Texas Department of Transportation

Permit to Construct Access Driveway Facilities on Highway Right of Way

Form 1058
(Rev. 09/23)
Page 1 of 2

PERMIT NUMBER: 23040324			
	GPS*	ROADWAY	
REQUESTOR	LATITUDE, LONGITUDE	HWY NAME	FM0359
	29.6269 -95.7704	FOR TxDOT'S USE	
		CONTROL	0543
NAME	County of Fort Bend, Texas c/o Schaumburg & Polk	SECTION	02
MAILING ADDRESS	3920 FM 359		
CITY, STATE, ZIP	Richmond, TX 77406		
PHONE NUMBER	(281) 920-0487		

*GLOBAL POSITIONING SYSTEM COORDINATES AT INTERSECTION OF DRIVEWAY CENTERLINE WITH ABUTTING ROADWAY

The Texas Department of Transportation, hereinafter called the State, hereby authorizes County of Fort Bend, Texas, hereinafter called the Permittee, to ☐ construct / ☒ reconstruct a street tie in, sidewalk, traffic signal (residential, convenience store, retail mall, farm, etc.) access driveway on the highway right of way abutting highway number FM0359 in Fort Bend County County, located McCrary Road.

USE ADDITIONAL SHEETS AS NEEDED

Is this parcel in current litigation with the State of Texas? ☐ YES ☒ NO

Is the Permittee or a family member of Permittee an employee or official of the Texas Department of Transportation? ☐ YES ☒ NO

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

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 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.
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 six (6) months from the issuance date of this permit.
10. The Permittee will contact the State's representative Juan M Mata telephone, (281)238-7963, 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.

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: 1/29/2025 Signed: DocuSigned by: kp George E54658TDD2BD433 (Property owner or owner's representative)

1/30/2025 Date of Issuance	Signed by: Carlos M. Zepeda Jr., P.E. 999EB2AF5AGE4F2... 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)

Access Driveway Policy

Title 43 Texas Administrative Code (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.

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 click on the section of the map closest to your location to find the local TxDOT office. You can also click on the drop down box below the map to find the district for your county.

Other Conditions

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

Provide for a 82' wide street tie-in using a single row of 3' x 2' RCB with SETs and 40' radii, modification to traffic signal, provide sidewalk to TxDOT and ADA standards from TxDOT roadway FM359 per executed LOSA and plans dated 07-16-2024. Hydraulic approval per following specs.: o No drainage coming to TXDOT Row. o Onsite drainage require approval by other entity. o Proposed modify McCrary Rd tie to FM 359 w = 82' and r = 40' Proposed 117 ft. of 3'x2' RCB Culvert with SET o Plan file: McCrary Road South_Revised_Final Plans_07-16-24.pdf o Last updated plan sheet date 7-16-2024
~~Also, attached Special Provisions dated July 1, 2022 must be followed.~~

Variance Documentation Justification

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.

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 emailing 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

- Close Window
- Print This Page
- Expand All | Collapse All

TR23040324

Contact Information

Application Name	TR23040324	**Application Status**	Complete - No Objections
Date of Submittal	9/19/2023	**Upload to Box**	☐
Date of Latest Resubmittal	11/14/2023	**Review Phase**	Complete - Phase 3
First Name (Authorized Agent)	Joseph	**Record Type**	Application record Type
Last Name (Authorized Agent)	Schwieterman	**Mailing Street**	11767 Katy Frwy, Ste. 900
Name of Owner as shown on Property Deed	Fort Bend County	**Mailing City**	Houston
Last Name (Property Owner)		**Mailing State/Province**	TX
Consulting Firm	Schaumburg & Polk, Inc.	**Mailing Zip/Postal Code**	77079
User edited Address	☐	**Email**	jschwieterman@spi-eng.com
Need Agreement	☑	**Owner or Developer or Secondary Email**	
Need ROW Land Donation Agreement	☐	**Phone**	2819200487
Upload to OnBase Complete	☐	**Contact Person**	
Area Engineer	Carlos M Zepeda Jr., P.E.	**Owner**	Joseph Schwieterman
Assistant Area Engineer	Daniel J Dvorak		
Permit Coordinator	Cindy S Kurtz		
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	; 2023-11-14 Can you please provide specific comments on what you'd like updated on the traffic signal plans that were in the plans submitted?; 2024-03-12 Please see attached Response to Comments and updated traffic signal plans along with supplemental signal plans from TxDOT; 2024-04-24 The existing poles are shown in the attached exhibit, overlayed on the proposed layout of the McCrary Road intersection.; 2024-07-25 Please see attached Response to Comments and revised final planset along with supporting documents as requested.

Maintanence Office Comments History

Site Information

Site Name	McCrary Road at FM 359	**Latitude**	29.6269207
Site Address	3920 Farm to Market 359	**Longitude**	-95.77041439999999
City	Richmond	**Is this parcel in current litigation?**	No
State	TX	**Control**	0543
Zip Code	77406	**Road Section**	02
County	Fort Bend County		
Section	Fort Bend		

Application Information

Permit Type	Street Tie-In; Traffic Signal	**Number of requested driveway(s)**	0
Highway	FM0359	**Number of requested street tie-in(s)**	0
Closest Cross Street	McCrary	**Number of requested turn lanes**	
Is Highway within an incorporated city?	☐	**No of Existing access(s) to be modified**	1
City		**Date of Signed & Sealed Plans Submitted**	7/16/2024
Assigned Maintenance Section	Fort Bend	**Type of highway design?**	Open Ditch
Property on which side of highway?	Westbound	**If open ditch, inside diameter of Pipes**	30-inch
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/a078y000001m95b/TR23040324	**Any drainage coming to TxDOT**	☐
		If no, name of entity/agency/authority	Fort Bend County

Access Details

Purpose of Request

THE PROJECT IS PART OF THE 2017 FORT BEND COUNTY MOBILITY BOND PROGRAM TO INCREASE THE LEVEL OF SERVICE AND SAFETY OF THE INTERSECTION FOR THE GROWING PROPULATION IN THE AREA. THE MAJORITY OF USE WILL BE BY PERSONAL VEHICLES OVER THE NEXT THREE YEARS, WITH FREQUENT USE BY SCHOOL BUSES AND OCCASSIONAL USE BY VARIOUS SERVICE TRUCKS.

Background

JUL. 28, 2021 - FM 359 PERMITING AND LOSA DISCUSSION ON TEAMS MEETING BETWEEN TXDOT (TRAFFIC, PLANNING AND DEVELOPMENT) AND COUNTY (SPI, ENGINEERING)
DEC. 17, 2021 - RECEIVED TRACKING NUMBER TR21526P FOR 95% REVIEW
FEB. 10, 2022 - ALIGNMENT DISCUSSION ON ZOOM MEETING BETWEEN TXDOT HOUSTON DISTRICT (TRAFFIC, PLANNING AND DEVELOPMENT) AND FORT BEND COUNTY (SPI, ENGINEERING, PRECINCT 1 COMISSIONER); FORT BEND COUTNY COMMIT TO MODIFYING THE INTERSECTION SOUTH OF FM 359 TO ALIGN WITH THIS PROJECT

Existing roadway characteristics	MCCRARY ROAD ALONG THE NORTH ROW OF FM 359 IS AN EXISTING ASPHALT OPEN DITCH SECTION WITH 1-11' NB LANE AND 1-11' SB LANE. THIS PROJECT PROPOSES A CONCRETE CURB AND GUTTER SECTION WITH 2-12' NB LANES, 2-12' SB LANES AND A 32' MEDIAN, HAVING A 40 MPH POSTED SPEED LIMIT. FM359 IS AN EXISTING ASPHALT OPEN DITCH SECTION WITH 1-11' EB LANE, 1-11' WB LANE, 12' CENTER NB/SB TURN LANE AND 3' SHOULDERS. THERE ARE NO SUCH EXISTING FEATURES WITHIN ONE-THOUSAND FEET.
Environmental Clearance Requirements	N/A
Agreements	LOCAL ON-SYSTEM AGREEMENT FOR THE PROPOSED SIGNAL

Request Customer Information.

Banner Message		**Needs Attention**	☐
Banner History	Cindy Kurtz : 1/25/2024 Please see comments Cindy Kurtz : 4/19/2024 Please see comments Cindy Kurtz : 7/2/2024 Please see comments.	**Banner Mode**	

Permit Information

Permit Issued Date	
1058 Status	
Permit Expiration Date	
Extension Issued Date	

DocuSign Fields

c/o Account Name	c/o Schaumburg & Polk, Inc.		
DSign Phone	(281) 920-0487		
Firm Address	11767 Katy Frwy, Ste. 900, Houston, TX 77079		
Location	3920 Farm to Market 359, Richmond, TX 77406		
Created By	Joseph Schwieterman, 9/19/2023, 4:40 PM	**Last Modified By**	DP Mulesoft Integration, 10/16/2024, 7:21 AM

Files

TxDOT ROW Map HOU054302AE005 for FM 359 at McCrary.pdf

Last Modified	**10/16/2024, 7:49 AM**
Created By	**DP Mulesoft Integration**

TR23040324_FM 359 _1st Round Hydraulic Comments_05-10-2024.pdf

Last Modified	**10/16/2024, 7:49 AM**
Created By	**DP Mulesoft Integration**

TR23040324 Response to Feb 23 comments.pdf

Last Modified	**10/16/2024, 7:49 AM**
Created By	**DP Mulesoft Integration**

TR23040324 Response to comments 20240724.pdf

Last Modified	**10/16/2024, 7:49 AM**
Created By	**DP Mulesoft Integration**

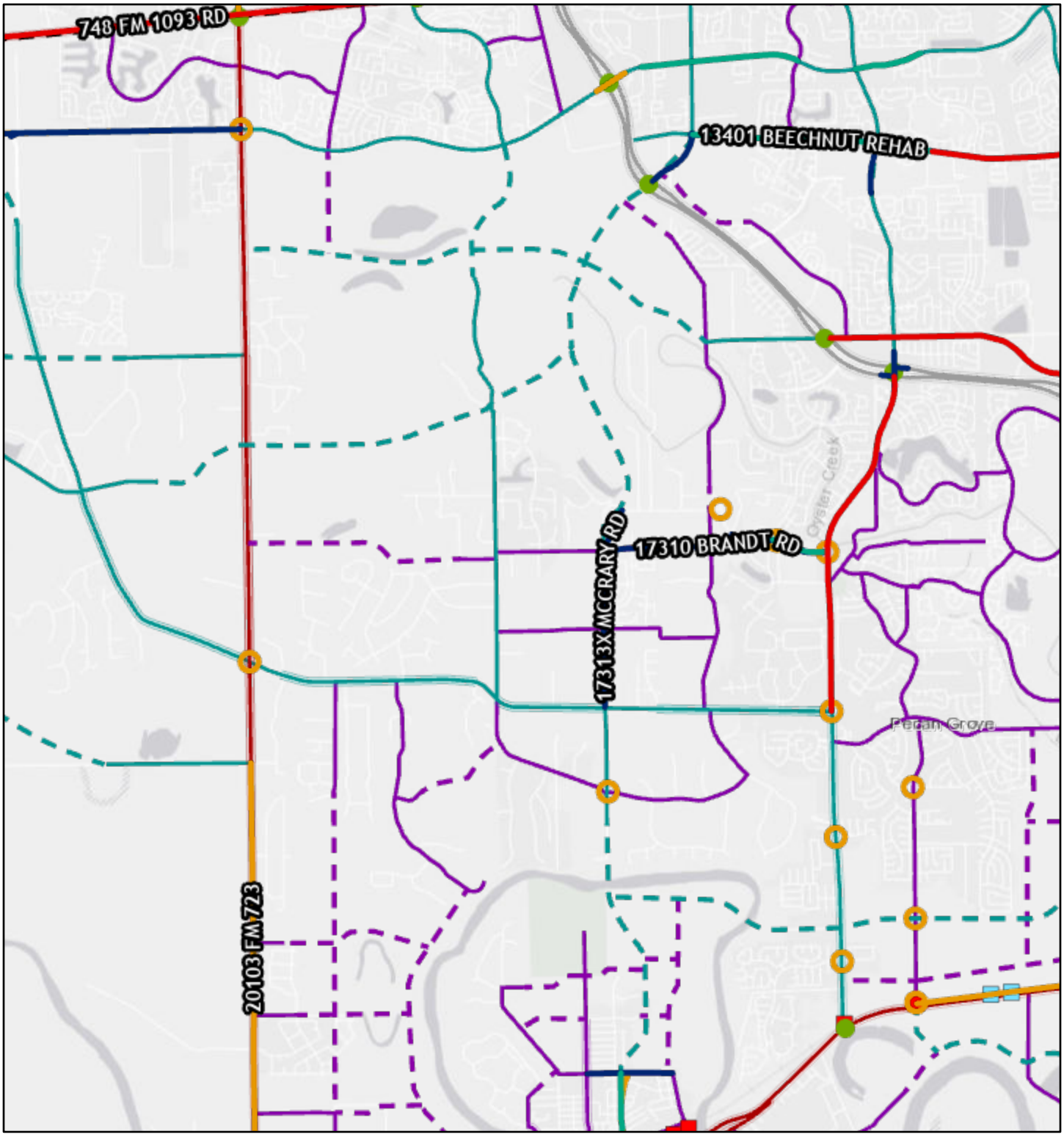
TR23040324 McCrary Signal Plans - Revised 20240308_TE Comments 7.2.24.pdf

Last Modified	**10/16/2024, 7:49 AM**
Created By	**DP Mulesoft Integration**

TR23040324 McCrary Signal Plans - Revised 20240308.pdf

Last Modified	**10/16/2024, 7:49 AM**
Created By	**DP Mulesoft Integration**

Fort Bend County Public Map



9/19/2023, 11:45:44 AM

1:72,224

0 0.5 1 2 mi

0 0.75 1.5 3 km

2020 2007

2020 2007

2017

2017 Existing Roadways

2013

2013

County Boundary

City/County Collector

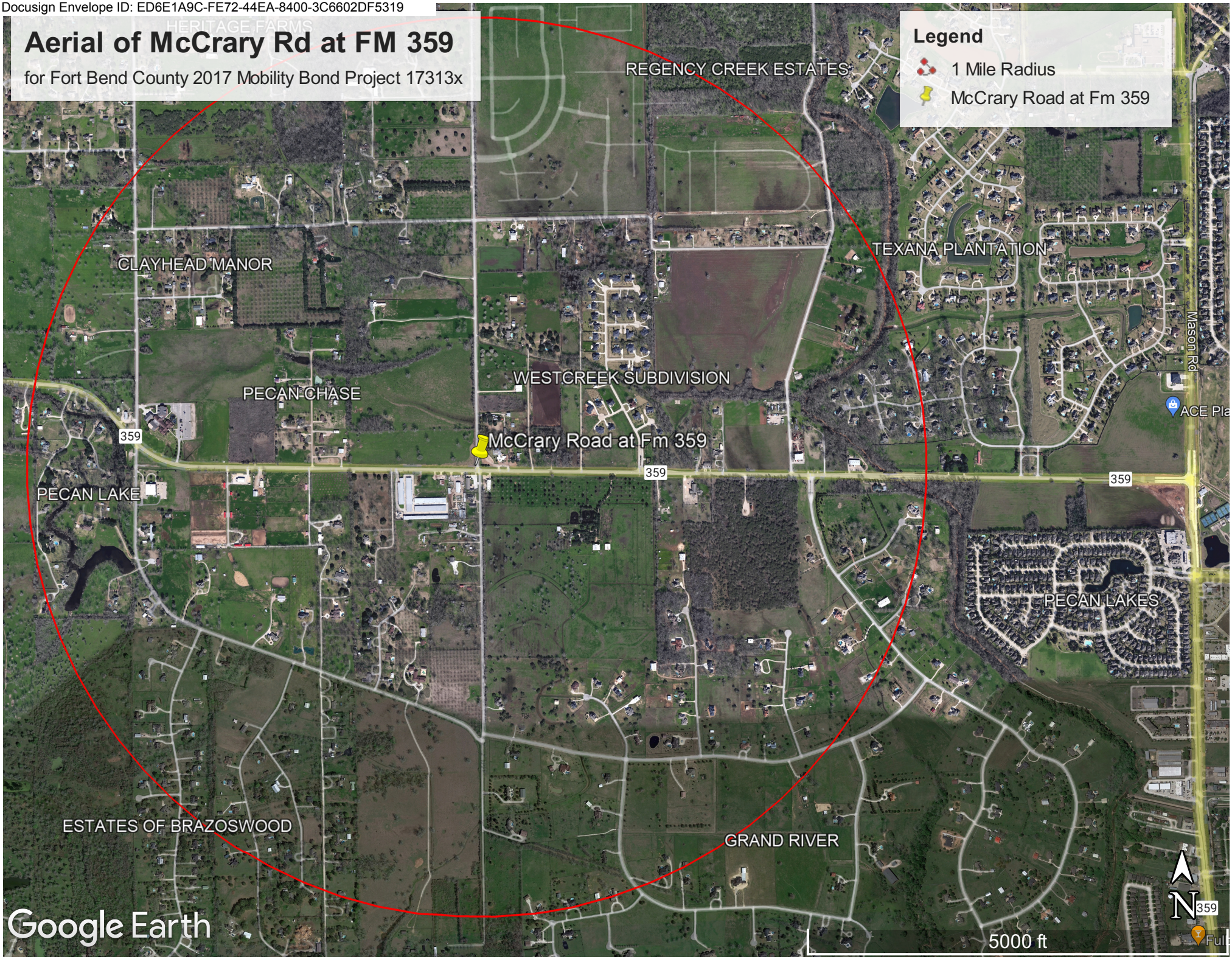
State Collector

State Controlled Access Freeway

Esri, HERE, City of Houston, HPB, Texas Parks & Wildlife, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA

Engineering GIS Division

GHC911, FBC Engineering GIS | FBC GIS | City of Houston, HPB, Texas Parks & Wildlife, Esri, HERE, Garmin, GeoTechnologies, Inc., USGS, EPA | Esri, HERE |



CSJ #	12-4LOSA002
District #	**HOU-12**
Code Chart 64 #	**50080**
Project Name	FM 359 at McCrary Road

STATE OF TEXAS §

COUNTY OF TRAVIS §

AGREEMENT
For A
LOCAL ON-SYSTEM IMPROVEMENT PROJECT

THIS AGREEMENT (Agreement) is made by and between the State of Texas, acting by and through the Texas Department of Transportation called the "State", and the **Fort Bend County**, acting by and through its duly authorized officials, called the "Local Government." The State and Local Government shall be collectively referred to as "the parties" hereinafter.

WITNESSETH

WHEREAS, the Texas Transportation Code, Section 201.103 establishes that the State shall design, construct and operate a system of highways in cooperation with local governments and Section 222.052 authorizes the Texas Transportation Commission to accept contributions from political subdivisions for development and construction of public roads and the state highway system within the political subdivision; and

WHEREAS, the Texas Transportation Commission passed Minute Order Number **116522**, authorizing the State to accept Local Government funded projects performed on the state highway system. The project covered by this Agreement includes only work within the state right of way as described in the Agreement, Article 2, Scope of Work (Project); and,

WHEREAS, the Governing Body of the Local Government has approved entering into this Agreement by resolution, ordinance, or commissioners court order dated _**December 5, 2023**, which is attached to and made a part of this Agreement as Attachment C, Resolution, Ordinance, or Commissioners Court Order (Attachment C) for the improvement covered by this Agreement. A map showing the Project location appears in Attachment A, Project Location Map (Attachment A), which is attached to and made a part of this Agreement**.**

NOW, THEREFORE, in consideration of the premises and of the mutual covenants and agreements of the parties, to be by them respectively kept and performed as set forth in this Agreement, it is agreed as follows:

AGREEMENT

1. Period of the Agreement

This Agreement becomes effective when signed by the last party whose signing makes the Agreement fully executed. This Agreement shall remain in effect until the completed Project is accepted by the State or unless terminated as provided below.

CSJ #	12-4LOSA002
District #	**HOU-12**
Code Chart 64 #	**50080**
Project Name	FM 359 at McCrary Road

2. Scope of Work

The Project consists of the construction of traffic signals from eastbound and westbound FM 359 at McCrary Road in ***Fulshear***, ***Fort Bend County,*** Texas as shown on Attachment A.

3. Local Project Sources and Uses of Funds

A. The total estimated cost of the Project is shown in Attachment B, Local On-System Improvement Project Budget (Attachment B), which is attached to and made a part of this Agreement. The estimated funds from the Local Government are shown in Attachment B. The State will pay for no Project costs performed by or managed by Local Government under this Agreement.

B. Attachment B shows how necessary resources for completing the Project will be provided by major cost categories. These categories may include but are not limited to: (1) costs of real property (right of way); (2) costs of utility work; (3) costs of environmental assessment and remediation; (4) cost of preliminary engineering and design; (5) cost of construction and construction management; and (6) any other Project costs.

C. The Local Government shall be solely responsible for all of its costs associated with the Project provided for in this Agreement. The Local Government shall be responsible for cost overruns for the Project in excess of the estimated amount to be paid by the Local Government on Attachment B. The Local Government shall also be responsible for direct and indirect costs incurred by the State related to performance of this project if so indicated on Attachment B. If the State determines that the on-system improvements are of significant operational benefit to the State, the State may waive its direct or indirect costs. The State's waiver of its direct or indirect costs shall be indicated on Attachment B by showing the State as responsible for these costs. When the Local Government is responsible for the State's direct or indirect costs, the amount indicated on Attachment B is a fixed fee and not subject to adjustment except through the execution of an amendment to this Agreement.

D. Prior to the performance of any engineering review work by the State, the Local Government shall pay to the State the amount of direct and indirect State costs specified in Attachment B.

E. Whenever funds are paid by the Local Government to the State under this Agreement, the Local Government shall remit a check or warrant made payable to the "Texas Department of Transportation" or may use the State's Automated Clearing House (ACH) system for electronic transfer of funds in accordance with instructions provided by TxDOT's Financial Management Division. The funds shall be deposited and managed by the State and are not refundable.

F. The Local Government will begin construction on the Project within 12 months after execution of the Agreement.

G. The Local Government will complete construction and receive the State's acceptance of the project within 36 months after the date the State authorizes in writing for the Local Government to commence construction of the Project.

H. If the Local Government chooses not to or fails to complete the work once construction on the Project commences, the State may terminate this Agreement in accordance with paragraph 4.C. below. The State may address unfinished construction work as it

determines necessary to protect the interests of the State, which includes returning the Project area to its original condition or completing the work using State forces or contractors. The Local Government shall pay all costs incurred by the State under this provision.

4. Termination of this Agreement

This Agreement shall remain in effect until the Project is completed and accepted by the State, unless:

A. The Agreement is terminated in writing with the mutual consent of the parties;

B. The State terminates the Agreement in writing due to the Local Government's failure to comply with paragraphs 3.F or 3.G; or

C. The Agreement is terminated by one party because of a breach, in which case any cost incurred because of the breach shall be paid by the breaching party.

5. Amendments

Amendments to this Agreement due to changes in the character of the work, terms of the Agreement, or responsibilities of the parties relating to the Project may be enacted through a mutually agreed upon, written amendment. Amendments may not include the addition of State or Federal funds. If any funds other than Local Government funds are proposed, this Agreement must be terminated and a new agreement with appropriate terms and clauses executed in its place.

6. Remedies

This Agreement shall not be considered as specifying the exclusive remedy for any Agreement default, but all remedies existing at law and in equity may be availed of by either party to this Agreement and shall be cumulative.

7. Architectural and Engineering Services

The Local Government has responsibility for the performance of architectural and engineering services. The engineering plans shall be developed in accordance with the applicable *State's Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges* and the special specifications and special provisions related to it. The Project design shall, at a minimum conform to applicable State manuals.

The State shall review the plans, specifications, and estimates provided by the Local Government upon completion or at any time deemed necessary by the State. Should the State determine that the complete plans, specifications, and estimates for the Project are not acceptable, the Local Government shall correct the design documents to the State's satisfaction. Should additional specifications or data be required by the State, the Local Government shall redesign the plans and specifications to the State's satisfaction. The costs for additional work on the plans, specifications, and estimates shall be borne by the Local Government.

8. Environmental Assessment and Mitigation

Development of a transportation project must comply with applicable environmental laws. The Local Government is responsible for:

A. The identification and assessment of any environmental problems associated with the development of the Project governed by this Agreement.
B. The cost of any environmental problem's mitigation and remediation.
C. Providing any public meetings or public hearings required for development of all required environmental documents and obtaining all required permits and approvals.
D. The preparation of documents required for the environmental clearance of the Project.

Before the advertisement for bids, the Local Government shall provide to the State written documentation from the appropriate regulatory agency or agencies that all environmental clearances and approvals have been obtained.

9. Right of Way and Real Property

The Local Government shall acquire all required right of way and necessary right of entry for performance of the Project in accordance with applicable requirements of the Texas Department of Transportation Right of Way Manual, State law, and Federal law governing the acquisition of real property including but not limited to Title II and Title III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 Title 42 U.S.C.A. Section 4601 et seq. Right of way acquired for improvements to the state highway system shall be acquired in the name of the State. Local Government shall provide right of entry to State personnel and its authorized representatives to areas off the state highway system throughout the duration of the Project for the State to perform inspection and oversight of the Project.

10. Utilities

The Local Government shall be responsible for the adjustment, removal, or relocation of utility facilities for the Project in accordance with applicable State and Federal laws, regulations, rules, policies, and procedures, including any cost to the State of a delay resulting from the Local Government's failure to ensure that utility facilities are adjusted, removed, or relocated before the scheduled beginning of construction. The Local Government will not be reimbursed for the cost of required utility work. The Local Government must obtain advance approval for any variance from established procedures.

11. Compliance with Texas Accessibility Standards and ADA

Local Government shall ensure that the plans for and the construction of the Project are in compliance with standards issued or approved by the Texas Department of Licensing and Regulation (TDLR) as meeting or consistent with minimum accessibility requirements of the Americans with Disabilities Act (P.L. 101-336) (ADA).

12. Construction Responsibilities

A. The Local Government shall advertise for construction bids, issue bid proposals, receive and tabulate the bids, and award and administer the contract for construction of the Project. Administration of the contract includes the responsibility for construction engineering and for issuance of any change orders, supplemental agreements, amendments, or additional work orders that may become necessary subsequent to the award of the construction contract. Project plans and specifications for improvements on the state highway system must be approved by the State prior to advertising for construction. Upon selection of a contractor and prior to commencing construction

within the state highway system right of way, the Local Government shall request and obtain written authorization to commence construction of the Project from the State. The Local Government will supervise and inspect all work performed hereunder and provide such engineering inspection and testing services as may be required to ensure that the construction is accomplished in accordance with the approved plans and specifications. All construction change orders impacting the proposed improvements, traffic control, environmental mitigation, or drainage on the state highway system require written pre-approval by the State prior to execution by the Local Government.

B. Upon completion of the Project, the Local Government will issue and sign a "Notification of Completion" acknowledging the Project's construction completion. A copy will be provided to the State prior to State's final acceptance of the improvements.

C. Prior to the State's acceptance of the improvements on the state highway system, Local Government shall furnish to the State written certification from a Texas Registered Professional Engineer that the Project was constructed in substantial compliance with the Project's plans, specifications, and quality assurance requirements.

13. Project Maintenance

After Local Government completion of the work and acceptance by the State, the State will be responsible for maintenance of the improvements within the state highway system right of way outside the boundaries of an incorporated city. This obligation may be fulfilled through other agreements signed by the State.

14. Notices

All notices to either party shall be delivered personally or sent by certified or U.S. mail, postage prepaid, addressed to that party at the following address:

Local Government	State
County Judge Fort Bend County 301 Jackson Street Richmond, Texas 77469	Director of Contract Services Texas Department of Transportation 125 E. 11th Street Austin, Texas 78701

All notices shall be deemed given on the date delivered in person or deposited in the mail, unless otherwise provided by this Agreement. Either party may change the above address by sending written notice of the change to the other party. Either party may request in writing that notices shall be delivered personally or by certified U.S. mail, and that request shall be carried out by the other party.

15. Legal Construction

If one or more of the provisions contained in this Agreement shall for any reason be held invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provisions and this Agreement shall be construed as if it did not contain the invalid, illegal, or unenforceable provision.

CSJ #	12-4LOSA002
District #	**HOU-12**
Code Chart 64 #	**50080**
Project Name	FM 359 at McCrary Road

16. Responsibilities of the Parties

The State and the Local Government agree that neither party is an agent, servant, or employee of the other party, and each party agrees it is responsible for its individual acts and deeds as well as the acts and deeds of its contractors, employees, representatives, and agents.

17. Ownership of Documents

Upon completion or termination of this Agreement, copies of all documents and data prepared under this Agreement by the Local Government for improvements within the state highway system right of way shall be provided to the State prior to State acceptance of the Project without restriction or limitation on their further use. The originals shall remain the property of the Local Government. At the request of the State, the Local Government shall submit any Project information required by the State in the format directed by the State.

18. Compliance with Laws

The parties shall comply with all federal, state, and local laws, statutes, ordinances, rules and regulations, and the orders and decrees of any courts or administrative bodies or tribunals in any manner affecting the performance of this Agreement. When required, the Local Government shall furnish the State with satisfactory proof of this compliance.

19. Sole Agreement

This Agreement constitutes the sole and only agreement between the parties and supersedes any prior understandings or written or oral agreements respecting the Agreement's subject matter.

20. Inspection of Books and Records

The parties to this Agreement shall maintain all books, documents, papers, accounting records, and other documentation relating to costs incurred and engineering inspection and testing services performed under this Agreement and shall make such materials available to the State and the Local Government or their duly authorized representatives for review and inspection at its office during the Agreement period and for seven (7) years from the date of completion of work defined under this Agreement or until any impending litigation or claims are resolved. Additionally, the State and the Local Government and their duly authorized representatives shall have access to all the governmental records that are directly applicable to this Agreement for the purpose of making audits, examinations, excerpts, and transcriptions.

21. Insurance

Before beginning work on the state highway system, the Local Government and its contractor performing the work shall provide the State with a fully executed copy of the State's Form 1560 Certificate of Insurance verifying the existence of coverage in the amounts and types specified on the Certificate of Insurance for all persons and entities working on state right of way. Self-insurance documentation acceptable to the State may be substituted for all or part of the coverage's required for the Local Government. This coverage shall be maintained until all work on the state right of way is complete. If coverage is not maintained, all work on state right of way shall cease immediately, and the State may recover damages and all costs of completing the work.

CSJ #	12-4LOSA002
District #	**HOU-12**
Code Chart 64 #	**50080**
Project Name	FM 359 at McCrary Road

22. Pertinent Non-Discrimination Authorities

During the performance of this Agreement, the Local Government, for itself, its assignees, and successors in interest agree to comply with all applicable Federal and State nondiscrimination statutes and authorities.

23. Signatory Warranty

Each signatory warrants that the signatory has necessary authority to execute this Agreement on behalf of the entity represented.

Each party is signing this agreement on the date stated under that party's signature.

THE STATE OF TEXAS

DocuSigned by:
Kenneth Stewart
F1CDA80FDB8C4B6...
Signature

Kenneth Stewart
Typed or Printed Name

Director of Contract Services
Typed or Printed Title

2/13/2024
Date

THE LOCAL GOVERNMENT

DocuSigned by:
KP George
1B36A26C926443B...
Signature

KP George
Typed or Printed Name

County Judge
Typed or Printed Title

2/12/2024
Date

CSJ #	12-4LOSA002
District #	**HOU-12**
Code Chart 64 #	**50080**
Project Name	FM 359 at McCrary Road

ATTACHMENT A
PROJECT LOCATION MAP

CSJ #	12-4LOSA002
District #	HOU-12
Code Chart 64 #	50080
Project Name	FM 359 at McCrary Road

ATTACHMENT B
LOCAL ON-SYSTEM IMPROVEMENT PROJECT BUDGET
(Locally Funded and Performed Project)

The Local Government is responsible for 100% of the costs allocated to it as described below, including overruns.

Description	Estimated Costs	Subtotals
PROJECT PHASES: Work performed by the Local Government or its Consultant or Contractor		
Environmental	$120.00	
Right of Way	$0	
Engineering	$55,454.57	
Utility Work	$100.00	
Construction	$352,652.46	
Subtotal for Project Phases		$408,327.03
DIRECT STATE COSTS:	**Paid By: ☐ Local Government ☒ State**	
Environmental	$120.00	
Right of Way	$200.00	
Engineering	$2,218.18	
Utility Work	$100.00	
Construction	$14,106.10	
Subtotal for Direct State Costs		$16,744.28
INDIRECT STATE COSTS:	**Paid By: ☐ Local Government ☒ State**	
Subtotal for Indirect State Costs		$770.24
TOTAL ESTIMATED COST OF PROJECT		$425,841.55

$0.00	Fixed price amount of payment by the Local Government to the State for the State's direct and indirect costs as stated in Article 3, C and D of the Agreement.

CSJ #	**12-4LOSA002**
District #	**HOU-12**
Code Chart 64 #	**50080**
Project Name	**FM 359 at McCrary Road**

ATTACHMENT C
RESOLUTION, ORDINANCE, OR COMMISSIONERS COURT ORDER

ORDER OF COMMISSIONERS COURT

The Commissioners Court of Fort Bend County, Texas, convened in regular session at a regular term of said Court, open to the public, at the Fort Bend County Courthouse in the City of Richmond, Texas, on December 5, 2023 with a quorum of said Court present:

Whereupon, among other business, the County considered the following:

AN ORDER AUTHORIZING EXECUTION OF AN AGREEMENT FOR A LOCAL ON-SYSTEM IMPROVEMENT PROJECT BETWEEN FORT BEND COUNTY AND THE STATE OF TEXAS ACTING BY AND THROUGH THE TEXAS DEPARTMENT OF TRANSPORTATION TO CONSTRUCT TRAFFIC SIGNALS FROM EASBOUND AND WESTBOUND FM 359 AT MCCRARY ROAD, FORT BEND COUNTY, TEXAS.

Commissioner Morales introduced an order and moved that Commissioners Court adopt the order. Commissioner Prestage seconded the motion for adoption of the order. The motion, carrying with it the adoption of the order, prevailed by the following vote:

	Yes	No	Abstain
Judge KP George	✓	–	–
Commissioner Vincent Morales	✓	–	–
Commissioner Grady Prestage	✓	–	–
Commissioner Andy Meyers	✓	–	–
Commissioner Dexter McCoy	✓	–	–

The County Judge thereupon announced that the motion had duly and lawfully carried and that the order had been duly and lawfully adopted. The order thus adopted follows:

IT IS ORDERED THAT:

1. The Fort Bend County Judge is authorized to execute on behalf of Fort Bend County the Agreement for a Local On-System Improvement Project between Fort Bend County and the State of Texas acting by and through the Texas Department of Transportation to construct traffic signals from eastbound and westbound FM 359 at McCrary Road, Fort Bend County, Texas. Fort Bend County will be responsible for one hundred percent of the Local Participation Cost as estimated and shown in the Advance Funding Agreement.

2. All Fort Bend County officials and employees are authorized to do any and all things necessary or convenient to accomplish the purposes of this order.

CSJ #	**12-4LOSA002**
District #	**HOU-12**
Code Chart 64 #	**50080**
Project Name	**FM 359 at McCrary Road**

ATTACHMENT C
RESOLUTION, ORDINANCE, OR COMMISSIONERS COURT ORDER

Approved by the Commissioners Court of Fort Bend County, Texas, this 5th day of December, 2023.

FORT BEND COUNTY, TEXAS

By: _____
County Judge KP George
KP George, County Judge

ATTEST:

_____
Laura Richard, County Clerk

Fort Bend County Engineering
FORT BEND COUNTY, TEXAS

J. Stacy Slawinski, P.E.
County Engineer

June 1, 2023

TxDOT Permits
7600 Washington Avenue
Houston, Texas 77007

RE: Sponsorship Letter for TxDOT Permit
FM 359 @ McCrary Road (new tie in alignment)

To Whom It May Concern:

McCrary Road is identified in the Fort Bend County Major Thoroughfare Plan to accommodate greater traffic volumes and extend south across the Brazos River. The first phase of this plan has been designing and constructing the widening of McCrary Road north of FM 359. Fort Bend County is working with the consultants Schaumburg and Polk, Inc and CivilCorp, LLC to prepare plans in accordance with TxDOT standards where required. This project proposes to align the intersection and transition to the existing McCrary Road south of FM 359. Fort Bend County commits to acquiring Right-of-Way, designing, and constructing this project prior to TxDOT's widening of FM 359. The plans have been reviewed by Fort Bend County and are ready to be submitted for a TxDOT permit.

Fort Bend County is a public governmental agency and all the work will occur within either the Fort Bend County or TxDOT Public Rights-of-Way. Therefore, no deed will be included with the above referenced application.

We appreciate TxDOT's cooperation in improving the mobility and safety of this road for our residents and motorists. Let us know if you need any additional information or have any further questions.

If you have any questions, you may contact me at (281) 633-7506.

Thank you,

Ike Akinwande, P.E.
Assistant County Engineer, Engineering Department

FORT BEND COUNTY ENGINEERING DEPARTMENT

RECONSTRUCTION & WIDENING OF MCCRARY RD SOUTH FROM FM 359 TO OLD MCCRARY RD

PROJECT NO. 17313X

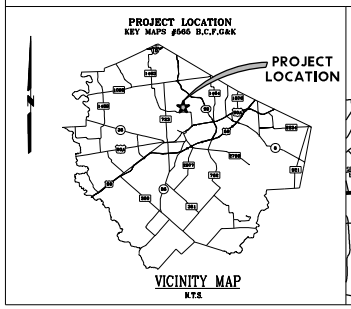
VINCENT M. MORALES, JR.
COMMISSIONER PRECINCT 1

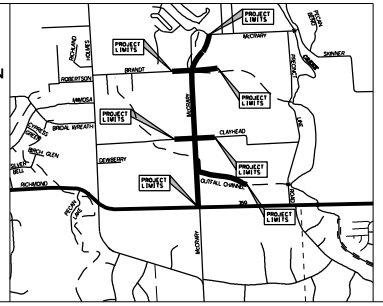
GRADY PRESTAGE
COMMISSIONER PRECINCT 2

KP GEORGE
COUNTY JUDGE

ANDY MEYERS
COMMISSIONER PRECINCT 3

DEXTER L. McCOY
COMMISSIONER PRECINCT 4





THE STATE OF TEXAS
FORT BEND COUNTY

DECEMBER 2022
PRECINCT 1
Fort Bend County, Texas

STATE OF TEXAS
JASON C. KASPAR
108672
LICENSED
PROFESSIONAL ENGINEER

12/21/2022

CivilCorp
ENGINEERS • SURVEYORS
29255 FM 1093, SUITE 74, FULSHEAR, TEXAS 77441
TEL: (832)252-8100 FAX: (832)252-8103 TXENG FIRM #10283

APPROVED: _____ 09/18/2023
COUNTY ENGINEER
J. STACY SLAWINSKI, P.E.
DATE

FBCED, STANDARD 01

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INDEX OF SHEETS

(1) ADDED DETAIL, 06/25/2024

(2) ADDED STANDARD, 07/24/2024

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED WITH A "*" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION, AND ARE APPLICABLE TO THIS PROJECT.

CivilCorp
ENGINEERS • SURVEYORS
29255 FM 1093, SUITE 7A, FULSHEAR, TEXAS 77441
TEL: (832)252-8100 FAX: (832)252-8103 TXENG FIRM #10283

STATE OF TEXAS
JASON C. KASPAR
108672
LICENSED
PROFESSIONAL ENGINEER

7/25/2024

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY RD SOUTH
FROM FM 359 TO OLD MCCRARY RD

INDEX OF SHEETS

CIVILCORP PROJECT NO. 18-2-0010	
DATE	SHEET NO.
7/25/2024	2

CONSTRUCTION

1. FORT BEND COUNTY MUST BE INVITED TO THE PRE-CONSTRUCTION MEETING.

2. CONTRACTOR SHALL NOTIFY FORT BEND COUNTY ENGINEERING DEPARTMENT 48 HOURS PRIOR TO COMMENCING CONSTRUCTION AND 48 HOUR NOTICE TO ANY CONSTRUCTION ACTIVITY WITHIN THE LIMITS OF THE PAVING AT CONSTRUCTION@FBCTX.GOV.

3. CONTRACTOR IS RESPONSIBLE FOR OETAINING ALL PERMITS REQUIRED FROM FORT BEND COUNTY PRIOR TO COMMENCING CONSTRUCTION OF ANY IMPROVEMENTS WITHIN COUNTY ROAD RIGHT OF WAYS.

4. ALL PAVING IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH FORT BEND COUNTY "RULES, REGULATIONS AND REQUIREMENTS" RELATING TO THE APPROVAL AND ACCEPTANCE OF IMPROVEMENTS IN SUBDIVISIONS AS CURRENTLY AMENDED.

5. ALL ROAD WIDTHS, CURB RADII AND CURB ALIGNMENT SHOWN INDICATES BACK OF CURB.

5. A CONTINUOUS LONGITUDINAL REINFORCING BAR SHALL BE USED IN THE CURBS.

7. ALL CONCRETE PAVEMENT SHALL BE 5½ SACK CEMENT WITH A MINIMUM COMPRESSIVE STRENGTH OF 3500 PSI AT 28 DAYS. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED AT EACH CURB RETURN AND AT A MAXIMUM SPACING OF 60 FEET.

