Permit to Construct Access Driveway Facilities on Highway Right of Way

PERMIT NUMBER: 24040148				
	* Attach kmz or kml file, OR	ROADWAY		
REQUESTOR	provide GPS Lat./Long.	HWY NAME	FM	521
	29.462912, -95.47445	FOR TxDOT'S USE		
		CONTROL	0111	
NAME	Fort Bend County Engineering Dept. c/o Binkley & Barfield	SECTION	03	
MAILING ADDRESS	FM521 @ Southern Colony Avenue			
CITY, STATE, ZIP	Rosharon, Texas 77583			
PHONE NUMBER	(713) 869-3433			
EMAIL ADDRESS	zjacobson@binkleybarfield.com			

*LOCATION OR COORDINATES AT INTERSECTION OF DRIVEWAY CENTERLINE WITH ABUTTING ROADWAY

The Texas Department of Transportation, hereinafter called the State, hereby authorizes Fort Bend County Engineering Dept., hereinafter called the Permittee (i.e., property owner) ☒ construct / ☐ reconstruct a temporary traffic signal (residential, convenience store, retail mall, farm, etc.) access driveway on the highway right of way abutting highway number FM521 in Fort Bend County, located @ Southern Colony Avenue.

USE ADDITIONAL SHEETS AS NEEDED

Is this parcel in current litigation with the State of Texas? ☐ YES ☒ NO (If Yes, TxDOT will coordinate with District ROW Office.)

Is the Permittee or a family member of Permittee an employee or official of the Texas Department of Transportation? ☐ YES ☒ NO
(If Yes, name of employee or official _____)

Does an employee or official of the Texas Department of Transportation serve as an employee or officer of Permittee or own a controlling interest in Permittee? ☐ YES ☒ NO (If Yes, name of employee or official _____)

This permit is subject to the Access Driveway Policy described on page 2 and the following:

1. The undersigned hereby agrees to comply with the terms and conditions set forth in this permit for construction and maintenance of an access driveway on the state highway right of way.
2. The Permittee represents that the design of the facilities, as shown in the attached design sketch, is in accordance with the Roadway Design Manual, Hydraulic Design Manual and the access management standards set forth in the Access Management Manual (except as otherwise permitted by an approved variance).
3. Construction of the driveway shall be in accordance with the attached design sketch, and is subject to inspection and approval by the State.
4. Maintenance of facilities constructed hereunder shall be the responsibility of the Permittee, and the State reserves the right to require any changes, maintenance or repairs as may be necessary to provide protection of life or property on or adjacent to the highway. Changes in design will be made only with prior written approval of the State. The department shall maintain all portions of public driveways that lie within the state highway right of way and that connect to highways that are the maintenance responsibility of the department.
5. The Permittee shall hold harmless the State and its duly appointed agents and employees against any action for personal injury or property damage related to the driveway permitted hereunder.
6. Except for regulatory and guide signs at county roads and city streets, the Permittee shall not erect any sign on or extending over any portion of the highway right of way. The Permittee shall ensure that any vehicle service fixtures such as fuel pumps, vendor stands, or tanks shall be located at least 12 feet from the right of way line to ensure that any vehicle services from these fixtures will be off the highway right of way.
7. The State reserves the right to require a new access driveway permit in the event of: (i) a material change in land use, driveway traffic volume or vehicle types using the driveway, or (ii) reconstruction or other modification of the highway facility by the State.
8. The State may revoke this permit upon violation of any provision of this permit by the Permittee.
9. This permit will become null and void if the above-referenced driveway facilities are not constructed within one year from the issuance date of this permit.
10. The Permittee will contact the State's representative Juan M. Mata telephone, (713) 448-0527, at least twenty-four (24) hours prior to beginning the work authorized by this permit.
11. The requesting Permittee will be provided instructions on the appeal process if this permit request is denied by the State. Note, a driveway involving an Access Denial Line (ADL) does not have a right to appeal.

The undersigned hereby agrees to comply with the terms and conditions set forth in this permit for construction and maintenance of an access driveway on the highway right of way.

Date: _____ Signed: _____

(Property owner or owner's representative)

Access Driveway Policy

Title 43 Texas Administrative Code (Transportation), Part 1 (Texas Department of Transportation) Chapter 11 (Design), Subchapter C (Access Connections To State Highways) and the "Access Management Manual" establish policy for the granting of access and the design, materials and construction of driveways connecting to state highways. All driveway facilities must follow this policy. To the extent there is any conflict between this permit and the policy, the policy shall control. If a proposed driveway does not comply with the access management standards, the owner may seek a variance to a requirement contained in the access management standards by contacting the local TxDOT office.

As to driveway permits that are issued under §11.59 of Subchapter C (Access Connections To State Highways), no rights of access are conveyed by issuance of a driveway permit. Issuance of a driveway permit under this section does not convey any property right, including a right of access to the highway facility. The department, in its sole discretion, may revoke a permit issued under this section on its determination that the access location is needed for a highway purpose. Such a revocation may not be the basis for any claim of a constitutional taking of property for the loss of access to the highway facility.

TxDOT Driveway Permit Request Contact

For a local contact for your TxDOT Driveway Permit Request or variance request, visit: http://www.txdot.gov/inside-txdot/district.html. You can select the respective District, and then select the District Contacts which will include the applicable Area Engineers.

Other Conditions

In addition to Items 1 thru 11 on page 1 of this permit, the driveway facility shall also be in accordance with the attached design sketch and subject to the following additional conditions stated below:

Provide for a temporary traffic signal at intersection of TxDOT FM521 and Southern Colony Avenue per plans dated 11-11-2024 and executed donation agreement. Access Only (No drainage to TxDOT). CSJ 0111-03-064 will install permanent traffic signal.

Also, attached Special Provisions dated July 1, 2022 must be followed."

Variance Documentation Justification

(A variance to any requirement contained in the access management standards may be granted if justified in accordance with an item below and approved by the district engineer, or the district engineer's designee.)

For a Variance request, please indicate which of the below are applicable, as required by TAC §11.52(e):

- ☐ a significant negative impact to the owner's real property or its use will likely result from the denial of its request for the variance, including the loss of reasonable access to the property or undue hardship on a business located on the property.
- ☐ an unusual condition affecting the property exists that was not caused by the property owner and justifies the request for the variance.

For the conditions selected above, provide written justification below. (Attach additional sheets, if needed)

For TXDOT use below:

For Variance denials, please indicate which of the below conditions, as provided in TAC §11.52(e), were determined:

☐ adversely affect the safety, design, construction, mobility, efficient operation, or maintenance of the highway; or

☐ likely impair the ability of the state or the department to receive funds for highway construction or maintenance from the federal government.

For driveway permits to be issued under TAC §11.59:
Is this driveway crossing an access denial line? ☐ YES ☐ NO

(If Yes, is this a ☐ private driveway or a ☐ commercial driveway?)

Private Driveway Fee: ☐ $250

Commercial Driveway Fee: ☐ $2,500 ☐ $10,000 ☐ $25,000

Date of Issuance of permit that crosses an access denial line	District Engineer Approval (No Delegation)
Date of Issuance of permit that does not cross an access denial line	District Engineer, or designee Approval
Date of Issuance as per Variance to AMM	District Engineer, or designee Approval
Date of Denial	District Engineer Denial (No Delegation)

Attachments:

Sketch of Installation

All Variance Documentation

Permit Special Provisions

Revised July 1, 2022

1. The Permittee is responsible for all costs associated with the construction of this access driveway.

2. All Pipes used shall be Reinforced Concrete Pipe (RCP), unless otherwise specified.

3. Culvert crossings within the 30-foot clear zone (parallel culverts) shall be required to have minimum 6:1 sloping ends known as Safety End Treatments (SETs). The culvert shall have sufficient length to allow the 6:1 slope to be achieved from the edge of pavement to the flowline at the end of the SET. Culverts that exceed 50'f in length shall have a junction box for clean out, or as specified by the TxDOT Area Engineer.

4. Culverts larger than single 33-inch diameter, double 30-inch diameter, or three or more 12-inch diameter shall require safety pipe runners.

5. Riprap or stabilizing material shall be provided and installed by grantee at time of construction, or as directed by the TxDOT Area Engineer.

6. For TxDOT-maintained ASPHALT SURFACED PAVEMENT, no concrete pavement or curbing shall be allowed within State right of way.

7. For TxDOT-maintained CONCRETE SURFACED PAVEMENT, additional full-depth saw cuts may be made as needed to facilitate removal of the concrete within the limits of the required full-depth cuts. Concrete adjacent to the patch shall not be spalled or fractured by the removal procedure.

8. Placement or removal of beautification on State right of way shall be under the direction of TxDOT.

9. The Permittee certifies that its storm water runoff to the State's right of way shall not be contaminated by any industrial processes or significant pollutants, and the State shall not be held liable for any pollutants entering State right of way through storm water connections.

10. The Permittee be in compliance with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and the Texas Accessibility Standards (TAS), and Texas Department of Licensing and Regulation (TDLR) requirements for items including but not limited to sidewalks, landings, and wheelchair ramps.

11. Permittee shall obtain overall environmental clearance with all appropriate regulatory agencies prior to beginning construction. Approval of this request by TxDOT does not relieve the Permittee or its agents of this obligation.

12. Work performed on railroad right-of-way, or easements controlled by others, is subject to the concurrence of the owner of said properties. Approval of this request by TxDOT does not relieve the Permittee of this obligation.

13. The complete permit package shall be on the project site at all times and available for review by TxDOT.

14. TxDOT will inspect the construction and may provide the flow-line elevation.

Permit Special Provisions

Revised July 1, 2022

15. All work within the State of Texas right-of-way shall be performed in accordance with State standards and specifications as to the installation and materials used. All materials and mix designs to be placed in TxDOT right-of-way must be obtained from TxDOT approved sources and be of approved TxDOT mix designs.

16. At least five (5) working days prior to any excavation, permittee shall request the location of all underground utilities within the work area by calling 811, and contacting local municipalities, utility districts, school districts, or any other utility owners. TxDOT-owned fiber optic, communications, power, illumination, and traffic signal cabling and conduit can be located by calling the TxDOT Houston District Traffic Operations Office at HOU-LocateRequest@txdot.gov. Do not perform underground work on the project until TxDOT – owned facilities have been located and marked. Use caution when working in these areas to avoid damaging or interfering with existing facilities. Permittee shall be responsible for relocating and/or adjusting any utilities within the work area.

17. This permit is subject to a separate traffic control plan being approved by the Area Engineer. All work must follow the TxDOT Traffic Control Plan Standards, Latest Revision, or if approved, Typical Applications shown in the Texas Manual on Uniform Traffic Control Devices, Latest Revision, Chapter 6-H. The advanced warning signage shown on standards BC(1)-21 thru BC(12)-21 will be required. It is mutually agreed and understood that the implementation and maintenance of the traffic control plan shall be the responsibility of the Permittee. Contractor is required to supply all sub-contractors with a copy of this permit and approved traffic control plan.

18. The Permittee shall coordinate the sequence of construction and traffic control plan with any adjacent highway construction or maintenance projects. No overnight lane closures will be permitted, unless otherwise approved by the Area Engineer.

19. Work performed within the waterways, such as rivers, creeks, bayous, and drainage ditches, is subject to the concurrence of appropriate regulatory agencies. Permittee shall use Best Management Practices to minimize erosion and sedimentation resulting from proposed activities. Permittee certifies that its drainage system meets all storm water quality criteria of the County and/or City where the permit is located. Construction and/or maintenance of this project shall not adversely affect the drainage patterns within the area.

20. All excavations within the right-of-way shall be backfilled according to the TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (SPECS), Item 400, as currently amended. All surplus material shall be removed from the right-of-way, and the excavation finished flush with surrounding natural ground.

21. In no event will an edge drop-off be permitted during the hours of darkness. If the Contractor is unable to complete a section before the end of the workday, base material capable of vehicle support shall be pulled back to the existing edge on a 4:1 or flatter slope, to provide for driver and pedestrian safety.

22. The Contractor shall not create a dirt nuisance or safety hazard in any roadway. The pavement shall be cleaned daily.

Permit Special Provisions

Revised July 1, 2022

23. All exposed dirt surfaces shall be sodded, unless otherwise approved by the Area Engineer. A slope of 4:1, or flatter, shall be required on the ditch front slope.

24. No trees, vegetation, valves, meter boxes, cleanouts, ground boxes, handholes, manhole covers, etc. will be allowed in the pavement. These appurtenances shall be relocated elsewhere within the right-of-way, unless otherwise approved by the Area Engineer.

25. The Texas Universal Triangular Slip Base Sign Supports shall be required for all signage within TxDOT right-of-way. Proposed signs, or those which require relocation, shall be done in accordance with the following TxDOT Sign Mounting Details Standards: SMD (GEN)-08, SMD (SLIP-1)-08, SMD (SLIP-2)-08, and SMD (SLIP-3)-08.

26. All work zone pavement markings shall meet the requirements of SPECS, Item 662. All permanent pavement markings shall meet the requirements of SPECS, Item 666, and be placed in accordance with the following TxDOT Pavement Standards: PM(1)-20, PM(2)-20, PM(3)-20, and PM(4)-22. All raised pavement markers shall meet the requirements of SPECS, Item 672.

27. Existing pavement markings shall be removed according to the requirements of SPECS, Item 677, or to the satisfaction of the Area Engineer. All pavement surfaces shall be cleaned and prepared in accordance with SPECS, Item 678.

28. For roadway improvements and Street Tie-Ins, the Contractor shall employ at his/her expense, an approved commercial testing laboratory to perform testing on concrete to determine the in-situ strength. Make at least one set of test specimens for each element cast each day. Cure these specimens under the same conditions as the portion of the structure involved for all stages of construction. Ensure safe handling, curing, and storage of all test specimens. Sample and test the hardened concrete in accordance with SPECS, Item 421. Certified reports of all test results shall be submitted to the Area Engineer.

29. Should the existing roadway pavement or other feature be damaged, it shall be repaired as specified by the Area Engineer.

30. Construction Access Permits are to expire after 12 months, unless renewed.

31. The Permittee acknowledges and fully accepts responsibility and liability for the design, construction, maintenance, and operation of this project, which shall be the responsibility of the Grantee for the life of the project. The Permittee shall indemnify and save harmless the State from any and all damages or losses that may develop due to this project.

32. All TxDOT Standard Sheets are available online for free download:
    Statewide http://www.dot.state.tx.us/business/standardplanfiles.htm
    Houston District http://www.dot.state.tx.us/hou/specinfo/specs.htm

Permit Special Provisions

Revised July 1, 2022

33. The contractor or sub-contractor is required to contact the TxDOT Local Maintenance Office Supervisor a minimum of 72 hours prior to commencing any work.

- Brazoria Maintenance Office – Permit Section 2: 979-864-8550
- Galveston Maintenance Office – Permit Section 3: 409-978-2551
- Fort Bend Maintenance Office – Permit Section 4: 281-238-7950
- Montgomery Maintenance Office – Permit Section 5: 936-538-3350
- Southeast Harris Maintenance Office – Permit Section 6: 281-464-5540
- Waller Maintenance Office – Permit Section 7: 979-921-2400
- West Harris Maintenance Office – Permit Section 8: 713-934-5900
- Metro Houston Maintenance Office – Permit Section 9: 713-636-7400
- North Harris Maintenance Office – Permit Section 10: 281-319-6450

TR24040148

Contact Information

Application Name	TR24040148	**Application Status**	Complete - No Objections
Date of Submittal	10/1/2024	**Upload to Box**	☐
Date of Latest Resubmittal		**Review Phase**	Complete - Phase 3
First Name (Authorized Agent)	Zach	**Record Type**	Application record Type
Last Name (Authorized Agent)	Jacobson	**Mailing Street**	1710 Seamist Drive
Name of Owner as shown on Property Deed	Fort Bend County Engineering Dept.	**Mailing City**	Houston
Last Name (Property Owner)		**Mailing State/Province**	TX
Consulting Firm	Binkley & Barfield Consulting Engineers	**Mailing Zip/Postal Code**	77008
User edited Address	☐	**Login Account Email**	zjacobson@binkleybarfield.com
Need Agreement	☑	**Owner Email**	
Need ROW Land Donation Agreement	☐	**Developer or Additional Email**	
Upload to OnBase Complete	☐	**Business Phone**	7138693433
Area Engineer	Carlos M Zepeda Jr., P.E.	**Cell Phone**	
Assistant Area Engineer	Daniel J Dvorak	**Contact Person**	
Permit Coordinator	Cindy S Kurtz	**Owner**	Zach Jacobson
Maintenance Section Supervisor	Juan M Mata		
Maintenance Section Supervisor Number	(281) 238-7963		
Permit Coordinator Phone Number	(281) 238-7956		
Due Date Status			

Comments

Maintenance Office Comments	
Application Withdrawn Comments	
Applicant Response	; 2024-11-11 TxDOT will need to maintain the signal. A permanent signal will be constructed with the CSJ 0111-03-064 project; 2024-11-25 TxDOT will need to maintain the temporary signal. A permanent signal will be constructed with the CSJ 0111-03-064 project. Please contact me with any questions - zjacobson@dccm.com; 2025-01-06 Please find the revised plans attached. We look forward to your review and approval.
Maintanence Office Comments History	

Site Information

Site Name	FM 521 at Southern Colony	**Latitude**	29.462912
Site Address	8413 FM 521	**Longitude**	-95.47445502949999999
City	Rosharon	**Is this parcel in current litigation?**	No
State	TX	**Control**	0111
Zip Code	77583	**Road Section**	03
County	Fort Bend County		
Section	Fort Bend		

Application Information

Permit Type	Traffic Signal	**Number of requested driveway(s)**	
Highway	FM0521	**Number of requested street tie-in(s)**	
Closest Cross Street	Southern Colony Ave	**Number of requested turn lanes**	
Is Highway within an incorporated city?	☑	**No of Existing access(s) to be modified**	
City	Rosharon	**Date of Signed & Sealed Plans Submitted**	12/31/2024
Assigned Maintenance Section	Fort Bend	**Type of highway design?**	Open Ditch
Property on which side of highway?	Northbound	**If open ditch, inside diameter of Pipes**	N/A
Applicant Status	Complete - No Objections	**Existing Roadway within 1000 ft**	☑
External Link for Community Users	https://txdot.my.site.com/houstondrivewaypermit/houstondrivewaypermit/s/dp-application/a07cs00000MFgxX/TR24040148	**Any drainage coming to TxDOT**	☐
		If no, name of entity/agency/authority	N/A

