052-Hercules Safety Lighting\DWGS\Construction Drawings\PS&E Plans\01 General\05 Project Layout.dwg  
 Report Date: 12/13/2023 11:31:35 AM  
 Alignment Name: Hercules Ave.  
 Station Range: Start: 0+00.00, End: 66+52.82  
 Description:  
 \*\*\*\*\*

Begin Hercules Ave.  
 N 10,690,463.5482 E 402,067.6167 0+00.00  
  
 Line (1)  
 S88° 03' 20"E 6,652.82'  
 N 10,690,237.8193 E 408,716.6044 66+52.82  
 Line (1)  
  
 N 10,690,237.8193 E 408,716.6044 66+52.82  
 End Hercules Ave.

\*\*\*\*\*  
 Alignment Length: 6,652.82'  
 \*\*\*\*\*



DIANA SOFIA GUERRERO  
 142472  
 LICENSED PROFESSIONAL ENGINEER  
 3/21/2024

**cea** group  
 813 N. Kansas St., Suite 300  
 El Paso, TX 79902  
 915.544.5232  
 www.ceagroup.net  
 TEXAS REGISTERED ENGINEERING FIRM F-4564

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**Texas Department of Transportation**

**HERCULES AVENUE  
 HORIZONTAL  
 ALIGNMENT DATA  
 0924-06-645**

SHEET 1 OF 1

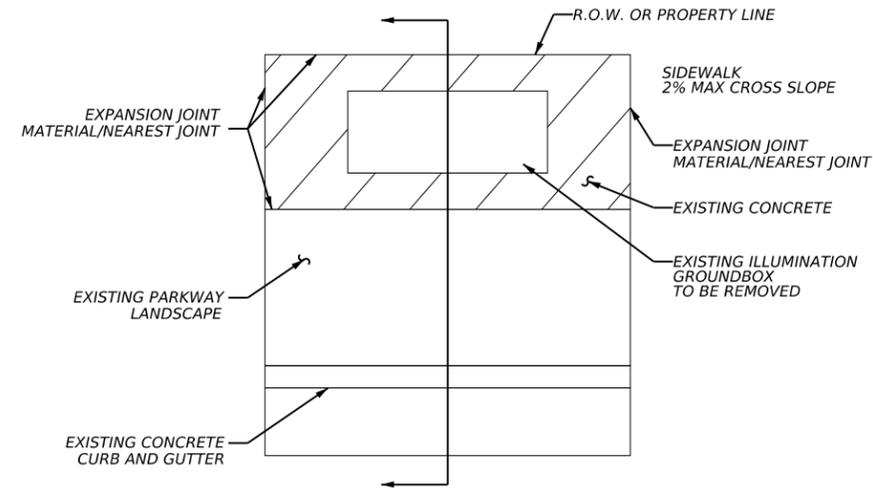
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	43	

**ILLUMINATION NOTES**

1. THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
2. THE LOCATIONS OF ROADWAY ILLUMINATION EQUIPMENT (POLES, GROUND BOXES, AND ELECTRICAL SERVICE POLES) SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. PROPOSED ILLUMINATION EQUIPMENT LOCATIONS WERE DESIGNED BASED ON TOPOGRAPHY GIVEN TXDOT AND FIELD INVESTIGATIONS. ILLUMINATION EQUIPMENT HAS BEEN PLACED TO AVOID EXISTING UTILITIES AND TREES. CONTRACTOR TO FIELD VERIFY FINAL ILLUMINATION EQUIPMENT LOCATIONS. CONTRACTOR SHALL PLACE ILLUMINATION POLES NEAR ROADWAY CENTERLINE OR AT A MINIMUM OF 2.5' BEHIND THE FACE OF CURB. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
3. THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
4. REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
5. REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
6. CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALKS, DRIVEWAYS, AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
7. CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
8. ROW OR PROPERTY LINE IS SHOWN FOR INFORMATION ONLY.
9. CONTRACTOR SHALL REMOVE ABANDON EXISTING CONDUIT IN PLACE AS NOTED ON PLANS AND REMOVE EXISTING CABLES IN ACCORDANCE WITH ITEM 6163 6002.
10. ALL ITEMS BEING REMOVED FROM THE PROJECT SITE: CABLES, GROUND BOXES, ETC. SHALL BE RETURNED TO THE CITY OF EL PASO. ALL ILLUMINATION POLES BEING REMOVED SHALL BE RETURNED TO TXDOT.
11. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.
12. EARTH MATERIAL REQUIRED UNDERNEATH PROPOSED CONCRETE SIDEWALKS TO FILL THE GAP FROM THE REMOVAL OF EXISTING GROUND BOXES SHALL BE SUBSIDIARY TO ITEM 0531 6001 "CONC SIDEWALKS (4)".
13. CONTRACTOR SHALL WORK WITH EXTREME CAUTION NEAR EXISTING TREE ROOT SYSTEMS TO AVOID HARMING THE EXISTING TREES.
14. ANY NECESSARY TREE TRMMING IS SUBSIDIARY TO BID IETMS 0610.

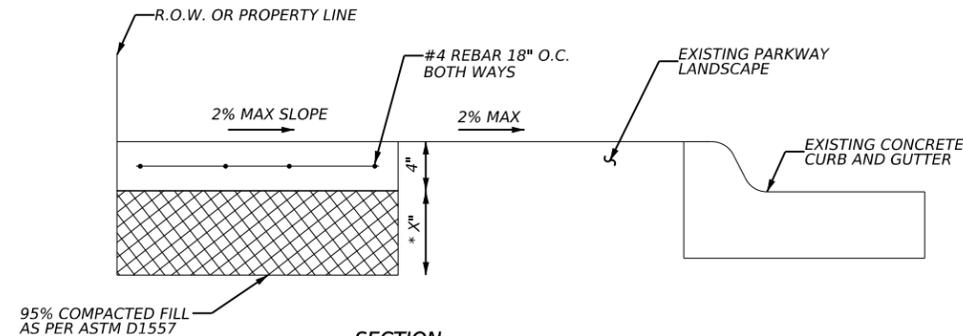
**WARNING ! BEFORE YOU DIG**

EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIAMTE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.



**PLAN**  
NTS

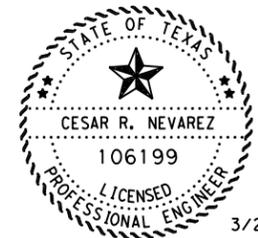
CONTRACTOR SHALL REMOVE CONCRETE SURROUNDING EXISTING GROUND BOX/ILLUMINATION POLE/ELECTRICAL SERVICE FROM JOINT TO JOINT. THIS IS SUBSIDIARY TO THE REMOVAL OF THE EXISTING ILLUMINATION GROUND BOX/ILLUMINATION POLE/ELECTRICAL SERVICE.



**SECTION**  
NTS

\* DEPTH "X" IS DETERMINED BY THE DEPTH OF EXISTING ILLUMINATION GROUND BOX/ILLUMINATION POLE FOUNDATION/ ELECTRICAL SERVICE FOUNDATION BEING REMOVED. COMPACTED FILL MATERIAL IS SUBSIDIARY TO 4" CONCRETE SIDEWALK.

**CONCRETE SIDEWALK DETAIL**



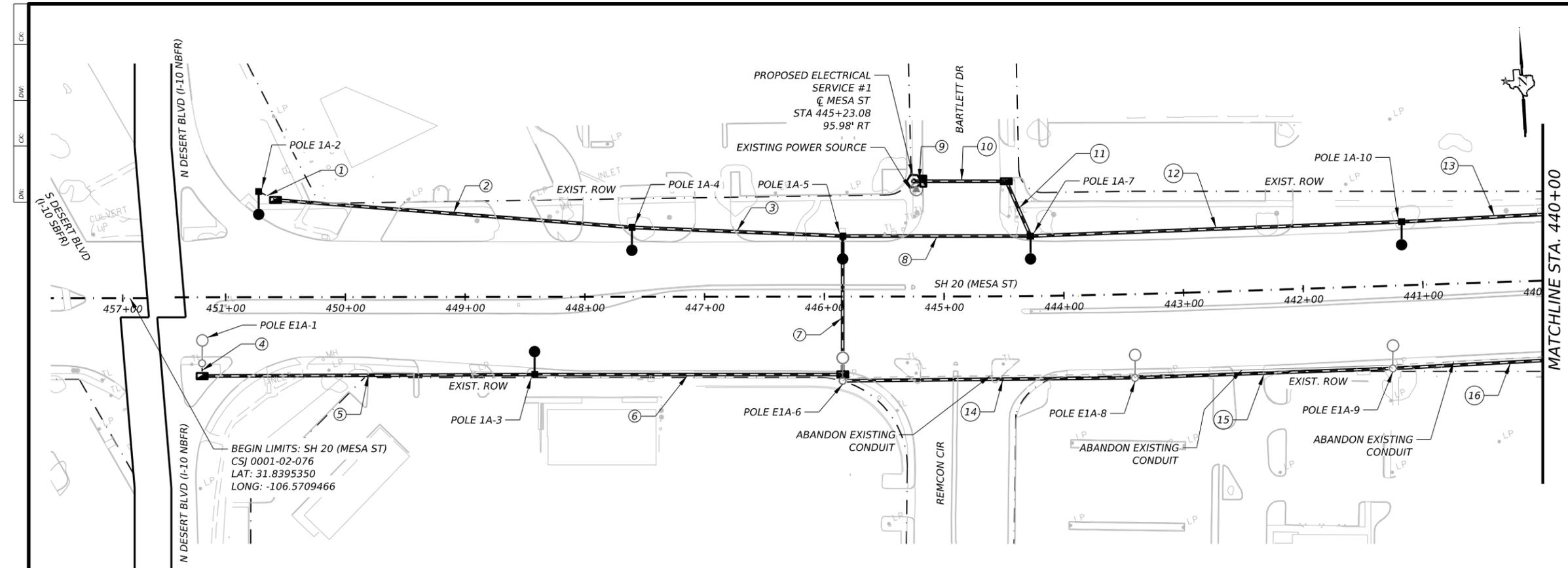
*Cesar R. Nevarez, P.E.*



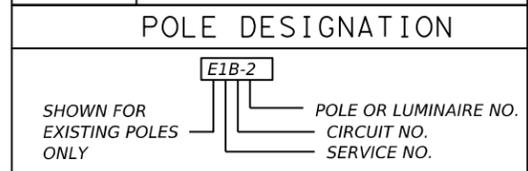
**SH 20  
ILLUMINATION NOTES  
& DETAILS**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST		COUNTY	SHEET NO.
ELP		EL PASO	44

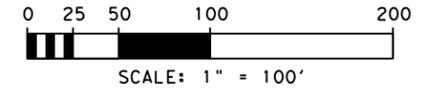


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-8 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW



EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT-HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TXDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063

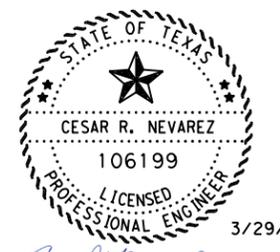


RUN NO.	CONDUIT STATUS	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
		ITEM 618 SIZE / TYPE CONDUIT			ITEM 620 ELECTRICAL CONDUCTORS			
		TRENCH	BORED		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1		I	1	2	15	1
2	I		1	I	1	2	300	2
3	I		1	I	1	2	180	3
4	I		1	I	1	2	15	4
5	I		1	I	1	2	260	5
6	I		1	I	1	2	260	6
7	I		1	I	1	2	120	7
8	I		1	I	1	2	160	8
9	I		1	I	1	2	10	9
10	I		1	I	1	2	70	10
11	I		1	I	1	2	50	11
12	I		1	I	1	2	310	12
13	I		1	I	1	2	120	13
14	I		1	I	1	2	245	14
15	I		1	I	1	2	215	15
16	I		1	I	1	2	125	16
<b>TOTAL</b>		<b>15</b>	<b>2440</b>		<b>2535</b>	<b>5070</b>		<b>TOTAL</b>

POLE ID	STA	OFF	NOTES
E1A-1	451+00	53.33' LT	REPLACE LUMINAIRE W / LED (400W EQ)
1A-2	450+72.22	88.07' RT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
1A-3	448+42.03	64.59' LT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
1A-4	447+60.64	57.83' RT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
1A-5	447+05.67	61.79' RT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
E1A-6	445+84.71	55.87' RT	REPLACE LUMINAIRE W / LED (400W EQ)
1A-7	444+27.77	50.11' RT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
E1A-8	443+41.12	67.87' LT	REPLACE LUMINAIRE W / LED (400W EQ)
E1A-9	441+27.45	68.89' LT	REPLACE LUMINAIRE W / LED (400W EQ)
1A-10	441+24.87	51.98' RT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	60
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6103	REPLACE LUMINAIRE W / LED (400W EQ)	EA	4
0610 6286	IN RD IL (TY SA) 50T-8 (400W EQ) LED	EA	6
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	15
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	2440
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	7605
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	5
0628 6041	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	EA	1
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	1
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	1800

- NOTES:**
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
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  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.
  - CONTRACTOR SHALL ABANDON EXISTING CONDUIT IN PLACE AS NOTED ON PLANS AND REMOVE EXISTING CABLES IN ACCORDANCE WITH ITEM 6163 6002.
  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.



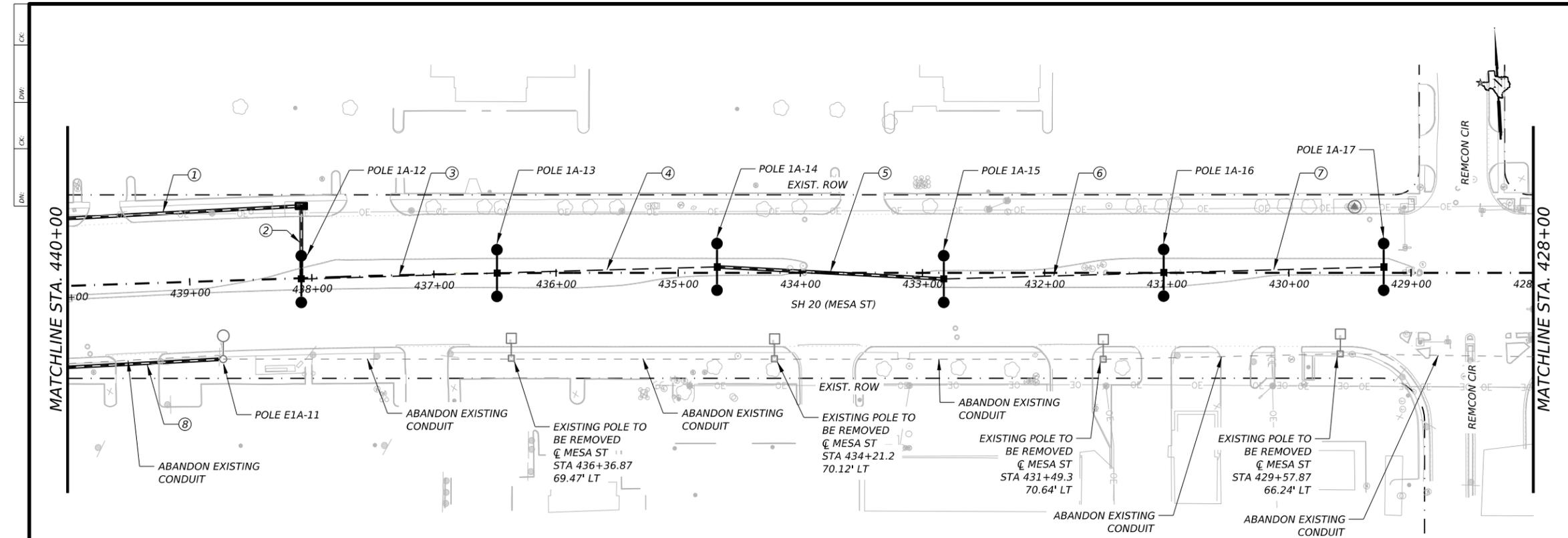
**SH 20  
ILLUMINATION PLAN  
0001-02-079**

SHEET 1 OF 12

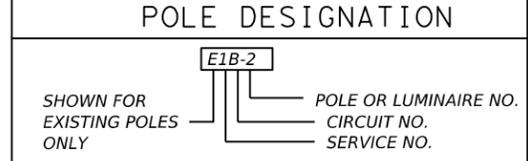
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	45	

DATE: 3/29/2024 1:38:24 AM  
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STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

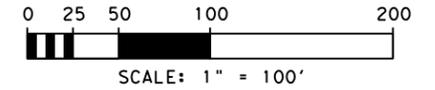


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW



EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT-HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TxDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063



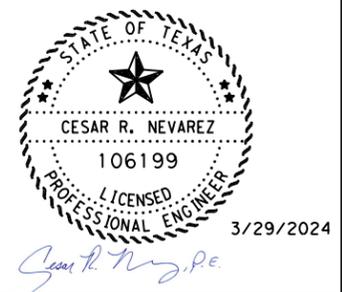
- NOTES:**
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.
  - CONTRACTOR SHALL ABANDON EXISTING CONDUIT IN PLACE AS NOTED ON PLANS AND REMOVE EXISTING CABLES IN ACCORDANCE WITH ITEM 6163 6002.
  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

RUN NO.	CONDUIT		NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
	CONDUIT STATUS	ITEM 618 SIZE / TYPE CONDUIT	ITEM 620 ELECTRICAL CONDUCTORS			
			TRENCH	BORED		
		PVC SCHED 40 (2")	PVC SCHED 40 (2") (BORE)	**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)	
1	I		1	1	2	195
2	I		1	1	2	60
3	I	1		1	2	160
4	I	1		1	2	180
5	I		1	1	2	185
6	I	1		1	2	180
7	I	1		1	2	180
8	I		1	1	2	130
TOTAL		700	570	1310	2620	TOTAL

STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

POLE ID	STA	OFF	NOTES
E1A-11	438+72.45	66.93' LT	REPLACE LUMINAIRE W / LED (400W EQ)
1A-12	438+08.62	0.8' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
1A-13	436+48.39	0.26' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
1A-14	434+68.21	4.91' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
1A-15	432+82.57	4.00' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
1A-16	431+00	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
1A-17	429+22.37	4.87' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	48
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6009	REMOVE RD IL ASM (TRANS - BASE)	EA	4
0610 6103	REPLACE LUMINAIRE W / LED (400W EQ)	EA	1
0610 6161	IN RD IL AM (TY SA) 30T - 4 - 4 (250W LED)	EA	6
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	700
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	570
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3930
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	1
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	4
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	3600

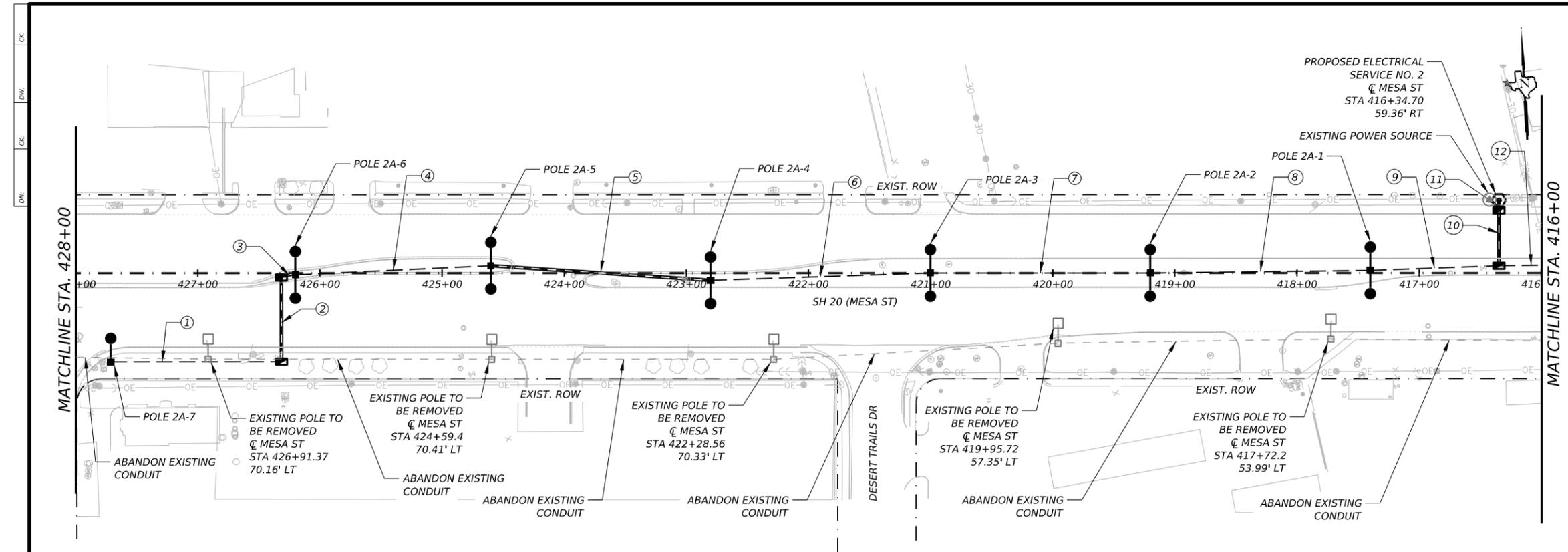


**SH 20  
ILLUMINATION PLAN  
0001-02-079**

SHEET 2 OF 12

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	46	

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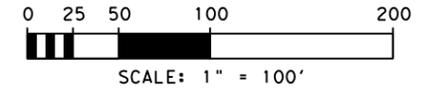


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-8 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW

POLE DESIGNATION	
	POLE OR LUMINAIRE NO.
	CIRCUIT NO.
	SERVICE NO.

EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT-HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

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 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TxDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063



- NOTES:**
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  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.
  - CONTRACTOR SHALL ABANDON EXISTING CONDUIT IN PLACE AS NOTED ON PLANS AND REMOVE EXISTING CABLES IN ACCORDANCE WITH ITEM 6163 6002.
  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

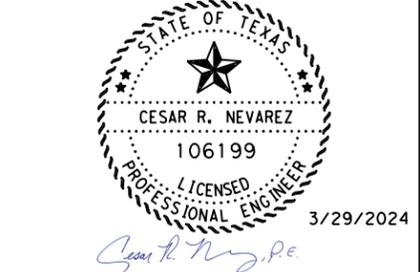
RUN NO.	CONDUIT STATUS	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
		ITEM 618 SIZE / TYPE CONDUIT			ITEM 620 ELECTRICAL CONDUCTORS			
		TRENCH	BORED		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1		I	1	2	140	1
2	I		1	I	1	2	70	2
3	I	1		I	1	2	15	3
4	I	1		I	1	2	160	4
5	I		1	I	1	2	180	5
6	I	1		I	1	2	180	6
7	I	1		I	1	2	180	7
8	I	1		I	1	2	180	8
9	I	1		I	1	2	105	9
10	I		1	I	1	4	45	10
11	I	1		I	1	4	10	11
12	I	1		I	1	2	35	12
<b>TOTAL</b>		<b>1005</b>	<b>295</b>		<b>1360</b>	<b>2850</b>		<b>TOTAL</b>

STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

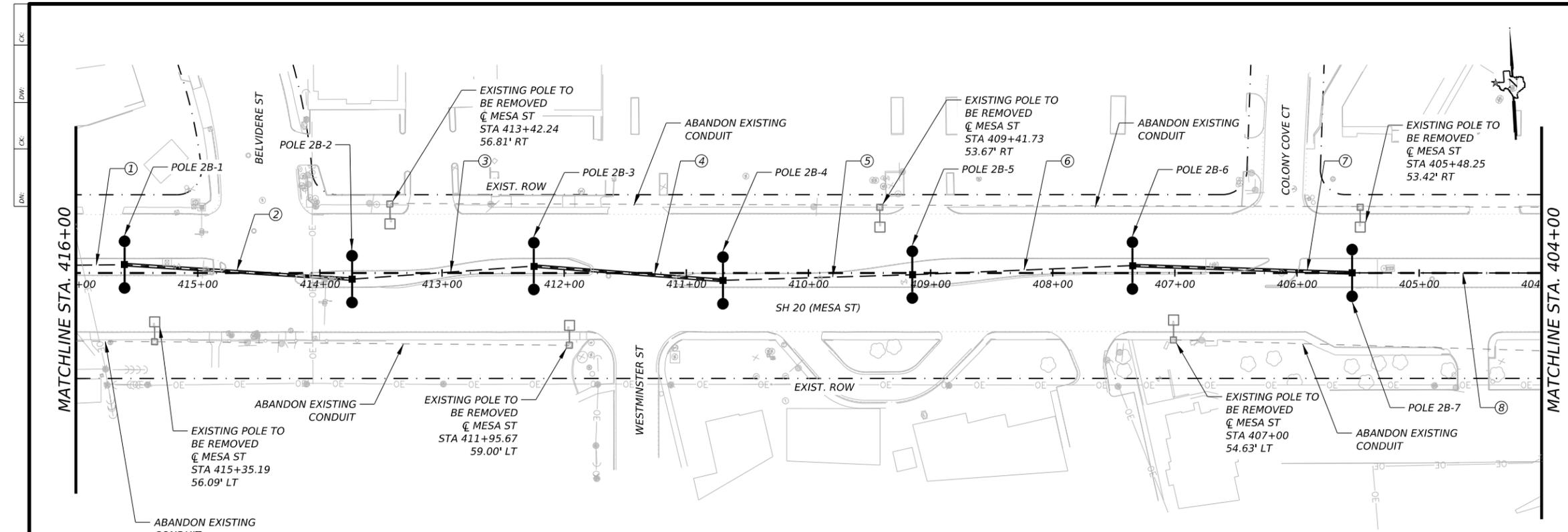
POLE ID	STA	OFF	NOTES
2A-7	427+71.2	72.38' LT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
2A-6	426+20.03	1.57' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2A-5	424+59.93	5.39' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2A-4	422+80.1	5.91' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2A-3	421+00	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2A-2	419+20.05	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2A-1	417+39.96	2.16' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	58
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6009	REMOVE RD IL ASM (TRANS - BASE)	EA	5
0610 6161	IN RD IL AM (TY SA) 30T - 4 - 4 (250W) LED	EA	6
0610 6286	IN RD IL (TY SA) 50T-8 (400W EQ) LED	EA	1
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	1005
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	295
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	4210
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	4
0628 6041	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	EA	1
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	5
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	3600

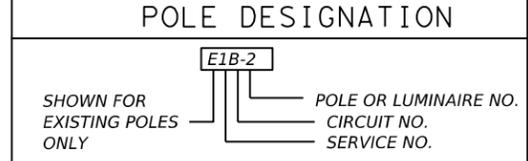
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SH 20 ILLUMINATION PLAN 0001-02-079			
SHEET 3 OF 12			
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	47	

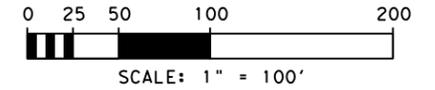


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-8 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW



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**CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 4 OF 12**

RUN NO.	CONDUIT		NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.	
	ITEM 618 SIZE / TYPE CONDUIT		ITEM 620 ELECTRICAL CONDUCTORS				
	TRENCH	BORED	**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)			
1	I	1	I	1	2	40	1
2	I	1	I	1	2	190	2
3	I	1	I	1	2	150	3
4	I	1	I	1	2	155	4
5	I	1	I	1	2	155	5
6	I	1	I	1	2	180	6
7	I	1	I	1	2	180	7
8	I	1	I	1	2	155	8
TOTAL		680	525	1245	2490		TOTAL

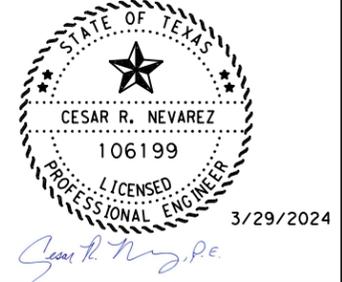
**POLE SCHEDULE**

POLE ID	STA	OFF	NOTES
2B-1	415+59.85	6.9' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2B-2	413+79.98	4.95' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2B-3	412+24.78	5.66' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2B-4	410+69.94	6.05' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2B-5	409+14.92	1.34' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2B-6	407+34.7	6.02' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2B-7	405+54.84	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)

**SUMMARY OF QUANTITIES - SHEET 4 OF 12**

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	56
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6009	REMOVE RD IL ASM (TRANS - BASE)	EA	6
0610 6161	IN RD IL AM (TY SA) 30T - 4 - 4 (250W) LED	EA	7
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	680
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	525
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3735
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	4
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	7200

STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

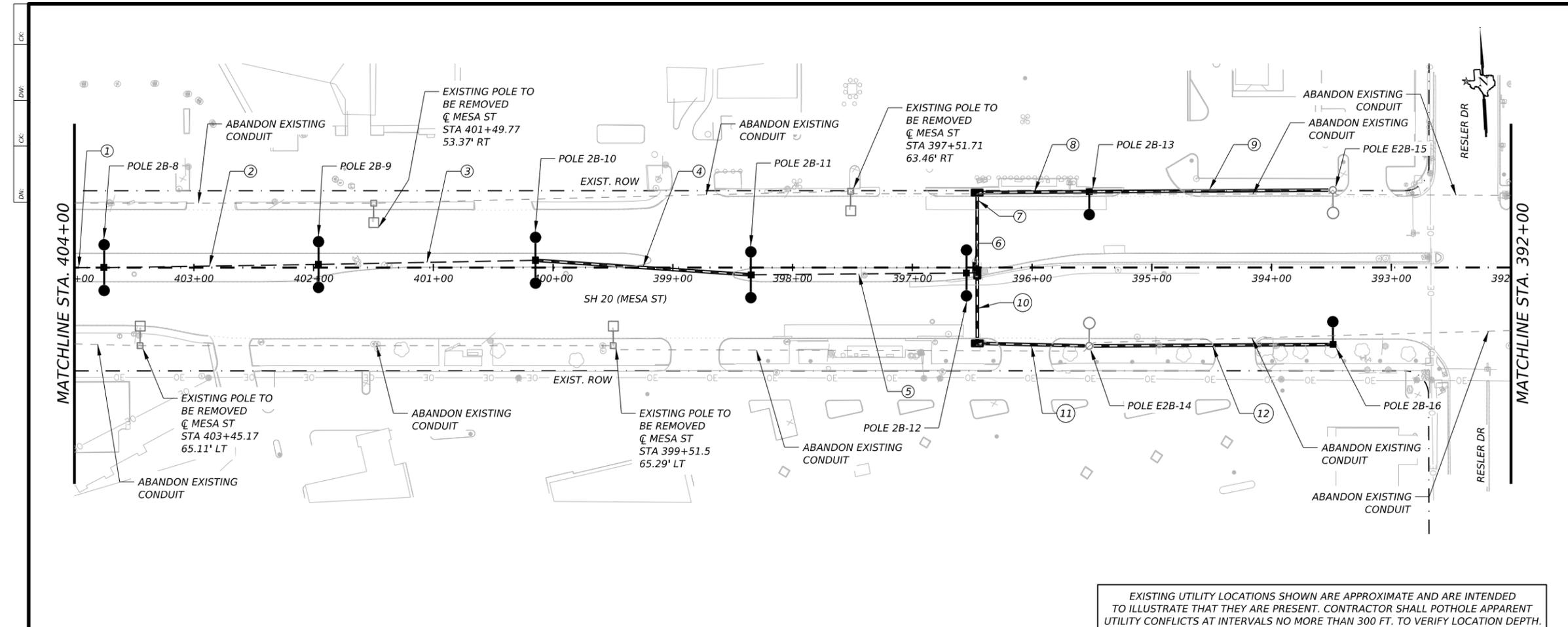


**SH 20  
ILLUMINATION PLAN  
0001-02-079**

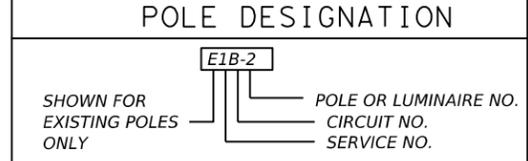
SHEET 4 OF 12

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	48	

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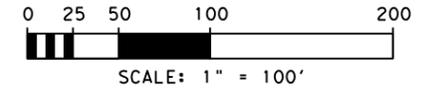


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW



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**CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 5 OF 12**

RUN NO.	CONDUIT STATUS	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
		ITEM 618 SIZE / TYPE CONDUIT			ITEM 620 ELECTRICAL CONDUCTORS			
		TRENCH	BORED		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1		I	1	2	25	1
2	I	1		I	1	2	180	2
3	I	1		I	1	2	185	3
4	I		1	I	1	2	180	4
5	I	1		I	1	2	180	5
6	I		1	I	1	2	10	6
7	I		1	I	1	2	70	7
8	I		1	I	1	2	95	8
9	I		1	I	1	2	205	9
10	I		1	I	1	2	60	10
11	I		1	I	1	2	100	11
12	I		1	I	1	2	205	12
TOTAL		570	925		1555	3110		TOTAL

**POLE SCHEDULE**

POLE ID	STA	OFF	NOTES
2B-8	403+74.85	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2B-9	401+95.81	2.49' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2B-10	400+14.61	6.02' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2B-11	398+34.77	6.13' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2B-12	396+54.71	4.45' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
2B-13	395+52.15	63.14' RT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
E2B-14	395+53.14	65.35' LT	REPLACE LUMINAIRE W / LED (400W EQ)
E2B-15	393+48.35	64.46' RT	REPLACE LUMINAIRE W / LED (400W EQ)
2B-16	393+48.74	64.21' LT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)

**SUMMARY OF QUANTITIES - SHEET 5 OF 12**

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	60
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6009	REMOVE RD IL ASM (TRANS - BASE)	EA	4
0610 6103	REPLACE LUMINAIRE W / LED (400W EQ)	EA	2
0610 6161	IN RD IL AM (TY SA) 30T - 4 - 4 (250W) LED	EA	5
0610 6286	IN RD IL (TY SA) 50T-8 (400W EQ) LED	EA	2
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	570
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	925
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	4665
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	3
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	3
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	7200

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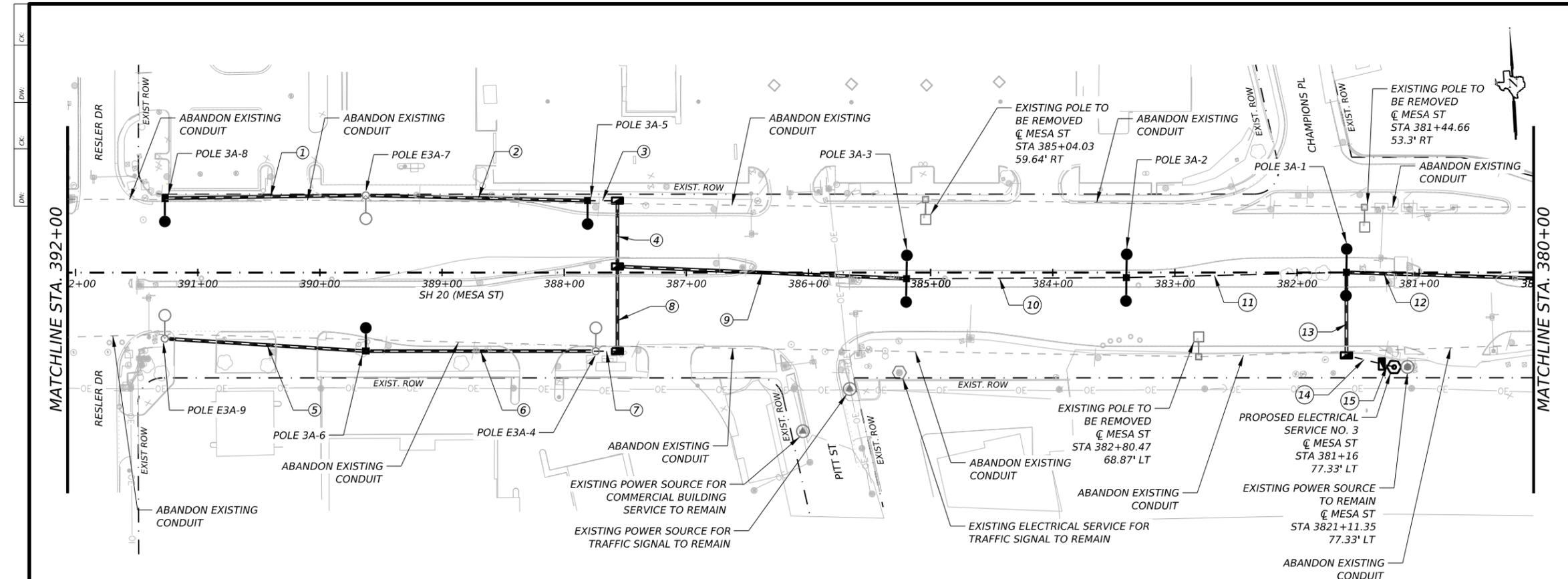
**SH 20 ILLUMINATION PLAN 0001-02-079**

SHEET 5 OF 12

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	49	

DATE: 3/29/2024 1:39:47 AM  
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STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

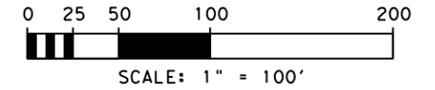


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
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POLE DESIGNATION	
	POLE OR LUMINAIRE NO.
	CIRCUIT NO.
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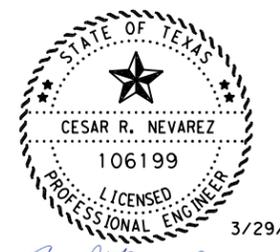


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  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

RUN NO.	CONDUIT		NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
	ITEM 618 SIZE / TYPE CONDUIT		ITEM 620 ELECTRICAL CONDUCTORS			
	TRENCH	BORED	**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I		1	2	165	1
2	I		1	2	185	2
3	I		1	2	25	3
4	I		1	2	55	4
5	I		1	2	165	5
6	I		1	2	190	6
7	I		1	2	20	7
8	I		1	2	70	8
9	I		1	2	240	9
10	I	1		2	180	10
11	I	1		2	180	11
12	I		1	2	160	12
13	I		1	4	70	13
14	I	1		4	30	14
15	I	1		4	10	15
TOTAL		400	1345	1820	3890	TOTAL

POLE ID	STA	OFF	NOTES
E3A-9	391+26.98	53.98' LT	REPLACE LUMINAIRE W / LED (400W EQ)
3A-8	391+26.86	60.8' RT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
3A-7	389+62.31	64.14' LT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
E3A-6	389+62.44	63.09' RT	REPLACE LUMINAIRE W / LED (400W EQ)
3A-5	387+80.75	53.97' RT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
E3A-4	387+74.05	64.26' LT	REPLACE LUMINAIRE W / LED (400W EQ)
3A-3	385+19.59	5.03' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3A-2	383+39.64	4.19' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3A-1	381+59.54	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	54
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6009	REMOVE RD IL ASM (TRANS - BASE)	EA	3
0610 6103	REPLACE LUMINAIRE W / LED (400W EQ)	EA	3
0610 6161	IN RD IL AM (TY SA) 30T - 4 - 4 (250W) LED	EA	3
0610 6286	IN RD IL (TY SA) 50T-8 (400W EQ) LED	EA	3
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	400
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	1345
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	5710
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	5
0628 6041	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	EA	1
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	2
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	7200

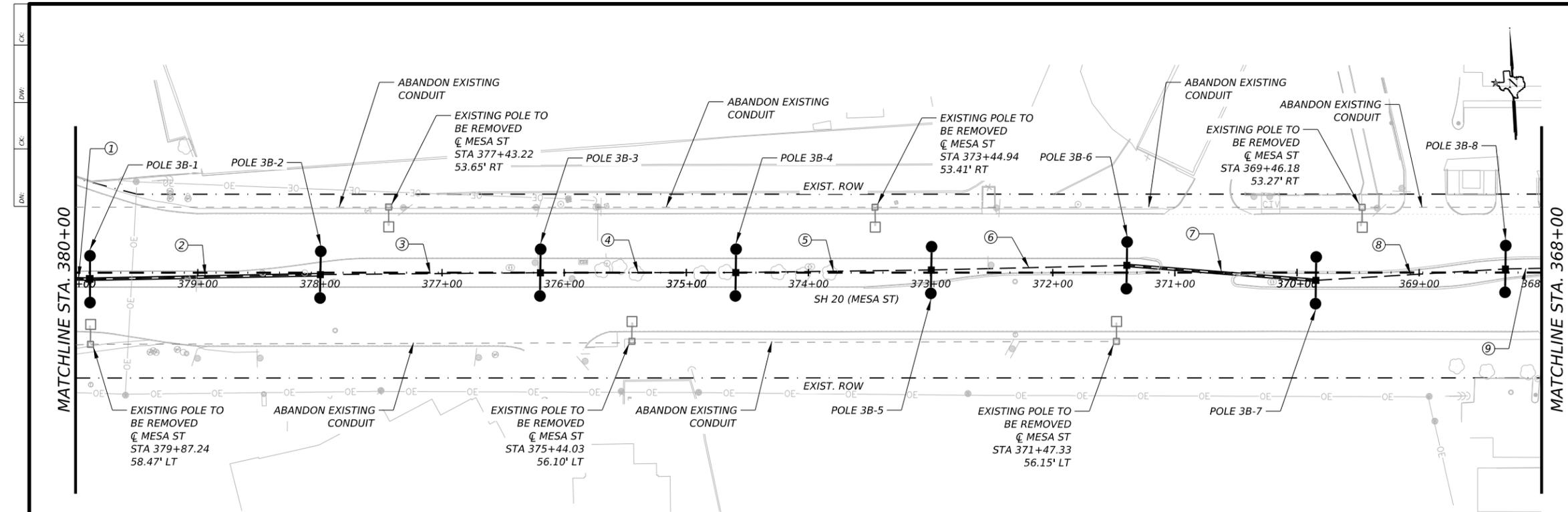


SH 20  
 ILLUMINATION PLAN  
 0001-02-079

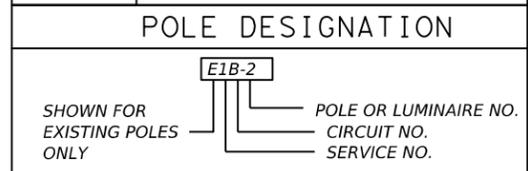
SHEET 6 OF 12			
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST		COUNTY	SHEET NO.
ELP		EL PASO	50

DATE: 3/29/2024 1:40:08 AM  
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STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

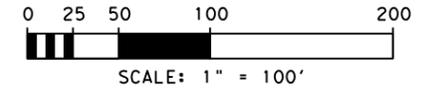


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-8 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW



EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT-HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TxDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063



CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 7 OF 12

RUN NO.	CONDUIT		NUMBER OF CONDUCTORS				RUN NO.	
	CONDUIT STATUS	TRENCH	BORED	CABLE STATUS	**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		LENGTH OF RUN
		PVC SCHED 40 (2")	PVC SCHED 40 (2") (BORE)					
1	I		1	I	1	2	15	1
2	I	1		I	1	2	200	2
3	I	1		I	1	2	185	3
4	I	1		I	1	2	165	4
5	I	1		I	1	2	165	5
6	I	1		I	1	2	165	6
7	I		1	I	1	2	160	7
8	I	1		I	1	2	160	8
9	I	1		I	1	2	25	9
TOTAL		1065	175		1285	2570		TOTAL

STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

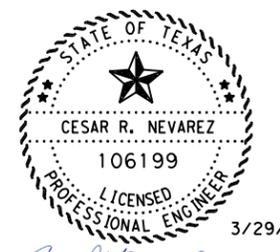
POLE SCHEDULE

POLE ID	STA	OFF	NOTES
3B-1	379+79.63	7.02' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-2	378+00	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-3	376+19.48	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-4	374+59.41	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-5	373+00	2.11' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-6	371+39.32	5.93' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-7	369+84.48	6.96' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-8	368+29.33	2.96' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)

SUMMARY OF QUANTITIES - SHEET 7 OF 12

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	64
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6009	REMOVE RD IL ASM (TRANS - BASE)	EA	6
0610 6161	IN RD IL AM (TY SA) 30T - 4 - 4 (250W) LED	EA	8
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	1065
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	175
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3855
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	5
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	6150

- NOTES:
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.
  - CONTRACTOR SHALL ABANDON EXISTING CONDUIT IN PLACE AS NOTED ON PLANS AND REMOVE EXISTING CABLES IN ACCORDANCE WITH ITEM 6163 6002.
  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

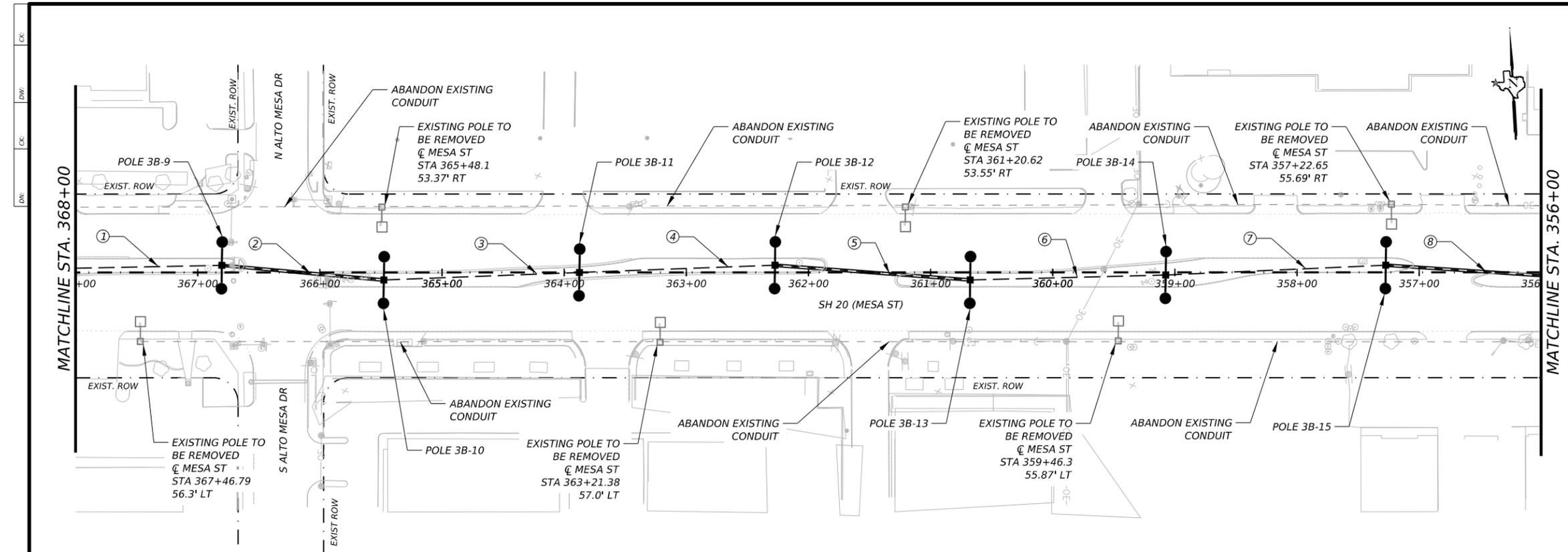


SH 20  
 ILLUMINATION PLAN  
 0001-02-079

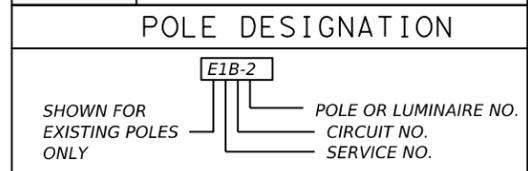
SHEET 7 OF 12

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	51	

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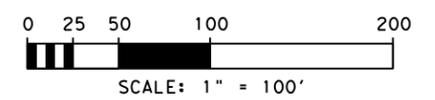


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-8 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW



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 TxDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063



CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 8 OF 12

RUN NO.	CONDUIT STATUS	CONDUIT		NUMBER OF CONDUCTORS			RUN NO.	
		TRENCH	BORED	CABLE STATUS	**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		LENGTH OF RUN
		PVC SCHED 40 (2")	PVC SCHED 40 (2") (BORE)					
1	I	1		I	1	2	130	1
2	I		1	I	1	2	135	2
3	I	1		I	1	2	165	3
4	I	1		I	1	2	165	4
5	I		1	I	1	2	165	5
6	I	1		I	1	2	165	6
7	I	1		I	1	2	185	7
8	I		1	I	1	2	125	8
TOTAL		810	425		1275	2550		TOTAL

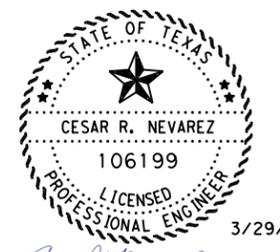
POLE SCHEDULE

POLE ID	STA	OFF	NOTES
3B-9	366+80.18	5.85' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-10	365+47.60	6.15' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-11	363+87.47	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-12	362+27.37	5.9' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-13	360+67.52	6.12' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-14	359+07.44	2.07' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-15	357+27.29	5.89' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)

SUMMARY OF QUANTITIES - SHEET 8 OF 12

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	56
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6009	REMOVE RD IL ASM (TRANS - BASE)	EA	6
0610 6161	IN RD IL AM (TY SA) 30T - 4 - 4 (250W) LED	EA	7
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	810
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	425
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3825
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	4
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	7200

- NOTES:
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
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  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

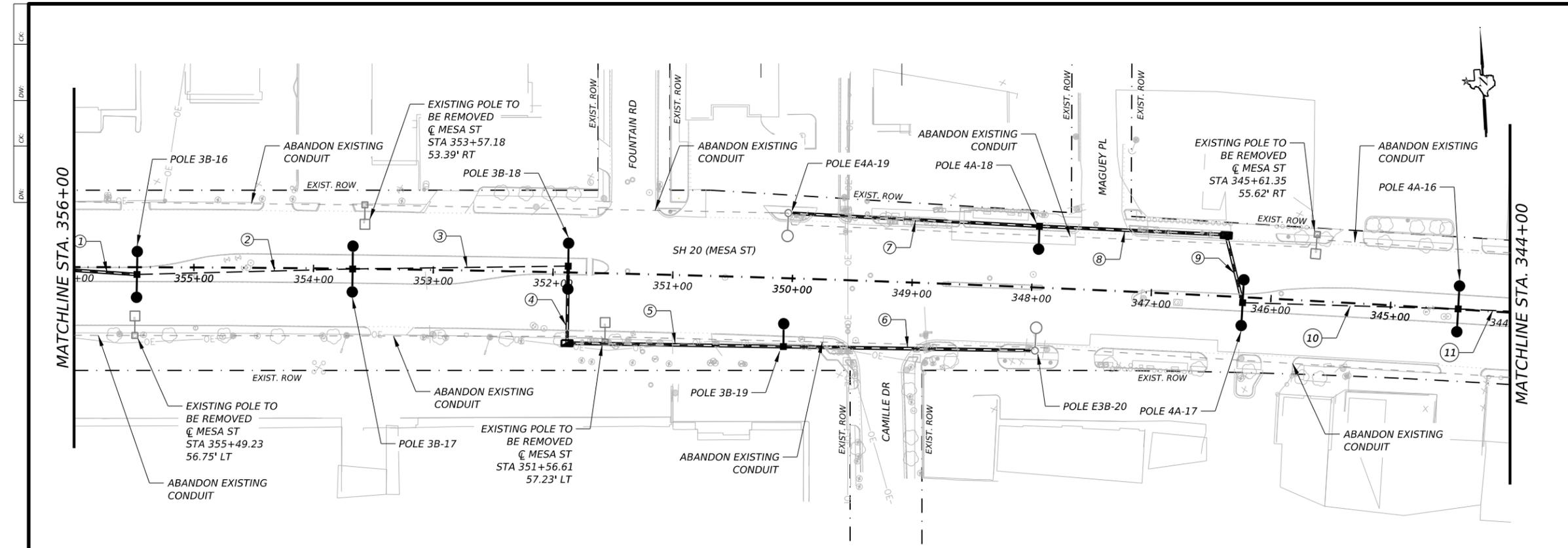


SH 20  
 ILLUMINATION PLAN  
 0001-02-079

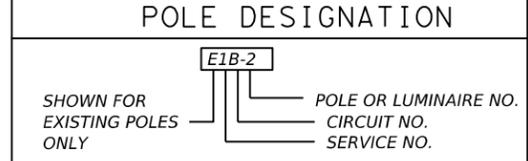
SHEET 8 OF 12

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	52	

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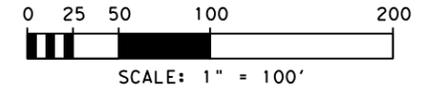


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-8 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW



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 TXDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063



- NOTES:**
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
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  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
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  - CONTRACTOR SHALL ABANDON EXISTING CONDUIT IN PLACE AS NOTED ON PLANS AND REMOVE EXISTING CABLES IN ACCORDANCE WITH ITEM 6163 6002.
  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 9 OF 12

RUN NO.	CONDUIT		NUMBER OF CONDUCTORS				RUN NO.
	TRENCH	BORED	CABLE STATUS	**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)	LENGTH OF RUN	
1	I		I	1	2	55	1
2	I	1	I	1	2	180	2
3	I	1	I	1	2	180	3
4	I		I	1	2	70	4
5	I		I	1	2	180	5
6	I		I	1	2	210	6
7	I		I	1	2	210	7
8	I		I	1	2	160	8
9	I		I	1	2	60	9
10	I	1	I	1	2	180	10
11	I	1	I	1	2	45	11
TOTAL		585		1585	3170		TOTAL

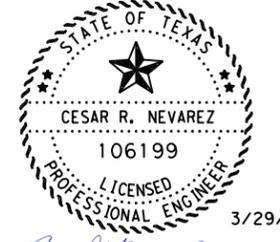
STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

POLE SCHEDULE

POLE ID	STA	OFF	NOTES
3B-16	355+47.47	5.97' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-17	353+67.30	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-18	351+87.32	5.31' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
3B-19	350+05.00	58.1' LT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
E4A-19	350+05.27	54.29' RT	REPLACE LUMINAIRE W / LED (400W EQ)
E3B-20	347+95.01	52.63' LT	REPLACE LUMINAIRE W / LED (400W EQ)
4A-18	347+95.84	50.98' RT	RDWY ILL ASSEMBLY 50T-8 (400W LED EQ)
4A-17	346+23.52	4.56' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-16	344+43.35	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)

SUMMARY OF QUANTITIES - SHEET 9 OF 12

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	60
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6009	REMOVE RD IL ASM (TRANS - BASE)	EA	4
0610 6103	REPLACE LUMINAIRE W / LED (400W EQ)	EA	2
0610 6161	IN RD IL AM (TY SA) 30T - 4 - 4 (250W LED)	EA	5
0610 6286	IN RD IL (TY SA) 50T-8 (400W EQ) LED	EA	2
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	585
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	945
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	4755
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	2
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	3
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	7200

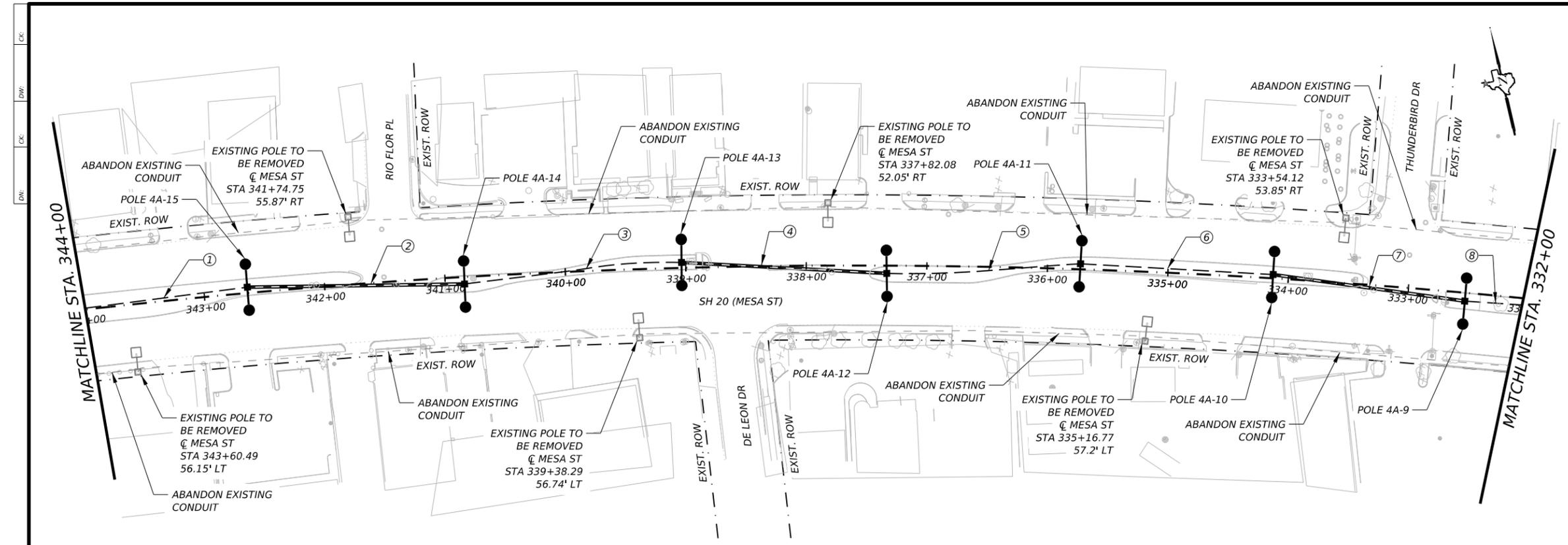


SH 20  
 ILLUMINATION PLAN  
 0001-02-079

SHEET 9 OF 12

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	53	

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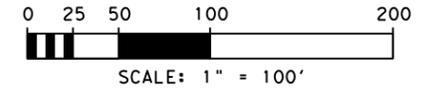


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-8 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW

POLE DESIGNATION	
	POLE OR LUMINAIRE NO.
	CIRCUIT NO.
	SERVICE NO.

EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT-HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TxDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063



RUN NO.	CONDUIT STATUS	CONDUIT		NUMBER OF CONDUCTORS			RUN NO.	
		TRENCH	BORED	CABLE STATUS	**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		LENGTH OF RUN
		PVC SCHED 40 (2")	PVC SCHED 40 (2") (BORE)					
1	I	1		I	1	2	140	1
2	I		1	I	1	2	180	2
3	I	1		I	1	2	180	3
4	I		1	I	1	2	170	4
5	I	1		I	1	2	165	5
6	I	1		I	1	2	160	6
7	I		1	I	1	2	160	7
8	I	1		I	1	2	50	8
TOTAL		695	510		1245	2490		TOTAL

POLE ID	STA	OFF	NOTES
4A-15	342+64.03	4.83' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-14	340+83.99	5.68' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-13	339+03.41	4.53' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-12	337+33.32	6.37' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-11	335+72.69	4.55' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-10	334+12.76	3.16' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-9	332+47.31	6.82' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	56
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6009	REMOVE RD IL ASM (TRANS - BASE)	EA	6
0610 6161	IN RD IL AM (TY SA) 30T - 4 - 4 (250W) LED	EA	7
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	695
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	510
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3735
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	4
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	7200

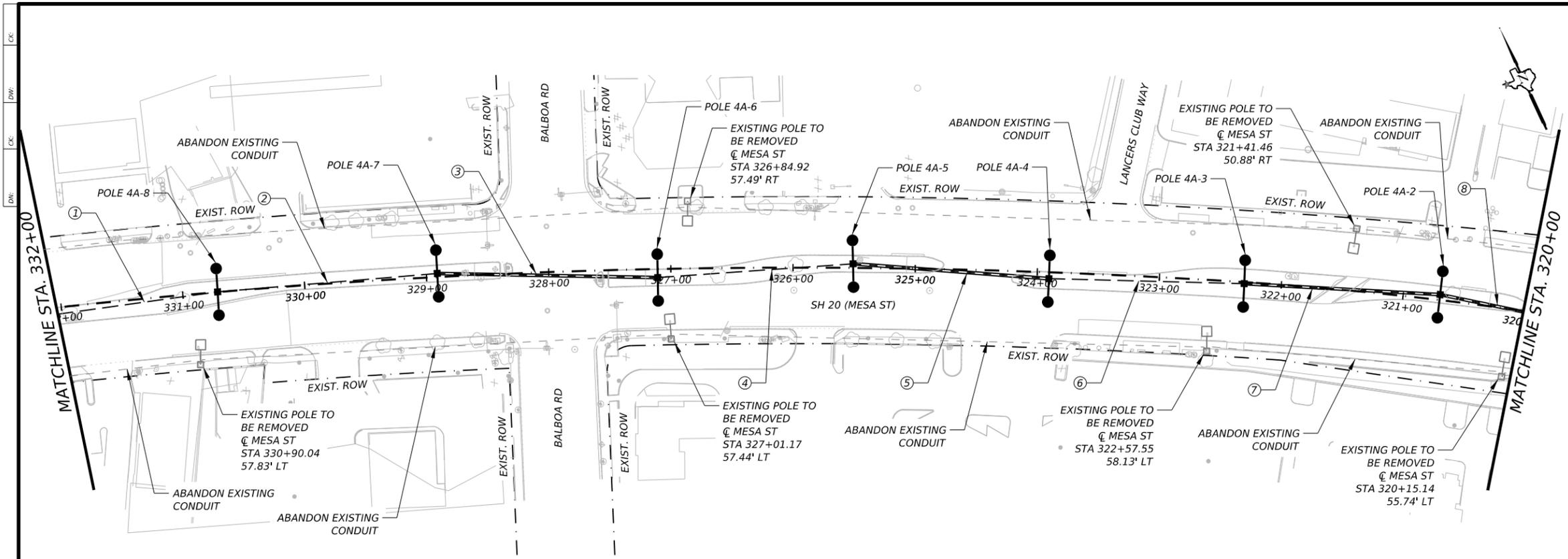
- NOTES:
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.
  - CONTRACTOR SHALL ABANDON EXISTING CONDUIT IN PLACE AS NOTED ON PLANS AND REMOVE EXISTING CABLES IN ACCORDANCE WITH ITEM 6163 6002.
  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.



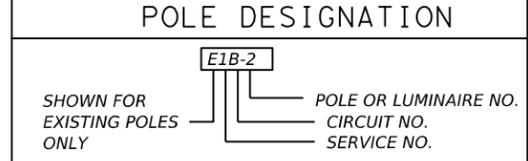
SH 20  
 ILLUMINATION PLAN  
 0001-02-079

SHEET 10 OF 12			
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	54	

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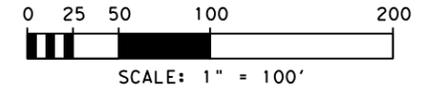


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-8 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW



EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT-HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

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 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TXDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063

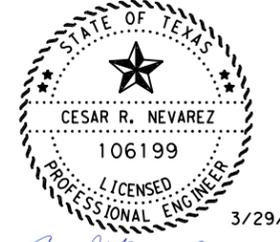


RUN NO.	CONDUIT STATUS	CONDUIT		NUMBER OF CONDUCTORS			RUN NO.	
		TRENCH	BORED	CABLE STATUS	**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		LENGTH OF RUN
1	I	1		I	1	2	135	1
2	I	1		I	1	2	180	2
3	I		1	I	1	2	180	3
4	I	1		I	1	2	160	4
5	I		1	I	1	2	160	5
6	I	1		I	1	2	160	6
7	I		1	I	1	2	160	7
8	I		1	I	1	2	70	8
TOTAL		635	570		1245	2490		TOTAL

POLE ID	STA	OFF	NOTES
4A-8	330+71.44	O.C.	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-7	328+91.04	2.93' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-6	327+10.85	8.11' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-5	325+50.95	3.39' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-4	323+90.63	5.63' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-3	322+30.44	1.21' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
4A-2	320+69.67	4.46' RT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	56
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6009	REMOVE RD IL ASM (TRANS - BASE)	EA	6
0610 6161	IN RD IL AM (TY SA) 30T - 4 - 4 (250W) LED	EA	7
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	635
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	570
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3735
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	3
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	7200

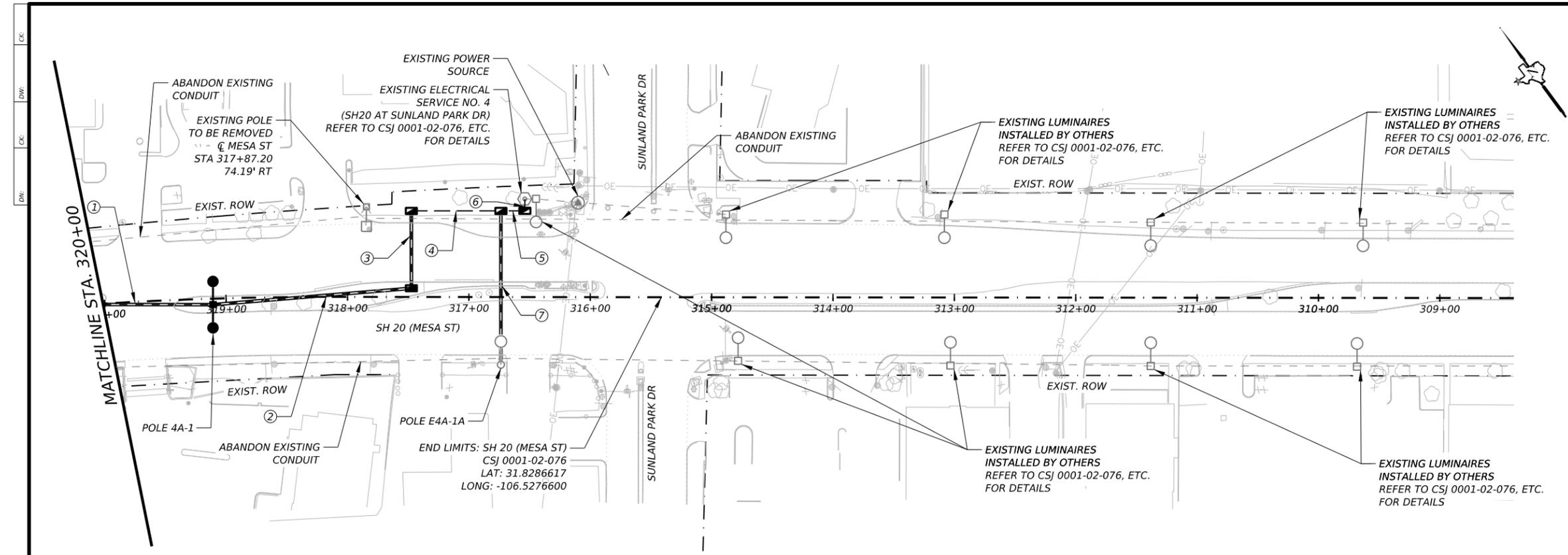
- NOTES:**
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
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  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
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  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.



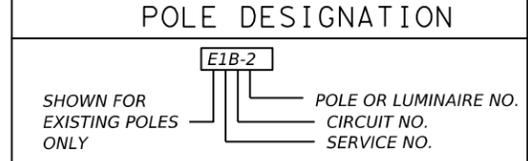
SH 20  
 ILLUMINATION PLAN  
 0001-02-079

SHEET 11 OF 12			
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST		COUNTY	SHEET NO.
ELP		EL PASO	55

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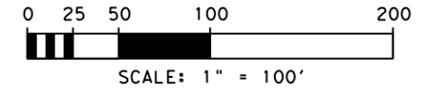


LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-8 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW



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 TxDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063



RUN NO.	CONDUIT STATUS	CONDUIT		NUMBER OF CONDUCTORS			RUN NO.	
		TRENCH	BORED	CABLE STATUS	**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		LENGTH OF RUN
		PVC SCHED 40 (2")	PVC SCHED 40 (2") (BORE)					
1	I		1	I	1	2	90	1
2	I		1	I	1	2	165	2
3	I		1	I	1	2	65	3
4	I	1					75	4
5	I	1					20	5
6	I	1		I	1	2	15	6
7	I		1				125	7
<b>TOTAL</b>		<b>110</b>	<b>445</b>		<b>355</b>	<b>710</b>		<b>TOTAL</b>

STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

POLE ID	STA	OFF	NOTES
4A-1	319+10.73	4.96' LT	RDWY ILL ASSEMBLY 30T-4-4 (250W LED EQ)
E4A-1A	316+75.73	55.53' LT	REPLACE LUMINAIRE W / LED (400W EQ)

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.25
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	8
0531 6001	CONC SIDEWALKS (4")	SY	1
0610 6009	REMOVE RD IL ASM (TRANS - BASE)	EA	1
0610 6103	REPLACE LUMINAIRE W / LED (400W EQ)	EA	1
0610 6161	IN RD IL AM (TY SA) 30T - 4 - 4 (250W) LED	EA	1
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	110
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	445
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	1065
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	4
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	1
6084 6001	MODIFYING EXISTING ELECTRICAL SERVICES	EA	1
6084 6001	MODIFY EXISTING ELECTRICAL SERVICES	EA	1
6163 6002	REMOVE EXISTING CABLES (POWER)	LF	2550

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  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
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  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.



**SH 20  
ILLUMINATION PLAN  
0001-02-079**

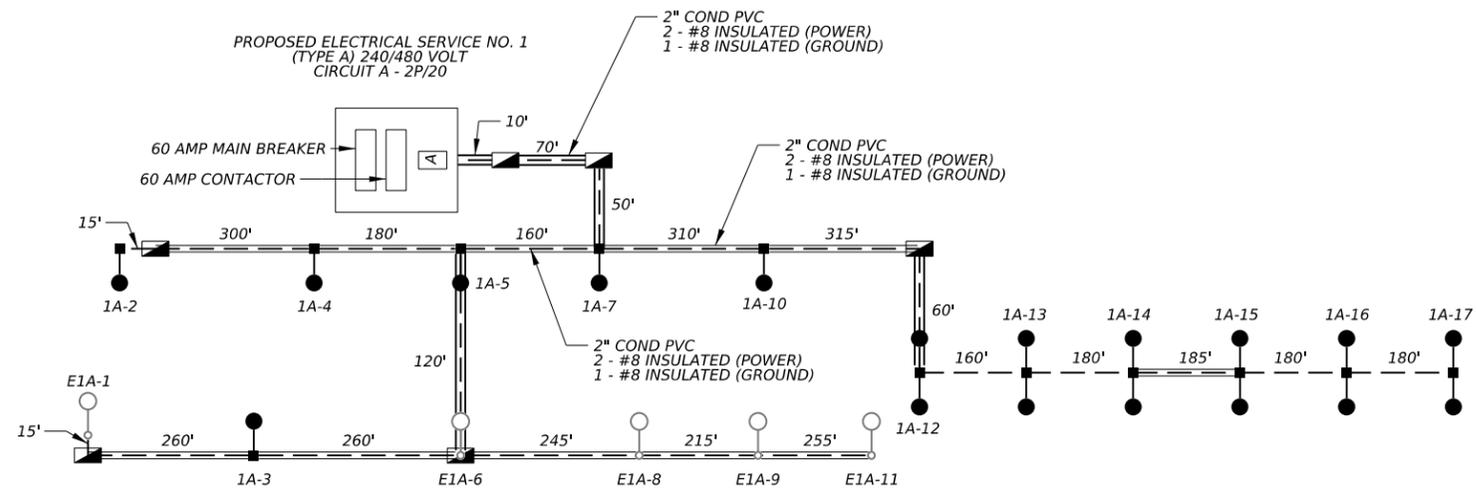
SHEET 12 OF 12

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	56	

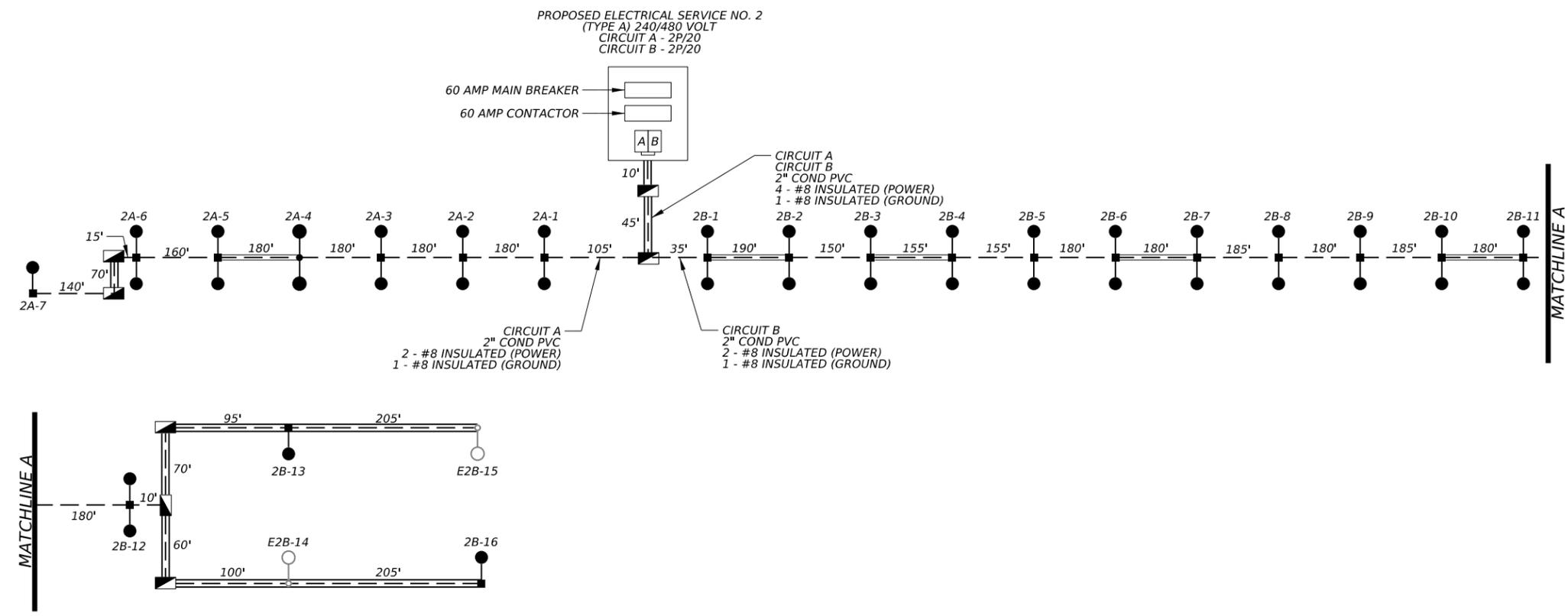
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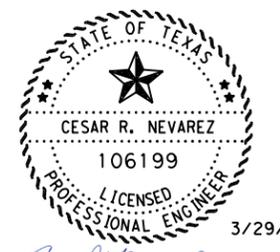
### ELECTRICAL SERVICE 1



### ELECTRICAL SERVICE 2



LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN REPLACE LUMINAIRE W/ LED (400W EQ)
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-8 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW
POLE DESIGNATION	
	E1B-2
SHOWN FOR EXISTING POLES ONLY	POLE OR LUMINAIRE NO. CIRCUIT NO. SERVICE NO.



SH 20  
CIRCUIT DIAGRAM  
0001-02-079

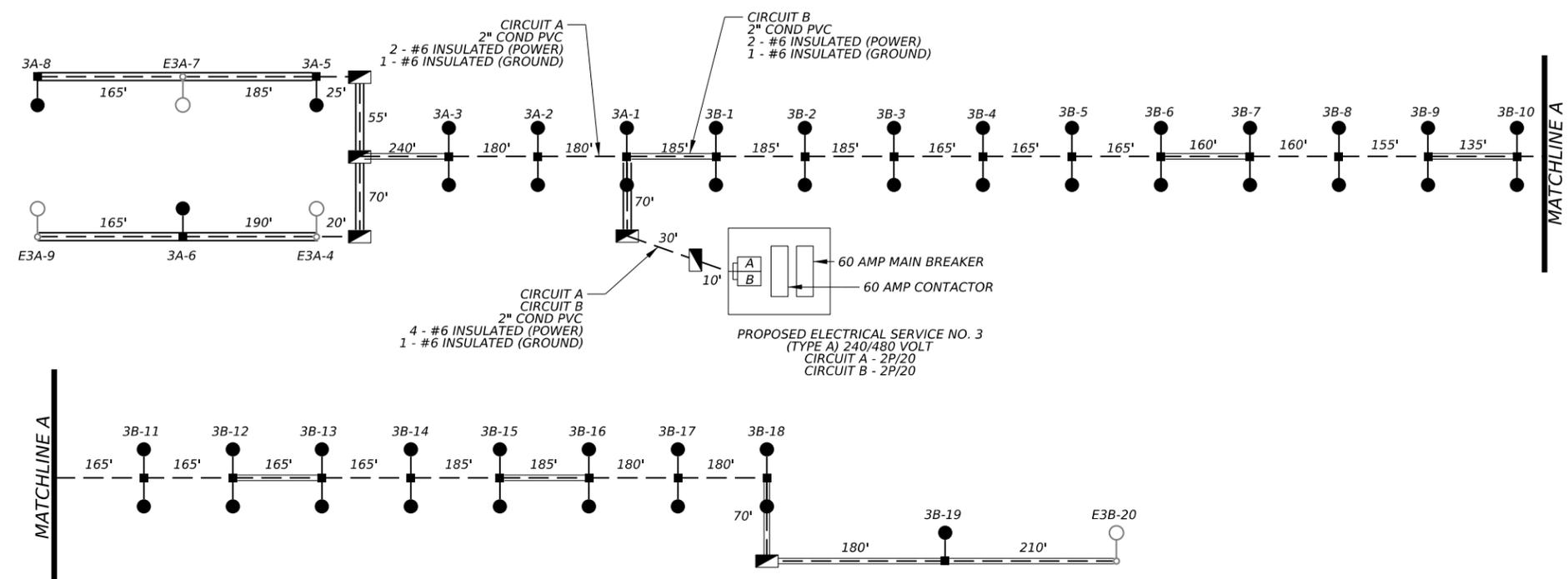
SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	57	

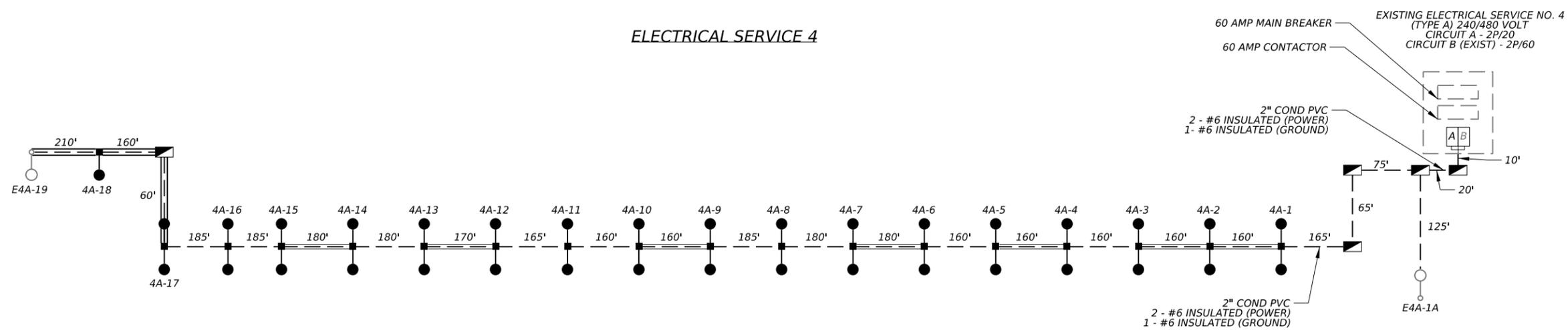
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DW:  
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DN:

**ELECTRICAL SERVICE 3**



**ELECTRICAL SERVICE 4**



LEGEND	
	EXISTING RDWY ILL ASSEMBLY
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-8 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT
	EXISTING ROW

POLE DESIGNATION	
	POLE OR LUMINAIRE NO.
	CIRCUIT NO.
	SERVICE NO.

SHOWN FOR EXISTING POLES ONLY

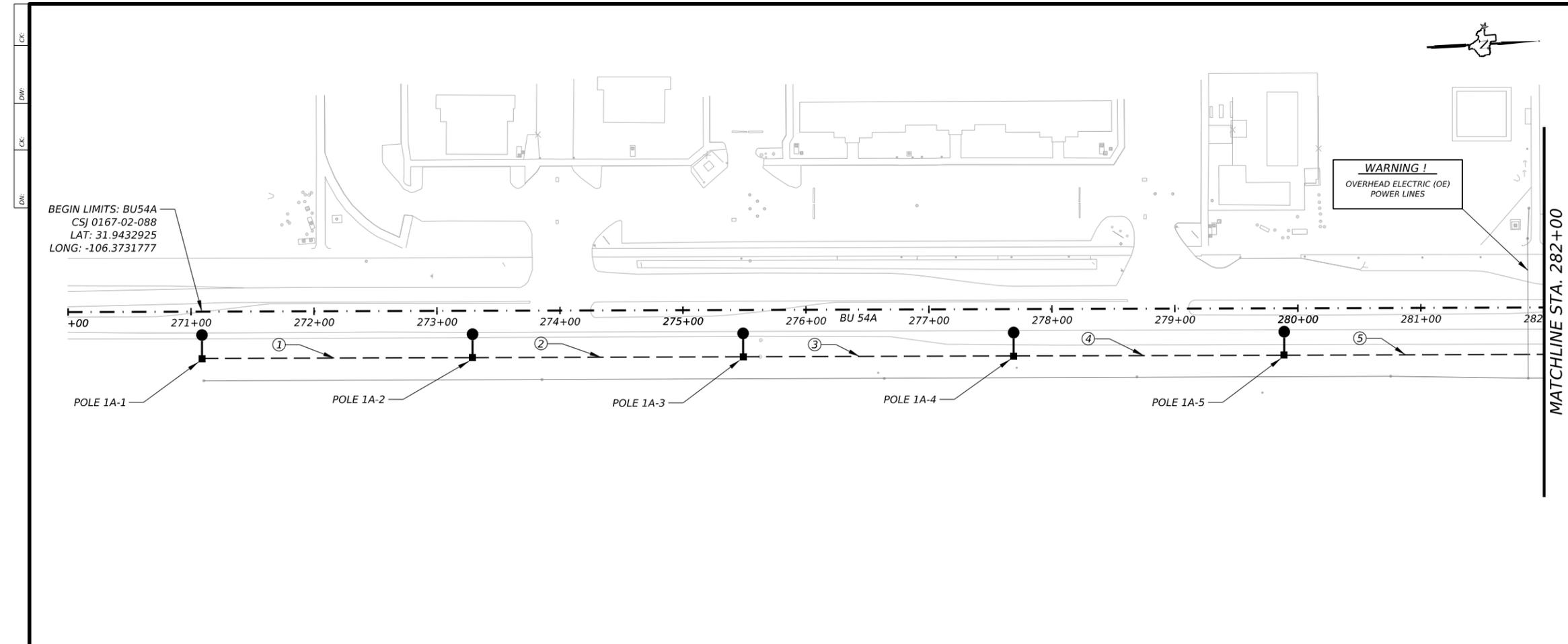


SH 20  
CIRCUIT DIAGRAM  
0001-02-079

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	58	

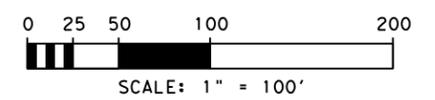
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FILE: WA4\_SH20\_CD02.dgn



BEGIN LIMITS: BU54A  
 CSJ 0167-02-088  
 LAT: 31.9432925  
 LONG: -106.3731777

LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-12 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	EXISTING CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT (BORE)
	EXISTING ROW

POLE DESIGNATION	
	E1B-2
SHOWN FOR EXISTING POLES ONLY	POLE OR LUMINAIRE NO. CIRCUIT NO. SERVICE NO.



RUN NO.	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
	CONDUIT STATUS	ITEM 618 SIZE / TYPE CONDUIT		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1	I	1	2	225	1
2	I	1	I	1	2	225	2
3	I	1	I	1	2	225	3
4	I	1	I	1	2	225	4
5	I	1	I	1	2	215	5
TOTAL		1115		1140	2280		TOTAL

STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

POLE ID	STA	OFF	NOTES
1A-1	271+08.77	38.06' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
1A-2	273+28.77	38.06' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
1A-3	275+48.77	38.06' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
1A-4	277+68.77	38.06' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
1A-5	279+88.77	38.06' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)

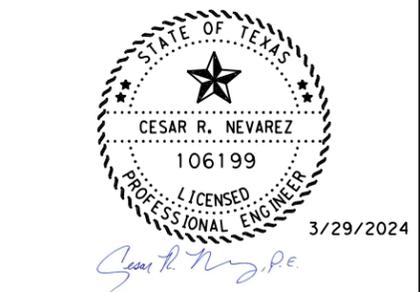
ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	40
0610 6290	IN RD IL (TY SA) 50T-12 (400W EQ) LED	EA	5
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	1115
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3420

- NOTES:
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.
  - CONTRACTOR SHALL REMOVE ALL EXISTING ILLUMINATION CABLES FROM ABANDONED AND PREPARED CONDUIT.
  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

SHEET QUANTITIES ARE APPROXIMATE  
 PENDING RECEIPT OF AS-BUILTS.