8. ALL WEATHER ACCESS TO ALL EXISTING STREETS AND DRIVEWAYS SHALL BE MAINTAINED AT ALL TIMES.

9. 4" X 12" REINFORCED CONCRETE CURB SHALL BE PLACED IN FRONT OF SINGLE FAMILY LOTS ONLY. ALL OTHER AREAS SHALL BE 6" REINFORCED CONCRETE CURB.

10. CURB HEADERS ARE REQUIRED AT CURB CONNECTIONS TO HANDICAP RAMPS, WITH NO CONSTRUCTION JOINT WITHIN 5' OF RAMPS.

11. GUIDELINES ARE SET FORTH IN THE TEXAS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", AS CURRENTLY AMENDED, SHALL BE OBSERVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE FLAGMEN, SIGNING, STRIPING AND WARNING DEVICES, ETC., DURING CONSTRUCTION – BOTH DAY AND NIGHT.

12. ALL R1-1 STOP SIGNS SHALL BE A MINIMUM OF 36"X36" WITH DIAMOND GRADE SHEETING PER TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

13. STREET NAME SIGNAGE SHALL BE ON A 9" HIGH SIGN FLAT BLADE W/REFLECTIVE GREEN BACKGROUND. STREET NAMES SHALL BE UPPER AND LOWERCASE LETTERING WITH UPPERCASE LETTERS OF 6" MINIMUM AND LOWERCASE LETTERS OF 4.5" MINIMUM. THE LETTERS SHALL BE REFLECTIVE WHITE. STREET NAME SIGNS SHALL BE MOUNTED ON STOP SIGN POST.

14. A BLUE DOUBLE REFLECTORIZED BUTTON SHALL BE PLACED AT ALL FIRE HYDRANT LOCATIONS. THE BUTTON SHALL BE PLACED 12 INCHES OFF OF THE CENTERLINE OF THE STREET ON THE SAME SIDE AS THE HYDRANT.

15. THE PROJECT AND ALL PARTS THEREOF SHALL BE SUBJECT TO INSPECTION FROM TIME TO TIME BY INSPECTORS DESIGNATED BY FORT BEND COUNTY. NO SUCH INSPECTIONS SHALL RELIEVE THE CONTRACTOR OF ANY OF ITS OBLIGATIONS HEREUNDER. NEITHER FAILURE TO INSPECT NOR FAILURE TO DISCOVER OR REJECT ANY OF THE WORK AS NOT IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS. REQUIREMENTS AND SPECIFICATIONS OF FORT BEND COUNTY OR ANY PROVISION OF THIS PROJECT SHALL BE CONSTRUED TO IMPLY AN ACCEPTANCE OF SUCH WORK OR TO RELIEVE THE CONTRACTOR OF ANY OF ITS OBLIGATIONS HEREUNDER.

16. STABILIZED SUBGRADE: DETERMINE THE THICKNESS OF THE STABILIZED SUBGRADE AFTER CURING AND COMPACTION. IF THE SUBGRADE DEPTH IS GREATER THAN THE PROPOSED THICKNESS BY 20% OR MORE, THE GWT LAB MUST PROVIDE VERIFICATION THE PERCENTAGE OF MATERIAL BEING USED TO STABILIZE THE SUBGRADE MEETS OR EXCEEDS PROJECT REQUIREMENTS. TEST RESULTS REQUIRED.

17. WHERE RCP STORM SEWER IS CALLED OUT IN THE PLANS, POLYPROPYLENE PIPE MEETING THE REQUIREMENTS OF ITEM 466 (INCLUDED IN PROJECT MANUAL) WILL BE AN APPROVED ALTERNATIVE.

NOTE: FORT BEND COUNTY NOTES SUPERSEDE ANY CONFLICTING NOTES.

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	2-1-22	RJS
2			
3			
4			
5			

FORT BEND COUNTY
ENGINEERING DEPARTMENT

THE STATE OF TEXAS · FORT BEND COUNTY

PROJECT TITLE:

DRAWN BY: INIT		FBCED STANDARD
CK'D BY: INIT	SHEET DESCRIPTION: CONSTRUCTION GENERAL NOTES	02
SCALE: NONE		SHEET NO:
DATE: 2-1-22	APPROVED BY:	3

J:\1704\1601\Fort Bend County Standards\Fort Bend County STD\FBC GENERAL NOTES\FORT BEND CO GENERAL NOTES.dwg

GENERAL

1. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS BEFORE BEGINNING CONSTRUCTION.
2. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SECURITY TO PROTECT THE PROJECT SITE, CONTRACTOR PROPERTY, EQUIPMENT, AND WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING STREETS OF CONSTRUCTION DIRT AND DEBRIS AT CLOSE OF EACH WORK DAY.
4. THE CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF THE JOB SHALL BE AS GOOD AS OR BETTER THAN PRIOR TO STARTING WORK.
5. PRIOR TO CONSTRUCTION, THE CONTRACTOR, ALONG WITH CONCURRENCE FROM THE FIELD ENGINEER, SHALL DETERMINE HIS/HER LAY-DOWN AND/OR STAGING AREA LOCATIONS.
6. THE CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS A MINIMUM OF 24 HOURS PRIOR TO BLOCKING DRIVEWAYS OR ENTERING UTILITY EASEMENTS.
7. TRAFFIC INGRESS AND EGRESS FOR DRIVEWAYS AND PEDESTRIAN ACCESS FACILITIES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION WITH ALL WEATHER SURFACES.
8. THE CONTRACTOR SHALL REMOVE ANY FENCES, POSTS, MAILBOXES, PLANTERS, PERMANENT TRASH CONTAINERS, CULVERTS, ETC. OR SECTIONS THEREOF, THAT ENCROACH WITHIN THE COUNTY'S RIGHT-OF-WAY. NOTE: PRIOR TO CONSTRUCTION, THE PROPERTY OWNER WAS PAID TO RELOCATE OR REPLACE THESE ITEMS OUTSIDE OF THE COUNTY'S RIGHT-OF-WAY. IF THE OWNER HAS FAILED TO DO SO, THE CONTRACTOR WILL REPLACE THEM WITH THE MINIMUM LEVEL OF QUALITY NEEDED TO SECURE THE PROPERTY AND/OR MAINTAIN MAIL DELIVERY. IN THAT CASE, PAYMENT FOR THESE INSTALLATIONS WILL BE INCLUDED AS EXTRA WORK ITEMS OR AS OVERRUNS TO EXISTING PAY ITEMS.

   ANY DAMAGE CAUSED BY THE CONTRACTOR TO SUCH ITEMS LOCATED OUTSIDE OF THE COUNTY'S RIGHT-OF-WAY, SHALL BE REPLACED WITH LIKE-KIND OR BETTER AT THE CONTRACTOR'S EXPENSE.

   ALSO, IF THESE ITEMS ARE LOCATED WITHIN THE PROJECT RIGHT-OF-WAY AND ARE DESIGNATED TO REMAIN, ANY DAMAGE CAUSED BY THE CONTRACTOR TO SUCH ITEMS, SHALL BE REPLACED WITH LIKE-KIND OR BETTER AT THE CONTRACTOR'S EXPENSE.

   TREES, BUSHES, SHRUBBERY AND OTHER DAMAGED PLANTINGS DESIGNATED TO REMAIN SHALL BE REPLACED WITHIN 72 HOURS OF REMOVAL AND ARE TO BE THOROUGHLY WATERED-IN. NO SEPARATE PAY.
9. PAVED SURFACES, PAVEMENT MARKERS AND MARKINGS SHALL BE PROTECTED FROM DAMAGE BY TRACKED EQUIPMENT.
10. IRON RODS DISTURBED DURING CONSTRUCTION ARE TO BE REPLACED BY A REGISTERED PROFESSIONAL LAND SURVEYOR FOR THE ORIGINAL PROPERTY OWNER AT NO SEPARATE PAY.
11. CONSTRUCTION STAKING WILL BE PROVIDED BY THE CONTRACTOR. TWO COPIES OF STAKING NOTES TO BE PROVIDED TO THE ENGINEER PRIOR TO CONSTRUCTION.
12. THE COUNTY OR THE COUNTY'S SURVEYOR SHALL PROVIDE A BENCHMARK OR TEMPORARY BENCHMARK AND SURVEY CONTROLS.
13. THE CONTRACTOR SHALL MAINTAIN UPDATED RED-LINED RECORD DRAWINGS ON SITE FOR INSPECTION BY THE ENGINEER.
14. MOWING, MAINTENANCE AND CLEAN-UP OF THE PROJECT SHALL MEET THE REQUIREMENT OF SPECIFICATION ITEM 560 (NO SEPARATE PAY). MOWING, MAINTENANCE, AND CLEAN-UP IS REQUIRED FOR THE PROJECT LIMITS AND DURATION, REGARDLESS OF THE CONTRACTOR'S SCOPE OF ACTIVITIES WITHIN THE PROJECT LIMITS.
15. THE REMOVAL OF ANY ABANDONED UTILITIES REQUIRED TO COMPLETE THE WORK SHALL BE INCIDENTAL AND NO SEPARATE PAYMENT SHALL BE MADE.
16. IT IS THE CONTRACTOR'S RESPONSIBILITY TO STOCKPILE NECESSARY MATERIAL ON-SITE OR AT A SECURED OFF-STE LOCATION AT NO ADDITIONAL EXPENSE TO FORT BEND COUNTY. ANY SUITABLE EXCAVATED MATERIAL ON THE PROJECT WHICH IS AVAILABLE AT THE TIME OF NEED; WHETHER FROM STORM SEWER, ROADWAY, AND/OR CHANNEL EXCAVATION, SHALL BE USED BEFORE BORROW IS BROUGHT ON-SITE.
17. MANHOLES, JUNCTION BOXES, INLETS, AND RISERS ARE TO BE PRE-CAST OR CAST IN PLACE.
18. THE FOLLOWING DETAILS ARE MINIMUM REQUIREMENTS AND MAY BE SUPERSEDED BY GEOTECHNICAL ENGINEER RECOMMENDATIONS OR MORE STRINGENT REQUIREMENTS FROM THE CITY'S ETJ PROJECT IS WITHIN.
19. POP UP DRAINS ARE NOT ALLOWED IN FORT BEND COUNTY RIGHT OF WAY.

TRAFFIC SIGNAL

1. ALL ITEMS RELATING TO THE CONSTRUCTION OF TRAFFIC SIGNAL INSTALLATIONS, EXCEPT FOR PUNCHLIST ITEMS, SHALL BE COMPLETED PRIOR TO THE ACTIVATION OF THE SIGNAL SYSTEM(S), UNLESS OTHERWISE REQUIRED BY THE CONTRACT.
2. THE CONTRACTOR SHALL MEET WITH THE FORT BEND COUNTY TRAFFIC SIGNAL MAINTENANCE GROUPS FIELD INSPECTOR, HEREAFTER REFERRED TO AS THE TRAFFIC INSPECTOR ONE-WEEK PRIOR TO THE DESIRED ACTIVATION OF ANY NEW TRAFFIC SIGNALS. THE CONTRACTOR SHALL OBTAIN VERBAL CONCURRENCE FROM THE TRAFFIC INSPECTOR THAT ADEQUATE PROGRESS HAS BEEN ACHIEVED AND THAT ADEQUATE PREPARATIONS ARE IN PLACE TO SCHEDULE A PRE-"TURN ON" WALK-THROUGH INSPECTION MEETING. IF IN THE OPINION OF THE TRAFFIC INSPECTOR, REQUIRED PROGRESS AND ADEQUATE PREPARATIONS ARE NOT COMPLETE, THE PRE-"TURN ON' WALK-THROUGH INSPECTION MEETING WILL BE POSTPONED TO ALLOW ADEQUATE TIME FOR INCOMPLETE CONSTRUCTION ITEMS AND PREPARATIONS TO BE COMPLETED. AFTER THE CONTRACTOR HAS COMPLETED ALL INCOMPLETE ITEMS AND PREPARATIONS, THE CONTRACTOR SHALL REQUEST THE TRAFFIC INSPECTOR REVIEW AND APPROVE ITEMS PREVIOUSLY IDENTIFIED. IF, IN THE OPINION OF THE TRAFFIC INSPECTOR, ALL ITEMS HAVE BEEN ADDRESSED SATISFACTORILY, THE DATE OF THE PRE-"TURN ON" WALK-THROUGH INSPECTION SHALL BE ESTABLISHED. TIME EXTENSIONS TO THE CONTRACT TIME WILL NOT BE GRANTED FOR DELAYS CAUSED BY INCOMPLETE CONSTRUCTION OR INADEQUATE CONTRACTOR PREPARATIONS REQUIRED TO COMPLETE TRAFFIC SIGNAL SYSTEM WITHIN THE TIMEFRAME SET FORTH IN THE CONTRACT.
3. PRIOR TO ACTIVATING A NEW TRAFFIC SIGNAL, THE CONTRACTOR SHALL REQUEST A PRE-TURN ON WALK-THROUGH INSPECTION MEETING, IN ACCORDANCE WITH ITEM 2. THE PURPOSE OF THE MEETING WILL BE TO ESTABLISH THAT THE TRAFFIC SIGNAL SYSTEM HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT, AND IN A MANNER THAT DOES NOT ADVERSELY IMPACT PUBLIC SAFETY. THIS MEETING SHALL BE ATTENDED BY THE TRAFFIC INSPECTOR THE ENGINEER OF RECORD, AND THE CONTRACTOR. AS A MINIMUM, ANY DEFICIENCIES THAT ADVERSELY IMPACT PUBLIC SAFETY WILL BE IDENTIFIED FOR CORRECTION PRIOR TO ESTABLISHING THE "TURN ON" DATE FOR THE TRAFFIC SIGNAL SYSTEM. ITEMS THAT HAVE AN IMPACT ON PUBLIC SAFETY INCLUDE, BUT ARE NOT LIMITED TO: PAVEMENT MARKINGS AND SIGNAGE, PROPER AND ACCEPTABLE BONDING OF EARTH GROUNDS, PROPERLY ALIGNED TRAFFIC SIGNALS, FULLY OPERATIONAL VEHICULAR AND PEDESTRIAN DETECTION, COMPLETED CABINET-TO-FIELD WIRING, AND PROPERLY TERMINATED ELECTRICAL SERVICE CONDUCTORS. FAILURE TO ADDRESS THE PUNCHLIST TEMS IDENTIFIED AS BEING CRITICAL TO PUBLIC SAFETY PRIOR TO THE PRE-TURN ON WALK-THROUGH MEETING WILL RESULT IN THE "TURN ON" BEING POSTPONED TO ALLOW ADEQUATE TIME FOR THE INCOMPLETE ITEMS TO BE COMPLETED. AT SUCH TIME AS MEETING ATTENDEES AGREE THAT THE TRAFFIC SIGNAL HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT, AND THAT THE TRAFFIC SIGNAL, AS IT EXISTS, IS NOT A THREAT TO PUBLIC SAFETY, A "TURN ON" DATE WILL BE ESTABLISHED.
4. THE CONTRACTOR SHALL HAVE 10 DAYS FROM THE DATE THE TRAFFIC SIGNAL SYSTEM IS TURNED ON TO COMPLETE ANY PUNCHLIST ITEMS IDENTIFIED AT THE PRE-"TURN ON" WALK-THROUGH MEETING OR AT THE TIME THE SIGNAL SYSTEM IS ACTIVATED THAT ARE NOT OTHERWISE ADDRESSED PRIOR TO ACTIVATION OF THE TRAFFIC SIGNAL SYSTEM.
5. THE CONTRACTOR'S ATTENTION IS DIRECTED TO STANDARD SPECIFICATION ITEM 1000 TRAFFIC SIGNAL INSTALLATION AND MODIFICATION, WHICH INCLUDES PROCEDURES AND REQUIREMENTS REGARDING ACTIVATION OF TRAFFIC SIGNAL CONTROL SYSTEMS. THE PROJECT MANUAL MAY INCLUDE SPECIAL SPECIFICATIONS AND/OR SPECIAL PROVISIONS RELATED TO PROPOSED TRAFFIC CONTROL SIGNAL SYSTEM INSTALLATION(S) AND MODIFICATION(S) REQUIRING THE CONTRACTOR'S ADHERENCE TO DEFINED CHECKLISTS, PROCEDURES AND/OR REPORTS AT NO ADDITIONAL COST TO THE COUNTY BEYOND THE ESTABLISHED BID ITEMS OF THE CONTRACT.
6. ALL SIGNAL ALTERATIONS MUST BE APPROVED AND COORDINATED THROUGH FBC ENGINEERING AND ROAD & BRIDGE.

TRAFFIC CONTROL

1. THE CONTRACTOR SHALL PROVIDE AND INSTALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH PART VI OF THE MOST RECENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND THE APPROVED TRAFFIC CONTROL PLAN.
2. THE CONTRACTOR SHALL MAINTAIN AT LEAST ONE LANE OF TRAFFIC IN EACH DIRECTION DURING WORKING HOURS EXCEPT DURING FLAGGING OPERATION
3. LANE CLOSURES SHALL BE DURING OFF-PEAK HOURS ONLY (MONDAY THROUGH FRIDAY 9 A.M. TO 4 P.M.) UNIFORMED PEACE OFFICERS OR FLAGGERS IN RADIO CONTACT ARE REQUIRED TO DIRECT TRAFFIC DURING LANE CLOSURES.
4. DETOURS REQUIRE PRIOR APPROVAL OF THE FIELD ENGINEER AND PRECINCT. DETOUR PLANS, IF ALLOWED, MUST INCLUDE APPROPRIATE DETOUR SIGNAGE, PUBLIC NOTICE VIA SIGNAGE TWO WEEKS IN ADVANCE STATING THE DATES OF THE AGREED UPON DATE OF CLOSURE AND DATE THE ROAD WILL RE-OPEN TO TRAFFIC. CONTRACTOR TO USE (WITH PRIOR APPROVAL OF THE FIELD ENGINEER) HIGH EARLY STRENGTH CONCRETE AND OTHER RELATED CONSTRUCTION METHODS TO MINIMIZE THE DURATION OF THE DETOUR AND TO ENSURE THAT THE ROADWAY IS OPEN ON, OR PRIOR TO, THE AGREED UPON DATE.
5. ONE DAY PRIOR TO THE IMPLEMENTATION OF A TRAFFIC CONTROL PLAN PHASE OR STEP, OR THE IMPLEMENTATION OF AN ADDITIONAL, REVISED, OR NEW TRAFFIC CONTROL ELEMENT, THE CONTRACTOR SHALL MEET WITH THE ENGINEER TO GIVE A DETAILED DESCRIPTION OF THE CONTRACTOR'S PLAN AND PREPARATIONS. THE CONTRACTOR SHALL OBTAIN WRITTEN CONCURRENCE FROM THE ENGINEER THAT ADEQUATE PROJECT PROGRESS HAS BEEN ACHIEVED AND THAT ADEQUATE PREPARATIONS ARE IN PLACE PRIOR TO SWITCHING TRAFFIC. IF, IN THE OPINION OF THE ENGINEER, REQUIRED PROGRESS AND ADEQUATE PREPARATIONS ARE NOT COMPLETE, THE CONTRACTOR SHALL NOT IMPLEMENT THE NEXT PHASE, STEP, OR ELEMENT OF TRAFFIC CONTROL UNTIL INCOMPLETE CONSTRUCTION ITEMS OR PREPARATIONS ARE COMPLETED. TIME EXTENSIONS WILL NOT BE GRANTED FOR DELAYS CAUSED BY THE INCOMPLETE CONSTRUCTION ITEMS OR INADEQUATE CONTRACTOR PREPARATIONS REQUIRED TO IMPLEMENT TRAFFIC CONTROL.
6. TRAFFIC CONTROL PER THE CONTRACT IS REQUIRED FOR THE ENTIRE DURATION OF THE PROJECT, INCLUDING THE PUNCHLIST PERIOD. PAYMENT FOR TRAFFIC CONTROL THAT IS PROPERLY INSTALLED FOR LESS THAN A FULL MONTH SHALL BE BASED ON A PERCENTAGE BASIS OF THE TIME INSTALLED. TRAFFIC CONTROL PAYMENTS TO THE CONTRACTOR SHALL END 10 DAYS AFTER SUBSTANTIAL COMPLETION, ALTHOUGH PROPER TRAFFIC CONTROL MUST BE MAINTAINED UNTIL PUNCHLIST COMPLETION.
7. THE PURPOSE OF THE CONSTRUCTION SEQUENCE AND TRAFFIC HANDLING OUTLINED HEREIN IS TO DOCUMENT A VIABLE TCP THAT CAN BE UTILIZED TO CONSTRUCT THE PROJECT. IT IS THE BASIS OF ESTIMATION FOR THE TRAFFIC CONTROL BID ITEMS, AND IS TO BE UTILIZED AND IMPLEMENTED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
   IF THE CONTRACTOR CHOOSES TO USE A DIFFERENT TCP, HE/SHE SHALL PREPARE AND SUBMIT THE ALTERNATIVE TCP TO THE COUNTY FOR APPROVAL NO LESS THAN 10 WORKING DAYS PRIOR TO THE PROPOSED IMPLEMENTATION DATE. THE TCP SHALL BE DRAWN TO SCALE AND SIGNED & SEALED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS. UPON APPROVAL BY FORT BEND COUNTY, THE ALTERNATIVE PLAN SHALL BECOME THE BASIS FOR A "CHANGE IN CONTRACT" TO REVISE THE TRAFFIC CONTROL BID ITEMS ACCORDINGLY AND BECOME PART OF THE CONTRACT DOCUMENTS.
8. ALL TEMPORARY PAVEMENT MARKINGS ON PERMANENT PAVEMENT SHOULD BE RPMS OR TABS.
9. TRAFFIC PATTERN CHANGES REQUIRE CHANGEABLE MESSAGE BOARDS PLACED AT LEAST 2 WEEKS IN ADVANCE OF PROPOSED CHANGE. QUANTITY, PLACEMENT AND WORDING TBD BY FBC.

NO.	REVISIONS	DATE	NAME
1	ORIGINAL STANDARD ISSUED	2-1-22	RJS
2			
3			
4			
5			

FORT BEND COUNTY
ENGINEERING DEPARTMENT

THE STATE OF TEXAS FORT BEND COUNTY

PROJECT TITLE:

DRAWN BY: INIT		FBCED STANDARD
CK'D BY: INIT	SHEET DESCRIPTION: PUBLIC WORKS AND SUBDIVISION	03
SCALE: NONE	GENERAL NOTES	SHEET NO: 4
DATE: 2-1-22	APPROVED BY:	

J:\1704\1601\Fort Bend County Standards\Fort Bend County STD\FBC GENERAL NOTES\FORT BEND CO GENERAL NOTES.dwg

UTILITIES

1. THE APPROXIMATE LOCATIONS OF KNOWN EXISTING UNDERGROUND UTILITIES ARE SHOWN ON THE PLANS. THE CONTRACTOR SHALL DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATIONS IN THE FIELD PRIOR TO COMMENCING WORK.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING UTILITIES AND OTHER FACILITIES. THE CONTRACTOR SHALL VERIFY IN THE FIELD THE EXACT LOCATIONS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY TEXAS ONE CALL AT 1-800-545-6005 AT LEAST 48 HOURS PRIOR TO PROCEEDING WITH ANY EXCAVATION.
3. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING UTILITIES DURING CONSTRUCITON. ALL DAMAGES SHALL BE REPAIRED IN ACCORDANCE WITH THE APPLICABLE STANDARDS AT THE CONTRACTOR'S EXPENSE.
4. THE FOLLOWING ARE KNOWN TO OWN AND/OR OPERATE PUBLIC UTILITIES OR PIPELINES WITHIN THE EXISTING AND PROPOSED RIGHT OF WAY AND SHALL BE CONTACTED 48 HOURS PRIOR TO ANY WORK THAT MAY INTERFERE WITH OR DAMAGE PRESENT FACILITIES:

CENTERPOINT ENERGY (GAS)

CAUTION: UNDERGROUND GAS FACILITIES

LOCATIONS OF CENTERPOINT ENERGY MAIN LINES (TO INCLUDE CENTERPOINT ENERGY, INTRASTATE PIPELINE, LLC. WHERE APPLICABLE) ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION. IT DOES NOT IMPLY THAT A CONFLICT ANALYSIS HAS BEEN MADE. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 1-800-545-6005 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

* WHEN CENTERPOINT ENERGY PIPE LINE MARKING ARE NOT VISIBLE, CALL (713) 945-8032 OR (713) 945-8037 (7:00 AM TO 4:30 PM) FOR STATUS OF THE LOCATION REQUEST BEFORE EXCAVATION BEGINS.
* WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES.
* WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.
* FOR EMERGENCIES REGARDING GAS LINES CALL 713-659-3552 OR 713-207-4200.

THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

CENTERPOINT ENERGY (ELECTRIC)

WARNING: OVERHEAD ELECTRICAL LINES

OVERHEAD LINES MAY EXIST ON THE PROPERTY. THE LOCATION OF OVERHEAD LINES HAS NOT BEEN SHOWN ON THESE DRAWINGS AS THE LINES ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY:

* ANY ACTIVITY WHERE PERSON OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND
* OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN 10 FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES.

PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR THE LINES TO BE TURNED OFF OR REMOVED CALL CENTERPOINT ENERGY AT 713-207-2222.

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY

NO APPROVAL TO USE, CROSS OR OCCUPY CENTERPOINT FEE OR EASEMENT PROPERTY IS GIVEN. IF YOU NEED TO USE CENTERPOINT PROPERTY, PLEASE CONTACT OUR SURVEYING & RIGHT-OF-WAY DIVISION AT 713-207-6348 OR 713-207-5769.

AT&T TEXAS/SWBT FACILITIES

1. THE LOCATIONS OF AT&T TEXAS/SWBT FACILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND UTILITIES.
2. THE CONTRACTOR SHALL CALL 1-800-344-8377 (TEXAS 811) A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.
3. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF AT&T TEXAS/SWBT FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING, THE CONTRACTOR SHALL EXPOSE THE AT&T TEXAS/SWBT FACILITIES.
4. WHEN AT&T TEXAS/SWBT FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.
5. THE PRESENCE OR ABSENCE OF AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES OR BURIED CABLE FACILITIES SHOWN ON THESE PLANS DOES NOT MEAN THAT THERE ARE NO DIRECT BURIED CABLES OR OTHER CABLES IN CONDUIT IN THE AREA.
6. PLEASE CONTACT THE AT&T TEXAS DAMAGE PREVENTION MANAGER ROOSEVELT LEE JR. AT 713-567-4552 OR E-MAIL HIM AT RL7259@ATT.COM, IF THERE ARE QUESTIONS ABOUT BORING OR EXCAVATING NEAR OUR AT&T TEXAS/SWBT FACILITIES.

COMCAST

CONTACT MS. MARGIE BLACKWELL AT (713) 341-8676 BEFORE PROCEEDING WITH CONSTRUCTION WORK IN THE VICINITY OF COMCAST FACILITIES.

HOUSTON PIPELINE COMPANY (ENERGY TRANSFER)

1. THE PARTY REQUESTING SUCH CROSSING SHALL USE ITS BEST EFFORTS TO PROVIDE ET WITH ITS FINALIZED PLANS AND PROFILE DRAWINGS AT LEAST THIRTY DAYS (30) DAYS PRIOR TO ANY RELATED CONSTRUCTION OR MAINTENANCE ACTIVITY. THE PIPELINE FACILITY SHALL INCLUDE, BUT IS NOT LIMITED TO, RIGHTS-OF-WAY, FEE PROPERTIES, EASEMENTS, PIPELINES, METER AND REGULATOR BUILDINGS AND VALVE SITES ("ET PIPELINE FACILITY" OR "FACILITIES"). UNLESS OTHERWISE AGREED TO BY ET IN WRITING, NO EQUIPMENT SHALL ENTER ONTO ET'S PIPELINE FACILITY UNLESS AN ET REPRESENTATIVE IS ON LOCATION.
2. NO EXCAVATION SHALL OCCUR IN THE VICINITY OF ET'S PIPELINE FACILITY UNTIL:

A. IN ACCORDANCE WITH THE STATE APPROVED NOTIFICATION CENTERS, ET SHALL BE NOTIFIED AT LEAST 48 HOURS IN ADVANCE OF ANY CONSTRUCTION OR MAINTENANCE ACTIVITY. YOU MUST CONTACT THE STATE APPROVED NOTIFICATION CENTER AT 811. BEFORE COMMENCING ANY CROSSING AT OR NEAR ET'S PIPELINE FACILITY YOU MUST ALSO CONTACT ET'S FIELD REPRESENTATIVE(S);

KORY PARTON AT (281)850-1417, KORY.PARTON@ENERGYTRANSFER.COM

B. UNLESS OTHERWISE AGREED TO BY ET IN WRITING, AN ET INSPECTOR IS ON SITE TO MONITOR THE EXCAVATION ACTIVITIES.

CivilCorp
ENGINEERS • SURVEYORS
29255 FM 1093, SUITE 7A, FULSHEAR, TEXAS 77441
TEL: (832)252-8100 FAX: (832)252-8103 TXENG FIRM #10283

STATE OF TEXAS
JASON C. KASPAR
108672
LICENSED PROFESSIONAL ENGINEER
11/3/2022

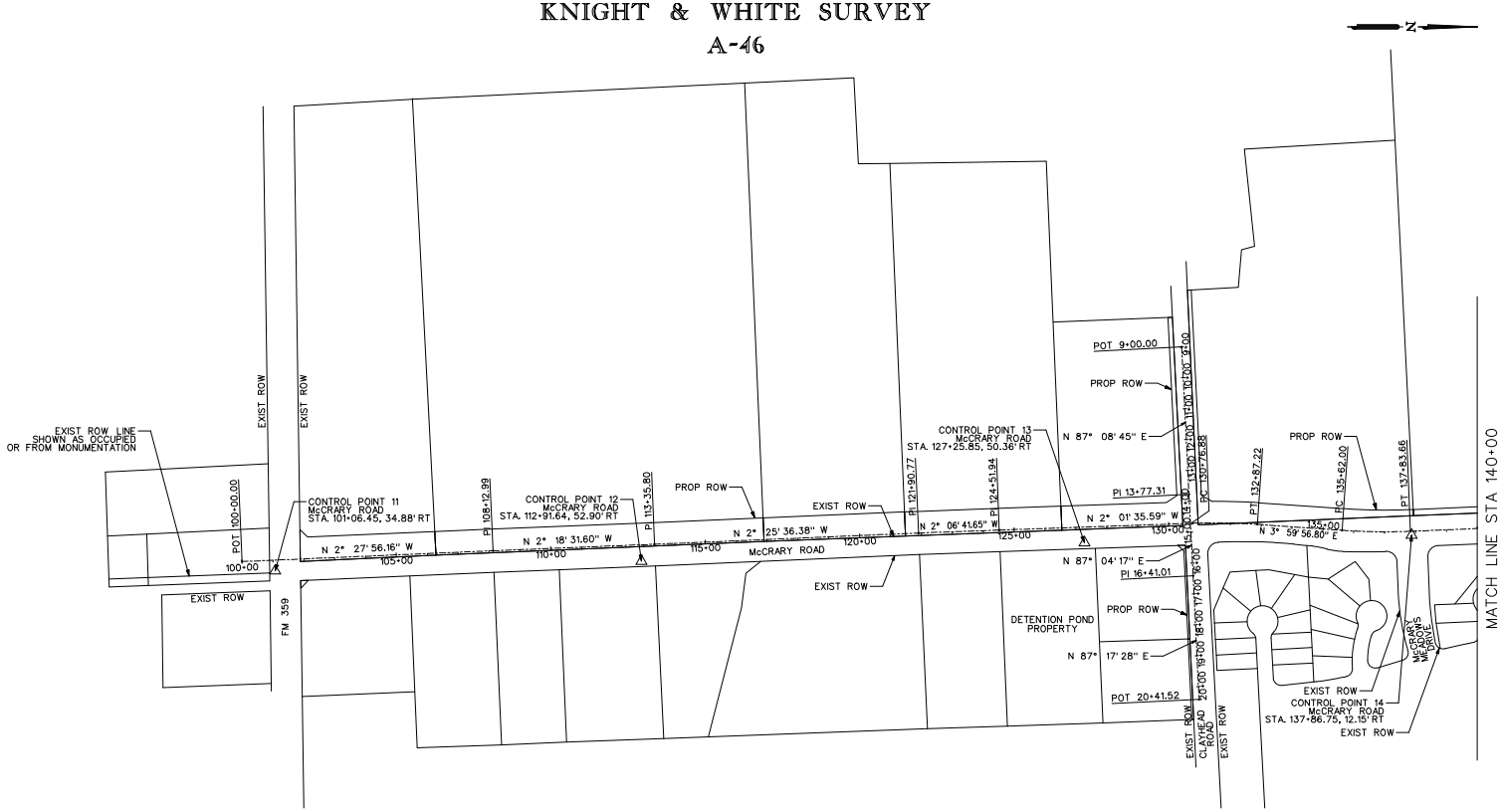
FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY RD SOUTH
FROM FM 359 TO OLD MCCRARY RD

UTILITIES
GENERAL NOTES

CIVILCORP PROJECT NO. 18-2-0010	
DATE	SHEET NO.
11/3/2022	5

KNIGHT & WHITE SURVEY
A-46



NOTES:

1. ALL COORDINATES AND BEARINGS SHOWN ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), (NAD83 CORS, 2011 ADJUSTMENT, EPOCH 2010.00). ALL COORDINATES AND DISTANCES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.00012.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, 2001) FBC LIDAR DATUM.

PROJECT BENCHMARK:
NGS BENCHMARK DESIGNATION: HGCSD 66, P.I.D. NO. AW5411
BENCHMARK IRON ROD LOCATED 4.6 MILES SOUTH ALONG PIN OAK ROAD FROM THE JUNCTION OF US HIGHWAY 90 IN KATY, THENCE 0.10 MI SOUTH ALONG FM ROAD 1463, 68.0 FT EAST OF THE CENTERLINE OF THE ROAD, 24.0 FT SOUTH OF THE CENTER OF A GRAVEL ROAD TO A FARM, 19.0 FT SOUTHEAST OF THE SOUTH POST OF A WOOD GATE. NOTE--ACCESS TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP. THE MARK IS ABOVE LEVEL WITH THE ROAD.
ELEV. = 136.60

3. ACCORDING TO FIRM MAP NUMBER 48157C0120L FOR HARRIS COUNTY, TEXAS, AND INCORPORATED AREAS (MAP REVISED APRIL 02, 2014) THE TRACTS OF LAND SHOWN ON THIS MAP ARE SITUATED IN THE FOLLOWING FLOOD ZONES:

ZONE A AND ZONE AE AREAS DETERMINED TO BE INSIDE THE 1% ANNUAL CHANCE FLOODPLAIN.

SHADED ZONE X AREAS DETERMINED TO BE INSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

CONTROL POINT 11 ELEVATION = 85.44'
CONTROL POINT 12 ELEVATION = 87.96'
CONTROL POINT 13 ELEVATION = 89.03'
CONTROL POINT 14 ELEVATION = 88.57'

CONVENTIONAL SIGNS

EXIST ROW
BASELINE
MONUMENT

0 100 200 400 800

SCALE: 1"=200' (22" X 34" SHEET)
SCALE: 1"=400' (11" X 17" SHEET)

REV	DATE	BY	DESCRIPTION

STATE OF TEXAS
REGISTERED
WALTER P. SASS
4410
PROFESSIONAL LAND SURVEYOR

WALTER P. SASS
REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF TEXAS, NO. 4410

WEISSER Engineering & Surveying

McCRARY ROAD

HORIZONTAL AND VERTICAL CONTROL INDEX SHEET

DESIGNED BY:		DRAWN BY: WEC	CAB
CHECKED BY:		CHECKED BY:	JH
CONT	SEC	JOB	HWY NO.
			McCRARY ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			6
STATE	STATE DIST.	COUNTY	
TEXAS	12	FORT BEND	

CONTROL TABLE (SURFACE)

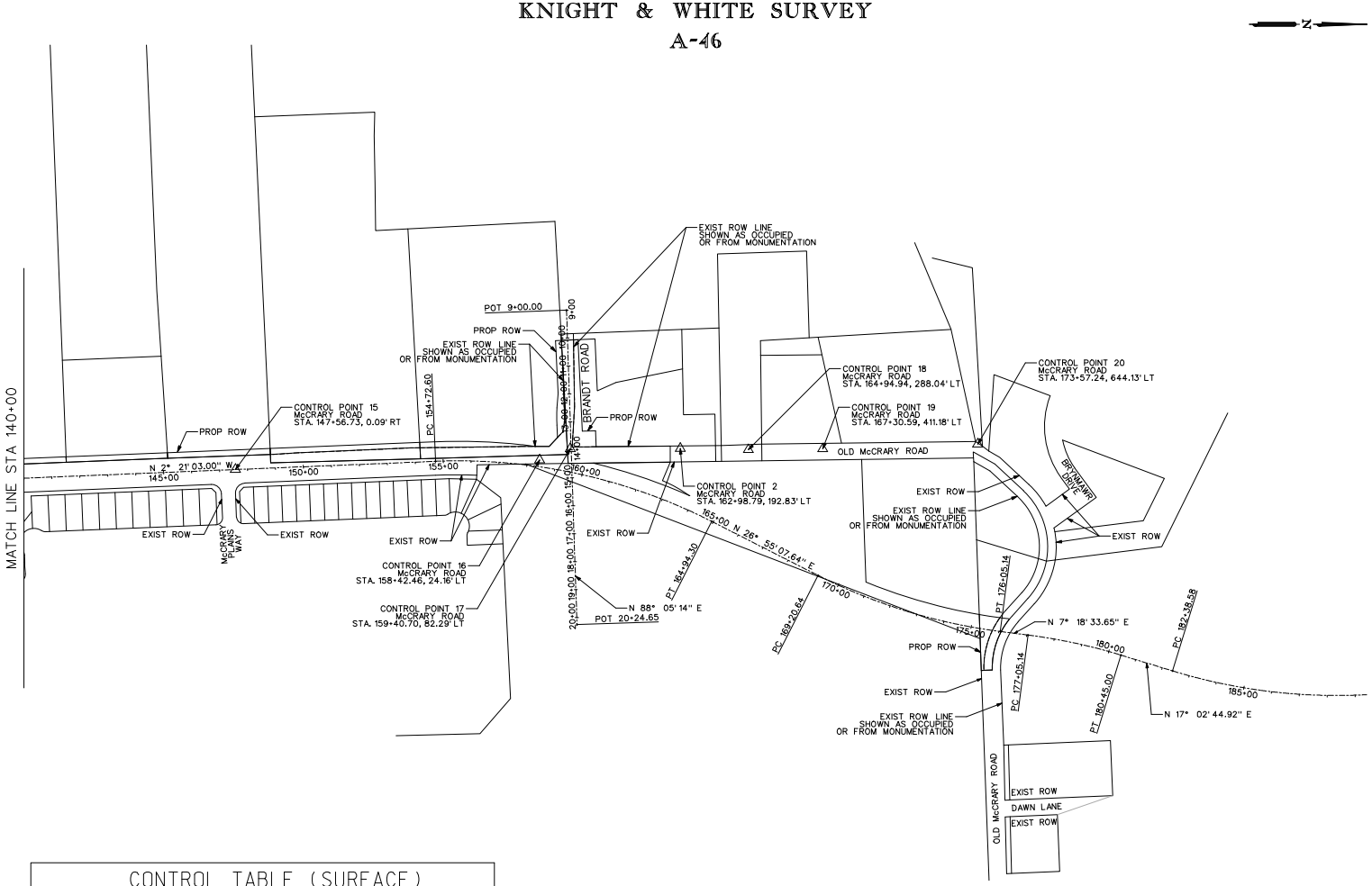
NO.	TYPE	N COORDINATE	E COORDINATE
11	FND. 5/8" I.R. W/ CAP	13,791,308.75	2,994,812.50
12	FND. 5/8" I.R. W/ CAP	13,792,493.52	2,994,780.83
13	FND. 5/8" I.R. W/ CAP	13,793,926.23	2,994,721.01
14	FND. 5/8" I.R. W/ CAP	13,794,984.69	2,994,696.26

ROADWAY CROSSING TABLE

ROAD	STATION	N COORDINATE	E COORDINATE
FM 359	101+39.32	13,791,340.08	2,994,776.24
CLAYHEAD ROAD	130+70.62	13,794,269.01	2,994,658.50
McCRARY MEADOWS DRIVE	137+86.20	13,794,983.64	2,994,684.14

FILE: ICOTT Control Sht 01.dgn
DATE: 10/18/2022

KNIGHT & WHITE SURVEY
A-46



NOTES:

1. ALL COORDINATES AND BEARINGS SHOWN ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), (NAD83, CORS, 2011 ADJUSTMENT, EPOCH 2010.00). ALL COORDINATES AND DISTANCES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.00012.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, 2001) FBC LIDAR DATUM.

PROJECT BENCHMARK:
NGS BENCHMARK DESIGNATION: HGCSD 66, P.I.D. NO. AW5411
BENCHMARK IRON ROD LOCATED 4.6 MILES SOUTH ALONG PIN OAK ROAD FROM THE JUNCTION OF US HIGHWAY 90 IN KATY, THENCE 0.10 MI SOUTH ALONG FM ROAD 1463, 68.0 FT EAST OF THE CENTERLINE OF THE ROAD, 24.0 FT SOUTH OF THE CENTER OF A GRAVEL ROAD TO A FARM, 19.0 FT SOUTHEAST OF THE SOUTH POST OF A WOOD GATE. NOTE--ACCESS TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP. THE MARK IS ABOVE LEVEL WITH THE ROAD.
ELEV. = 136.60

3. ACCORDING TO FIRM MAP NUMBER 48157C0120L FOR HARRIS COUNTY, TEXAS, AND INCORPORATED AREAS (MAP REVISED APRIL 02, 2014) THE TRACTS OF LAND SHOWN ON THIS MAP ARE SITUATED IN THE FOLLOWING FLOOD ZONES:

ZONE A AND ZONE AE AREAS DETERMINED TO BE INSIDE THE 1% ANNUAL CHANCE FLOODPLAIN.