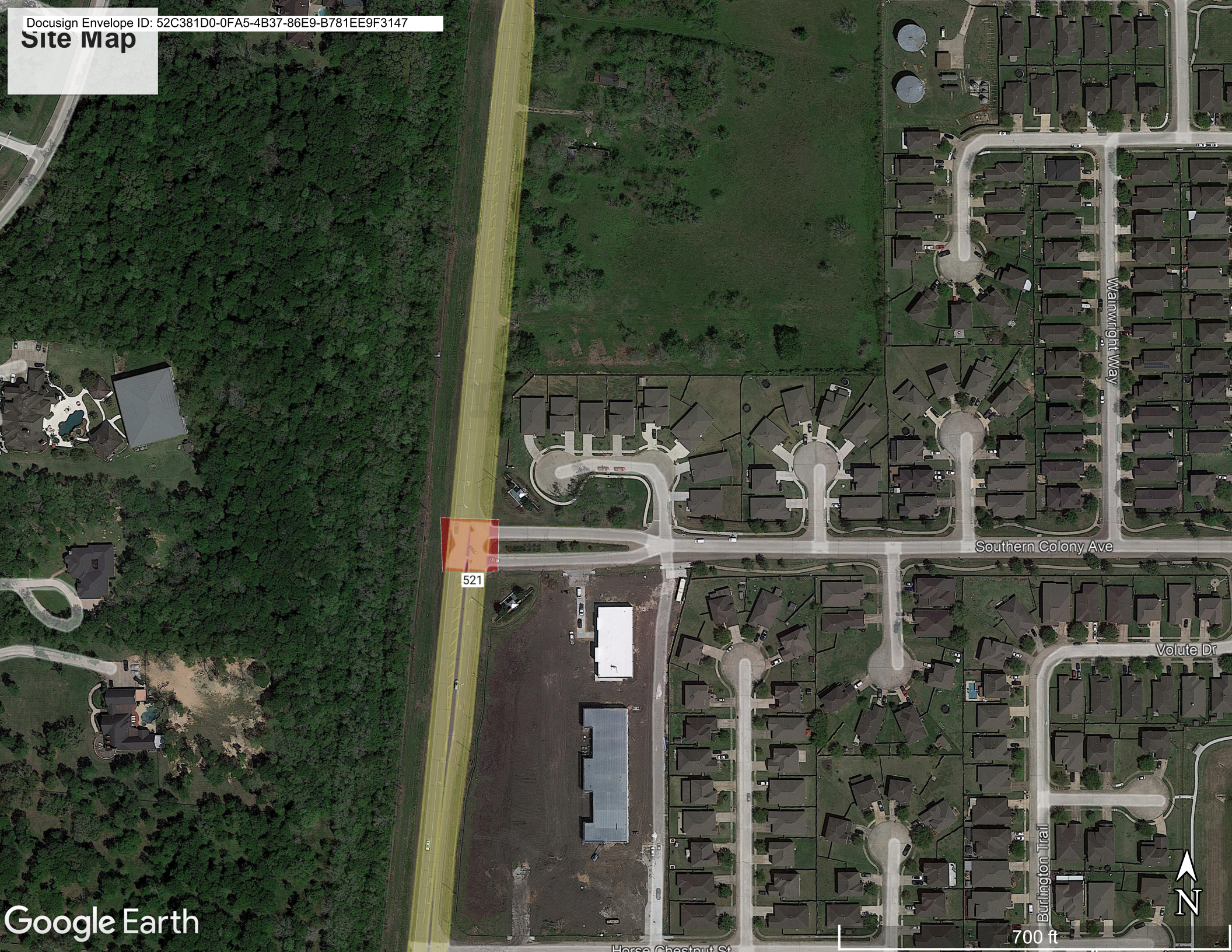
Access Details

Purpose of Request	Install a Temporary Traffic Signal at the intersection of FM 521 and Southern Colony Avenue
Background	
Existing roadway characteristics	
Environmental Clearance Requirements	
Agreements	

Request Customer Information.

Banner Message		**Needs Attention**	☐
Banner History	Cindy Kurtz : 10/29/2024 Please see comments.	**Banner Mode**	

Site Map



SEE SHEET 2 FOR INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

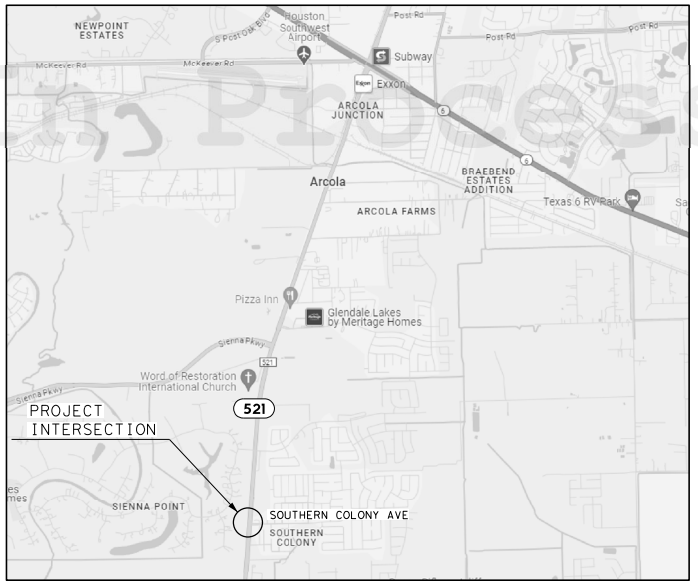
PROJECT NO. NH ( )

CSJ 0111-03-064

FM 521 AT SOUTHERN COLONY AVE
FORT BEND COUNTY

FOR THE CONSTRUCTION AND DESIGN OF A FACILITY CONSISTING OF A TEM
TRAFFIC SIGNAL

PROJECT LENGTH = ONE INTERSECTION



LOCATION MAP

EQUATIONS : NONE
EXCEPTIONS : NONE
RR CROSSINGS : NONE

XXXXX
XX/XXXX

INDEX OF SHEETS

ITEM NO.	CODE NO.	DESCRIPTION	UNIT	FM 521 AT SOUTHERN COLONY AVENUE
666	7244	RE PM TY III (W) (24") (SLD)	LF	80
666	7248	RE PM TY III (Y) (6") (SLD)	LF	40
668	7091	PREFAB PM TY C (W)(ARROW)	EA	2
668	7103	PREFAB PM TY C (W)(WORD)	EA	2
677	7002	ELIM EXT PM & MRKS (6")	LF	122
677	7008	ELIM EXT PM & MRKS (24")	LF	15
677	7009	ELIM EXT PM & MRKS (ARROW)	EA	2
677	7015	ELIM EXT PM & MRKS (WORD)	EA	2
678	7002	PAV SURF PREP FOR MRK (6")	LF	40
678	7008	PAV SURF PREP FOR MRK (24")	LF	80
681	7001	TEMP TRAF SIGNALS	EA	1
	*	ELC SRV TY D 120/240 060 (NS) SS (E) SP (O)	EA	1
	*	POLE, 50 FT WOOD	EA	4
	*	ASSEMBLY, GUY WIRE (3/8"), ANCHOR SCREW AND GUY WIRE GUARD	EA	8
	*	ZINC-COAT STL WIRE STRAND (3/8")	LF	375
	*	ZINC-COAT STL WIRE STRAND (1/4")	LF	375
	*	SIGNAL HEAD, (HORZ) (3-SEC. 12 IN LENS)(RYG)	EA	6
	*	SIGNAL HEAD, (HORZ) (4-SEC. 12 IN LENS)(<R<R<Y<G)	EA	1
	*	CABLE, #12/7C	LF	824
	*	TRAY CABLE (4 CONDR) (12 AWG)	LF	492
	*	#4 XHHW	LF	120
	*	#4 BARE COPPER	LF	60
	*	#6 BARE COPPER	LF	100
	*	CONTROLLER, FULL ACTUATED W/CABINET	EA	1
	*	CABINET FOUNDATION	EA	1
	*	18" CABINET'S BASE EXTENSION	EA	1
	*	COPPER-CLAD GROUND ROD (5/8"x8') (CONTROLLER ONLY)	EA	1
	*	CONDUIT (SCH 80)(2")	LF	100
	*	CONDUIT (SCH 80)(3")	LF	70
	*	CONDUIT (RM)(3")	LF	20
	*	10' LUMINAIRE ARM	EA	3
	*	LED RDWY LUMINAIRE (250W HPS EQUIV)	EA	3
	*	SIGN, R3-8LR (30"x30")	EA	1
	*	SIGN, "FM 521" (48"x18")	EA	1
	*	SIGN, "Southern Colony AVE" (120"x18")	EA	2
	*	BACKPLATE W/REF BRDR (3 SEC) (VENT) ALUM	EA	6
	*	BACKPLATE W/REF BRDR (4 SEC) (VENT) ALUM	EA	1
	*	GROUND BOX	EA	1
6006	7006	VIVDS TEMPORARY	EA	1
	*	VIVDS PROCESSOR SYSTEM	EA	1
	*	VIVDS CAMERA ASSEMBLY	EA	3
	*	VIVDS SET-UP	EA	1
	*	VIVDS COMMUNICATION CABLE (COAXIAL)	LF	512
	*	VIVDS POWER CABLE (3/C-#16)	LF	512

GENERAL NOTES

General: Traffic Signals

For traffic signal items, use materials from the Pre-Qualified Producers List (located at http://www.dot.state.tx.us/GSD/purchasing/supps.htm) and the materials pre-qualified for illumination and electrical items (located at https://ftp.dot.state.tx.us/pub/txdot-info/cmd/mpl/archive/) as shown on the Department's Material Producers List and the Roadway Illumination and Electrical Supplies List. Check the latest links on the Department's website for these lists. No substitutions will be allowed for materials found on these lists.

Item 618: Conduit

When backfilling bore pits, ensure that the conduit is not damaged during installation or due to settling backfill material. Compact select backfill in 3 equal lifts to the bottom of the conduit; or if using sand, place it 2 in. above the conduit. Ensure backfill density is equal to that of the existing soil. Prevent material from entering the conduit.

Construct bore pits a minimum of 5 ft. from the edge of the base or pavement. Close the bore pit holes overnight.

Unless otherwise shown on the plans, install underground conduit a minimum of 24 in. deep. Install the conduit in accordance with the latest National Electrical Code (NEC) and applicable Department standard sheets. Place conduit under driveways or roadways a minimum of 24 in. below the pavement surface.

If using casing to place bored conduit, the casing is subsidiary to the conduit.

Item 620: Electrical Conductors

Test each wire of each cable or conductor after installation. Incomplete circuits or damage to the wire or the cable are cause for immediate rejection of the entire cable being tested. Remove and replace the entire cable at no expense to the Department. Also test the replacement cable after installation.

When pulling cables or conductors through the conduit, do not exceed the manufacturer's recommended pulling tensions. Lubricate the cables or conductors with a lubricant recommended by the cable manufacturer.

Ensure that circuits test clear of faults, grounds, and open circuits.

Split bolt connectors are allowed only for splices on the grounding conductors.

Item 624: Ground Boxes

The ground box locations are approximate. Alternate ground box locations may be used as directed, to avoid placing in sidewalks or driveways.

Ground metal ground box covers. Bond the ground box cover and ground conductors to a ground rod located in the ground box and to the system ground.

Ground the existing metal ground box covers as shown on the latest standard sheet ED (4)-14.

During construction and until project completion, provide personnel and equipment necessary to remove ground box lids for inspection. Provide this assistance within 24 hours of notification.

Construct concrete aprons in accordance with the latest standard sheet ED (4)-14. Make the depth of

Item 636: Signs

Furnish and install signs shown on the traffic signal "Summar
Ensure that the legend on these sign panels is in accordance wi
Designs for Texas" manual.

Item 666: Retroreflectorized Pavement Markings

Item 668: Prefabricated Pavement Markings and Rumble St

Use Type III glass beads for thermoplastic and multipolymer pave

Use a 0.100 in. (100 mil) thickness for thermoplastic pavement m
thermoplastic, not including the exposed glass beads.

Use a 0.022 in. (22 mil) thickness for multipolymer pavement m
multipolymer, not including the exposed glass beads.

If the Type II markings become dirty and require cleaning by wa
other approved methods before applying the Type I thermoplastic
subsidiary to the Item, "Retroreflectorized Pavement Markings."

Establish the alignment and layout for work zone striping and per

Stripe all roadways before opening them to traffic.

Place pavement markings under these items in accordance with
"Texas Manual on Uniform Traffic Control Devices," or as directe

When design details are not shown on the plans, provide pavem
symbols conforming to the latest "Standard Highway Sign Design

Item 677: Eliminating Existing Pavement Markings and Mark

Remove existing pavement markings on concrete or asphalt su
Do not use flail milling on grooved concrete or porous asphalt.

Item 678: Pavement Surface Preparation for Markings

Do not blast clean asphalt concrete pavement. Clean asphalt c
the applicable specifications or as directed.

On new concrete pavement or on existing concrete pavement w
location, remove the curing compounds and contamination from
or as directed. In addition, air-blast the surface with compres
stripe.

On existing concrete pavement when placing a new stripe on an
existing stripe under the Item, "Eliminating Existing Pavement M
surface with compressed air just before placing the new stripe.

Do not clean concrete pavement by grinding.

Staking in the field is subject to approval.

Adjust project construction, if needed, due to conflicts with underground utilities.

Do not aim the luminaire arms mounted on traffic signal poles into the intersection. Aim each arm perpendicular to the centerline of the roadway it is intended to cover, to develop the proper illumination pattern for the intersection.
cable.

Abrasions to the conductor insulation caused while pulling cable for the traffic signal system are cause for immediate rejection. Remove and replace the entire damaged cable at no expense to the Department.

When pulling cables or conductors through conduit, do not exceed the manufacturer's recommended pulling tensions. Lubricate the cables or conductors with a lubricant as recommended by the cable manufacturer.

Bond the controller housing, signal poles, conduit, and spans to a minimum No. 6 AWG stranded copper conductor. An equipment grounding conductor is required in every conduit to form a continuous grounding system. Effectively connect the grounding system to ground rods or concrete encased grounding electrodes as indicated in the plans.

Wrap signal heads with dark plastic or suitable material to conceal the signal faces from the time of installation until placing into operation. Do not use burlap.

Furnish signal heads from the same manufacturer.

Use Type B (high intensity prismatic) or Type D (diamond grade) retroreflective sheeting for signs mounted under or adjacent to the signal heads.

Furnish and attach compression type connectors. Install the connectors with a compression mechanical release hand-crimping tool to each individual conductor before making connections to the terminal strips.

Item 682: Vehicle Signal Heads

Install two set screws on vehicle signal head mounting hardware fittings.

Furnish black housings for vehicle signals. Furnish black vehicle signal head back plates with 2 in. retroreflective yellow borders.

Item 690: Maintenance of Traffic Signals and Illumination

Furnish the cable to operate the Video Imaging Vehicle Detection System (VIVDS) in accordance with the manufacturer's recommendations or purchase it from the same manufacturer as the VIVDS equipment.

Supply VIVDS equipment that can process up to a maximum of 6 camera inputs per intersection. Additional equipment to accommodate up to 6 camera inputs is subsidiary to the various bid.items. No extra compensation will be allowed for additional equipment needed to make the VIVDS equipment fully operational under this Item.

Video Imaging Vehicle Detection System R

Specification Items	Description
1	**Description**
	Variable Focal Cameras
	VIVDS Card Rack Processor System
	Field Setup Computer (1 Required) (Laptop)
	Field Setup Video Monitor (1 Ea. Controller)
	Connectors and Camera Mounting Hardware
3	**Functional Capabilities**
	System Software
4	**Vehicle Detection**
	Detection Zone Video Taping
5	**VIVDS Processor Unit**
	Provide both TS1 and TS2 Environmental Requ
	12 Volt/5 Amp Power Supply
6	**Camera Assembly**
	Camera Interface Panel
7	**Field Communications Link**
	Lightning and Transient Surge Suppression De
9	**Temporary Use and Retesting**
10	**Operation from Central Control**
	Telephone Interconnect
	ISDN Interconnect
11	**Installation and Training**

Other items not specifically listed in this table are required. When s
deliver temporary VIVDS equipment to the Department's Signal Sh
Texas, or as directed.

NOTES FOR TEMPORARY TRAFFIC SIGNAL(S):

1. PROVIDE AND INSTALL TEMPORARY TRAFFIC SIGNALS PRIOR TO REMOVING THE EXISTING STOP SIGNS. UTILIZE AN EXISTING POWER SOURCE FOR INSTALLING THE TEMPORARY SIGNALS, IF POSSIBLE. INSPECT THE SITE TO DETERMINE THE METHOD OF PROVIDING SERVICE TO TEMPORARY SIGNAL INSTALLATION, IF NECESSARY. ADDITIONAL CONDUIT, POLES, CABLE, ETC., ARE CONSIDERED INCIDENTAL TO ITEM 681, "TEMPORARY TRAFFIC SIGNALS".

2. PROVIDE A CONTROLLER FOR EACH TEMPORARY SIGNAL INSTALLATION. PROVIDE TWO (2) SIGNAL HEADS FOR EACH APPROACH. PROVIDE EACH SPAN WITH SUFFICIENT SPARE SIGNAL CABLE TO ALLOW FOR ADJUSTMENTS NECESSARY TO LOCATE THE SIGNAL HEADS OVER THE APPROPRIATE LANES DURING EACH PHASE AND SEQUENCE OF CONSTRUCTION. THE TEMPORARY SIGNAL IS PAID FOR UNDER ITEM 681, "TEMPORARY TRAFFIC SIGNALS".

3. MAINTAIN THE EXISTING STOP SIGNS INSTALLATION UNTIL THE TEMPORARY SIGNAL INSTALLATION IS OPERATIONAL.

4. MAINTAIN THE TEMPORARY SIGNAL INSTALLATION UNTIL THE PERMANENT SIGNAL INSTALLATION IS OPERATIONAL. WRAP THE SIGNAL HEADS WITH DARK PLASTIC OR SUITABLE MATERIAL TO CONCEAL THE SIGNAL FACES FROM THE TIME OF THE INSTALLATION UNTIL PLACING INTO OPERATION. DO NOT USE BURLAP.

5. INSTALL TEMPORARY WOOD POLES WITHIN THE EXISTING RIGHT-OF-WAY OR TEMPORARY CONSTRUCTION EASEMENT IN ACCORDANCE WITH THE LATEST TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. THE ENGINEER WILL APPROVE THE LOCATION(S) OF POLES, CONTROLLER(S), ELECTRICAL SERVICE,ETC.

6. PROVIDE A UNIFORMED POLICE OFFICER FOR TRAFFIC CONTROL, AT NO EXPENSE TO THE DEPARTMENT, DURING THE "SWITCH OVER" OF SIGNAL INSTALLATIONS AND DURING ANY PERIOD OF TIME THAT A SIGNAL INSTALLATION MAY BE OUT OF SERVICE.

7. ALL EQUIPMENT UTILIZED FOR THE TEMPORARY TRAFFIC SIGNAL INSTALLATION MUST CONFORM TO, AND BE INSTALLED IN ACCORDANCE WITH, THE DEPARTMENT STANDARDS AND SPECIFICATIONS.

8. INSTALL SIGNALS HORIZONTALLY AT A MINIMUM OF 18 FT. - 6 IN. ABOVE THE ROADWAY.

9. REPLACE PAVEMENT, SIDEWALKS, OR CURBS DAMAGED BY THE CONTRACTOR DURING CONSTRUCTION. SUCH REPAIR IS INCIDENTAL TO ITEM 681, "TEMPORARY TRAFFIC SIGNALS".

10. DETERMINE THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. REPAIR ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION BY THE CONTRACTOR AT NO EXPENSE TO THE DEPARTMENT.