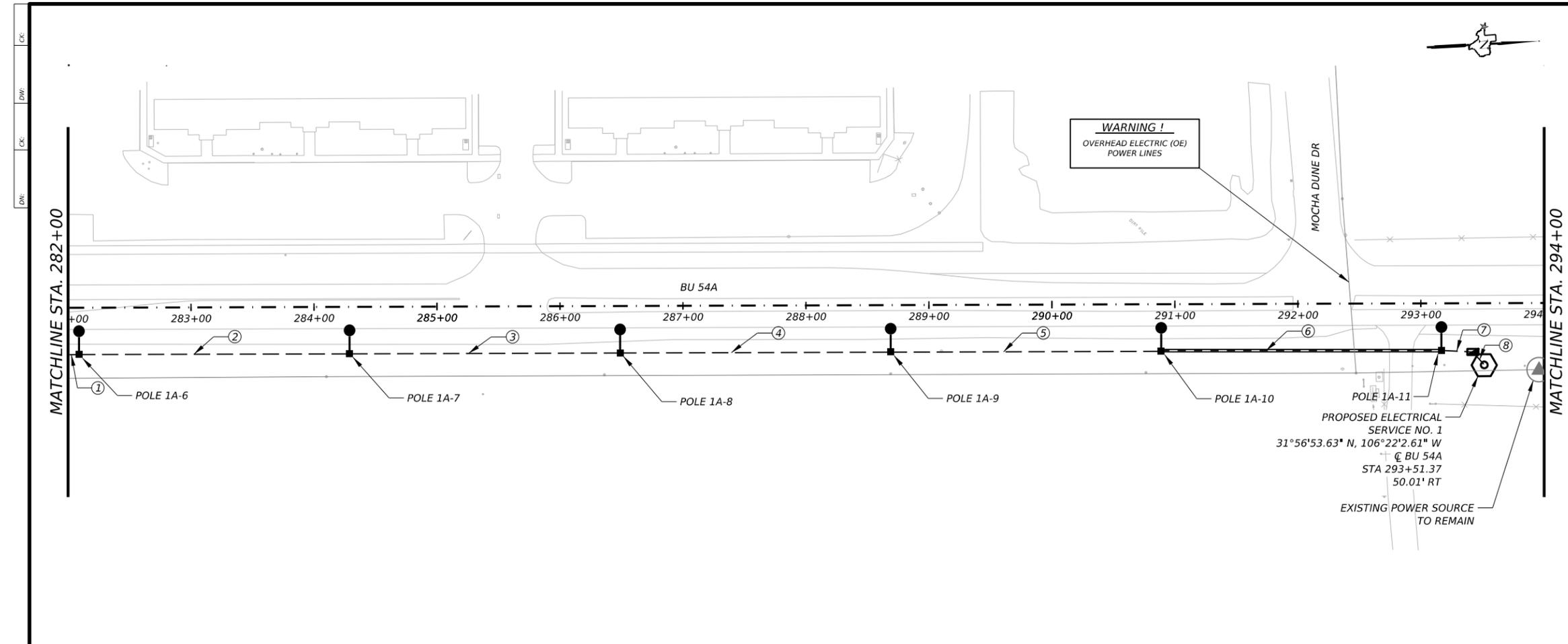
EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TXDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063



BU 54A ILLUMINATION PLAN 0167-02-088			
SHEET 1 OF 10			
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	59	

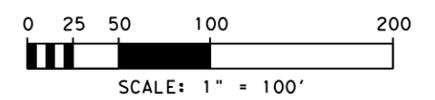
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LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-12 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	EXISTING CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT (BORE)
	EXISTING ROW

POLE DESIGNATION	
	POLE OR LUMINAIRE NO.
	CIRCUIT NO.
	SERVICE NO.

SHOWN FOR EXISTING POLES ONLY



RUN NO.	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.	
	ITEM 618 SIZE / TYPE CONDUIT			ITEM 620 ELECTRICAL CONDUCTORS				
	TRENCH	BORED		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)			
1	I	1	I	1	2	10	1	
2	I	1	I	1	2	225	2	
3	I	1	I	1	2	225	3	
4	I	1	I	1	2	225	4	
5	I	1	I	1	2	225	5	
6	I	1	I	1	2	230	6	
7	I	1	I	1	2	30	7	
8	I	1	I	1	2	15	8	
TOTAL		925	230			1225	2450	TOTAL

STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

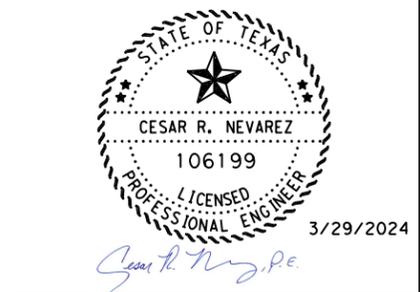
POLE ID	STA	OFF	NOTES
1A-6	282+08.77	38.06' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
1A-7	284+28.77	38.06' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
1A-8	286+48.77	38.06' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
1A-9	288+68.77	38.06' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
1A-10	290+88.77	38.06' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
1A-11	293+16.60	38.54' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	48
0610 6290	IN RD IL (TY SA) 50T-12 (400W EQ) LED	EA	6
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	925
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	230
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3675
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	1
0628 6041	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	EA	1

- NOTES:
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
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  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

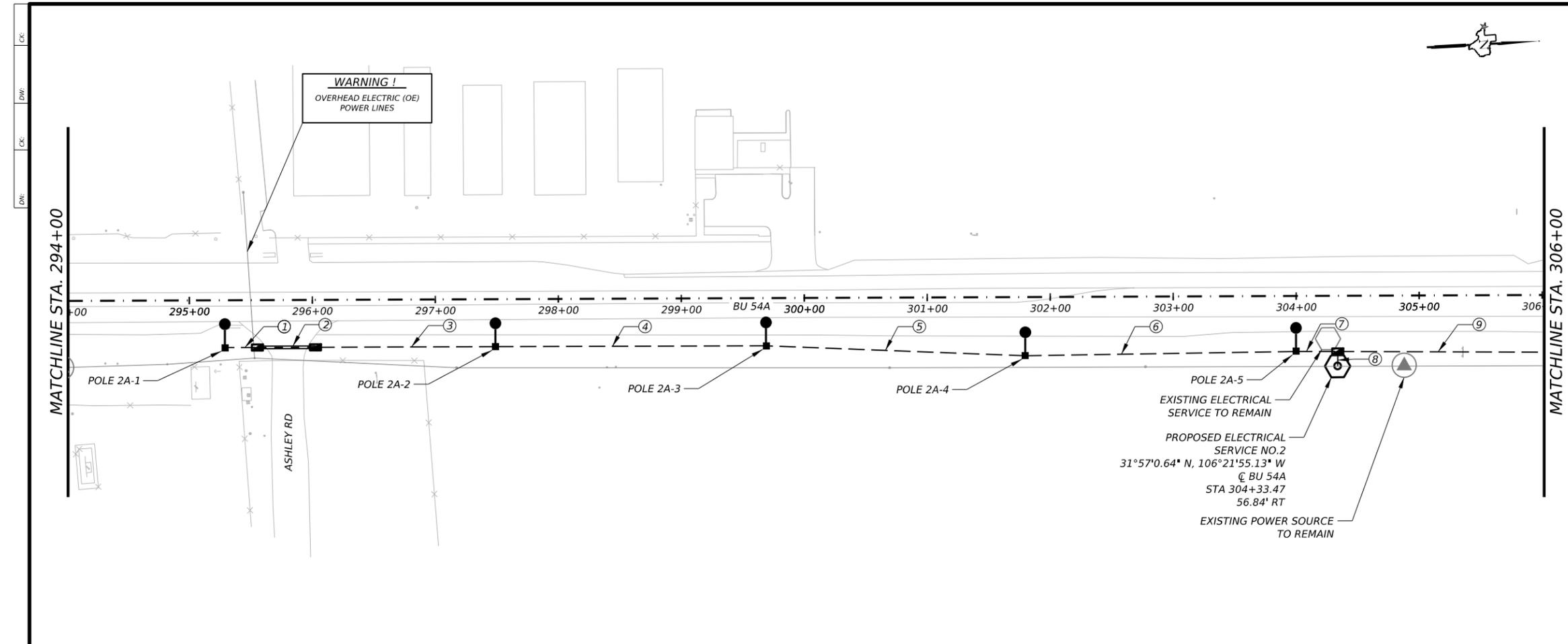
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**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TXDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063

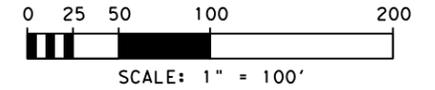
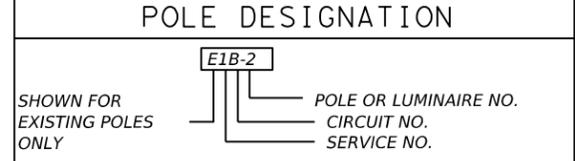


<b>BU 54A ILLUMINATION PLAN</b> 0167-02-088			
SHEET 2 OF 10			
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	60	

DATE: 3/29/2024 1:43:52 AM  
FILE: BU54\_ILLO2.dgn



LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-12 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	EXISTING CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT (BORE)
	EXISTING ROW



CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 3 OF 10

RUN NO.	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
	ITEM 618 SIZE / TYPE CONDUIT			ITEM 620 ELECTRICAL CONDUCTORS			
	TRENCH	BORED		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1	I	1	2	30	1
2	I	1	I	1	2	50	2
3	I	1	I	1	2	150	3
4	I	1	I	1	2	225	4
5	I	1	I	1	2	215	5
6	I	1	I	1	2	225	6
7	I	1	I	1	2	35	7
8	I	1	I	1	4	15	8
9	I	1	I	1	2	170	9
TOTAL		1065	50		1160	2360	TOTAL

POLE SCHEDULE

POLE ID	STA	OFF	NOTES
2A-1	295+28.73	38.32' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2A-2	297+48.73	38.52' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2A-3	299+68.73	38.73' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2A-4	301+79.55	47.54' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2A-5	303+99.62	44.92' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)

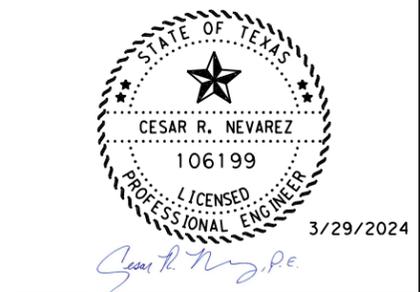
SUMMARY OF QUANTITIES - SHEET 3 OF 10

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	40
0610 6290	IN RD IL (TY SA) 50T-12 (400W EQ) LED	EA	5
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	1065
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	50
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3520
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	3
0628 6041	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	EA	1

- NOTES:
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  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
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 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TXDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063

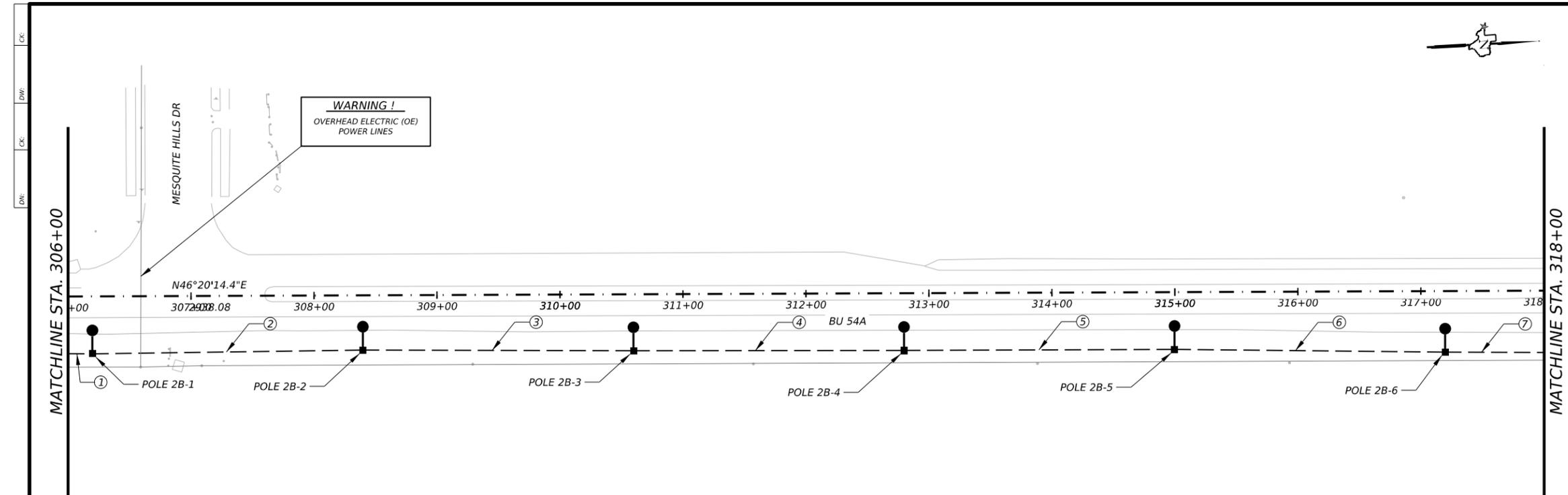


**BU 54A ILLUMINATION PLAN**  
0167-02-088

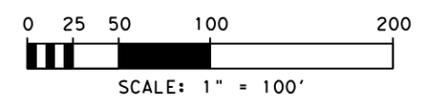
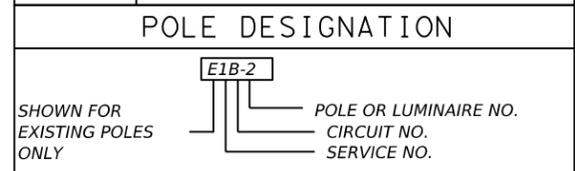
SHEET 3 OF 10

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	61	

DATE: 3/29/2024 1:44:16 AM  
 FILE: BU54\_ILLO3.dgn



LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-12 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	EXISTING CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT (BORE)
	EXISTING ROW



CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 4 OF 10

RUN NO.	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
	CONDUIT STATUS	ITEM 618 SIZE / TYPE CONDUIT		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1	I	1	2	20	1
2	I	1	I	1	2	225	2
3	I	1	I	1	2	225	3
4	I	1	I	1	2	225	4
5	I	1	I	1	2	225	5
6	I	1	I	1	2	165	6
7	I	1	I	1	2	85	7
TOTAL		1170		1205	2410		TOTAL

POLE SCHEDULE

POLE ID	STA	OFF	NOTES
2B-1	306+19.62	46.52' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-2	308+39.62	44.44' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-3	310+59.62	45.79' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-4	312+79.62	46.41' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-5	314+99.62	46.50' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-6	317+19.62	49.53' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)

SUMMARY OF QUANTITIES - SHEET 4 OF 10

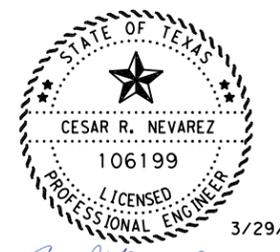
ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	48
0610 6290	IN RD IL (TY SA) 50T-12 (400W EQ) LED	EA	6
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	1170
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3615

- NOTES:
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
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  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.
  - CONTRACTOR SHALL REMOVE ALL EXISTING ILLUMINATION CABLES FROM ABANDONED AND PREPARED CONDUIT.
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STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

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 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TXDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063

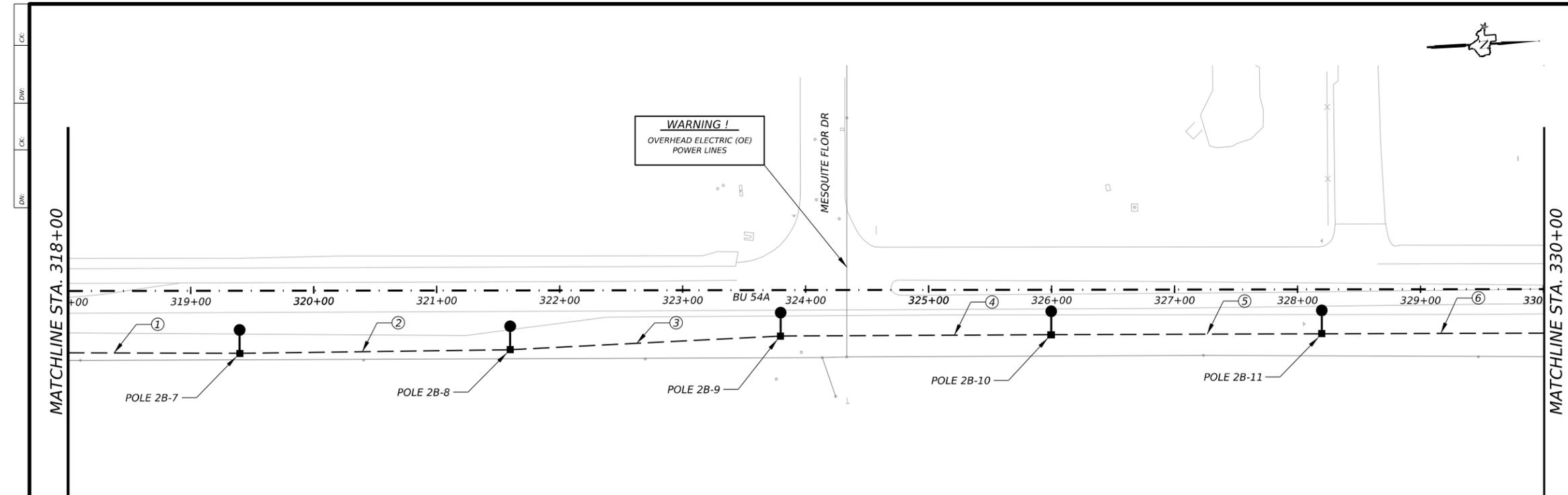


**BU 54A  
 ILLUMINATION PLAN  
 0167-02-088**

SHEET 4 OF 10

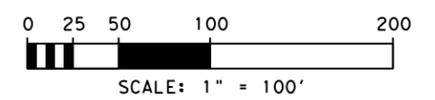
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	62	

DATE: 3/29/2024 1:44:42 AM  
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LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-12 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	EXISTING CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT (BORE)
	EXISTING ROW

POLE DESIGNATION	
	E1B-2
SHOWN FOR EXISTING POLES ONLY	POLE OR LUMINAIRE NO. CIRCUIT NO. SERVICE NO.



RUN NO.	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
	CONDUIT STATUS	ITEM 618 SIZE / TYPE CONDUIT		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1	I	1	2	140	1
2	I	1	I	1	2	225	2
3	I	1	I	1	2	225	3
4	I	1	I	1	2	225	4
5	I	1	I	1	2	225	5
6	I	1	I	1	2	185	6
TOTAL		1225		1255	2510		TOTAL

STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

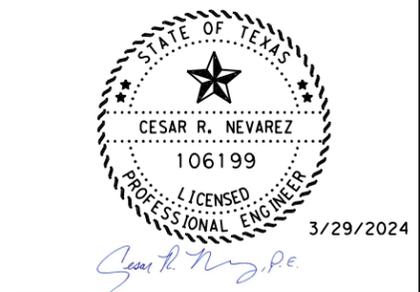
POLE ID	STA	OFF	NOTES
2B-7	319+39.62	51.22' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-8	321+59.62	49.11' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-9	323+79.79	38.13' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-10	325+99.78	37.02' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-11	328+19.80	36.25' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	40
0610 6290	IN RD IL (TY SA) 50T-12 (400W EQ) LED	EA	5
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	1225
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3765

- NOTES:
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.
  - CONTRACTOR SHALL REMOVE ALL EXISTING ILLUMINATION CABLES FROM ABANDONED AND PREPARED CONDUIT.
  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

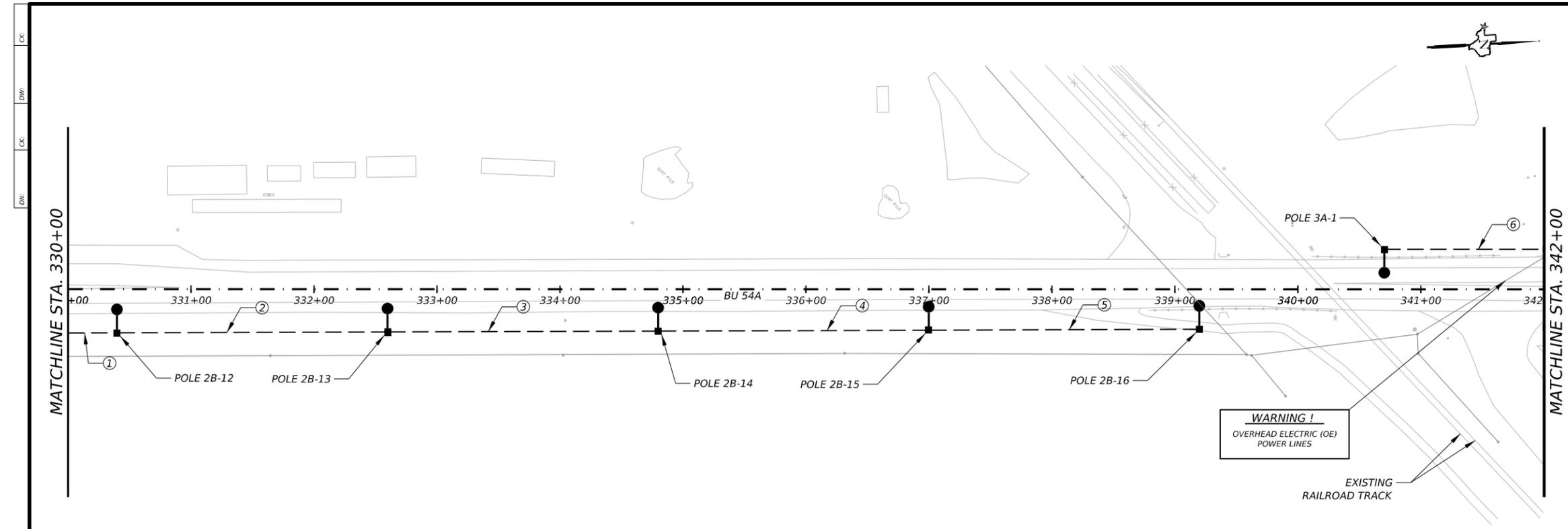
EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TXDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063



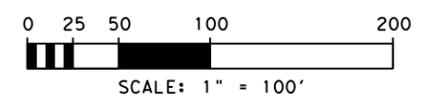
BU 54A ILLUMINATION PLAN 0167-02-088			
SHEET 5 OF 10			
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	63	

DATE: 3/29/2024 1:45:02 AM  
 FILE: BU54\_ILLO5.dgn



LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-12 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	EXISTING CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT (BORE)
	EXISTING ROW

POLE DESIGNATION	
	E1B-2
SHOWN FOR EXISTING POLES ONLY	POLE OR LUMINAIRE NO. CIRCUIT NO. SERVICE NO.



RUN NO.	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
	CONDUIT STATUS	ITEM 618 SIZE / TYPE CONDUIT		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1	I	1	2	40	1
2	I	1	I	1	2	225	2
3	I	1	I	1	2	225	3
4	I	1	I	1	2	225	4
5	I	1	I	1	2	225	5
6	I	1	I	1	2	130	6
TOTAL		1070		1100	2200		TOTAL

STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

POLE ID	STA	OFF	NOTES
2B-12	330+39.82	35.49' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-13	332+59.84	34.73' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-14	334+79.86	33.96' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-15	336+99.87	33.20' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
2B-16	339+19.89	32.43' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-1	340+70.32	32.46' LT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	48
0610 6290	IN RD IL (TY SA) 50T-12 (400W EQ) LED	EA	6
0618 6023	COND'T (PVC) (SCH 40) (2")	LF	1070
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3300

- NOTES:
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
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  - CONTRACTOR SHALL REMOVE ALL EXISTING ILLUMINATION CABLES FROM ABANDONED AND PREPARED CONDUIT.
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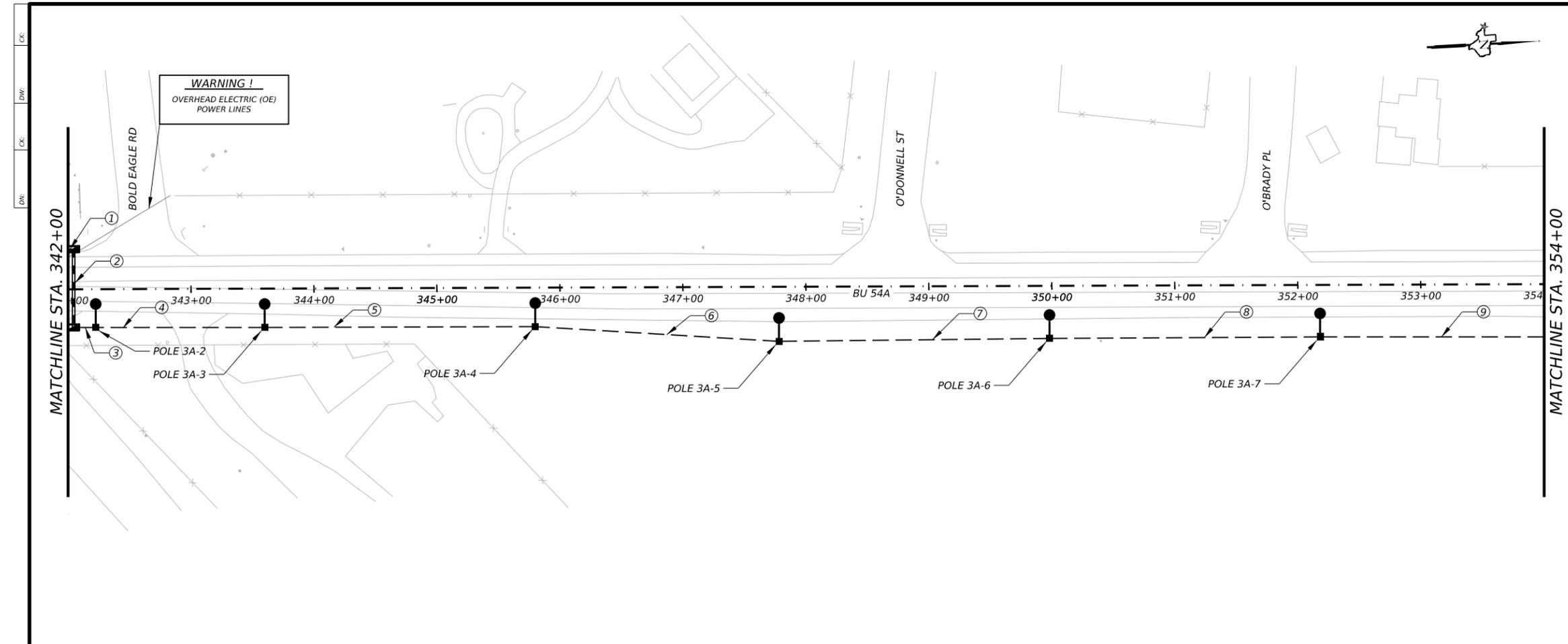
**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TxDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063



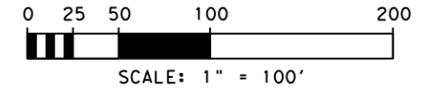
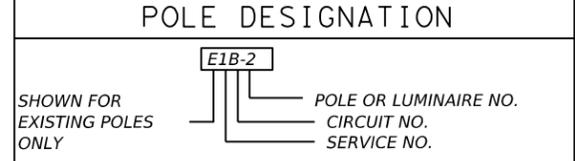
BU 54A  
 ILLUMINATION PLAN  
 0167-02-088

SHEET 6 OF 10			
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST		COUNTY	SHEET NO.
ELP		EL PASO	64

DATE: 3/29/2024 1:45:24 AM  
 FILE: BU54\_ILLO6.dgn



LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-12 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	EXISTING CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT (BORE)
	EXISTING ROW



CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 7 OF 10

RUN NO.	CONDUIT STATUS	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
		ITEM 618 SIZE / TYPE CONDUIT			ITEM 620 ELECTRICAL CONDUCTORS			
		TRENCH	BORED		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1		I	1	2	5	1
2	I		1	I	1	2	65	2
3	I	1		I	1	2	20	3
4	I	1		I	1	2	140	4
5	I	1		I	1	2	225	5
6	I	1		I	1	2	200	6
7	I	1		I	1	2	225	7
8	I	1		I	1	2	225	8
9	I	1		I	1	2	185	9
TOTAL		1225	65		1335	2670		TOTAL

POLE SCHEDULE

POLE ID	STA	OFF	NOTES
3A-2	342+22.53	30.93' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-3	343+59.81	31.20' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-4	345+79.83	31.30' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-5	347+77.99	44.08' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-6	349+97.99	42.51' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-7	352+17.99	42.10' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)

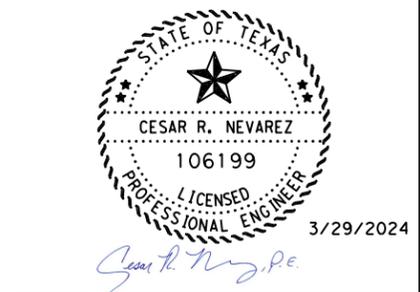
SUMMARY OF QUANTITIES - SHEET 7 OF 10

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	48
0610 6290	IN RD IL (TY SA) 50T-12 (400W EQ) LED	EA	6
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	1225
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	65
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	4005
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	2

- NOTES:
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.
  - CONTRACTOR SHALL REMOVE ALL EXISTING ILLUMINATION CABLES FROM ABANDONED AND PREPARED CONDUIT.
  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TXDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063

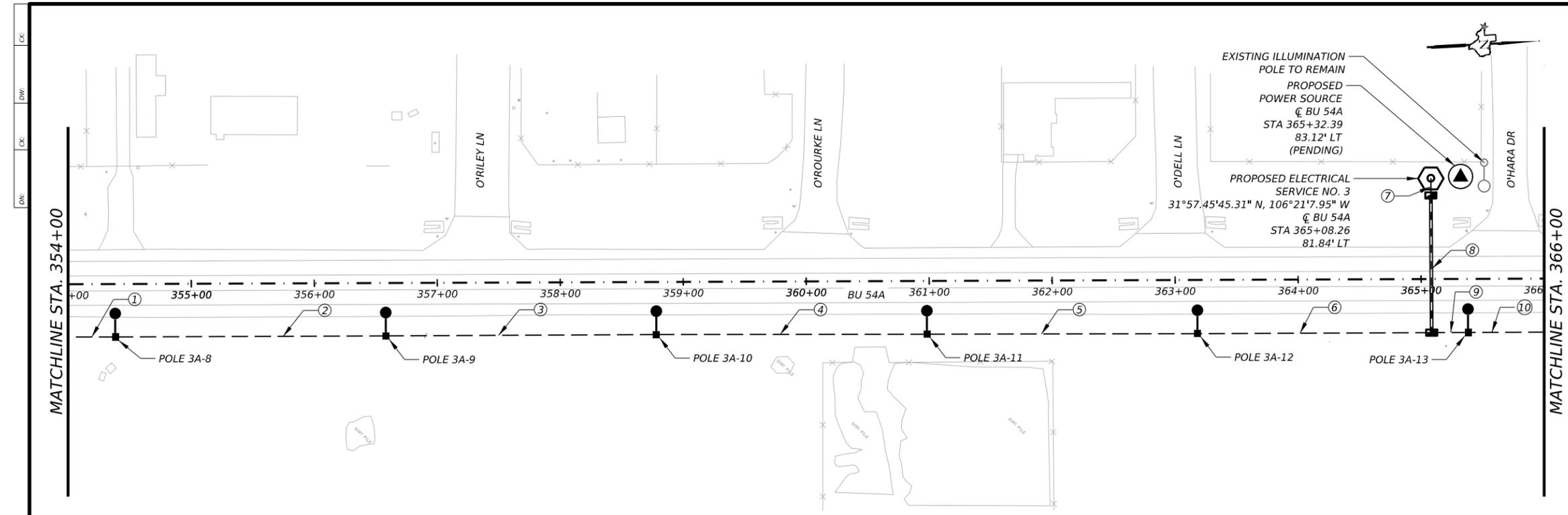


BU 54A  
ILLUMINATION PLAN  
0167-02-088

SHEET 7 OF 10

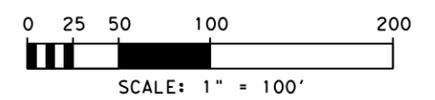
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	65	

DATE: 3/29/2024 1:45:43 AM  
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LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-12 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	EXISTING CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT (BORE)
	EXISTING ROW

POLE DESIGNATION	
	E1B-2
SHOWN FOR EXISTING POLES ONLY	POLE OR LUMINAIRE NO. CIRCUIT NO. SERVICE NO.



RUN NO.	CONDUIT STATUS	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
		ITEM 618 SIZE / TYPE CONDUIT			ITEM 620 ELECTRICAL CONDUCTORS			
		TRENCH	BORED		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1		I	1	2	45	1
2	I	1		I	1	2	225	2
3	I	1		I	1	2	225	3
4	I	1		I	1	2	225	4
5	I	1		I	1	2	225	5
6	I	1		I	1	2	195	6
7	I	1		I	1	4	15	7
8	I		1	I	1	4	115	8
9	I	1		I	1	4	30	9
10	I	1		I	1	4	65	10
TOTAL		1250	115		1415	3320		TOTAL

STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

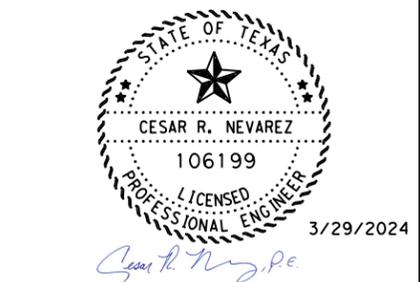
POLE ID	STA	OFF	NOTES
3A-8	354+37.99	42.97' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-9	356+57.99	43.02' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-10	358+77.99	42.72' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-11	360+97.99	43.25' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-12	363+17.99	43.61' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-13	365+37.99	43.52' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	48
0610 6290	IN RD IL (TY SA) 50T-12 (400W EQ) LED	EA	6
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	1250
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	115
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	4735
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	2
0628 6041	ELC SRV TY A 240 / 480 060 (NS) SS (E) GC (O)	EA	1

- NOTES:
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
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  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
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  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

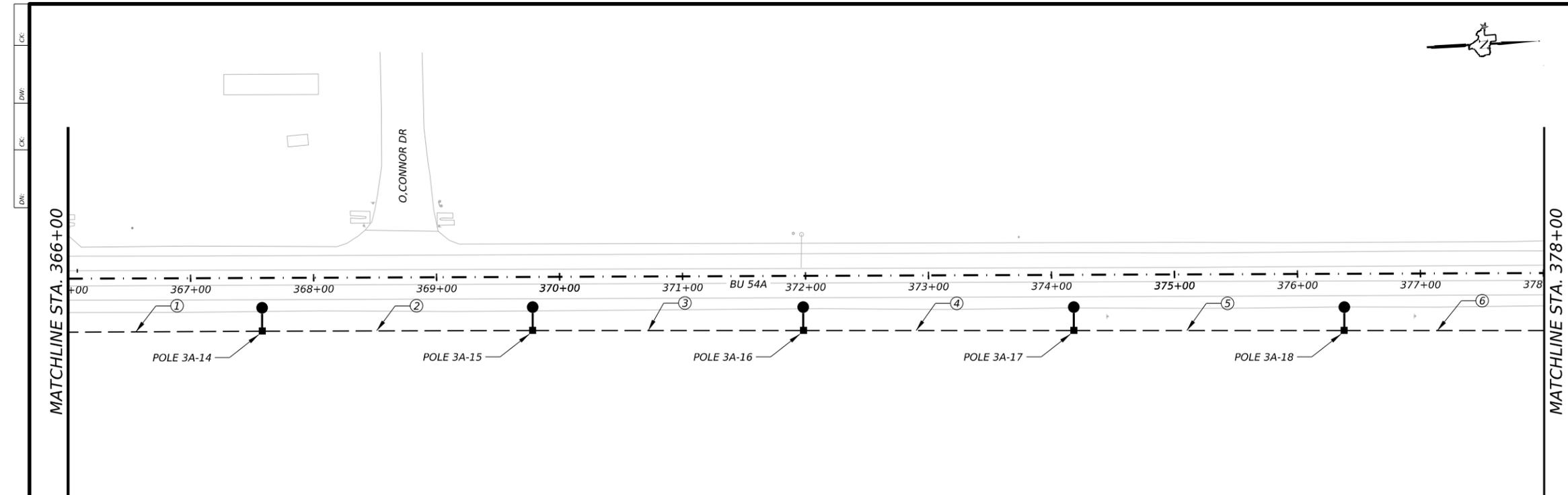
EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TXDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063

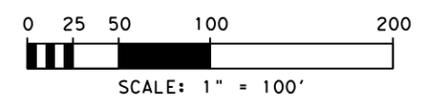
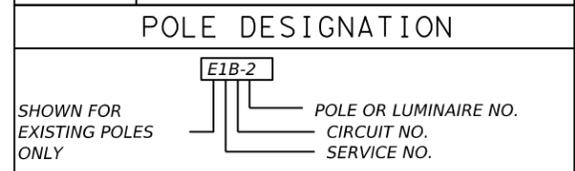


BU 54A ILLUMINATION PLAN 0167-02-088			
SHEET 8 OF 10			
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	66	

DATE: 3/29/2024 1:46:05 AM  
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LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-12 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	EXISTING CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT (BORE)
	EXISTING ROW



CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 9 OF 10

RUN NO.	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
	CONDUIT STATUS	ITEM 618 SIZE / TYPE CONDUIT		ITEM 620 ELECTRICAL CONDUCTORS			
		TRENCH		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1	I	1	4	160	1
2	I	1	I	1	4	225	2
3	I	1	I	1	4	225	3
4	I	1	I	1	4	225	4
5	I	1	I	1	4	225	5
6	I	1	I	1	4	165	6
TOTAL		1225		1255	5020		TOTAL

POLE SCHEDULE

POLE ID	STA	OFF	NOTES
3A-14	367+57.99	43.23' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-15	369+77.99	43.54' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-16	371+97.99	44.37' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-17	374+17.99	45.20' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-18	376+37.99	46.03' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)

SUMMARY OF QUANTITIES - SHEET 9 OF 10

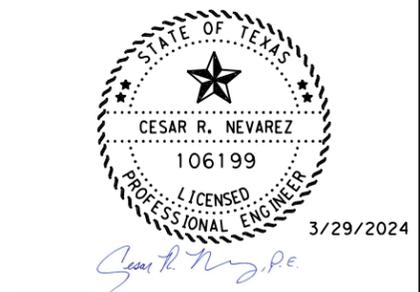
ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	40
0610 6290	IN RD IL (TY SA) 50T-12 (400W EQ) LED	EA	5
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	1225
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	6275

- NOTES:
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.
  - CONTRACTOR SHALL REMOVE ALL EXISTING ILLUMINATION CABLES FROM ABANDONED AND PREPARED CONDUIT.
  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

STATUS: E=EXISTING, I=INSTALL SEE NOTE 9 FOR CONDUIT STATUS "E".  
 \*\* INCLUDES 5 FT SLACK PER CABLE

EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POT-HOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TxDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063

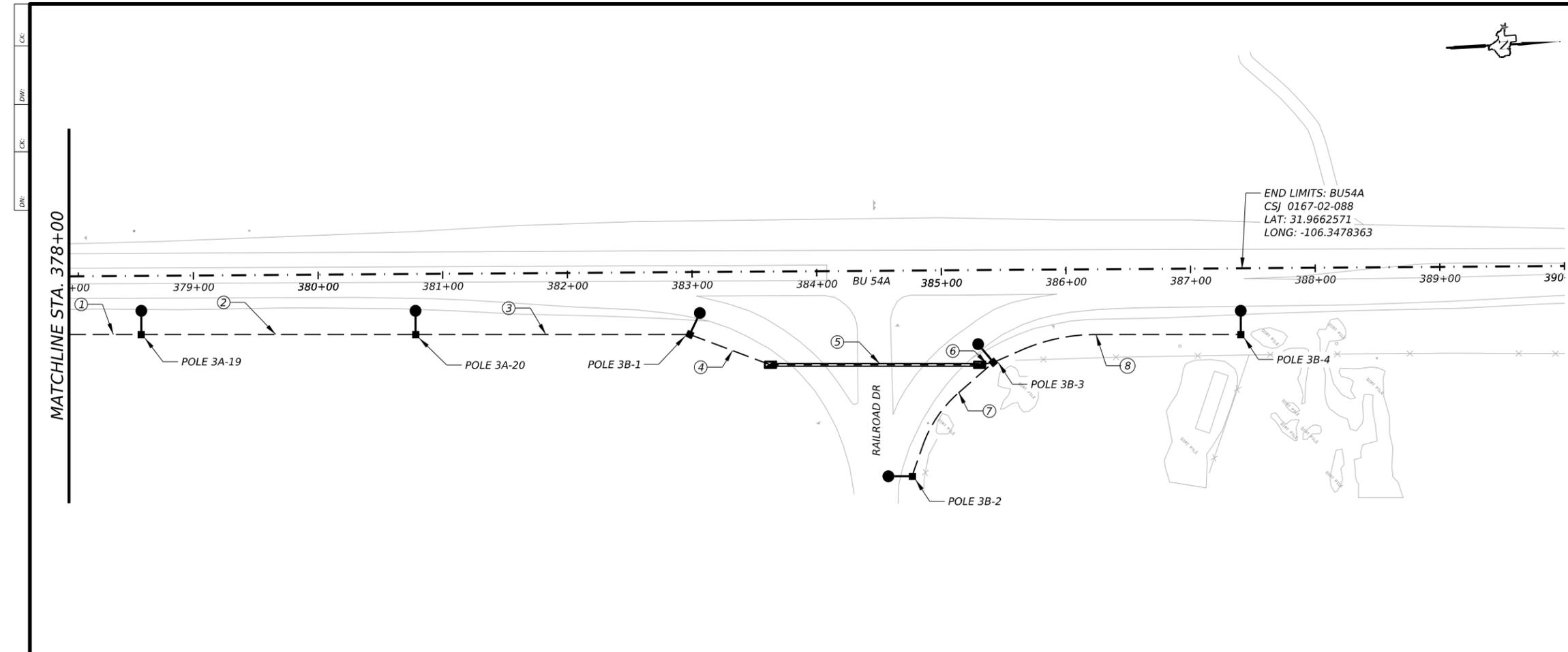


**BU 54A  
ILLUMINATION PLAN  
0167-02-088**

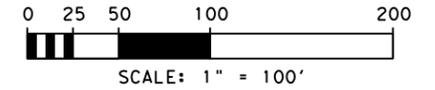
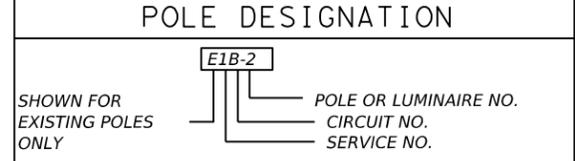
SHEET 9 OF 10

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	67	

DATE: 3/29/2024 1:46:39 AM  
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LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-12 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	EXISTING CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT (BORE)
	EXISTING ROW



**CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 10 OF 10**

RUN NO.	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH OF RUN	RUN NO.
	ITEM 618 SIZE / TYPE CONDUIT			ITEM 620 ELECTRICAL CONDUCTORS			
	TRENCH	BORED		**NO. 8 XHHW (INSULATED) (GROUND)	**NO. 8 XHHW (INSULATED) (POWER)		
1	I	1	I	1	4	60	1
2	I	1	I	1	4	225	2
3	I	1	I	1	2	225	3
4	I	1	I	1	2	70	4
5	I	1	I	1	2	170	5
6	I	1	I	1	2	15	6
7	I	1	I	1	2	120	7
8	I	1	I	1	2	205	8
<b>TOTAL</b>		920		1130	2850		<b>TOTAL</b>

**POLE SCHEDULE**

POLE ID	STA	OFF	NOTES
3A-19	378+57.99	46.86' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3A-20	380+77.99	47.70' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3B-1	382+97.74	48.63' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3B-2	384+75.08	163.70' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3B-3	385+41.10	73.07' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)
3B-4	387+39.81	52.54' RT	RDWY ILL ASSEMBLY 50T-12 (400W LED EQ)

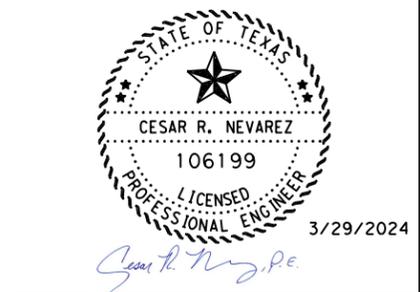
**SUMMARY OF QUANTITIES - SHEET 10 OF 10**

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	48
0610 6290	IN RD IL (TY SA) 50T-12 (400W EQ) LED	EA	6
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	920
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	170
0620 6008	ELEC CONDR (NO.8) INSULATED	LF	3980
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	2

- NOTES:**
- THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
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  - CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL EXISTING ILLUMINATION INFRASTRUCTURE.