SHADED ZONE X AREAS DETERMINED TO BE INSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

CONTROL POINT 15 ELEVATION = 89.24'
CONTROL POINT 16 ELEVATION = 87.61'
CONTROL POINT 17 ELEVATION = 84.82'
CONTROL POINT 2 ELEVATION = 88.37'
CONTROL POINT 18 ELEVATION = 87.17'
CONTROL POINT 19 ELEVATION = 88.47'
CONTROL POINT 20 ELEVATION = 89.52'

CONVENTIONAL SIGNS

EXIST ROW
BASELINE
MONUMENT

0 100 200 400 800

SCALE: 1"=200' (22" X 34" SHEET)
SCALE: 1"=400' (11" X 17" SHEET)

REV.	DATE	BY	DESCRIPTION

STATE OF TEXAS REGISTERED ★ WALTER P. SASS 4410 PROFESSIONAL LAND SURVEYOR

WALTER P. SASS
REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF TEXAS. NO. 4410

FIRST STATE OF TEXAS FORT BEND COUNTY

WEISSER Engineering & Surveying

McCRARY ROAD

HORIZONTAL AND VERTICAL CONTROL INDEX SHEET

DESIGNED BY:			DRAWN BY: WEC CAB
CHECKED BY:			CHECKED BY: JH
CONT	SEC	JOB	HWY NO.
			McCRARY ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			7
STATE	STATE DIST.	COUNTY	
TEXAS	12	FORT BEND	

CONTROL TABLE (SURFACE)

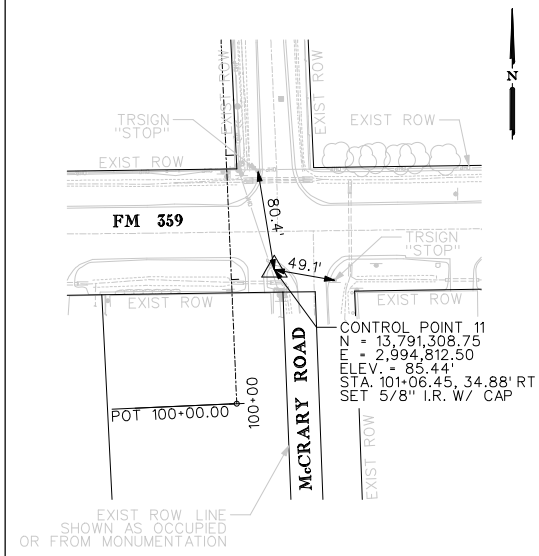
NO.	TYPE	N COORDINATE	E COORDINATE
15	FND. 1/2" I.R. W/ CAP	13,795,953.36	2,994,644.42
16	FND. 5/8" I.R. W/ CAP	13,797,041.03	2,994,610.05
17	FND. P.K. NAIL	13,797,150.47	2,994,569.73
2	FND. 1/2" I.R. W/ CAP	13,797,543.44	2,994,568.83
18	FND. 5/8" I.R. W/ CAP	13,797,787.09	2,994,573.44
19	FND. P.K. NAIL	13,798,052.95	2,994,570.33
20	FND. 1/2" I.R. W/ CAP	13,798,606.62	2,994,553.51

ROADWAY CROSSING TABLE

ROAD	STATION	N COORDINATE	E COORDINATE
McCRARY PLAINS WAY	147+28.65	13,795,925.31	2,994,645.48
BRANDT ROAD	159+63.03	13,797,156.21	2,994,654.83
McCRARY ROAD	176+08.61	13,798,690.70	2,995,223.89

FILE: ICOTT Control Sht 02.dgn
DATE: 10/18/2022

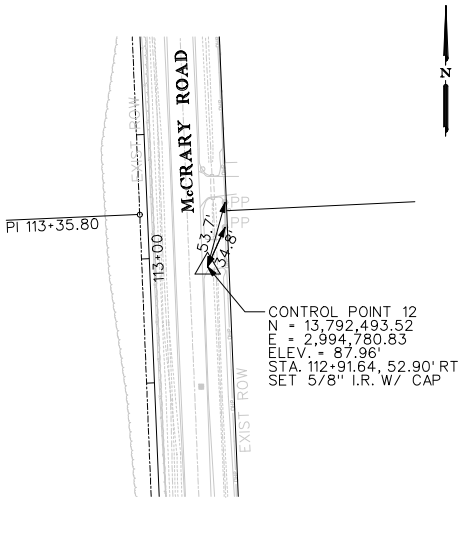
SCALE: NTS



CONTROL PT. #11
SET 5/8" I.R. W/CAP
ELEV. = 85.44'
STA. 101+06.45, 34.88' RT

SURFACE:
N 13,791,308.75
E 2,994,812.50

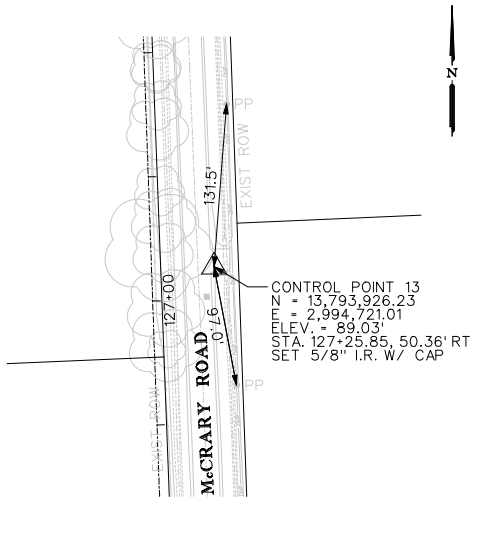
SCALE: NTS



CONTROL PT. #12
SET 5/8" I.R. W/CAP
ELEV. = 87.96'
STA. 112+91.64, 52.90' RT

SURFACE:
N 13,792,493.52
E 2,994,780.83

SCALE: NTS



CONTROL PT. #13
SET 5/8" I.R. W/CAP
ELEV. = 89.03'
STA. 127+25.85, 50.36' RT

SURFACE:
N 13,793,926.23
E 2,994,721.01

NOTES:

1. ALL COORDINATES AND BEARINGS SHOWN ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), (NAD83, CORS, 2011 ADJUSTMENT, EPOCH 2010.00). ALL COORDINATES AN DISTANCES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.00012.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO TH NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD8 2001) FBC LIDAR DATUM.

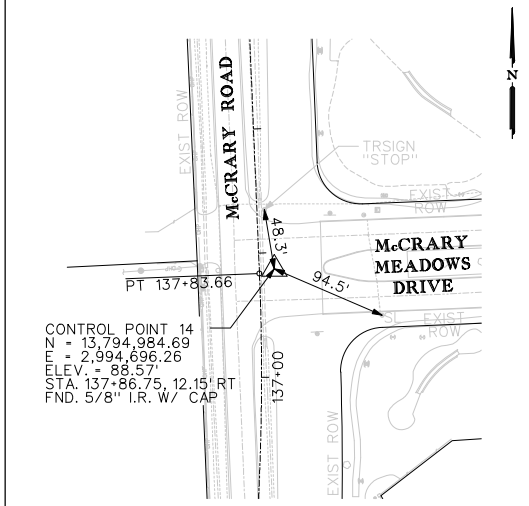
PROJECT BENCHMARK:
NGS BENCHMARK DESIGNATION: HGCSD 66, P.I.D. NO. AW5411
BENCHMARK IRON ROD LOCATED 4.6 MILES SOUTH ALONG PIN OAK ROAD FROM THE JUNCTION OF US HIGHWAY 90 IN KATY, THENCE 0.10 MI SOUTH ALONG FM ROAD 1463, 68.0 FT EAST OF THE CENTERLINE OF THE ROAD, 24.0 FT SOUTH OF THE CENTER OF GRAVEL ROAD TO A FARM, 19.0 FT SOUTHEAST OF THE SOUTH POST OF A WOOD GATE. NOTE--ACCES TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP. THE MARK IS ABOVE LEVEL WITH THE ROAD. ELEV. = 136.60

3. ACCORDING TO FIRM MAP NUMBER 48157C0120L FOR HARRIS COUNTY, TEXAS, AND INCORPORATED AREAS (MAP REVISED APRIL 02, 2014) THE TRACTS OF LAND SHOWN ON THIS MAP ARE SITUATED IN TH FOLLOWING FLOOD ZONES:

ZONE A AND ZONE AE AREAS DETERMINED TO BE INSIDE THE 1% ANNUAL CHANCE FLOODPLAIN.

SHADED ZONE X AREAS DETERMINED TO BE INSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

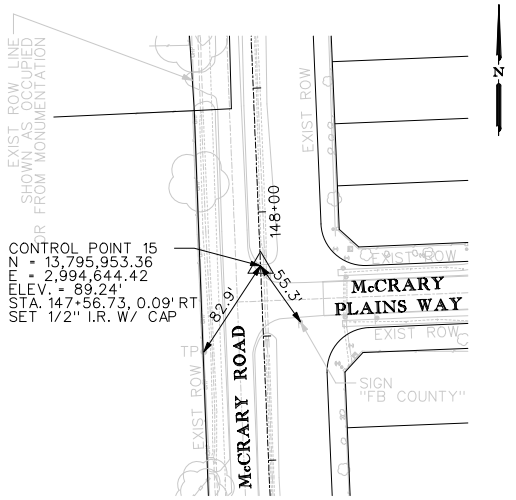
SCALE: NTS



CONTROL PT. #14
SET 5/8" I.R. W/CAP
ELEV. = 88.57'
STA. 137+86.75, 12.15' RT

SURFACE:
N 13,794,984.69
E 2,994,696.26

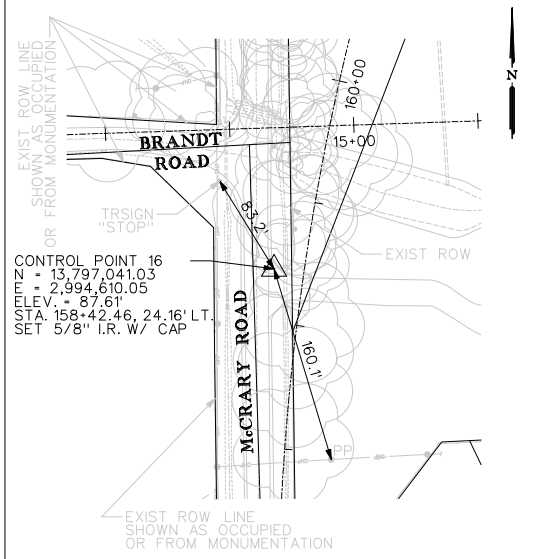
SCALE: NTS



CONTROL PT. #15
SET 1/2" I.R. W/CAP
ELEV. = 89.24'
STA. 147+56.73, 0.09' RT

SURFACE:
N 13,795,953.36
E 2,994,644.42

SCALE: NTS



CONTROL PT. #16
SET 5/8" I.R. W/CAP
ELEV. = 87.61'
STA. 158+42.46, 24.16' RT

SURFACE:
N 13,797,041.03
E 2,994,610.05

REV	DATE	BY	DESCRIPTION

STATE OF TEXAS REGISTERED WALTER P. SASS 4410 PROFESSIONAL LAND SURVEYOR

WALTER P. SASS
REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF TEXAS, NO. 4410

WEISSER Engineering & Surveying
19306 Park Row, Suite 100 | Houston, Texas 77084
TBPE Reg No. F-687 | TBPLS Reg No. 10194351
www.weisserengr.com | 281.579.7300

McCRARY ROAD

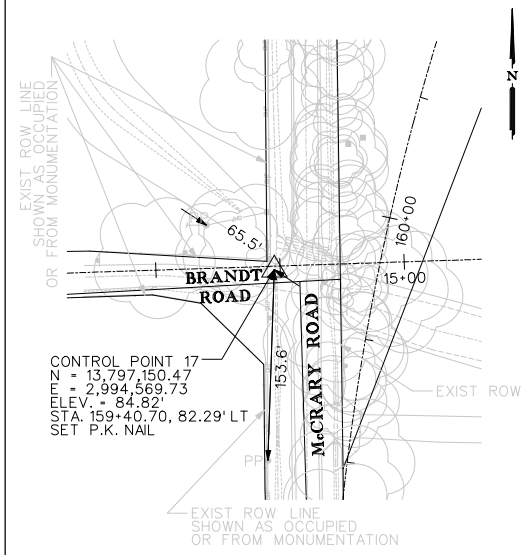
HORIZONTAL AND VERTICAL CONTROL

DESIGNED BY:			DRAWN BY: WEC CAB
CHECKED BY:			CHECKED BY: JH
CONT	SEC	JOB	HWY NO.
			McCRARY ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			8
STATE	STATE DIST.	COUNTY	
TEXAS	12	FORT BEND	

FILE: ICDT Control Sht 03.dgn
DATE: 10/18/2022

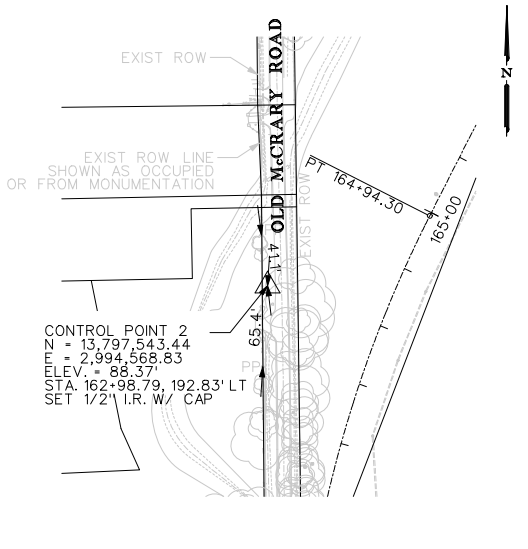
SCALE: NTS



CONTROL PT. #17
SET P.K. NAIL
ELEV. = 84.82'
STA. 159+40.70, 82.29' LT

SURFACE:
N 13,797,150.47
E 2,994,569.73

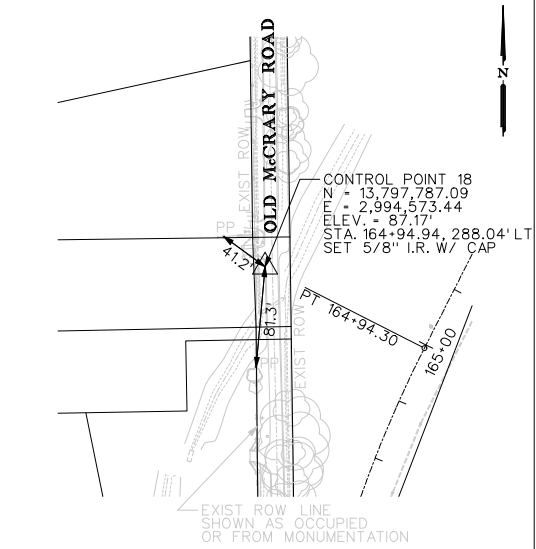
SCALE: NTS



CONTROL PT. #2
SET 1/2" I.R. W/CAP
ELEV. = 88.37'
STA. 162+98.79, 192.83' LT

SURFACE:
N 13,797,543.44
E 2,994,568.83

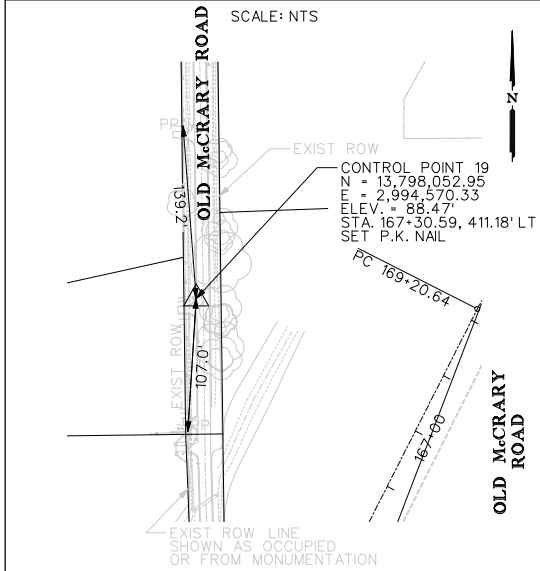
SCALE: NTS



CONTROL PT. #18
SET 5/8" I.R. W/CAP
ELEV. = 87.17'
STA. 164+94.94, 288.04' LT

SURFACE:
N 13,797,787.09
E 2,994,573.44

SCALE: NTS

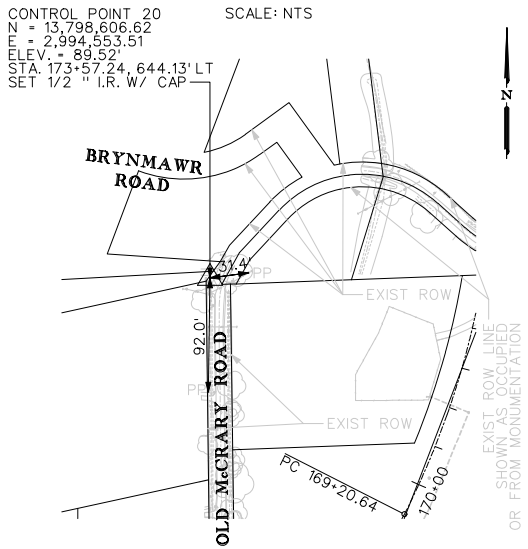


CONTROL PT. #19
SET P.K. NAIL
ELEV. = 88.47'
STA. 167+30.59, 411.18' LT

SURFACE:
N 13,798,052.95
E 2,994,570.33

CONTROL POINT 20
N = 13,798,606.62
E = 2,994,553.51
ELEV. = 89.52'
STA. 173+57.24, 644.13' LT
SET 1/2 " I.R. W/ CAP

SCALE: NTS



CONTROL PT. #20
SET 1/2" I.R. W/CAP
ELEV. = 89.52'
STA. 173+57.24, 644.13' LT

SURFACE:
N 13,798,606.62
E 2,994,553.51

NOTES:

1. ALL COORDINATES AND BEARINGS SHOWN ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), (NAD83, CORS, 2011 ADJUSTMENT, EPOCH 2010.00). ALL COORDINATES AN DISTANCES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.00012.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO TH NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD8 2001) FBC LIDAR DATUM.

PROJECT BENCHMARK:
NGS BENCHMARK DESIGNATION: HGCSD 66, P.I.D. NO. AW5411
BENCHMARK IRON ROD LOCATED 4.6 MILES SOUTH ALONG PIN OAK ROAD FROM THE JUNCTION OF US HIGHWAY 90 IN KATY, THENCE 0.10 MI SOUTH ALONG FM ROAD 1463, 68.0 FT EAST OF THE CENTERLINE OF THE ROAD, 24.0 FT SOUTH OF THE CENTER OF GRAVEL ROAD TO A FARM, 19.0 FT SOUTHEAST OF THE SOUTH POST OF A WOOD GATE. NOTE--ACCES TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP. THE MARK IS ABOVE LEVEL WITH THE ROAD. ELEV. = 136.60

3. ACCORDING TO FIRM MAP NUMBER 48157C0120L FOR HARRIS COUNTY, TEXAS, AND INCORPORATED AREAS (MAP REVISED APRIL 02, 2014) THE TRACTS OF LAND SHOWN ON THIS MAP ARE SITUATED IN TH FOLLOWING FLOOD ZONES:

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SHADED ZONE X AREAS DETERMINED TO BE INSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

REV	DATE	BY	DESCRIPTION

STATE OF TEXAS REGISTERED WALTER P. SASS 4410 PROFESSIONAL LAND SURVEYOR

WALTER P. SASS
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STATE OF TEXAS, NO. 4410

WEISSER Engineering & Surveying
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TBPE Reg No. F-687 | TBPLS Reg No. 10194351
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McCRARY ROAD

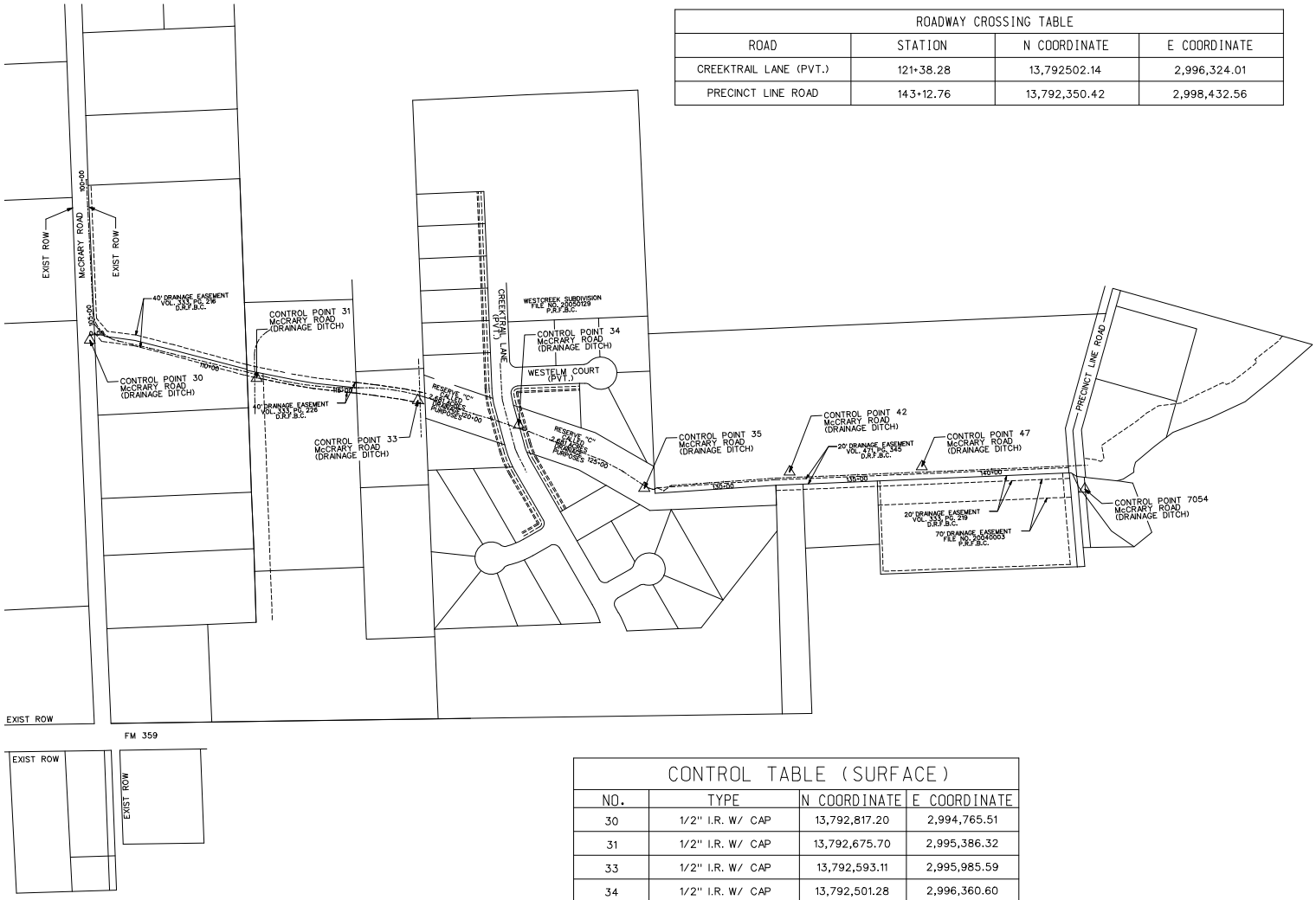
HORIZONTAL AND VERTICAL CONTROL

DESIGNED BY:			DRAWN BY: WEC CAB
CHECKED BY:			CHECKED BY: JH
CONT	SEC	JOB	HWY NO.
			McCRARY ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			9
STATE	STATE DIST.	COUNTY	
TEXAS	12	FORT BEND	

FILE: ICOTT Control Sht 04.dgn
DATE: 10/18/2022

KNIGHT & WHITE SURVEY
A-46



ROADWAY CROSSING TABLE			
ROAD	STATION	N COORDINATE	E COORDINATE
CREEKTRAIL LANE (PVT.)	121+38.28	13,792502.14	2,996,324.01
PRECINCT LINE ROAD	143+12.76	13,792,350.42	2,998,432.56

CONTROL TABLE (SURFACE)			
NO.	TYPE	N COORDINATE	E COORDINATE
30	1/2" I.R. W/ CAP	13,792,817.20	2,994,765.51
31	1/2" I.R. W/ CAP	13,792,675.70	2,995,386.32
33	1/2" I.R. W/ CAP	13,792,593.11	2,995,985.59
34	1/2" I.R. W/ CAP	13,792,501.28	2,996,360.60
35	5/8" I.R. W/CAP	13,792,266.43	2,996,827.76
42	1/2" I.R. W/ CAP	13,792,326.92	2,997,367.64
47	100 D NAIL	13,792,347.08	2,997,859.56
7054	100 D NAIL	13,792,263.17	2,998,465.77

NOTES:

1. ALL COORDINATES AND BEARINGS SHOWN ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), (NAD83 CORS, 2011 ADJUSTMENT, EPOCH 2010.00). ALL COORDINATES AND DISTANCES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.00012.

2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, 2001) FBC LIDAR DATUM.

PROJECT BENCHMARK:
NGS BENCHMARK DESIGNATION: HGCSD 66, P.I.D. NO. AW5411
BENCHMARK IRON ROD LOCATED 4.6 MILES SOUTH ALONG PIN OAK ROAD FROM THE JUNCTION OF US HIGHWAY 90 IN KATY, THENCE 0.10 MI SOUTH ALONG FM ROAD 1463, 68.0 FT EAST OF THE CENTERLINE OF THE ROAD, 24.0 FT SOUTH OF THE CENTER OF A GRAVEL ROAD TO A FARM, 19.0 FT SOUTHEAST OF THE SOUTH POST OF A WOOD GATE. NOTE--ACCESS TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP. THE MARK IS ABOVE LEVEL WITH THE ROAD.
ELEV. - 136.60

3. ACCORDING TO FIRM MAP NUMBER 48157C0120L FOR HARRIS COUNTY, TEXAS, AND INCORPORATED AREAS (MAP REVISED APRIL 02, 2014) THE TRACTS OF LAND SHOWN ON THIS MAP ARE SITUATED IN THE FOLLOWING FLOOD ZONES:

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SHADED ZONE X AREAS DETERMINED TO BE INSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

CONTROL POINT 30 ELEVATION = 87.17'
CONTROL POINT 31 ELEVATION = 86.43'
CONTROL POINT 33 ELEVATION = 84.76'
CONTROL POINT 34 ELEVATION = 86.42'
CONTROL POINT 35 ELEVATION = 79.72'
CONTROL POINT 42 ELEVATION = 84.01'
CONTROL POINT 47 ELEVATION = 81.13'
CONTROL POINT 7054 ELEVATION = 87.92'

CONVENTIONAL SIGNS

EXIST ROW
BASELINE
MONUMENT △

0 100 200 400 800

SCALE: 1"=200' (22" X 34" SHEET)
SCALE: 1"=400' (11" X 17" SHEET)

REV	DATE	BY	DESCRIPTION

STATE OF TEXAS REGISTERED WALTER P. SASS 4410 PROFESSIONAL LAND SURVEYOR

WALTER P. SASS
REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF TEXAS, NO. 4410

WEISSER Engineering & Surveying

McCRARY ROAD
(DRAINAGE DITCH)

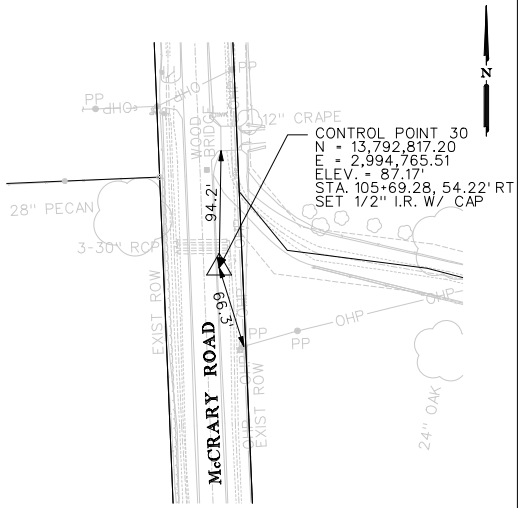
HORIZONTAL AND VERTICAL
CONTROL INDEX SHEET

DESIGNED BY:			DRAWN BY: WEC
CHECKED BY:			CHECKED BY: JH
CONT	SEC	JOB	HWY NO.
			McCRARY ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			10
STATE	STATE DIST.	COUNTY	
TEXAS	12	FORT BEND	

FILE: ICOTT Control Sht 01 2st- E-W Ditchdgn
DATE: 10/18/2022

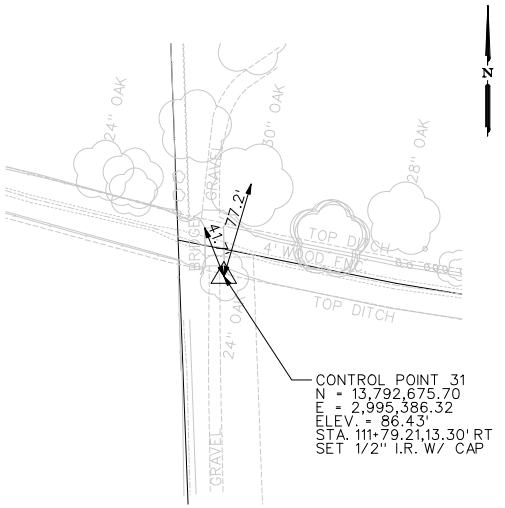
SCALE: NTS



CONTROL PT. #30
SET 1/2" I.R. W/CAP
ELEV. = 87.17'
STA. 105+69.28, 54.22' RT

SURFACE:
N 13,792,817.20
E 2,994,765.51

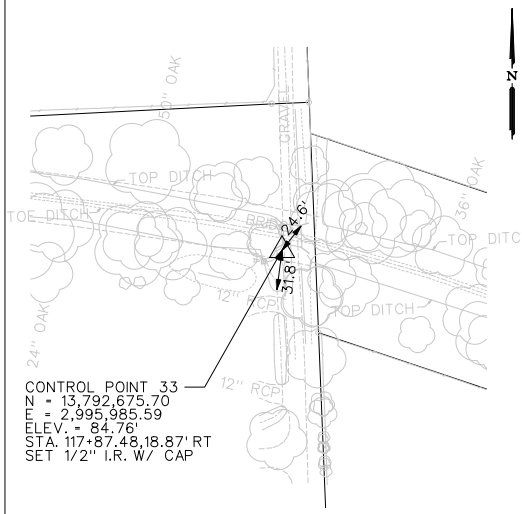
SCALE: NTS



CONTROL PT. #31
SET 1/2" I.R. W/CAP
ELEV. = 86.43'
STA. 111+79.21,13.30' RT

SURFACE:
N 13,792,675.70
E 2,995,386.32

SCALE: NTS



CONTROL PT. #33
SET 1/2" I.R. W/CAP
ELEV. = 84.76'
STA. 117+87.48,18.87' RT

SURFACE:
N 13,792,675.70
E 2,995,985.59

NOTES:

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2. ALL ELEVATIONS SHOWN ARE REFERENCED TO TI NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD8 2001) FBC LIDAR DATUM.

PROJECT BENCHMARK:
NGS BENCHMARK DESIGNATION: HGCSD 66, P.I.D. NO. AW5411
BENCHMARK IRON ROD LOCATED 4.6 MILES SOUTH ALONG PIN OAK ROAD FROM THE JUNCTION OF US HIGHWAY 90 IN KATY, THENCE 0.10 MI SOUTH ALONG FM ROAD 1463, 68.0 FT EAST OF THE CENTERLINE OF THE ROAD, 24.0 FT SOUTH OF THE CENTER OF GRAVEL ROAD TO A FARM, 19.0 FT SOUTHEAST OF THE SOUTH POST OF A WOOD GATE. NOTE--ACCES TO DATUM POINT IS HAD THROUGH A 5-INCH LOGO CAP. THE MARK IS ABOVE LEVEL WITH THE ROAD. ELEV. = 136.60

3. ACCORDING TO FIRM MAP NUMBER 48157C0120L FOR HARRIS COUNTY, TEXAS, AND INCORPORATED AREAS (MAP REVISED APRIL 02, 2014) THE TRACTS OF LAND SHOWN ON THIS MAP ARE SITUATED IN TH FOLLOWING FLOOD ZONES:

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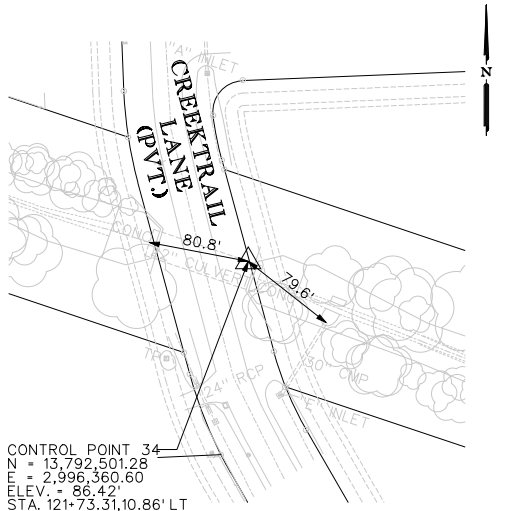
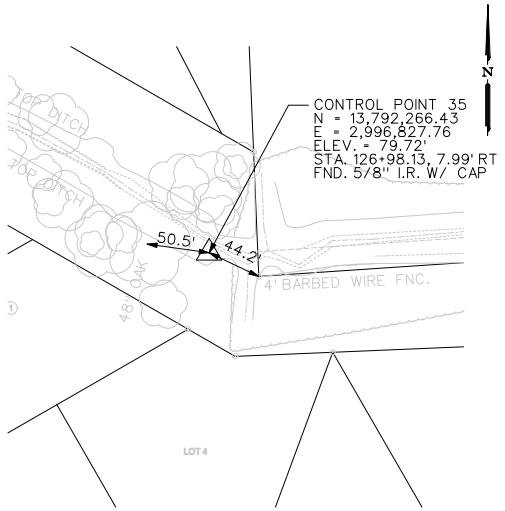
SCALE: NTS



CONTROL PT. #34
SET 1/2" I.R. W/CAP
ELEV. = 86.42'
STA. 121+73.31,10.86' LT

SURFACE:
N 13,792,501.28
E 2,996,360.60

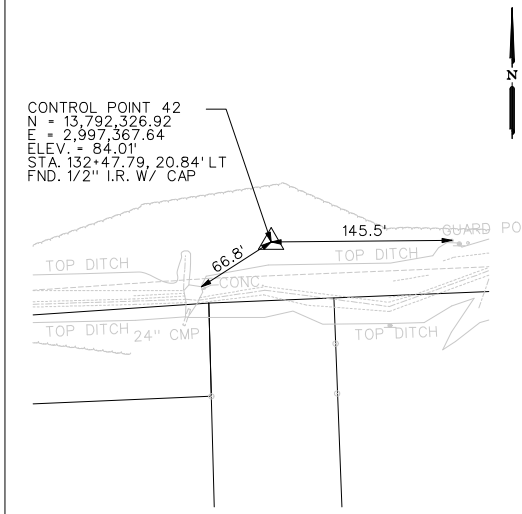
SCALE: NTS



CONTROL PT. #35
SET 1/2" I.R. W/CAP
ELEV. = 79.72'
STA. 126+98.13, 7.99' RT

SURFACE:
N 13,792,266.43
E 2,996,827.76

SCALE: NTS



CONTROL PT. #42
SET 1/2" I.R. W/CAP
ELEV. = 84.01'
STA. 132+47.79, 20.84' LT

SURFACE:
N 13,792,326.92
E 2,997,367.64

REV	DATE	BY	DESCRIPTION

STATE OF TEXAS REGISTERED WALTER P. SASS 4410 PROFESSIONAL LAND SURVEYOR

WALTER P. SASS
REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF TEXAS, NO. 4410

WEISSER Engineering & Surveying

McCRARY ROAD
(DRAINAGE DITCH)

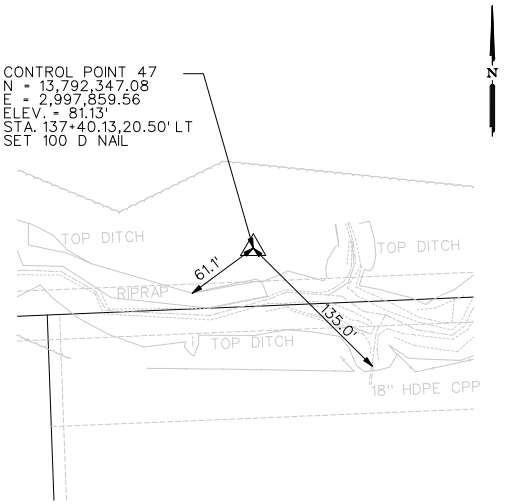
HORIZONTAL AND
VERTICAL CONTROL

DESIGNED BY:			DRAWN BY: WEC CAB
CHECKED BY:			CHECKED BY: JH
CONT	SEC	JOB	HWY NO.
			McCRARY ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			11
STATE	STATE DIST.	COUNTY	
TEXAS	12	FORT BEND	

FILE: ICOTT Control Sht 02 - E-W Ditchdgn
DATE: 10/18/2022

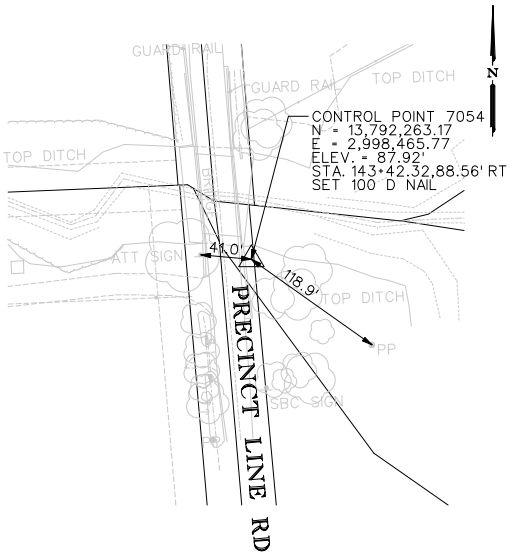
SCALE: NTS



CONTROL PT. #47
SET 100 D NAIL
ELEV. = 81.13'
STA. 137+40.13,20.50' LT

SURFACE:
N 13,792,347.08
E 2,997,859.56

SCALE: NTS



CONTROL PT. #7054
SET 100 D NAIL
ELEV. = 87.92'
STA. 143+42.32,88.56' RT

SURFACE:
N 13,792,263.17
E 2,998,465.77

NOTES:

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PROJECT BENCHMARK:
NGS BENCHMARK DESIGNATION: HGCSD 66, P.I.D. NO. AW5411
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SHADED ZONE X AREAS DETERMINED TO BE INSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

REV	DATE	BY	DESCRIPTION

STATE OF TEXAS REGISTERED WALTER P. SASS 4410 PROFESSIONAL LAND SURVEYOR

WALTER P. SASS
REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF TEXAS, NO. 4410

WEISSER Engineering & Surveying
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TBPE Reg No. F-451 | TBPLS Reg No. 10194351
www.weisserengr.com | 281.579.7300

McCRARY ROAD
(DRAINAGE DITCH)