11. ONCE THE INTEGRITY AND/OR FUNCTION OF THE EXISTING TRAFFIC SIGNAL(S) IS ALTERED BY THE CONTRACTOR, MAINTAIN AND OPERATE THE EXISTING TRAFFIC SIGNAL(S) UNTIL THE TRAFFIC SIGNAL WORK IS ACCEPTED BY THE DEPARTMENT. DURING CONSTRUCTION OF THE PROPOSED TRAFFIC SIGNAL WORK, MAINTAIN THE CONTINUOUS OPERATION OF THE EXISTING TRAFFIC SIGNAL(S) AND/OR TEMPORARY TRAFFIC SIGNAL(S) IN CONFORMANCE WITH THE LATEST TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. ASSUME FULL RESPONSIBILITY FOR THE CONTINUOUS MAINTENANCE AND REPAIR OF THE SIGNAL EQUIPMENT. NO EXTRA COMPENSATION WILL BE ALLOWED FOR THIS WORK.

12. RESPOND IMMEDIATELY (24 HOURS A DAY) TO REPORTED TRAFFIC SIGNAL MALFUNCTIONS AT ANY OF THE INCLUDED SIGNALIZED INTERSECTIONS AFTER ASSUMING RESPONSIBILITY FOR THE MAINTENANCE OF THE SIGNAL EQUIPMENT AS OUTLINED ABOVE.

13. PHASING SEQUENCE AND SIGNAL TIMING WILL BE DETERMINED BY THE DEPARTMENT AND/OR CITY OF SUBJECT TO THE APPROVAL OF THE ENGINEER.

15. PROVIDE A FULL TIME QUALIFIED TRAFFIC SIGNAL TECHNICIAN RESPONSIBLE FOR THE MAINTENANCE AND/OR REPLACEMENT OF ALL TRAFFIC SIGNAL DEVICES.

16. COORDINATE INSTALLATIONS OF THE TEMPORARY TRAFFIC SIGNALS DURING CONSTRUCTION WITH THE VARIOUS PHASES AND SEQUENCES OF THE PROPOSED ROADWAY CONSTRUCTION.

17. REMOVE EXISTING CONCRETE POLE FOUNDATIONS TO TWO (2) FEET BELOW THE FINAL GRADE. BACKFILL WITH LIKE MATERIAL EQUAL IN COMPOSITION AND DENSITY TO THE SURROUNDING AREA, AND BY REPLACING ANY SURFACING WITH LIKE MATERIAL TO EQUIVALENT CONDITION. THIS WORK IS INCIDENTAL TO ITEM 681, "TEMPORARY TRAFFIC SIGNALS".

18. INSTALL CERTAIN PORTIONS OF THE PERMANENT TRAFFIC SIGNAL SYSTEMS, IF POSSIBLE, DURING CONSTRUCTION, IF THERE IS NO CONFLICT WITH ROADWAY CONSTRUCTION AND AS APPROVED.

19. WRAP TRAFFIC SIGNAL HEADS NOT USED DURING CERTAIN PHASES OR SEQUENCES OF THE TRAFFIC CONTROL PLAN WITH DARK PLASTIC OR SUITABLE MATERIAL TO CONCEAL SIGNAL FACES UNTIL THEY ARE PLACED IN OPERATION. DO NOT USE BURLAP. DISCONNECT TRAFFIC SIGNAL CABLE IN THE CONTROLLER FOR UNUSED SIGNAL HEADS.

20. COIL SUFFICIENT AMOUNT OF SIGNAL CABLE TO ACCOMMODATE SIGNAL HEAD ADJUSTMENTS DURING THE VARIOUS PHASES OF CONSTRUCTION.

21. REUSE EXISTING WIRE AND CABLES, IF POSSIBLE, DURING VARIOUS PHASES/SEQUENCES OF CONSTRUCTION IF DEEMED ACCEPTABLE.

22. VERIFY THE EXACT LOCATION OF THE SERVICE OUTLET DURING THE VARIOUS PHASES/SEQUENCES OF CONSTRUCTION. THE SERVICE OUTLET IS SUBJECT TO RELOCATION TO ANY CORNER AT NO ADDITIONAL COST TO THE DEPARTMENT DURING ANY PHASE/SEQUENCE OF CONSTRUCTION.

23. FOR EACH PHASE/SEQUENCE OF THE TRAFFIC CONTROL, BEFORE STARTING OTHER CONSTRUCTION, CONSTRUCT AND MAKE THE TEMPORARY TRAFFIC SIGNAL(S) OPERATIONAL.

24. ENSURE THE TEMPORARY SIGNALS REMAIN OPERATIONAL UNTIL THE "SWITCH OVER" TO NEXT PHASE/SEQUENCE OF CONSTRUCTION. KEEP DOWN TIME, IF ANY, TO A MINIMUM. ACCOMPLISH THE "SWITCH OVER" DURING OFF-PEAK HOURS BETWEEN 9:00 AM AND 3:00 PM.

25. FURNISH NEW SOLID STATE TEMPORARY POLE MOUNTED CONTROLLERS WITH AN INTERNAL TIME BASED COORDINATION UNIT. IN ADDITION TO ATTACHING THE CONTROLLER TO THE POLE, FURNISH AND INSTALL A STURDY PLATFORM TO STABILIZE THE CONTROLLER. SECURE THE ENGINEER'S APPROVAL OF THE CABINET PLATFORM BEFORE INSTALLATION.

26. FURNISH 3/8-IN. GALVANIZED DOWN GUY(S) (HIGH STRENGTH) FOR WOOD POLES. FURNISH 8 FT. - 10 IN. SCREW ANCHORS. FURNISH "SIDEWALK" DOWN-GUYS IF FIELD CONDITIONS DO NOT ALLOW FOR THE STANDARD DOWN-GUY ASSEMBLY.

27. PROVIDE CONTINUOUS CONDUCTORS WITHOUT SPLICES FROM SIGNAL CONTROLLERS TO SIGNAL HEADS. PROVIDE CONTINUOUS CONDUCTORS WITHOUT SPLICES FROM LUMINAIRES (IF REQUIRED) TO SERVICE ENCLOSURE. IF USING EXISTING SERVICE, PROVIDE NEW SERVICE ENCLOSURE (IF NECESSARY) WITH PHOTOELECTRIC CONTROL TO ACCOMMODATE THE LUMINAIRE CABLE.

28. AIM LUMINAIRE ARMS MOUNTED ON TRAFFIC SIGNAL POLES PERPENDICULAR TO THE CENTERLINE OF THE ROADWAY IT IS INTENDED TO COVER, TO DEVELOP THE PROPER ILLUMINATION PATTERN FOR THE INTERSECTION.

29. PROVIDE 250 WATT HIGH PRESSURE SODIUM VAPOR LAMP OR LED EQUIVALENT LUMINAIRES OPERATING AT 240 VOLTS.

31. FOR PAN WIRE S
IN. GALVANIZED
ABOVE THE TRA
WITH A UV STA
SPACING) THAT

32. FOR VIVDS CAM
AND POWER CA
MINIMUM WIDTH
USE.

33. FURNISH VIDE
RECOMMENDED
MANUFACTURER

34. RETAIN ALL REM
FURNISHED BY
UNLESS OTHERW

35. THE VIVDS EQU
TRAFFIC SIGNA
EQUIPMENT AND
KATY ROAD, H
ENGINEER.

36. FURNISH ITS RA
ITS RADIO CABI
FROM THE SAM
EQUIPMENT.

37. FURNISH INTEG
RADIO SUPPLIED

38. ITS RADIO'S ARE
CONTROLLERS
RADIO EQUIPME
CABLE CONDUC
VARIOUS PHASE
BID ITEM".

39. FOR ITS RADIO
RADIO CAT5 CA
STAINLESS STEE
SPACING.

40. FOR SPAN WIR
GALVANIZED GU
THE TRAFFIC SI
WITH A METAL C
WIDTH AND TWO

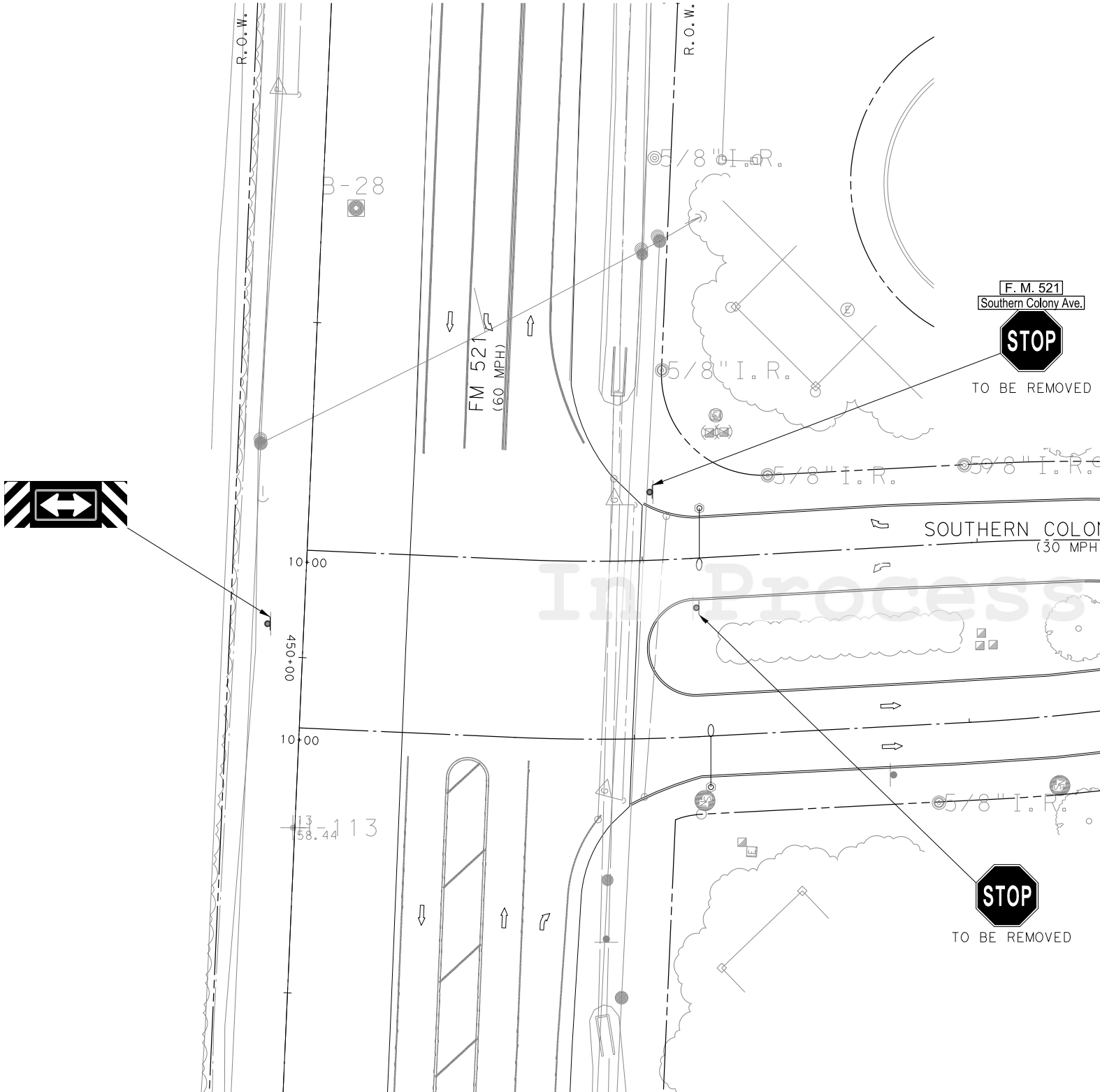
41. RETAIN ALL REM
RADIO EQUIPME

42. THE ITS RADI
COMPUTATIONS
REMOVED AND
ROAD, HOUSTON

43. FURNISH INTEG
RADIO SUPPLIED

44. CONTRACTOR T
THE EXISTING
TRAFFIC SIGNAL
TO PERTINENT IT

45. CONTRACTOR T
PRIOR TO REMO



PROPOSED SIGNAL HEAD SCHEDULE

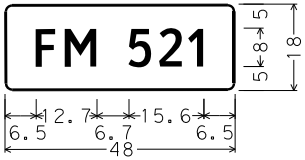
A, B, D, E, F, G

C

SIGN SCHEDULE

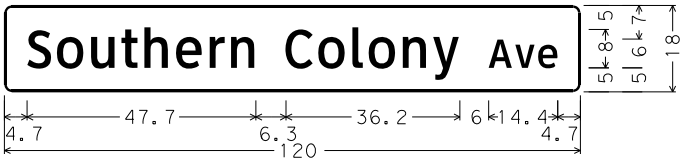
R3-8LR
30"x30"

S3



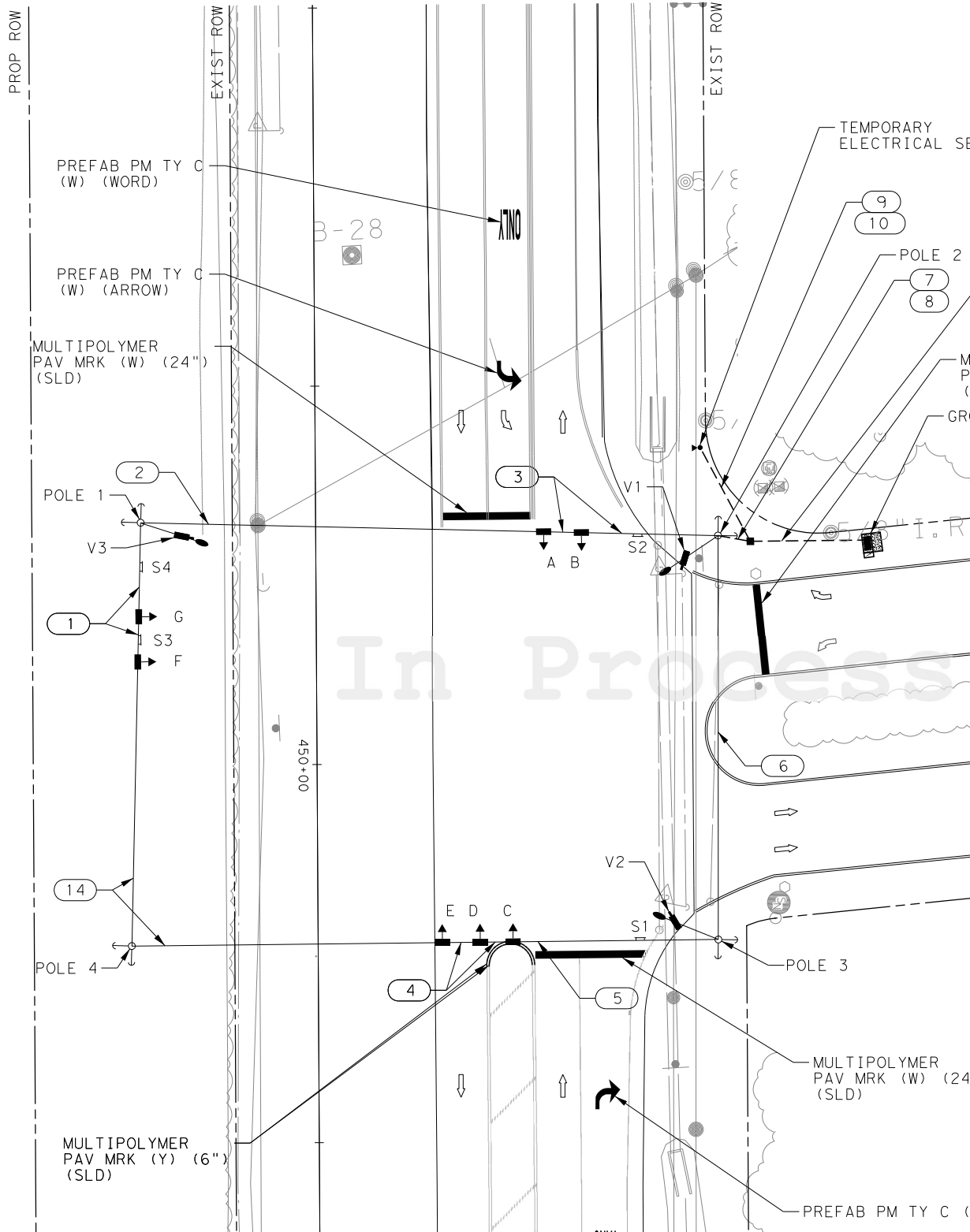
1.5" Radius, 0.5" Border, White on, Green;
"FM 521", ClearviewHwy-3-W;

S4



1.5" Radius, 0.5" Border, White on, Green;
"Southern Colony", ClearviewHwy-3-W 75% spacing;
"Ave", ClearviewHwy-3-W 75% spacing;

S1, S2



CONDUIT AND CONDUCTOR RUNS

RUN NO.	CONDUIT (618)				CONDUCTORS (620)						TRAY CABLE (621)		TEMP. TRAF. SIGNALS (681)				CABLES (684)		
	PVC				GROUND				POWER		LUMINAIRE		CABLES				SIGNAL		
	2" (SCH 80) (7054)		3" (SCH 80) (7060)		#6 BARE (7009)		#4 BARE (7011)		#4 INSULATED (7012)		#12/4C TRAY CABLE (7005)		3/8" GAL. MESS. STRAND *		1/4" GAL. MESS. STRAND *		#12/7C (7012)		(SU
	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.
	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA
1	-	-	-	-	-	-	-	-	-	-	-	-	1	37	1	37	1	37	-
2	-	-	-	-	-	-	-	-	-	-	1	109	1	109	1	109	1	109	1
3	-	-	-	-	-	-	-	-	-	-	1	45	1	45	1	45	2	45	1
4	-	-	-	-	-	-	-	-	-	-	-	-	1	20	1	20	1	20	-
5	-	-	-	-	-	-	-	-	-	-	-	-	1	56	1	56	2	56	-
6	-	-	-	-	-	-	-	-	-	-	1	108	1	108	1	108	2	108	1
7	-	-	1	10	1	10	-	-	-	-	3	10	-	-	-	-	4	10	-
8	1	10	-	-	1	10	-	-	-	-	-	-	-	-	-	-			3
9	1	30	-	-	1	30	-	-	-	-	3	30	-	-	-	-	-	-	-
10	-	-	1	30	-	-	1	30	2	30	-	-	-	-	-	-	-	-	-
11	-	-	1	30	1	30	-	-	-	-	-	-	-	-	-	-	4	30	-
12	1	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
13	1	30	-	-	-	-	1	30	2	30	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL		100		70		80		60		120	-	382	-	375	-	375		744	

* INCIDENTAL TO ITEM 681 "TEMPORARY TRAFFIC SIGNALS".

VIVDS DETECTOR CHART

CAMERA	SETTING
V1	NORTHBOUND FM 521 PRESENCE DETECTOR
V2	SOUTHBOUND FM 521 PRESENCE DETECTOR
V3	EAST & WESTBOUND SOUTHERN COLONY PRESENCE DETECTOR

GENERAL NOTES FOR ALL ELECTRICAL WORK

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

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

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

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

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

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

CONDUIT

A. MATERIALS

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

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

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

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

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure

8. Provide PVC elbows in PVC conduit systems, unless oth a flat, high tensile strength polyester fiber pull to the PVC conduit system. When galvanized steel RMC elb the plans and any portion of the RMC elbow is buried elbow by means of a grounding bushing on a rigid meta metal elbow is not required if the entire RMC elbow i concrete. PVC extensions are allowed on these concret PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDP conductors according to Item 622 "Duct Cable." At the the Engineer, substitute HDPE conduit with no conduct conduit bid under Item 618. Ensure bored HDPE substit size PVC called for in the plans. Ensure the substitu except that the conduit is supplied without factory-i the HDPE conduit to PVC (or RMC elbow when required) and schedule as shown on the plans. Do not extend sub foundations. Provide PVC or galvanized steel RMC elbo foundations.