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**WARNING ! BEFORE YOU DIG**  
 NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
 TXDOT: (915) 790-4245 CITY OF EL PASO: (915) 212-7063



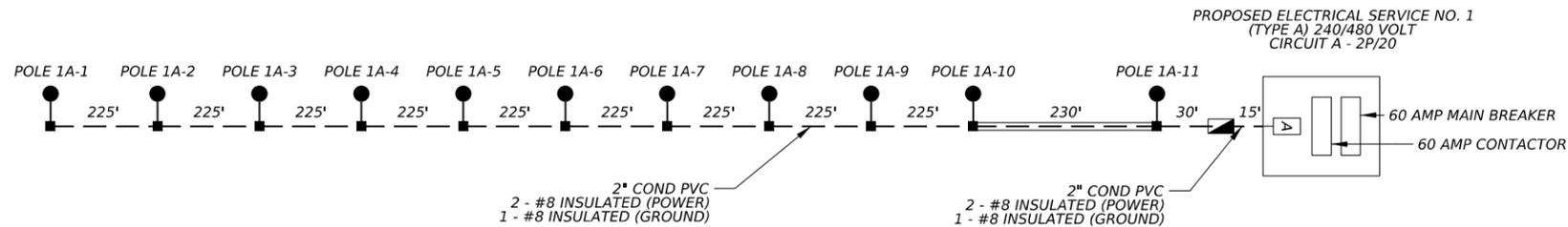
**BU 54A ILLUMINATION PLAN 0167-02-088**

SHEET 10 OF 10

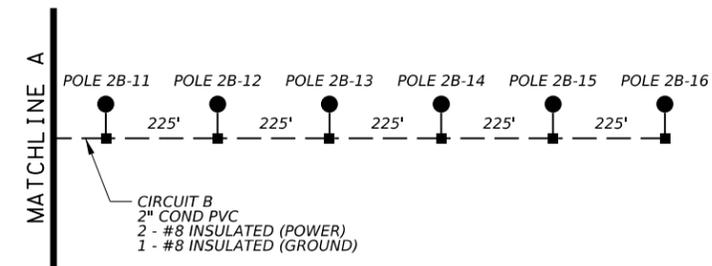
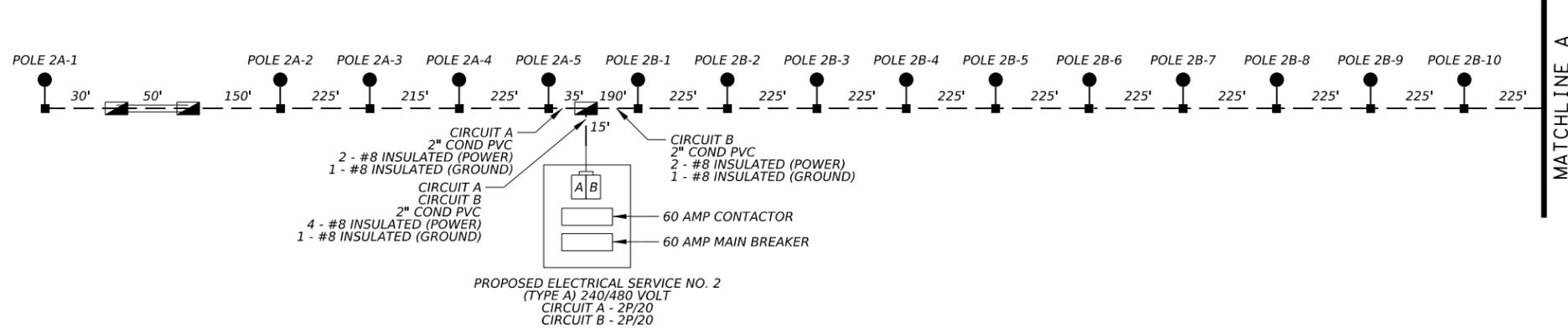
CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	68	

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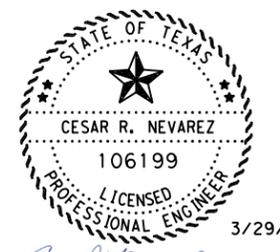
**ELECTRICAL SERVICE NO. 1**



**ELECTRICAL SERVICE NO. 2**



LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO BE REMOVED
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 50T-12 (400W EQ) LED
	PROPOSED RDWY ILL ASSEMBLY IN RD IL (TY SA) 30T-4-4 (250W EQ) LED
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	PROPOSED POWER SOURCE
	CONDUIT RUN NUMBER
	PROPOSED GROUND BOX TY A (W/APRON)
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	PROPOSED CONDUIT (TRENCHED)
	EXISTING CONDUIT (TRENCHED)
	PROPOSED CONDUIT (BORE)
	EXISTING CONDUIT (BORE)
	EXISTING ROW
POLE DESIGNATION	
	E1B-2
SHOWN FOR EXISTING POLES ONLY	POLE OR LUMINAIRE NO. CIRCUIT NO. SERVICE NO.



**BU 54A  
CIRCUIT DIAGRAM  
0167-02-088**

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0001	02	079, ETC.	SH 20, ETC.
DIST		COUNTY	SHEET NO.
ELP		EL PASO	69

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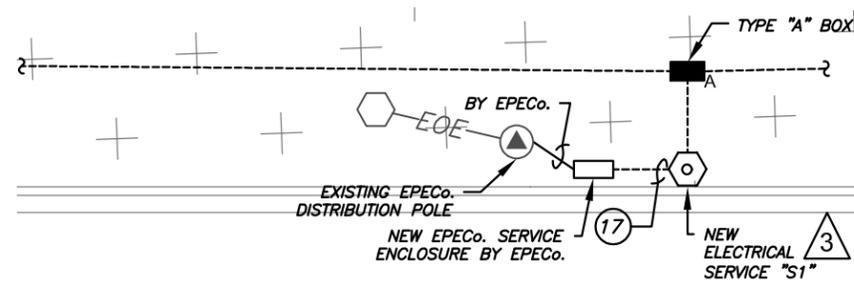
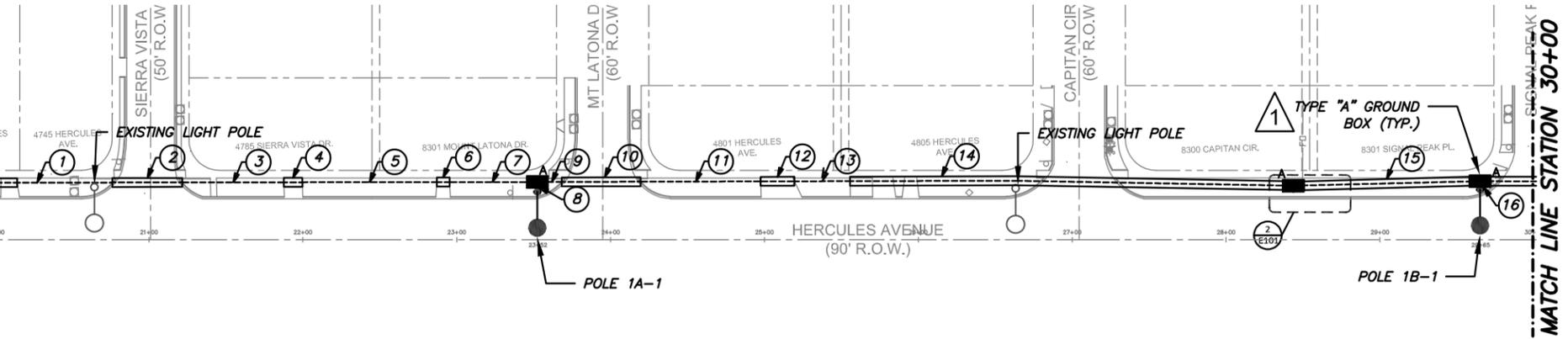






DNE  
 DWG  
 DNE

MATCH LINE STATION 20+00  
 MATCH LINE STATION 30+00



1 ENLARGED SERVICE PLAN  
 E102 Scale: NONE

CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 3 OF 7

RUN NO.	CONDUIT STATUS	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS			LENGTH RUN	RUN NO.
		ITEM 618 SIZE/ TYPE CONDUIT			ITEM 620 ELECTRICAL CONDUCTORS				
		TRENCH	BORED		**NO 8 XHHW (INSULATED) (GROUND)	**NO 8 XHHW (INSULATED) (POWER)	**NO 4 XHHW (INSULATED) (POWER)		
1	I		1	I	1	2	62	1	
2	I	1		I	1	2	46	2	
3	I		1	I	1	2	67	3	
4	I	1		I	1	2	13	4	
5	I		1	I	1	2	88	5	
6	I	1		I	1	2	9	6	
7	I		1	I	1	2	56	7	
8	I		1	I	1	2	8	8	
9	I	1		I	1	2	15	9	
10	I		1	I	1	2	52	10	
11	I	1		I	1	2	78	11	
12	I		1	I	1	2	22	12	
13	I	1		I	1	2	37	13	
14	I		1	I	1	2	287	14	
15	I	1		I	1	2	119	15	
16	I		1	I	1	2	8	16	
17	I		1	I		3	20	17	
TOTAL		317	670		1052	2104	75	TOTAL	

POLE SCHEDULE 2

POLE ID	STA	OFF	NOTES
1A-1	23+52	18"	LED ILLUMINATION ASSEMBLY 8' - 100W - TYPE "A"
1B-1	29+65	18"	LED ILLUMINATION ASSEMBLY 8' - 100W - TYPE "A"

SUMMARY OF QUANTITIES-SHEET 3 OF 7

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) (30 IN) (NO RIP-RAP)	LF	16
0531 6001	CONC SIDEWALKS (4")	SY	1
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	317
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	670
0620 6012	ELEC CONDR (NO. 4) INSULATED	LF	75
0620 6008	ELEC CONDR (NO. 8) INSULATED	LF	3156
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	3
0628 6041	ELEC SERV TY A 240 / 480 060 (NS) SS (E) GC (U)	EA	1
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	4
6391 6002	LED ILLUMINATION ASSEMBLY 8' ARM - 100W	EA	2

- NOTES:
- CONTRACTOR SHALL COORDINATE AND VERIFY LOCATION OF OVERHEAD AND UNDERGROUND UTILITIES PRIOR TO COMMENCING ANY WORK.
  - CONTRACTOR SHALL COORDINATE ROUTING OF UNDERGROUND CONDUITS WITH ALL UTILITIES AND IRRIGATION LINES. CONTRACTOR SHALL ADJUST PATH OF CONDUIT TO AVOID DISTURBING EXISTING UTILITIES AND IRRIGATION LINES.
  - REFER TO CIVIL DRAWINGS FOR CONDUIT TRENCHING DETAIL.
  - THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.

- KEYED NOTES:
- REFER TO ED(4)-14 FOR ADDITIONAL INFORMATION AND REQUIREMENTS. MAKE SPLICES AS REQUIRED BY ED(3)-4. EXTEND FULL SIZE CIRCUIT CONDUCTORS UP TO POLE. DO NOT TAPPER CONDUCTORS BETWEEN GROUND BOX AND TRANSFORMER BASE.
  - INSTALL LIGHTNING PROTECTION GROUND ROD EMBEDDED IN CONCRETE SHAFT. SUCH THAT GROUND ROD IS WITHIN THE TRANSFORMER BASE AND TOP OF GROUND ROD IS 2"-4" A.F.F. OF BASE.
  - LOCATION OF NEW ELECTRICAL SERVICE "S1" SHALL BE COORDINATED WITH EPECO. TO MEET ALL THEIR STANDARDS AND REQUIREMENTS TO INCLUDE DSO 1870, DSU 410 AND DSU 405.

**WARNING ! BEFORE YOU DIG**

NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.

TxDOT: (915) 790-4245  
 CITY OF EL PASO: (915) 212-7063  
 linespots@elpasotexas.gov  
 DIG TESS: 811

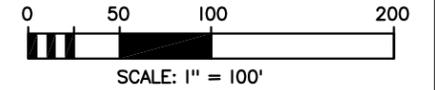
EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POTHOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.

LEGEND

	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED LED ILLUMINATION ASSEMBLY 8' - 100W
	PROPOSED LED ILLUMINATION ASSEMBLY 8' - 200W
	EXISTING RDWY ILL AM (U/P)
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	CONDUIT RUN NUMBER
	NEW TYPE "A" GROUND BOX WITH APRON REF: ED(4)-14 FOR ADDITIONAL INFORMATION.
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	NEW UNDERGROUND ELECTRICAL (TRENCHED)
	EXISTING UNDERGROUND ELECTRICAL (TRENCHED)
	NEW UNDERGROUND ELECTRICAL (BORED)
	EXISTING UNDERGROUND ELECTRICAL (BORED)
	EXISTING UNDERGROUND ELECTRICAL (TRENCHED)

POLE DESIGNATION

SHOWN FOR EXISTING POLES ONLY	POLE OR LUMINAIRE NO. CIRCUIT NO. SERVICE NO.
	E1B-2



**IDSIE ENGINEERING, INC.**  
 2150 TRAWOOD Dr., Ste. B251, EL PASO, TX 79935  
 O: (915) 444-8519 C: (915) 867-4041 FAX: F-16861



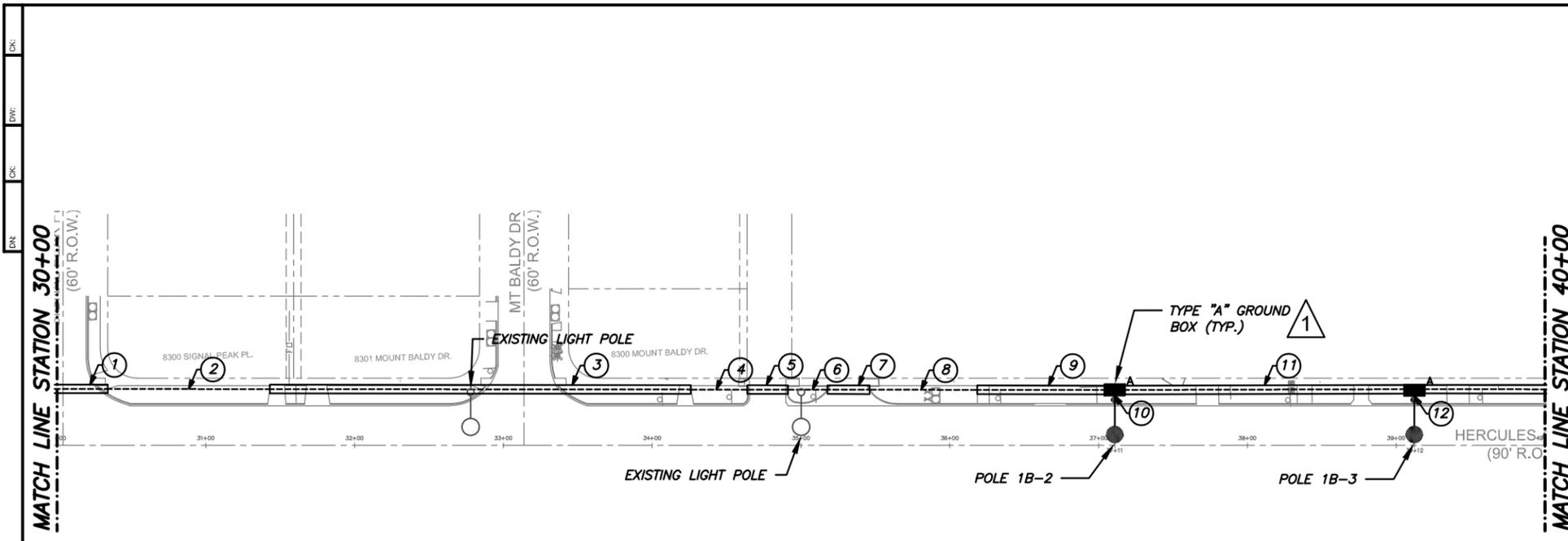
HERCULES AVENUE ILLUMINATION PLAN  
0924-06-645

SHEET 3 OF 7

CONT	SECT	JOB	HIGHWAY
0001	02	079	SH 20, ETC
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	73	

DATE: \$DATE\$  
 \$FILES\$  
 \$TIMES\$

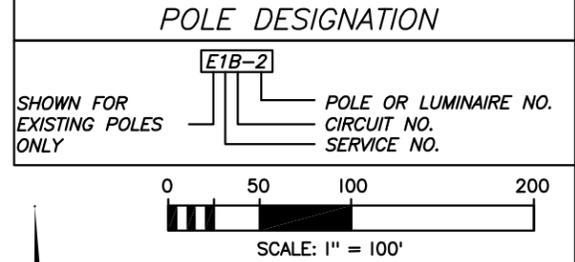
STATUS: E=EXISTING, I=INSTAL  
 \*\*INCLUDES 5 FT PER CABLE



LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED LED ILLUMINATION ASSEMBLY 8' - 100W
	PROPOSED LED ILLUMINATION ASSEMBLY 8' - 200W
	EXISTING RDWY ILL AM (U/P)
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	CONDUIT RUN NUMBER
	NEW TYPE "A" GROUND BOX WITH APRON REF: ED(4)-14 FOR ADDITIONAL INFORMATION.
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	NEW UNDERGROUND ELECTRICAL (TRENCHED)
	EXISTING UNDERGROUND ELECTRICAL (TRENCHED)
	NEW UNDERGROUND ELECTRICAL (BORED)
	EXISTING UNDERGROUND ELECTRICAL (BORED)
	EXISTING UNDERGROUND ELECTRICAL (TRENCHED)

- NOTES:**
- CONTRACTOR SHALL COORDINATE AND VERIFY LOCATION OF OVERHEAD AND UNDERGROUND UTILITIES PRIOR TO COMMENCING ANY WORK.
  - CONTRACTOR SHALL COORDINATE ROUTING OF UNDERGROUND CONDUITS WITH ALL UTILITIES AND IRRIGATION LINES. CONTRACTOR SHALL ADJUST PATH OF CONDUIT TO AVOID DISTURBING EXISTING UTILITIES AND IRRIGATION LINES.
  - REFER TO CIVIL DRAWINGS FOR CONDUIT TRENCHING DETAIL.
  - THE CONTRACTOR SHALL CONFIRM ALL UTILITY DEPTHS AND LOCATIONS PRIOR TO EXCAVATION.
  - THE LOCATIONS OF ROADWAY ILLUMINATION POLES, GROUND BOXES AND ELECTRICAL SERVICE POLES SHOWN ON THESE PLANS ARE DIAGRAMMATIC ONLY AND MAY BE SHIFTED TO ACCOMMODATE LOCAL CONDITIONS. EXACT LOCATION OF ROADWAY ILLUMINATION EQUIPMENT SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.
  - THE CONTRACTOR HAS THE OPTION TO BORE AT THE CONTRACTOR'S DISCRETION AND CONVENIENCE WHEN AN ITEM CALLS FOR A TRENCH. THIS WORK WILL BE PAID AS A TRENCH CONDUIT INSTALLATION.
  - REFER TO THE ILLUMINATION CIRCUIT DIAGRAM FOR SYSTEM DETAILS.
  - REFER TO THE ELECTRICAL SERVICE DATA SHEET FOR ELECTRICAL SERVICE DESCRIPTION.
  - CONTRACTOR SHALL REPAIR THE EXISTING IRRIGATION SYSTEM, SIDEWALK AND CURB & GUTTER TO AN EQUAL OR BETTER CONDITION IF IT IS DAMAGED DURING CONSTRUCTION. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO CONDUIT AND ROADWAY ILLUMINATION POLE INSTALLATION.
  - CONTRACTOR SHALL VERIFY THAT ALL EXISTING SYSTEMS ARE FUNCTIONAL AFTER INSTALLATION OF CONDUIT AND ILLUMINATION. ANY NON-FUNCTIONING SYSTEMS AS A RESULT OF THIS INSTALLATION MUST BE REPAIRED TO AN EQUAL OR BETTER CONDITION BY THE CONTRACTOR. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
  - ROW IS SHOWN FOR INFORMATION ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF CITY AND STATE ROW.

ILLUMINATION ASSEMBLY SCHEDULE					
TYPE	DESCRIPTION	MANUFACTURER	MOUNTING	LUMINAIRE	
				VOLTS	TYPE
A	LED ILLUMINATION ASSEMBLY 8'-100W	LED LIGHT FIXTURE: AEL #ATB0-P303-480-R3L-3000K-GN-NR-HSS POLE: VALMONT FL30-750A266-8S-FP/GV-NC-SCB-AB-M093 T-BASE, MOSS GREEN	CONCRETE BASE	480	LED



CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 4 OF 7								
RUN NO.	CONDUIT STATUS	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH RUN	
		ITEM 618 SIZE/TYPE CONDUIT			ITEM 620 ELECTRICAL CONDUCTORS			
		TRENCH	BORED		**NO 8 XHHW (INSULATED) (GROUND)	**NO 8 XHHW (INSULATED) (POWER)		
1	I		1	I	1	2	68	1
2	I	1		I	1	2	110	2
3	I		1	I	1	2	284	3
4	I	1		I	1	2	38	4
5	I		1	I	1	2	28	5
6	I	1		I	1	2	27	6
7	I		1	I	1	2	29	7
8	I	1		I	1	2	73	8
9	I		1	I	1	2	92	9
10	I		1	I	1	2	8	10
11	I	1		I	1	2	200	11
12	I		1	I	1	2	8	12
TOTAL		448	517		1025	2050		TOTAL

POLE SCHEDULE			
POLE ID	STA	OFF	NOTES
1B-2	37+11	18"	LED ILLUMINATION ASSEMBLY 8' - 100W - TYPE "A"
1B-3	39+12	18"	LED ILLUMINATION ASSEMBLY 8' - 100W - TYPE "A"

SUMMARY OF QUANTITIES-SHEET 4 OF 7			
ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) ( 30 IN) (NO RIP-RAP)	LF	16
0531 6001	CONC SIDEWALKS (4")	SY	1
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	448
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	517
0620 6008	ELEC CONDR (NO. 8) INSULATED	LF	3075
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	2
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	4
6391 6002	LED ILLUMINATION ASSEMBLY 8'ARM - 100W	EA	2

DATE: \$DATE\$  
FILE: \$FILES\$

STATUS: E=EXISTING, I=INSTAL  
\*\*INCLUDES 5 FT PER CABLE

**WARNING ! BEFORE YOU DIG**  
NOTE: CONTRACTOR SHALL FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION WITH ALL UTILITY COMPANIES.  
TXDOT: (915) 790-4245  
CITY OF EL PASO: (915) 212-7063  
linespots@elpasotexas.gov  
DIG TESS: 811

EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND ARE INTENDED TO ILLUSTRATE THAT THEY ARE PRESENT. CONTRACTOR SHALL POTHOLE APPARENT UTILITY CONFLICTS AT INTERVALS NO MORE THAN 300 FT. TO VERIFY LOCATION DEPTH.



**IDSIE ENGINEERING, INC.**  
2150 TRAWOOD Dr., Ste. B251, EL PASO, TX 79935  
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Texas Department of Transportation

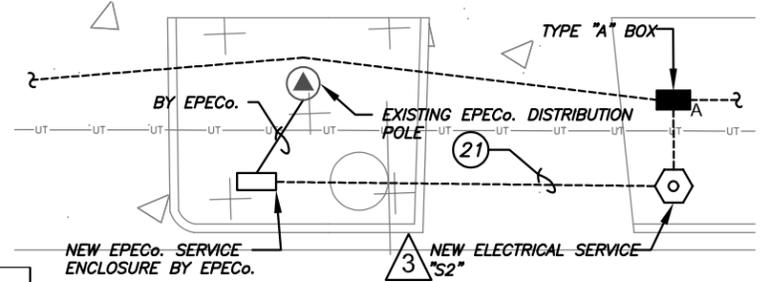
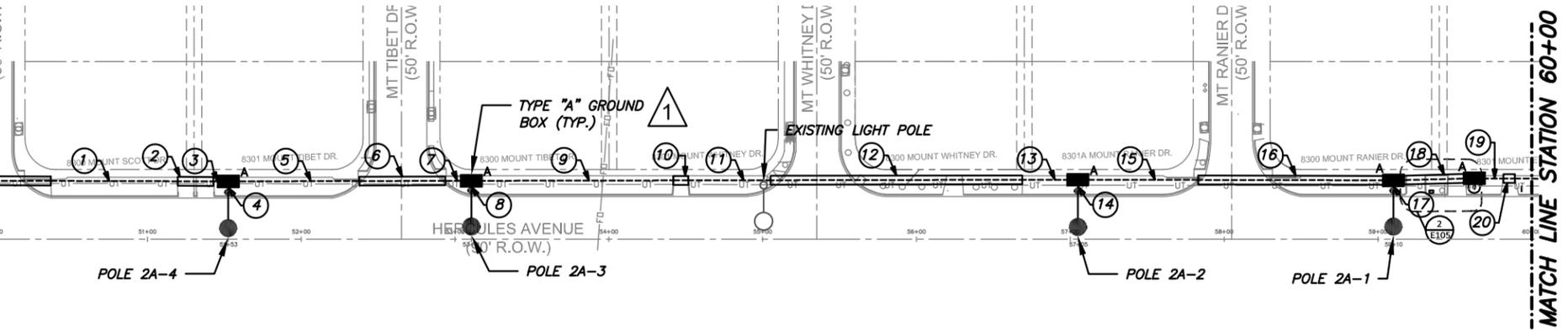
HERCULES AVENUE ILLUMINATION PLAN			
0924-06-645			
SHEET 4 OF 7			
CONT	SECT	JOB	HIGHWAY
0001	02	079	SH 20, ETC
DIST	COUNTY		SHEET NO.
ELP	EL PASO		74



DNE  
DWE  
DCK

MATCH LINE STATION 50+00

MATCH LINE STATION 60+00



**1 ENLARGED SERVICE PLAN**  
 E105 Scale: NONE

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**POLE SCHEDULE** 2

POLE ID	STA	OFF	NOTES
2A-4	51+53	18"	LED ILLUMINATION ASSEMBLY 8' - 100W - TYPE "A"
2A-3	53+11	18"	LED ILLUMINATION ASSEMBLY 8' - 100W - TYPE "A"
2A-2	57+05	18"	LED ILLUMINATION ASSEMBLY 8' - 100W - TYPE "A"
2A-1	59+10	18"	LED ILLUMINATION ASSEMBLY 8' - 100W - TYPE "A"

**SUMMARY OF QUANTITIES-SHEET 6 OF 7**

ITEM	DESCRIPTOIN	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) ( 30 IN) (NO RIP-RAP)	LF	32
0531 6001	CONC SIDEWALKS (4")	SY	1
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	427
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	572
0620 6008	ELEC CONDR (NO. 8) INSULATED	LF	3252
0620 6012	ELEC CONDR (NO. 4) INSULATED	LF	75
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	5
0628 6041	ELEC SERV TY A 240 / 480 060 (NS) SS (E) GC (U)	EA	1
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	4
6391 6002	LED ILLUMINATION ASSEMBLY 8' ARM - 100W	EA	4

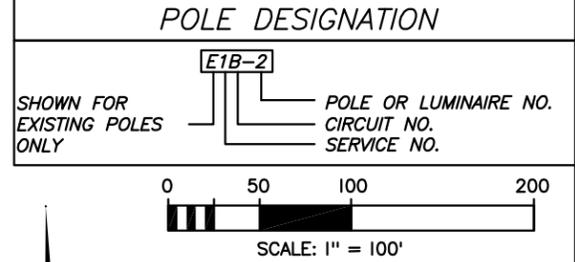
**CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 6 OF 7**

RUN NO.	CONDUIT		CABLE STATUS	NUMBER OF CONDUCTORS			LENGTH RUN	RUN NO.
	ITEM 618 SIZE/ TYPE CONDUIT			ITEM 620 ELECTRICAL CONDUCTORS				
	TRENCH	BORED		**NO 8 XHHW (INSULATED) (GROUND)	**NO 8 XHHW (INSULATED) (POWER)	**NO 4 XHHW (INSULATED) (POWER)		
1	I		I	1	2		83	1
2	I	1	I	1	2		24	2
3	I		I	1	2		9	3
4	I		I	1	2		8	4
5	I	1	I	1	2		85	5
6	I		I	1	2		56	6
7	I		I	1	2		16	7
8	I		I	1	2		8	8
9	I		I	1	2		131	9
10	I	1	I	1	2		10	10
11	I		I	1	2		54	11
12	I	1	I	1	2		164	12
13	I		I	1	2		35	13
14	I		I	1	2		8	14
15	I	1	I	1	2		77	15
16	I		I	1	2		126	16
17	I		I	1	2		8	17
18	I	1	I	1	2		51	18
19	I		I	1	2		18	19
20	I		I	1	2		8	20
21	I		I	1	2	3	20	21
TOTAL		427	572	1084	2168	75		TOTAL

STATUS: E=EXISTING, I=INSTAL  
 \*\*INCLUDES 5 FT PER CABLE

**LEGEND**

	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED LED ILLUMINATION ASSEMBLY 8' - 100W
	PROPOSED LED ILLUMINATION ASSEMBLY 8' - 200W
	EXISTING RDWY ILL AM (U/P)
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	CONDUIT RUN NUMBER
	NEW TYPE "A" GROUND BOX WITH APRON REF: ED(4)-14 FOR ADDITIONAL INFORMATION.
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	NEW UNDERGROUND ELECTRICAL (TRENCHED)
	EXISTING UNDERGROUND ELECTRICAL (TRENCHED)
	NEW UNDERGROUND ELECTRICAL (BORED)
	EXISTING UNDERGROUND ELECTRICAL (BORED)
	EXISTING UNDERGROUND ELECTRICAL (TRENCHED)



THIS SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY LORENZO L. DE SANTIAGO, P.E.  
 #90120 ON MARCH 28, 2024. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION  
 TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT

2150 TRAWOOD Dr., Ste. B251, EL PASO, TX 79935  
 O: (915) 444-8519 C: (915) 867-4041 FAX: F-16861

**HERCULES AVENUE ILLUMINATION PLAN**  
 0924-06-645

SHEET 6 OF 7

CONT	SECT	JOB	HIGHWAY
0001	02	079	SH 20, ETC
DIST	COUNTY		SHEET NO.
ELP	EL PASO		76

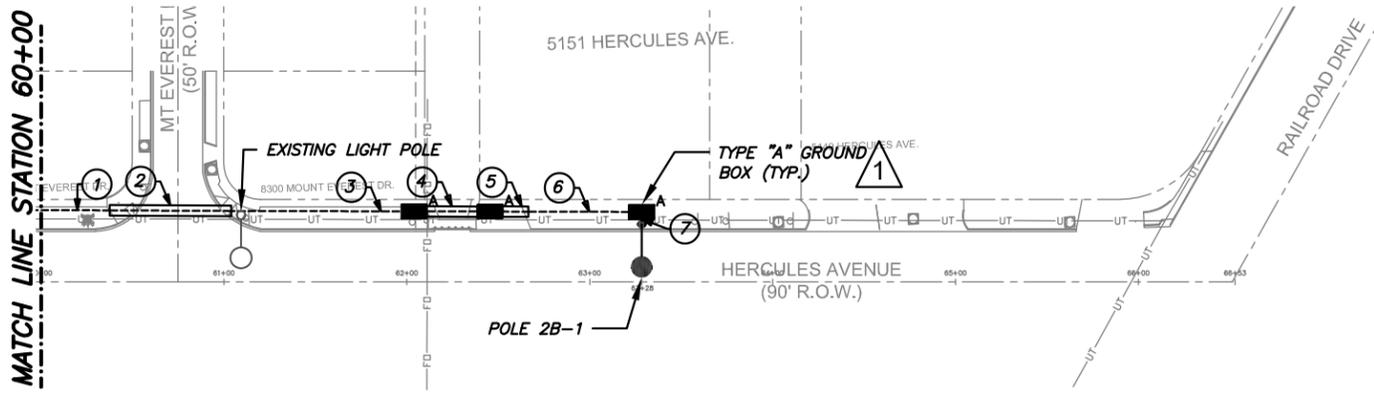
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 CITY OF EL PASO: (915) 212-7063  
 linespots@elpasotexas.gov  
 DIG TESS: 811

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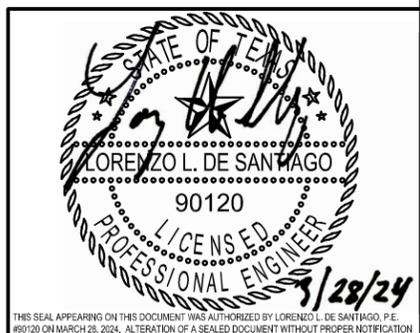
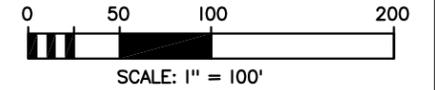
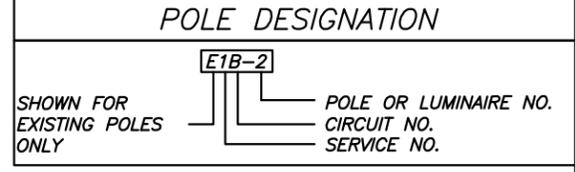
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DNE  
DWE  
DKE  
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LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED LED ILLUMINATION ASSEMBLY 8' - 100W
	PROPOSED LED ILLUMINATION ASSEMBLY 8' - 200W
	EXISTING RDWY ILL AM (U/P)
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	CONDUIT RUN NUMBER
	NEW TYPE "A" GROUND BOX WITH APRON REF: ED(4)-14 FOR ADDITIONAL INFORMATION.
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	NEW UNDERGROUND ELECTRICAL (TRENCHED)
	EXISTING UNDERGROUND ELECTRICAL (TRENCHED)
	NEW UNDERGROUND ELECTRICAL (BORED)
	EXISTING UNDERGROUND ELECTRICAL (BORED)
	EXISTING UNDERGROUND ELECTRICAL (TRENCHED)



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**Texas Department of Transportation**

**HERCULES AVENUE  
ILLUMINATION PLAN**  
0924-06-645

SHEET 7 OF 7

CONT	SECT	JOB	HIGHWAY
0001	02	079	SH 20, ETC
DIST	COUNTY	SHEET NO	
ELP	EL PASO	77	

CONDUIT, CONDUCTOR & CABLE SCHEDULE SHEET 7 OF 7

RUN NO.	CONDUIT STATUS	CONDUIT			CABLE STATUS	NUMBER OF CONDUCTORS		LENGTH RUN	RUN NO.
		ITEM 618 SIZE/ TYPE CONDUIT				ITEM 620 ELECTRICAL CONDUCTORS			
		TRENCH	BORED	EXPOSED		**NO 8 XHHW (INSULATED) (GROUND)	**NO 8 XHHW (INSULATED) (POWER)		
1	I	1			I	1	2	49	1
2	I		1		I	1	2	67	2
3	I	1			I	1	2	107	3
4	I			1	I	1	2	28	4
5	I		1		I	1	2	15	5
6	I	1			I	1	2	61	6
7	I		1		I	1	2	8	7
<b>TOTAL</b>		<b>217</b>	<b>90</b>	<b>28</b>		<b>370</b>	<b>740</b>		<b>TOTAL</b>

STATUS: E=EXISTING, I=INSTAL  
 \*\*INCLUDES 5 FT PER CABLE

POLE SCHEDULE 2

POLE ID	STA	OFF	NOTES
2B-1	63+28	18"	LED ILLUMINATION ASSEMBLY 8' - 100W - TYPE "A"

SUMMARY OF QUANTITIES-SHEET 7 OF 7

ITEM	DESCRIPTION	UNIT	QTY
0110 6003	EXCAVATION (SPECIAL)	CY	0.15
0416 6029	DRILL SHAFT (RDWY ILL POLE) ( 30 IN) (NO RIP-RAP)	LF	8
0531 6001	CONC SIDEWALKS (4")	SY	1
0618 6023	CONDT (PVC) (SCH 40) (2")	LF	220
0618 6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	97
0618 6070	CONDT (RM) (2")	LF	25
0620 6008	ELEC CONDR (NO. 8) INSULATED	LF	1116
0624 6002	GROUND BOX TY A (122311) W / APRON	EA	3
1005 6002	LOOSE AGGR FOR GROUND COVER (TYPE II)	CY	4
6391 6002	LED ILLUMINATION ASSEMBLY 8' ARM - 100W	EA	1

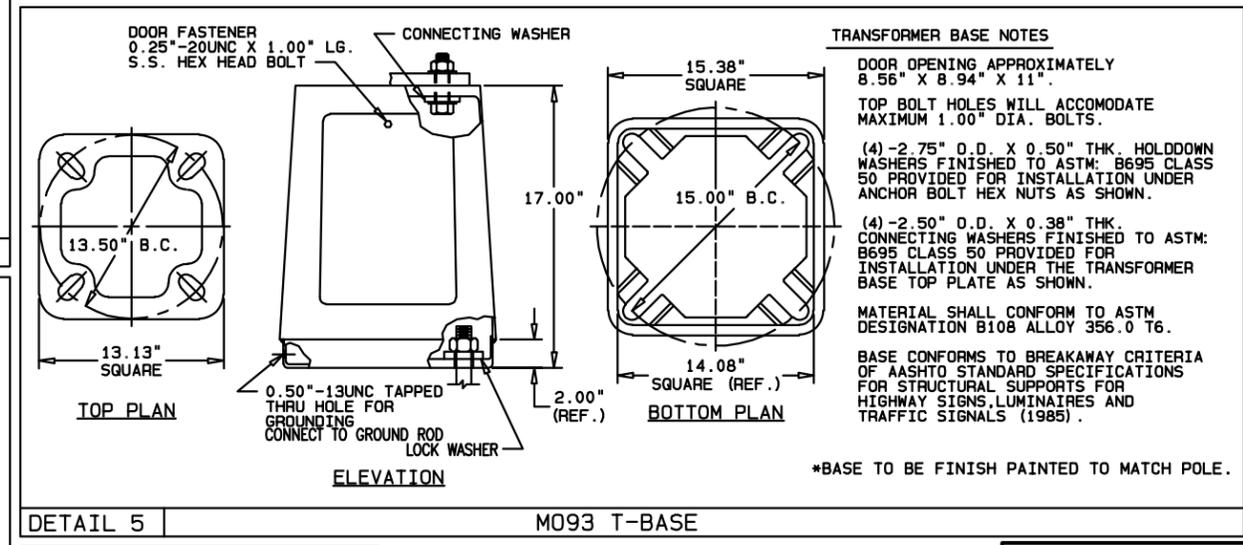
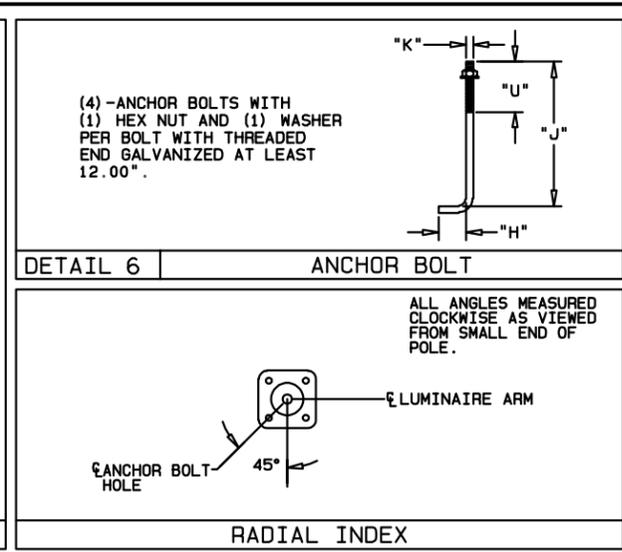
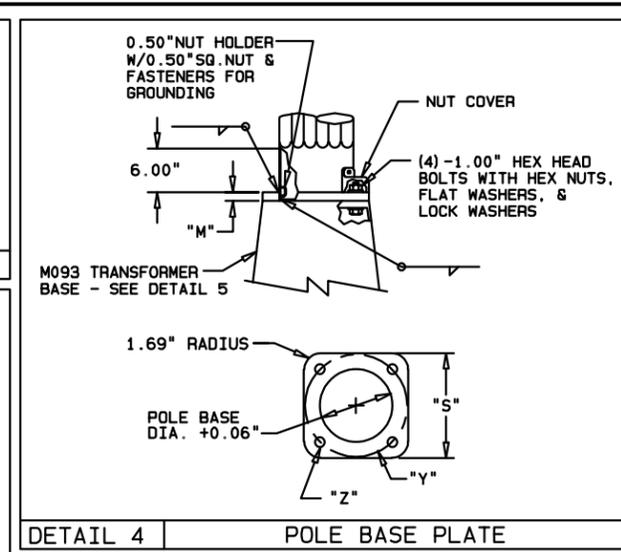
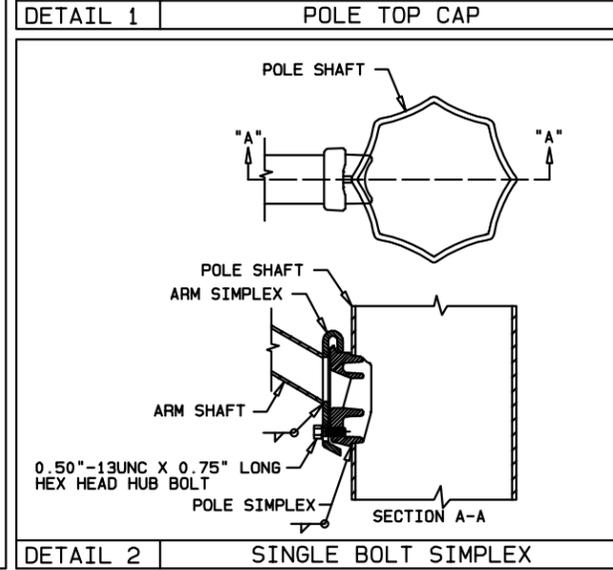
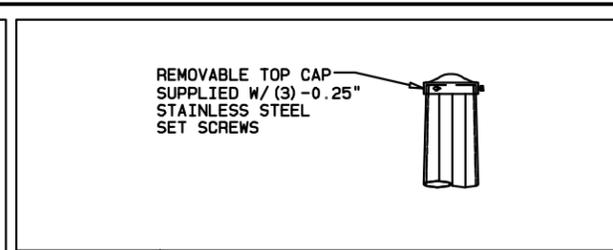
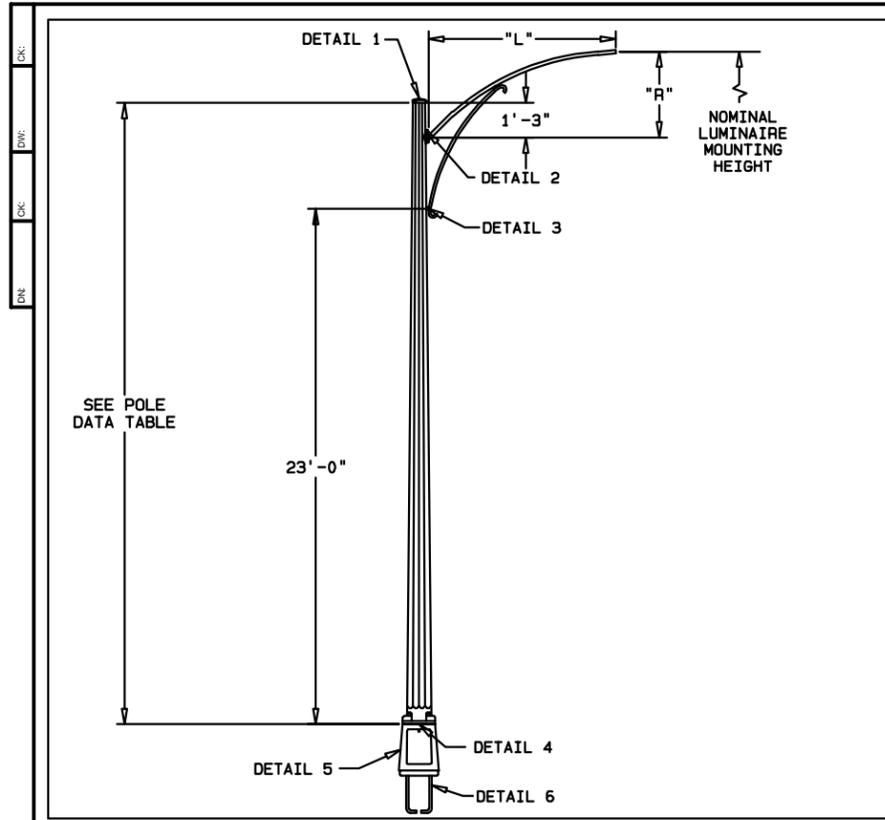
- KEYED NOTES:**
- REFER TO ED(4)-14 FOR ADDITIONAL INFORMATION AND REQUIREMENTS. MAKE SPLICES AS REQUIRED BY ED(3)-4. EXTEND FULL SIZE CIRCUIT CONDUCTORS UP TO POLE. DO NOT TAPPER CONDUCTORS BETWEEN GROUND BOX AND TRANSFORMER BASE.
  - INSTALL LIGHTNING PROTECTION GROUND ROD EMBEDDED IN CONCRETE SHAFT. SUCH THAT GROUND ROD IS WITHIN THE TRANSFORMER BASE AND TOP OF GROUND ROD IS 2"-4" A.F.F. OF BASE.