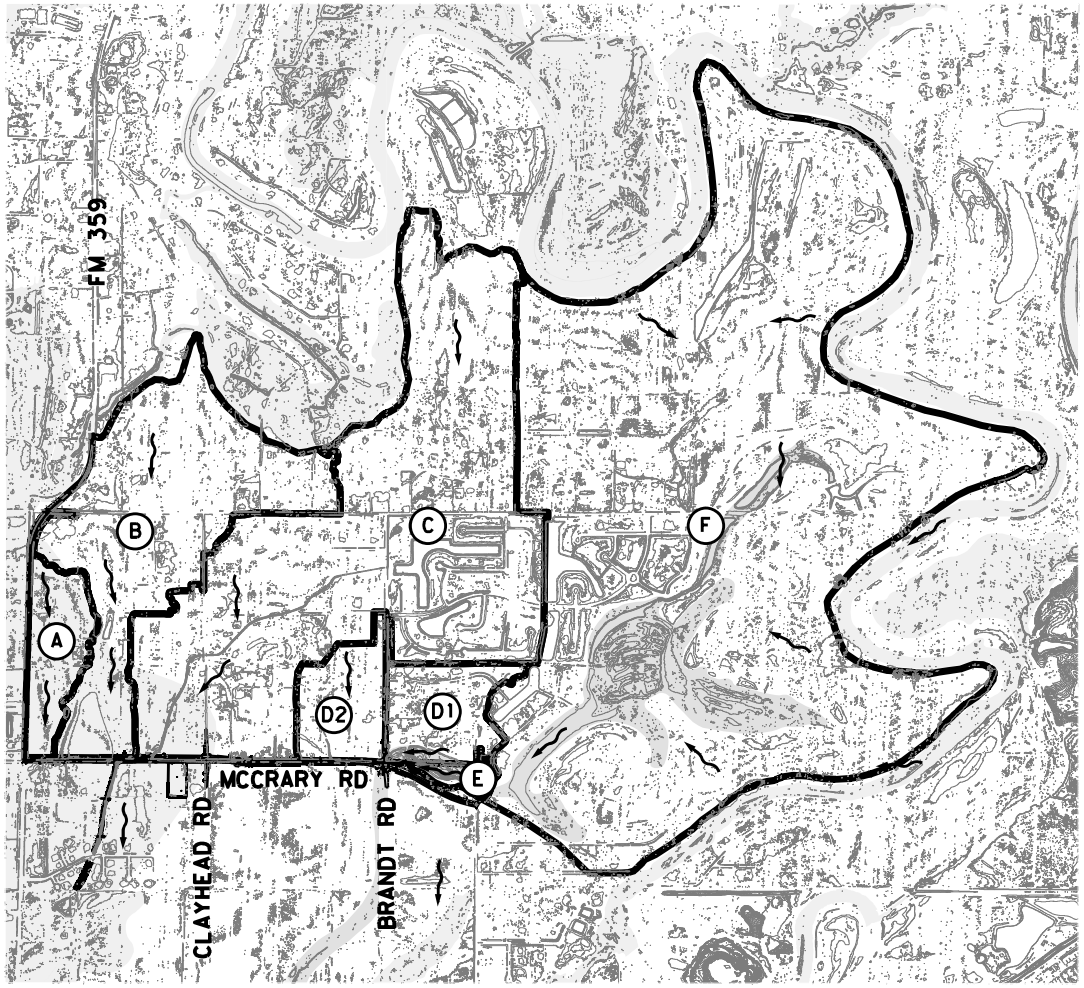
HORIZONTAL AND
VERTICAL CONTROL

DESIGNED BY:	DRAWN BY: WEC CAB
CHECKED BY:	CHECKED BY: JH

CONT	SEC	JOB	HWY NO.
			McCRARY ROAD

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			12
STATE	STATE DIST.	COUNTY	
TEXAS	12	FORT BEND	

FILE: ICOTT Control Sht 03 - E-W Ditchdgn
DATE: 10/18/2022



LEGEND

- DRAINAGE AREA BOUNDARY
- STREAM CENTERLINE
- FLOW DIRECTION
- (X) DRAINAGE AREA LABEL
- FEMA ZONE AE
- FEMA ZONE A
- 1 FT CONTOUR

0 1000' 2000'
SCALE: 1" = 2000'

Drainage Area ID	Area (sq mi)	Percent Impervious	TC (hour)	R (hour)	Q10PCT (cfs)	Q4PCT (cfs)	Q1PCT (cfs)
A	0.0955	8.45	1.76	2.35	59	78	114
B	0.4514	12.59	2.66	4.20	187	252	377
C	0.9858	14.25	2.92	4.20	406	549	822
D1	0.1068	18.76	2.60	3.83	41	56	83
D2	0.0943	10.45	0.96	1.55	83	107	151
E	0.0183	8.51	1.59	0.21	26	32	43
F	2.2063	3.62	3.93	4.86	747	1,028	1,578

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.4282400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10193974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER
MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

OVERALL DRAINAGE AREA MAP

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	13

...\5. Drainage\PD_DDA00.dgn

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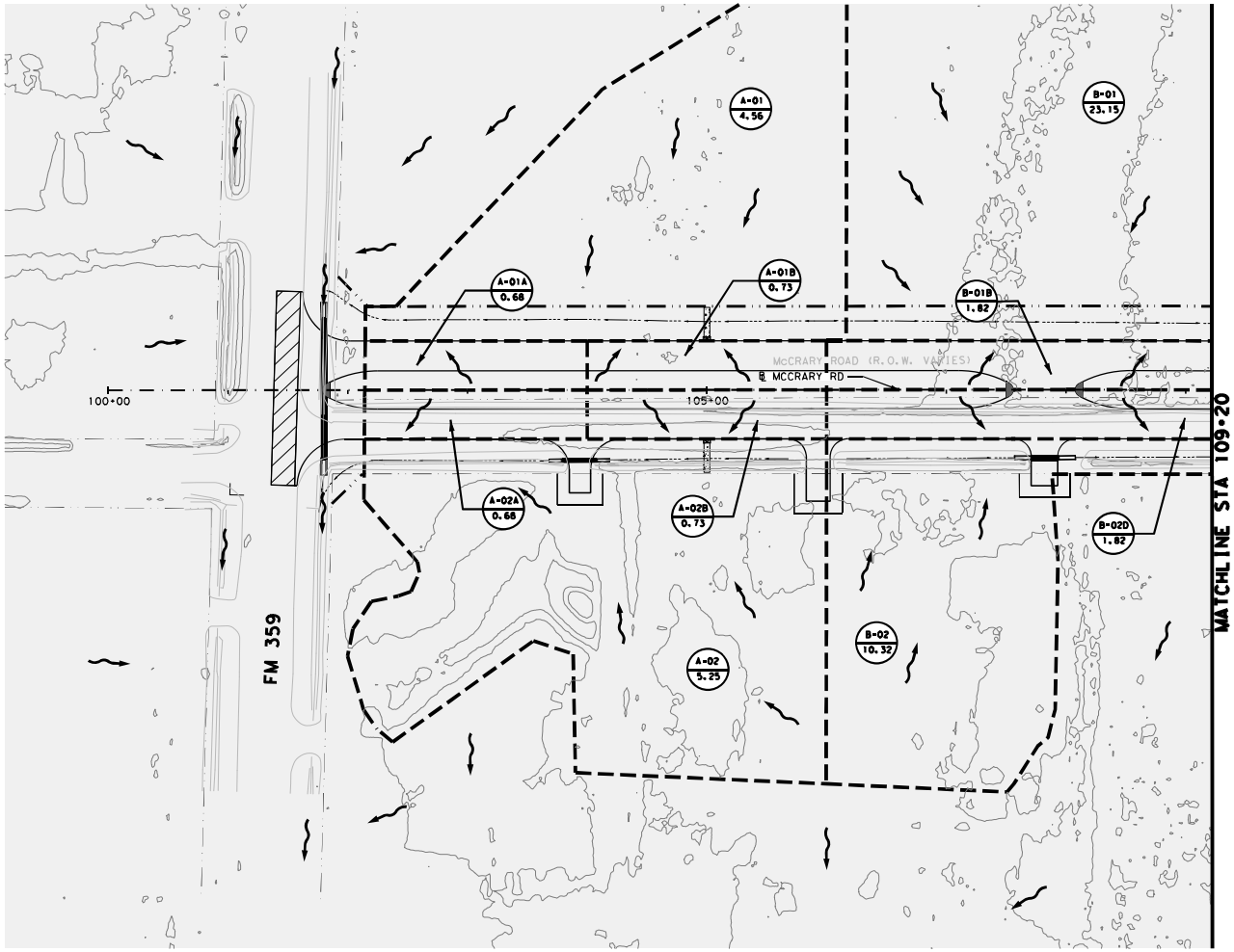

LEGEND

- DRAINAGE AREA BOUNDARY
- STREAM CENTERLINE
- FLOW DIRECTION
- X.XX / X.XX — DRAINAGE AREA ID / 2 YR FLOW (CFS)
- FEMA ZONE AE
- FEMA ZONE A
- 1 FT CONTOUR
- DITCH ℄
- EXIST ROW
- PROP ROW

0 50' 100'
SCALE: 1" = 100'

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.4282400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10108974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER
MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

INTERIOR DRAINAGE AREA MAP
BEGIN TO STA 109+20

SHEET 1 OF 8

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	14

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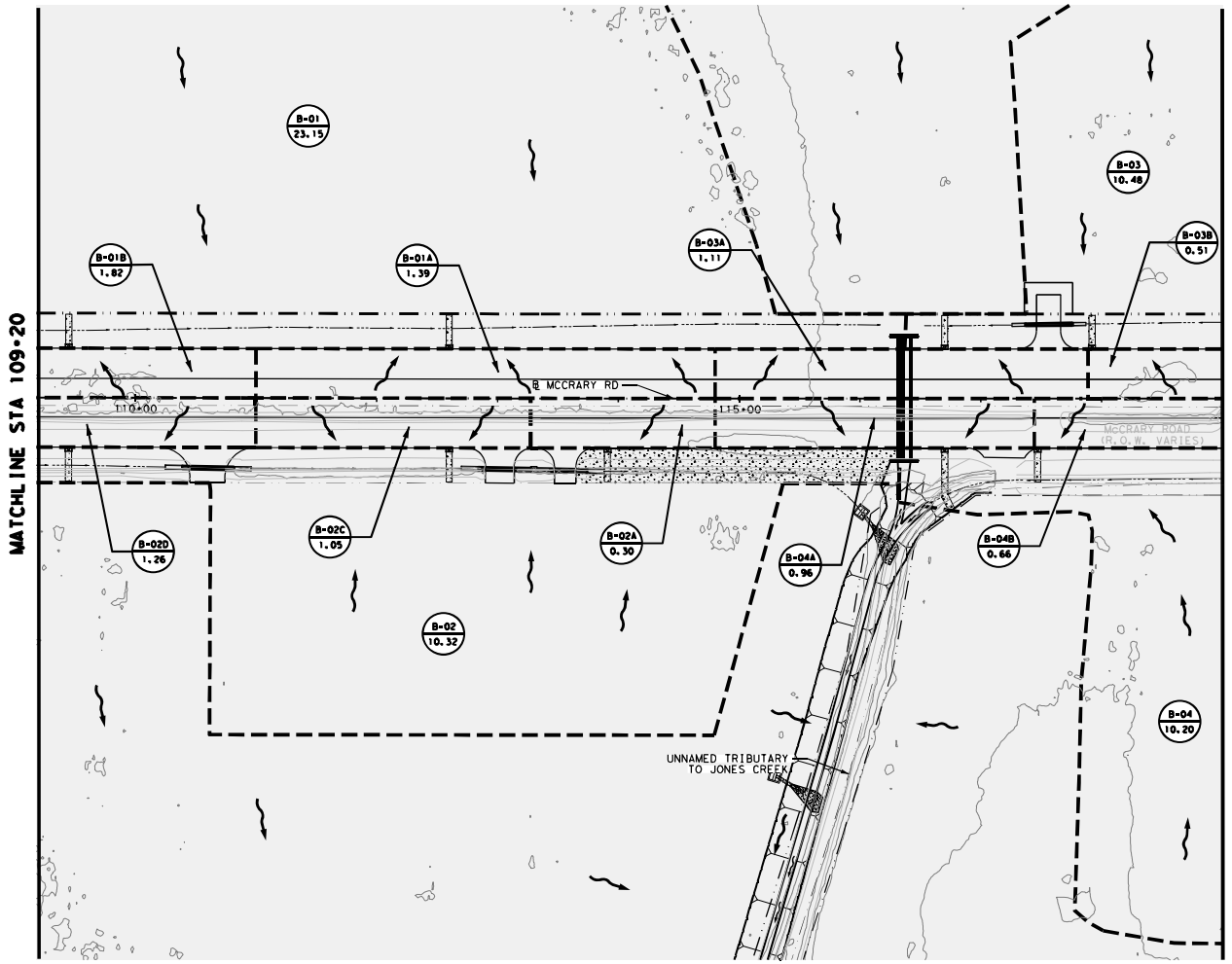

LEGEND

- DRAINAGE AREA BOUNDARY
- STREAM CENTERLINE
- FLOW DIRECTION
- X.XX / X.XX — DRAINAGE AREA ID / 2 YR FLOW (CFS)
- FEMA ZONE AE
- FEMA ZONE A
- 1 FT CONTOUR
- DITCH ℄
- EXIST ROW
- PROP ROW

0 50' 100'
SCALE: 1" = 100'

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.4282400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10108974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER
MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

INTERIOR DRAINAGE AREA MAP
STA 109+20 TO STA 119+00

SHEET 2 OF 8

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	15

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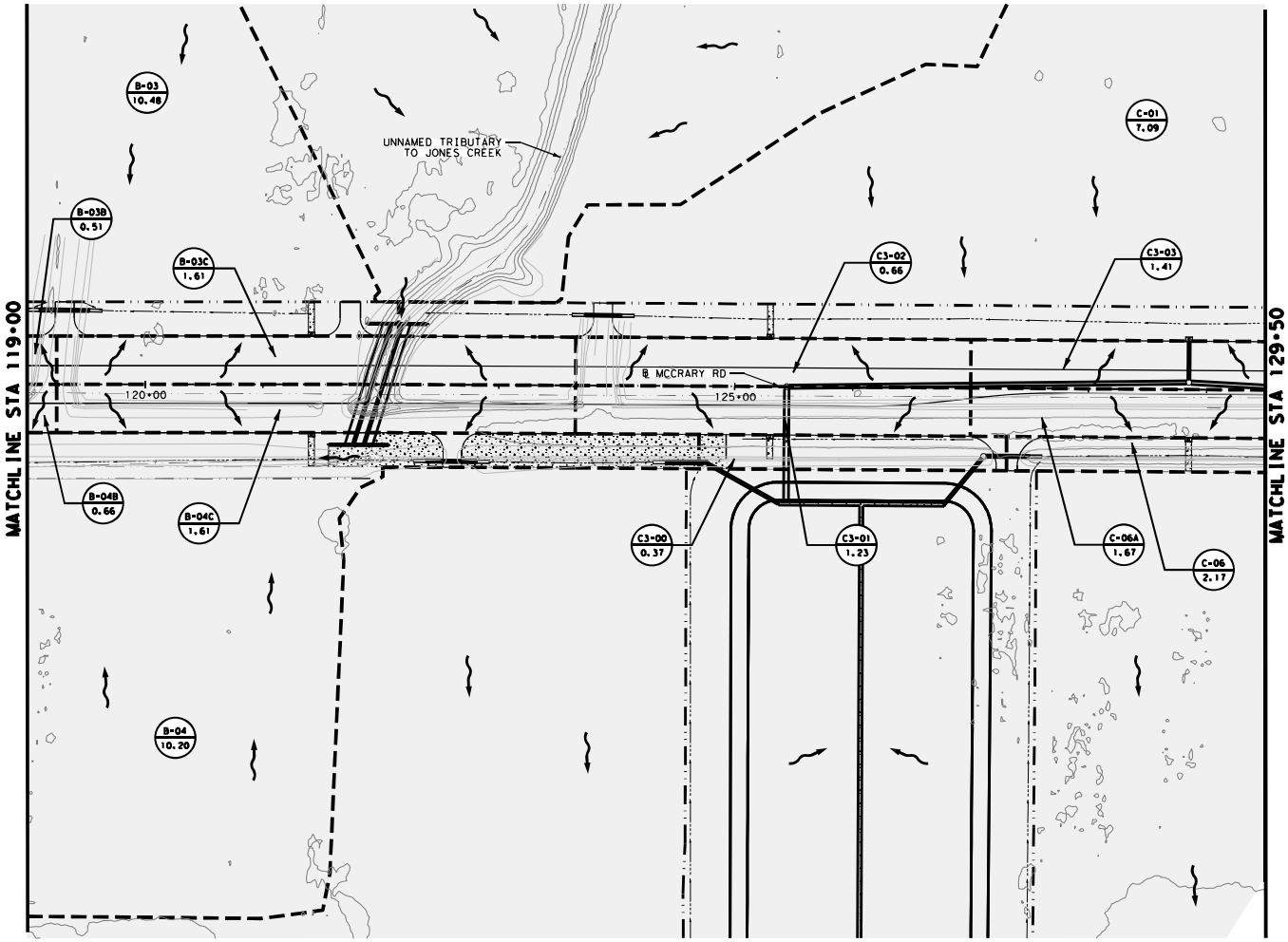

LEGEND

- DRAINAGE AREA BOUNDARY
- STREAM CENTERLINE
- FLOW DIRECTION
- X.XX / X.XX — DRAINAGE AREA ID / 2 YR FLOW (CFS)
- FEMA ZONE AE
- FEMA ZONE A
- 1 FT CONTOUR
- DITCH ℄
- EXIST ROW
- PROP ROW

0 50' 100'
SCALE: 1" = 100'

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS

HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.462.2400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10039974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER
MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

INTERIOR DRAINAGE AREA MAP
STA 119+00 TO STA 129+50

SHEET 3 OF 8

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	16

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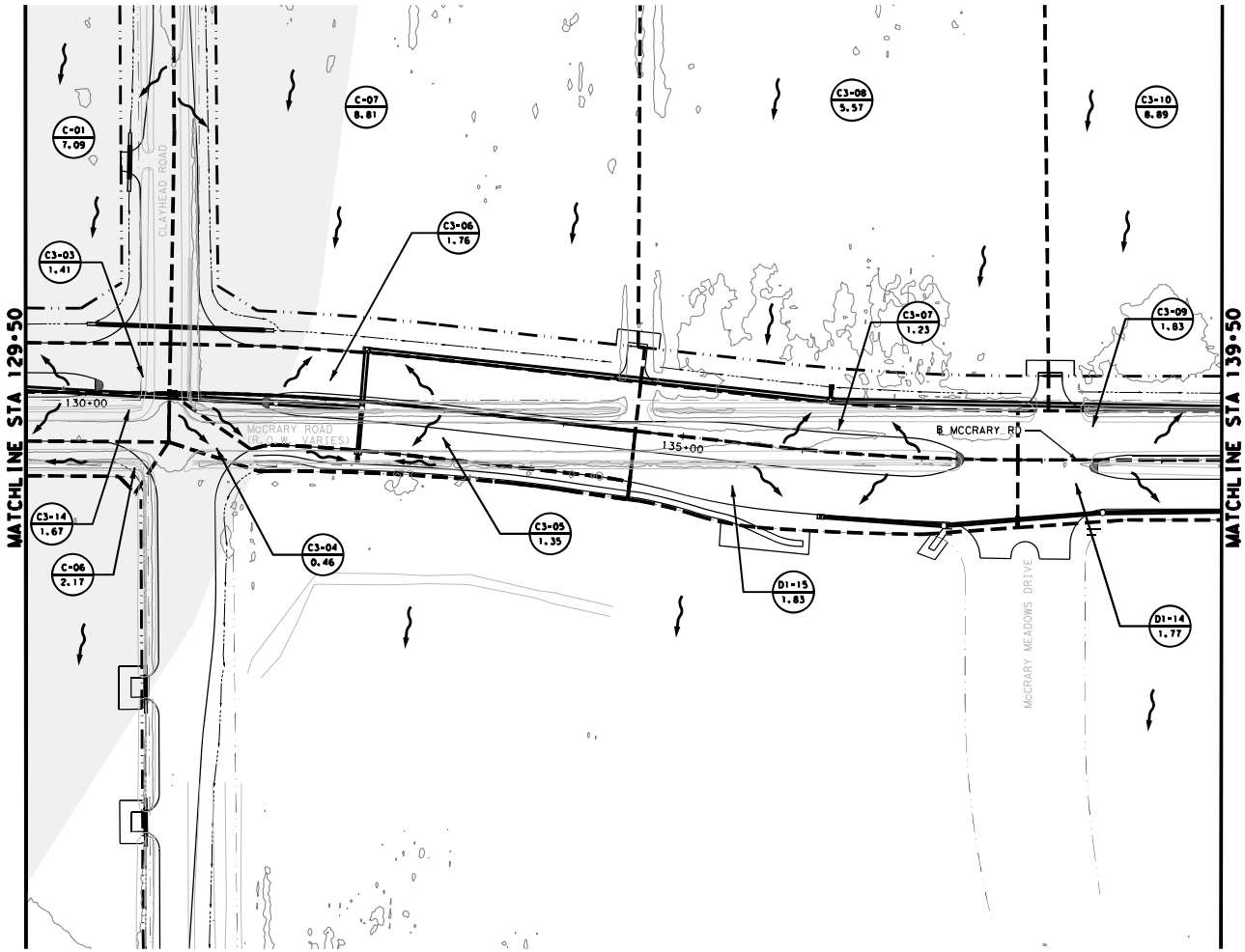

LEGEND

- DRAINAGE AREA BOUNDARY
- STREAM CENTERLINE
- FLOW DIRECTION
- X.XX / X.XX — DRAINAGE AREA ID / 2 YR FLOW (CFS)
- FEMA ZONE AE
- FEMA ZONE A
- 1 FT CONTOUR
- DITCH ℄
- EXIST ROW
- PROP ROW

0 50' 100'
SCALE: 1" = 100'

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.4282400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10108974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER
MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

INTERIOR DRAINAGE AREA MAP
STA 129+50 TO STA 139+50

SHEET 4 OF 8

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	17

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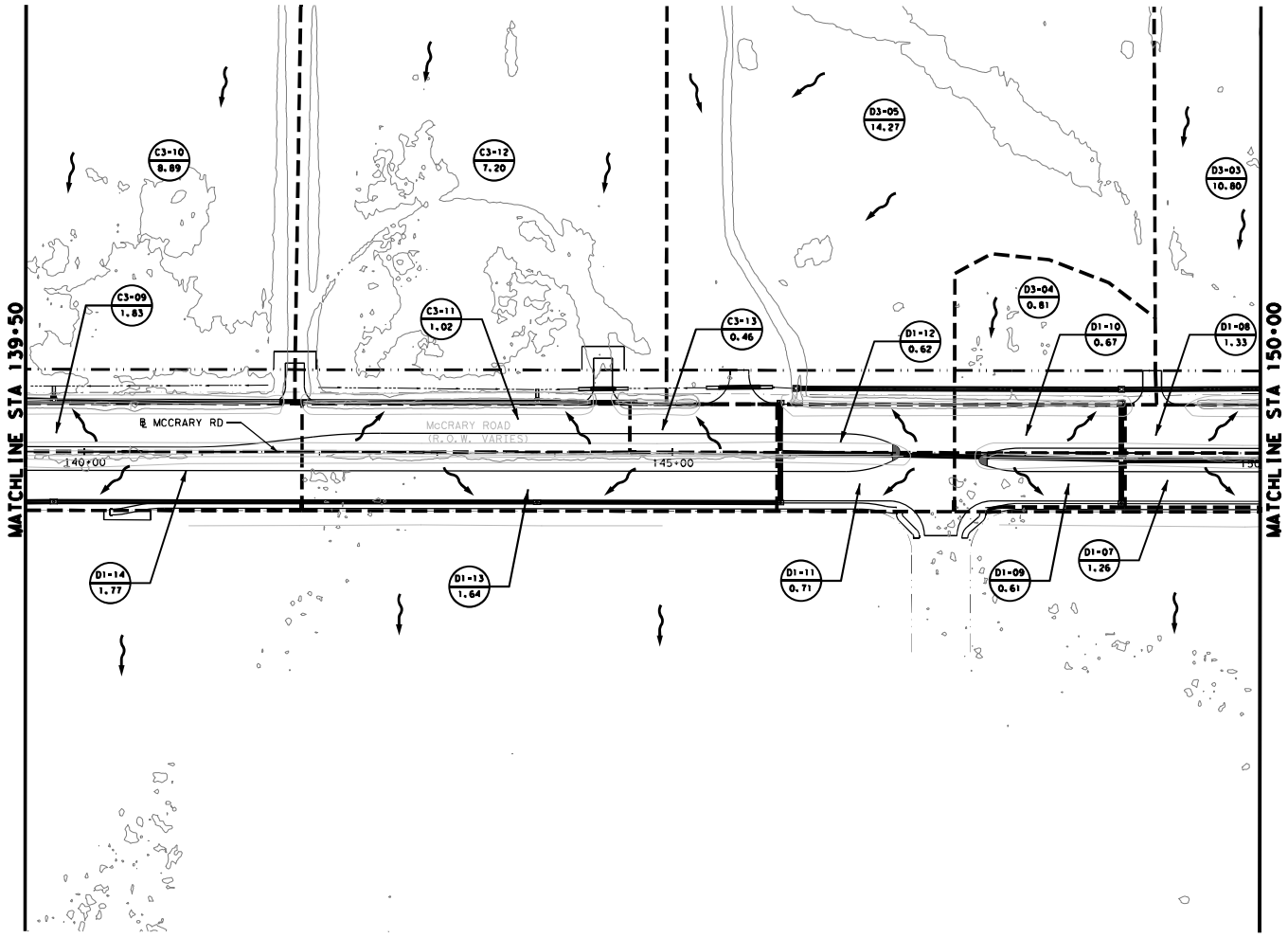

LEGEND

- DRAINAGE AREA BOUNDARY
- STREAM CENTERLINE
- FLOW DIRECTION
- X.XX / X.XX — DRAINAGE AREA ID / 2 YR FLOW (CFS)
- FEMA ZONE AE
- FEMA ZONE A
- 1 FT CONTOUR
- DITCH ℄
- EXIST ROW
- PROP ROW

0 50' 100'
SCALE: 1" = 100'

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS

HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.462.2400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10108974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER
MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

INTERIOR DRAINAGE AREA MAP
STA 139+50 TO STA 150+00

SHEET 5 OF 8

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	18

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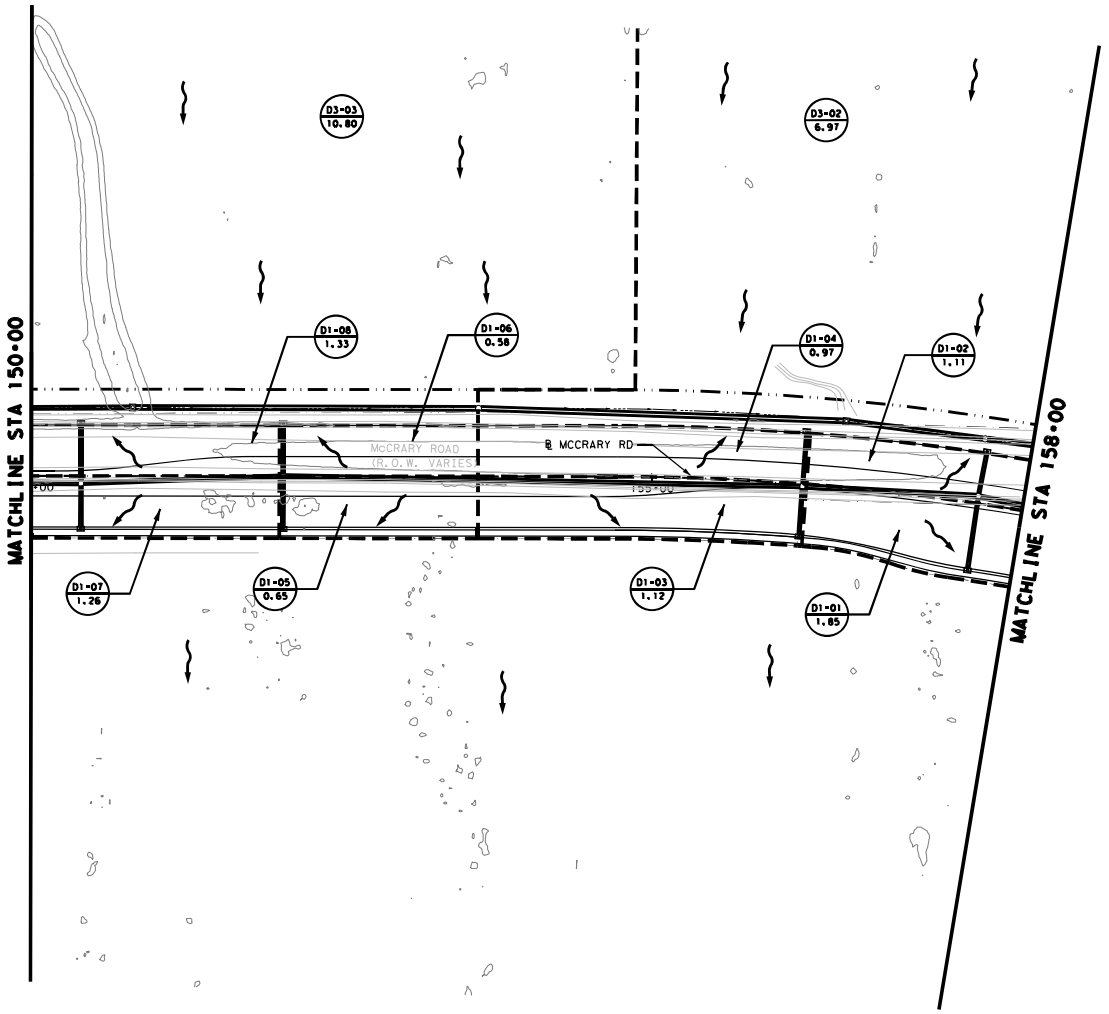

LEGEND

- DRAINAGE AREA BOUNDARY
- STREAM CENTERLINE
- FLOW DIRECTION
- X.XX / X.XX — DRAINAGE AREA ID / 2 YR FLOW (CFS)
- FEMA ZONE AE
- FEMA ZONE A
- 1 FT CONTOUR
- DITCH ℄
- EXIST ROW
- PROP ROW

0 50' 100'
SCALE: 1" = 100'

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.428.2400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10199974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER
MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

INTERIOR DRAINAGE AREA MAP
STA 150+00 TO STA 158+00

SHEET 6 OF 8

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	19

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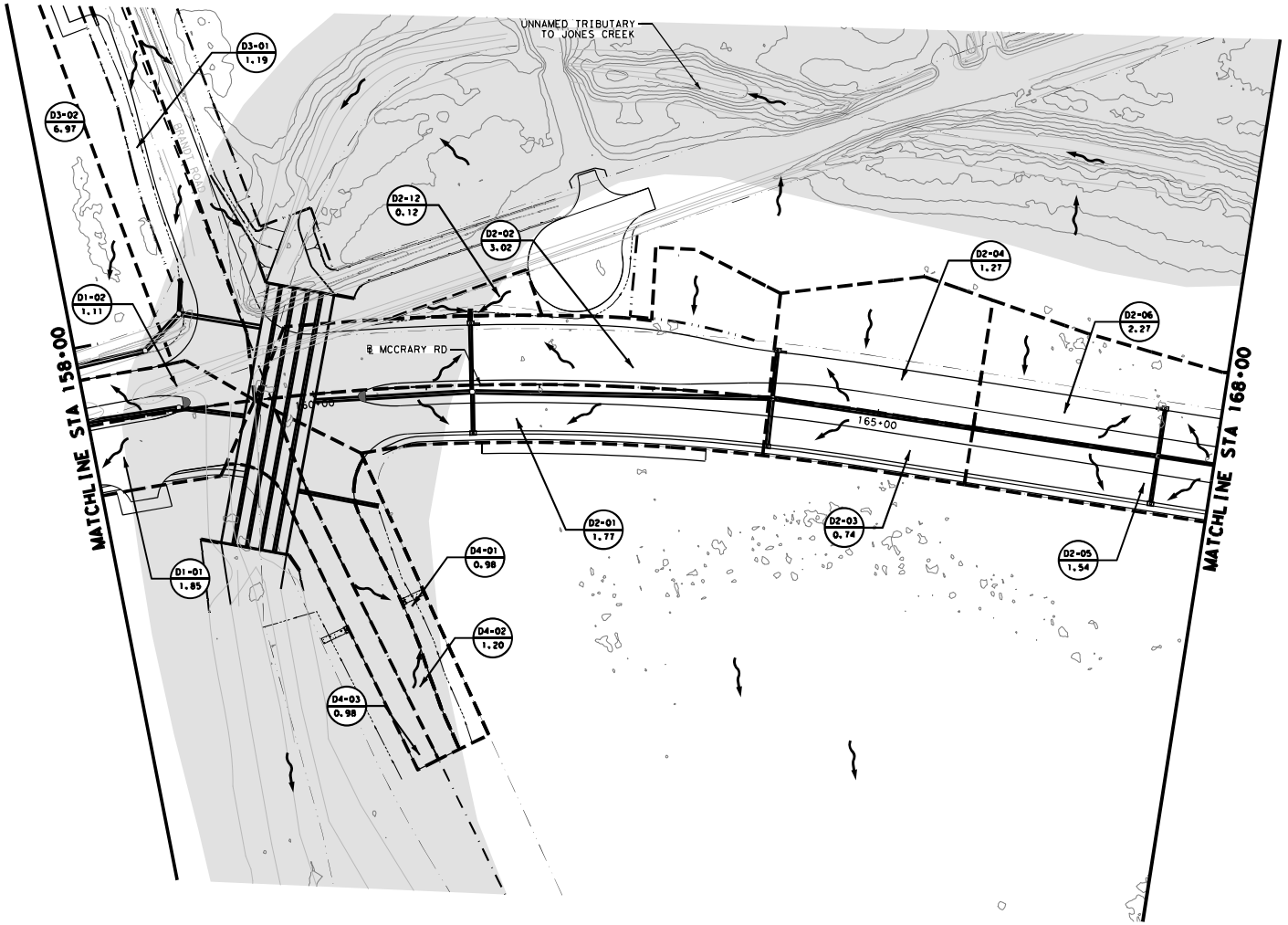

LEGEND

- DRAINAGE AREA BOUNDARY
- STREAM CENTERLINE
- FLOW DIRECTION
- X.XX / X.XX — DRAINAGE AREA ID / 2 YR FLOW (CFS)
- FEMA ZONE AE
- FEMA ZONE A
- 1 FT CONTOUR
- DITCH ℄
- EXIST ROW
- PROP ROW

0 50' 100'
SCALE: 1" = 100'

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.428.2400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10108974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER
MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

INTERIOR DRAINAGE AREA MAP
STA 158+00 TO STA 168+00

SHEET 7 OF 8

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	20

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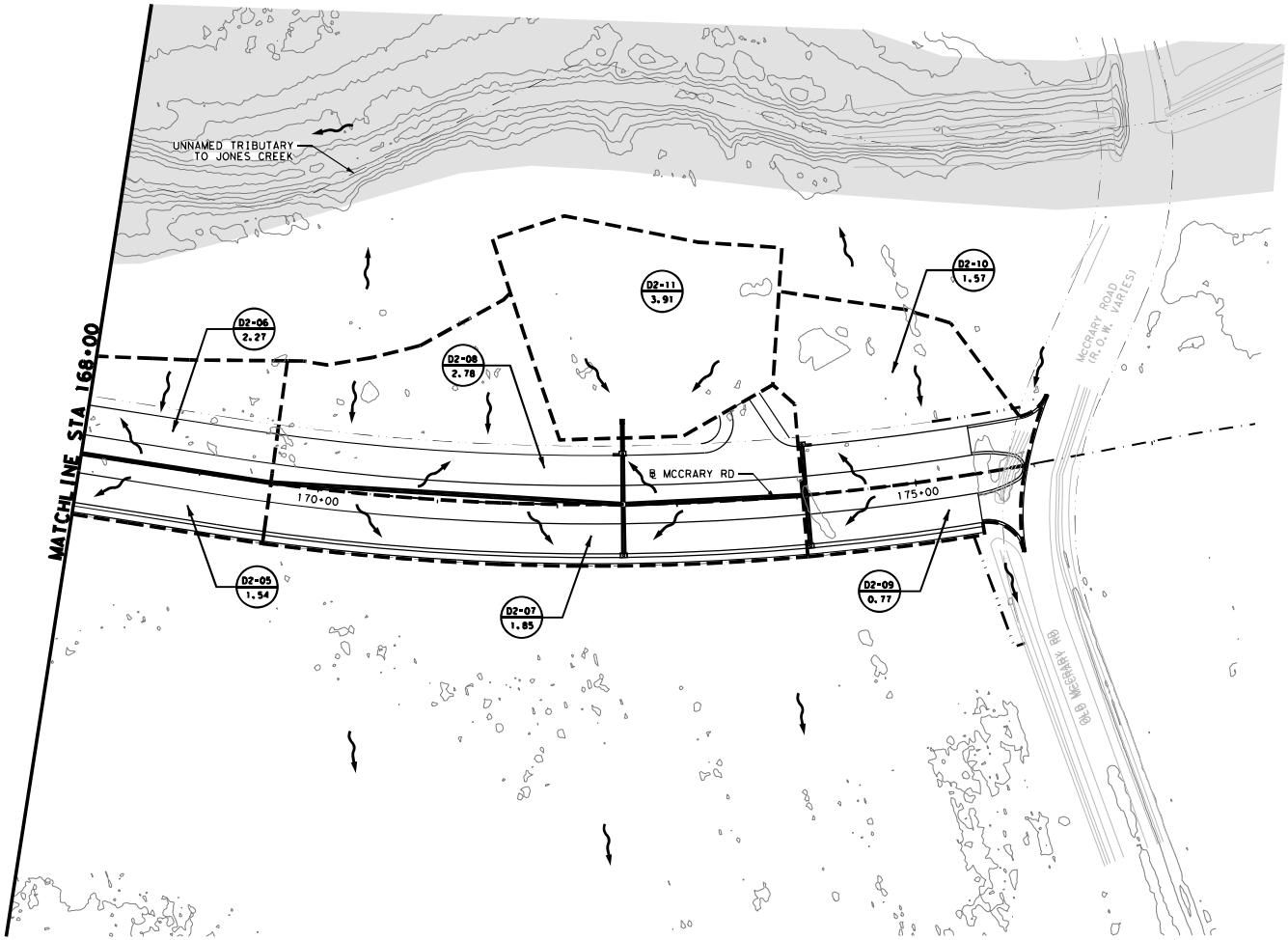

LEGEND

- DRAINAGE AREA BOUNDARY
- STREAM CENTERLINE
- FLOW DIRECTION
- DRAINAGE AREA ID (X.XX) / 2 YR FLOW (CFS) (X.XX)
- FEMA ZONE AE
- FEMA ZONE A
- 1 FT CONTOUR
- DITCH ℄
- EXIST ROW
- PROP ROW

0 50' 100'
SCALE: 1" = 100'

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.428.2400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10108974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER
MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

INTERIOR DRAINAGE AREA MAP
STA 168+00 TO END

SHEET 8 OF 8

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	21

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CURB INLET COMPUTATIONS

INLET NO	INLET TYPE	INLET CONTROL	INLET STATION	DRAINAGE AREA NO	Q_o FROM AREA CFS	CARRY OVER FLOW CFS	TOTAL Q_o CFS	LONGITUDINAL ROAD SLOPE FT/FT	DEPTH OF FLOW FT	ALLOWABLE PONDED WIDTH FT	PONDED WIDTH FT	LENGTH INLET REQ'D FT	LENGTH INLET ACTUAL FT	BY PASS FLOW CFS	REMARKS	
CI-A-01B	FBC TYPE C INLET (SPL)	41.00'LT BL*MCCRARY	105+00.00	A-01B	1.6	0	0.7	---	0.10	12.00	6.48	0.0	5.0	0	*SUMP	
CI-A-02B	FBC TYPE C INLET (SPL)	41.00'RT BL*MCCRARY	105+00.00	A-02B	1.6	0	0.7	---	0.10	12.00	6.48	0.0	5.0	0	*SUMP	
CI-B-01A	FBC TYPE C INLET (SPL)	41.00'LT BL*MCCRARY	112+60.00	B-01A	3.0	0	1.4	---	0.15	12.00	7.71	6.9	5.0	0	*SUMP	
CI-B-01B	FBC TYPE C INLET (SPL)	41.00'LT BL*MCCRARY	109+45.00	B-01B	3.9	0	1.8	---	0.18	12.00	8.99	0.0	5.0	0	*SUMP	
CI-B-02A	FBC TYPE C INLET (SPL)	41.00'RT BL*MCCRARY	113+91.00	B-02A	0.7	0	0.4	0.0035	0.12	12.00	6.06	3.2	5.0	0	C.O. TO	B-02B
CI-B-02B	FBC TYPE C INLET (SPL)	41.00'RT BL*MCCRARY	112+60.00	B-02C	1.8	0	0.8	---	0.11	12.00	6.35	5.2	5.0	0	*SUMP	
CI-B-02C	FBC TYPE C INLET (SPL)	41.00'RT BL*MCCRARY	109+45.00	B-02D	1.8	0	1.3	---	0.14	12.00	7.43	0.0	5.0	0	*SUMP	
CI-B-02D	FBC TYPE C INLET (SPL)	41.00'LT BL*MCCRARY	116+70.00	B-03A	2.4	0	1.1	---	0.13	12.00	6.92	0.0	5.0	0	*SUMP	
CI-B-02E	FBC TYPE C INLET (SPL)	41.00'LT BL*MCCRARY	117+92.00	B-03B	1.1	0	0.5	0.0035	0.13	12.00	6.61	3.9	5.0	0	C.O. TO	B-02A
CI-B-03A	FBC TYPE C INLET (SPL)	41.00'LT BL*MCCRARY	121+41.00	B-03C	3.4	0	1.6	---	0.17	12.00	8.26	0.0	5.0	0	*SUMP	
CI-B-03B	FBC TYPE C INLET (SPL)	41.00'RT BL*MCCRARY	116+70.00	B-04A	2.1	0	1.0	---	0.12	12.00	6.53	0.0	5.0	0	*SUMP	
CI-B-03C	FBC TYPE C INLET (SPL)	41.00'RT BL*MCCRARY	117+47.00	B-04B	1.4	0	0.7	0.0035	0.15	12.00	7.35	4.5	5.0	0	C.O. TO	B-04A
CI-B-04A	FBC TYPE C INLET (SPL)	41.00'RT BL*MCCRARY	121+41.00	B-04C	3.4	0	1.6	---	0.17	12.00	8.25	0.0	5.0	0	*SUMP	