10. Use two-hole straps when supporting 2 in. and larger properly sized stainless steel or hot dipped galvaniz the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings the structure's expansion joints to allow for movemer and install expansion joint fittings on all continuou externally exposed on structures such as bridges at m requested by the project Engineer, supply manufacture joint conduit fittings. Repair or replace expansion j movement at no additional cost to the Department. Pro amount of expansion to the Engineer upon request. Do for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 attaching metal conduit to surface of concrete struct on ED(2). Install conduit support within 3 ft. of all

3. Do not attach conduit supports directly to pre-stress specifically in the plans or as approved by the Engir

4. Unless otherwise shown on the plans, jack or bore cor driveways, sidewalks, or after the base or surfacing compact the bore pits below the conduit per Item 476 or Box" prior to installing conduit or duct cable to

5. When placing conduit in the sub-grade of new roadways material unless otherwise noted on the plans. When pl new roadways, backfill all trenches with cement-stabi Items 110 "Excavation", 400 "Excavation and Backfill Backfill", 402 "Trench Excavation Protection", and 40

6. Provide and place warning tape approximately 10 in. c

7. During construction, temporarily cap or plug open end after installation to prevent entry of dirt, debris c durable duct tape are allowed. Tightly fix the tape t conduit and prove it clear in accordance with Item 61

8. Ensure conduit entry into the top of any enclosure is hubs or using boxes with threaded bosses. This includ cans, service enclosures, auxiliary enclosures and ju tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bus install a grounding type bushing on all metal conduit

10. Install a bonding jumper from each grounding bushing or equipment grounding conductor. Ensure all bonding grounding conductor. Bonding of conduit used as a cas required, if the duct extends the full length through

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.

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

C. TEMPORARY WIRING

1. Install temporary conductors and electrical equipment in accor the NEC article "Temporary Installations" and Department stand

2. Provide a ground fault circuit interrupter (GFCI) for power ou portable electrical equipment, power tools, ice machines, ice and refrigerators located outdoors at grade. GFCI may be any o following: molded cord and plug set, receptacle, or circuit br

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

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

5. Protect and when necessary repair any existing electrical cond during the construction process in a timely manner and in conf the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

1. Provide and install a grounding electrode at electrical servic ground rods according to DMS 11040 and the plans. Larger diame length rods may be called for in some specific locations, see plans sheets. Concrete encased grounding electrodes may be cal specific locations including electrical service, see individua

B. CONSTRUCTION METHODS

1. Furnish auxiliary ground rods for lightning protection and ins concrete, or both, as called for in the plans. For ground rods in concrete, ensure the connection of the conductor to the gro readily accessible for inspection or repairs. For ground rods soil, ensure that the upper end is between 2 to 4 in. below f

2. Do not place ground rods in the same drilled hole as a timber

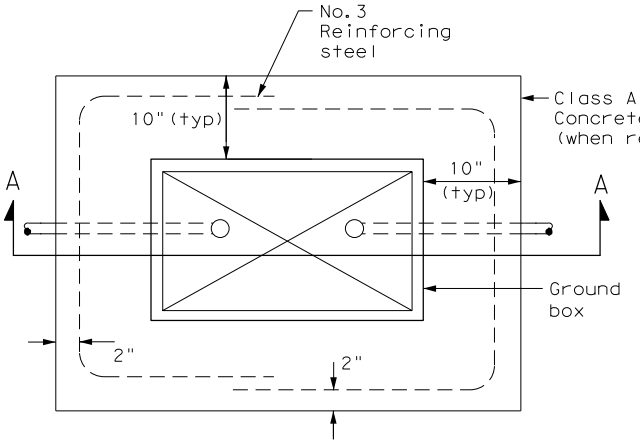
3. Install ground rods so the imprinted part number is at the upp the rod.

4. Remove all non-conductive coatings such as concrete splatter f at the clamp location.

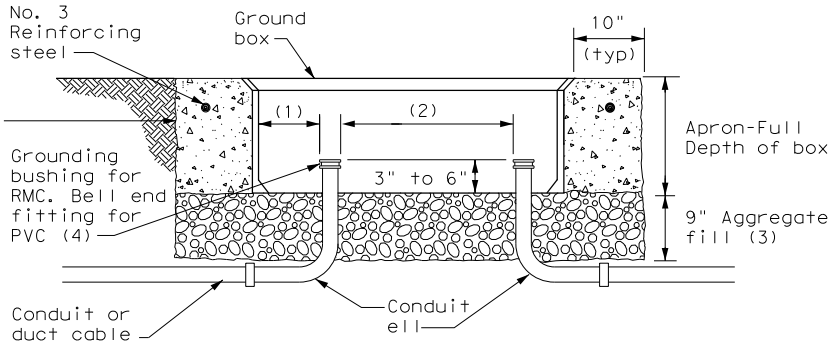
5. Route all conductors as short and straight as possible for con lightning protection ground rods. When a bend is required, ens radius bend of four inches for these conductors.

6. Unless otherwise called for in the plans, protect grounding el conductors with non-metallic conduit. When protecting groundin conductors with metal conduit, provide and install a grounding and properly sized bonding jumper on each end of the metal con

7. Written authorization is required before installing a ground r horizontal trench for rocky soil or a solid rock bottom.



PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

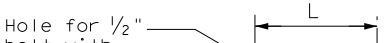
(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

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

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

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

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



GROUND

A. MATER

1. Provid accord Item 6

2. Provid the Ma and El

3. Ensure

4. Provid

B. CONST

1. Remove and se Item 3 least aggreg

2. Cast g of con under subsid

3. Keep b boxes.

4. Instal condui

5. Tempor

6. Perman and pu foam, Do not

7. When a togeth

8. When a to cut below

9. If an equipm as the Verify fully

10. If oth of the identi

11. Bond m

ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclos

2. Type galvanized steel (GS) enclosures may be used for Type C panelb and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordanc DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) a DMS 11080 and 11085. Do not provide GS pedestal services. If GS is in the PS descriptive code, provide an AL enclosure.

* ELECTRIC				
Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Servi Conduct No./Si
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6

* Example only, not for construction. All new electrical services must hav electrical service data chart specific to that service as shown in the p

** Verify service conduit size with utility. Size may change due to utility requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIP

ELEC SERV TY X XXX/XXX XXX (XX) XX (X

Schematic Type

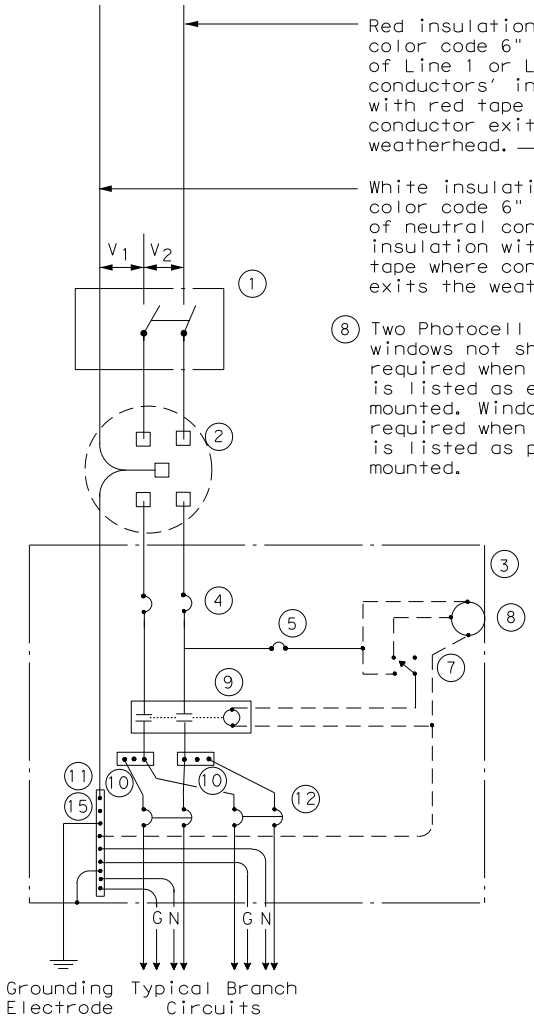
Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

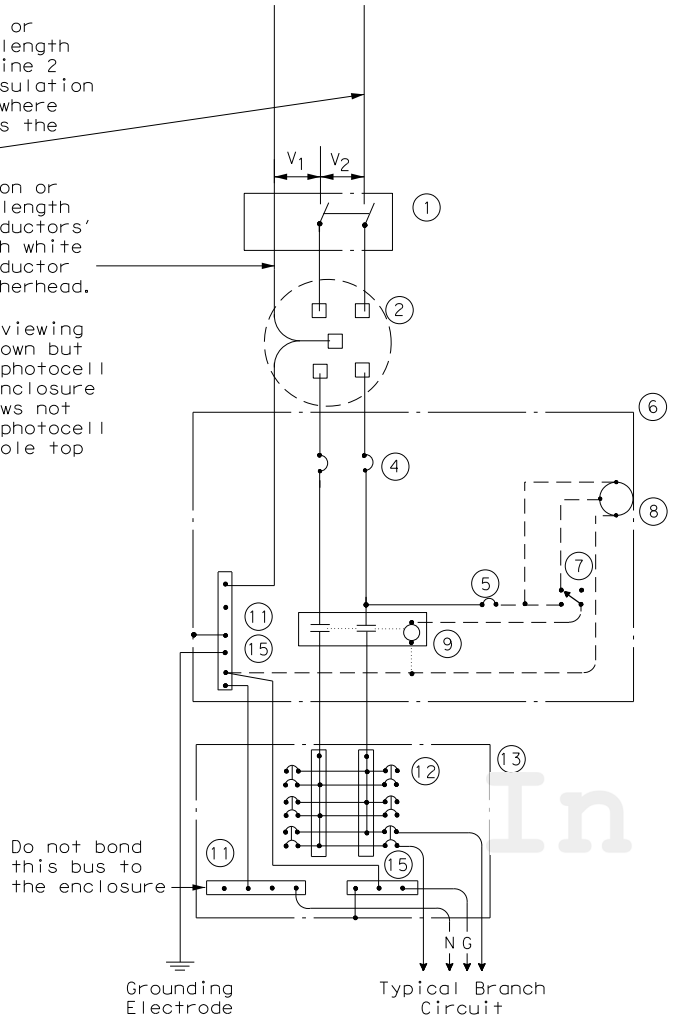
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

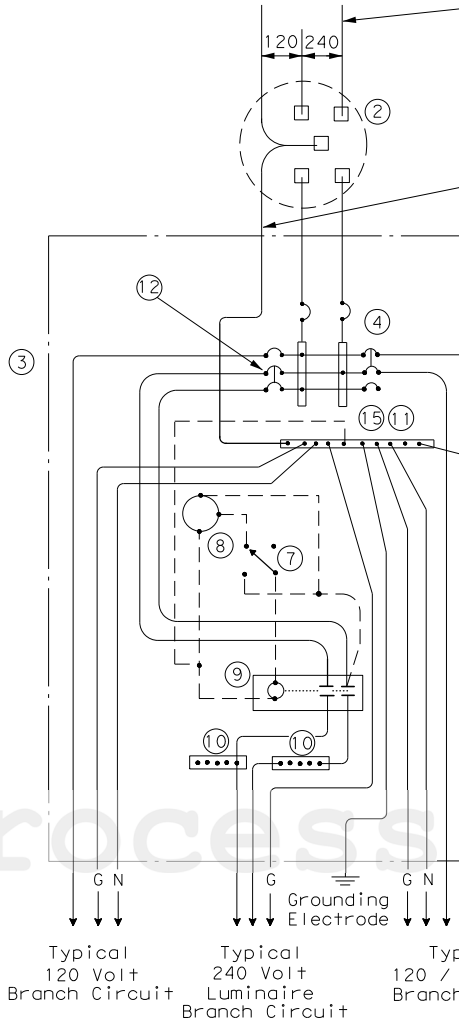
Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or



SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUST
120/240 VOLTS - THREE W

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

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

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.

2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.

3. Provide and install galvanized ¾ in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized ¾ in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 ¼ in. to 3 ½ in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.

4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.

5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.

6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.

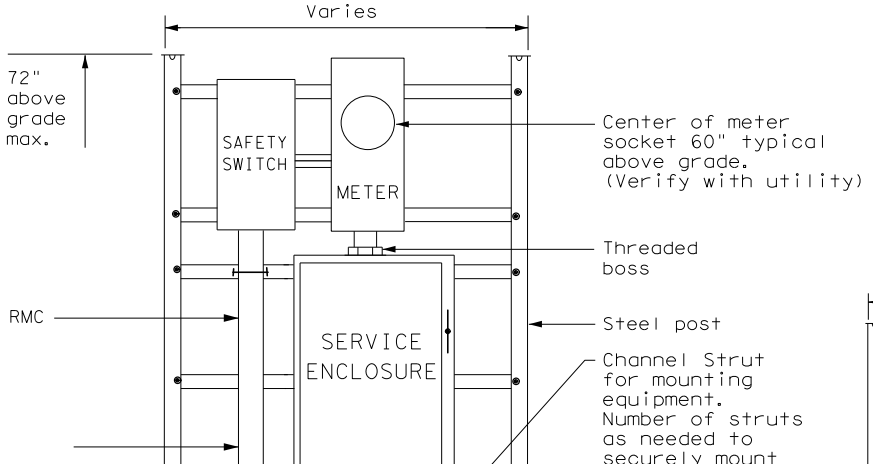
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.

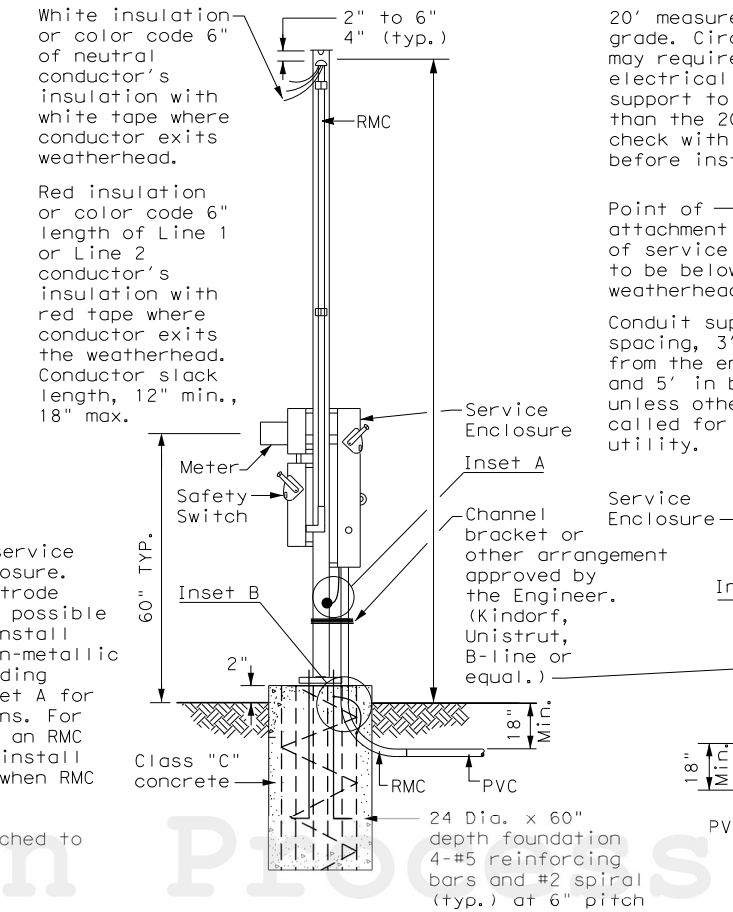
8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.

9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.

10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.

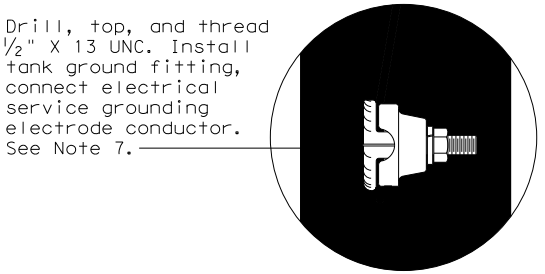
11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.





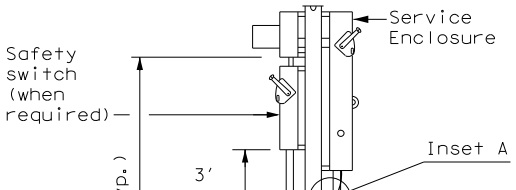
WITH SAFETY SWITCH W

SERVICE SUPPORT TYPE SP (O) -



FRONT VIEW

INSET A



TIMBER POLE (TP) SERVICE SUPPORT NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627 "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Conduit and electrical conductors attached to the electrical service pole and underground within 12 in. of service pole are not paid for directly but are subsidiary to the electrial service.
3. Install pole-top mounted photocell (T) on north side of pole, or in service enclosure (E) as required. See Electrical Service Data chart in plan set.
4. Gain pole as required to provide flat surface for each channel. Gain timber pole to ⅝ in. max. depth and 1 ⅞ 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 ¾ in. maximum depth, and 1½ in. to 1⅝ 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, ¼ in. minimum diameter by 1½ 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.

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

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

1. Provide GC and OC poles that meet the requirements of I "Electrical Services."
2. Provide prestressed concrete poles suitable for direct the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Locat should be approximately 4′ above final grade. Use the locations when handling pole in horizontal position, ar pickup location for use in raising the pole to a vertic These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., wh
5. Ensure all installation details of services are in acc company specifications.
6. Install a one point rack or eye bolt bracket 6 inches the weatherhead as an overhead service drop anchoring p electric utility.
7. Furnish and install galvanized or stainless steel chann or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep (Unistru or equal). Attach channel strut with stainless steel c 1" depth), square U-bolts or back to back channel stru or other secure mounting as approved by the Engineer. galvanized in accordance with ASTM A153. Do not stack c
8. Backfill the holes thoroughly by tamping in 6 in. lift grade, place additional backfill material in a 6 inch pole to allow for settling. Use material equal in compo to the surrounding area. Backfilling will not be paid subsidiary to various bid items.