**WARNING !  
BEFORE YOU DIG**

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DATE: \$DATE\$  
 FILE: \$FILES\$  
 \$TIMES\$

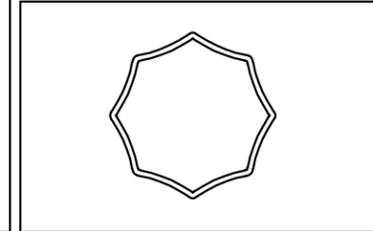
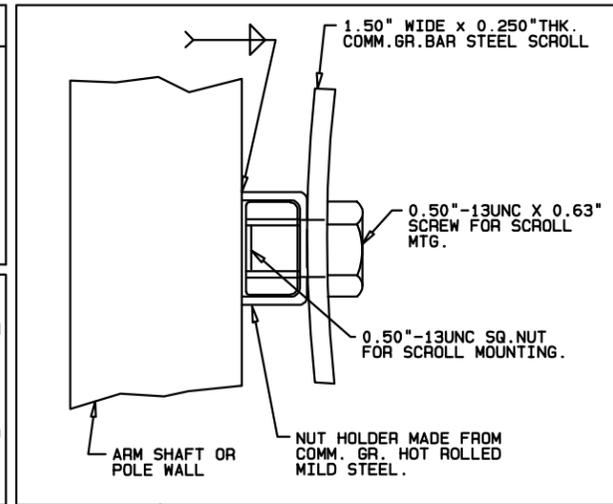


MATERIAL DATA		
COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
POLE TUBE	A595 GR. A OR A572	55
POLE BASE	A36	36
ANCHOR BOLTS	F1554 GR. 55	55
LUMINAIRE ARM PIPE	A36	36
LUMINAIRE ATTACHMENT	A27 GR. 65	35
LUMINAIRE CONNECT BLTS	SAE GR. 5	
GALVANIZING - HARDWARE	HOT DIP ZINC	

FINISH DATA	
SYSTEM:	FINISH PAINT/GALVANIZED (FPGV)
BASE COAT:	HOT-DIP GALVANIZED TO ASTM A123
PRIME COAT:	NONE
FINISH COAT:	TGIC OR URETHANE POLYESTER POWDER
COLOR:	MOSS GREEN RAL 6005
SPEC:	F-283BQ

ALTHOUGH RARE, VIBRATIONS SEVERE ENOUGH TO CAUSE DAMAGE CAN OCCASIONALLY OCCUR IN STRUCTURES OF ALL TYPES. BECAUSE THEY ARE INFLUENCED BY MANY INTERACTING VARIABLES, VIBRATIONS ARE GENERALLY UNPREDICTABLE. THE USER'S MAINTENANCE PROGRAM SHOULD INCLUDE OBSERVATION FOR EXCESSIVE VIBRATION AND EXAMINATION FOR ANY STRUCTURAL DAMAGE OR BOLT LOOSENING. THE VALMONT WARRANTY SPECIFICALLY EXCLUDES FATIGUE FAILURE OR SIMILAR PHENOMENA RESULTING FROM INDUCED VIBRATION, HARMONIC OSCILLATION OR RESONANCE ASSOCIATED WITH MOVEMENT OF AIR CURRENTS AROUND THE PRODUCT.

**VIBRATION DISCLAIMER**



POLE AND LUMINAIRE ARM DATA - TYPE "A"																					
ITEM	QTY.	CATALOG DESCRIPTION	POLE TUBE				POLE BASE				ANCHOR BOLT				LUMINAIRE ARM TUBE						
			BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	GAUGE OR THK. (IN)	SQUARE (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD LENGTH "U" (IN)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THICK (IN)	LENGTH "L" (FT)	RISE "R" (FT)	NOMINAL LUMINAIRE MOUNTING HEIGHT (FT)	ARM QTY.
1	20	LED ILLUMINATION ASSEMBLY 8' - 100W FL30-750A266-8S-FP/GV-NC-SCB-AB M093 TBASE	7.50	3.79	26.50	11	13.00	13.00	1.250	1.25	1.00	36.00	4.00	6.00	2.38	2.38	0.154	8.00	2.25	30.00	1



**DSIE ENGINEERING INC.**  
 2150 TRAWOOD Dr., Ste. B251, EL PASO, TX 79935  
 O: (915) 444-8519 C: (915) 867-4041 FIRM No: F-16861

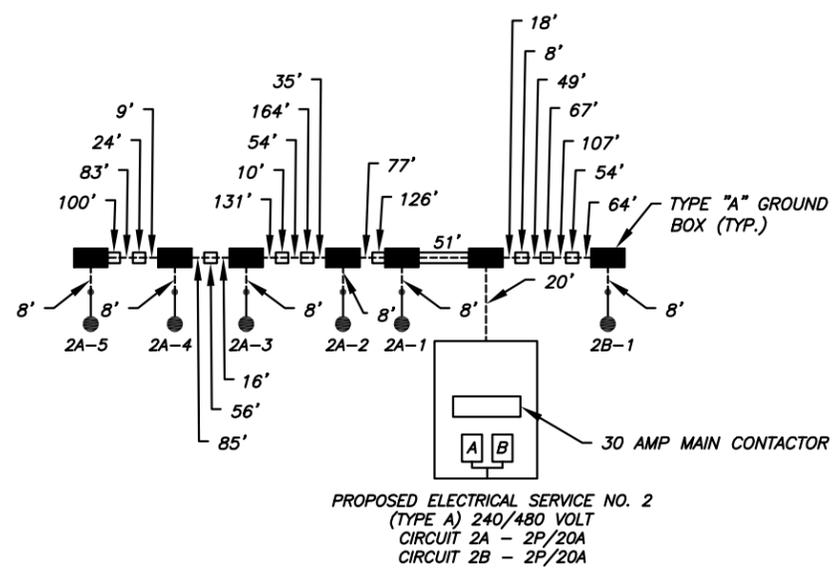
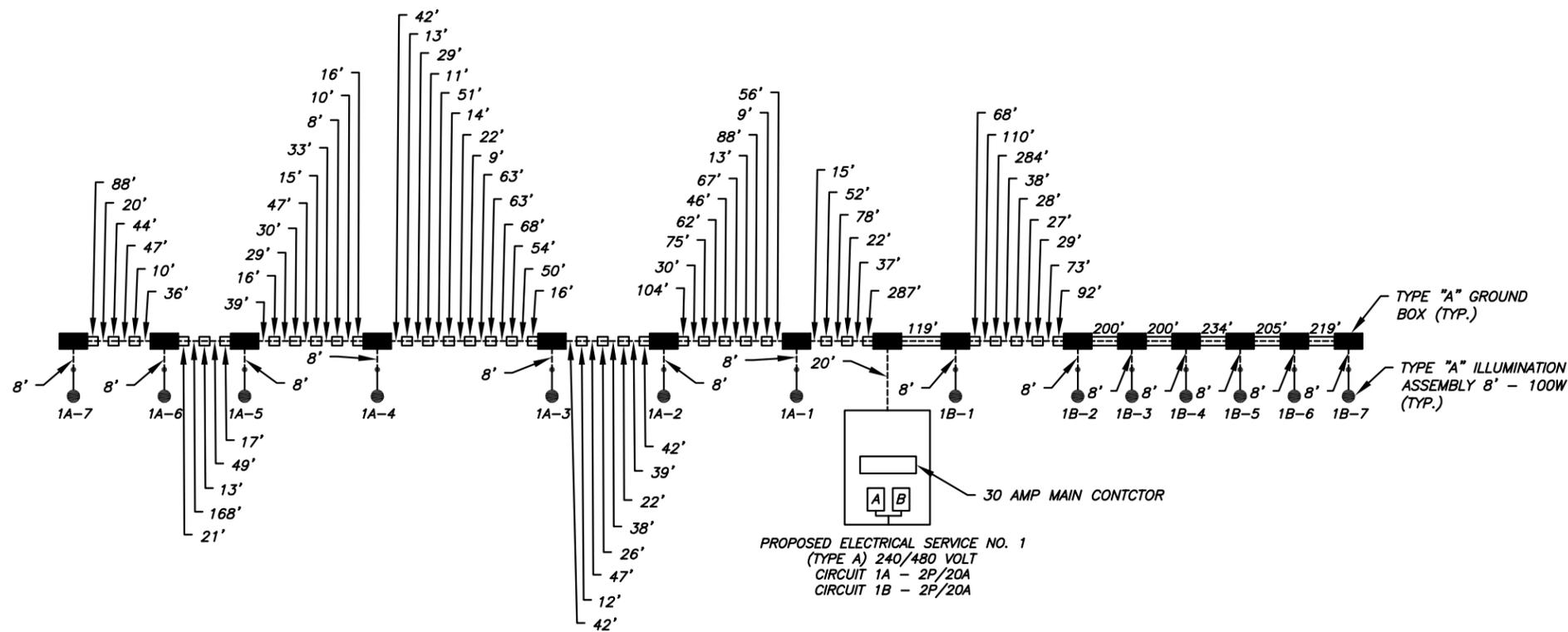


**HERCULES AVENUE  
ILLUMINATION POLES  
0924-06-645**

SHEET 1 OF 1			
CONT	SECT	JOB	HIGHWAY
0001	02	079	SH 20, ETC
DIST		COUNTY	SHEET NO.
ELP		EL PASO	78

DATE: \$DATES\$  
FILE: \$FILES\$

DWG: DNE  
 DWG: DNE  
 DWG: DNE



LEGEND	
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	EXISTING RDWY ILL ASSEMBLY TO REMAIN
	PROPOSED LED ILLUMINATION ASSEMBLY 8' - 100W
	PROPOSED LED ILLUMINATION ASSEMBLY 8' - 200W
	EXISTING RDWY ILL AM (U/P)
	EXISTING ELECTRICAL SERVICE
	PROPOSED ELECTRICAL SERVICE
	EXISTING POWER SOURCE
	CONDUIT RUN NUMBER
	NEW TYPE "A" GROUND BOX WITH APRON REF: ED(4)-14 FOR ADDITIONAL INFORMATION.
	EXISTING ILLUM GROUND BOX TO REMAIN
	REMOVE GROUND BOX
	NEW UNDERGROUND ELECTRICAL (TRENCHED)
	EXISTING UNDERGROUND ELECTRICAL (TRENCHED)
	NEW UNDERGROUND ELECTRICAL (BORED)
	EXISTING UNDERGROUND ELECTRICAL (BORED)
	EXISTING UNDERGROUND ELECTRICAL (TRENCHED)
POLE DESIGNATION	
	E1B-2
SHOWN FOR EXISTING POLES ONLY	POLE OR LUMINAIRE NO. CIRCUIT NO. SERVICE NO.



**IDSIE ENGINEERING, INC.**  
 2150 TRAWOOD Dr., Ste. B251, EL PASO, TX 79935  
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**HERCULES AVENUE**  
**CIRCUIT DIAGRAMS**  
 0924-06-645

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0001	02	079	SH 20, ETC
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	79	

DATE: \$DATE\$ \$TIMES\$  
 FILE: \$FILES\$

**GENERAL NOTES FOR ALL ELECTRICAL WORK**

- The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.
- Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.
- Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is 1/2 in. or less in diameter.
- Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.
- Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.
- When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

**CONDUIT**

**A. MATERIALS**

- Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.
- Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.
- Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

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

- Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.
- Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.
- Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.
- Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

- Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.
- When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.
- Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

**B. CONSTRUCTION METHODS**

- Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.
- Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.
- Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.
- Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.
- When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."
- Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.
- During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.
- Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.
- Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.
- Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.
- At all electrical services, install a 6 AWG solid copper grounding electrode conductor.
- Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).
- Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.
- File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

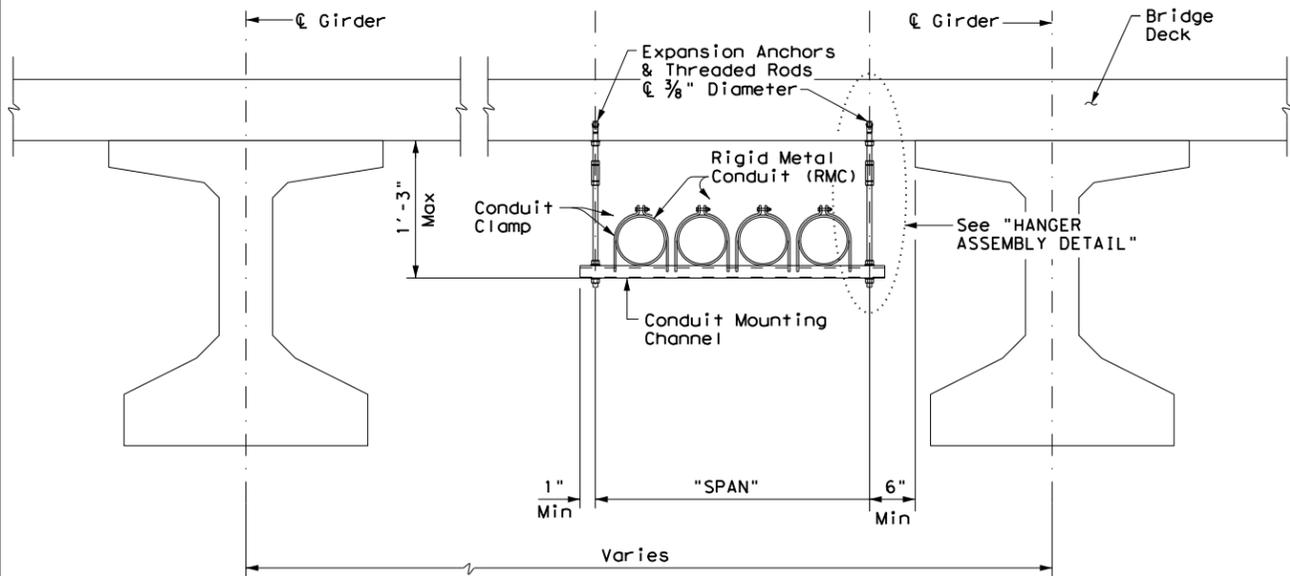
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		<b>Traffic Operations Division Standard</b>	
<h1>ELECTRICAL DETAILS CONDUITS &amp; NOTES</h1>			
<h2>ED(1) - 14</h2>			
FILE:	ed1-14.dgn	DWG:	CK:
© TxDOT	October 2014	CONT	SECT
REVISIONS		JOB	
0001	02	079, ETC.	SH 20, ETC.
DIST		SHEET NO.	
ELP		EL PASO	
		80	

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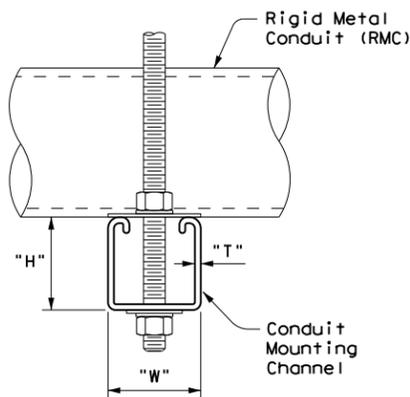
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CONDUIT HANGING DETAIL

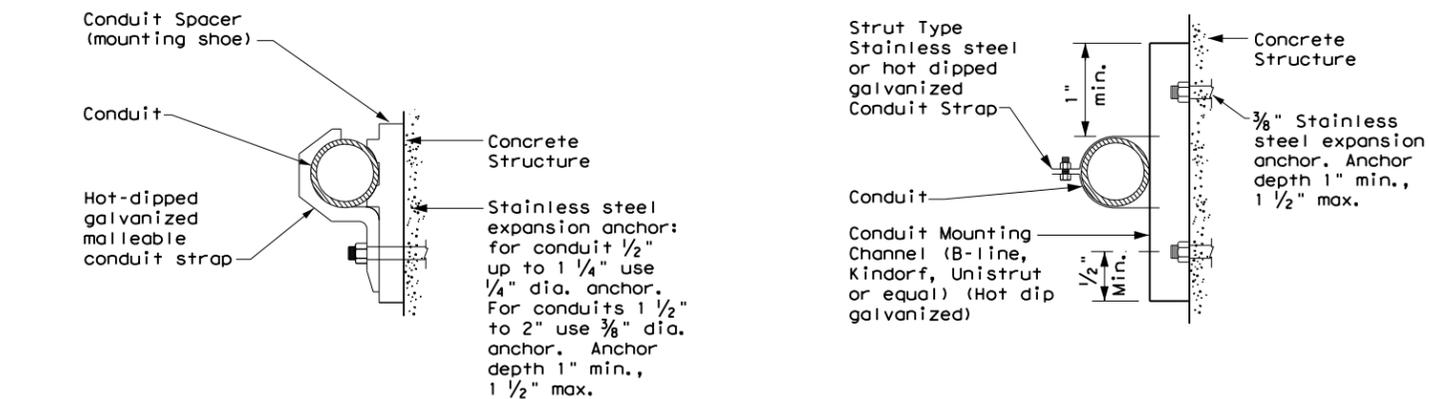
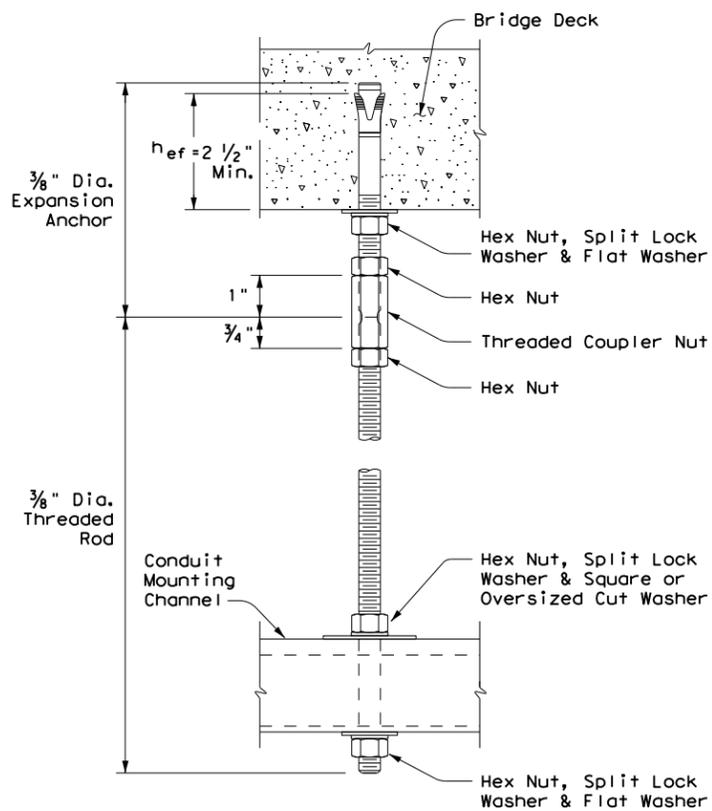
CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

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



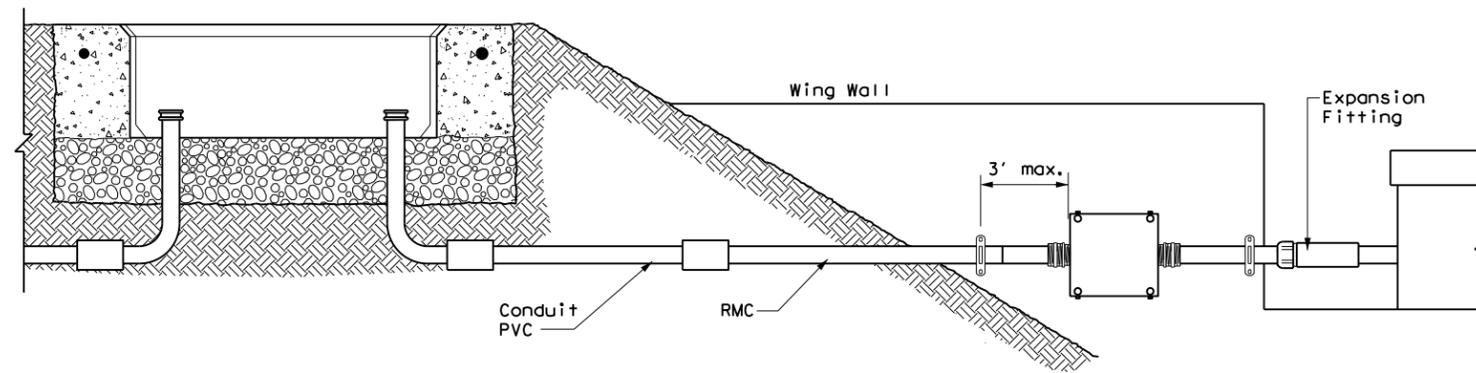
HANGER ASSEMBLY DETAIL

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<sub>ef</sub>), as shown. Increase (h<sub>ef</sub>) as needed to ensure sufficient thread length for proper torquing 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<sub>ef</sub>). No lateral loads shall be introduced after conduit installation.

		<b>Traffic Operations Division Standard</b>	
<h2>ELECTRICAL DETAILS CONDUIT SUPPORTS</h2>			
<h3>ED(2) - 14</h3>			
FILE: ed2-14.dgn	DW: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CONT	SECT	JOB
REVISIONS	0001	02	079, ETC. SH 20, ETC.
DIST	COUNTY		SHEET NO.
ELP	EL PASO		81

# 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.

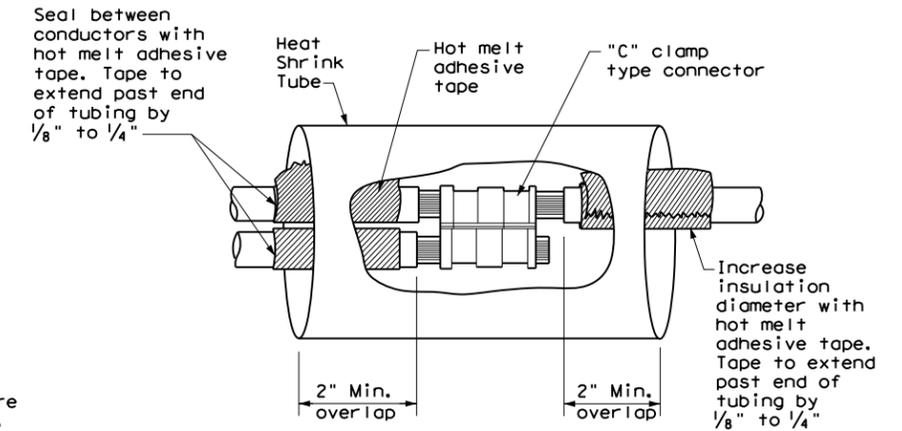
## B. CONSTRUCTION METHODS

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.



**SPLICE OPTION 1  
Compression Type**

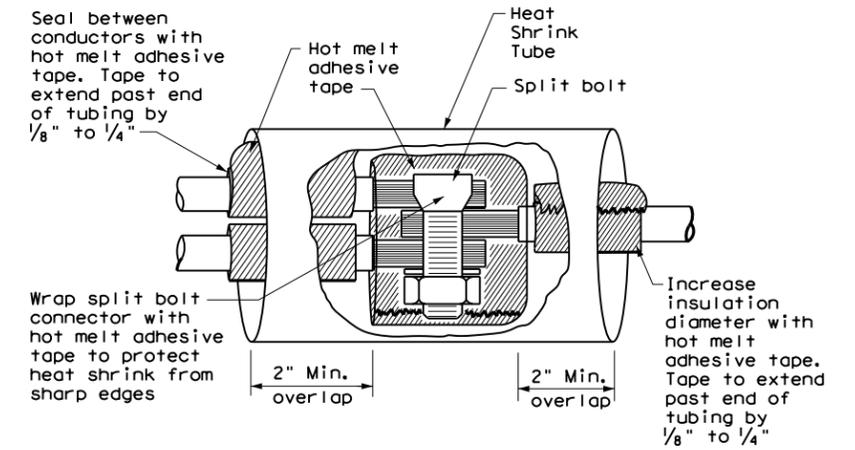
## GROUND RODS & GROUNDING ELECTRODES

### A. MATERIAL INFORMATION

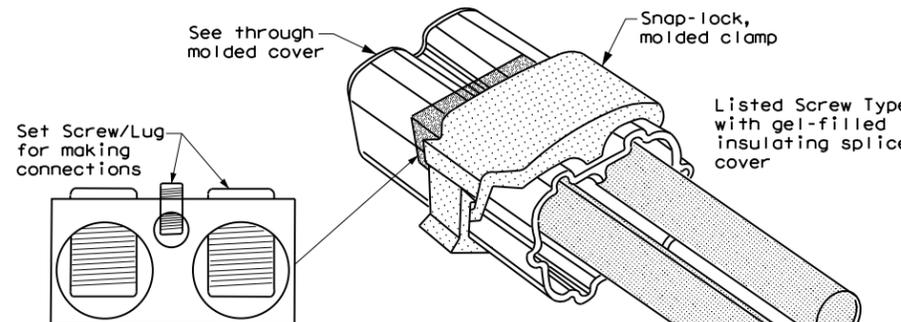
1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in 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 2  
Split Bolt Type**



**SPLICE OPTION 3  
Listed Screw Type**

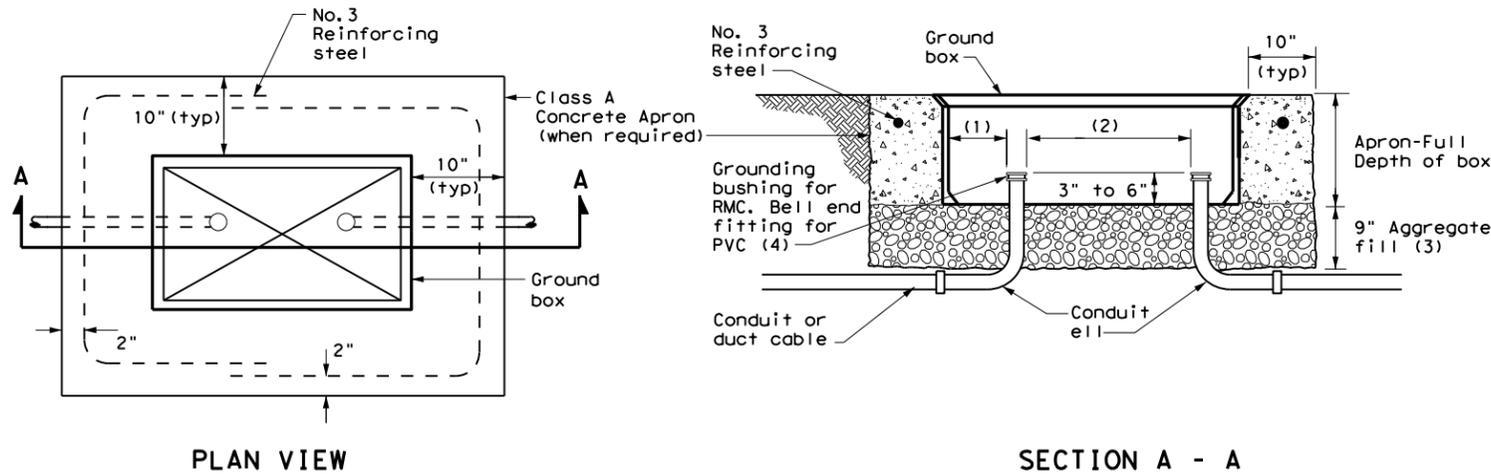
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 Texas Department of Transportation		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS CONDUCTORS</h2>			
<h3>ED(3) - 14</h3>			
FILE: ed3-14.dgn	DW: TxDOT	CK: TxDOT	CR: TxDOT
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REVISIONS	0001	02	079, ETC. SH 20, ETC.
	DIST	COUNTY	SHEET NO.
	ELP	EL PASO	82

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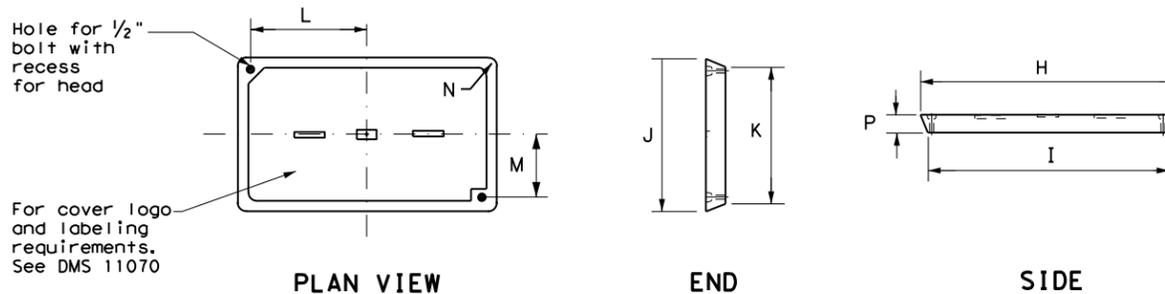


**APRON FOR GROUND BOX**

- (1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.
- (2) Maintain sufficient space between conduits to allow for proper installation of bushing.
- (3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.
- (4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

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



**GROUND BOX COVER**

**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.

				Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS</h2> <h3>GROUND BOXES</h3>					
<h3>ED(4) - 14</h3>					
FILE:	ed4-14.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2014	CONT:	0001	SECT:	02
REVISIONS		JOB:	079, ETC. SH 20, ETC.		HIGHWAY
DIST:	ELP	COUNTY:	EL PASO		SHEET NO.
					83

**ELECTRICAL SERVICES NOTES**

- Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.
- Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services," DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.
- Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.
- Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.
- The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.
- Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.
- When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.
- Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.
- All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.
- Provide rigid metal conduit (RMC) for all conduits on service, except for the 1/2 in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.
- Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.
- Ensure all mounting hardware and installation details of services conform to utility company specifications.
- For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 1/2 in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.
- When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 1/2 in. x 11 in. before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.
- Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

**SERVICE ASSEMBLY ENCLOSURE**

- Provide threaded hub for all conduit entries into the top of enclosure.
- Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photoceII or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.
- Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.
- Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

**MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS**

- Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.
- When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

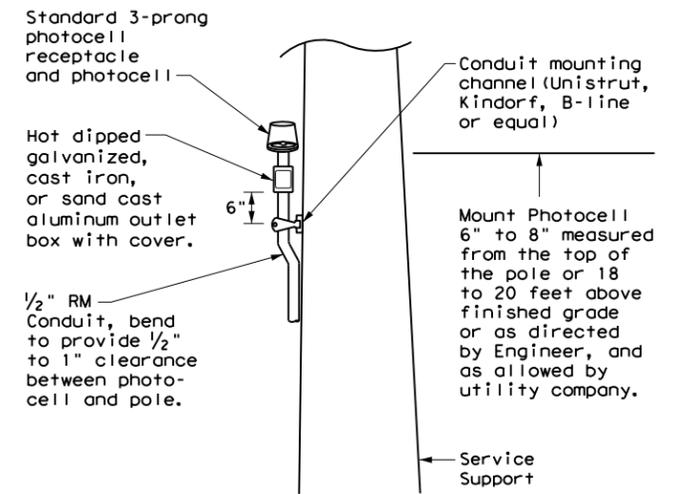
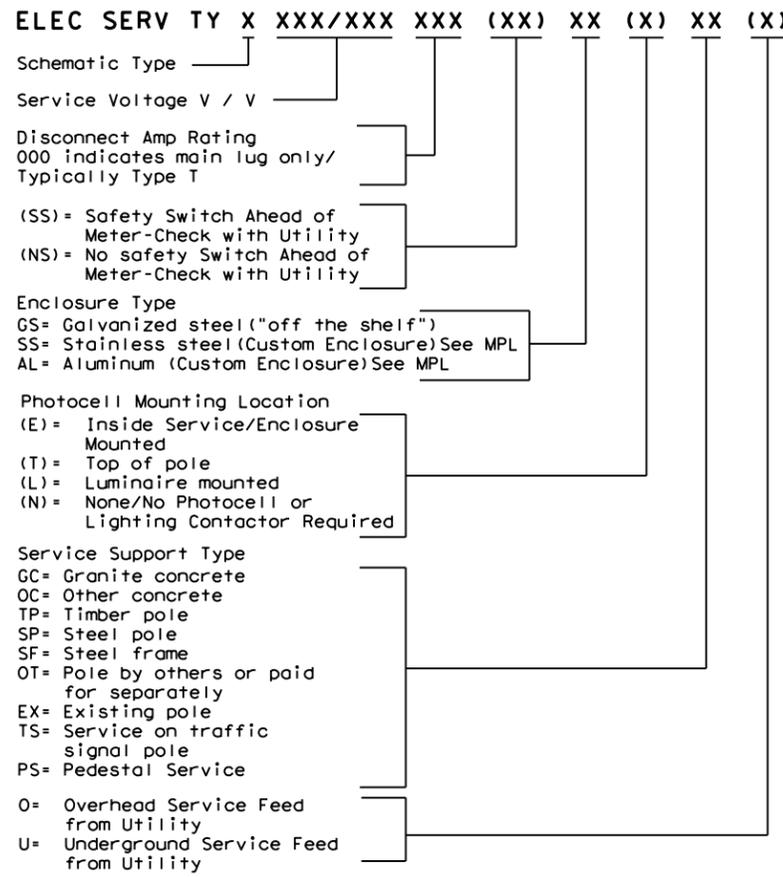
**PHOTOELECTRIC CONTROL**

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

* ELECTRICAL SERVICE DATA												
Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit *xSize	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 1/4"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

\* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.  
 \*\* Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National Electrical Code.

**EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE**



**TOP MOUNTED PHOTOCELL**

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

Texas Department of Transportation Traffic Operations Division Standard

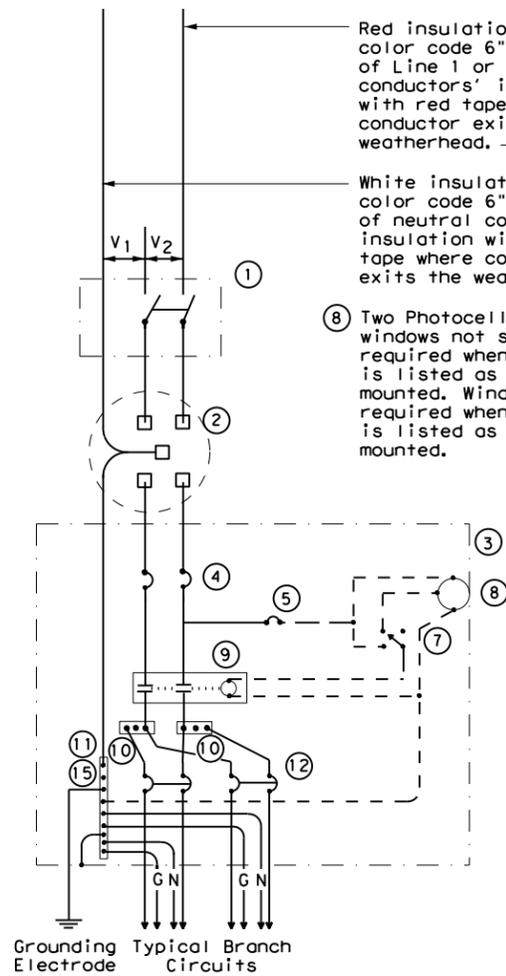
**ELECTRICAL DETAILS SERVICE NOTES & DATA**

**ED(5) - 14**

FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0001	02	079, ETC.	SH 20, ETC.
	DIST	COUNTY	SHEET NO.	
	ELP	EL PASO	84	

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**SCHEMATIC TYPE A  
THREE WIRE**

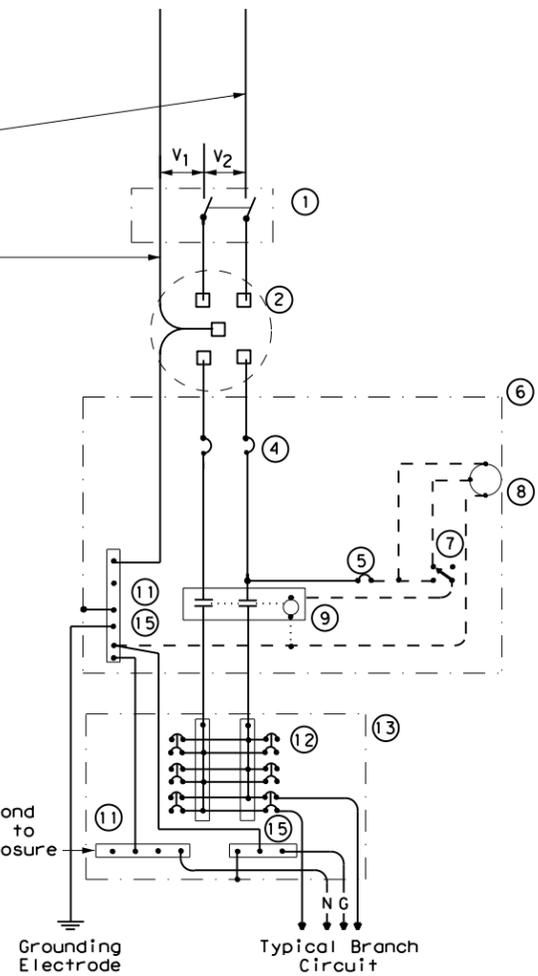
Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.

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

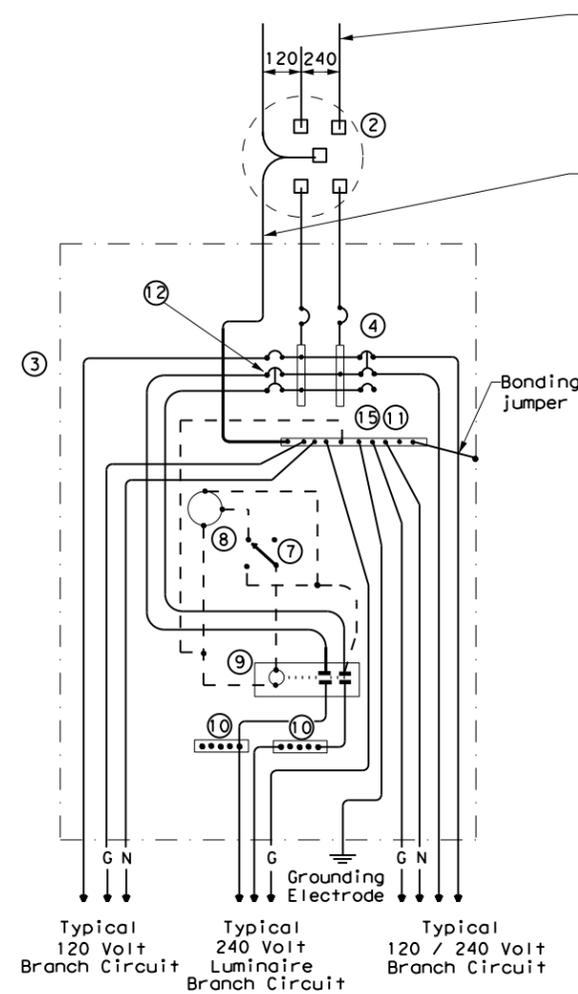
⑧ Two Photocell viewing windows not shown but required when photocell is listed as enclosure mounted. Windows not required when photocell is listed as pole top mounted.

Do not bond this bus to the enclosure

WIRING LEGEND	
————	Power Wiring
- - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required



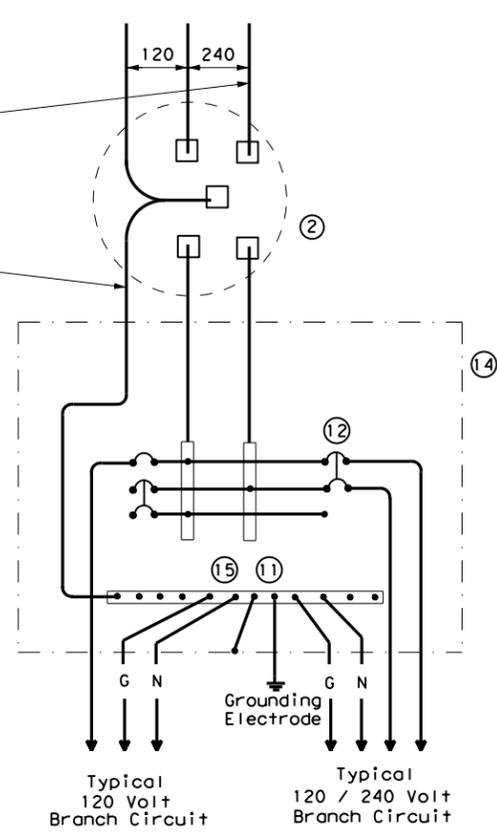
**SCHEMATIC TYPE C  
THREE WIRE**



**SCHEMATIC TYPE D - CUSTOM  
120/240 VOLTS - THREE WIRE**

Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.