RUNOFF COMPUTATIONS - RATIONAL METHOD

AREA ID	AREA (ac)	C	CA	Tc (MIN)	I_x (IN/HR)	Q_x (CFS)	I_m (IN/HR)	Q_m (CFS)	TO INLET/JUNCTION
A-01	2.18	0.37	0.81	10	12.04	9.7	12.04	9.7	
A-02	2.53	0.37	0.93	10	12.04	11.2	12.04	11.2	
B-01	17.39	0.32	5.56	20	8.68	48.3	8.68	48.3	
B-02	4.79	0.38	1.82	10	12.04	22.0	12.04	22.0	
B-03	6.99	0.35	2.46	19	8.90	21.9	8.90	21.9	
B-04	4.79	0.38	1.80	10	12.04	21.6	12.04	21.6	
C-01	5.51	0.33	1.83	23	8.10	14.8	8.10	14.8	
C-06	0.57	0.67	0.38	10	12.04	4.6	12.04	4.6	
C-07	9.73	0.31	3.05	39	6.17	18.8	6.17	18.8	
A-01A	0.18	0.69	0.12	10	12.04	1.4	12.04	1.4	
A-01B	0.19	0.69	0.13	10	12.04	1.6	12.04	1.6	CI-A-01B
A-02A	0.18	0.69	0.12	10	12.04	1.4	12.04	1.4	CI-A-02A
A-02B	0.19	0.69	0.13	10	12.04	1.6	12.04	1.6	CI-A-02B
B-01A	0.36	0.69	0.25	10	12.04	3.0	12.04	3.0	CI-B-01A
B-01B	0.47	0.69	0.32	10	12.04	3.9	12.04	3.9	CI-B-01B
B-02A	0.09	0.69	0.06	10	12.04	0.7	12.04	0.7	CI-B-02A
B-02C	0.27	0.69	0.19	10	12.04	1.8	12.04	2.2	CI-B-02B
B-02D	0.47	0.69	0.32	10	5.66	1.8	12.04	3.9	CI-B-02C
B-03A	0.29	0.69	0.20	10	12.04	2.4	12.04	2.4	CI-B-02D
B-03B	0.13	0.69	0.09	10	12.04	1.1	12.04	1.1	CI-B-02E
B-03C	0.41	0.69	0.28	10	12.04	3.4	12.04	3.4	CI-B-03A
B-04A	0.25	0.69	0.17	10	12.04	2.1	12.04	2.1	CI-B-03B
B-04B	0.17	0.69	0.12	10	12.04	1.4	12.04	1.4	CI-B-03C
B-04C	0.41	0.69	0.28	10	12.04	3.4	12.04	3.4	CI-B-04A

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.4282400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10108974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER

R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER

MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

HYDRAULIC CALCULATIONS
SYSTEM A, B, C

SHEET 1 OF 5

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	22

...\5. Drainage\PD_DHCØ1.dgn

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DATE: 11/1/2022 3:35:47 PM

CURB INLET COMPUTATIONS

INLET NO	INLET TYPE	INLET CONTROL	INLET STATION	DRAINAGE AREA NO	Q_s FROM AREA CFS	CARRY OVER FLOW CFS	TOTAL Q_s CFS	LONGITUDINAL ROAD SLOPE FT/FT	DEPTH OF FLOW FT	ALLOWABLE PONDED WIDTH FT	PONDED WIDTH FT	LENGTH INLET REQ'D FT	LENGTH INLET ACTUAL FT	BY PASS FLOW CFS	REMARKS
CI-C3-01	FBC TYPE C INLET (SPL)	41.00'RT BL*MCCRARY	125+30.00	C3-01	1.2	0	1.2	---	0.14	12.00	7.16	0.0	5.0	0	*SUMP
CI-C3-02	FBC TYPE C INLET (SPL)	41.00'LT BL*MCCRARY	125+30.00	C3-02	1.2	0	1.2	---	0.14	12.00	7.14	0.0	5.0	0	*SUMP
CI-C3-03	FBC TYPE C INLET	41.00'LT BL*MCCRARY	128+85.00	C3-03	1.4	0	1.4	---	0.15	12.00	7.57	0.0	5.0	0	*SUMP
CI-C3-05	FBC TYPE C INLET	41.00'RT BL*MCCRARY	132+31.00	C3-05	1.3	0	1.3	---	0.15	12.00	7.40	0.0	5.0	0	*SUMP
CI-C3-06	FBC TYPE C INLET (4 FT)	41.00'LT BL*MCCRARY	132+31.00	C3-06	1.8	0	1.8	---	0.22	12.00	10.74	0.0	5.0	0	*SUMP
CI-C3-07	FBC TYPE C INLET (4 FT)	41.00'LT BL*MCCRARY	136+20.00	C3-07	1.2	0	1.2	---	0.17	12.00	8.46	0.0	5.0	0	*SUMP
CI-C3-09	FBC TYPE C INLET (4 FT)	41.00'LT BL*MCCRARY	139+74.00	C3-09	1.8	0	1.8	---	0.22	12.00	10.99	0.0	5.0	0	*SUMP
CI-C3-11	FBC TYPE C INLET	41.00'LT BL*MCCRARY	143+85.00	C3-11	1.0	0	1.0	---	0.12	12.00	6.68	0.0	5.0	0	*SUMP
CI-C3-13	FBC TYPE C INLET	41.00'LT BL*MCCRARY	144+67.00	C3-13	0.5	0	0.5	0.0035	0.13	12.00	6.40	3.7	5.0	0	C.O. TO C3-11
CI-C3-14	FBC TYPE C INLET (SPL)	41.00'RT BL*MCCRARY	128+85.00	C3-14	1.7	0	1.7	---	0.17	6.50	2.39	0.0	5.0	0	*SUMP

DROP/TRAFFIC INLET COMPUTATIONS

INLET NO	INLET TYPE	INLET CONTROL	INLET STATION	DRAINAGE AREA NO	Q_s CFS	INLET HEAD FT	REQ'D AREA FT²	INLET AREA FT²	INLET TYPE	CARRY OVER	REMARKS
DI-C3-00	FBC TYPE E INLET	44.50'RT BL*MCCRARY	125+44.00	C3-00	0.4	0.06	0.55	n/a	FBC TYPE E INLET	0 C.O. FROM	*SUMP
DI-C3-04	FBC TYPE A INLET (MOD)	49.10'RT BL*MCCRARY	132+31.00	C3-04	0.5	0.07	0.60	6.14	FBC TYPE A INLET (MOD)	0 C.O. FROM	*SUMP
DI-C3-08	FBC TYPE A INLET	54.00'RT BL*MCCRARY	136+20.00	C3-08	5.6	0.51	2.78	4.14	FBC TYPE A INLET	0 C.O. FROM	*SUMP

RUNOFF COMPUTATIONS - RATIONAL METHOD

AREA ID	AREA (ac)	C	CA	Tc (MIN)	I_s (IN/HR)	Q_s (CFS)	I_{100} (IN/HR)	Q_{100} (CFS)	TO INLET/JUNCTION
C-01	5.51	0.33	1.83	23	3.87	7.1	8.10	14.8	
C-06	0.57	0.67	0.38	10	5.66	2.2	12.04	4.6	
C-07	9.73	0.31	3.05	39	2.89	8.8	6.17	18.8	
C3-00	0.17	0.37	0.06	10	5.66	0.4	12.04	0.8	DI-C3-00
C3-01	0.32	0.69	0.22	10	5.66	1.2	12.04	2.6	CI-C3-01
C3-02	0.32	0.69	0.22	10	5.66	1.2	12.04	2.6	CI-C3-02
C3-03	0.35	0.72	0.25	10	5.66	1.4	12.04	3.0	CI-C3-03
C3-04	0.17	0.49	0.08	10	5.66	0.5	12.04	1.0	DI-C3-04
C3-05	0.34	0.70	0.24	10	5.66	1.3	12.04	2.9	CI-C3-05
C3-06	0.37	0.85	0.31	10	5.66	1.8	12.04	3.8	CI-C3-06
C3-07	0.30	0.73	0.22	10	5.66	1.2	12.04	2.6	CI-C3-07
C3-08	4.18	0.30	1.27	18	4.38	5.6	9.14	11.6	DI-C3-08
C3-09	0.38	0.85	0.32	10	5.66	1.8	12.04	3.9	CI-C3-09
C3-10	10.18	0.30	3.07	39	2.89	8.9	6.17	19.0	SET-C3-10
C3-11	0.26	0.69	0.18	10	5.66	1.0	12.04	2.2	CI-C3-11
C3-12	8.30	0.30	2.49	39	2.89	7.2	6.17	15.4	SET-C3-12
C3-13	0.12	0.69	0.08	10	5.66	0.5	12.04	1.0	CI-C3-13
C3-14	0.35	0.85	0.29	10	5.66	1.7	12.04	3.5	CI-C3-14

STORM DRAIN COMPUTATIONS

LINE NO	FROM	TO	LENGTH (FT)	TC (MIN)	CUMLATIVE AREA (ACRE)	I_s (in/hr)	Q_s (CFS)	DESIGN STR SIZE	DESIGN SLOPE %	DESIGN CAP (CFS)	DESIGN VEL (FT/SEC)
LINE C3	DI-C3-04	CI-C3-05	3.36	10.10	0.50	5.63	0.5	18" RCP	0.10	3.9	0.3
LINE C3	SET-C3-10	CI-C3-09	3.04	39.01	18.68	2.89	8.9	24" RCP	1.59	33.2	2.8
LINE C3	CI-C3-11	CI-C3-09	406.00	39.01	18.68	2.89	8.0	24" RCP	0.10	8.0	2.5
LINE C3	SET-C3-12	CI-C3-11	2.00	39.02	8.68	2.89	7.2	24" RCP	0.60	18.8	2.3
LINE C3	CI-C3-13	CI-C3-11	77.00	39.02	8.68	2.89	0.5	24" RCP	0.10	7.7	0.1
LINE C3	DI-C3-08	CI-C3-07	7.76	40.64	23.16	2.82	5.6	18" RCP	0.25	6.1	3.1
LINE C3	CI-C3-09	CI-C3-07	345.37	40.64	23.16	2.82	17.3	36" RCP	0.10	24.6	2.6
LINE C3	CI-C3-07	CI-C3-06	383.95	42.55	23.53	2.74	21.1	36" RCP	0.09	23.5	3.2
LINE C3	CI-C3-05	MH-C3-04	33.25	42.79	24.03	2.74	1.8	24" RCP	0.10	7.7	0.6
LINE C3	CI-C3-06	MH-C3-04	45.25	42.79	24.03	2.74	21.3	36" RCP	0.10	24.1	3.4
LINE C3	MH-C3-04	MH-C3-03	68.28	43.16	24.03	2.74	22.1	36" RCP	0.10	22.7	3.8
LINE C3	CI-C3-03	MH-C3-02	33.25	44.59	24.38	2.67	1.4	24" RCP	0.10	7.7	0.4
LINE C3	MH-C3-03	MH-C3-02	270.57	44.59	24.38	2.67	22.1	36" RCP	0.10	22.7	3.8
LINE C3	MH-C3-02	MH-C3-01	337.55	46.34	24.38	2.67	22.3	36" RCP	0.10	22.7	4.3
LINE C3	MH-C3-01	DI-C3-00	40.75	46.56	24.55	2.67	22.3	4'x2' SBC	0.10	30.7	2.8

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.4282400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10108974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
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FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

HYDRAULIC CALCULATIONS
SYSTEM C3

SHEET 2 OF 5

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	23

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CURB INLET COMPUTATIONS

INLET NO	INLET TYPE	INLET CONTROL	INLET STATION	DRAINAGE AREA NO	Q_o FROM AREA (CFS)	CARRY OVER FLOW (CFS)	TOTAL Q2 (CFS)	LONGITUDINAL ROAD SLOPE (FT/FT)	DEPTH OF FLOW (FT)	ALLOWABLE PONDED WIDTH (FT)	PONDED WIDTH (FT)	LENGTH INLET REQ'D (FT)	LENGTH INLET ACTUAL (FT)	BY PASS FLOW (CFS)	REMARKS
CI-D1-12	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	132+65.00	C3-12	1.4	0	1.4	---	0.15	12.00	7.76	0.0	5.0	0	*SUMP
CI-D1-01	FBC TYPE C INLET	52.95 'RT BL*MCCRARY	157+63.62	D1-01	1.8	0	1.9	---	0.18	12.00	9.19	0.0	5.0	0	*SUMP
CI-D1-02	FBC TYPE C INLET	41.00 'LT BL*MCCRARY	157+63.62	D1-02	1.1	0	1.1	---	0.13	12.00	6.92	0.0	5.0	0	*SUMP
CI-D1-03	FBC TYPE C INLET	41.21 'RT BL*MCCRARY	156+22.01	D1-03	1.1	0.04	1.1	0.0035	0.18	12.00	8.95	5.9	5.0	0.04	C.O. TO D1-01
CI-D1-04	FBC TYPE C INLET	41.00 'LT BL*MCCRARY	156+22.00	D1-04	1.0	0.01	1.0	0.0035	0.17	12.00	8.49	5.5	5.0	0.01	C.O. TO D1-02
CI-D1-05	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	152+03.00	D1-05	0.6	0	0.6	0.0040	0.14	12.00	7.12	4.6	5.0	0	C.O. TO D1-07
CI-D1-06	FBC TYPE C INLET	41.00 'LT BL*MCCRARY	152+03.00	D1-06	0.6	0	0.6	0.0040	0.14	12.00	6.84	4.3	5.0	0	C.O. TO D1-08
CI-D1-07	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	150+40.00	D1-07	1.3	0	1.3	---	0.14	12.00	7.21	0.0	5.0	0	*SUMP
CI-D1-08	FBC TYPE C INLET	41.00 'LT BL*MCCRARY	150+40.00	D1-08	1.3	0	1.3	---	0.15	12.00	7.38	0.0	5.0	0	*SUMP
CI-D1-09	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	148+82.00	D1-09	0.6	0	0.6	0.0035	0.14	12.00	7.14	4.3	5.0	0	C.O. TO D1-07
CI-D1-10	FBC TYPE C INLET	41.00 'LT BL*MCCRARY	148+82.00	D1-10	0.7	0	0.7	0.0035	0.15	12.00	7.37	4.5	5.0	0	C.O. TO D1-08
CI-D1-11	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	145+92.00	D1-11	0.7	0	0.7	0.0035	0.15	12.00	7.53	4.6	5.0	0	C.O. TO D1-13
CI-D1-12	FBC TYPE C INLET	41.00 'LT BL*MCCRARY	145+92.00	D1-12	0.6	0	0.6	0.0035	0.14	12.00	7.16	4.3	5.0	0	C.O. TO C3-11
CI-D1-13	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	143+85.00	D1-13	1.6	0	1.6	---	0.17	12.00	8.37	0.0	5.0		*SUMP
CI-D1-14	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	139+74.00	D1-14	1.8	0	1.8	---	0.18	12.00	8.80	0.0	5.0		*SUMP
CI-D1-15	FBC TYPE C INLET	53.00 'RT BL*MCCRARY	136+20.00	D1-15	2.0	0	2.0	---	0.19	12.00	9.46	0.0	5.0		*SUMP

RUNOFF COMPUTATIONS - RATIONAL METHOD

AREA ID	AREA (ac)	C	CA	Tc (MIN)	I_1 (IN/HR)	Q_1 (CFS)	I_{100} (IN/HR)	Q_{100} (CFS)	TO INLET/JUNCTION
D1-01	0.41	0.80	0.33	10	5.66	1.8	12.04	3.9	CI-D1-01
D1-02	0.28	0.70	0.20	10	5.66	1.1	12.04	2.4	CI-D1-02
D1-03	0.30	0.65	0.20	10	5.66	1.1	12.04	2.4	CI-D1-03
D1-04	0.25	0.69	0.17	10	5.66	1.0	12.04	2.1	CI-D1-04
D1-05	0.18	0.63	0.12	10	5.66	0.6	12.04	1.4	CI-D1-05
D1-06	0.15	0.69	0.10	10	5.66	0.6	12.04	1.2	CI-D1-06
D1-07	0.35	0.63	0.22	10	5.66	1.3	12.04	2.7	CI-D1-07
D1-08	0.30	0.80	0.24	10	5.66	1.3	12.04	2.8	CI-D1-08
D1-09	0.16	0.69	0.11	10	5.66	0.6	12.04	1.3	CI-D1-09
D1-10	0.14	0.86	0.12	10	5.66	0.7	12.04	1.4	CI-D1-10
D1-11	0.17	0.71	0.12	10	5.66	0.7	12.04	1.5	CI-D1-11
D1-12	0.14	0.77	0.11	10	5.66	0.6	12.04	1.3	CI-D1-12
D1-13	0.46	0.63	0.29	10	5.66	1.6	12.04	3.5	CI-D1-13
D1-14	0.47	0.66	0.31	10	5.66	1.8	12.04	3.8	CI-D1-14
D1-15	0.55	0.64	0.35	10	5.66	2.0	12.04	4.2	CI-D1-15

STORM DRAIN COMPUTATIONS

LINE NO	FROM	TO	LENGTH (FT)	TC (MIN)	CUMLATIVE AREA (ACRE)	I_1 (in/hr)	Q_1 (CFS)	DESIGN STR SIZE	DESIGN SLOPE %	DESIGN CAP (CFS)	DESIGN VEL (FT/SEC)
LINE D1	CI-D1-15	MH-D1-08	98.51	10.86	0.54	5.65	2.0	24" RCP	0.10	7.7	0.6
LINE D1	MH-D1-08	MH-D1-07	129.72	11.98	0.54	5.65	2.0	24" RCP	0.10	7.7	0.6
LINE D1	MH-D1-07	CI-D1-14	118.76	12.95	1.02	5.09	2.0	24" RCP	0.12	8.5	0.6
LINE D1	CI-D1-14	CI-D1-13	406.00	16.15	1.48	4.61	3.4	24" RCP	0.09	7.4	1.1
LINE D1	CI-D1-13	CI-D1-11	202.00	17.66	1.65	4.42	4.4	24" RCP	0.09	7.5	1.4
LINE D1	CI-D1-11	MH-D1-06	39.25	17.88	1.80	4.39	4.8	24" RCP	0.20	10.9	1.6
LINE D1	CI-D1-12	MH-D1-06	39.25	17.88	1.80	4.39	0.6	24" RCP	0.20	10.9	0.2
LINE D1	CI-D1-09	MH-D1-05	33.25	19.87	2.09	4.17	0.6	24" RCP	0.20	10.9	0.2
LINE D1	CI-D1-10	MH-D1-05	45.25	19.87	2.09	4.17	0.7	24" RCP	0.20	10.9	0.3
LINE D1	MH-D1-06	MH-D1-05	286.56	19.87	2.09	4.17	5.2	24" RCP	0.10	7.8	1.7
LINE D1	CI-D1-07	MH-D1-04	33.25	20.93	2.74	4.06	1.3	24" RCP	0.20	10.9	0.4
LINE D1	CI-D1-08	MH-D1-04	45.25	20.93	2.74	4.06	1.3	24" RCP	0.20	10.9	0.4
LINE D1	MH-D1-05	MH-D1-04	154.50	20.93	2.74	4.06	5.9	24" RCP	0.10	7.7	1.9
LINE D1	CI-D1-05	MH-D1-03	39.25	22.02	3.07	3.96	0.6	24" RCP	0.20	10.9	0.5
LINE D1	CI-D1-06	MH-D1-03	39.25	22.02	3.07	3.96	0.6	24" RCP	0.20	10.9	0.3
LINE D1	MH-D1-04	MH-D1-03	159.61	22.02	3.07	3.96	7.6	24" RCP	0.10	7.7	2.4
LINE D1	CI-D1-03	MH-D1-02	37.46	24.55	3.62	3.74	1.1	24" RCP	0.20	10.9	0.7
LINE D1	CI-D1-04	MH-D1-02	41.25	24.55	3.62	3.74	1.0	24" RCP	0.20	10.9	0.6
LINE D1	MH-D1-03	MH-D1-02	415.28	24.55	3.62	3.74	8.3	30" RCP	0.10	14.0	1.7
LINE D1	CI-D1-01	MH-D1-01	57.20	25.42	4.32	3.67	1.8	24" RCP	0.22	11.4	0.8
LINE D1	CI-D1-02	MH-D1-01	33.25	25.42	4.32	3.67	1.1	24" RCP	0.20	10.9	0.7
LINE D1	MH-D1-02	MH-D1-01	138.46	25.42	4.32	3.67	9.2	30" RCP	0.10	13.9	1.9
LINE D1	MH-D1-01	MH-D1-10	114.16	26.08	4.32	3.67	10.9	30" RCP	0.10	14.0	2.2
LINE D1	MH-D1-10	OUT-D1	55.29	26.40	4.32	---	10.9	30" RCP	0.11	14.3	2.2

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.4282400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10108974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
11/1/2022
R MATTHEW ESTES, P.E. — DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER
11/1/2022
MASHHOOD ALI SHAH, P.E. — DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

HYDRAULIC CALCULATIONS
SYSTEM D1

SHEET 3 OF 5

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	24

...\5. Drainage\PD_DHC03.dgn

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CURB INLET COMPUTATIONS

INLET NO	INLET TYPE	INLET CONTROL	INLET STATION	DRAINAGE AREA NO	Q_o FROM AREA (CFS)	CARRY OVER FLOW (CFS)	TOTAL Q_t (CFS)	LONGITUDINAL ROAD SLOPE (FT/FT)	DEPTH OF FLOW (FT)	ALLOWABLE PONDED WIDTH (FT)	PONDED WIDTH (FT)	LENGTH INLET REQ'D (FT)	LENGTH INLET ACTUAL (FT)	BY PASS FLOW (CFS)	REMARKS
CI-D2-01	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	161+40.50	D2-01	1.8	0	1.8	---	0.18	12.00	8.82	17.1	5.0	0	*SUMP
CI-D2-02	FBC TYPE C-1 INLET	52.97 'LT BL*MCCRARY	161+40.50	D2-02	3.0	0	3.0	---	0.19	12.00	9.68	17.1	10.0	0	*SUMP
CI-D2-03	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	164+06.00	D2-03	0.7	0.00	0.7	0.0051	0.14	12.00	7.15	5.2	5.0	0.00	C.O. TO D2-02
CI-D2-04	FBC TYPE C-1 INLET	41.00 'LT BL*MCCRARY	164+06.00	D2-04	1.3	0	1.3	0.0051	0.18	12.00	8.73	6.9	10.0	0	C.O. TO D2-02
CI-D2-05	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	167+50.00	D2-05	1.5	0	1.5	---	0.16	12.00	8.04	0.0	5.0	0	*SUMP
CI-D2-06	FBC TYPE C-1 INLET	41.00 'LT BL*MCCRARY	167+50.00	D2-06	2.3	0	2.3	---	0.16	12.00	8.42	0.0	10.0	0	*SUMP
CI-D2-07	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	172+55.00	D2-07	1.9	0	1.9	---	0.18	12.00	9.09	0.0	5.0	0	*SUMP
CI-D2-08	FBC TYPE C-1 INLET	41.00 'LT BL*MCCRARY	172+55.00	D2-08	2.8	0	2.8	---	0.18	12.00	9.71	0.0	10.0	0	*SUMP
CI-D2-09	FBC TYPE C INLET	41.00 'RT BL*MCCRARY	174+08.00	D2-09	0.8	0	0.8	0.0035	0.16	12.00	7.79	4.9	5.0	0	C.O. TO D2-07
CI-D2-10	FBC TYPE C-1 INLET	41.00 'LT BL*MCCRARY	174+08.00	D2-10	1.6	0	1.6	0.0035	0.20	12.00	10.16	7.1	10.0	0	C.O. TO D2-09

DROP/TRAFFIC INLET COMPUTATIONS

INLET NO	INLET TYPE	INLET CONTROL	INLET STATION	DRAINAGE AREA NO	Q_o (CFS)	INLET HEAD (FT)	REQ'D AREA (FT^2)	INLET AREA (FT^2)	INLET TYPE	CARRY OVER	REMARKS
DI-D2-11	FBC TYPE A INLET	69.18 'RT BL*MCCRARY	172+55.00	D2-11	3.9	0.40	2.19	4.14	FBC TYPE A INLET	0 C.O. FROM	*SUMP *BY OTHERS
DI-D2-12	FBC TYPE A INLET (MOD)	65.00 'RT BL*MCCRARY	161+40.50	D2-12	0.1	0.04	0.22	4.14	FBC TYPE A INLET (MOD)	0 C.O. FROM	*SUMP

RUNOFF COMPUTATIONS - RATIONAL METHOD

AREA ID	AREA (ac)	C	CA	Tc (MIN)	I_t (IN/HR)	Q_o (CFS)	I_m (IN/HR)	Q_m (CFS)	TO INLET/JUNCTION
D2-01	0.48	0.35	0.17	10	5.66	1.0	12.04	3.8	CI-D2-01
D2-02	0.77	0.35	0.27	10	5.66	1.5	12.04	6.4	CI-D2-02
D2-03	0.21	0.35	0.07	10	5.66	0.4	12.04	1.6	CI-D2-03
D2-04	0.47	0.35	0.17	10	5.66	0.9	12.04	2.7	CI-D2-04
D2-05	0.44	0.35	0.15	10	5.66	0.9	12.04	3.3	CI-D2-05
D2-06	0.81	0.35	0.28	10	5.66	1.6	12.04	4.8	CI-D2-06
D2-07	0.53	0.35	0.19	10	5.66	1.0	12.04	3.9	CI-D2-07
D2-08	0.97	0.35	0.34	10	5.66	1.9	12.04	5.9	CI-D2-08
D2-09	0.21	0.35	0.07	10	5.66	0.4	12.04	1.6	CI-D2-09
D2-10	0.60	0.35	0.21	10	5.66	1.2	12.04	3.3	CI-D2-10
D2-11	1.51	0.46	0.69	10	5.62	3.9	5.62	3.9	DI-D2-11
D2-12	0.06	0.35	0.02	10	5.66	0.1	12.04	0.3	DI-D2-12

STORM DRAIN COMPUTATIONS

LINE NO	FROM	TO	LENGTH (FT)	TC (MIN)	CUMLATIVE AREA (ACRE)	I_t (in/hr)	Q_o (CFS)	DESIGN STR SIZE	DESIGN SLOPE %	DESIGN CAP (CFS)	DESIGN VEL (FT/SEC)
LINE D2	DI-D2-12	CI-D2-02	7.79	10.13	0.84	5.63	0.1	24" RCP	0.50	17.2	0.04
LINE D2	DI-D2-11	CI-D2-08	23.94	10.29	2.48	5.59	3.9	24" RCP	0.30	13.3	2.23
LINE D2	CI-D2-09	MH-D2-09	39.25	10.32	0.81	5.59	0.4	24" RCP	0.20	10.9	0.44
LINE D2	CI-D2-10	MH-D2-09	39.25	10.32	0.81	5.59	1.2	24" RCP	0.20	10.9	1.25
LINE D2	CI-D2-07	MH-D2-06	39.25	10.56	3.74	5.53	1.0	24" RCP	0.20	10.9	1.08
LINE D2	CI-D2-08	MH-D2-06	39.25	10.56	3.74	5.53	5.8	24" RCP	0.10	7.7	4.29
LINE D2	MH-D2-09	MH-D2-06	149.46	10.56	3.74	5.53	1.6	24" RCP	0.20	10.9	1.18
LINE D2	MH-D2-06	MH-D2-05	290.24	11.86	3.74	5.53	8.1	24" RCP	0.20	11.8	2.59
LINE D2	CI-D2-05	MH-D2-04	39.25	13.07	4.98	5.07	0.9	24" RCP	0.20	10.9	2.70
LINE D2	CI-D2-06	MH-D2-04	39.25	13.07	4.98	5.07	1.6	24" RCP	0.20	10.9	3.07
LINE D2	MH-D2-05	MH-D2-04	207.50	13.07	4.98	5.07	8.1	30" RCP	0.10	15.1	1.66
LINE D2	CI-D2-03	MH-D2-03	39.25	15.06	5.67	4.76	0.4	30" RCP	0.20	19.7	0.19
LINE D2	CI-D2-04	MH-D2-03	39.25	15.06	5.67	4.76	0.9	24" RCP	0.20	10.9	1.06
LINE D2	MH-D2-04	MH-D2-03	340.48	15.06	5.67	4.76	9.7	30" RCP	0.10	14.0	1.97
LINE D2	CI-D2-01	MH-D2-01	33.25	16.58	6.99	4.55	1.0	24" RCP	0.20	10.9	0.35
LINE D2	CI-D2-02	MH-D2-01	57.22	16.58	6.99	4.55	1.6	24" RCP	0.37	14.9	0.52
LINE D2	MH-D2-03	MH-D2-01	261.47	16.58	6.99	4.55	10.2	30" RCP	0.10	14.0	2.08
LINE D2	MH-D2-01	OUT-D2	136.57	17.36	6.99	---	11.9	30" RCP	0.10	14.0	2.42

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.4282400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10018974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER

R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER

MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

HYDRAULIC CALCULATIONS SYSTEM D2

SHEET 4 OF 5

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	25

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DROP/TRAFFIC INLET COMPUTATIONS

INLET NO	INLET TYPE	INLET CONTROL	INLET STATION	DRAINAGE AREA NO	Q_o CFS	INLET HEAD FT	REQ'D AREA FT²	INLET AREA FT²	INLET TYPE	CARRY OVER	BY PASS FLOW
DI-D4-01	FBC TYPE A INLET (MOD)	51.00 'RT BL*BRANDT	13+28.11	D4-01	0.7	0.13	0.72	4.14	FBC TYPE A INLET (MOD)	*SUMP C.O. FROM	

CURB INLET COMPUTATIONS

INLET NO	INLET TYPE	INLET CONTROL	INLET STATION	DRAINAGE AREA NO	Q_o FROM AREA CFS	CARRY OVER FLOW CFS	TOTAL Q_o CFS	LONGITUDINAL ROAD SLOPE FT/FT	DEPTH OF FLOW FT	ALLOWABLE PONDED WIDTH FT	PONDED WIDTH FT	LENGTH INLET REQ'D FT	LENGTH INLET ACTUAL FT	BY PASS FLOW CFS	REMARKS
CI-D4-02	FBC TYPE C INLET (SPL)	31.95 'LT BRA	14+15.00	D4-02	1.2		1.2	---	0.14	0.50	7.26	17.1	5.0		*SUMP
CI-D4-03	FBC TYPE C INLET (SPL)	20.50 'RT BRA	14+15.00	D4-03	1.0		1.0	---	0.12	0.50	6.72	17.1	5.0		*SUMP

RUNOFF COMPUTATIONS - RATIONAL METHOD

AREA ID	AREA (ac)	C	CA	Tc (MIN)	I_o (IN/HR)	Q_o (CFS)	I_{100} (IN/HR)	Q_{100} (CFS)	TO INLET/JUNCTION
D4-01	0.14	0.90	0.13	10	5.66	0.7	12.04	1.5	DI-D4-01
D4-02	0.24	0.90	0.21	10	5.66	1.2	12.04	2.5	CI-D4-02
D4-03	0.19	0.90	0.17	10	5.66	1.0	12.04	2.1	CI-D4-03

STORM DRAIN COMPUTATIONS

LINE NO	FROM	TO	LENGTH (FT)	TC (MIN)	CUMLATIVE AREA (ACRE)	I_o (in/hr)	Q_o (CFS)	DESIGN STR SIZE	DESIGN SLOPE %	DESIGN CAP (CFS)	DESIGN VEL (FT/SEC)
LINE D4	DI-D4-01	OUT-D4	68.77	10.45	0.14	---	0.7	24" RCP	0.50	17.2	0.2

DROP/TRAFFIC INLET COMPUTATIONS

INLET NO	INLET TYPE	INLET CONTROL	INLET STATION	DRAINAGE AREA NO	Q_o CFS	INLET HEAD FT	REQ'D AREA FT²	INLET AREA FT²	INLET TYPE	CARRY OVER	BY PASS FLOW
DI-D3-01	TYPE A INLET	38.00 'RT BL*BRANDT	10+77.00	D3-01	1.2	0.18	0.99	4.14	GRAD4S	0 C.O. FROM	*SUMP
DI-D3-02	CoH TYPE E INLET	53.50 'RT BL*MCCRARY	156+52.00	D3-02	7.0	0.59	3.23	n/a	TYPE E INLET	0 C.O. FROM	*SUMP
DI-D3-03	CoH TYPE E INLET	56.00 'RT BL*MCCRARY	150+82.00	D3-03	10.8	0.54	5.26	n/a	TYPE E INLET	0 C.O. FROM	*SUMP
DI-D3-04	CoH TYPE E INLET	54.00 'RT BL*MCCRARY	148+82.00	D3-04	0.8	0.10	0.93	n/a	TYPE E INLET	0 C.O. FROM	*SUMP
DI-D3-05	CoH TYPE E INLET	54.50 'RT BL*MCCRARY	146+05.00	D3-05	14.3	0.64	6.33	n/a	TYPE E INLET	0 C.O. FROM	*SUMP

RUNOFF COMPUTATIONS - RATIONAL METHOD

AREA ID	AREA (ac)	C	CA	Tc (MIN)	I_o (IN/HR)	Q_o (CFS)	I_{100} (IN/HR)	Q_{100} (CFS)	TO INLET/JUNCTION
D3-01	0.73	0.55	0.40	37	2.98	1.2	6.35	2.5	DI-D3-01
D3-02	5.95	0.30	1.80	23	3.87	7.0	8.10	14.6	DI-D3-02
D3-03	9.24	0.30	2.79	23	3.87	10.8	8.10	22.6	DI-D3-03
D3-04	0.44	0.32	0.14	10	5.66	0.8	12.04	1.7	DI-D3-04
D3-05	34.96	0.26	9.12	103.7	1.57	14.3	3.66	33.3	DI-D3-05

STORM DRAIN COMPUTATIONS

LINE NO	FROM	TO	LENGTH (FT)	TC (MIN)	CUMLATIVE AREA (ACRE)	I_o (in/hr)	Q_o (CFS)	DESIGN STR SIZE	DESIGN SLOPE %	DESIGN CAP (CFS)	DESIGN VEL (FT/SEC)
LINE D3	DI-D3-05	DI-D3-04	272.88	105.09	35.40	1.55	14.3	30" RCP	0.12	15.3	2.9
LINE D3	DI-D3-04	DI-D3-03	195.72	106.09	44.64	1.54	14.4	30" RCP	0.12	15.3	2.9
LINE D3	DI-D3-03	MH-D3-04	274.95	107.42	44.64	1.54	18.6	36" RCP	0.10	22.7	2.6
LINE D3	MH-D3-04	DI-D3-02	293.70	108.84	50.59	1.52	18.6	36" RCP	0.10	22.7	2.6
LINE D3	DI-D3-02	MH-D3-03	109.71	109.39	50.59	1.52	21.0	36" RCP	0.10	22.7	3.0
LINE D3	MH-D3-03	MH-D3-02	96.97	109.89	50.59	1.52	21.0	36" RCP	0.10	22.7	3.0
LINE D3	DI-D3-01	MH-D3-01	25.87	110.09	51.33	1.51	1.2	24" RCP	0.09	7.4	0.4
LINE D3	MH-D3-02	MH-D3-01	40.74	110.09	51.33	1.51	21.0	36" RCP	0.12	24.5	3.0
LINE D3	MH-D3-01	OUT-C3	71.19	110.39	51.33	---	21.5	36" RCP	0.14	26.6	3.0

NO	DATE	REVISION	APP

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.462.2400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10108974

STATE OF TEXAS — R MATTHEW ESTES — 101558 — LICENSED PROFESSIONAL ENGINEER
R MATTHEW ESTES, P.E. — 11/1/2022 DATE

STATE OF TEXAS — MASHHOOD ALI SHAH — 82080 — REGISTERED PROFESSIONAL ENGINEER
MASHHOOD ALI SHAH, P.E. — 11/1/2022 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

HYDRAULIC CALCULATIONS
SYSTEM D3, D4

SHEET 5 OF 5

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/1/2022	26

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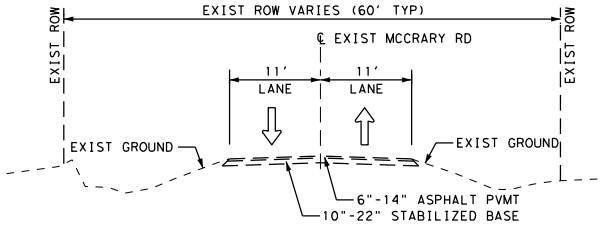
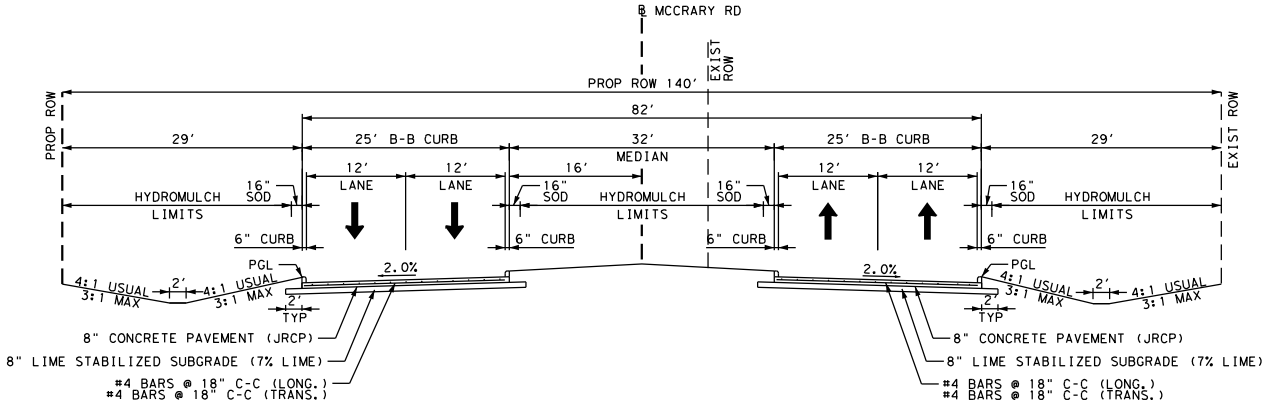


EXISTING MCCRARY ROAD TYPICAL SECTION

* BEGIN TO STA 102+24.85
FM 359/MCCRARY RD INTERSECTION

** STA 107+10.25 TO STA 108+55.79
MEDIAN OPENING.

*** STA 146+48.05 TO STA 147+96.77
MCCRARY RD/MCCRARY PLAINS WAY INTERSECTION



PROPOSED MCCRARY ROAD TYPICAL SECTION

* STA 102+24.85 TO STA 107+10.25 **
** STA 108+55.79 TO STA 126+10.84
STA 142+51.28 TO STA 146+48.05 ***
STA 151+81.00 TO STA 154+62.60

NOT TO SCALE

NO	DATE	REVISION	APP

CivilCorp
ENGINEERS · SURVEYORS
29255 FM 1093, SUITE 7A, FULSHEAR, TEXAS 77441
TEL: (832)252-8100 FAX: (832)252-8103 TXENG FIRM #10283

STATE OF TEXAS
JASON C. KASPAR
108672
LICENSED
PROFESSIONAL ENGINEER
11/3/2022

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY RD SOUTH
FROM FM 359 TO OLD MCCRARY RD

MCCRARY RD
TYPICAL SECTIONS

SHEET 1 OF 4

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/3/2022	27

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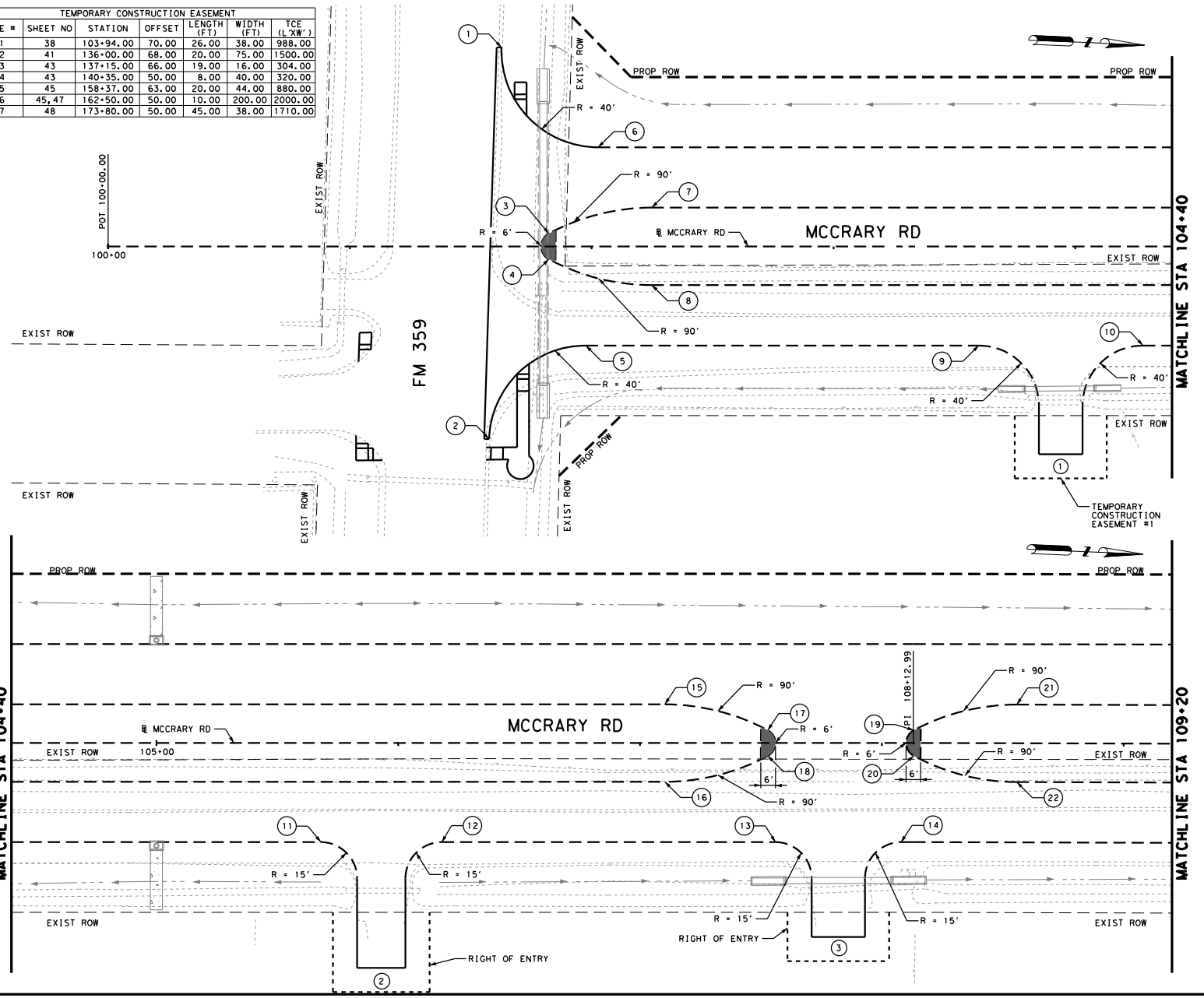
TEMPORARY CONSTRUCTION EASEMENT						
TCE #	SHEET NO	STATION	OFFSET	LENGTH (FT)	WIDTH (FT)	TCE (L'XW')
1	38	103+94.00	70.00	26.00	38.00	988.00
2	41	136+00.00	68.00	20.00	75.00	1500.00
3	43	137+15.00	66.00	19.00	16.00	304.00
4	43	140+35.00	50.00	8.00	40.00	320.00
5	45	158+37.00	63.00	20.00	44.00	880.00
6	45,47	162+50.00	50.00	10.00	200.00	2000.00
7	48	173+80.00	50.00	45.00	38.00	1710.00