(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)

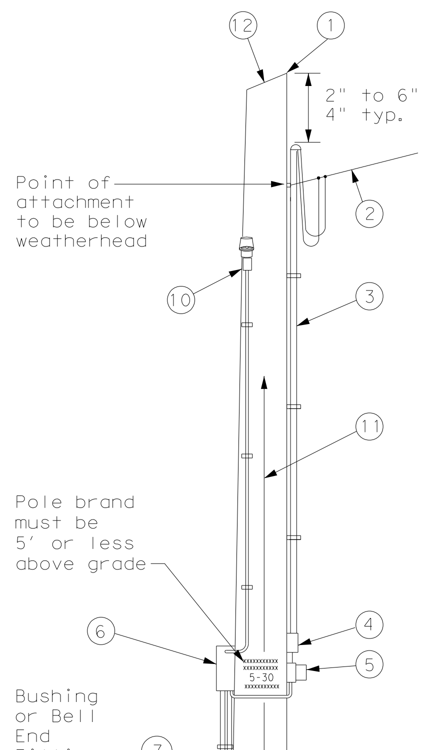
(5) Meter (when required)

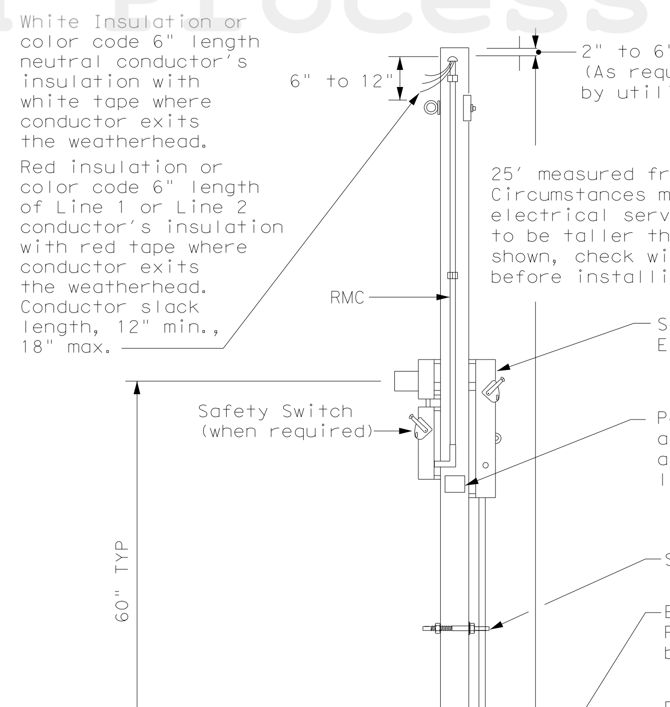
(6) Service enclosure

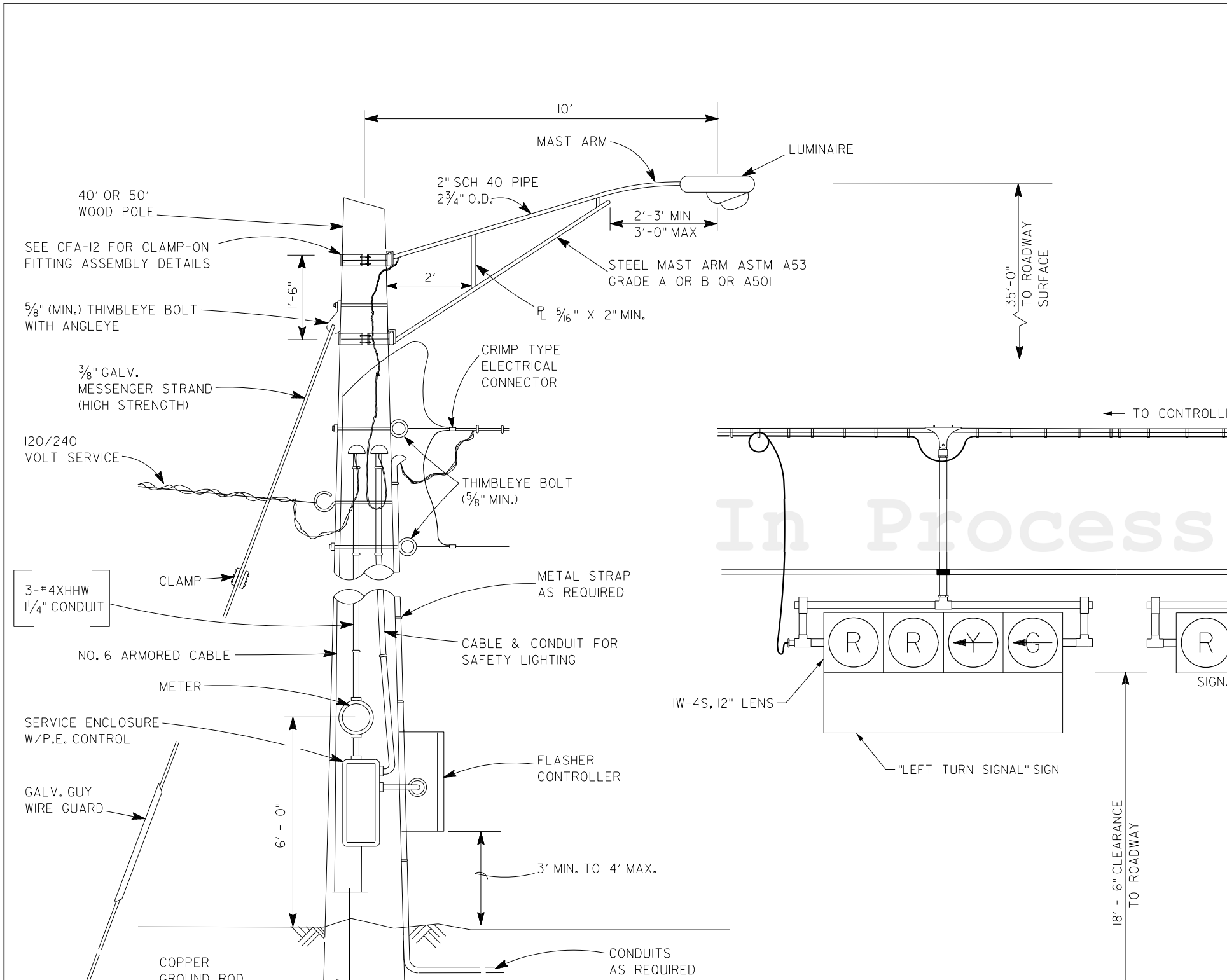
(7) 6 AWG bare grounding electrode conductor in ½ in. PVC to ground rod - extend ½ in. PVC 6 in. underground.

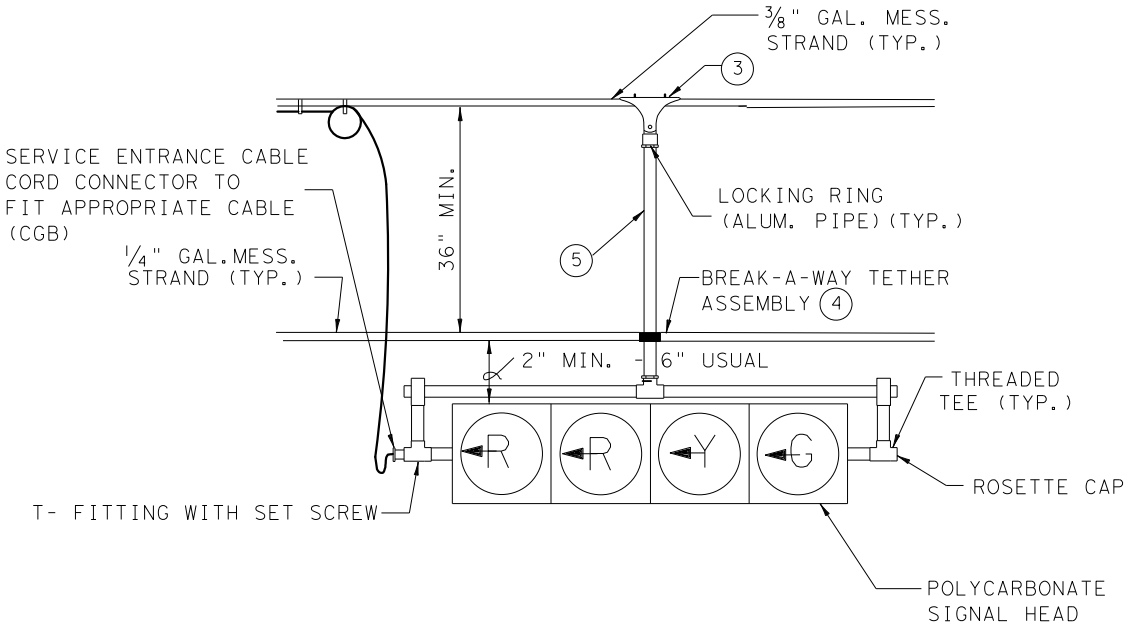
(8) ⅝ in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.

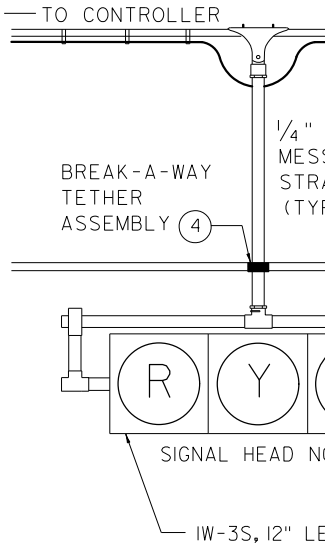
(9) RMC same size as branch circuit conduit

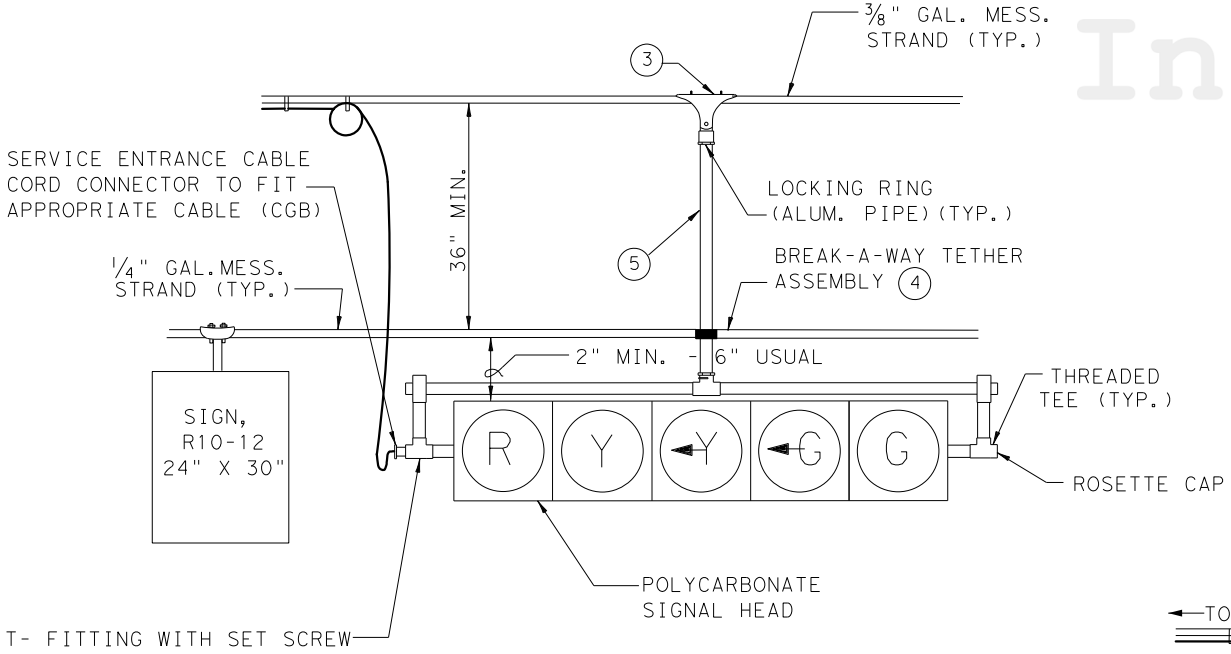


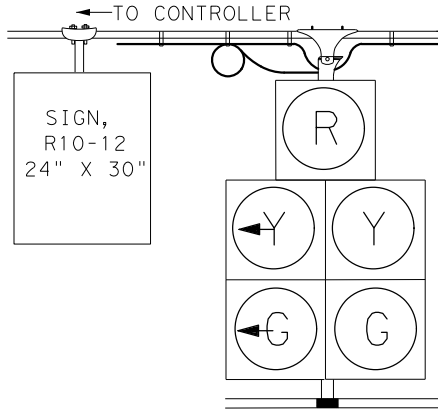


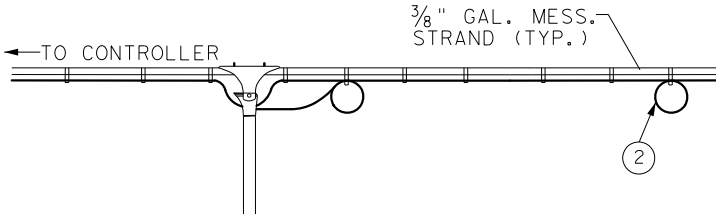




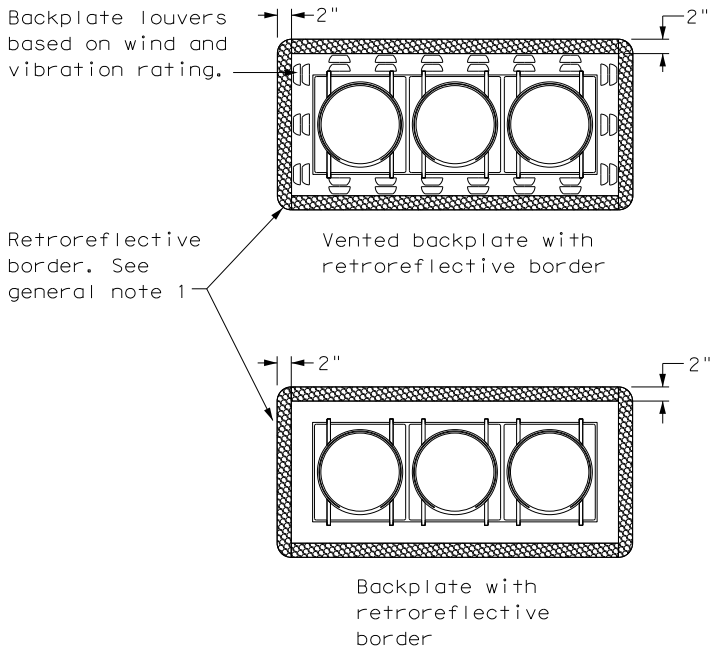




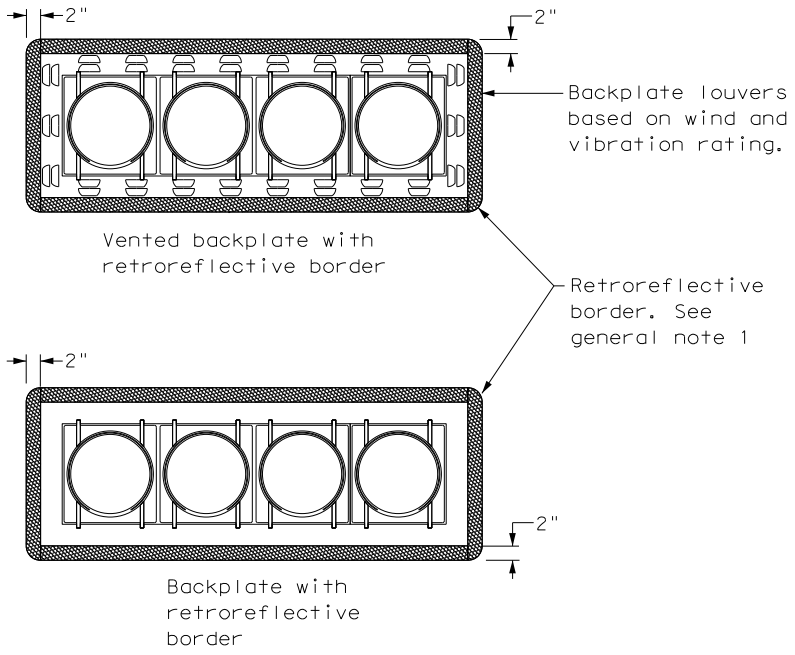




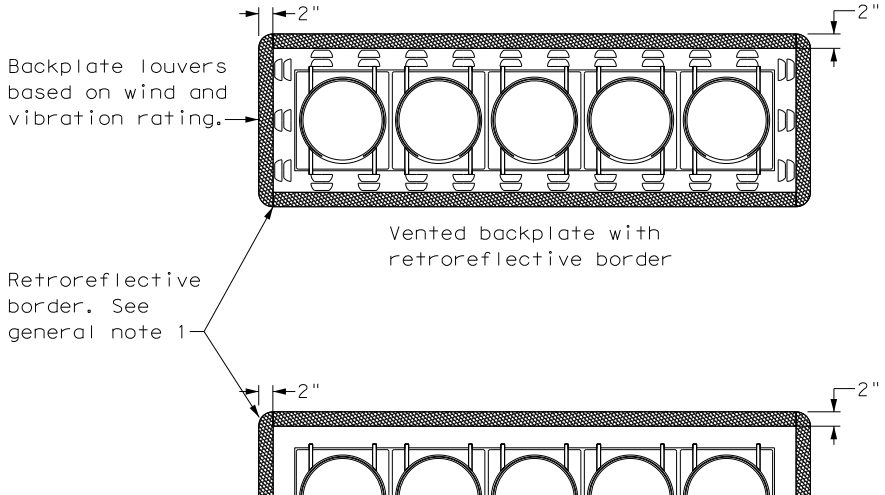
(1) LEAD - IN CABLE FROM CONTROLLER TO SIGNAL HEAD NO. 1

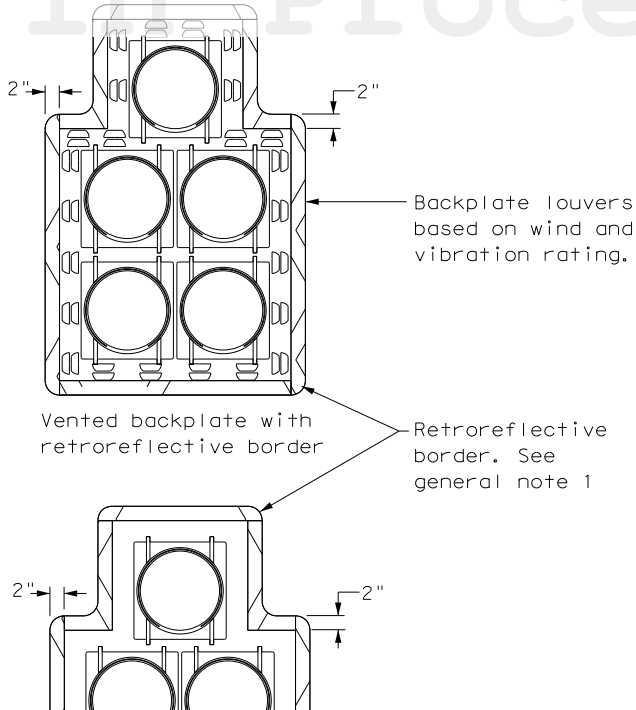


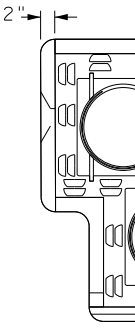
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL

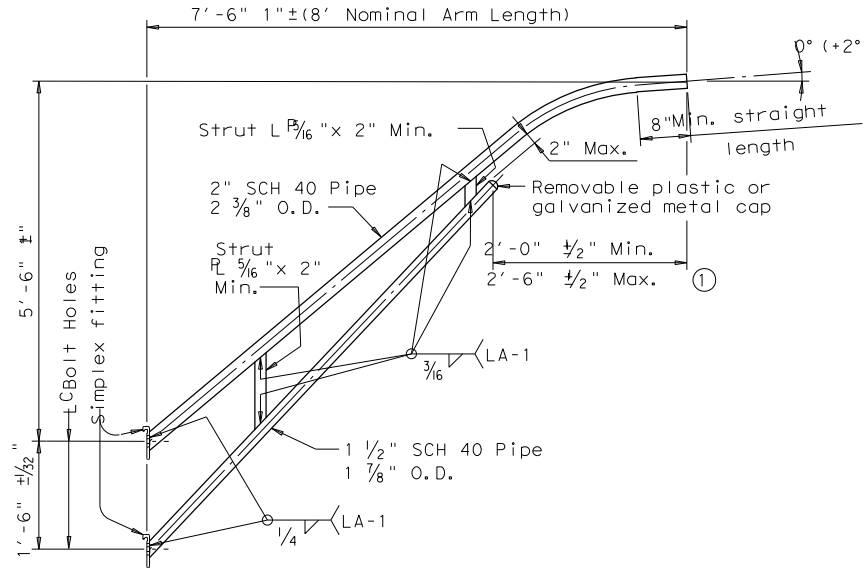


FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL

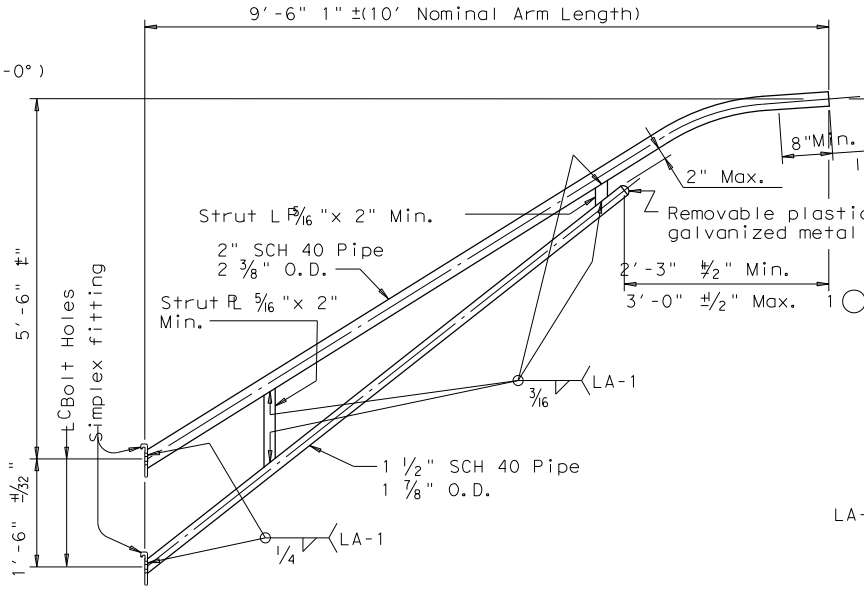




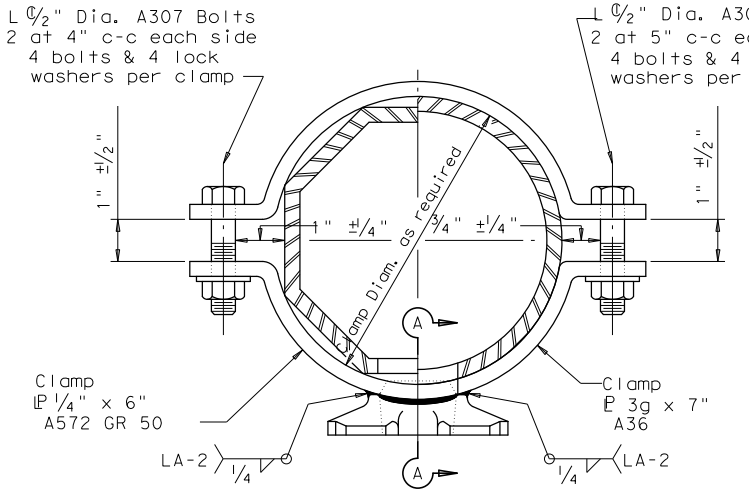




8-FOOT LUMINAIRE ARM

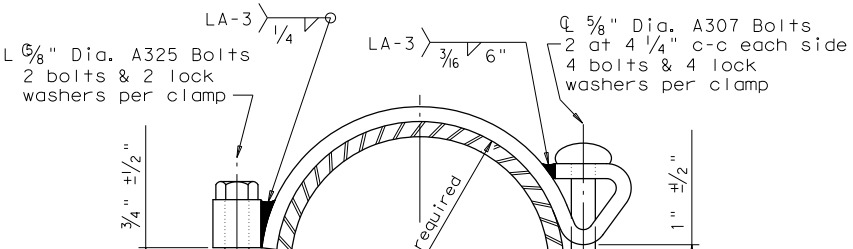


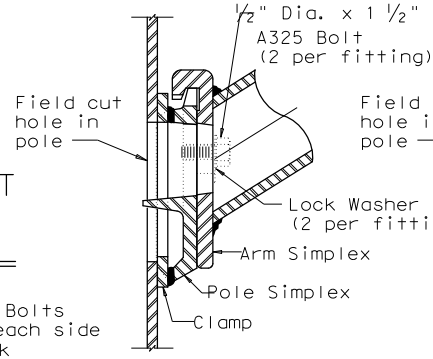
10-FOOT LUMINAIRE ARM



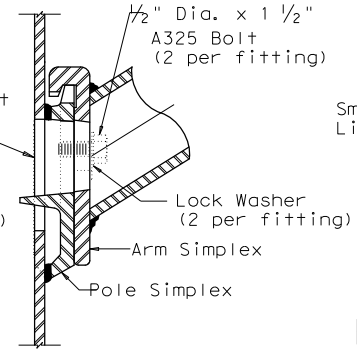
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)

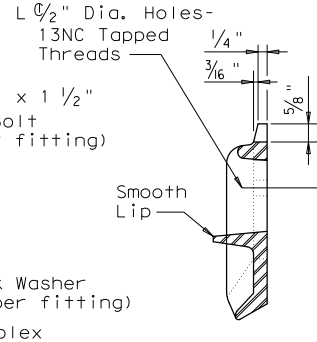




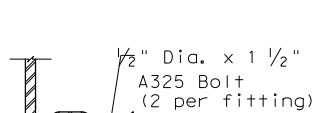
UPPER SIMPLEX FITTING

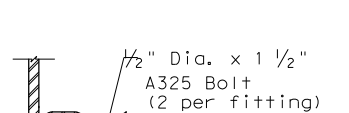


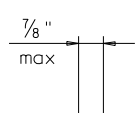
UPPER SIMPLEX FITTING

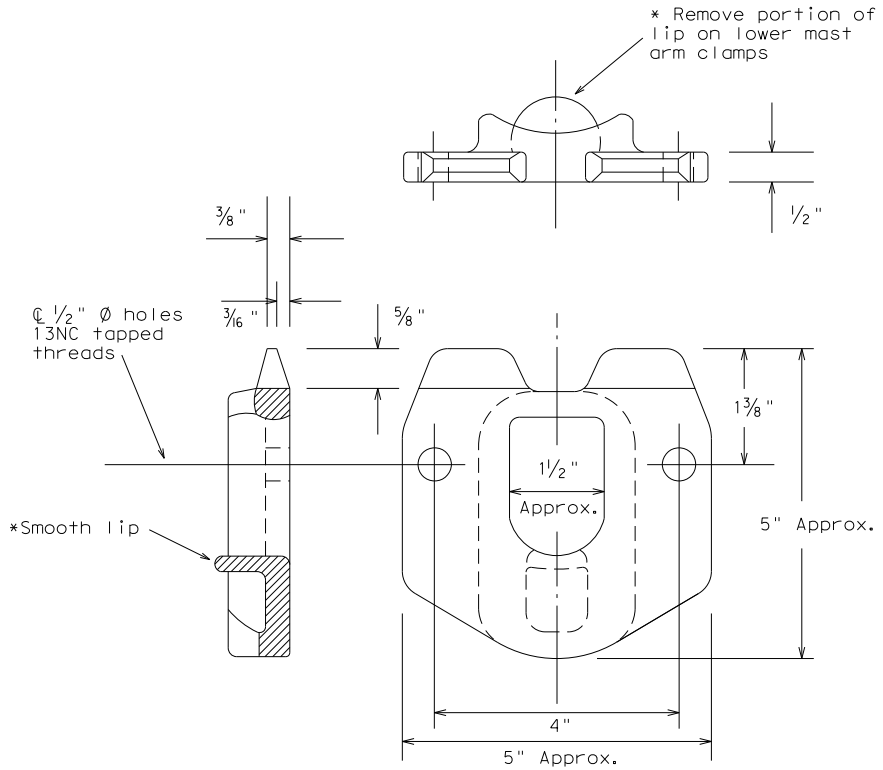


POLE SIM

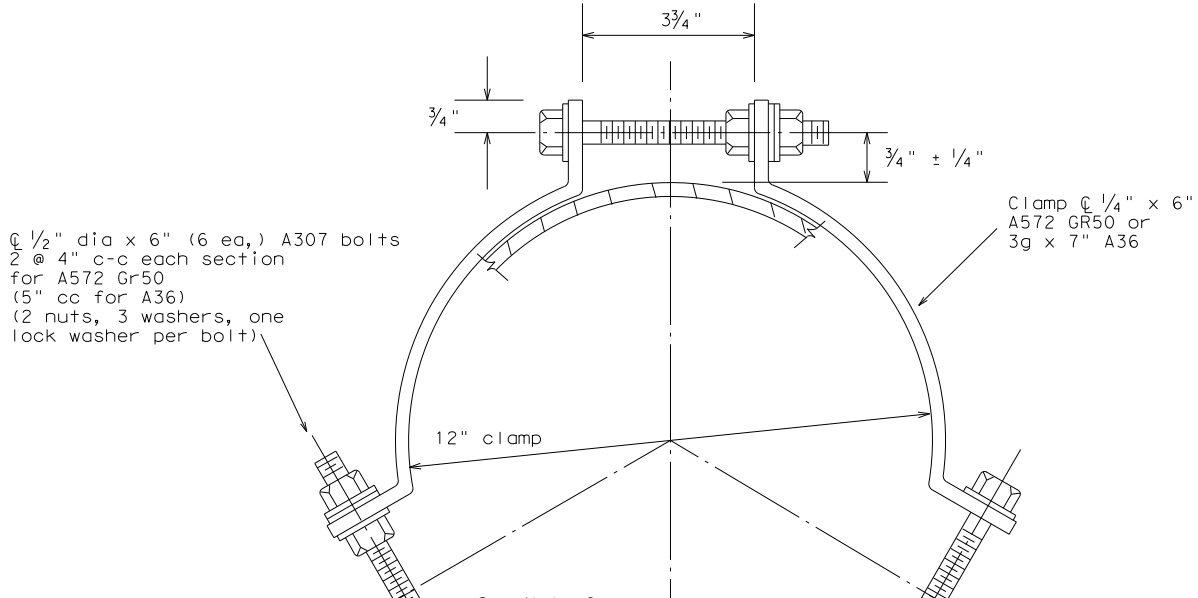


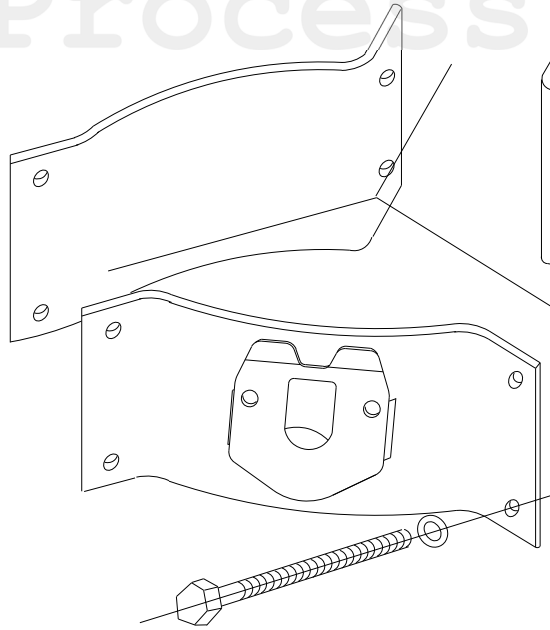






POLE SIMPLEX DETAILS





PROJECTIO

OTHER

1. P s m
2. W
3. N

GENER

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2. A T 9
3. B 2 h i
4. D t W 1
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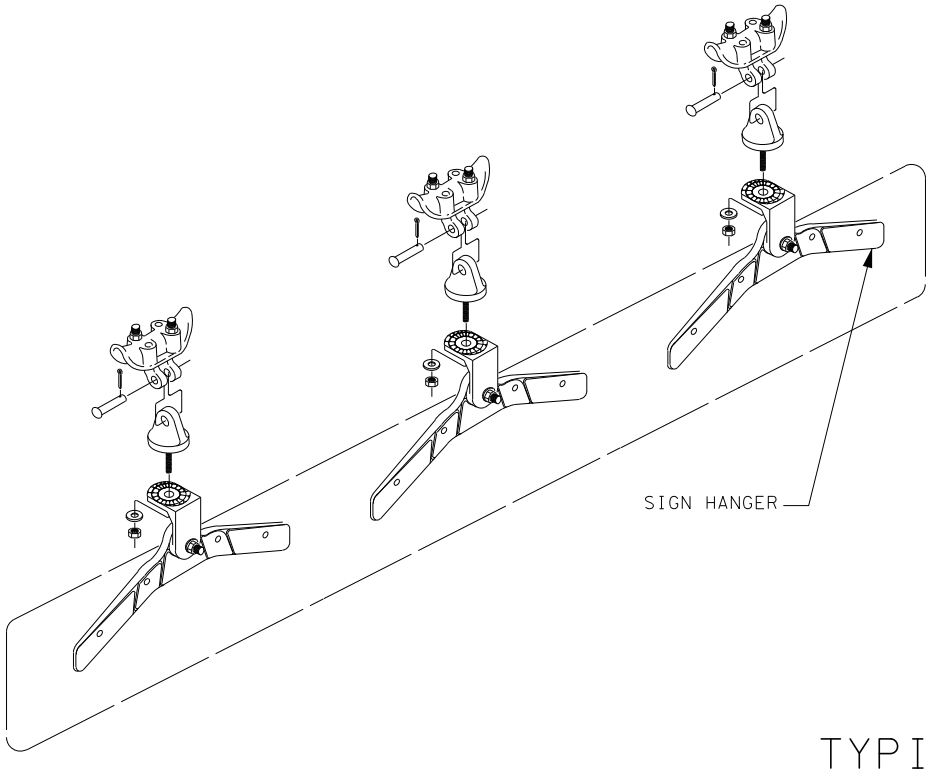
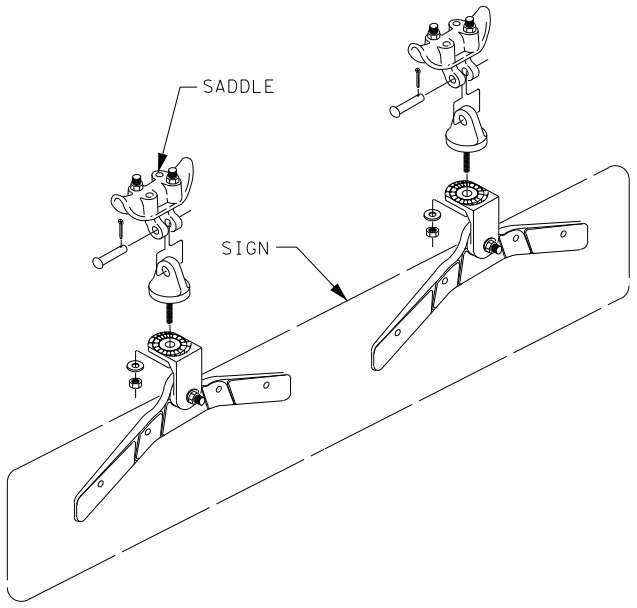
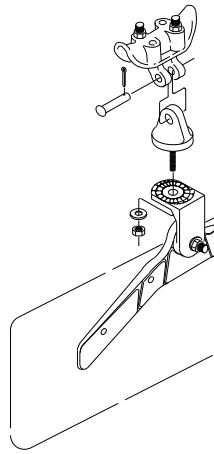
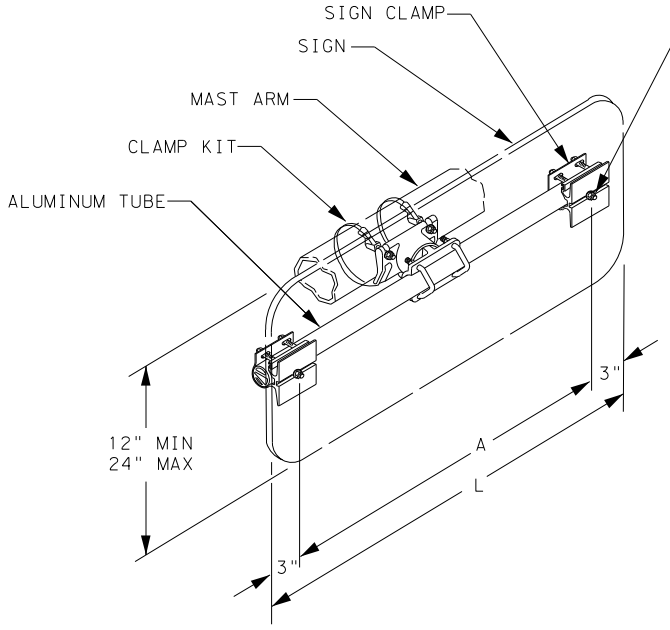
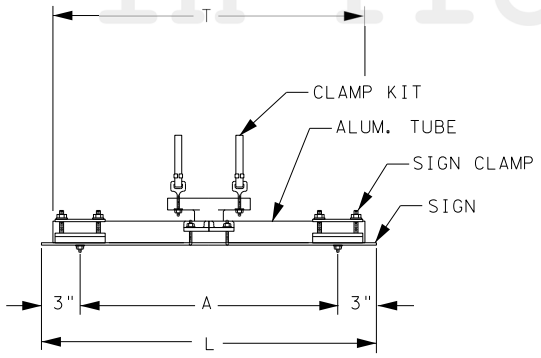






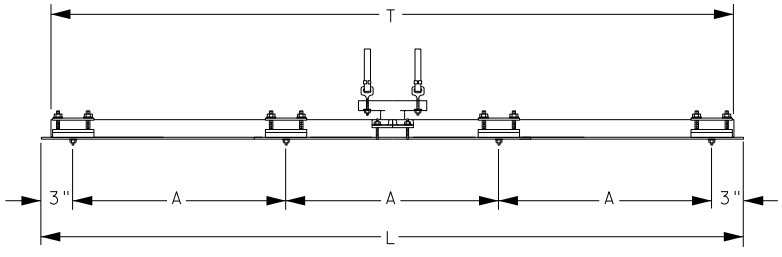
TYPICAL SPAN WIRE SIGN HANGER DETAI





SIGNS (1'-6" to

SIGN LENGTH (L)	TUBE
1'-6"	16"
2'-0"	22"
2'-6"	28"
3'-0"	34"



SIGNS (3'-6" to

SIGN LENGTH (L)	TUBE
3'-6"	40"
4'-0"	46"
4'-6"	52"
5'-0"	58"
5'-6"	64"
6'-0"	70"
6'-6"	76"
7'-0"	82"
7'-6"	88"
8'-0"	94"

NOTES FOR VIDEO DETECTION:

1. INSTALL VIDEO DETECTION PROCESSOR UNIT INSIDE CONTROLLER CABINET.

2. INSTALL VIDEO DETECTION CAMERA & BRACKET AS DETAILED OR AS DIRECTED BY THE VIDEO DETECTION SUPPLIER.

3. MOUNT CAMERAS AS FAR OVER THE ROADWAY AS POSSIBLE.

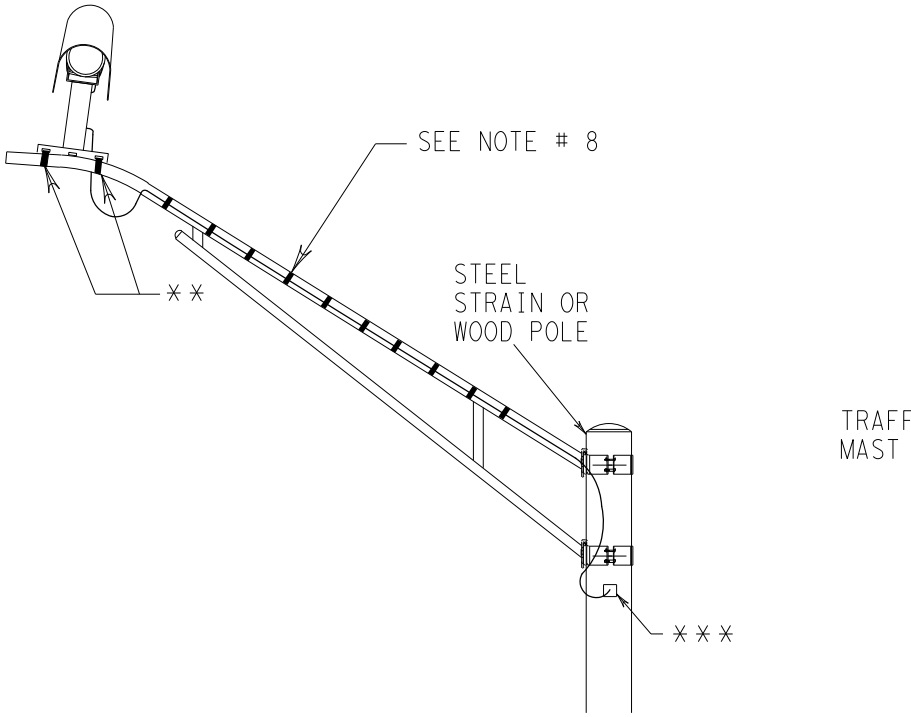
4. USE ¾ IN. STAINLESS STEEL BANDING MATERIAL TO INSTALL CAMERA MOUNTS.