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



**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.

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

				Traffic Operations Division Standard	
<b>ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES</b>					
<b>ED(6) - 14</b>					
FILE:	ed6-14.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2014	CONT:	SECT:	JOB:	HIGHWAY:
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		ELP	EL PASO	85	

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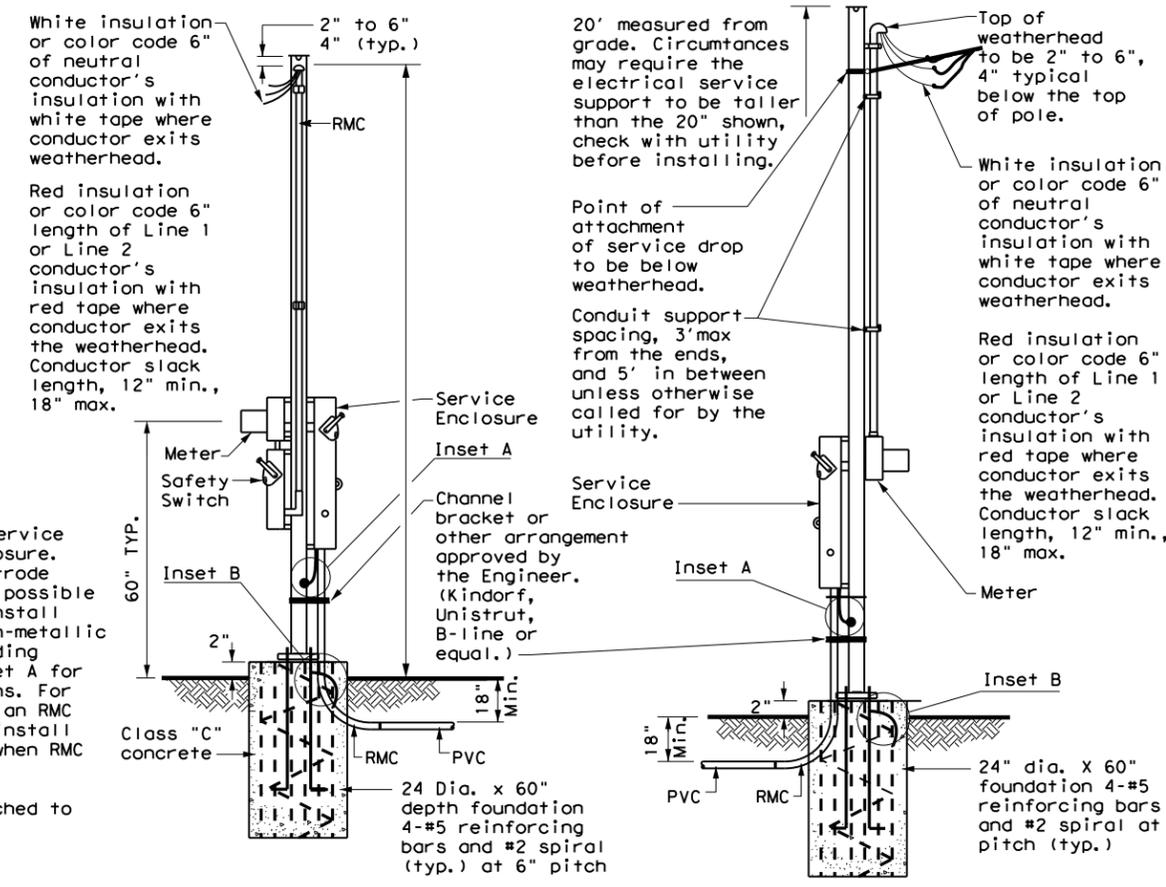
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**SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)**

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 1/2 in. or 1 3/8 in. wide by 1 in. up to 3 3/4 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 3/4 in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized 3/4 in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in. of thread, with 3 1/4 in. to 3 1/2 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 ellis 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 1/2 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 1/4" - 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.

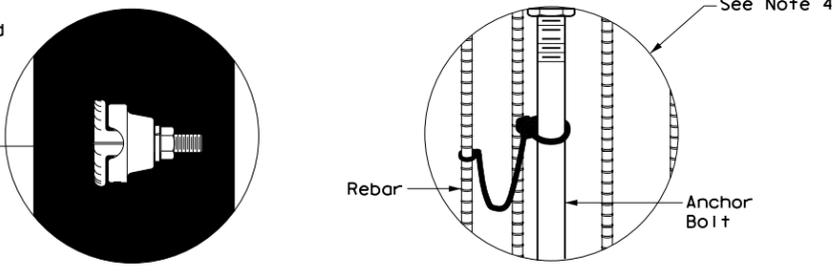
White insulation or color code 6" of neutral conductor's insulation with white tape where conductor exits weatherhead.

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

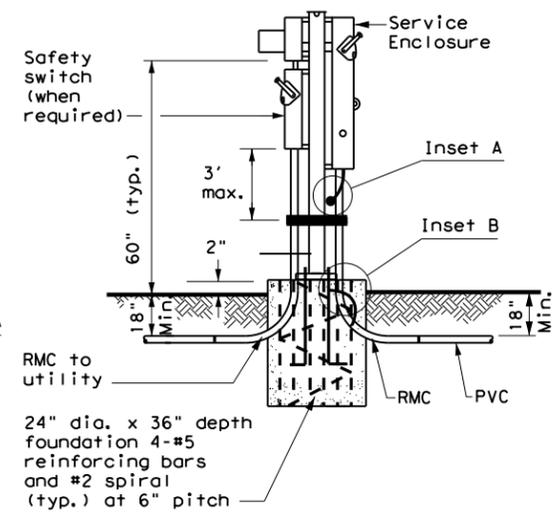


WITH SAFETY SWITCH  
WITHOUT SAFETY SWITCH  
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE

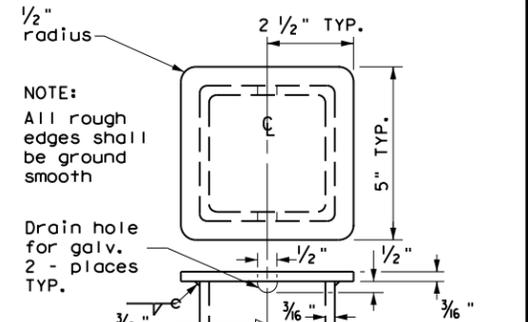
Drill, tap, and thread 1/2" X 13 UNC. Install tank ground fitting, connect electrical service grounding electrode conductor. See Note 7.



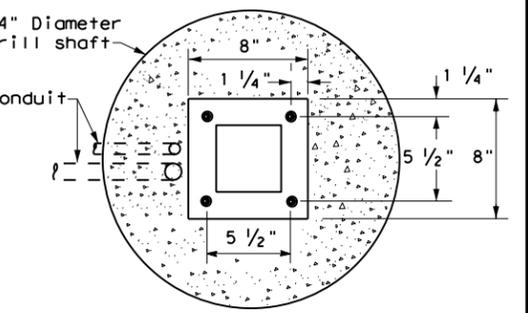
FRONT VIEW INSET A  
INSET B



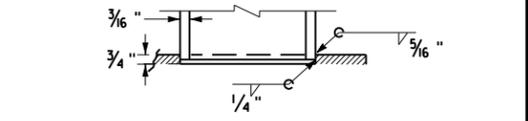
WITH SAFETY SWITCH  
SERVICE SUPPORT TYPE SP (U) - UNDERGROUND SERVICE  
HOOKED ANCHOR DETAIL



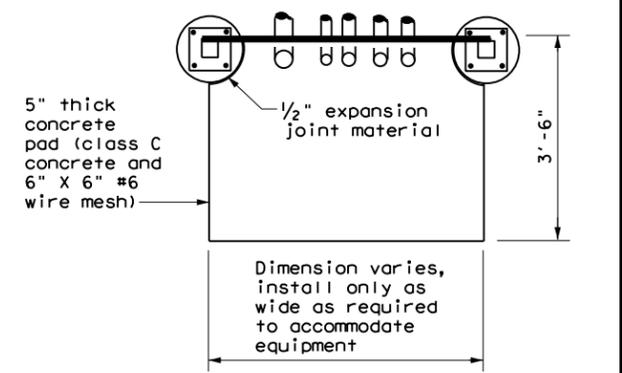
POLE TOP PLATE



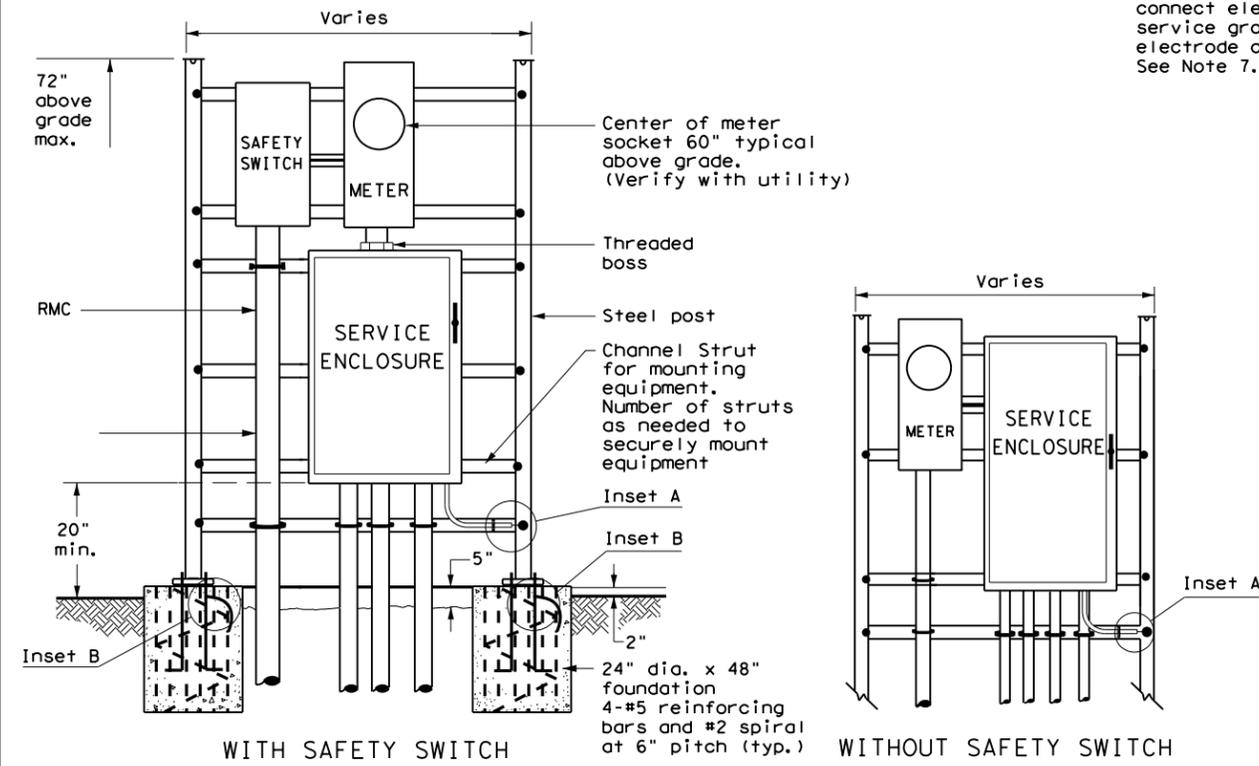
BASE PLATE DETAIL



BOTTOM OF POLE  
SERVICE SUPPORT TYPE SF & SP



TOP VIEW  
SERVICE SUPPORT TYPE SF (O) & SF (U)



WITH SAFETY SWITCH  
WITHOUT SAFETY SWITCH  
SERVICE SUPPORT TYPE SF (U) - UNDERGROUND SERVICE  
SERVICE SUPPORT TYPE SF (O) - OVERHEAD SERVICE

		Traffic Operations Division Standard	
<b>ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF &amp; SP ED(7)-14</b>			
FILE: ed7-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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REVISIONS	DIST: ELP	COUNTY: EL PASO	SHEET NO.: 86

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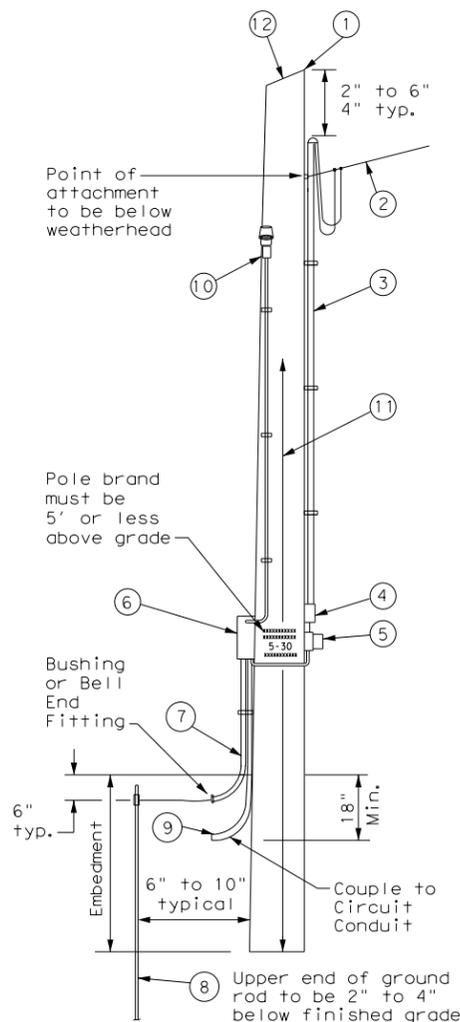
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TIMBER POLE (TP) SERVICE SUPPORT NOTES

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 electrical 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 3/8 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.

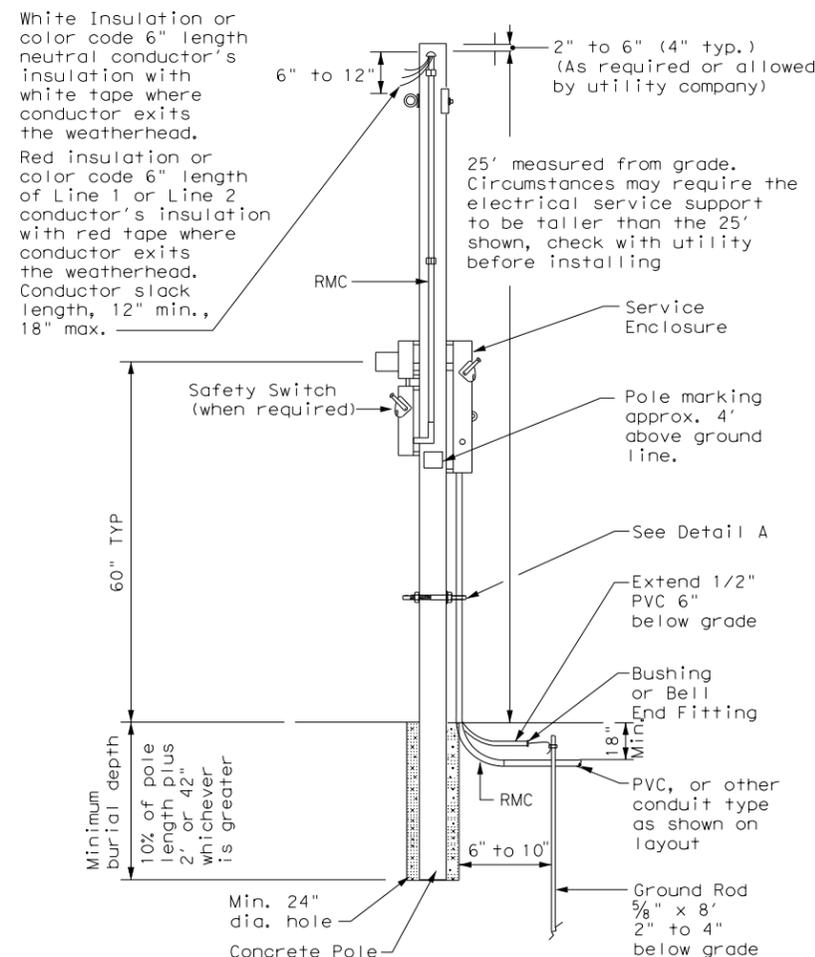


SERVICE SUPPORT TYPE TP (O)

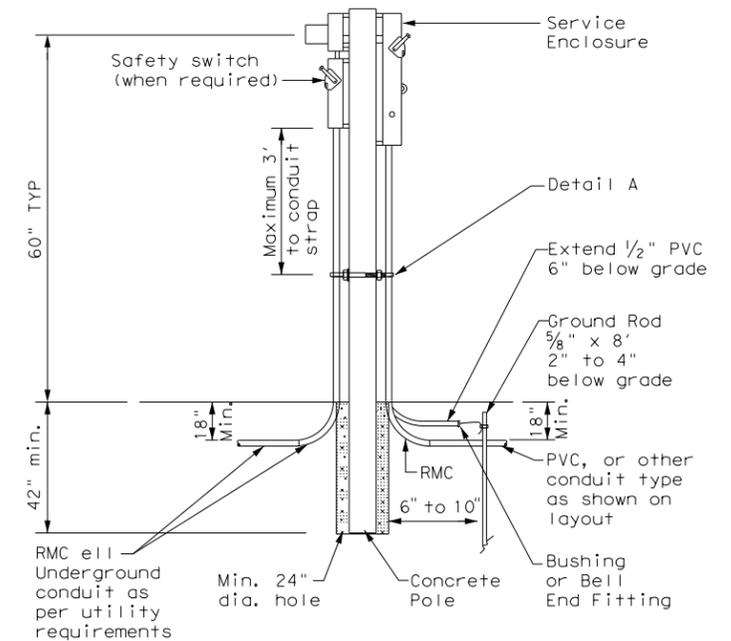
GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

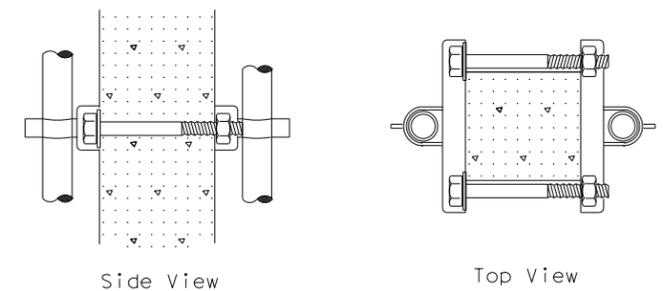
1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' 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)



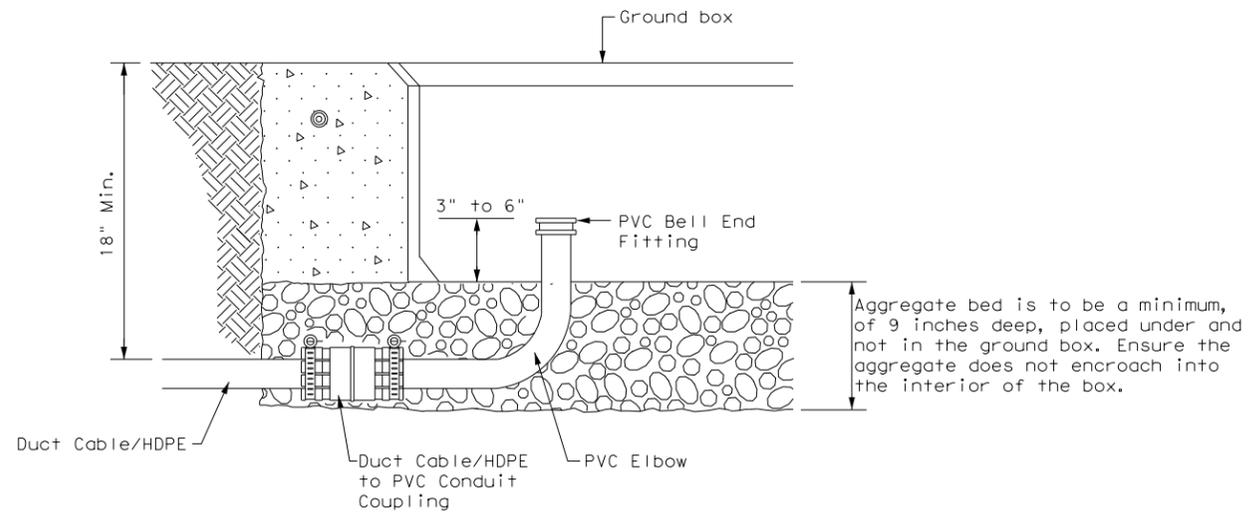
DETAIL A

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.

					<b>Traffic Operations Division Standard</b>
<p>ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, &amp; TP</p> <p>ED(10)-14</p>					
FILE:	ed10-14.dgn	DN:	TxDOT	CK:	TxDOT
©TxDOT	October 2014	CONT	SECT	JOB	HIGHWAY
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		ELP	EL PASO		87

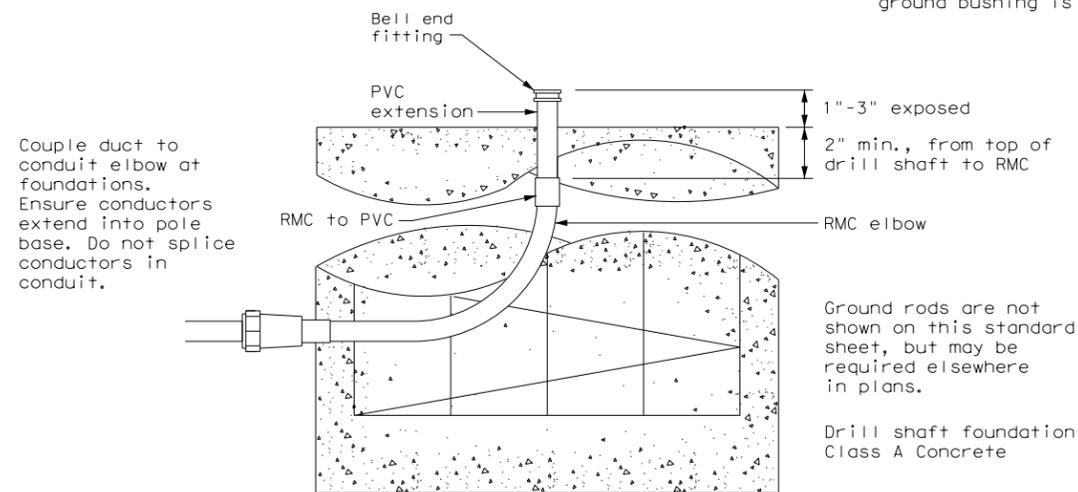
DUCT CABLE & HDPE CONDUIT NOTES

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.

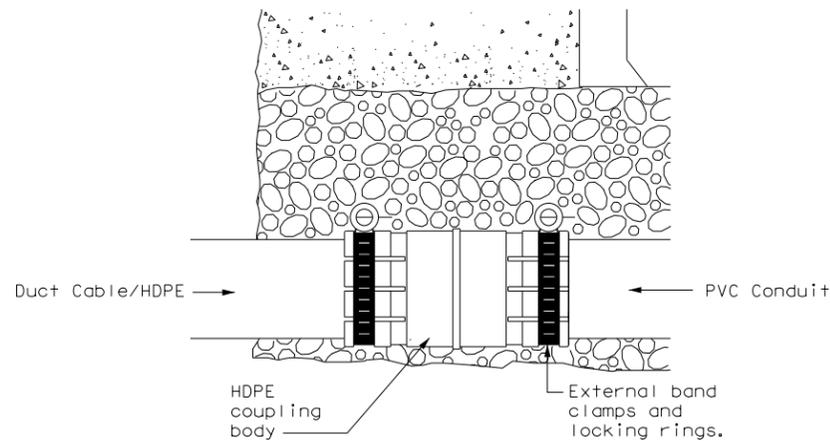


DUCT CABLE/HDPE AT GROUND BOX

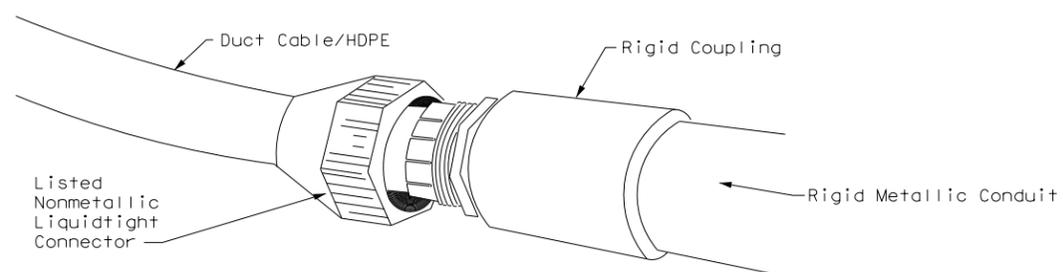
When the upper end of an RMC Ell does not enter the ground box, it may be extended with a SCH-40 PVC conduit nipple and bell end, provided there is a minimum of 18" of cover over all parts of the elbow. If not, a rigid extension and ground bushing is required.



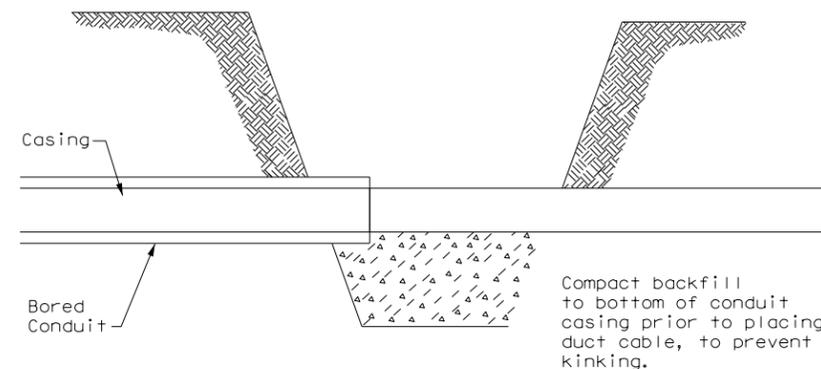
DUCT CABLE / HDPE AT FOUNDATION



DUCT CABLE/HDPE TO PVC



DUCT CABLE/HDPE TO RMC



BORE PIT DETAIL

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		<b>Traffic Operations Division Standard</b>	
<p>ELECTRICAL DETAILS DUCT CABLE/ HDPE CONDUIT</p> <p>ED(11)-14</p>			
FILE: ed11-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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		ELP	EL PASO
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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.

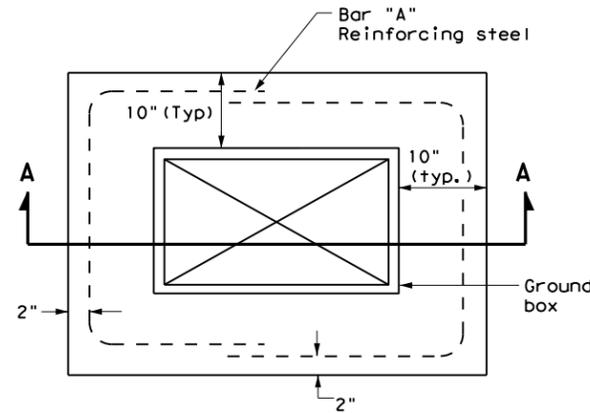
#### B. CONSTRUCTION METHODS

1. Ensure conduit entry will not interfere with placement of the batteries in the battery box ground box.

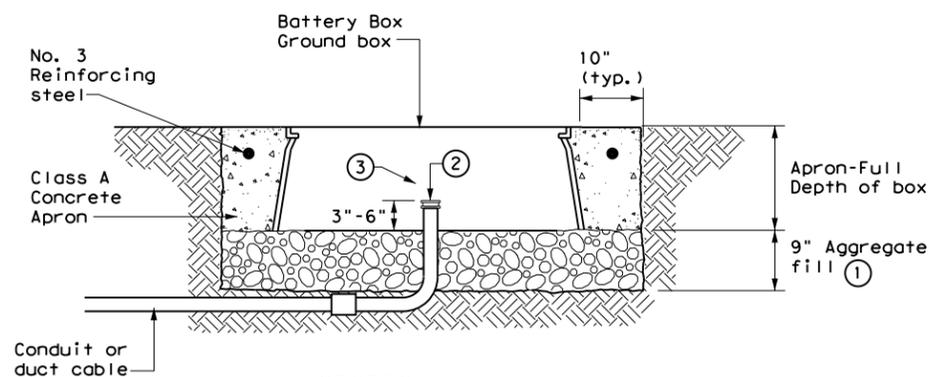
2. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting battery box ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure the aggregate bed is in place and is a minimum of 9 in. deep prior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



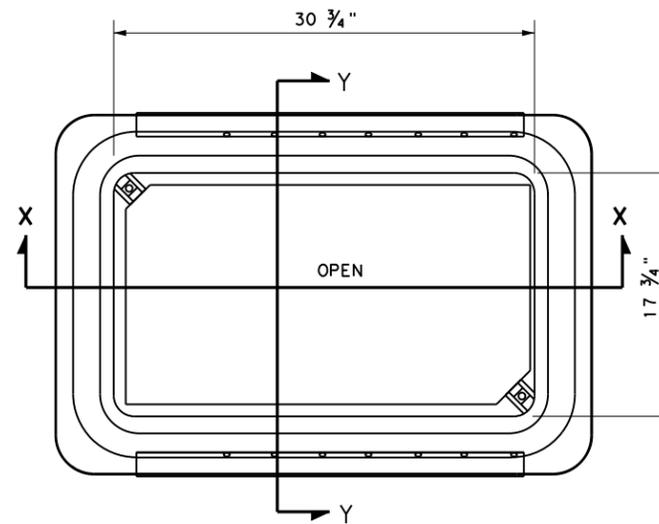
**PLAN VIEW**



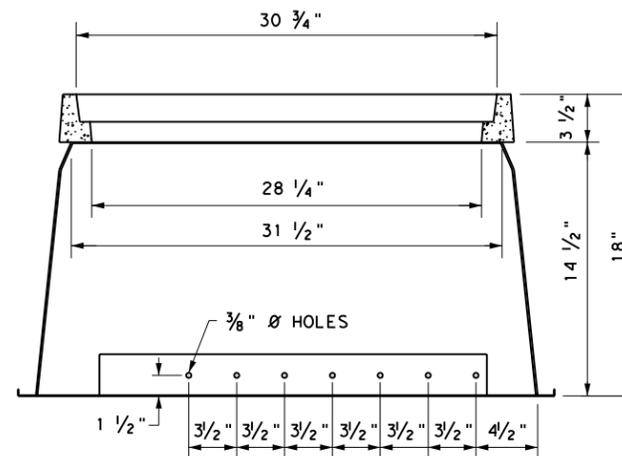
**SECTION A - A**

#### APRON FOR BATTERY BOX GROUND BOXES

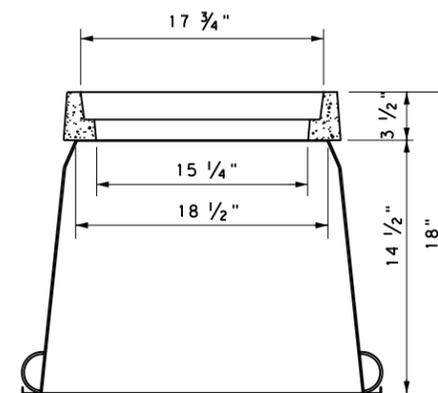
- ① Place aggregate under the box and not in the box. Aggregate should not encroach on the interior volume of the box.
- ② Install bushing or bell end fitting on the upper end of all elbows.
- ③ Install all conduits in a neat and workmanlike manner.



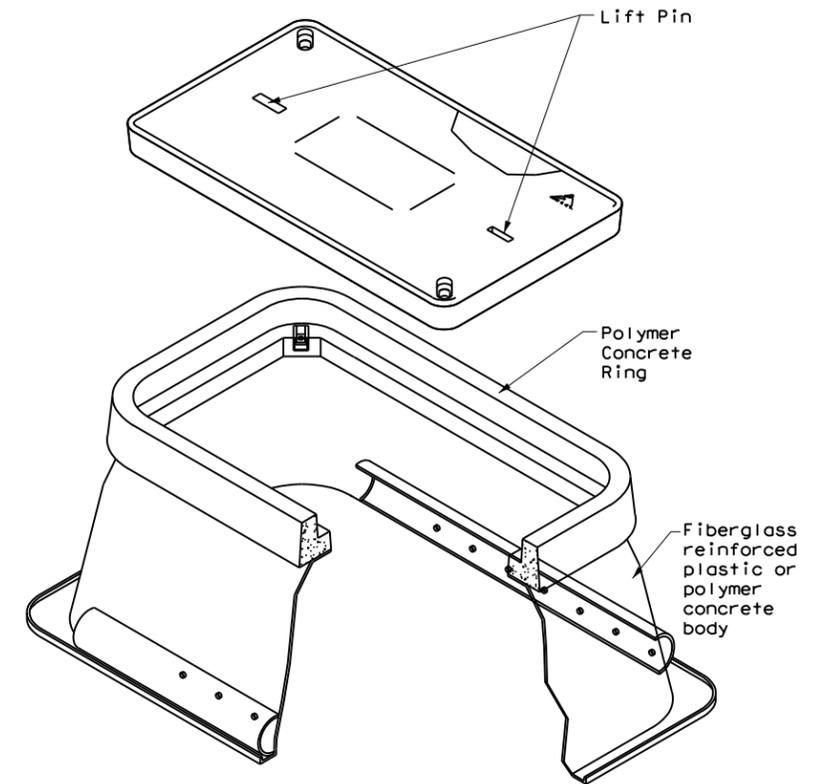
**BATTERY BOX TOP VIEW**



**SECTION X-X**



**SECTION Y-Y**



		<b>Traffic Operations Division Standard</b>	
<b>ELECTRICAL DETAILS BATTERY BOX GROUND BOXES</b>			
<b>ED(12)-14</b>			
FILE: ed12-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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# ROADWAY ILLUMINATION ASSEMBLY NOTES

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1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.
2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.
3. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.
4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.
5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.
  - a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.
  - b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25' above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 6th Edition (2013) of the AASHTO Design Specifications. For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25' above the surrounding terrain, provide poles meeting the following requirements:
    - i. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).
    - ii. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to resist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.
6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.
7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.
8. Install T-Base with following procedure:
  - a. Anchor Bolt Tightening.
    - i. Coat the threads of the anchor bolts with electrically conductive lubricant.
    - ii. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.
    - iii. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.
    - iv. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.
    - v. Check top of T-base for level. If not level then foundation must be leveled.
  - b. Top Bolt Procedure
    - i. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.

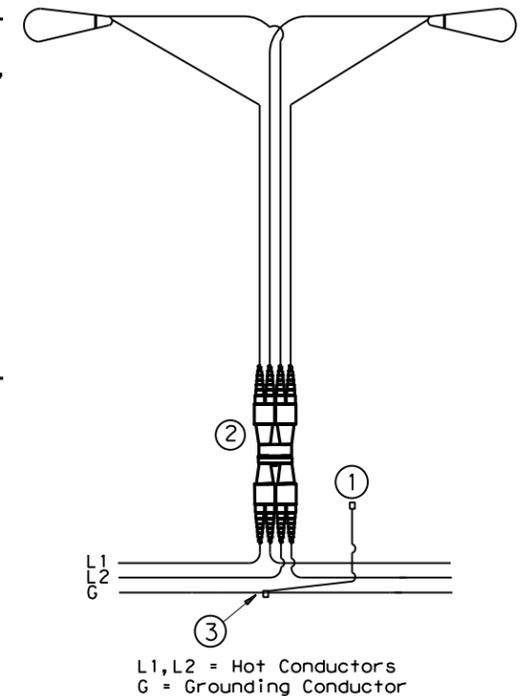
- ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."
  - iii. Tighten each nut to 150 ft-lb. using a torque wrench.
- c. Level and Plumb
- i. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.
9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).
  10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150W HPS or 150W EQ LED.
  11. Mount luminaires on arms level as shown by the luminaire level indicator.
  12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

## Wiring Diagram Notes:

- ① Use 1/2 in. -13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.
- ② Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.
- ③ Split Bolt or other connector.

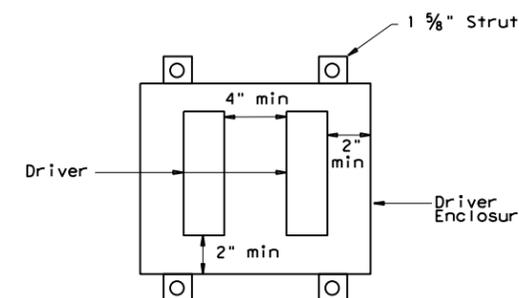
## Decorative LED Lighting Notes:

1. LED Drivers in Remote Outdoor enclosures (for drivers that do not include an enclosure as part of a factory assembly):
  - a. Provide NEMA 3R outdoor enclosure or as approved.
  - b. Install enclosure at least 12" above ground or other horizontal surface. Mount vertically or on ceiling, and avoid direct sun where possible.
  - c. Install drivers with at least 2 inches of space from enclosure walls.
  - d. For multiple drivers in an enclosure, provide at least 4 inches side to side and 1 inch end to end from other drivers or electronic equipment
  - e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.
  - f. Provide remote drivers with a maximum of 100 watts
  - g. Provide drivers with documentation of 100,000 hr lifetime at Tcase of 65C or higher.



## TYPICAL WIRING DIAGRAM

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



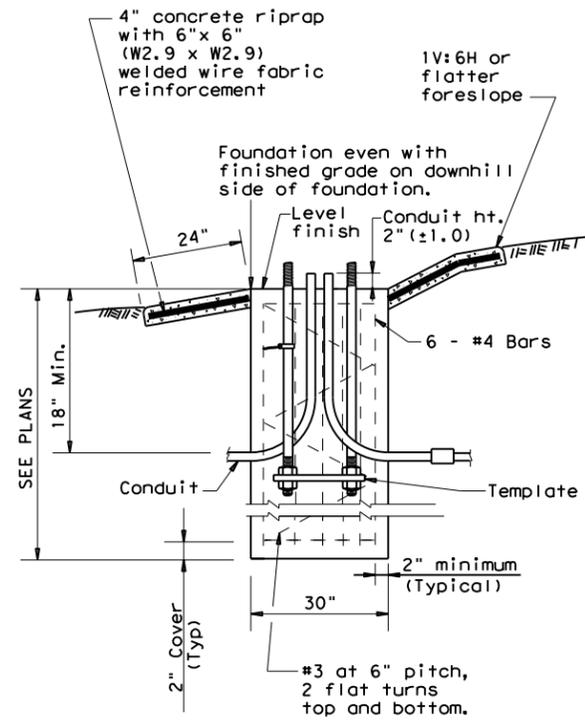
Driver Spacing In Remote Enclosure

		<b>Traffic Safety Division Standard</b>	
<h1>ROADWAY ILLUMINATION DETAILS</h1> <h2>RID(1)-20</h2>			
FILE:	rid1-20.dgn	DN:	CK:
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REVISIONS		0001	02
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			SHEET NO. <b>90</b>

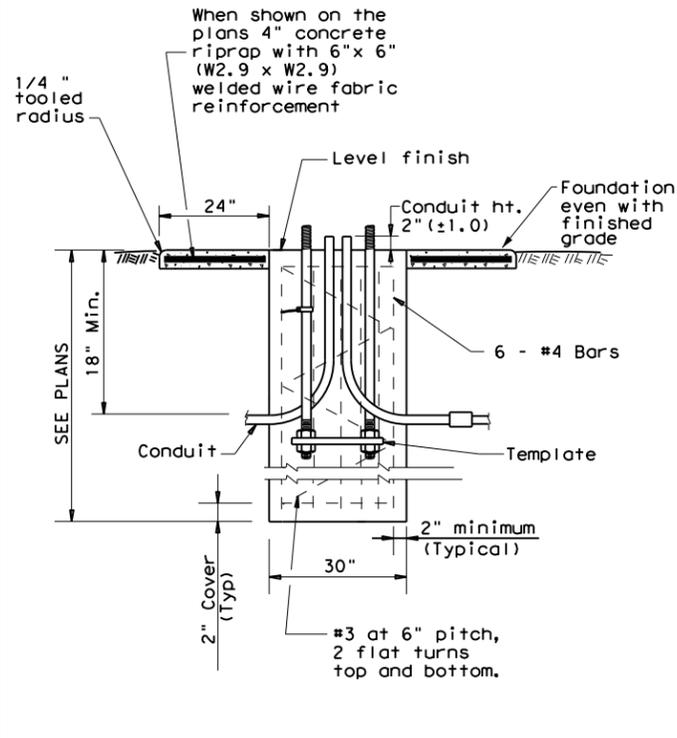
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**SECTION A-A**  
SHOWING SLOPED GRADE



**SECTION A-A**  
SHOWING CONSTANT GRADE

**TABLE 1**  
**ANCHOR BOLTS**

POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1 in. x 30 in.
40-50 ft.	15 in.	17 1/4 in.	1 1/4 in. x 30 in.