LEGEND

- EXIST ROW
- PROPOSED ROW
- PROPOSED BACK OF CURB
- PROPOSED EDGE OF PAVEMEN
- (XX) DRIVEWAY NUMBER

POINT NO.	STATION	OFFSET	LT/RT
1	101+62.70	82.27	LT
2	101+57.56	79.73	RT
3	101+82.26	5.29	LT
4	101+82.26	5.29	RT
5	101+97.54	41.00	RT
6	102+02.68	41.00	LT
7	102+24.85	16.00	LT
8	102+24.85	16.00	RT
9	103+60.00	41.00	RT
10	104+28.00	41.00	RT
11	105+68.00	41.00	RT
12	106+18.00	41.00	RT
13	107+56.00	41.00	RT
14	108+08.00	41.00	RT
15	107+10.25	16.00	LT
16	107+10.25	16.00	RT
17	107+52.84	5.29	LT
18	107+52.84	5.29	RT
19	108+13.20	5.29	LT
20	108+13.20	5.29	RT
21	108+55.79	16.00	LT
22	108+55.79	16.00	RT

NOTES:

1. SEE "DRIVEWAY SUMMARY" SHEET FOR DRIVEWAY INFORMATION.

0 20' 40'
SCALE: 1" = 40' H

NO	DATE	REVISION	APP

CivilCorp
ENGINEERS · SURVEYORS
29255 FM 1093, SUITE 7A, FULSHEAR, TEXAS 77441
TEL: (832)252-8100 FAX: (832)252-8103 TXENG FIRM #10283

STATE OF TEXAS
JASON C. KASPAR
108672
LICENSED
PROFESSIONAL ENGINEER
11/3/2022

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY RD SOUTH
FROM FM 359 TO OLD MCCRARY RD

PAVEMENT GEOMETRIC LAYOUT
BEGIN TO STA 109+20

SHEET 1 OF 11

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/3/2022	38

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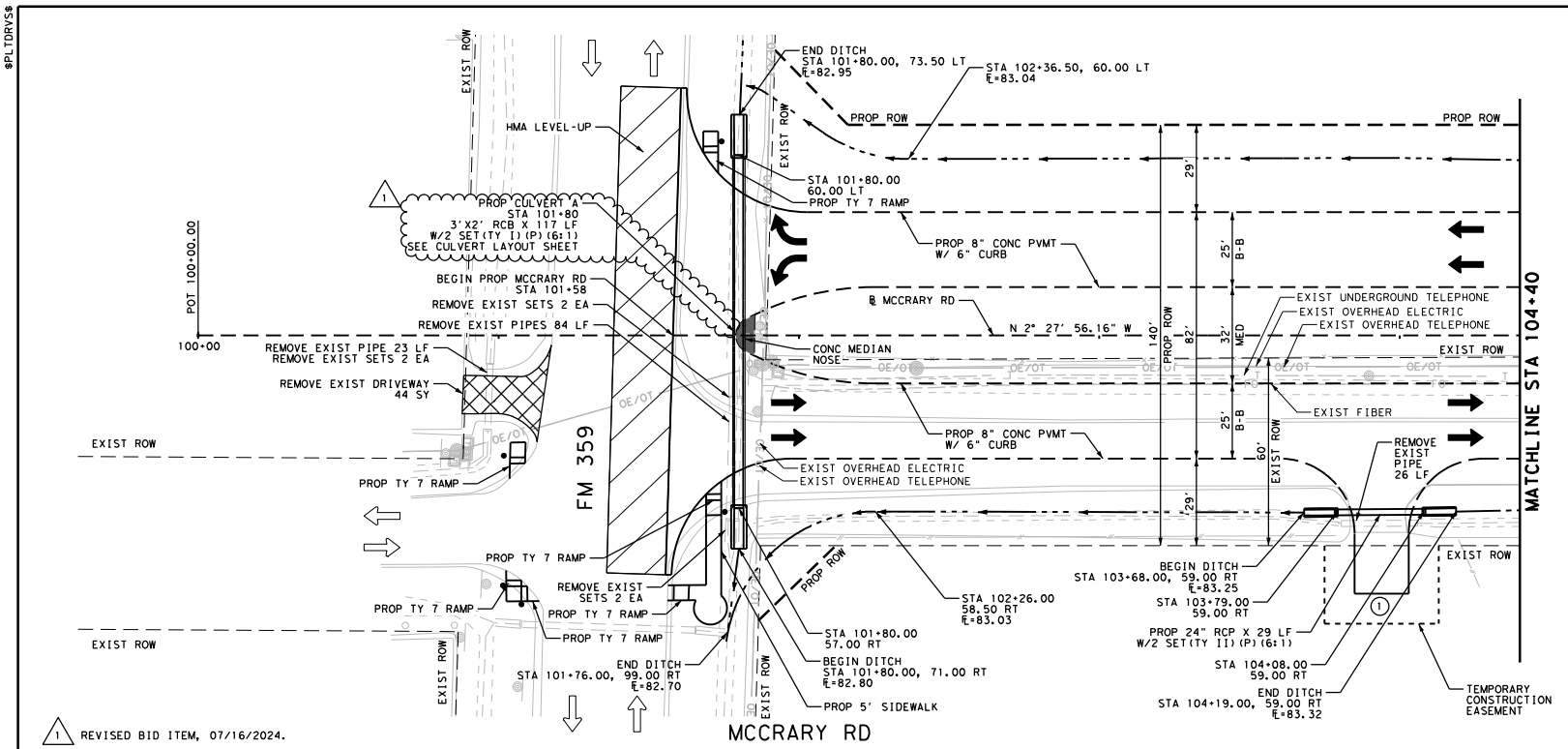

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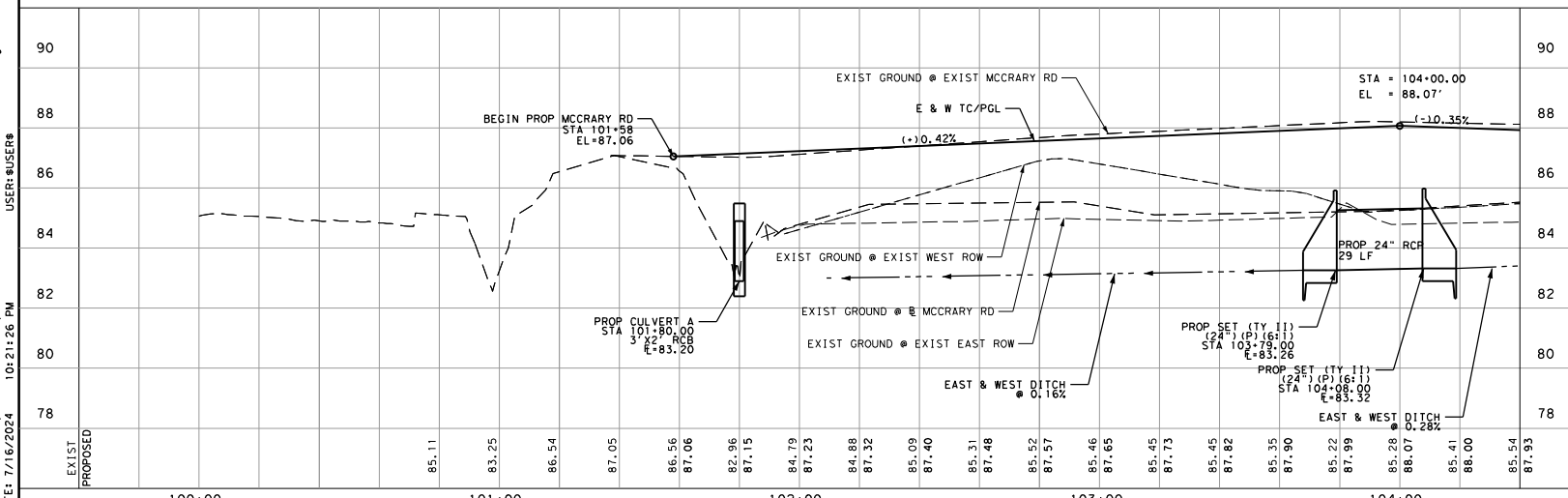

LEGEND

- PROPOSED TRAFFIC
- EXIST ROW
- PROPOSED ROW
- PROPOSED BACK OF CURB
- PROPOSED EDGE OF PAVEMENT
- PROPOSED DITCH
- (XX) DRIVEWAY NUMBER
- FLOW ARROW

NOTES:

1. ALL PAVEMENT DIMENSIONS AND OFFSETS ARE BACK OF CURB UNLESS OTHERWISE NOTED.
2. SEE "TYPICAL SECTIONS" PLAN SHEETS FOR MORE INFORMATION.
3. SEE "PAVEMENT GEOMETRICS LAYOUTS" FOR PAVING LIMITS AND TEMPORARY CONSTRUCTION EASEMENT INFORMATION.
4. SEE "DRIVEWAY SUMMARY" SHEET FOR DRIVEWAY AND TEMPORARY CONSTRUCTION EASEMENT INFORMATION.
5. SPECIFIED PIPE MUST BE RCP.

0 20' 40'
SCALE: 1" = 40' H
1" = 4' V

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.428.2400
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10018074

CivilCorp ENGINEERS • SURVEYORS
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STATE OF TEXAS
JASON C. KASPAR
108672
LICENSED PROFESSIONAL ENGINEER
7/16/2024
JASON C. KASPAR, P.E.

STATE OF TEXAS
R MATTHEW ESTES
101558
REGISTERED PROFESSIONAL ENGINEER
7/16/2024
R MATTHEW ESTES, P.E.

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY RD SOUTH
FROM FM 359 TO OLD MCCRARY RD

PLAN & PROFILE
BEGIN TO STA 104+40

SHEET 1 OF 18

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
7/16/2024	49

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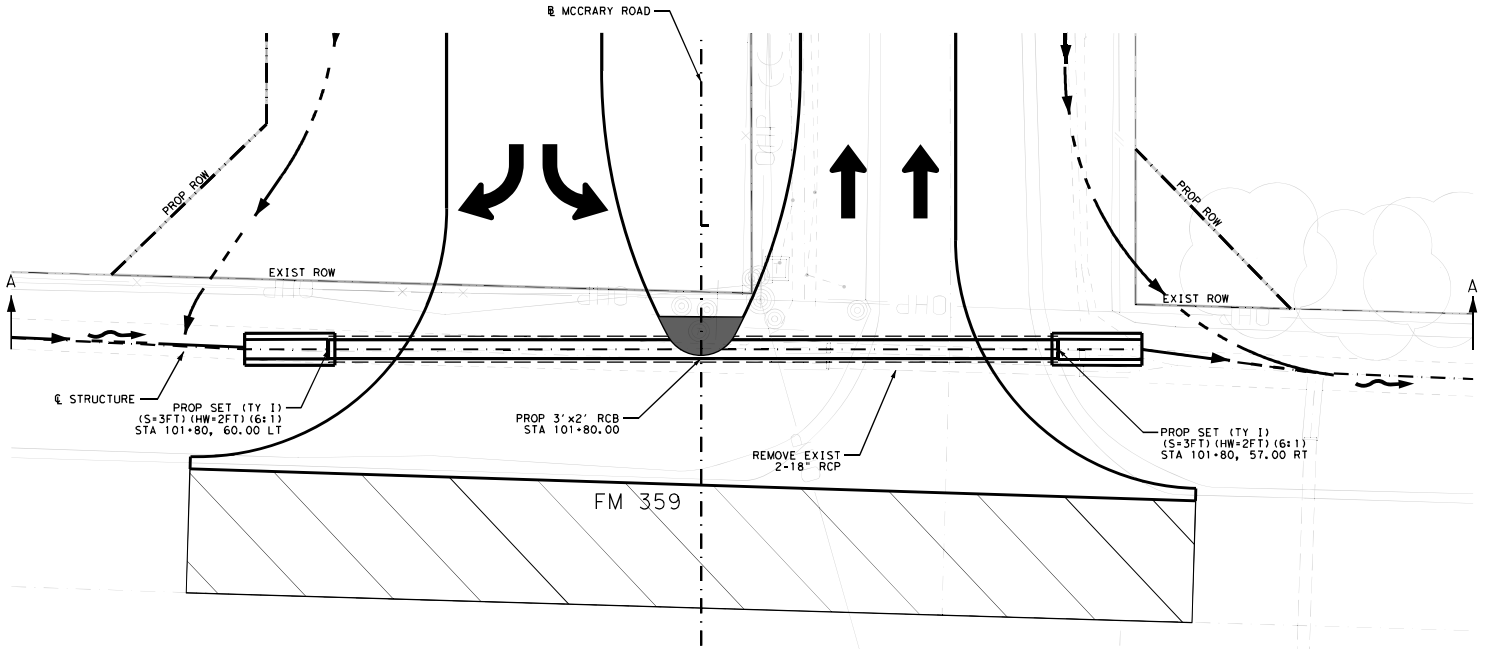


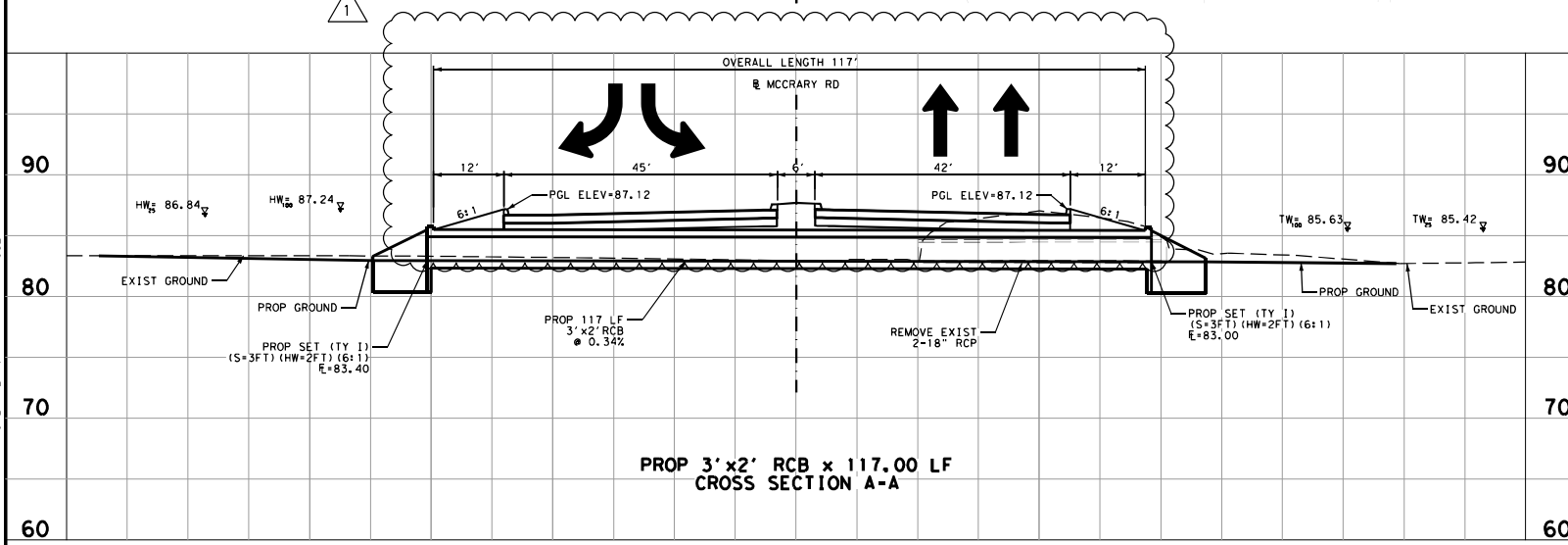
LEGEND

- PROP TRAFFIC FLOW
- PROP ROW
- EXIST ROW
- DITCH CENTERLINE
- FLOW DIRECTION

N

0 10' 20'

SCALE: 1" = 20' H
1" = 10' V



PROP 3'x2' RCB x 117.00 LF
CROSS SECTION A-A

NO	DATE	REVISION	APP
1	7/16/24	DIMENSIONS ADDED	ALS

PAPE-DAWSON ENGINEERS
HOUSTON | SAN ANTONIO | AUSTIN | FORT WORTH | DALLAS
10350 RICHMOND AVE, STE 200 | HOUSTON, TX 77042 | 713.4282400
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10108974

STATE OF TEXAS
R MATTHEW ESTES
101558
LICENSED
PROFESSIONAL ENGINEER

R MATTHEW ESTES, P.E. — 7/16/2024 DATE

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

CULVERT A (STA 101+80.00)
LAYOUT

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
7/16/2024	85

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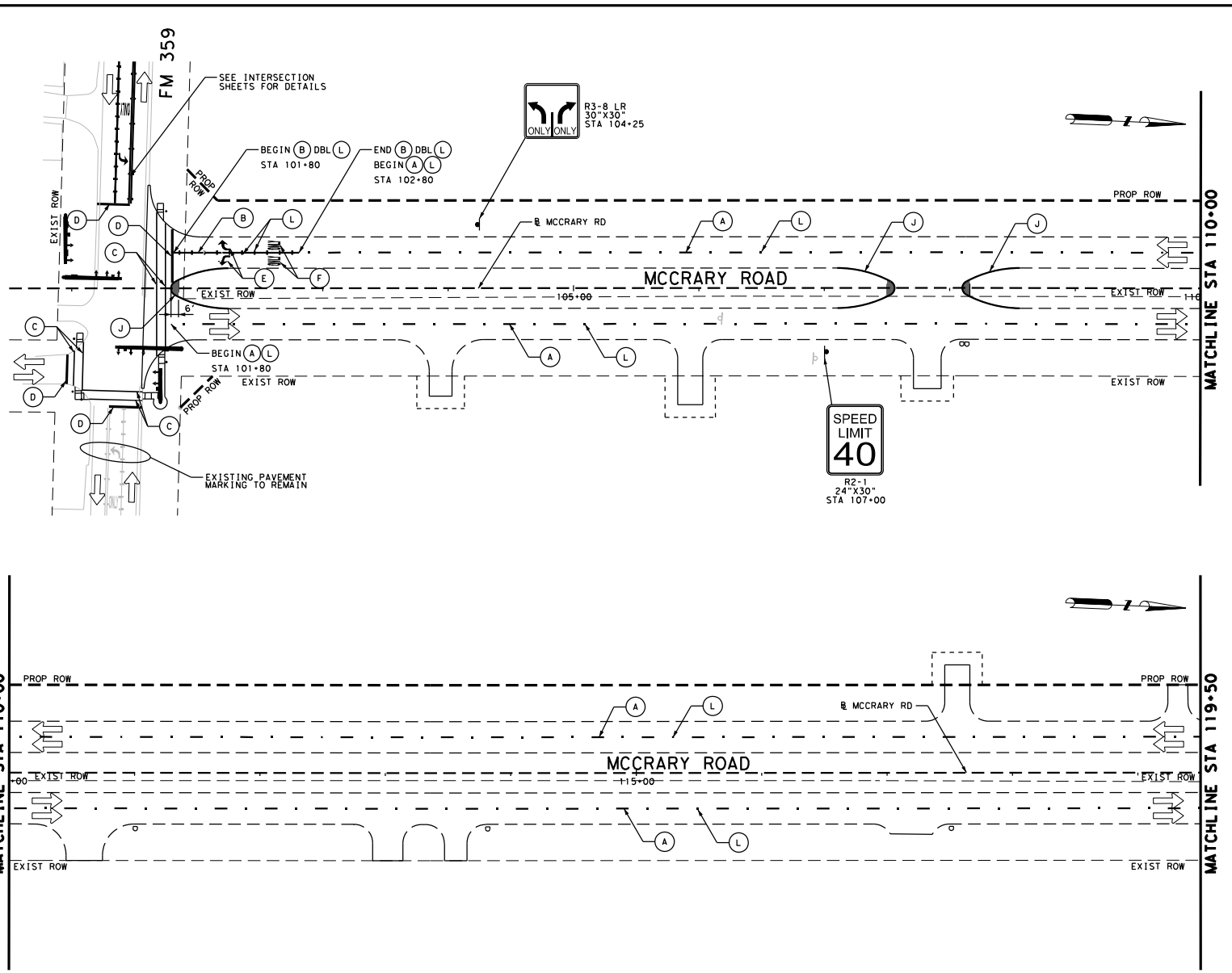

LEGEND

- (A) REFL PAV MRK TY I (W) 4" (DASHED)
- (B) REFL PAV MRK TY I (W) 8" (SLD)
- (C) REFL PAV MRK TY I (W) 12" (SLD)
- (D) REFL PAV MRK TY I (W) 24" (SLD)
- (E) REFL PAV MRK TY I (W) ARROW
- (F) REFL PAV MRK TY I (W) WORD
- (G) REFL PAV MRK TY I (Y) 4" (SLD)
- (H) REFL PAV MRK TY I (Y) 24" (SLD)
- (J) REFL PAV MRK TY II (Y) (MED NOSE)
- (K) 4" SQ 1-WAY REFL PAV MRK (TYPE I-C)
- (L) 4" SQ 2-WAY REFL PAV MRK (TYPE II C-F)
- (M) 4" SQ 2-WAY REFL PAV MRK (TY II A-A)
- EXISTING SIGN TO BE REMOVED
- PROPOSED SIGN
- DIRECTION OF TRAFFIC FLOW

NOTES:

1. ALL SIGNS AND PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (TMUTCD).
2. SEE PAVEMENT MARKING AND SIGN DETAIL SHEETS FOR MORE INFORMATION.
3. THE LOCATION OF SIGNS SHOWN ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

0 40' 80'
SCALE: 1" = 80' H

NO	DATE	REVISION	APP

CivilCorp
ENGINEERS · SURVEYORS
29255 FM 1093, SUITE 7A, FULSHEAR, TEXAS 77441
TEL: (832)252-8100 FAX: (832)252-8103 TXENG FIRM #10283

STATE OF TEXAS
JASON C. KASPAR
108672
LICENSED PROFESSIONAL ENGINEER
11/3/2022

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY RD SOUTH
FROM FM 359 TO OLD MCCRARY RD

SIGNING AND STRIPING LAYOUT

SHEET 1 OF 7

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/3/2022	244

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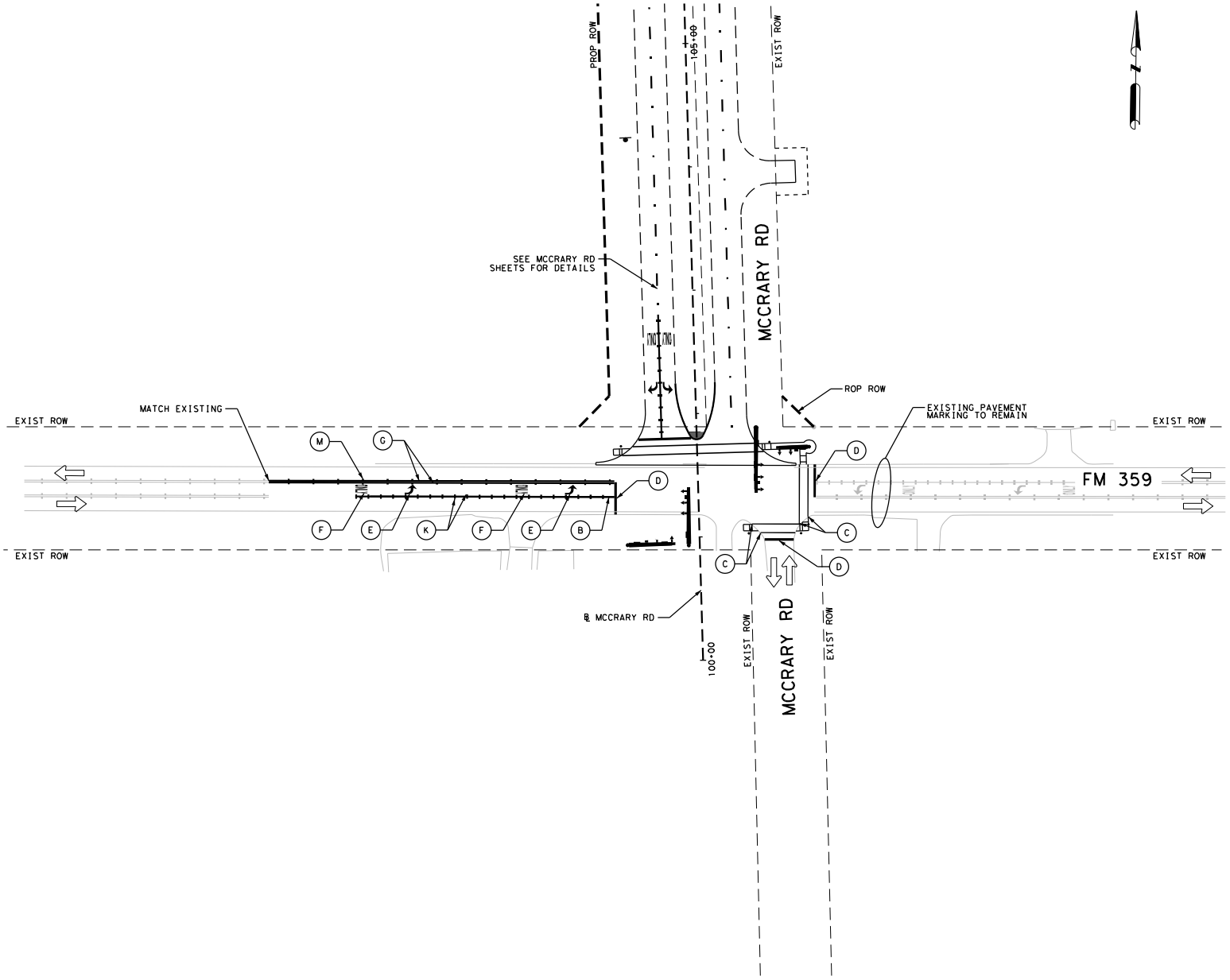

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- (M) 4" SQ 2-WAY REFL PAV MRK (TY II A-A)
- EXISTING SIGN TO BE REMOVED
- PROPOSED SIGN
- DIRECTION OF TRAFFIC FLOW

NOTES:

1. ALL SIGNS AND PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (TMUTCD).
2. SEE PAVEMENT MARKING AND SIGN DETAIL SHEETS FOR MORE INFORMATION.
3. THE LOCATION OF SIGNS SHOWN ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

0 40' 80'
SCALE: 1" = 80' H

NO	DATE	REVISION	APP

CivilCorp
ENGINEERS - SURVEYORS
29255 FM 1093, SUITE 7A, FULSHEAR, TEXAS 77441
TEL: (832)252-8100 FAX: (832)252-8103 TXENG FIRM #10283

STATE OF TEXAS
JASON C. KASPAR
108672
LICENSED
PROFESSIONAL ENGINEER
11/3/2022

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY RD SOUTH
FROM FM 359 TO OLD MCCRARY RD

SIGNING AND STRIPING LAYOUT

SHEET 5 OF 7

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
11/3/2022	248

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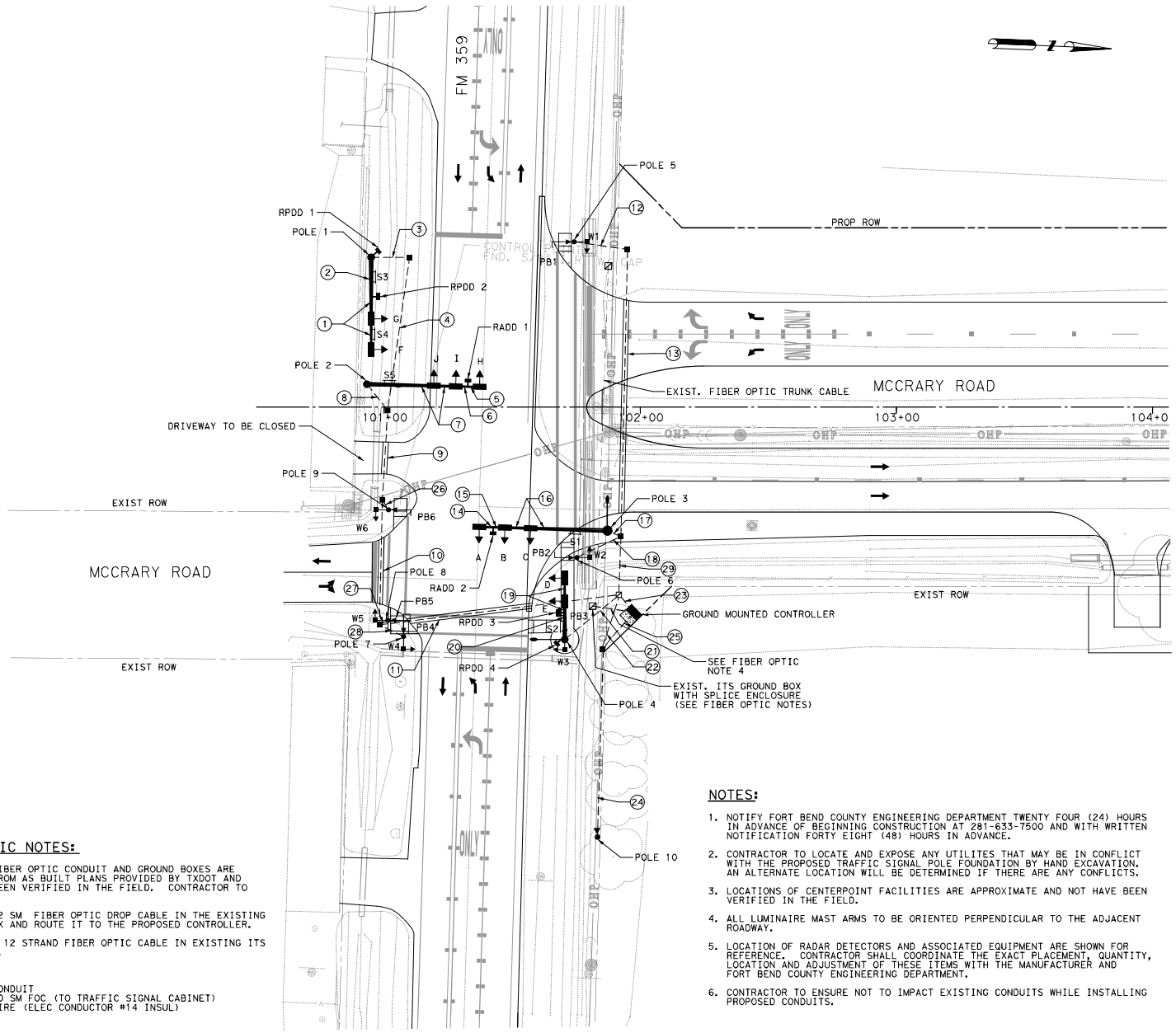

LEGEND

- MAST ARM POLE
- PEDESTAL POLE
- GROUND MOUNTED CONTROLLER
- 8' LUMINAIRE ARM
- SIGNAL HEAD
- PEDESTRIAN SIGNAL HEAD
- PEDESTRIAN PUSH BUTTON/SIGN
- OVERHEAD SIGN
- ELECTRIC SERVICE
- GROUND BOX (TY D)
- GROUND BOX (TY 2)
- CONDUIT
- CONDUIT (BORE)
- DIRECTION OF TRAFFIC FLOW
- RADAR DETECTOR (RVDS) (PRESENCE AND ADVANCE)
- (#) CONDUIT RUN

POSTED SPEED LIMIT:

FM 359 = 55 MPH
MCRARY ROAD (SB) = 45 MPH
MCRARY ROAD (NB) = 35 MPH

0 20' 40'
SCALE: 1" = 40'

FIBER OPTIC NOTES:

1. EXISTING FIBER OPTIC CONDUIT AND GROUND BOXES ARE OBTAINED FROM AS BUILT PLANS PROVIDED BY TXDOT AND HAVE NOT BEEN VERIFIED IN THE FIELD. CONTRACTOR TO VERIFY.
2. SPLICE 1-12 SM FIBER OPTIC DROP CABLE IN THE EXISTING GROUND BOX AND ROUTE IT TO THE PROPOSED CONTROLLER.
3. COIL 50 FT 12 STRAND FIBER OPTIC CABLE IN EXISTING ITS GROUND BOX.
4. INSTALL

   1-2" PVC CONDUIT
   1-12 STRAND SM FOC (TO TRAFFIC SIGNAL CABINET)
   1-TRACER WIRE (ELEC CONDUCTOR #14 INSUL)

NOTES:

1. NOTIFY FORT BEND COUNTY ENGINEERING DEPARTMENT TWENTY FOUR (24) HOURS IN ADVANCE OF BEGINNING CONSTRUCTION AT 281-633-7500 AND WITH WRITTEN NOTIFICATION FORTY EIGHT (48) HOURS IN ADVANCE.
2. CONTRACTOR TO LOCATE AND EXPOSE ANY UTILITIES THAT MAY BE IN CONFLICT WITH THE PROPOSED TRAFFIC SIGNAL POLE FOUNDATION BY HAND EXCAVATION. AN ALTERNATE LOCATION WILL BE DETERMINED IF THERE ARE ANY CONFLICTS.
3. LOCATIONS OF CENTERPOINT FACILITIES ARE APPROXIMATE AND NOT HAVE BEEN VERIFIED IN THE FIELD.
4. ALL LUMINAIRE MAST ARMS TO BE ORIENTED PERPENDICULAR TO THE ADJACENT ROADWAY.
5. LOCATION OF RADAR DETECTORS AND ASSOCIATED EQUIPMENT ARE SHOWN FOR REFERENCE. CONTRACTOR SHALL COORDINATE THE EXACT PLACEMENT, QUANTITY, LOCATION AND ADJUSTMENT OF THESE ITEMS WITH THE MANUFACTURER AND FORT BEND COUNTY ENGINEERING DEPARTMENT.
6. CONTRACTOR TO ENSURE NOT TO IMPACT EXISTING CONDUITS WHILE INSTALLING PROPOSED CONDUITS.