5. AIM CAMERA SO THAT HORIZON IS NOT VISIBLE IN THE FIELD OF VIEW.

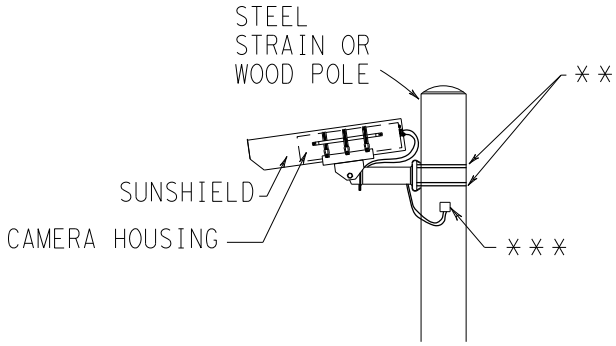
6. INSTALL CAMERA ENCLOSURE ASSEMBLY SO THAT IT CAN ROTATE AFTER INSTALLATION TO PROVIDE PROPER ALIGNMENT.

7. PROVIDE WATER TIGHT CABLE ENTRY AND EXIT POINTS IN THE MAST ARM AND/OR POLES.

8. FOR VIVDS COAX AND POWER CABLES ATTACHED TO LUMINAIRE ARM, PROVIDE A METAL CABLE STRAP (ALUMINUM OR STAINLESS STEEL), 3/4-IN MINIMUM WIDTH AND TWO WRAPS AT 8 IN. MAXIMUM SPACING.

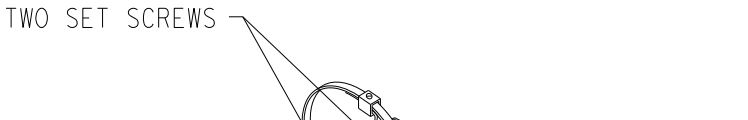


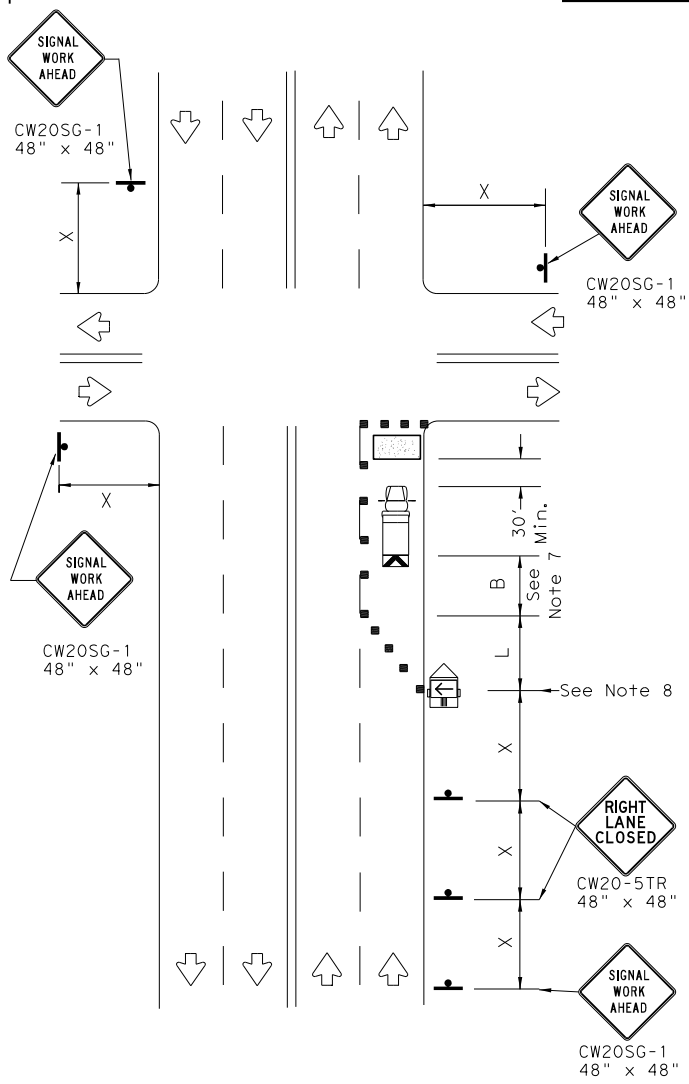
LUMINAIRE ARM MOUNT



POLE MOUNT

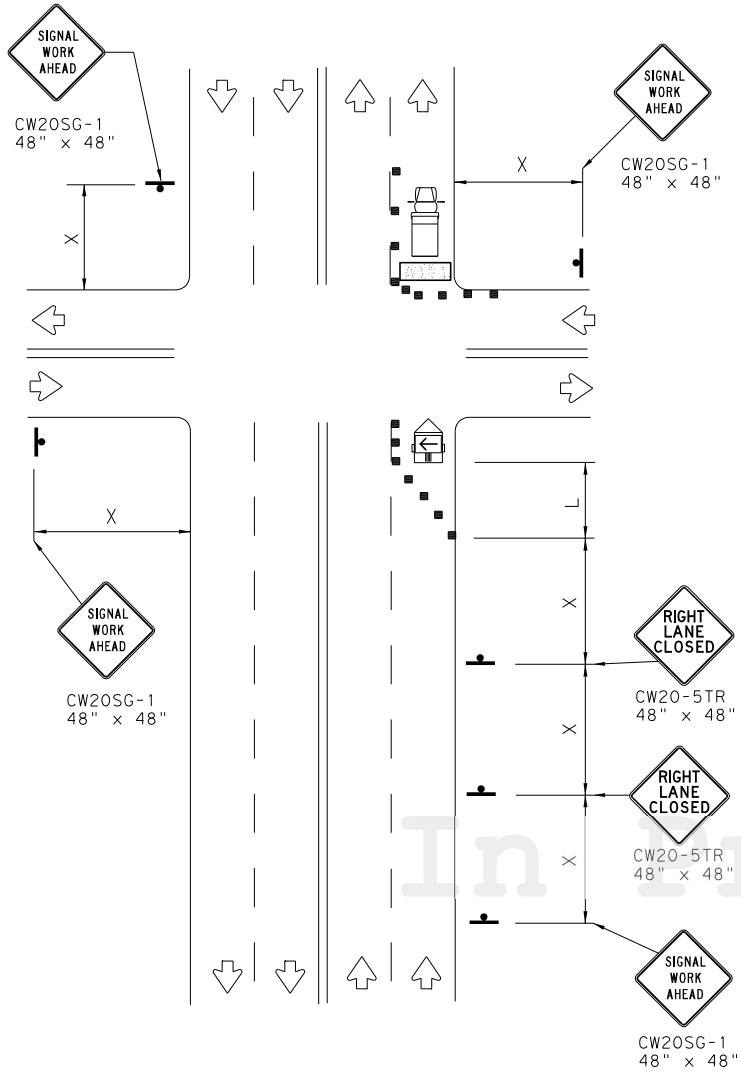
* 4 FT. PIPE EXTENSION WHEN MOUNTED ON TRAFFIC SIGNAL MAST ARM.





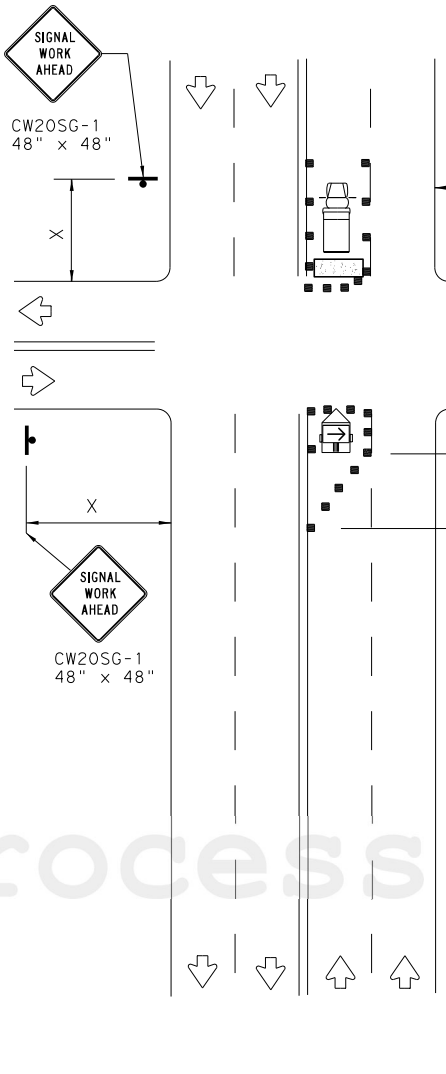
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



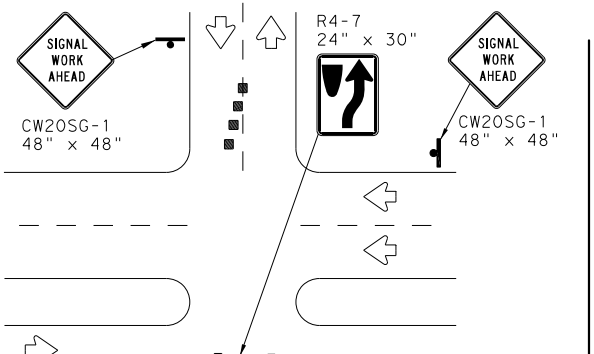
FAR SIDE RIGHT LANE CLOSURE

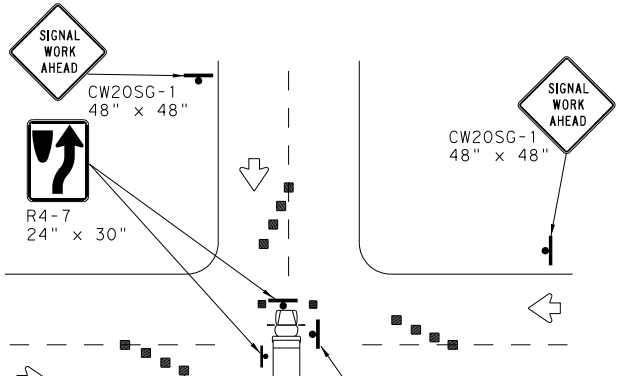
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LAN

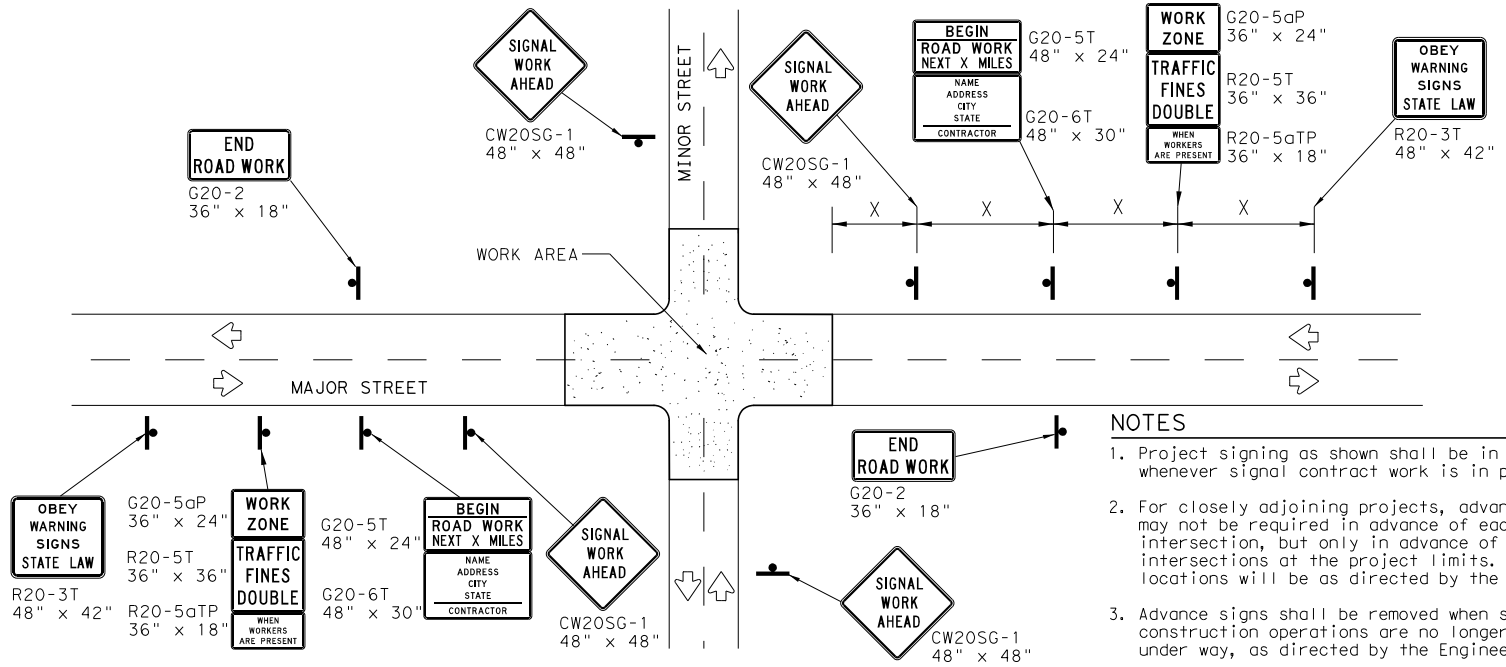
SHORT DURATION OR SHORT TE





GENERAL NOTES

1. The minimum size channelizing device cones, drums, vertical panels or barr the device must be left unattended at
2. Obstructions or hazards at the work ar and delineated at all times.
3. Flaggers and Flagger Symbol (CW20-7) s to field conditions.
4. Vehicles parked in roadway shall be eq high intensity rotating, flashing, osc
5. High level warning devices (flag trees the vehicle.



TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

DURATION OF WORK

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

SIGN MOUNTING HEIGHT

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

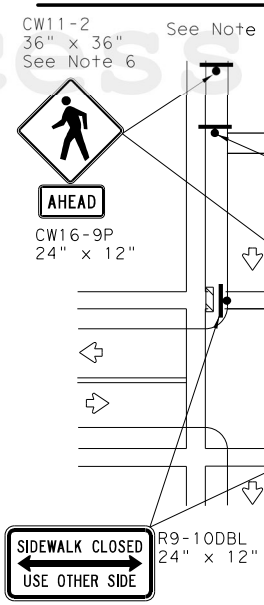
REFLECTIVE SHEETING

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

SIGN SUPPORT WEIGHTS

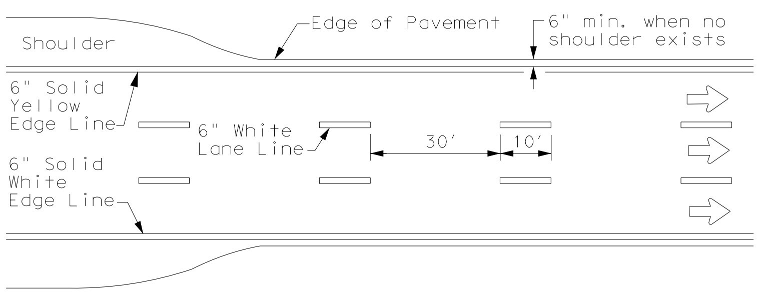
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

LEGEND	
	Sign
	Channelizing Devices
	Type 3 Barricade

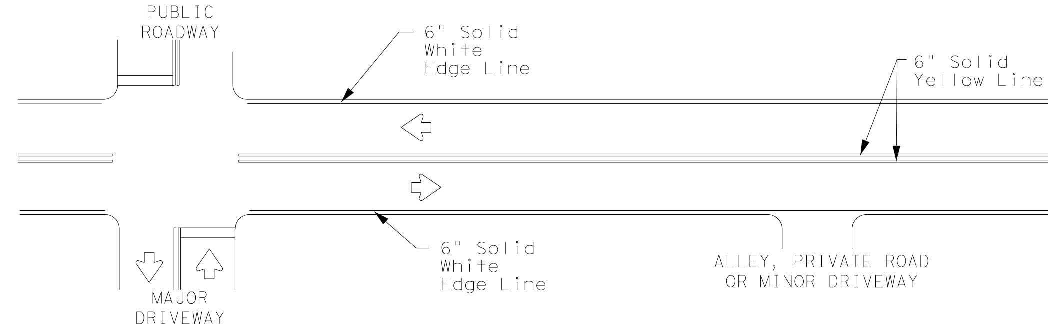


PEDESTRIAN CONTROL

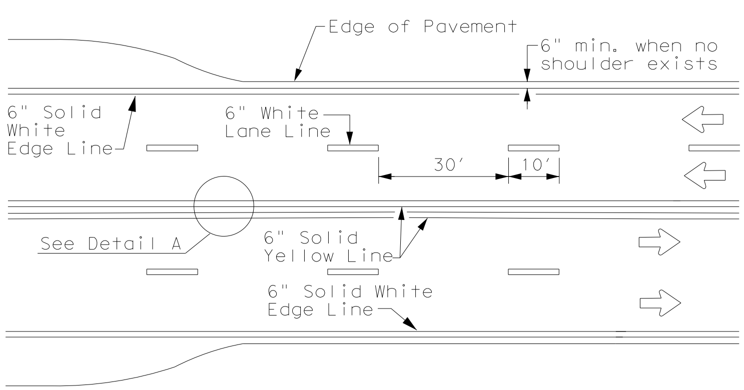
1. Holes, trenches or other
   delineating or surroundi
   fencing or longitudinal
2. "CROSSWALK CLOSURES" as



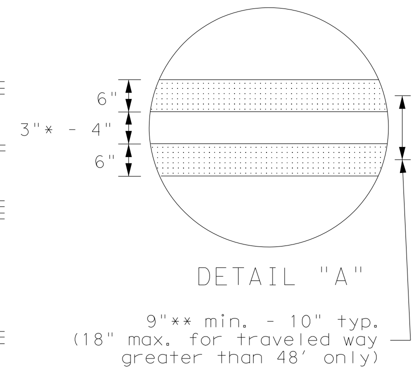
EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



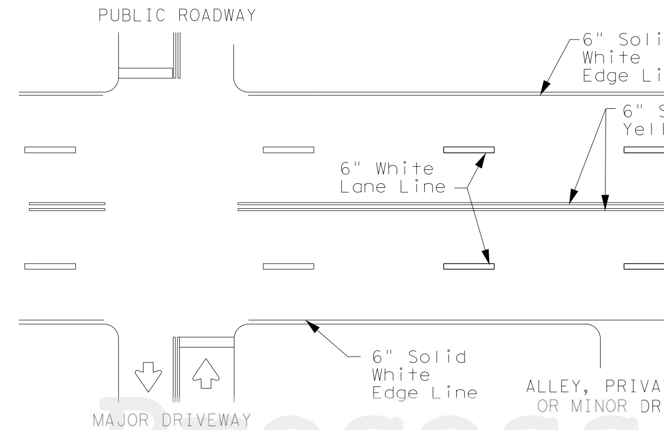
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



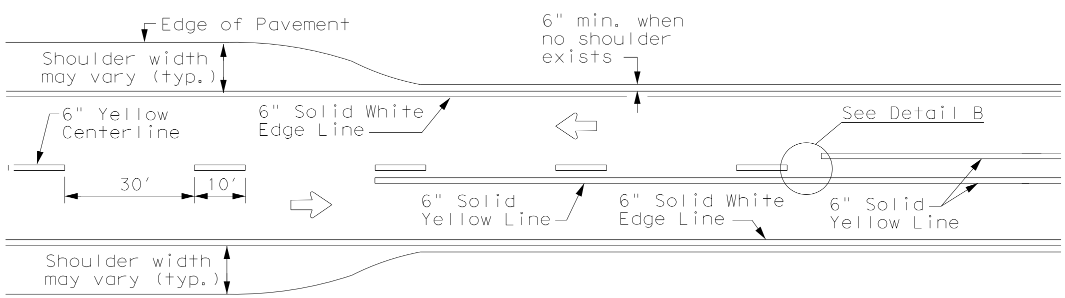
DETAIL "A"

* 2" minimum for restripe projects when approved by the Engineer.