**TABLE 2**  
**RECOMMENDED FOUNDATION LENGTHS**  
(See note 1)

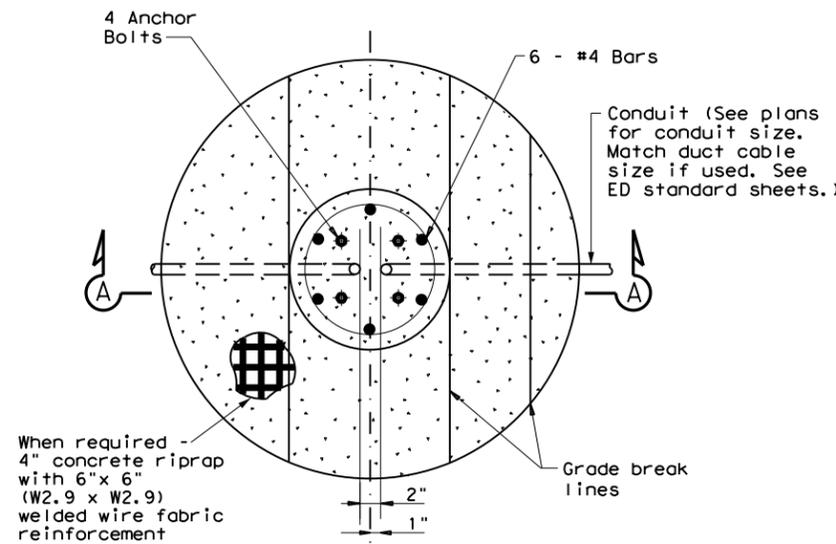
MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
<20 ft.	6'	6'	6'
>20 ft. to 30 ft.	8'	6'	6'
>30 ft. to 40 ft.	8'	8'	6'
>40 ft. to 50 ft.	10'	8'	6'

**TABLE 3**  
**PAY QUANTITY OF RIPRAP PER FOUNDATION**  
(Install only when shown on the plans)

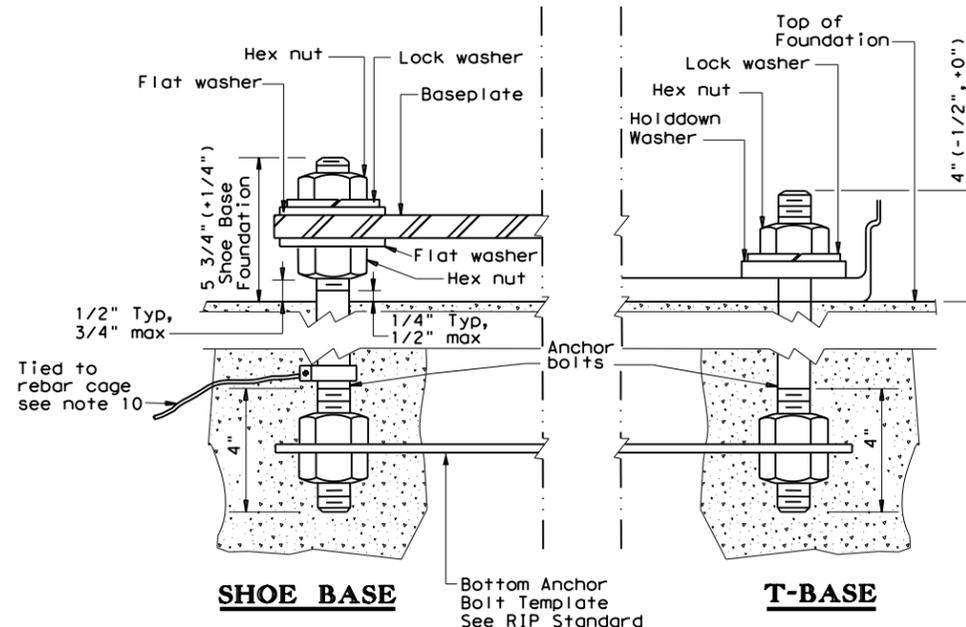
Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

**GENERAL NOTES:**

1. "Recommended Foundation Lengths" table is for information purposes only. Foundation lengths shall be as shown on the plans, or as directed by the Engineer. Foundations will be paid for under Item 416, "Drilled Shaft Foundations," unless otherwise shown on the plans.
2. Erect roadway illumination assembly poles plumb and true. Form and level the top 6" of the foundation so the pole will be plumb. Use leveling nuts to plumb shoe base poles. Do not use shims or leveling nuts under transformer bases. Do not grout between baseplate and the foundation.
3. Ensure Class 2A and 2B fit for anchor bolts and nuts. Tap and chase nuts after galvanizing. Anchor bolt body with rolled threads need not be full size.
4. Use appropriate class of concrete as specified in Items 416 and 432. Concrete for riprap may be upgraded to Class C at no extra cost to the Department.
5. Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
6. Locate breakaway roadway illumination assemblies as shown in the placement table, unless otherwise dimensioned on the plans. Protect non-breakaway illumination assemblies from vehicular impact (i.e. 2.5 ft. behind guard rail or mounted on traffic barrier), or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less. See Roadway Design Manual for further information.
7. Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
8. Install a minimum of 2 conduits in each foundation. See lighting layout sheets for locations of foundations with more than 2 conduits. Cap unused conduits in foundations on both ends.
9. Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
10. Bond anchor bolt to rebar cage with #6 bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. The bonded steel in the foundation creates a concrete encased grounding electrode which replaces the ground rod.
11. Grade earthwork around T-base foundations even with the finished grade as shown in Section A-A to ensure proper function of the breakaway device. Use riprap on T-base foundations that are located on sloped grades, and as shown on the plans for level grades.



**FOUNDATION DETAIL**



**ANCHOR BOLT DETAIL**

**TABLE 4**  
**BREAKAWAY POLE PLACEMENT (See note 6)**

ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

\* or as close to ROW line as is practical  
\*\* provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.

Texas Department of Transportation  
Traffic Safety Division Standard

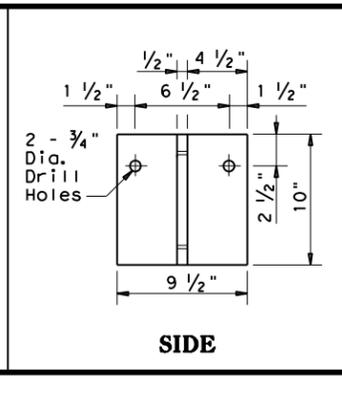
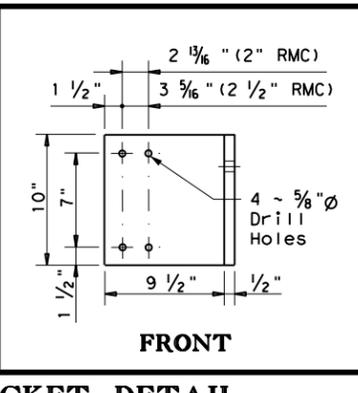
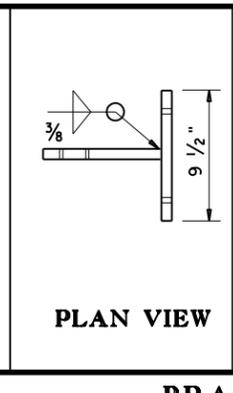
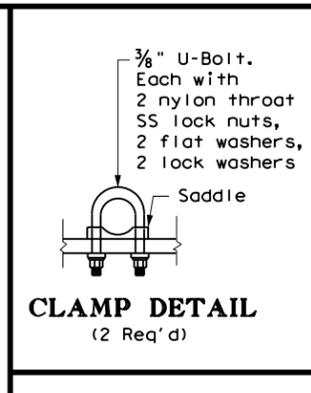
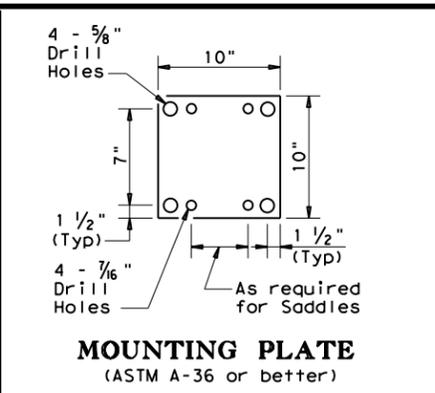
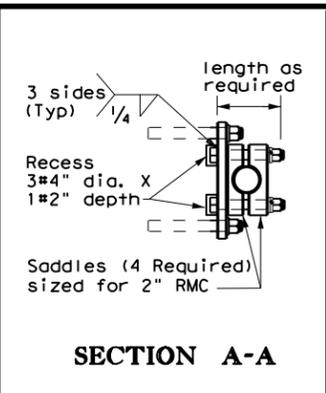
**ROADWAY ILLUMINATION DETAILS (RDWY ILLUM FOUNDATIONS)**  
**RID(2)-20**

FILE: rid2-20.dgn	DN:	CK:	DW:	CK:
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7-17	ELP	EL PASO	91	
12-20				

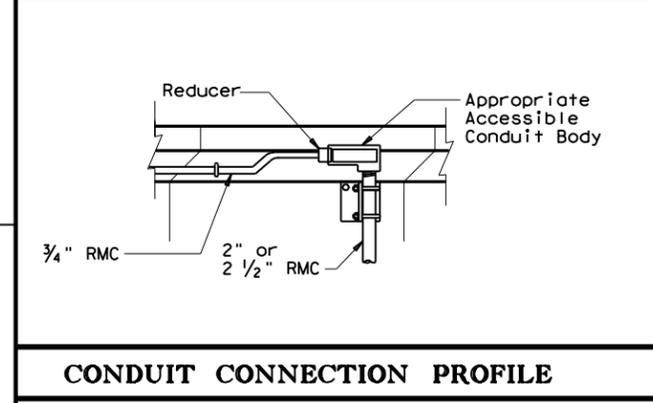
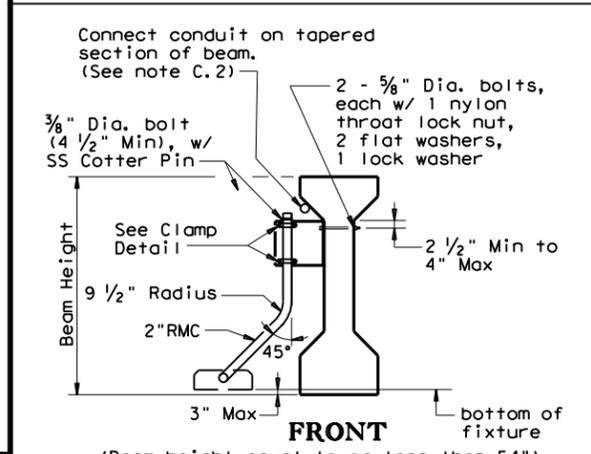
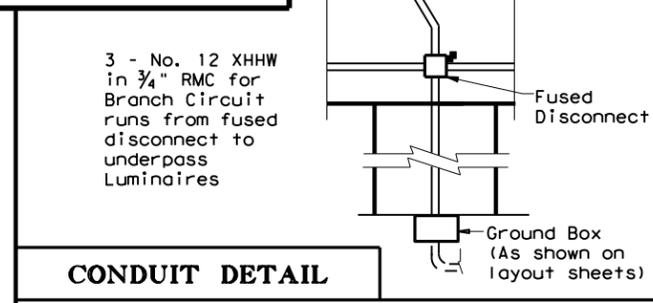
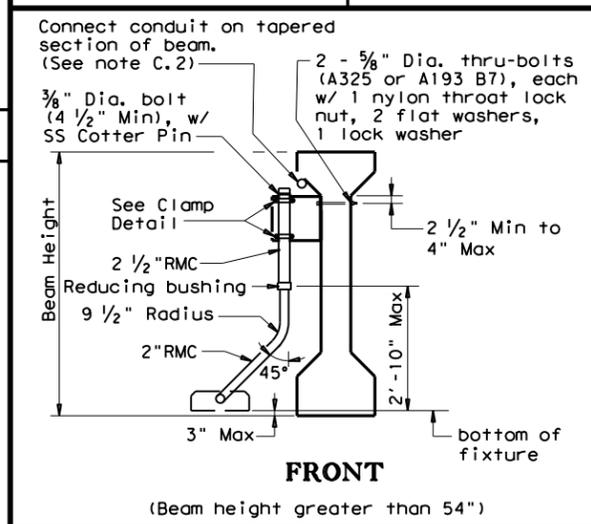
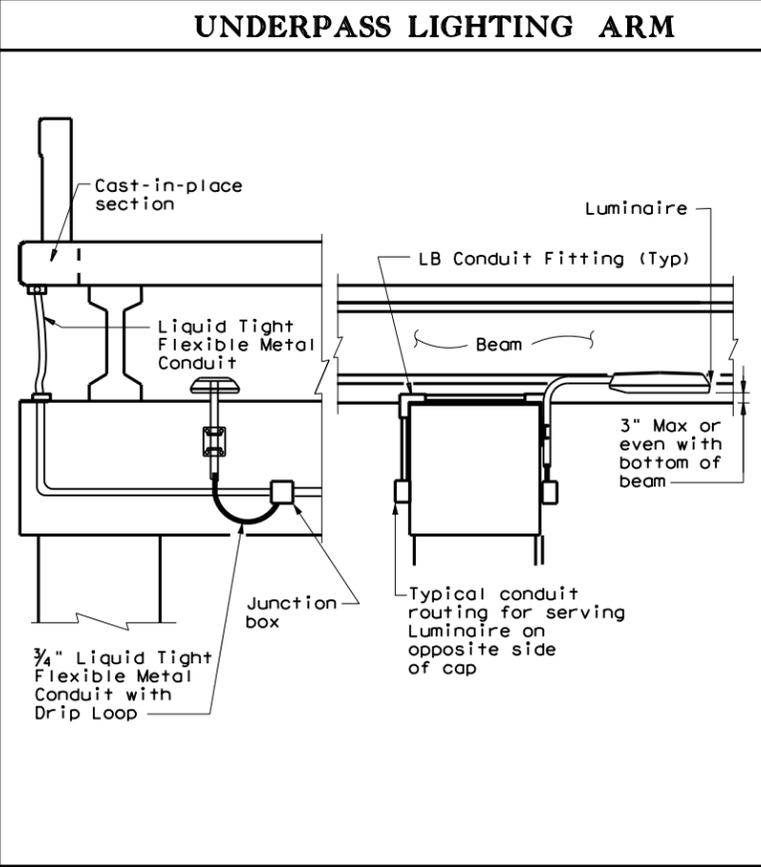
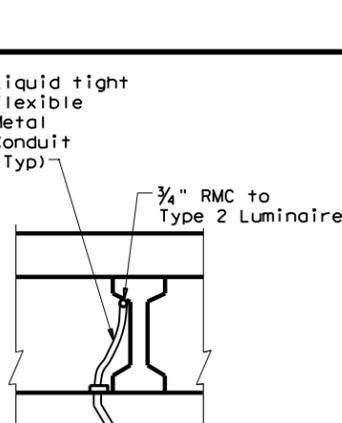
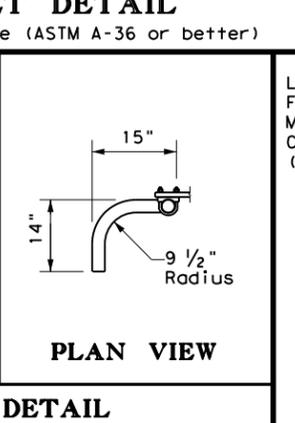
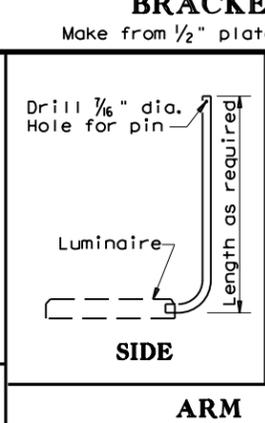
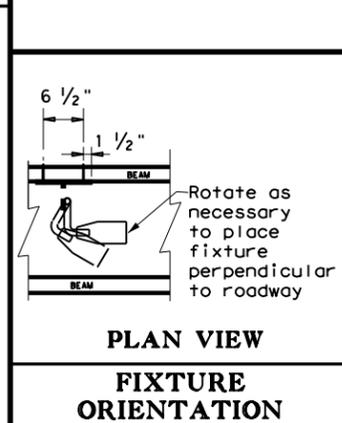
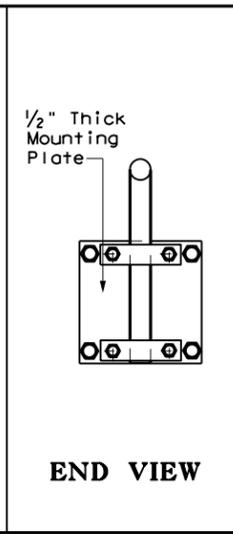
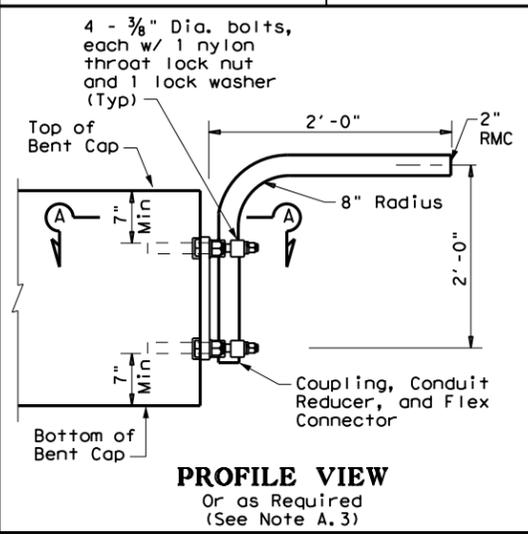
72B

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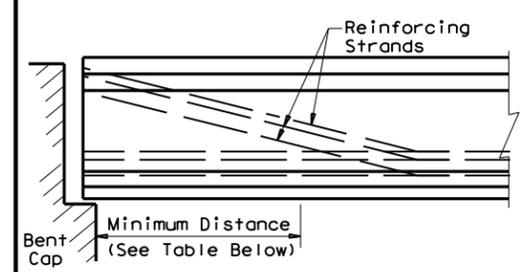
- GENERAL NOTES:**
- A. ALL 150 watt HPS and 150 watt equivalent LED Luminaires**
- Luminaire locations, conduit and conductor sizes and routing are typical and diagrammatic only. See project layout sheets for specific details.
  - Conduit will be paid for under Item 618, "Conduit" and conductors will be paid for under Item 620, "Electrical Conductors," unless otherwise shown on the plans.
  - Adjust conduit in saddles to place fixture height and orientation as required. See fixture orientation detail and plans. Where practicable, place luminaires so the bottom of luminaire is above the bottom of the beam, maximum of 3 in. (See detail UNDERPASS LIGHTING ARM TYPE 2)
  - Except as noted, galvanize all structural steel and exposed bolts, nuts, and washers in accordance with Item 445 "Galvanizing".
  - Fabrication of brackets and support arms will not be paid for directly but is subsidiary to Item 610, "Roadway Illumination Assemblies."
  - Install a heavy duty NEMA 3R fused disconnect or breaker enclosure rated at 30 amps and 480 volts to switch underpass luminaires as shown on plans, with at least one per bridge circuit. Install 20 amp time-delay fuses or inverse-time circuit breakers. Mount disconnect or breaker enclosure 10 ft. (min) above grade on columns or bent caps as approved by the Department. Modify disconnect to allow padlocking in the "ON" and "OFF" positions. Padlocks and disconnect switches or circuit breakers for underpass fixtures will not be paid for directly but are subsidiary to the various bid items of the contract.
  - Conduit on columns, caps, and slab is shown surface mounted. For new columns and caps, embed PVC conduit in concrete. Bond and ground metal junction boxes and conduit.



- B. TYPE 1**
- Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) for Type 1 arm shaft.
  - Use 3/8 in. stainless steel bolt or stud non-epoxy type expansion anchors for concrete for Type 1 mounting. Except as noted, provide an allowable 2650 lbs minimum pull-out force (after consideration of adjustment factors for edge distance and bolt spacing) for each anchor. Install each anchor to the embedment depth recommended by the manufacturer.
  - Attach conduit to plate with 4 saddles, four - 3/8 in. diameter bolts, nylon throat lock nuts, and lock washers.
- C. TYPE 2**
- Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) or provide a combination of 2 1/2 in. (2.875" O.D., 0.193" wall) and 2 in. (2.375" O.D., 0.146" wall) rigid metal conduits with a reducing bushing as beam height stipulated for Type 2 arm shaft. Field cutting and threading will be permitted. Paint cut and threaded areas with zinc rich paint after conduit is connected to adjacent fitting.
  - Connecting conduit may be strapped to tapered section only of precast beams as shown. Anchor as approved by the Engineer. Maximum anchor depth is 1 in.
  - Indiscriminate drilling into precast concrete beams may result in reduced beam strength. Use drilling location and method as directed by the Engineer. See Location of Underpass Lighting Mounting Bracket detail. The locations shown in the table are such that reinforcing strands will not be damaged.

**IN RD IL AM (U/P) (TY 1)**  
 If bridge has pre-cast panels under deck, run circuit under deck edge.  
**UNDERPASS LIGHTING TYPE 1**

**IN RD IL AM (U/P) (TY 2)**  
**UNDERPASS LIGHTING TYPE 2**



SPAN LENGTH	MINIMUM DISTANCE
≤ 50'	10'-0"
50' - 70'	15'-0"
70' - 90'	20'-0"
> 90'	25'-0"

Texas Department of Transportation

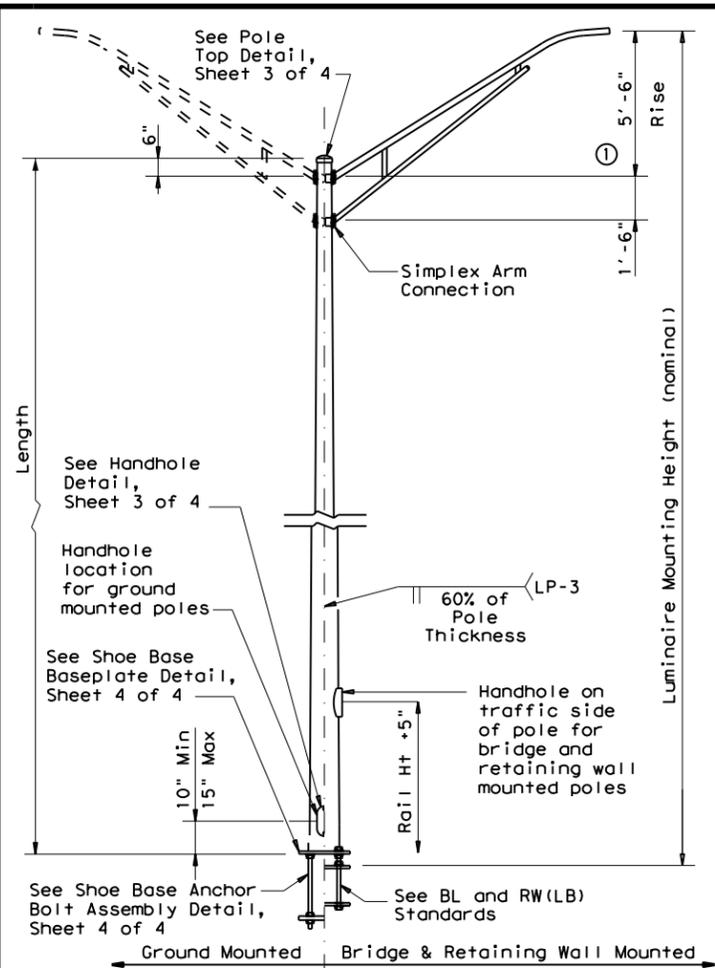
**ROADWAY ILLUMINATION DETAILS**  
 (UNDERPASS LIGHT FIXTURES)  
**RID(3)-20**

FILE: r1d3-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 2013	CONT	SECT	JOB	HIGHWAY
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2-14	DIST	COUNTY	SHEET NO.	
7-17	ELP	EL PASO	92	
12-20				



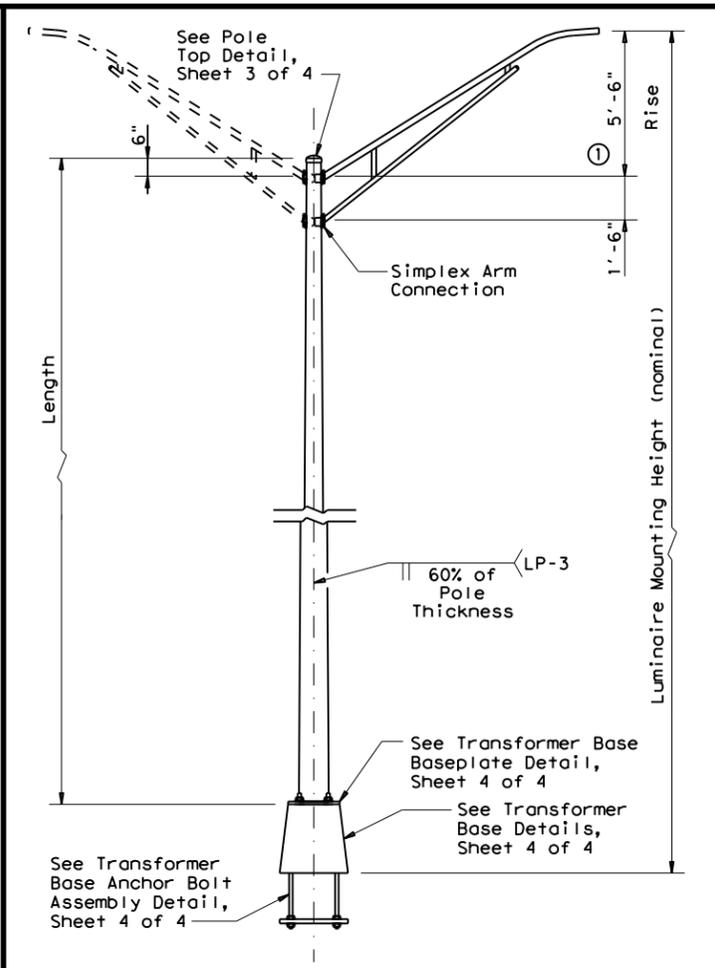
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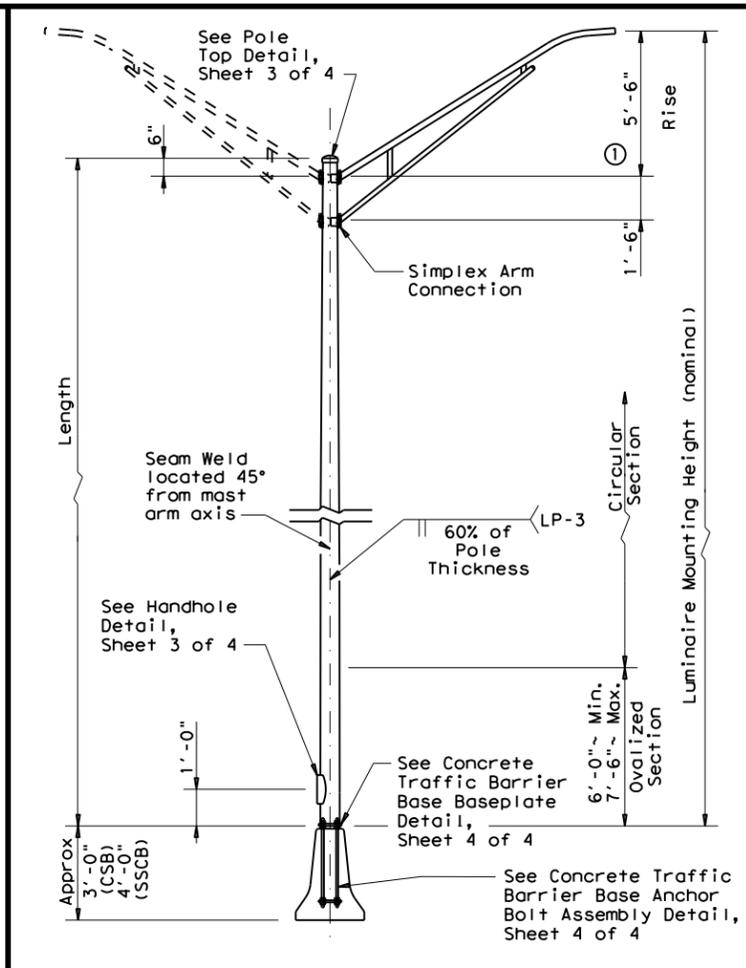
**SHOE BASE POLE**

SHOE BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	4.90	15.00	0.1196	7.1
30.00	7.50	4.00	25.00	0.1196	13.2
31.00-39.00	8.00	4.36-3.24	26.00-34.00	0.1196	20.7
40.00	8.50	3.60	35.00	0.1196	20.7
50.00	10.50	4.20	45.00	0.1196	30.3



**TRANSFORMER BASE POLE**

TRANSFORMER BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	5.11	13.50	0.1196	7.1
30.00	7.50	4.21	23.50	0.1196	13.2
31.00-39.00	8.00	4.57-3.45	24.50-32.50	0.1196	20.7
40.00	8.50	3.81	33.50	0.1196	20.7
50.00	10.00	3.91	43.50	0.1196	30.3



**CONCRETE TRAFFIC BARRIER BASE POLE**

CONCRETE TRAFFIC BARRIER BASE POLE (CSB/SSCB)						
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)	
					About C of Rail	Perp. to Rail
28.00	9.00	5.78	23.00	0.1196	10.3	13.2
38.00	9.00	4.38	33.00	0.1196	16.6	20.8
48.00	10.50	4.48	43.00	0.1345	25.1	30.5

**GENERAL NOTES:**

- Designs conform to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto. Design 3-Second Gust Wind Speed equals 110 mph with a 1.14 gust factor. A wind importance factor of 0.80 is applied to adjust the wind speed to a 25 year recurrence interval. Design moments listed in tables assume base of pole is 25' above natural ground level.
- Structures are designed to support two 12' luminaire mast arms and luminaires. Mast arms are designed to support a 60-pound luminaire having an effective projected area of 1.6 square feet.
- Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Do not submit shop drawings for roadway illumination pole assemblies fabricated in accordance with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of these sheets and the Specifications. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
- For mounting heights between values shown in the tables, use base diameter and thickness values for the larger height.
- Unless otherwise noted, all steel parts shall be galvanized in accordance with Item 445, "Galvanizing."
- Steel poles shall be fabricated in accordance with Item 441, "Steel Structures." Longitudinal seam welds for pole sections shall have 60% minimum penetration. All welding shall be in accordance with AWS D1.1, Structural Welding Code-Steel.
- Two-section poles joined by circumferential welds will not be permitted, unless otherwise shown on the plans. Poles may be fabricated in two sections and field-assembled by the lap-joint method. The two sections shall telescope together with a lap length of not less than 1-1/2 times the shaft diameter at the lap joint.
- Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
- Lubricate and tighten anchor bolts, when erecting shoe base poles and concrete traffic barrier base poles, in accordance with Item 449, "Anchor Bolts."
- All poles, except Transformer Base Poles, shall have hand holes with reinforcing frames and covers. For ground mounted shoe base poles, hand holes shall be placed 90 degrees to mast arm unless otherwise noted on the plans. For poles mounted on a concrete traffic barrier with one luminaire arm, hand holes shall be located 180 degrees from luminaire arm. For poles mounted on a concrete traffic barrier with two luminaire arms, all hand holes shall be on the same side of the barrier. For poles mounted on a bridge lighting bracket or a retaining wall lighting bracket, hand hole shall be on traffic side of the pole, at a height that will clear the barrier.
- The finished pole shall have a smooth, uniform finish free of pits, blisters, or other defects. Scratched, chipped, and other damaged galvanized areas on poles and mast arms shall be repaired in accordance with Item 445, "Galvanizing."
- Pole length is based on a 5'-6" luminaire arm rise. 4 ft. luminaire arms have a 2'-6" rise. A pole with 4 ft. luminaire arms will have an actual mounting height 3'-0" less than the nominal mounting height. Increasing the pole length to meet the nominal mounting height is allowed, but unnecessary unless otherwise directed by the engineer.
- Erect transformer base poles in accordance with sheet RID(1).

**MATERIAL DATA**

COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)
Pole Shaft (0.14"/ft. Taper)	A572 Gr 50, A595 Gr A, A1011 HSLAS Gr 50 Cl 2 ③, or A1008 HSLAS Gr 50 Cl 2	50
Base Plate and Handhole Frame	A572 Gr.50, or A36	36
T-Base Connecting Bolts	F3125 Gr A325	92
Anchor Bolts	F1554 Gr 55, A193-B7 or A321	55 105
Anchor Bolt Templates	A36	36
Heavy Hex (H.H.) Nuts	A194 Gr 2H, or A563 Gr DH	
Flat Washers	F436	

**NOTES:**

- 2'-6" rise for 4 ft. luminaire arms.
- Before ovalized as shown on Concrete Traffic Barrier Base Baseplate details, Sheet 4 of 4.
- A1011 SS Gr 50 may be used instead of HSLAS, provided the material meets the elongation requirements for HSLAS.

**POLE ASSEMBLY FABRICATION TOLERANCES TABLE**

DIMENSION	TOLERANCE
Shaft length	+1"
I.D. of outside piece of slip fitting pieces	+1/8", -1/16"
O.D. of inside piece of slip fitting pieces	+1/32", -1/8"
Shaft diameter: other	+3/16"
Out of "round"	1/4"
Straightness of shaft	±1/4" in 10 ft
Twist in multi-sided shaft	4° in 50 ft
Perpendicular to baseplate	1/8" in 24"
Pole centered on baseplate	±1/4"
Location of Attachments	±1/4"
Bolt hole spacing	±1/16"

SHEET 2 OF 4

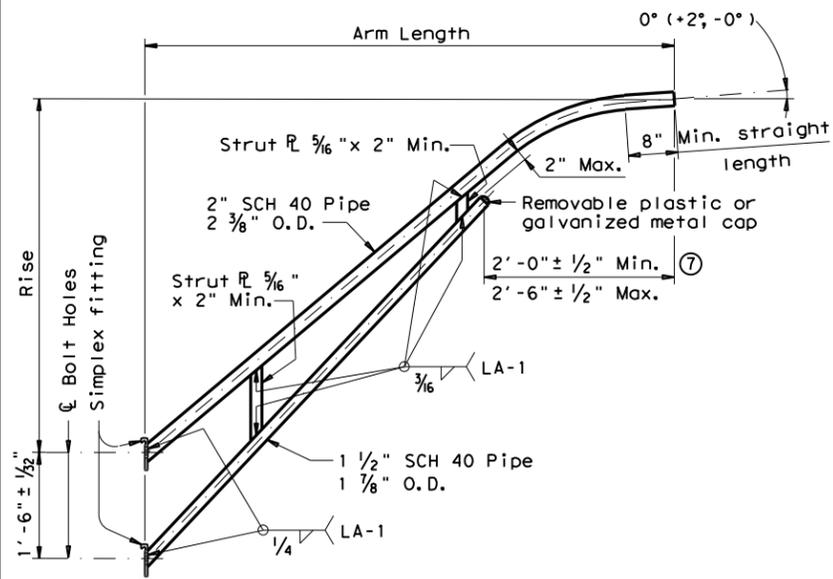


**ROADWAY ILLUMINATION POLES  
 RIP(2) - 19**

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© TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
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12-19	ELP	EL PASO	94	

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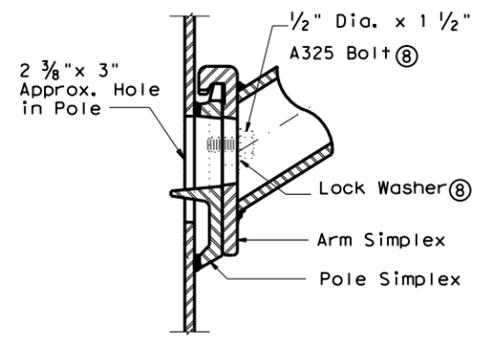
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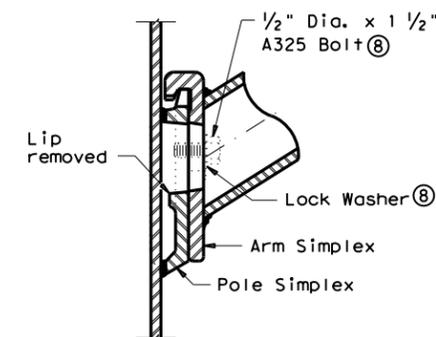
**LUMINAIRE ARM**

LUMINAIRE ARM DIMENSIONS		
Nominal Arm Length	Arm Length	Rise
4'-0"	3'-6"	2'-6"
6'-0"	5'-6"	5'-6"
8'-0"	7'-6"	5'-6"
10'-0"	9'-6"	5'-6"
12'-0"	11'-6"	5'-6"

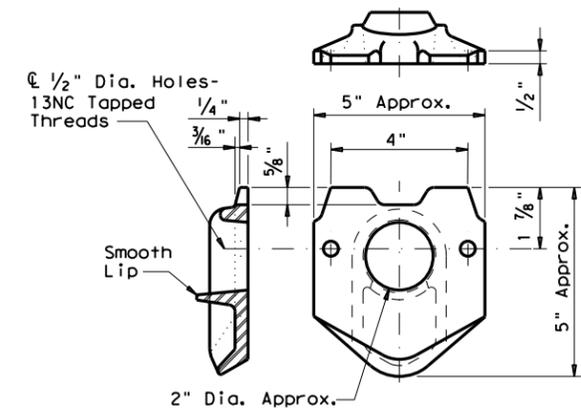
ARM ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Arm Length	±1"
Arm Rise	±1"
Deviation from flat	1/8" in 12"
Spacing between holes	±1/32"



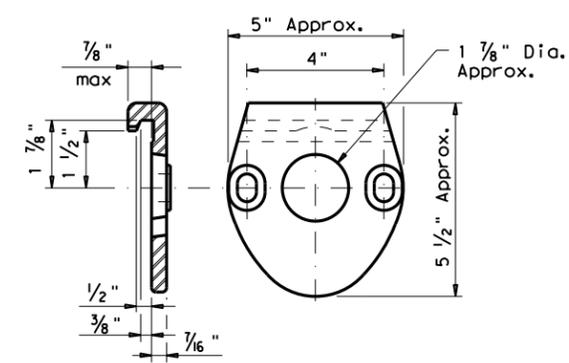
**UPPER SIMPLEX FITTING**  
 (Gusset not shown for clarity)



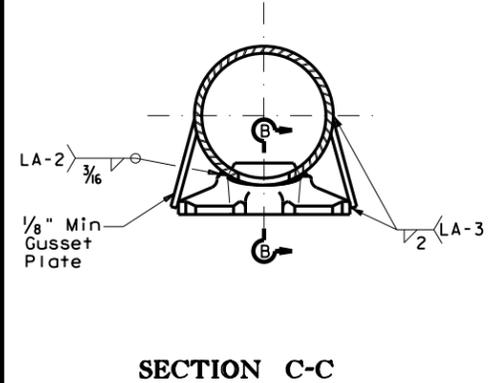
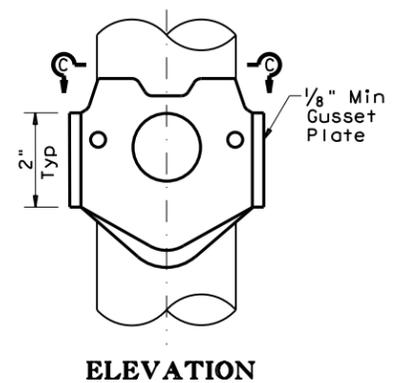
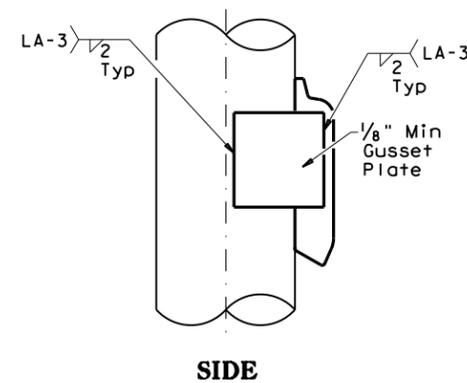
**LOWER SIMPLEX FITTING**  
 (Gusset not shown for clarity)  
**SECTION B-B**



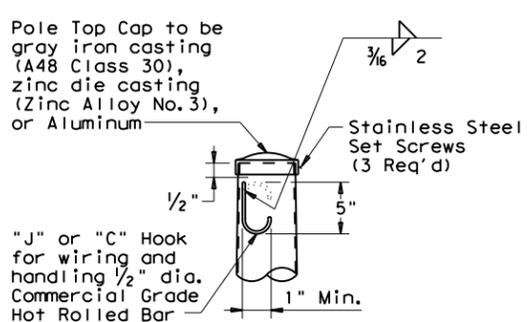
**POLE SIMPLEX DETAIL**



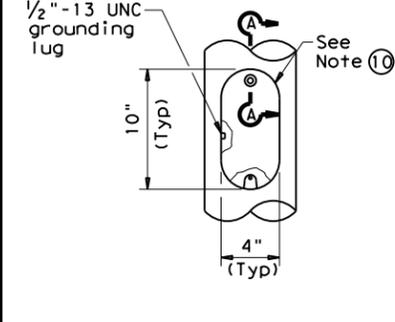
**ARM SIMPLEX DETAIL**



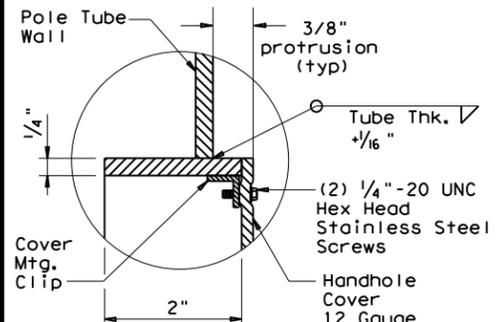
**SIMPLEX ATTACHMENT DETAIL**



**POLE TOP**



**ELEVATION**



**SECTION A-A**

**HANDHOLE**

**NOTES:**

- ④ Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.
- ⑤ A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.
- ⑥ A572, A1008 HSLAS-F, and A1011 HSLAS-F materials may have higher yield strengths but shall not have less elongation than the grade indicated.
- ⑦ Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.
- ⑧ Each pole simplex fitting shall be supplied with 2 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans.
- ⑨ Proposed deviations in arm simplex dimensions or materials must be submitted to the Department for approval.
- ⑩ A welded handhole frame is permissible. Maximum of two (2) CJP weld splices is allowed.