NO	DATE	REVISION	APP

TBPE FIRM F-11000
EPIC TRANSPORTATION GROUP, LP
Engineering • Planning • Infrastructure • Construction
800 Wilcrest Drive, Suite 240, Houston, TX 77042
PH: (713) 600-9418

STATE OF TEXAS
HARISH NARAYANAPPA
82041
REGISTERED PROFESSIONAL ENGINEER

7/16/2024

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

TRAFFIC SIGNAL LAYOUT
FM 359 AT MCCRARY ROAD

SHEET 1 OF 2

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
7/16/2024	151

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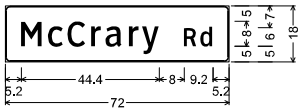
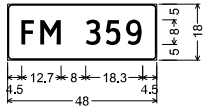
CONDUIT AND CONDUCTOR RUNS

RUN NO.	CONDUIT (618) PVC 2" (SCHD 80) (6046) NO. EA	2" (SCHD 80) (6046) TRENCH LF	3" (SCHD 80) (6053) NO. EA	3" (SCHD 80) (6053) TRENCH LF	3" (SCHD 80) (6054) NO. EA	3" (SCHD 80) (6054) BORE LF	4" (SCHD 80) (6058) NO. EA	4" (SCHD 80) (6058) TRENCH LF	CONDUCTORS (620) POWER #4 INSULATED (6012) NO. EA	POWER #4 INSULATED (6012) LENGTH LF	GROUND #8 BARE (6007) NO. EA	GROUND #8 BARE (6007) LENGTH LF	TRAY CABLE (621) LUMINAIRE #12/4C Tray Cable (6005) NO. EA	LUMINAIRE #12/4C Tray Cable (6005) LENGTH LF	CABLES (684) SIGNAL #12/7C (6012) NO. EA	SIGNAL #12/7C (6012) LENGTH LF	CABLES (684) PEDESTRIAN #12/4C (6009) NO. EA	PEDESTRIAN #12/4C (6009) LENGTH LF	PEDESTRIAN #12/2C (6007) NO. EA	PEDESTRIAN #12/2C (6007) LENGTH LF	RADAR (6292) PRES. RADAR # 18/2C & #22/4C (Subsidary) NO. EA	PRES. RADAR # 18/2C & #22/4C (Subsidary) LENGTH LF	RADAR (6292) ADV. RADAR # 18/2C & #22/4C (Subsidary) NO. EA	ADV. RADAR # 18/2C & #22/4C (Subsidary) LENGTH LF
1															1	21									
2															1	16					1	16		
3			1	20							1	20			1	15					2	20		
4			1	65							1	65			1	65					2	65		
5															1	5								
6															1	5							1	5
7															2	35							1	35
8			1	20							1	20	1	20	2	20							1	20
9			1	25	1	20					1	45	1	45	3	45					2	45	1	45
10			1	30	1	30					1	60	1	60	3	60	1	60	1	60	2	60	1	60
11			1	50	1	50					1	100	1	100	3	100	3	100	3	100	2	100	1	100
12	1	25									1	25					1	25	1	25				
13			1	40	1	85					1	125					1	125	1	125				
14															1	6								
15															1	5							1	5
16															2	40							1	40
17			1	10							1	10	1	10	2	10							1	10
18	1	20									1	20					1	20	1	20				
19															1	15								
20															1	11					1	11		
21			1	30							1	30	1	30	1	30	1	30	1	30	2	30		
22	1	30									1	30	3	30										
23			1	15			1	15			2	15			6	15	6	15	6	15	4	15	2	15
24	1	100							3	100	1	100	3	100										
25	1	25							2	25	1	25												
26	1	8									1	8					1	8	1	8				
27	1	5									1	5					1	5	1	5				
28	1	15									1	15					1	15	1	15				
29			1	25							1	25	1	25	2	25	2	25	2	25			1	25
POLE 1															1	30					2	30		
POLE 2													1	50	2	30							1	30
POLE 3													1	50	2	30							1	30
POLE 4													1	50	1	30					2	30		
POLE 5																	1	10	1	5				
POLE 6																	1	10	1	5				
POLE 7																	1	10	1	5				
POLE 8																	1	10	1	5				
POLE 9																	1	10	1	5				
TOTAL (LF)		228		330		185		15		350		758		830		1339		778		753		847		435

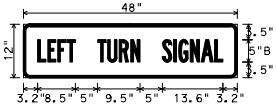
SIGN SCHEDULE



1.5" Radius, 0.5" Border, White on Green;
"McCrary", ClearviewHwy-3-W;
"Rd", ClearviewHwy-3-W;
S1, S5



1.5" Radius, 0.5" Border, White on Green;
"FM", ClearviewHwy-3-W;
"359", ClearviewHwy-3-W;
S2, S3



1.5" Radius, 0.5" Border, Black on White;
(LEFT TURN SIGNAL) B;
LEGEND AND BORDER NON REFLECTIVE BLACK
BACKGROUND WHITE TY C HIGH SPECIFIC INTENSITY

R3-8LR
(36"x36")
S4

R10-3eR
(9"x15")
(ACCESSIBLE PEDESTRIAN PUSH BUTTON)
(PB1, PB3, PB5)

R10-3eL
(9"x15")
(ACCESSIBLE PEDESTRIAN PUSH BUTTON)
(PB2, PB4, PB6)

NOT TO SCALE

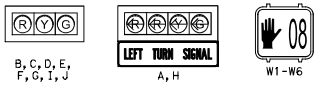
TRAFFIC SIGNAL POLE INFORMATION

POLE NO.	SIGNAL POLE DESIGNATION	FOUNDATION TYPE/DEPTH	MCCRARY STATION	OFFSET
1	SMA 36	36-A/13'	100+95	59'LT
2	SMA 44L	36-B/15'	100+93	9'LT
3	LMA 50L	48-A/22'	101+87	48'RT
4	SMA 24L	36-A/13'	101+70	91'RT
5	PEDESTAL POLE	SCREW-IN ANCHOR	101+74	65'LT
6	PEDESTAL POLE	SCREW-IN ANCHOR	101+75	59'RT
7	PEDESTAL POLE	SCREW-IN ANCHOR	101+08	90'RT
8	PEDESTAL POLE	SCREW-IN ANCHOR	101+01	83'RT
9	PEDESTAL POLE	SCREW-IN ANCHOR	101+02	40'RT
10	ELECTRICAL SERVICE TY D	N/A	101+83	168'RT
	GROUND MOUNTED CONTROLLER	N/A	101+96	82'RT

VEHICLE DETECTION CHART

RVDS	SETTING
RPDD 1	PRESENCE EB THRU AND LEFT
RPDD 2	PRESENCE SB LEFT AND RIGHT
RPDD 3	PRESENCE NB LEFT AND RIGHT
RPDD 4	PRESENCE WB THRU AND LEFT
RADD 1	ADVANCE EB THRU
RADD 2	ADVANCE WB THRU

SIGNAL HEAD SCHEDULE



ELECTRICAL SERVICE DATA

ELEC SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED (4), & (5) -14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN CKT. BRK. POLE/AMP	TWO-POLE CONTACTOR AMPS	PANELBD./ LOADCENTER AMP RATING	BRANCH CIRCUIT ID.	BRANCH CKT. BRK. POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
ES (FM 359 @McCRARY RD)	TY D (120/240) 60 (NS) SS (E) SP (O)	1-1/4"	3/#6	N/A	2P/60		100	SIGNAL CONTROLLER	1P/50	30	4.08
						30		LUMINAIRES	2P/20	2	

NO	DATE	REVISION	APP

TBPE FIRM F-11000
TRANSPORTATION GROUP, LP
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800 Wilcrest Drive, Suite 240, Houston, TX 77042
PH: (713) 600-9418

STATE OF TEXAS
HARISH NARAYANAPPA
82041
REGISTERED
PROFESSIONAL ENGINEER

7/16/2024

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

TRAFFIC SIGNAL LAYOUT
FM 359 AT MCCRARY ROAD

SHEET 2 OF 2

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
7/16/2024	152

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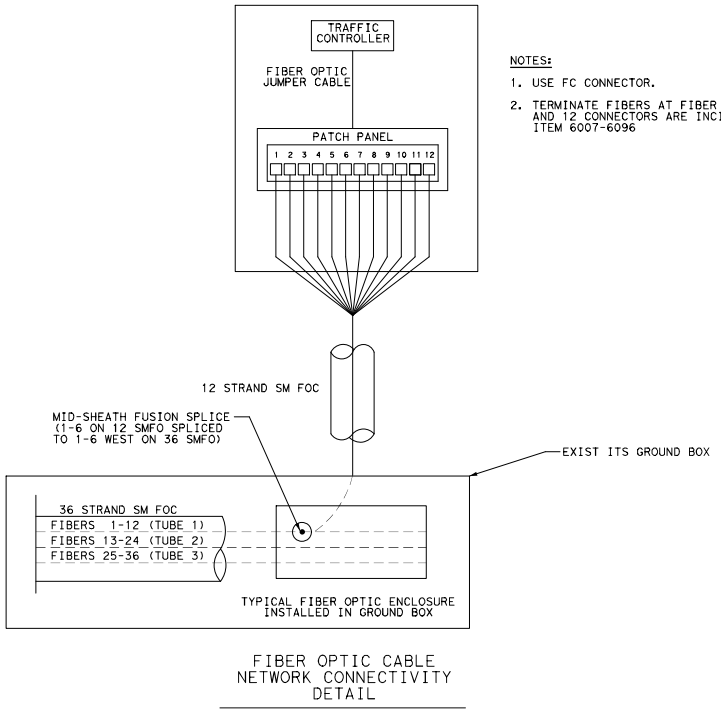
FM 359 AT
MCCRARY
PROPOSED SIGNAL CABINET



FIBER OPTIC CABLE
NETWORK CONNECTIVITY
DETAIL

NOTES:

1. USE FC CONNECTOR.
2. TERMINATE FIBERS AT FIBER PATCH PANELS AND 12 CONNECTORS ARE INCIDENTAL TO ITEM 6007-6096

NOT TO SCALE

NO	DATE	REVISION	APP

TBPE FIRM F-11000
EPIC TRANSPORTATION GROUP, LP
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STATE OF TEXAS
HARISH NARAYANAPPA
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REGISTERED PROFESSIONAL ENGINEER

3/8/2024

FORT BEND COUNTY
ENGINEERING DEPARTMENT

RECONSTRUCTION OF
MCCRARY ROAD SOUTH
FROM FM 359 TO OLD MCCRARY RD

FIBER OPTIC CONNECTIVITY DETAIL
FM 359 AT MCCRARY ROAD
SHEET 1 OF 1

CIVILCORP PROJECT NO. 18-2-0010

DATE	SHEET NO.
3/8/2024	152A

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GENERAL NOTES FOR ALL ELECTRICAL WORK

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

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

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

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

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

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

CONDUIT

A. MATERIALS

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

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

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

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

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

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

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

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

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

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

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

B. CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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		HOU	FORT BEND		153

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

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

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

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

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

B. CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

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

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

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

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

C. TEMPORARY WIRING

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

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

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

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

5. Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

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

B. CONSTRUCTION METHODS

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

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

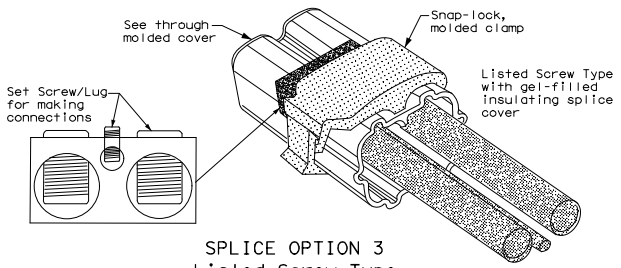
3. Install ground rods so the imprinted part number is at the upper end of the rod.

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

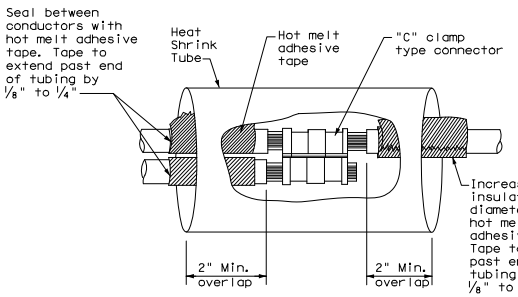
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

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

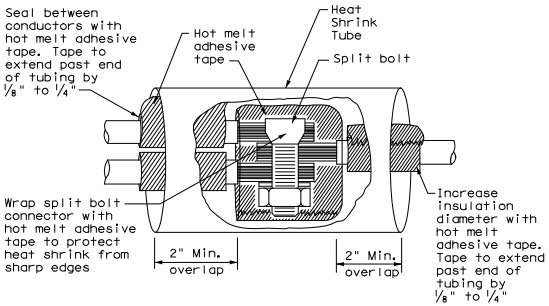
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 3
Listed Screw Type



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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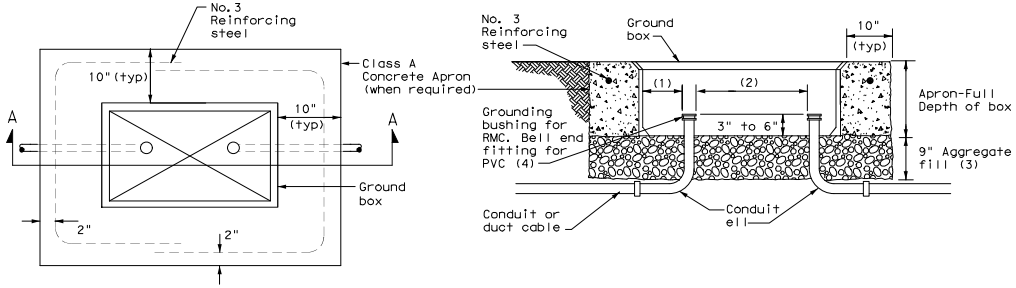


PLAN VIEW SECTION A - A

APRON FOR GROUND BOX

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

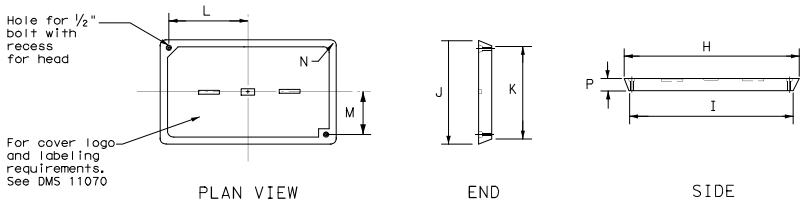
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

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

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

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

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



PLAN VIEW END SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."
2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.
3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.
4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.
2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.
3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.
4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.
5. Temporarily seal all conduits in the ground box until conductors are installed.
6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.
7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.
8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.
9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.
10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.
11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

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ELECTRICAL DETAILS GROUND BOXES

ED(4)-14

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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 circuitry 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 the service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

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

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

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

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

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

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

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

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

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

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

* ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

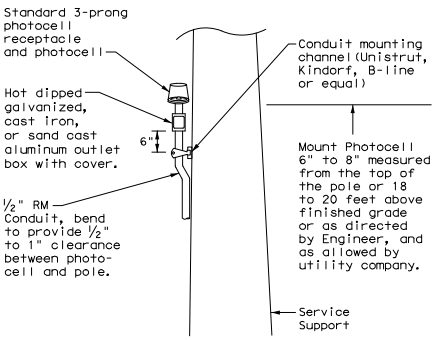
* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

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

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

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

- Schematic Type
- Service Voltage V / V
- Disconnect Amp Rating
  000 indicates main lug only/
  Typically Type T
- (SS)= Safety Switch Ahead of Meter-Check with Utility
- (NS)= No safety Switch Ahead of Meter-Check with Utility
- Enclosure Type
  GS= Galvanized steel("off the shelf")
  SS= Stainless steel(Custom Enclosure)See MPL
  AL= Aluminum (Custom Enclosure)See MPL
- Photocell Mounting Location
  (E)= Inside Service/Enclosure Mounted
  (T)= Top of pole
  (L)= Luminaire mounted
  (N)= None/No Photocell or Lighting Contactor Required
- Service Support Type
  GC= Granite concrete
  OC= Other concrete
  TP= Timber pole
  SP= Steel pole
  SF= Steel frame
  OT= Pole by others or paid for separately
  EX= Existing pole
  TS= Service on traffic signal pole
  PS= Pedestal Service
- O= Overhead Service Feed from Utility
- U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

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

Texas Department of Transportation | Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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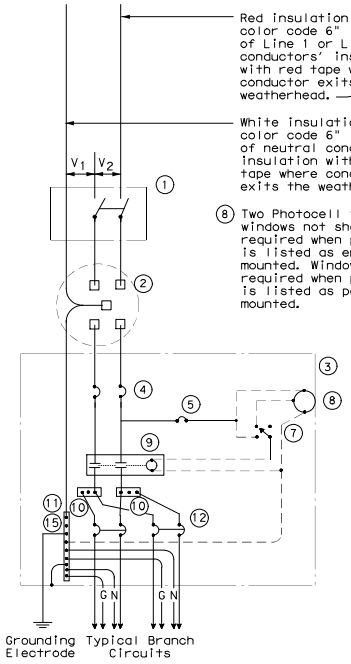
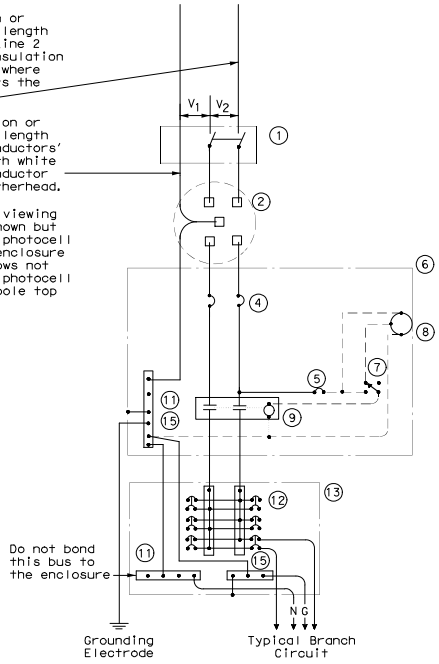
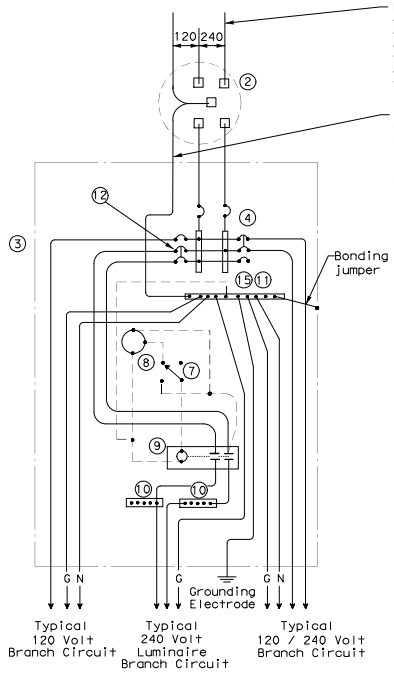


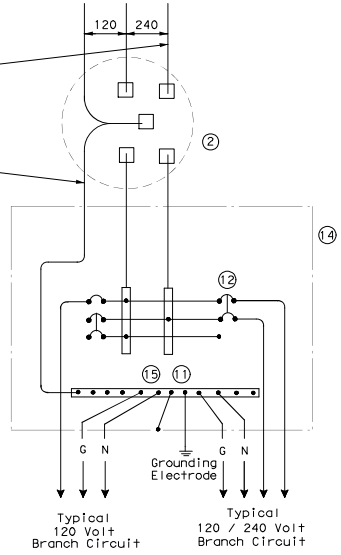
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



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



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

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

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

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

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

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

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

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

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

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

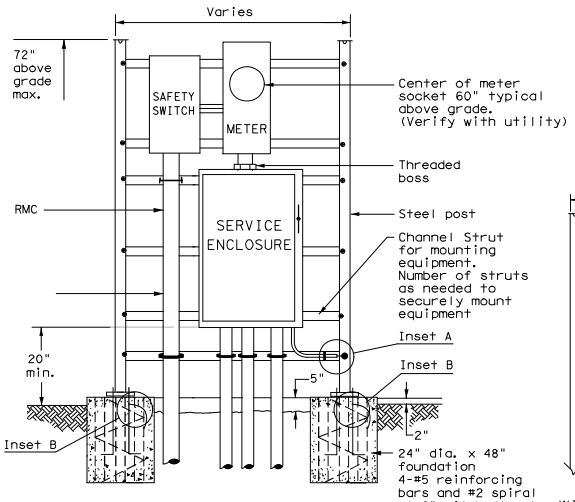
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode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

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

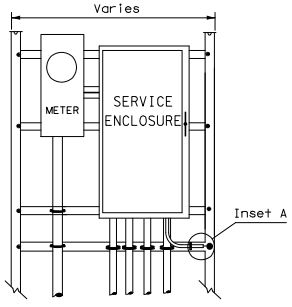
9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.

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

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

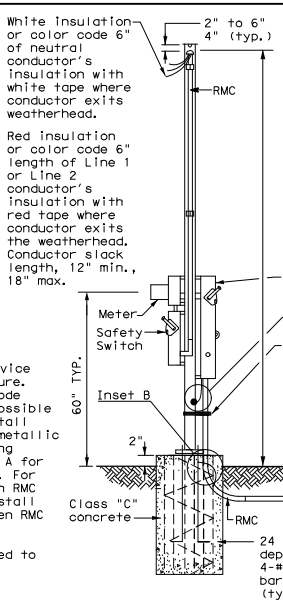


WITH SAFETY SWITCH
FRONT VIEW

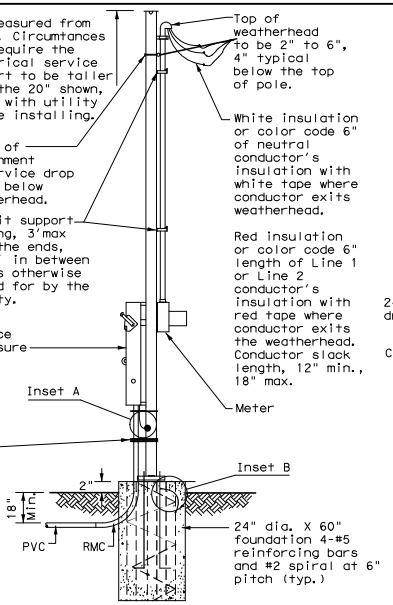


WITHOUT SAFETY SWITCH

SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE

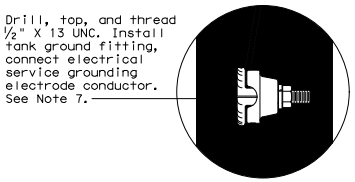


WITH SAFETY SWITCH

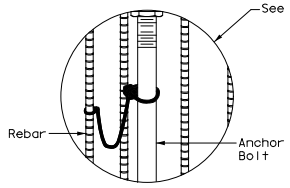


WITHOUT SAFETY SWITCH

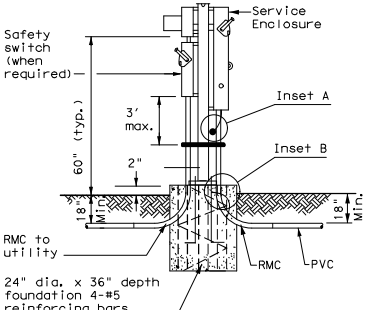
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE



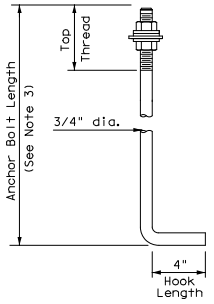
FRONT VIEW
INSET A



INSET B

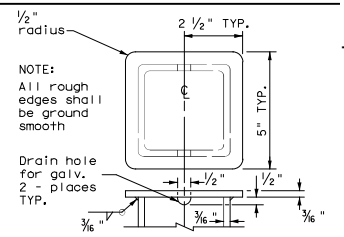


WITH SAFETY SWITCH

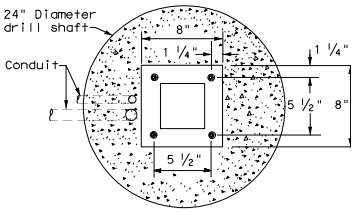


HOOKED ANCHOR DETAIL

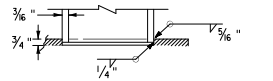
SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE



POLE TOP PLATE

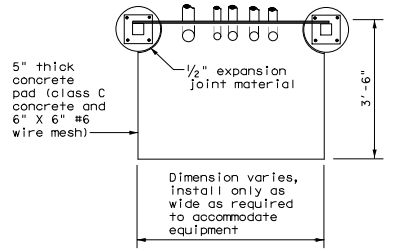


BASE PLATE DETAIL



BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



TOP VIEW

SERVICE SUPPORT TY SF (O) & SF (U)

Texas Department of Transportation | Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP

ED(7)-14

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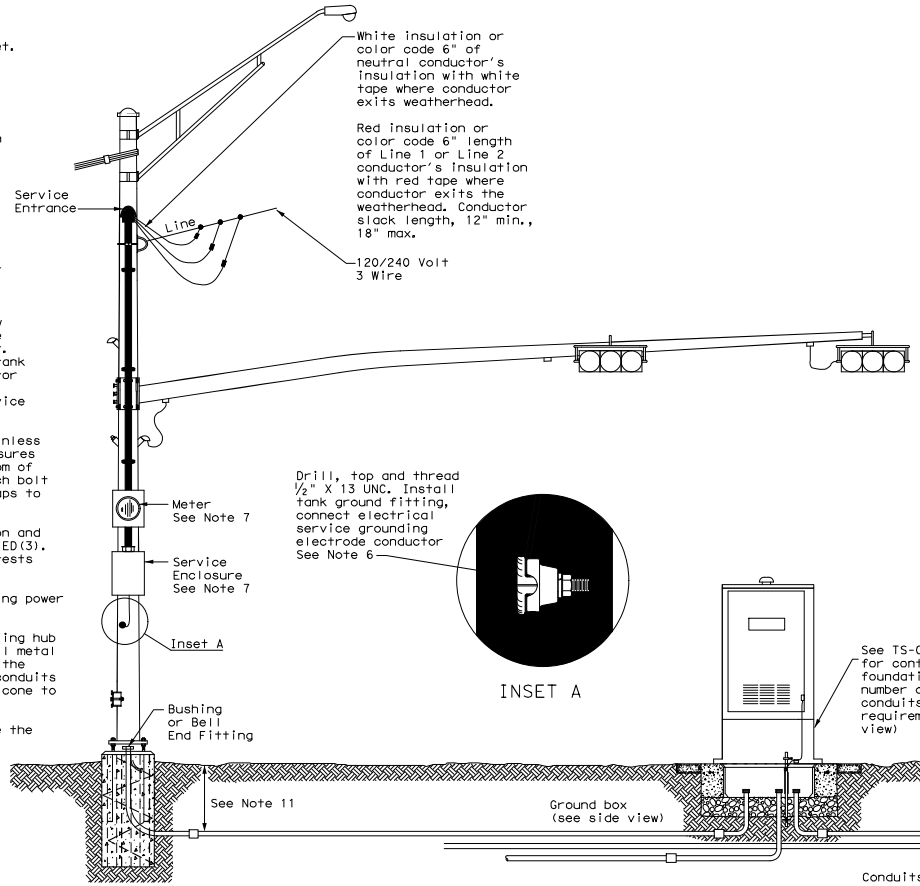
TRAFFIC SIGNAL NOTES

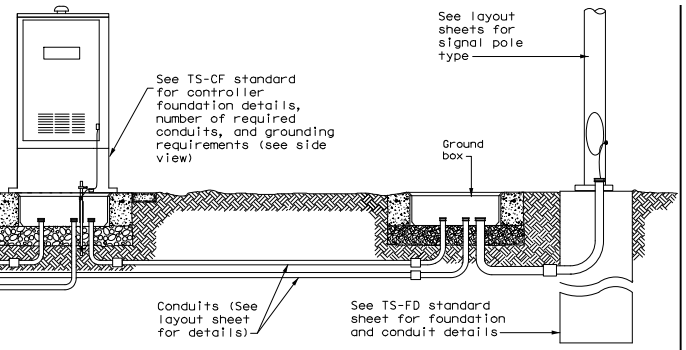
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



SIGNAL POLE WITH SERVICE

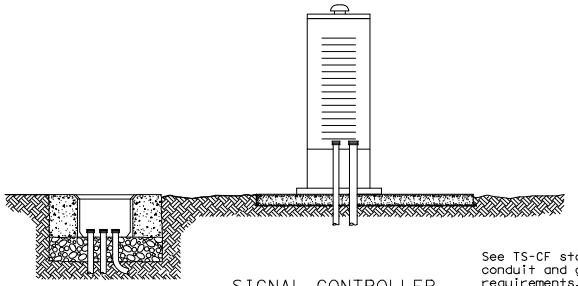
Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

INSET A



SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

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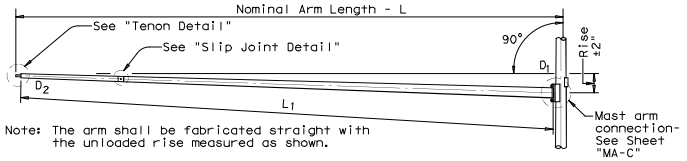
Arm Length	ROUND POLES					POLYGONAL POLES					Foundation Type
	D_B	D_{19}	D_{24}	D_{30}	① thk	D_B	D_{19}	D_{24}	D_{30}	① thk	
ft.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	
20	12.0	9.3	8.6	7.8	.239	12.5	9.5	8.7	7.8	.239	36-A
24	12.0	9.3	8.6	7.8	.239	13.0	10.0	9.2	8.3	.239	36-A
28	12.0	9.3	8.6	7.8	.239	13.5	10.5	9.7	8.8	.239	36-A
32	13.0	10.3	9.6	8.8	.239	14.0	11.0	10.2	9.3	.239	36-A
36	13.5	10.8	10.1	9.3	.239	15.0	12.0	11.2	10.3	.239	36-A
40	14.0	11.3	10.6	9.8	.239	16.0	13.0	12.2	11.3	.239	36-B
44	14.5	11.8	11.1	10.3	.239	16.5	13.5	12.7	11.8	.239	36-B

Arm Length	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	① thk	Rise	L_1	D_1	② D_2	① thk	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

D_B = Pole Base O.D.
D_{19} = Pole Top O.D. with no Luminaire and no ILSN
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L = Nominal Arm Length

① Thickness shown are minimums, thicker materials may be used.

② D_2 may be increased by up to 1" for polygonal arms.



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

TRAFFIC SIGNAL ARM

(Fixed Mount)

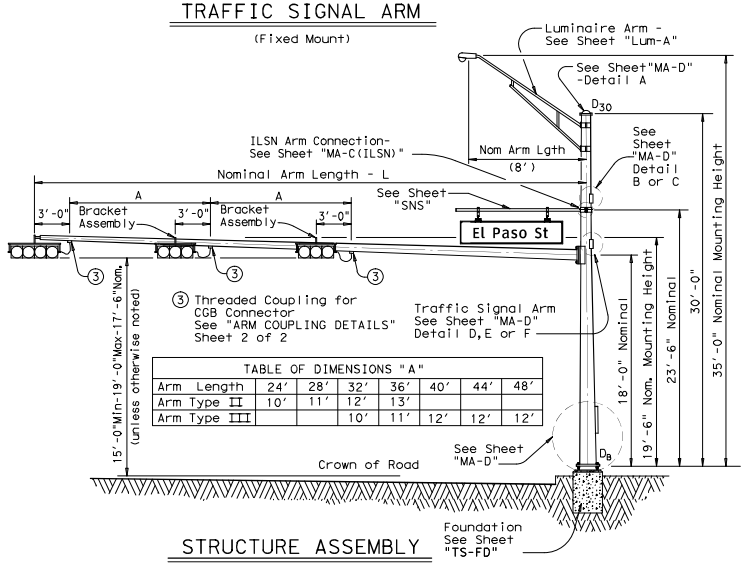


TABLE OF DIMENSIONS "A"							
Arm Length	24'	28'	32'	36'	40'	44'	48'
Arm Type II	10'	11'	12'	13'			
Arm Type III			10'	11'	12'	12'	12'

STRUCTURE ASSEMBLY

SHIPPING PARTS LIST

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed-arm connection bolts and washers, and any additional hardware listed in the table.

Nominal Arm Length	30' Poles With Luminaire		24' Poles With ILSN		19' Poles With No Luminaire and No ILSN	
	Above hardware plus: One (or two if ILSN attached) small hand hole, clamp-on simplex		Above hardware plus one small hand hole		See note above	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20L-100		20S-100		20-100	
24	24L-100	1	24S-100		24-100	
28	28L-100		28S-100		28-100	
32	32L-100		32S-100		32-100	
36	36L-100		36S-100		36-100	1
40	40L-100		40S-100		40-100	
44	44L-100	1	44S-100		44-100	

Traffic Signal Arms (1 per pole) Ship each arm with the listed equipment attache

Nominal Arm Length	Type I Arm (1 Signal)		Type II Arm (2 Signals)		Type III Arm (3 Signals)	
	1 CGB connector		1 Bracket Assembly and 2 CGB Connectors		2 Bracket Assemblies and 3 CGB Connectors	
ft	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100	1		
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100	1	36III-100	
40					40III-100	
44					44III-100	1

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	2

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
1 1/2"	3'-4"	
1 3/4"	3'-10"	2
2"	4'-3"	1

Each anchor bolt assembly consists of the following: Top and Bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers, and 4 nut anchor devices (Type 2) per Standard Drawing "TS-FD".

Templates may be removed for shipment.

FM 359 AT MCCRARY RD

3/8/2024

SHEET 1 OF 2

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(100 MPH WIND ZONE)

SMA-100(1)-12

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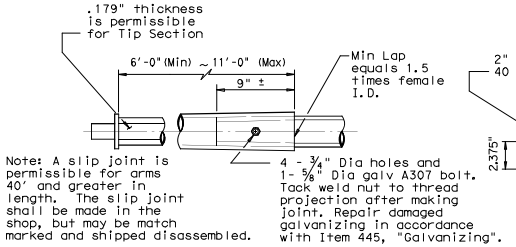
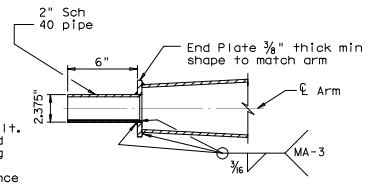


SLIP JOINT DETAIL



TENON DETAIL

VIBRATION WARNING

Mast Arms of SMA and DMA structures and clamp-on Arms of LMA structures of approximately 40 ft or longer are subject to harmonic vertical vibrations in light wind conditions due to the aeroelastic characteristics of a few of the myriads of possible combinations of the following: signal numbers, weights and positions; existence/solidity of backplates; presence of additional attachments to the arm, such as signs and cameras; arm-wind orientation; and arm-pole stiffness.

Such vibrations may cause fatigue damage to the structure and may lead to galloping in moderate wind conditions which may further damage the structure and alarm the public. Tests have indicated that when wind is blowing toward the back side of signal heads having un-vented backplates attached the probability of unacceptable harmonic vibration and/or galloping is rather high.

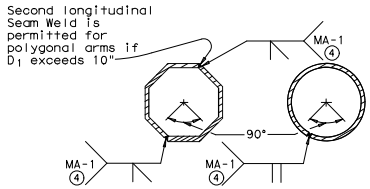
If backplates are not required for improved visibility they should not be applied to the signal heads or, if they must be applied, they should be vented as a first and inexpensive measure to mitigate vibrations.

The traffic signal mast arms shall be visually inspected in 5 to 20 mph wind conditions after installation of signal heads and any attachments, including any required backpates. If vertical movements with a total excursion (maximum upward excursion to maximum downward excursion) of more than approximately 8" are observed at the arm tip, a damping plate shall be fitted to the arm. See "Damping Plate Mounting Details" on standard sheet, MA-DPD-10.

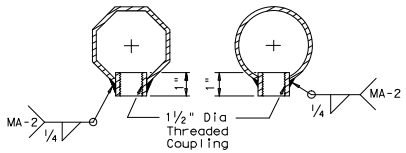
This visual inspection shall be repeated after each modification of the structure that could affect its aeroelastic response. Excessive vibrations shall not be allowed to continue for more than two days.

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL



ARM COUPLING DETAILS

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

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed equals 100 mph plus a 1.3 gust factor.

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

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

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

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

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

SINGLE MAST ARM ASSEMBLY

(100 MPH WIND ZONE)

SMA-100(2)-12

DN: MS	CK: JSY	DW: MMF	CK: JSY

REVISIONS	CONT	SECT	JOB	HIGHWAY
5-96				
1-12				
	DIST	COUNTY		SHEET NO.
	HOU	FORT BEND		161

123B

DATE:
FILE:

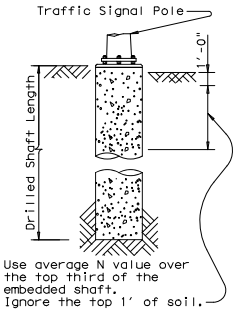
DATE:
FILE:

FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft ④, ⑤, ⑥			ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft 10	15	40	ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

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

		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A
80 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH	32'	48'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'			
		28' X 28'			
		32' X 28'	32' X 32'		
			36' X 36'		
			40' X 36'		
			44' X 28'	44' X 36'	
100 MPH DESIGN WIND SPEED	MAX SINGLE ARM LENGTH		36'	44'	
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS		24' X 24'		
			28' X 28'		
			32' X 24'	32' X 32'	
				36' X 36'	
				40' x24'	40' X 36'
					44' x 36'



Use average N value over the top third of the embedded shaft. Ignore the top 1' of soil.

NOTES:

① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

③ Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

④ Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

⑤ If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

⑥ Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

ANCHOR BOLT & TEMPLATE SIZES

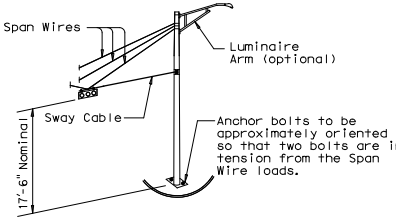
BOLT DIA IN.	⑦ BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	12 ¾"	7 ⅛"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

⑦ Min dimensions given, longer bolts are acceptable.

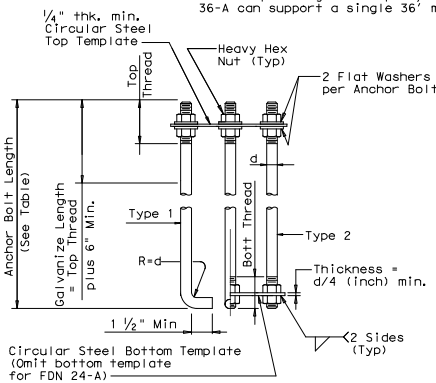
* FOUNDATION SUMMARY TABLE ③

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH ⑥ (FEET) 24-A	30-A	36-A	36-B	42-
POLE 1	10	36-A	1			13		
POLE 2	10	36-B	1				15	
POLE 4	10	36-A	1			13		
TOTAL DRILLED SHAFT LENGTHS						26	15	

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

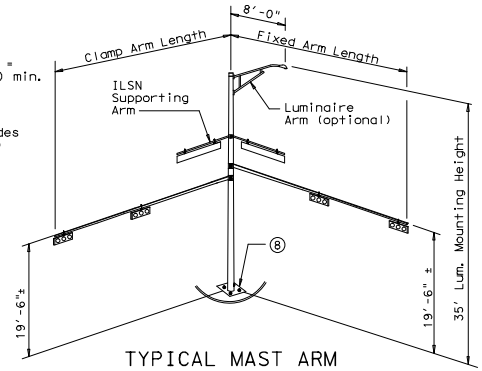


TYPICAL STRAIN POLE ASSEMBLY



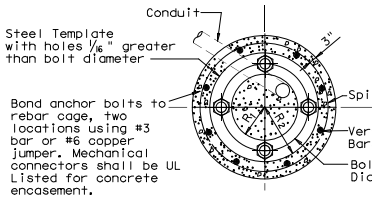
HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

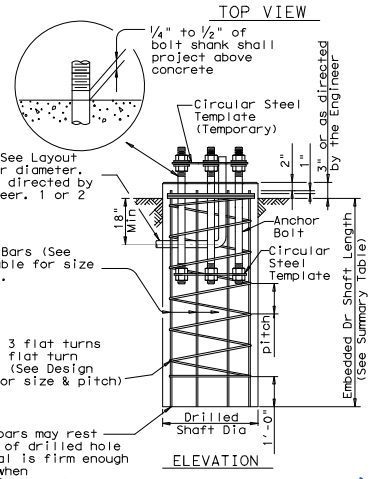
ANCHOR BOLT ASSEMBLY



⑧Orient anchor bolts orthogonal with the fixed arm direction to ensure that two bolts are in tension under dead load.

TYPICAL MAST ARM ASSEMBLY





ELEVATION

FOUNDATION DETAILS

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

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

Concrete shall be Class "C".

Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".

Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".

FM 359 AT MCCRARY RD

STATE OF TEXAS HARISH NARAYANAPPA 82041 REGISTERED PROFESSIONAL ENGINEER

3/8/2024

Texas Department of Transportation
Traffic Operations Division

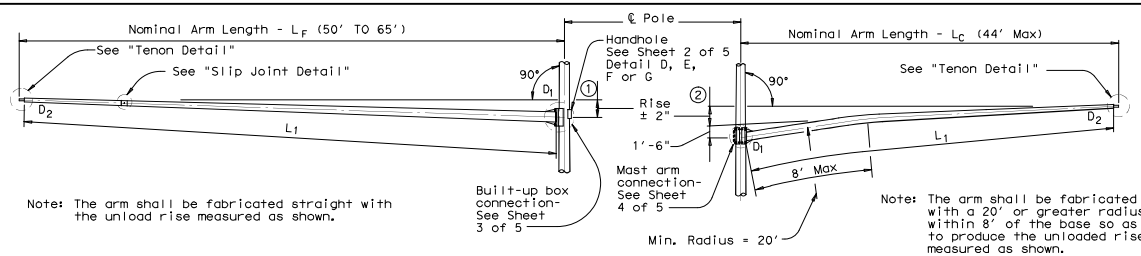
TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

© TxDOT August 1995	DN: MS	CK: JSY	DW: MAO/MMF	CK: JSY/TEB
REVISIONS 5-96 11-98 1-12	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.
	HOU	FORT BEND		162

128

DATE:
FILE:

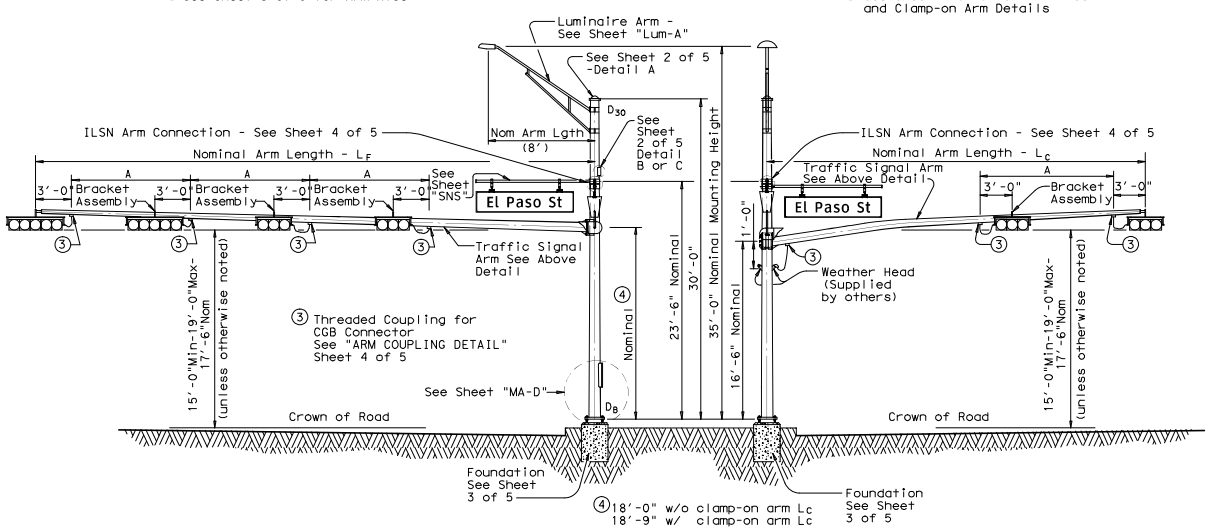


FIXED MOUNT TRAFFIC SIGNAL ARM

① See Sheet 3 of 5 for Arm Rise

CLAMP-ON TRAFFIC SIGNAL ARM (IF REQUIRED)

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

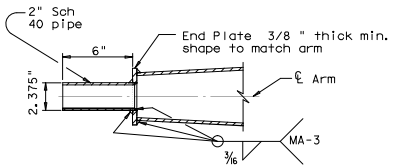


ELEVATION
(Showing fixed mount arm)

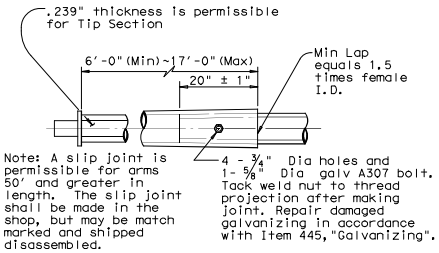
STRUCTURE ASSEMBLY

ELEVATION
(Showing clamp-on arm)

TABLE OF DIMENSIONS "A"										
Arm Length	24'	28'	32'	36'	40'	44'	50'	55'	60'	65'
Arm Type II	10'	11'	12'	13'						
Arm Type III			10'	11'	12'	12'				
Arm Type IV							12'	12'	12'	12'



TENON DETAIL



SLIP JOINT DETAIL (FIXED MOUNT ARM)

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed can be either 100 mph or 80 mph plus a 1.3 gust factor. If clamp-on traffic signal is required, designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

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

Each arm with its related attachment is shown below

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

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

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

Except as noted in Sheet 1 thru 5 of 5, other details not covered shall refer to Standard Sheet "MA-D" for pole details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details.