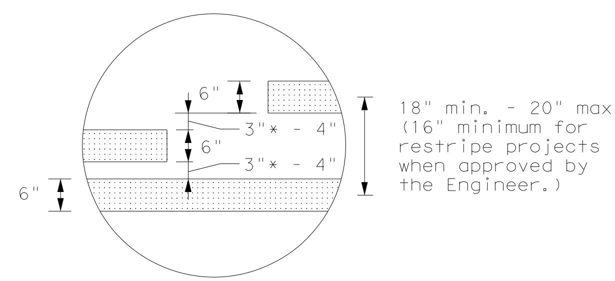
** 8" minimum for restripe projects when approved by the Engineer.



TYPICAL MULTI-LANE, TWO-WAY PA
MARKINGS THROUGH INTERSECT

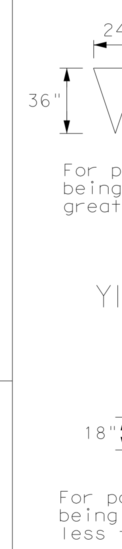


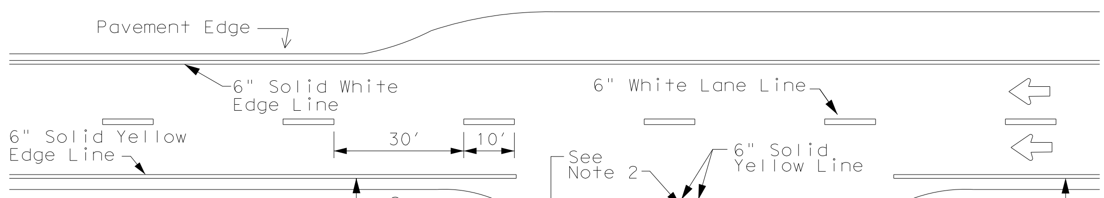
TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



DETAIL "B"

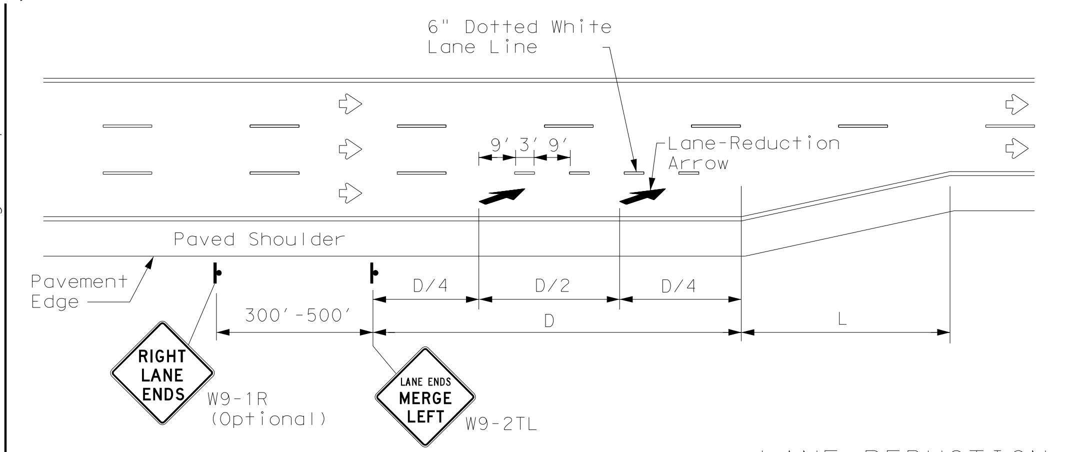
* 2" minimum for restripe projects when approved by the Engineer.





NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median



LANE REDUCTION

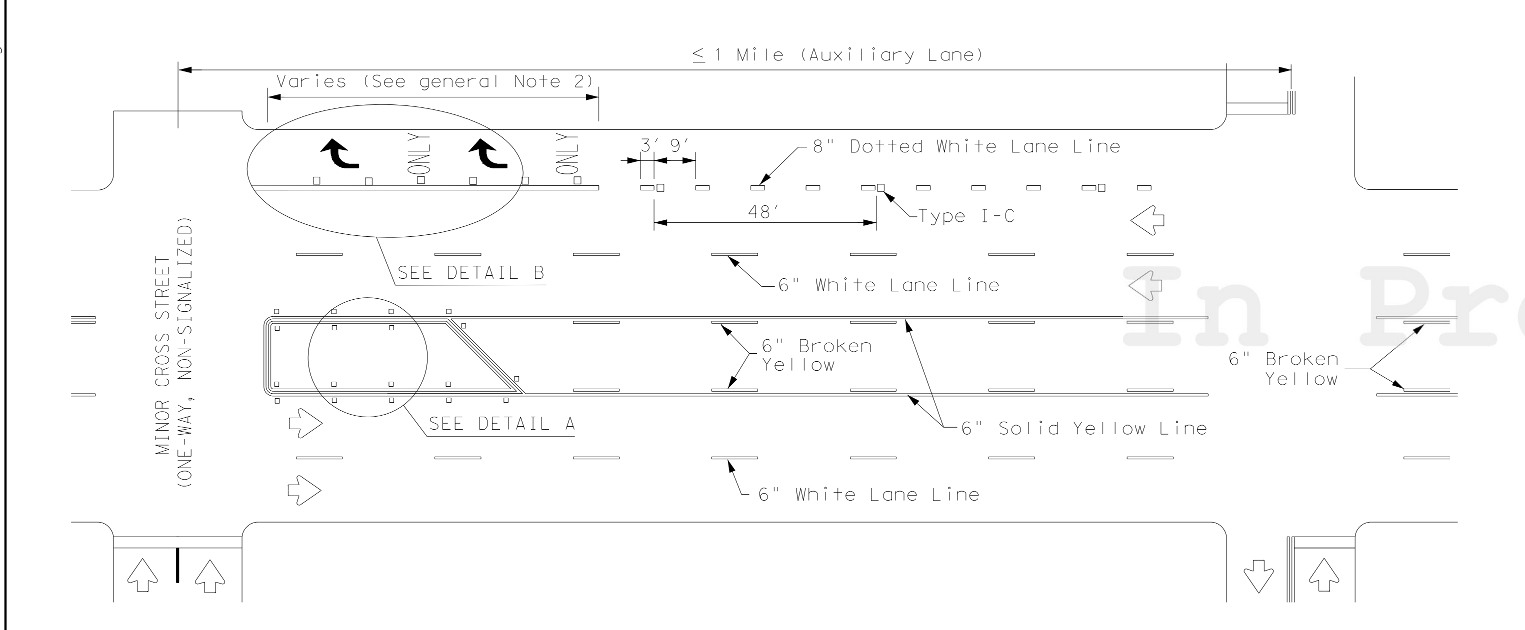
NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.

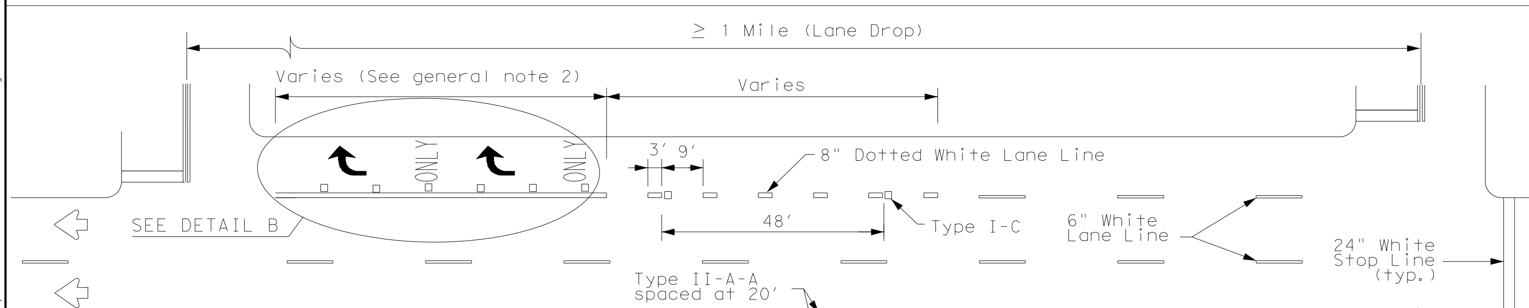
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.

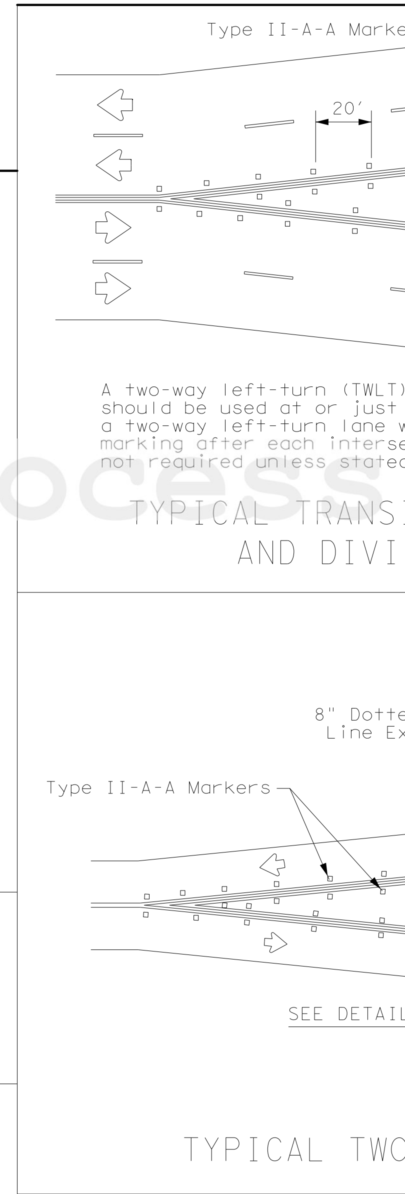
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.

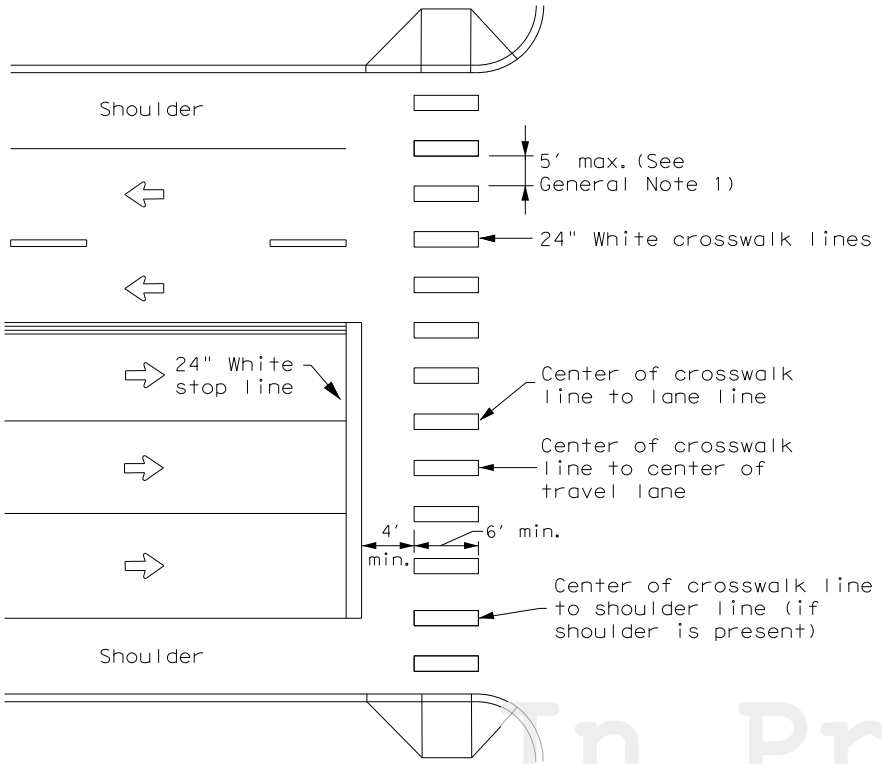
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.



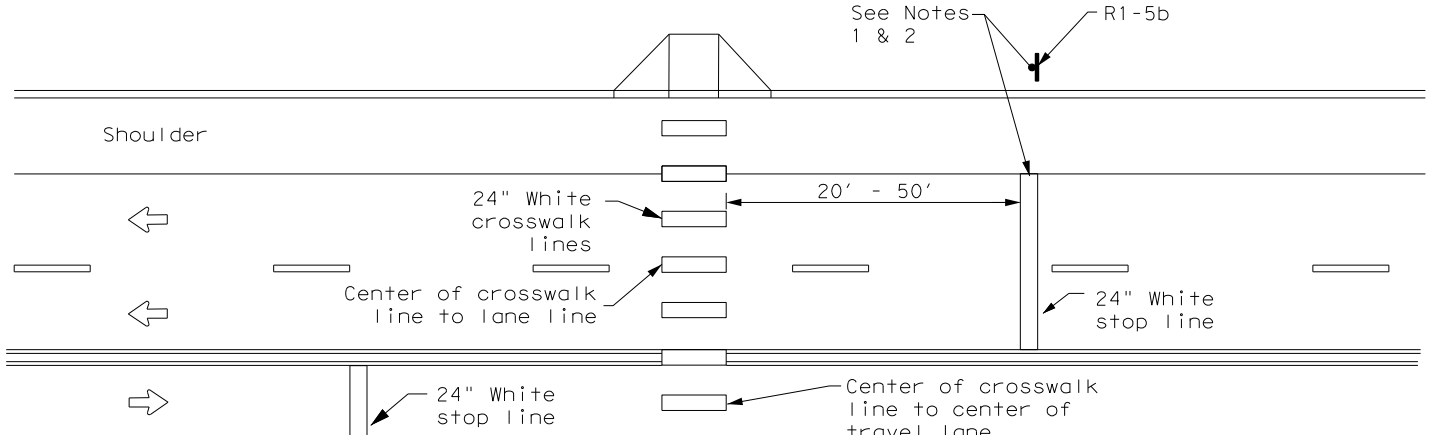
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE







HIGH-VISIBILITY LONGITUDINAL CROSSWALK
AT CONTROLLED APPROACH



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Tarik Taheri Tarik.Taheri@txdot.gov Security Level: Email, Account Authentication (Optional) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		

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Tony Novosad Tony.Novosad@txdot.gov Security Level: Email, Account Authentication (Optional) **Electronic Record and Signature Disclosure:** Not Offered via Docusign		
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Notary Events	Signature	Timestamp

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If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. To indicate to us that you are changing your mind, you must withdraw your consent using the DocuSign 'Withdraw Consent' form on the signing page of your DocuSign account. This will indicate to us that you have withdrawn your consent to receive required notices and disclosures electronically from us and you will no longer be able to use your DocuSign Express user account to receive required notices and consents electronically from us or to sign electronically documents from us.

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Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through your DocuSign user account all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures electronically from us.

How to contact Texas Department of Transportation:

You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:
To contact us by email send messages to: kevin.setoda@txdot.gov

To advise Texas Department of Transportation of your new e-mail address

To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at kevin.setoda@txdot.gov and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..

In addition, you must notify DocuSign, Inc to arrange for your new email address to be reflected in your DocuSign account by following the process for changing e-mail in DocuSign.

To request paper copies from Texas Department of Transportation
To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an e-mail to kevin.setoda@txdot.gov and in the body of such request you must state your e-mail address, full name, US Postal address, and telephone number. We will bill you for any fees at that time, if any.
To withdraw your consent with Texas Department of Transportation

To inform us that you no longer want to receive future notices and disclosures in electronic format you may:

i. decline to sign a document from within your DocuSign account, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;

ii. send us an e-mail to kevin.setoda@txdot.gov and in the body of such request you must state your e-mail, full name, IS Postal Address, telephone number, and account number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows2000? or WindowsXP?
Browsers (for SENDERS):	Internet Explorer 6.0? or above
Browsers (for SIGNERS):	Internet Explorer 6.0?, Mozilla FireFox 1.0, NetScape 7.2 (or above)
Email:	Access to a valid email account
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	• Allow per session cookies

	• Users accessing the internet behind a Proxy Server must enable HTTP 1.1 settings via proxy connection

** These minimum requirements are subject to change. If these requirements change, we will provide you with an email message at the email address we have on file for you at that time providing you with the revised hardware and software requirements, at which time you will have the right to withdraw your consent.

Acknowledging your access and consent to receive materials electronically

To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.

By checking the 'I Agree' box, I confirm that:

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- Until or unless I notify Texas Department of Transportation as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by Texas Department of Transportation during the course of my relationship with you.