**MATERIALS**

Pole or Arm Simplex	ASTM A27 Gr 65-35 or Gr 70-36, A148 Gr 80-50, A576 Gr 1021 ⑤, or A36 (Arm only)
Arm Pipes	ASTM A53 Gr A or B, A500 Gr B, A501, A 1008 HSLAS-F Gr 50 ⑥, or A1011 HSLAS-F Gr 50 ⑥
Arm Struts and Gusset Plates ④	ASTM A36, A572 Gr 50 ⑥, or A588
Misc.	ASTM designations as noted

SHEET 3 OF 4

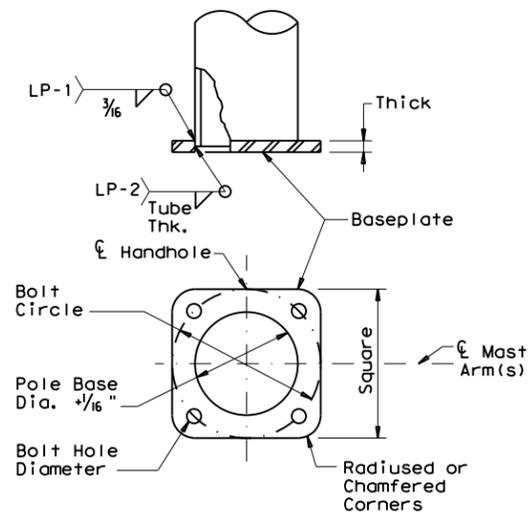


**ROADWAY ILLUMINATION POLES**  
**RIP(3) - 19**

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©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
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12-19	ELP	EL PASO	95	

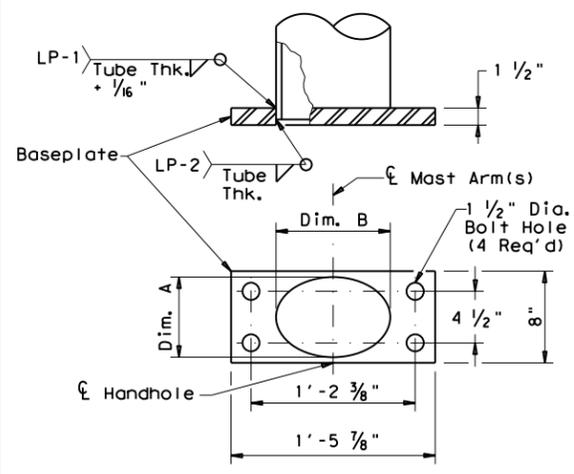
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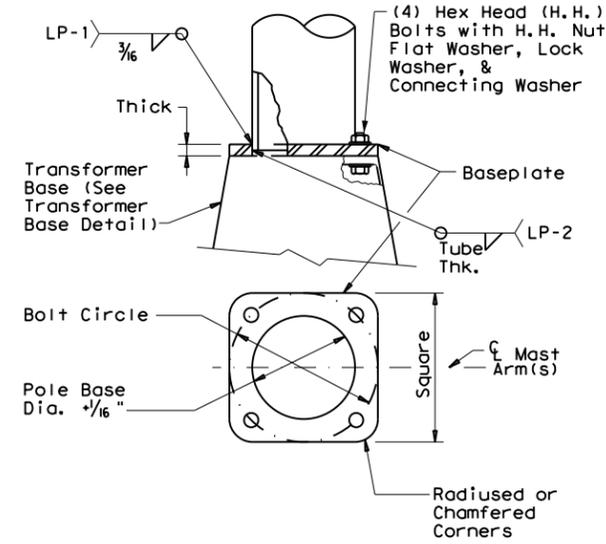
**SHOE BASE  
BASEPLATE**

SHOE BASE BASEPLATE TABLE				
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	BOLT HOLE DIAMETER
20' - 39'	13"	13"	1 1/4"	1 1/4"
40'	15"	15"	1 1/4"	1 1/2"
50'	15"	15"	1 1/2"	1 1/2"



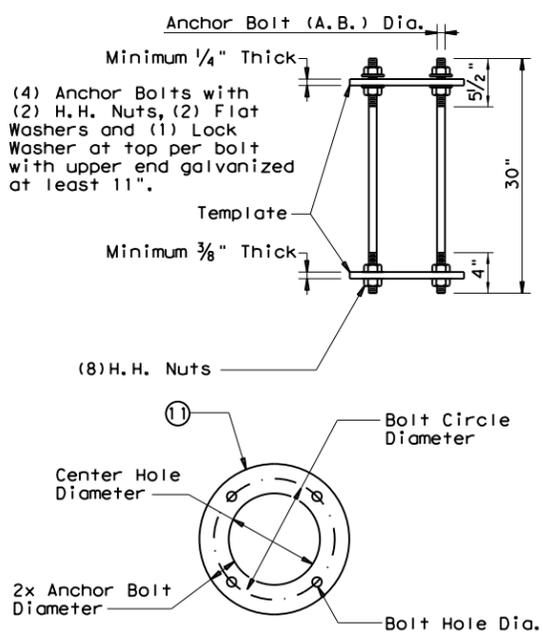
**CONCRETE TRAFFIC  
BARRIER BASE BASEPLATE**

CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA. (1)	DIM. A	DIM. B
28' - 38'	9"	7" ± 1/4"	10" ± 1/4"
48'	10 1/2"	7" ± 1/4"	13" ± 1/4"



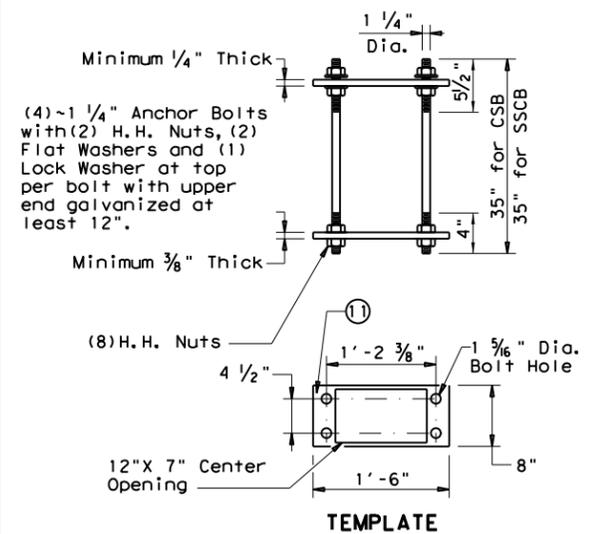
**TRANSFORMER  
BASE BASEPLATE**

TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFORMER BASE TYPE
20' - 39'	13"	13"	1 1/4"	1"	1 1/4"	A
40'	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50'	15"	15"	1 1/2"	1 1/4"	1 1/2"	B



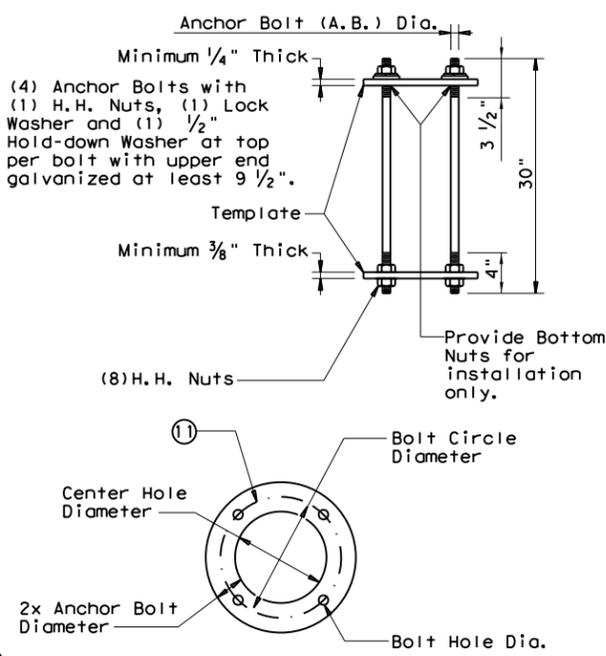
**SHOE BASE  
ANCHOR BOLT ASSEMBLY**

SHOE BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20' - 39'	1"	13"	11"	1 1/16"
40' - 50'	1 1/4"	15"	12 1/2"	1 5/16"

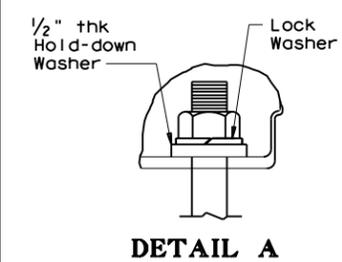


**CONCRETE TRAFFIC BARRIER  
BASE ANCHOR BOLT ASSEMBLY**

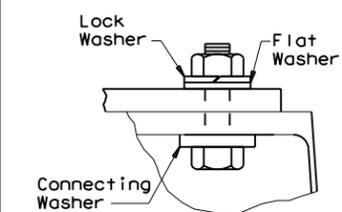
TRANSFORMER BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20' - 39'	1"	14"	12"	1 1/16"
40' - 50'	1 1/4"	17 1/4"	14 3/4"	1 5/16"



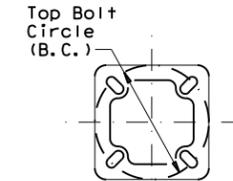
**TRANSFORMER BASE  
ANCHOR BOLT ASSEMBLY**



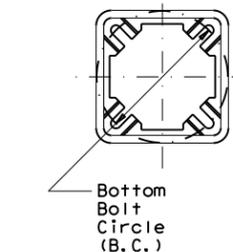
**DETAIL A**



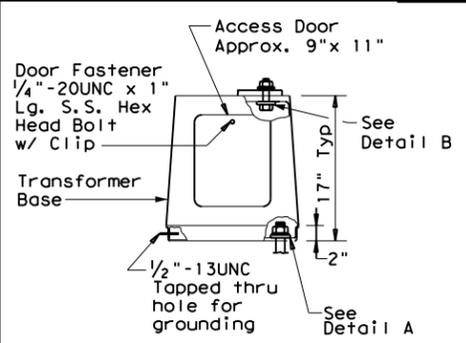
**DETAIL B**



**TOP PLAN**



**BOTTOM PLAN**



**ELEVATION**

**TRANSFORMER BASE  
DETAILS**

**GENERAL NOTES:**

- For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
- All breakaway bases shall meet the breakaway requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to resist 150% of the design moment.
- Transformer bases shall be cast from aluminum, ASTM B108 or B26 Alloy 356.0-T6, or other material approved by the Engineer. Four Hex Head (H.H.) bolts with four H.H. nuts, four lock washers, four flat washers, and connecting and hold-down washers as recommended by the manufacturer, galvanized to ASTM A153 Class C or D, or B695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A563 grade DH galvanized.
- Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
- Doors for transformer bases shall be made of plastic, fiberglass or other non-metallic material approved by the Engineer and shall be attached with stainless steel screws or bolts. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.

**NOTES:**

- Anchor Bolt Templates do not need to be galvanized.
- Pole diameter before ovalized.

**ANCHOR BOLT FABRICATION  
TOLERANCES TABLE**

DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"

SHEET 4 OF 4



**ROADWAY  
ILLUMINATION  
POLES  
RIP(4)-19**

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	SH
REVISIONS	0001	02	079, ETC.	SH 20, ETC.
7-17	DIST	COUNTY	SHEET NO.	
12-19	ELP	EL PASO		96

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For projects with less than one acre of soil disturbing activity and that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

**1.0 SITE/PROJECT DESCRIPTION**

**1.1 PROJECT CONTROL SECTION JOB (CSJ):**

0001-02-079, ETC. Federal Aid Project No. F 2B24(194)

**1.2 PROJECT LIMITS:**

From: I-10

To: SUNLAND PARK DRIVE

**1.3 PROJECT COORDINATES:**

BEGIN: (Lat) 31.8395350, (Long) -106.5709466

END: (Lat) 31.8286617, (Long) -106.5276600

**1.4 TOTAL PROJECT AREA (Acres):** 71.63

**1.5 TOTAL AREA TO BE DISTURBED (Acres):** 0.92

**1.6 NATURE OF CONSTRUCTION ACTIVITY:**

CONSTRUCTION OF SAFETY LIGHTING CONSISTING OF ILLUMINATION IMPROVEMENTS

**1.7 MAJOR SOIL TYPES:**

Soil Type	Description
SAND	FINE TO MEDIUM, GRAVELY, SILTY, CLAYEY

**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
N/A	

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: DRILL SOIL FOR SHAFTS, BORE OR TRENCH ACTIVITIES

Other: \_\_\_\_\_

Other: \_\_\_\_\_

**1.10 POTENTIAL POLLUTANTS AND SOURCES:**

- Sediment laden stormwater from stormwater conveyance over disturbed area
- Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- Solvents, paints, adhesives, etc. from various construction activities
- Transported soils from offsite vehicle tracking
- Construction debris and waste from various construction activities
- Contaminated water from excavation or dewatering pump-out water
- Sanitary waste from onsite restroom facilities
- Trash from various construction activities/receptacles
- Long-term stockpiles of material and waste
- Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.11 RECEIVING WATERS:**

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody

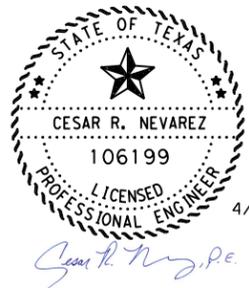
\* Add (\*) for impaired waterbodies with pollutant in ( ).

**1.12 ROLES AND RESPONSIBILITIES: TxDOT**

- Development of plans and specifications
- Perform SWP3 inspections
- Maintain SWP3 records and update to reflect daily operations
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR**

- Day To Day Operational Control
- Maintain schedule of major construction activities
- Install, maintain and modify BMPs
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_



**STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)**

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
				97
STATE	STATE DIST.	COUNTY		
TEXAS	ELP	EL PASO		
CONT.	SECT.	JOB	HIGHWAY NO.	
0001	02	079, ETC.	SH 20, ETC.	

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

**2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE**

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

**2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:**

**T / P**

- Protection of Existing Vegetation
- Vegetated Buffer Zones
- Soil Retention Blankets
- Geotextiles
- Mulching/ Hydromulching
- Soil Surface Treatments
- Temporary Seeding
- Permanent Planting, Sodding or Seeding
- Biodegradable Erosion Control Logs
- Rock Filter Dams/ Rock Check Dams
- Vertical Tracking
- Interceptor Swale
- Riprap
- Diversion Dike
- Temporary Pipe Slope Drain
- Embankment for Erosion Control
- Paved Flumes
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.2 SEDIMENT CONTROL BMPs:**

**T / P**

- Biodegradable Erosion Control Logs
- Dewatering Controls
- Inlet Protection
- Rock Filter Dams/ Rock Check Dams
- Sandbag Berms
- Sediment Control Fence
- Stabilized Construction Exit
- Floating Turbidity Barrier
- Vegetated Buffer Zones
- Vegetated Filter Strips
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.3 PERMANENT CONTROLS:**

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
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:**

- Excess dirt/mud on road removed daily
- Haul roads dampened for dust control
- Loaded haul trucks to be covered with tarpaulin
- Stabilized construction exit
- Daily street sweeping
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.5 POLLUTION PREVENTION MEASURES:**

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.6 VEGETATED BUFFER ZONES:**

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To
NONE		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.7 ALLOWABLE NON-STORMWATER DISCHARGES:**

- Fire hydrant flushings
- Irrigation drainage
- Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- Potable water sources
- Springs
- Uncontaminated groundwater
- Water used to wash vehicles or control dust
- Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

**2.8 DEWATERING:**

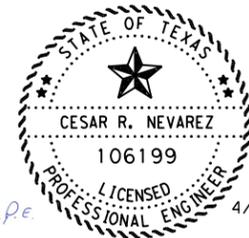
Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

**2.9 INSPECTIONS:**

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

**2.10 MAINTENANCE:**

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.



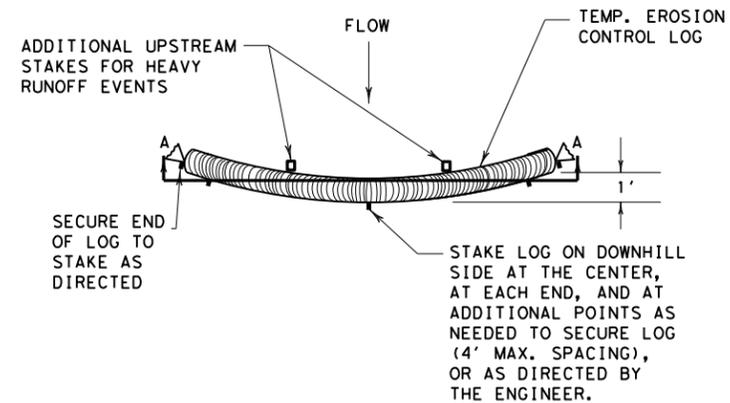
*Cesar R. Nevarez, P.E.*

**STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)**

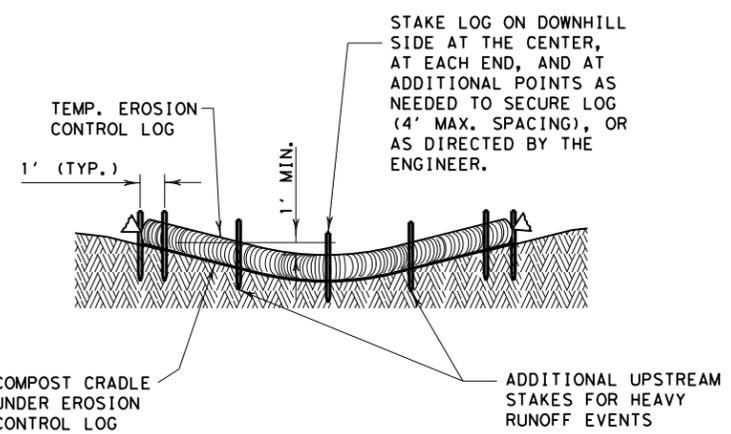
FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
				98
STATE	STATE DIST.	COUNTY		
TEXAS	ELP	EL PASO		
CONT.	SECT.	JOB	HIGHWAY NO.	
0001	02	079, ETC.	SH 20, ETC.	

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DATE: 3/29/2024  
FILE: ec916.dgn

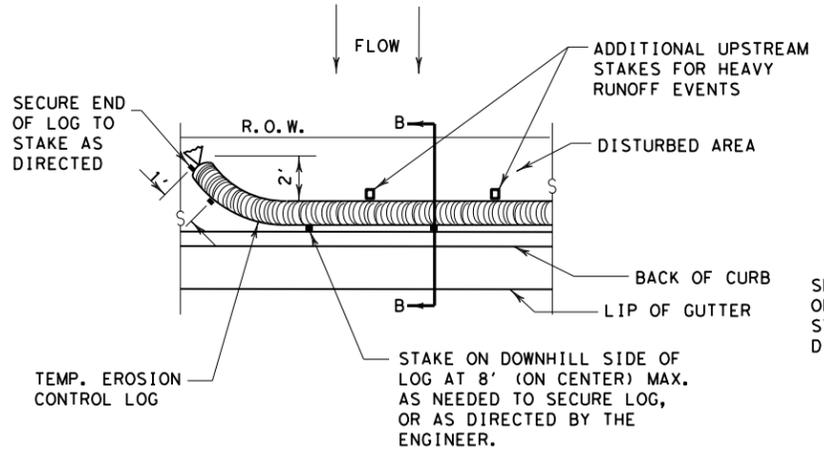


PLAN VIEW

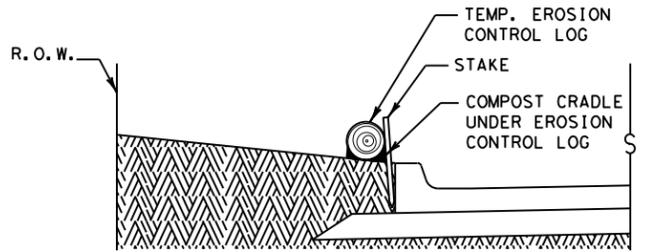


SECTION A-A  
EROSION CONTROL LOG DAM

CL-D



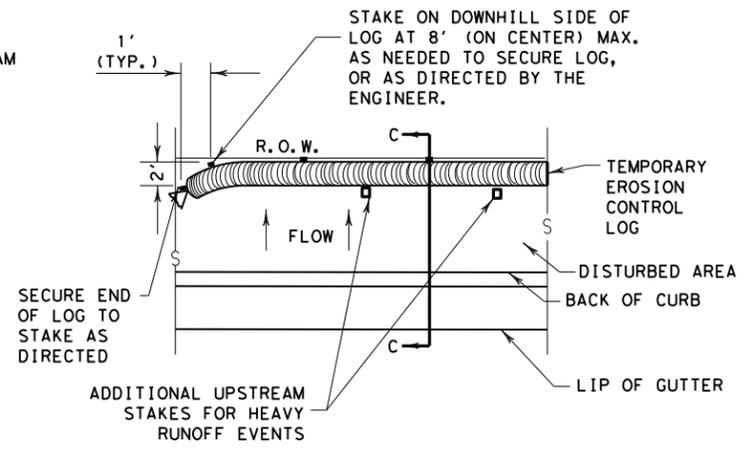
PLAN VIEW



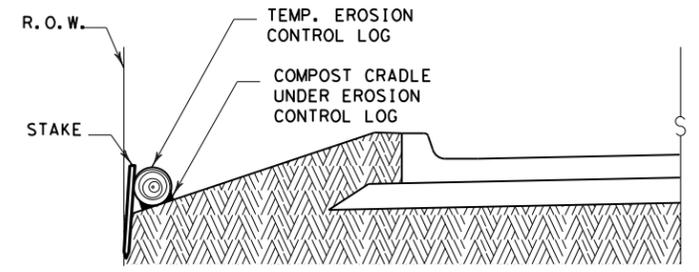
SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



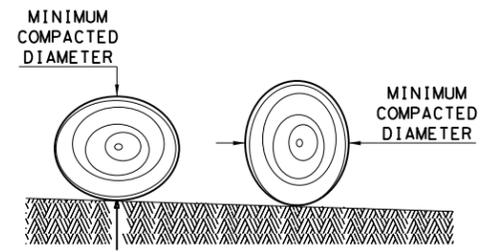
PLAN VIEW



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SHEET 1 OF 3

		Design Division Standard	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0001	02	079, ETC. SH 20, ETC.
	DIST	COUNTY	SHEET NO.
	ELP	EL PASO	99

**SEDIMENT BASIN & TRAP USAGE GUIDELINES**

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

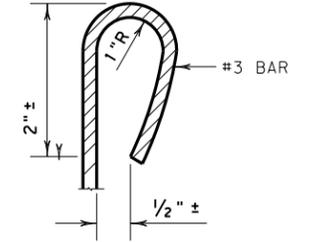
**Log Traps:** The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

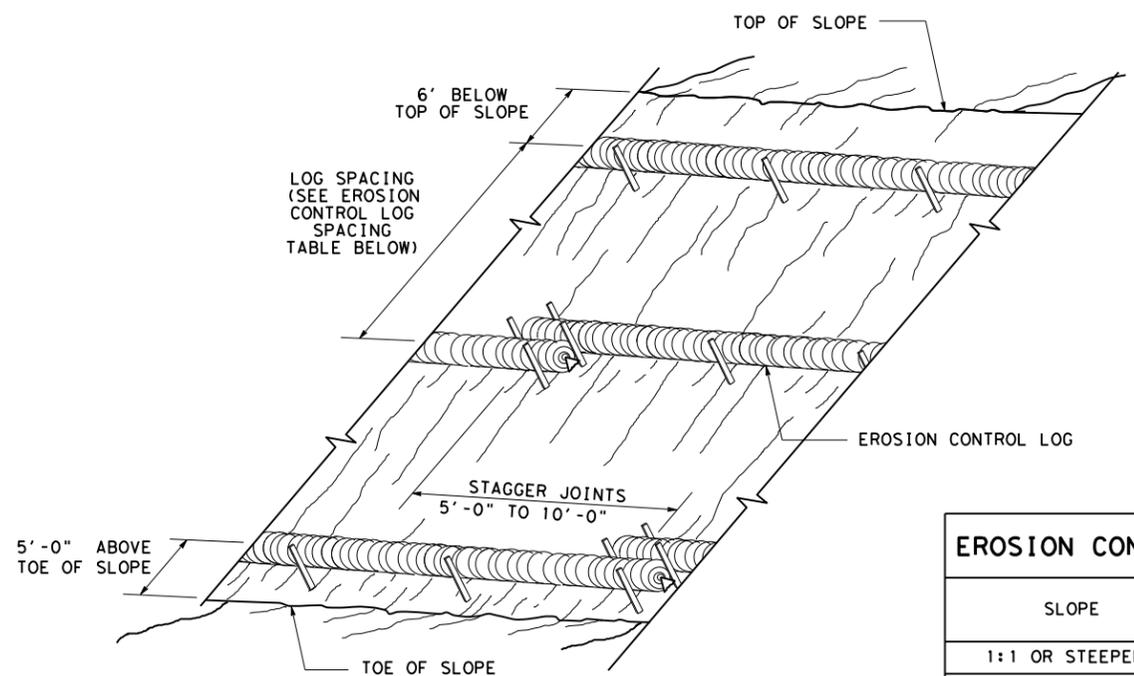
Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



REBAR STAKE DETAIL

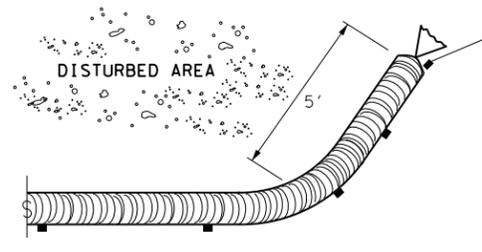
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DATE: 3/29/2024  
 FILE: ec916.dgn



**EROSION CONTROL LOGS ON SLOPES  
STAKE AND TRENCHING ANCHORING**

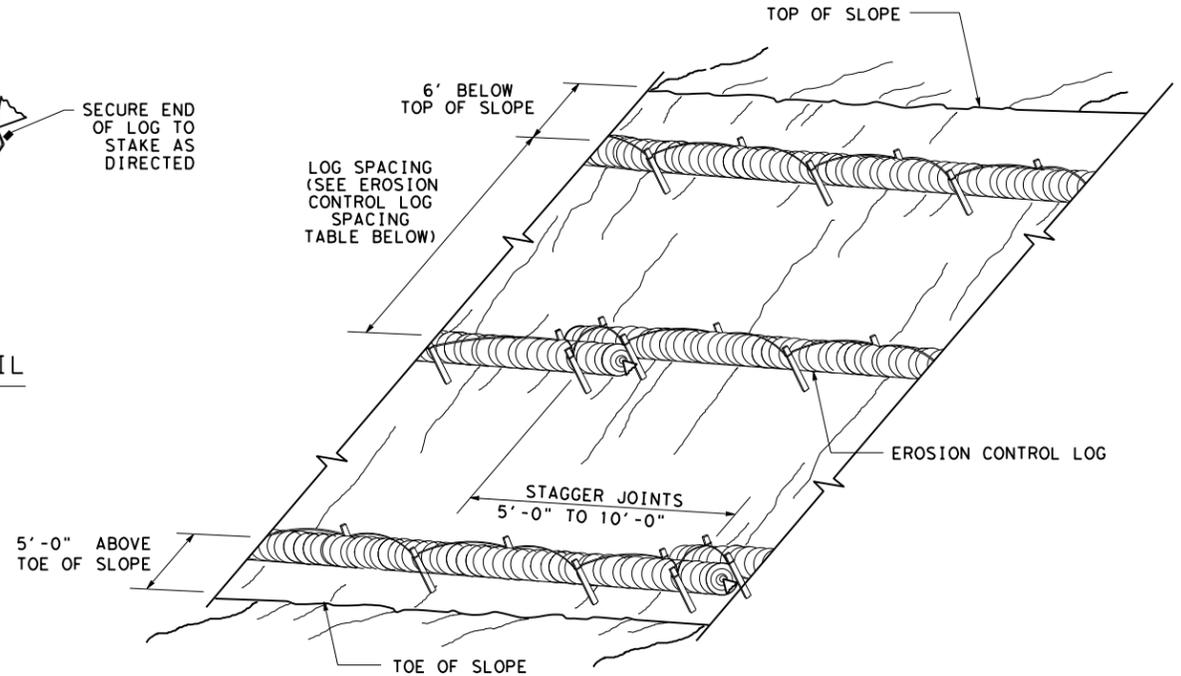
CL-SST



**END SECTION RAP DETAIL**

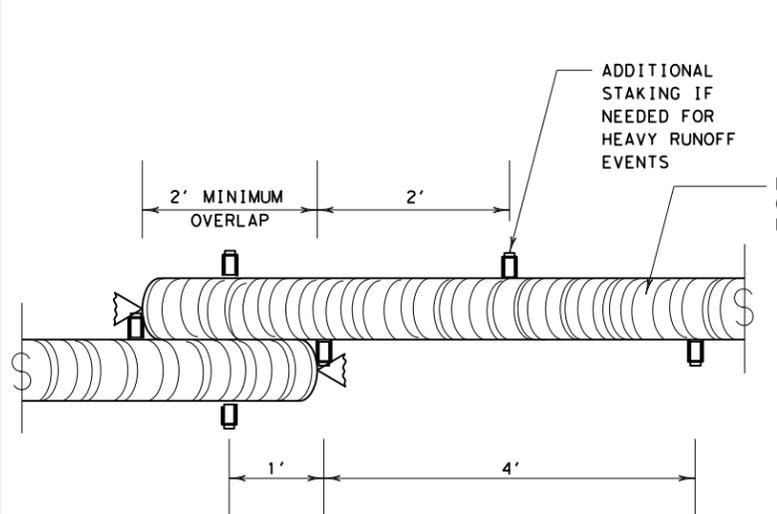
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

\* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:  
 SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;  
 HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



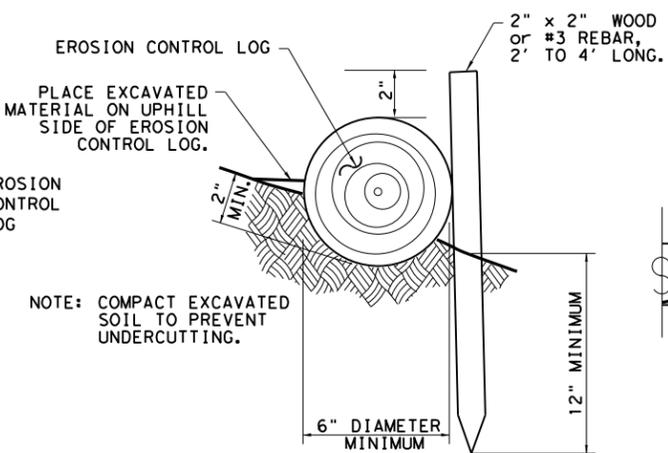
**EROSION CONTROL LOGS ON SLOPES  
STAKE AND LASHING ANCHORING**

CL-SSL



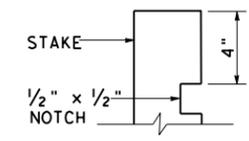
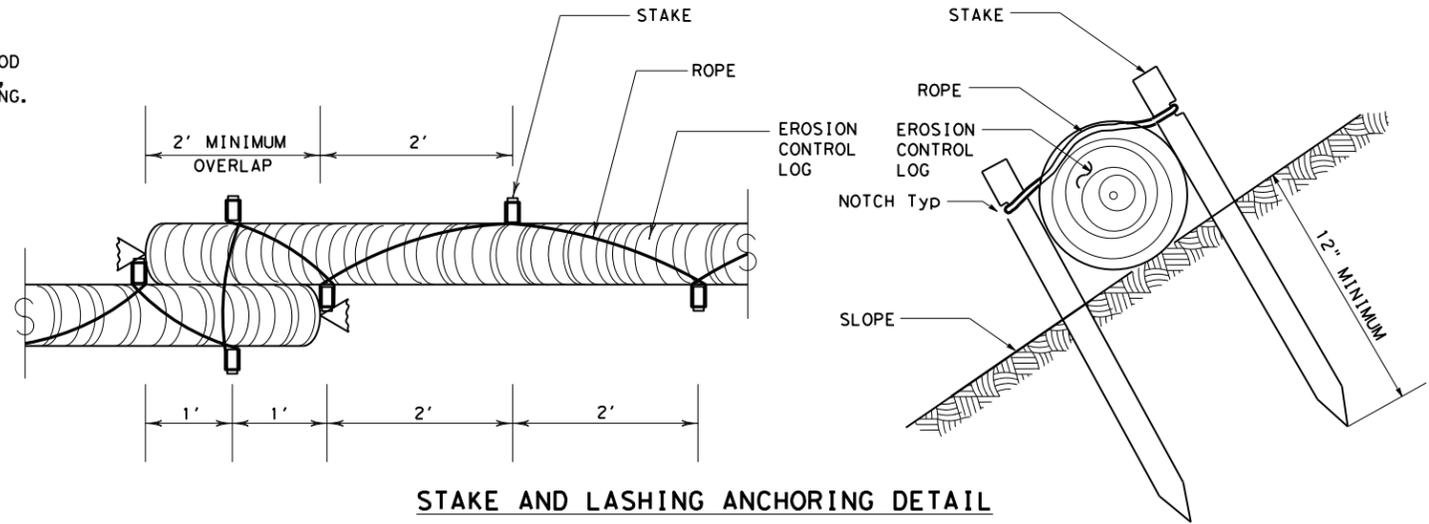
**STAKE AND TRENCHING ANCHORING DETAIL**

CL-SST



**STAKE AND LASHING ANCHORING DETAIL**

CL-SSL



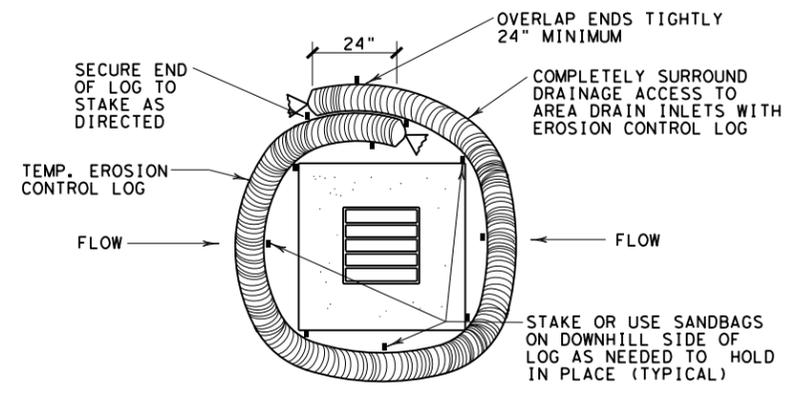
**STAKE NOTCH DETAIL**

LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

SHEET 2 OF 3

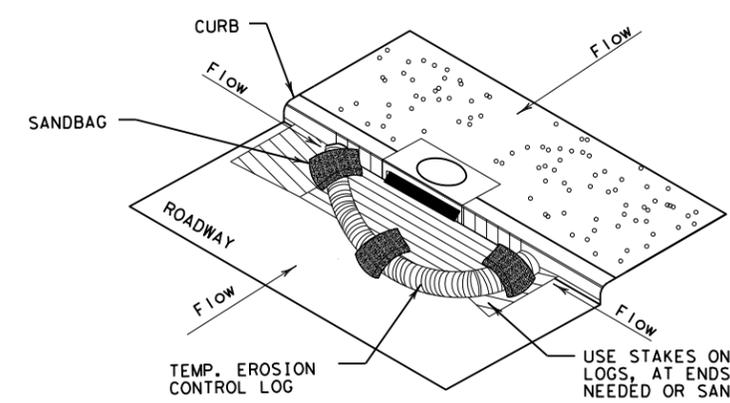
		Design Division Standard	
<b>TEMPORARY EROSION,          SEDIMENT AND WATER          POLLUTION CONTROL MEASURES          EROSION CONTROL LOG          EC(9) - 16</b>			
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0001	02	079, ETC. SH 20, ETC.
DIST	COUNTY	SHEET NO.	
ELP	EL PASO	100	

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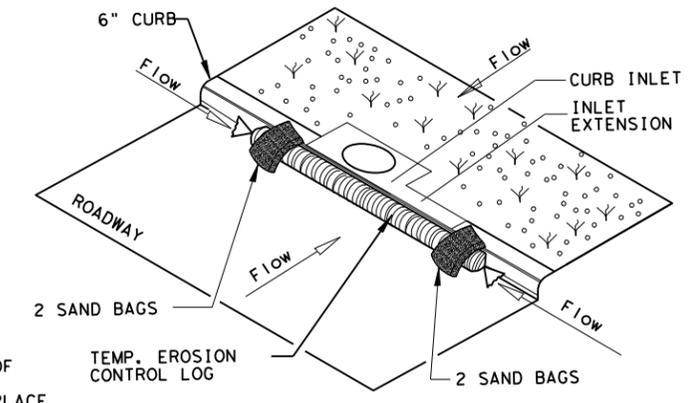
**EROSION CONTROL LOG AT DROP INLET**

CL-DI



**EROSION CONTROL LOG AT CURB INLET**

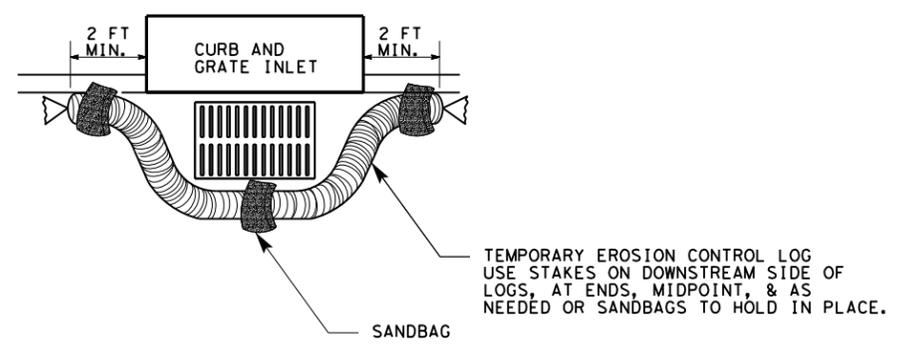
CL-CI



**EROSION CONTROL LOG AT CURB INLET**

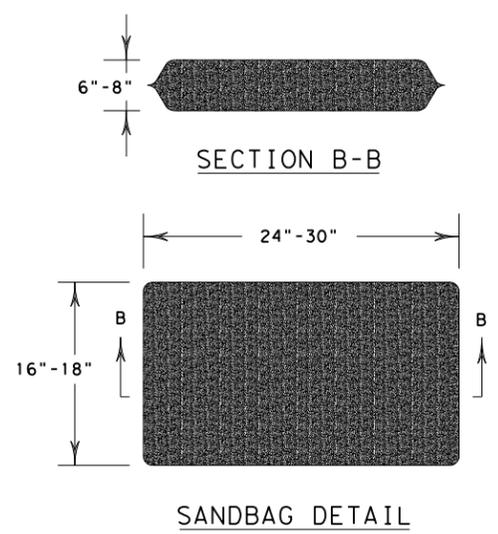
CL-CI

NOTE:  
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



**EROSION CONTROL LOG AT CURB & GRADE INLET**

CL-GI



SHEET 3 OF 3

		<i>Design Division Standard</i>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0001	02	079, ETC. SH 20, ETC.
	DIST	COUNTY	SHEET NO.
	ELP	EL PASO	101

DATE: 3/29/2024  
FILE: ec916.dgn

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**I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)**

This project is adjacent or parallel work, not within RR ROW:  
 DOT No.: 741186L  
 Crossing Type: At Grade  
 RR Company Operating Track at Crossing: Union Pacific Railroad Company  
 RR Company Owning Track at Crossing: Union Pacific Railroad Company  
 RR MP: 954.05  
 RR Subdivision: Carrizozo  
 City: El Paso  
 County: El Paso  
 CSJ at this Crossing: 0167-02-088  
 Latitude: 31.9574760  
 Longitude: -106.3575586

Scope of Work, including any TCP, to be performed by State Contractor:

Installation of Safety Lighting along BU 54A.

Scope of Work to be performed by Railroad Company:

N/A

**II. FLAGGING & INSPECTION**

No. of Days of Railroad Flagging Expected: 0  
 On this project, night or weekend flagging is:  
 Expected  
 Not Expected

Flagging services will be provided by:

Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.  
 Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

**UPRR** UP.info@railpros.com  
 Call Center 877-315-0513, Select #1 for flagging  
 UP.request@nrssinc.net  
 Call Center 877-984-6777

**BNSF** BNSFinfo@railprofs.com  
 Call Center 877-315-0513, Select #1 for flagging

**CPKCR** KCS.info@railpros.com  
 Call Center 877-315-0513, Select #1 for flagging  
 Bottom Line On-Track Safety Services  
 bottomline076@aol.com, 903-767-7630

OTHERS:

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

Not Required  
 Required. Contact Information for Construction Inspection:

**III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD**

Required.  
 Not Required  
 Railroad Point of Contact: \_\_\_\_\_

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

**IV. RAILROAD INSURANCE REQUIREMENTS**

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits	
Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	\$500,000 / \$500,000 / \$500,000
Commercial General Liability	\$2,000,000 / \$4,000,000
Business Automobile	\$2,000,000

Railroad Protective Liability Limits	
<input checked="" type="checkbox"/> Not Required	
<input type="checkbox"/> Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	\$2,000,000 / \$6,000,000
<input type="checkbox"/> Bridge Structure Projects. Includes new construction or replacement of overpass/underpass structures	\$5,000,000 / \$10,000,000
<input type="checkbox"/> Other: _____	

**V. CONTRACTOR'S RIGHT OF ENTRY (CROE)**

Not Required  
 Required: UPRR Maintenance Consent Letter. TxDOT to assist  
 Required: TxDOT to assist in obtaining the UPRR CROE  
 Required: Contractor to obtain
 

- BNSF: \_\_\_\_\_  
https://bnsf.railpermitting.com
- CPKCR  
https://jllrpg.360works.com/fmi/webd/rpo\_web\_kcs.fmp12
- Other Railroads: \_\_\_\_\_

To view previously approved CROE templates agreed upon between the State and Railroad, see: <https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html>

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

**VI. RAILROAD COORDINATION MEETING**

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

**VII. RAILROAD SAFETY ORIENTATION**

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

**VIII. SUBCONTRACTORS**

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

**IX. EMERGENCY NOTIFICATION**

**In Case of Railroad Emergency**  
 Call: Union Pacific Railroad Company  
 Railroad Emergency Line at: 800-848-8715  
 Location: DOT 741186L  
 RR Milepost: 954.050  
 Subdivision: Carrizozo

**RRD Review Only**  
 Initials: KS  
 Date: 4-19-24

**Rail Division**

## RAILROAD SCOPE OF WORK

### PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf	DN: TxDOT	CK:	DW:	CK:
© TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
6/2023	0001	02	079, ETC	SH 20, ETC
REVISIONS		DIST		SHEET NO.
		ELP		102

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

**1.02 REQUEST FOR INFORMATION / CLARIFICATION**

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

**1.03 PLANS / SPECIFICATIONS**

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

**PART 2 - UTILITIES AND FIBER OPTIC**

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

**PART 3 - CONSTRUCTION**

**3.01 GENERAL**

- A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.
- B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.
- C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.
- D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.
- E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.
- F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.
- G. All permanent clearances shall be verified before project closing.

**3.02 RAILROAD OPERATIONS**

- A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.
- B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. Railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.
- C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:
  - 1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.
  - 2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

**3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES**

- A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.
- B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.
- C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.
- D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
  - 1. Exactly what the work entails.
  - 2. The days and hours that work will be performed.
  - 3. The exact location of work, and proximity to the tracks.
  - 4. The type of window requested and the amount of time requested.
  - 5. The designated contact person.
 Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.
- E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

**3.04 INSURANCE**

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

**3.05 RAILROAD SAFETY ORIENTATION**

- A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.
 

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."
- B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

**3.06 COOPERATION**

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

**3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES**

Abide by the following minimum temporary clearances during the course of construction:  
A. 15' - 0" (BNSF) (UPRR) and 14' - 0" (KCS) horizontal from centerline of track  
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

**3.08 APPROVAL OF REDUCED CLEARANCES**

- A. Maintain minimum track clearances during construction as specified in Section 3.07.
- B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.
- C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

		Rail Division	
<b>RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS</b>			
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REVISIONS March 2020	0001	02	079, ETC. SH 20, ETC.
	DIST	COUNTY	SHEET NO.
	ELP	EL PASO	103

**3.09 MAINTENANCE OF RAILROAD FACILITIES**

- A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.
- B. Perform all such maintenance and repair of damages due to the Contractor's operations at Contractor's expense.
- C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

**3.10 SITE INSPECTIONS BY RAILROAD'S DESIGNATED REPRESENTATIVE**

- A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
  1. Pre-construction meetings.
  2. Pile driving/drilling of caissons or drilled shafts.
  3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
  4. Erection of precast concrete or steel bridge superstructure.
  5. Placement of waterproofing (prior to placing ballast on bridge deck).
  6. Completion of the bridge structure.
- B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.
- C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

**3.11 RAILROAD REPRESENTATIVES**

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

- A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.
- B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.
- C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.
- D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.
- E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

**3.12 COMMUNICATIONS AND SIGNAL LINES**

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

**3.13 TRAFFIC CONTROL**

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

**3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK**

- A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".
- B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

UPRR 1-800-336-9193  
7:00 AM to 9:00 PM CST Monday-Friday except holidays,  
staffed 24 hrs/day for emergencies  
48 hrs notice required

BNSF 1-800-533-2891  
24 hour number  
5 working days notice required

KCS 1-800-344-8377  
Texas One Call, a 24 hour number  
48 hrs notice required, excluding weekends and holidays

If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

- C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

**3.15 RAILROAD FLAGGING**

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

**3.16 CLEANING OF RIGHT-OF-WAY**

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.



**RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS**

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REVISIONS	0001	02	079, ETC.	SH 20, ETC.
March 2020	DIST	COUNTY	SHEET NO.	
ELP	EL PASO	104		