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

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

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

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

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

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

Texas Department of Transportation
Traffic Operations Division

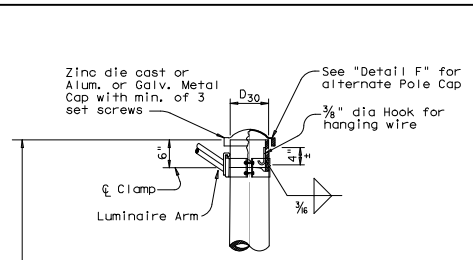
TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)
LMA(1)-12

Sheet 1 of 5

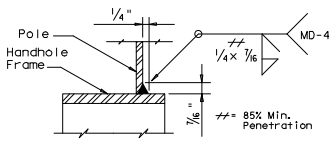
DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
4-20-01 1-12				
	DIST	COUNTY		SHEET NO.
	HOU	FORT BEND		163

131A

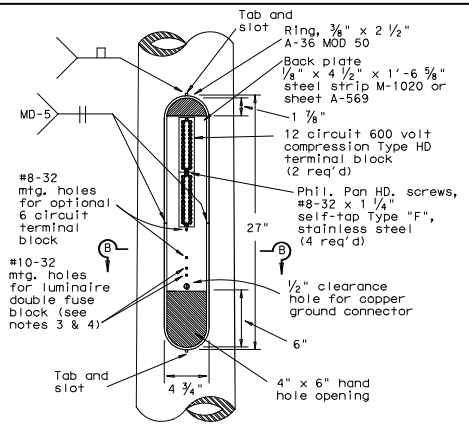
DATE:
FILE:



DETAIL A
(for pole with luminaire)



DETAIL H

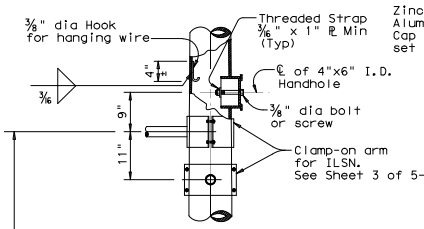


ACCESS COMPARTMENT

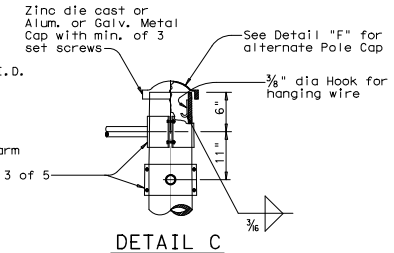
MATERIALS	
Round Shafts or Polygonal Shafts (7)	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 (8)
Plates (7)	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325, or A449 except where noted
Pin Bolts	ASTM A325
Pipe (7)	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

(7) ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

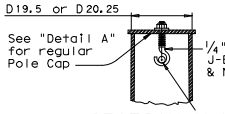
(8) ASTM A1011 SS Gr.50 shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.



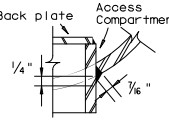
DETAIL B
(if ILSN applied)



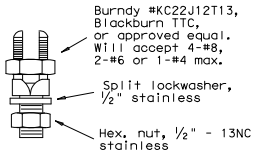
DETAIL C



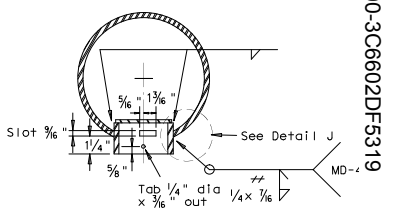
SECTION Y-Y



DETAIL J

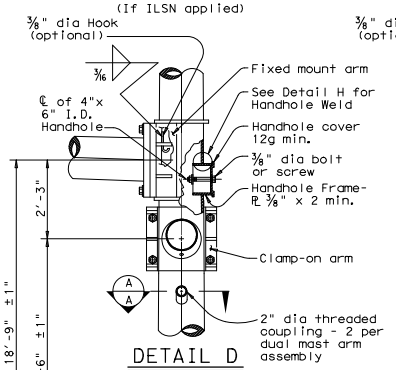


COPPER GROUND CONNECTOR

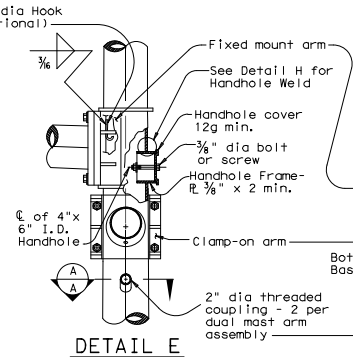


SECTION B-B = 85% Min. Penetration

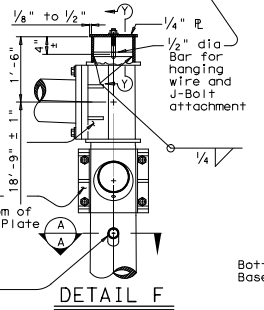
Opening for access compartment shall be no more than 1⁄16 inch wider than the access compartment itself.



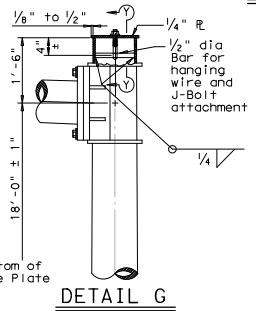
DETAIL D
(for 30' pole with luminaire and ILSN sign)



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



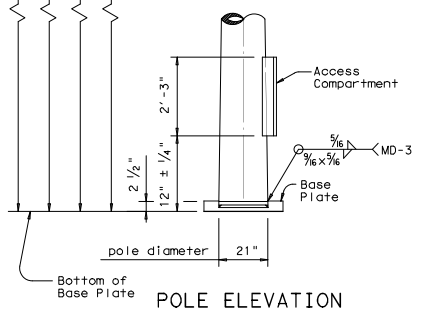
DETAIL F
(for 20.25' pole with no ILSN sign and no luminaire, dual mast arm)



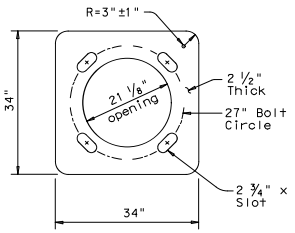
DETAIL G
(for 19.5' pole with no ILSN sign and no luminaire, single mast arm)

ACCESS COMPARTMENT NOTES:

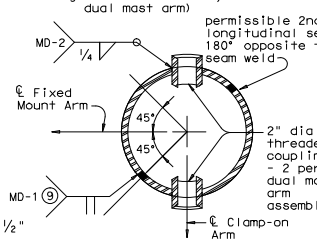
1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 ¼" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.



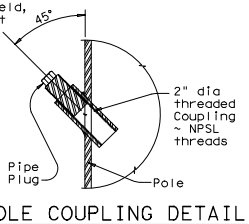
POLE ELEVATION



BASE PLATE



SECTION A-A



POLE COUPLING DETAIL

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

Texas Department of Transportation
Traffic Operations Division

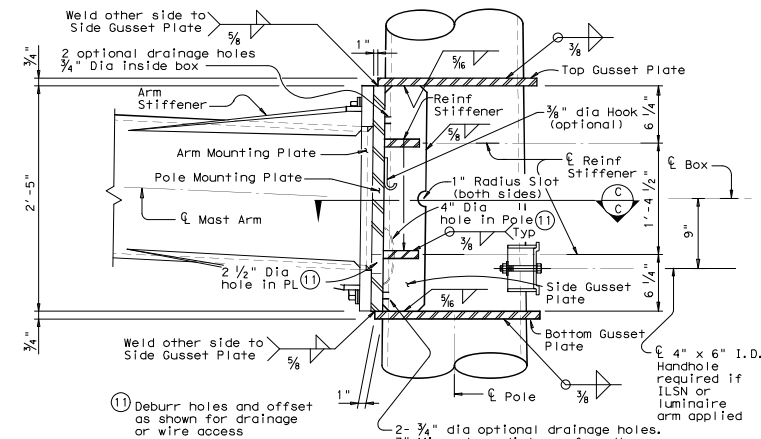
TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 2 of 5 LMA(2)-12

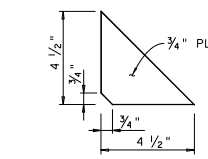
ON: JSY	CK: ARC	DW: TGG	CK: JSY
REVISIONS	CONT	SECT	JOB	HIGHWAY
4-20-01 1-12				
	DIST	COUNTY		SHEET NO.
	HOU	FORT BEND		164

131B

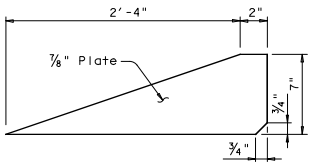
DATE:
FILE:



BUILT-UP BOX CONNECTION

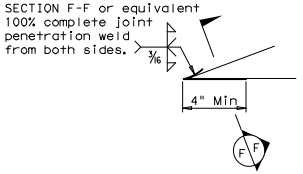


REINFORCING STIFFENER



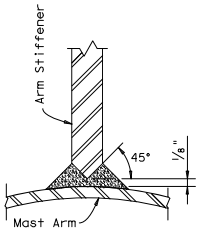
ARM STIFFENER
(Cut to match arm inclination and taper)

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



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

DETAIL "K"



SECTION F-F

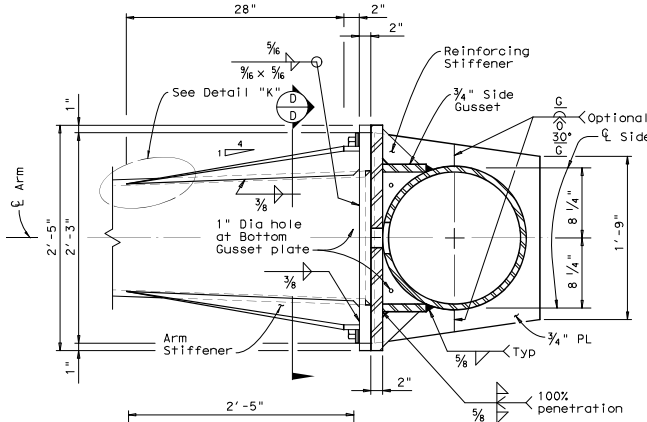
Fixed Mount Arm L F	ROUND POLES (13)					Foundation Type
	D_B	$D_{19.5}$ or $D_{20.25}$	D_{24}	D_{30}	(12) thk	
ft.	in.	in.	in.	in.	in.	
50', 55' 60', 65'	21.0	18.2	17.6	16.8	.3125	48-A

Fixed Mount Arm L F	ROUND ARMS (13)				
	L_1	D_1	D_2	(12) thk	Rise
ft.	ft.	in.	in.	in.	
50	49	18.5	11.7	.3125	3'- 3"
55	54	18.5	11.0	.3125	3'- 7"
60	59	18.5	10.3	.3125	3'-11"
65	64	18.5	9.6	.3125	4'- 4"

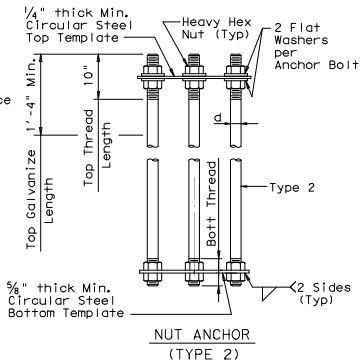
D_B = Pole Base O.D.
$D_{19.5}$ = Pole Top O.D. with no Luminaire and no ILSN (single mast arm)
$D_{20.25}$ = Pole Top O.D. with no Luminaire and no ILSN (dual mast arm)
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L_F = Fixed Arm Length

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

(13) Shaft profile 16-sided or 18-sided is considered to be equivalent to round section.

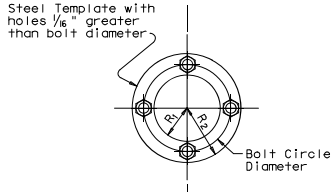


SECTION C-C



NUT ANCHOR
(TYPE 2)

ANCHOR BOLT ASSEMBLY



TEMPLATE DETAIL

GENERAL NOTES:

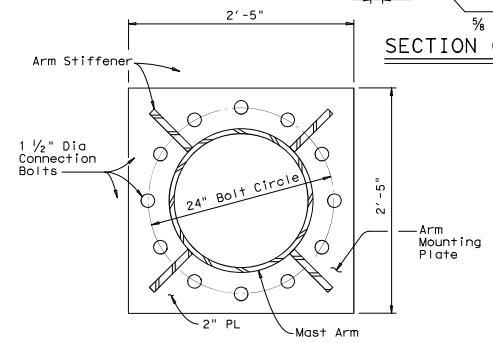
Built-up Box Connection: For the welded arm-to-pole connection as a build-up box configuration illustrated here is an example only, fabricators are required to submit a shop drawing of box connection for approval. The drawing shall specify the details of each box element, welds of arm-to-pole connection,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

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

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

ANCHOR BOLT & TEMPLATE SIZE						
Bolt Dia in.	Length ǂ	Top Thread	Bottom Thread	Bolt Circle	R_2	R_1
2 1/2"	5'-2"	10"	6 1/2"	27"	16"	11"

ǂ Min dimension given, longer bolts are acceptable.



SECTION D-D

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

SEE SHEET "TS-FD" FOR ADDITIONAL DETAILS.

(14) Anchor bolt design develops the foundation capacity given under Foundation Design Laods.

(15) Foundation Design Loads are the allowable moments and shears at the base of the structure.

(16) Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

(17) If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

(18) Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Texas Department of Transportation
Traffic Operations Division

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

Sheet 3 of 5 LMA(3)-12

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DIST	COUNTY		SHEET NO.
HOU	FORT BEND		165

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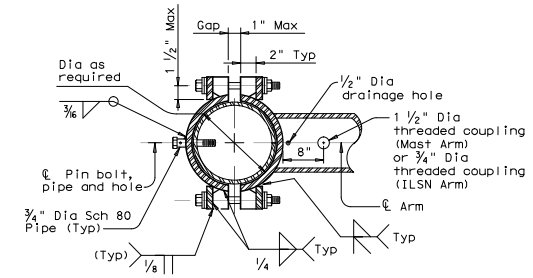
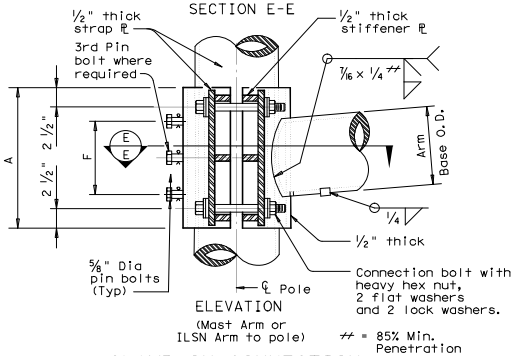


SECTION E-E



ELEVATION
(Mast Arm or ILSN Arm to pole)

CLAMP-ON CONNECTION

80 MPH WIND

Clamp-on Arm Lc	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	thk (12)	Rise	L_1	D_1	D_2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1′-9"	19.1	7.0	3.5	.179	1′-8"
24	23.1	7.5	4.3	.179	1′-10"	23.1	7.5	3.5	.179	1′-9"
28	27.1	8.0	4.2	.179	1′-11"	27.1	8.0	3.5	.179	1′-10"
32	31.0	9.0	4.7	.179	2′-1"	31.0	9.0	3.5	.179	2′-0"
36	35.0	9.5	4.6	.179	2′-4"	35.0	10.0	3.5	.179	2′-1"
40	39.0	9.5	4.1	.239	2′-8"	39.0	9.5	3.5	.239	2′-3"
44	43.0	10.0	4.1	.239	2′-11"	43.0	10.0	3.5	.239	2′-6"

100 MPH WIND

Clamp-on Arm Lc	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	thk (12)	Rise	L_1	D_1	D_2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1′-8"	19.1	8.0	3.5	.179	1′-7"
24	23.1	9.0	5.8	.179	1′-9"	23.1	9.0	3.5	.179	1′-8"
28	27.1	9.5	5.7	.179	1′-10"	27.1	10.0	3.5	.179	1′-9"
32	31.0	9.5	5.2	.239	1′-11"	31.0	9.5	3.5	.239	1′-10"
36	35.0	10.0	5.1	.239	2′-0"	35.0	10.0	3.5	.239	1′-11"
40	39.0	10.5	5.1	.239	2′-3"	39.0	11.0	3.5	.239	2′-1"
44	43.0	11.0	5.1	.239	2′-8"	43.0	11.5	4.0	.239	2′-3"

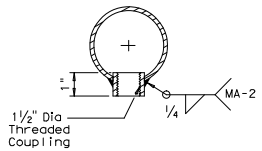
D1 = Arm Base O.D.
D2 = Arm End O.D.
L1 = Shaft Length
Lc = Clamp-on Arm Length

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

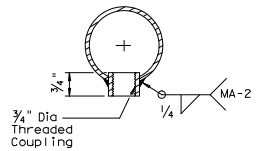
CLAMP-ON ARM CONNECTION

ILSN Arm Size		A	F	4 Conn. Bolts	⅝" Dia. Pin Bolts
Sch 40 pipe Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
3	.216	10	4	¾	2

Mast Arm Size		A	F	4 Conn. Bolts	⅝" Dia. Pin Bolts
Base Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
6.5	.179	12	6	1	2
7.5	.179	14	8	1	2
8.0	.179	14	8	1	2
9.0	.179	16	10	1	2
9.5	.179	18	12	1 ¼	3
9.5	.239	18	12	1 ¼	3
10.0	.239	18	12	1 ¼	3
10.5	.239	18	12	1 ¼	3
11.0	.239	18	12	1 ¼	3
11.5	.239	18	12	1 ¼	3



ARM COUPLING DETAIL



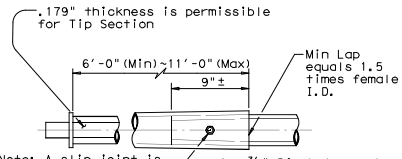
ILSN ARM COUPLING DETAIL

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies or ILSN arm support. For a clamp-on mast arm, a maximum 1 ½" wide vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1". For an ILSN arm, a 1 ½" diameter hole shall be cut in the front clamp plate for wire access. A matched hole shall be field drilled through the pole to provide wire access after arm is oriented. Deburr both holes.

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

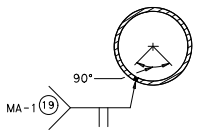
Pin bolts are required to prevent rotation of clamp-on arms under design wind forces. Pin bolts shall be ASTM A325 with threads excluded from the shear plane. Pin bolt and ¾" diameter pipe shall have 7/16" diameter holes for a ⅛" diameter galvanized cotter pin. Back clamp plate shall be furnished with a ¾" diameter hole for each pin bolt. An 11/4" diameter hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.



SLIP JOINT DETAIL (CLAMP-ON ARM)

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

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

Texas Department of Transportation
Traffic Operations Division

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

Sheet 4 of 5 LMA(4)-12

DN: JK	CK: GRB	DW: FDN	CK: CAL

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	HOU	FORT BEND		166

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* Shipping Parts List

Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers, and any additional hardware listed in the table.

Nominal Arm Length	30' Poles with Luminaire: See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex	24' Poles with ILSN: See note above plus one small hand hole	19.50' (Single Mast Arm) 20.25' (Dual Mast Arm) Poles with no Luminaire and no ILSN: See note above

Single Mast Arm

Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	50L	1	50S		50	
55	55L		55S		55	
60	60L		60S		60	
65	65L		65S		65	

Dual Mast Arm

Lf ft.	Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	20	5020L		5020S		5020	
	24	5024L		5024S		5024	
	28	5028L		5028S		5028	
	32	5032L		5032S		5032	
	36	5036L		5036S		5036	
	40	5040L		5040S		5040	
	44	5044L		5044S		5044	
55	20	5520L		5520S		5520	
	24	5524L		5524S		5524	
	28	5528L		5528S		5528	
	32	5532L		5532S		5532	
	36	5536L		5536S		5536	
	40	5540L		5540S		5540	
	44	5544L		5544S		5544	
60	20	6020L		6020S		6020	
	24	6024L		6024S		6024	
	28	6028L		6028S		6028	
	32	6032L		6032S		6032	
	36	6036L		6036S		6036	
	40	6040L		6040S		6040	
	44	6044L		6044S		6044	
65	20	6520L		6520S		6520	
	24	6524L		6524S		6524	
	28	6528L		6528S		6528	
	32	6532L		6532S		6532	
	36	6536L		6536S		6536	
	40	6540L		6540S		6540	
	44	6544L		6544S		6544	

Foundation Summary Table **

Location * Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet)
			48-A
POLE #3	10	1	22
Total Drill Shaft Length			22

Notes

** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

*** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

* Shipping Parts List

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

Nominal Arm Length	Type IV Arm (4 Signals) 3 Bracket Assembly and 4 CGB Connectors	
ft.	Designation	Quantity
50	50IV	1
55	55IV	
60	60IV	
65	65IV	

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	1

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp w/bolts and washers		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44					44III-80	

Traffic Signal Arms (100 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
2 1/2 "	5' - 3"	1

Each anchor bolt assembly consists of the following: Top and bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers and 4 nut anchor devices (type 2) per Standard Drawing "TS-FD". Templates may be removed for shipment.

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

STATE OF TEXAS
HARISH NARAYANAPPA
82041
REGISTERED
PROFESSIONAL ENGINEER

3/8/2024

FM 359 AT MCCRARY RD

Texas Department of Transportation
Traffic Operations Division

LONG MAST ARM ASSEMBLY PARTS LIST

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Sheet 5 of 5

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HOU	FORT BEND		167

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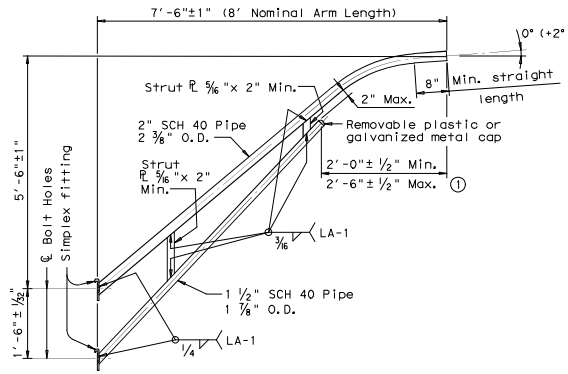
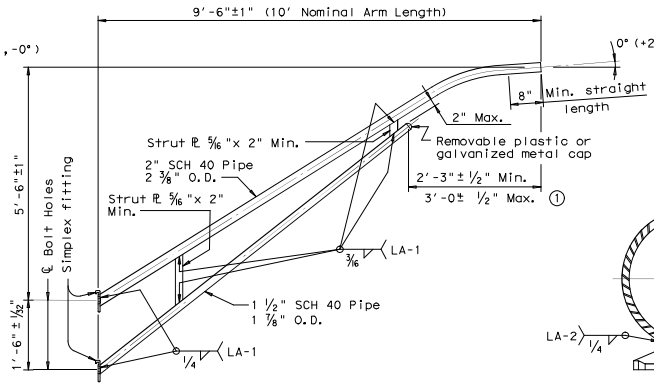
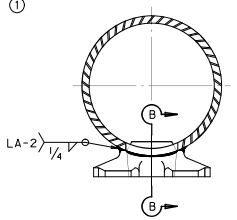
MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr.65-35 or A148 Gr.80-50, A576 Gr.1021 ③, or A36 (Arm only)
Arm Pipes	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50 ④, or A1011 HSLAS-F Gr.50 ④
Arm Strut Plates ②	ASTM A36, A572 Gr.50 ④, or A588
Misc.	ASTM designations as noted



8-FOOT LUMINAIRE ARM



10-FOOT LUMINAIRE ARM



DIRECT ATTACHMENT DETAIL

① Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

② Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

③ A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

④ ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Revisions thereto. Design Wind Speed equals 90 mph plus a 1.3 gust factor. Arms are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq. ft.

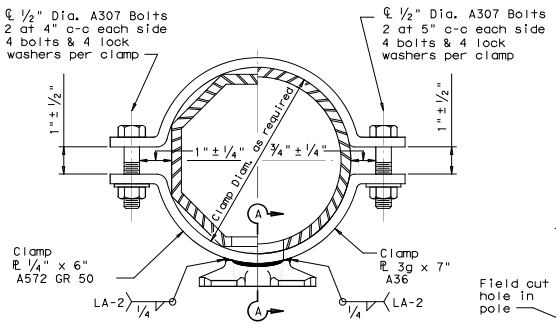
Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absense of specified Fabricaton tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

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

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

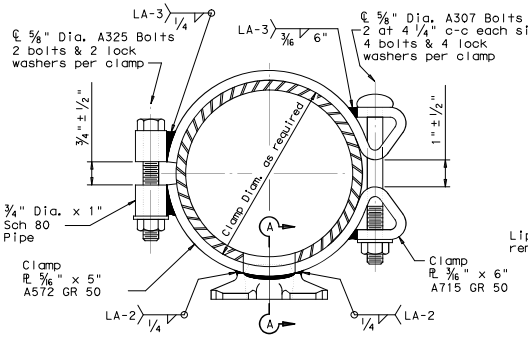
Each pole simplex fitting shall be supplied with 2 ASTM A325 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans. When clamp attachment is specified, the Fabricator shall ship the clamp assembly securely attached to the pole at the location shown on the plans.

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



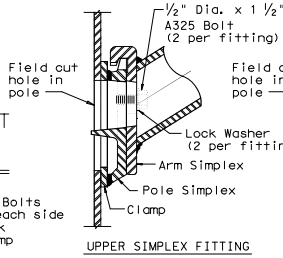
CLAMP ATTACHMENT DETAIL NO.1 (HALF SECTION)

CLAMP ATTACHMENT DETAIL NO.2 (HALF SECTION)

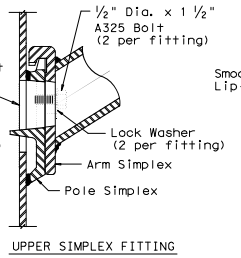


CLAMP ATTACHMENT DETAIL NO.3 (HALF SECTION)

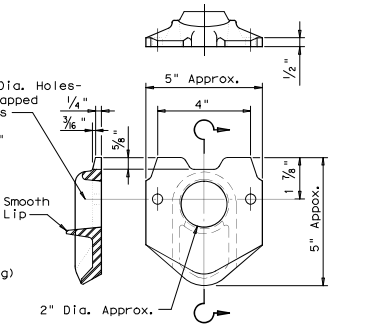
CLAMP ATTACHMENT DETAIL NO.4 (HALF SECTION)



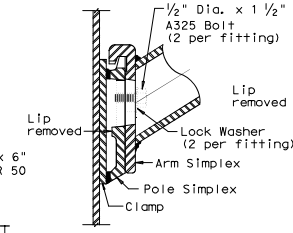
UPPER SIMPLEX FITTING



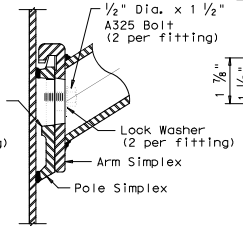
UPPER SIMPLEX FITTING



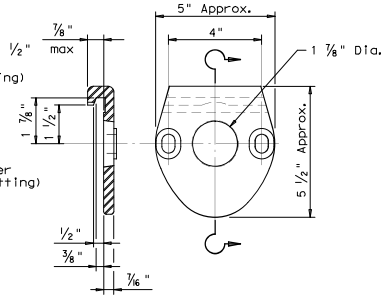
POLE SIMPLEX DETAIL



LOWER SIMPLEX FITTING



LOWER SIMPLEX FITTING



SECTON A-A

SECTON B-B

ARM SIMPLEX DETAIL

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES

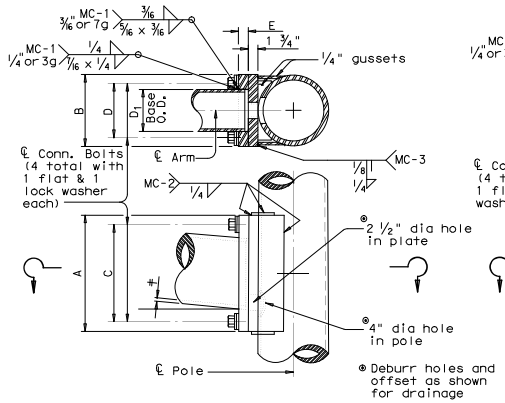
ARM DETAILS

LUM-A-12

DN: LEH	CK: JSY	DW: LTT	CK: TEB
REVISIONS 5-96 1-99 1-12	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY	SHEET NO.
	HOU	FORT BEND	168

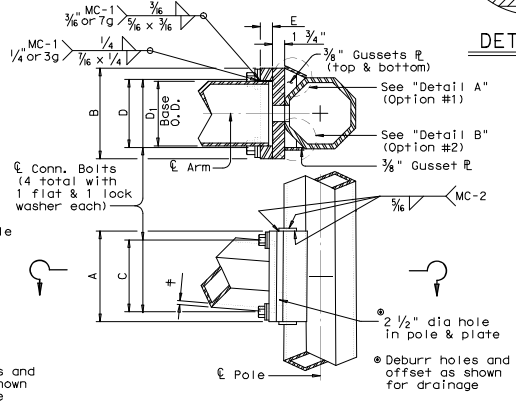
DATE:
FILE:

ARM SIZE D_1	ARM SIZE ∓	A	B	C	D	E	CONN BOLT DIA
in.	in.	in.	in.	in.	in.	in.	in.
6.5	.179	12	9	9	6	1 ¾	1
7.5	.179	13	9	10	6	1 ¾	1
8.0	.179	14	10	11	7	2	1 ¼
9.0	.179	16	11	13	8	2	1 ¼
9.5	.179	17	12	14	9	2	1 ¼
9.5	.239	18	12	15	9	2	1 ¼
10.0	.239	18	12	15	9	2	1 ¼
10.5	.239	18	13	15	10	3	1 ½
11.0	.239	18	13	15	10	3	1 ½

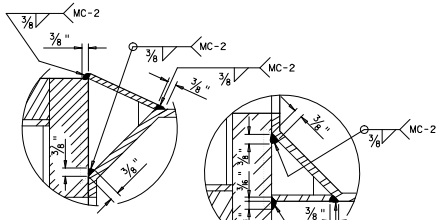


FIXED MOUNT DETAIL 1

ARM SIZE D_1	ARM SIZE ∓	A	B	C	D	E	CONN BOLT DIA
in.	in.	in.	in.	in.	in.	in.	in.
7.0	.179	11	11	8	8	1 ¾	1 ¼
7.5	.179	11	11	8	8	1 ¾	1 ¼
8.0	.179	11	11	8	8	2	1 ¼
9.0	.179	13	13	10	10	2	1 ¼
10.0	.179	13	13	10	10	2	1 ¼
9.5	.239	13	13	10	10	2	1 ¼
10.0	.239	14	14	11	11	2	1 ½
11.0	.239	14	14	11	11	3	1 ½
11.5	.239	14	14	11	11	3	1 ½



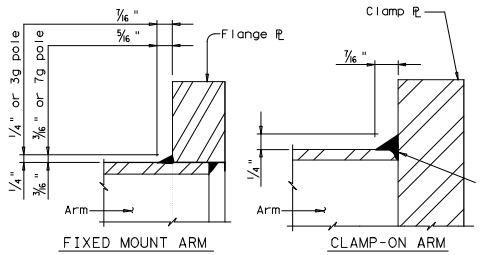
FIXED MOUNT DETAIL 2



MATERIALS	
Round Shafts or Polygonal Shafts ①	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 ②
Plates ①	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325 or A449, except where noted
Pin Bolts	ASTM A325
Pipe ①	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

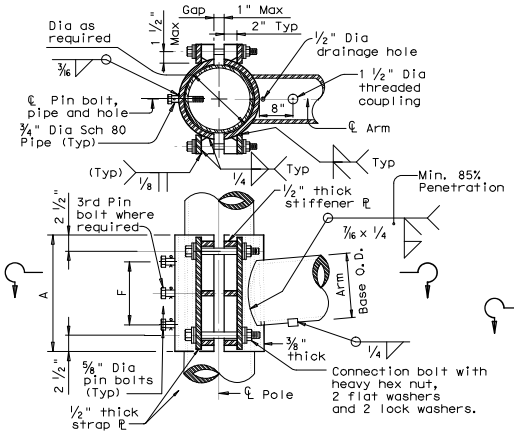
① ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

② ASTM A1011 SS Gr.50 material shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.



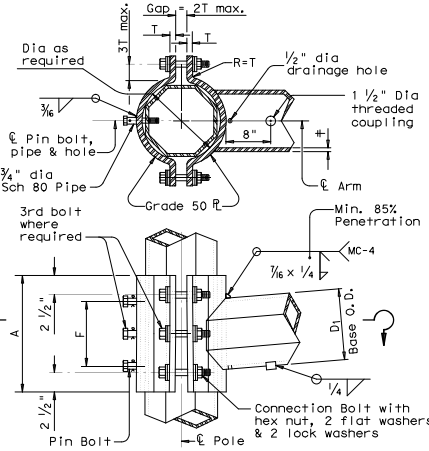
ARM BASE WELD DETAILS

ARM SIZE D_1	ARM SIZE ∓	A	F	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	ea.	in.	ea.	in.
6.5	.179	12	6	4	1	2	⅝
7.5	.179	14	8	4	1	2	⅝
8.0	.179	14	8	4	1	2	⅝
9.0	.179	16	10	4	1	2	⅝
9.5	.179	18	12	4	1 ¼	3	⅝
9.5	.239	18	12	4	1 ¼	3	⅝
10.0	.239	18	12	4	1 ¼	3	⅝

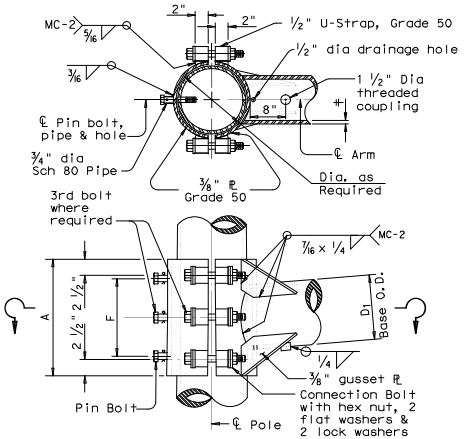


CLAMP-ON DETAIL 1

ARM SIZE D_1	ARM SIZE ∓	A	F	T	CONN. BOLTS No.	CONN. BOLTS Dia	PIN BOLTS No.	PIN BOLTS Dia
in.	in.	in.	in.	in.	ea.	in.	ea.	in.
7.0	.179	12	6	¾	4	¾	2	⅝
7.5	.179	14	8	¾	4	¾	2	⅝
8.0	.179	14	8	¾	4	¾	2	⅝
9.0	.179	16	10	⅞	4	1	2	⅝
10.0	.179	18	10	⅞	4	1	2	⅝
9.5	.239	18	10	1	6	1	3	⅝
10.0	.239	18	10	1	6	1	3	⅝



CLAMP-ON DETAIL 2



CLAMP-ON DETAIL 3

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies. A Maximum 1 ½" wide vertical slotted hole shall be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1"

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

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

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces.

NOTE:

Pin bolts shall be A325 with threads excluded from the shear plane. Pin bolt and ¾" dia pipe shall have ⅝" dia holes for a ⅛" dia galvanized cotter pin. Back clamp plate shall be furnished with a ¾" dia hole for each pin bolt. An 11/16 " dia hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

Texas Department of Transportation
Traffic Operations Division

STANDARD ASSEMBLY FOR TRAFFIC SIGNAL SUPPORT STRUCTURES

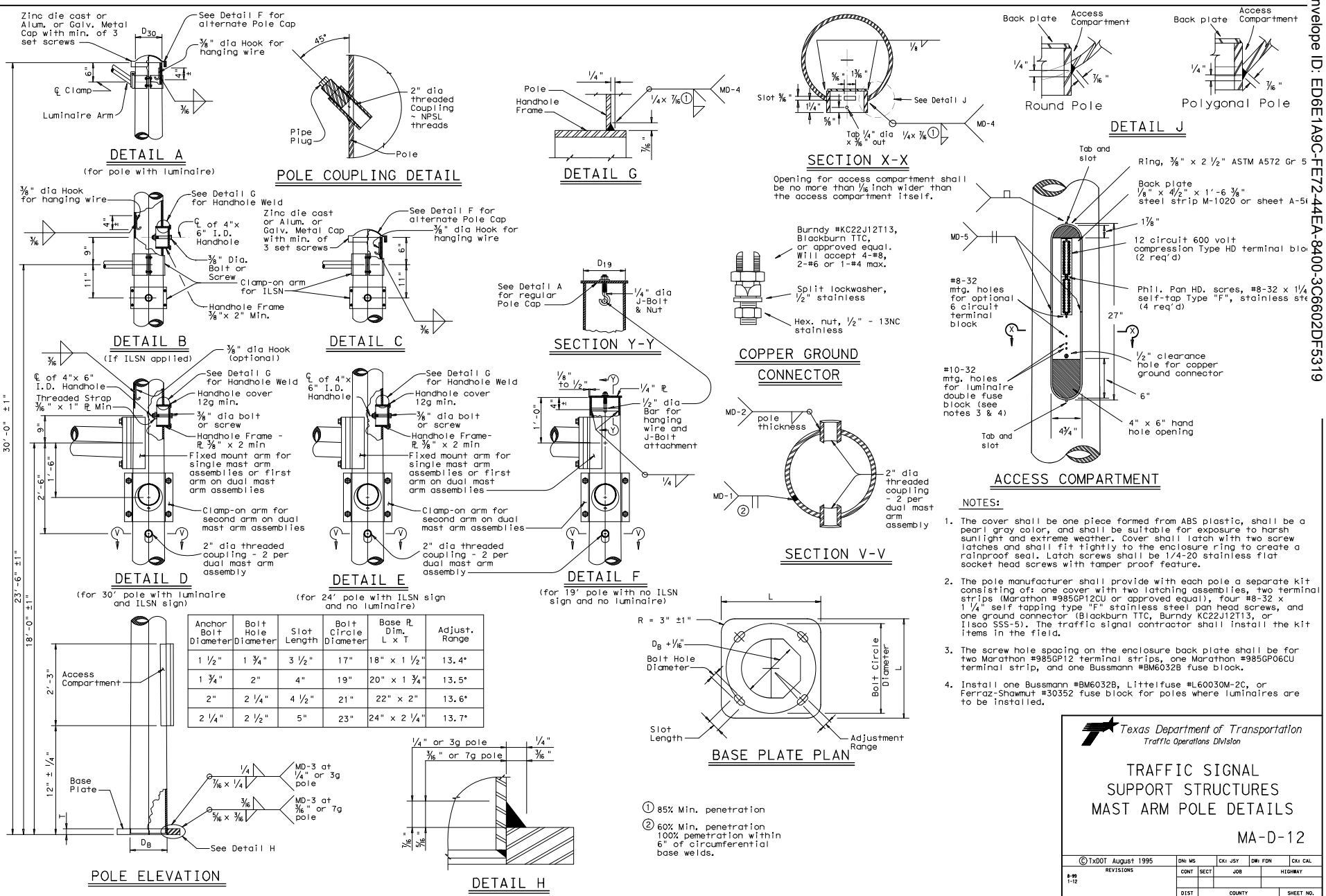
MAST ARM CONNECTIONS

MA-C-12

DN: MS	CK: JSY	DW: MMF	CK: JSY
REVISIONS	CONT	SECT	JOB	HIGHWAY
5-96				
5-09				
1-12				
	DIST	COUNTY		SHEET NO.
	HOU	FORT BEND		169

126A

DATE:
FILE:



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

① 85% Min. penetration

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

NOTES:

1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES MAST ARM POLE DETAILS

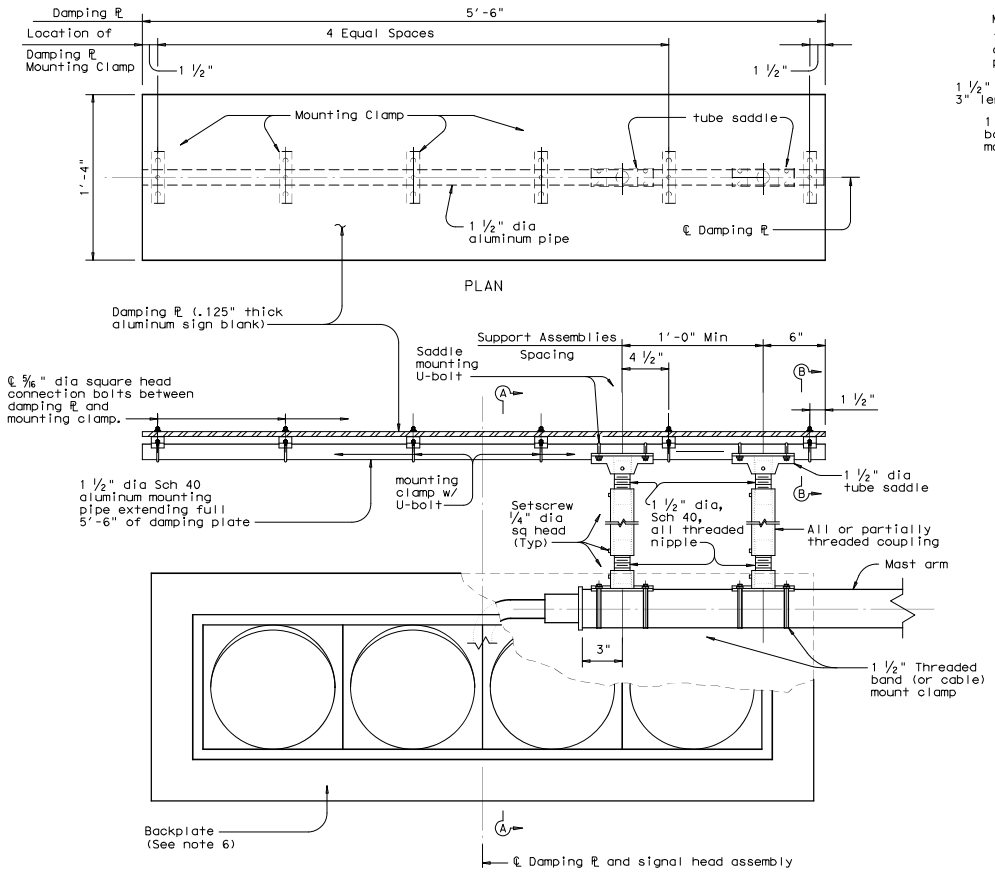
MA-D-12

DN: MS	CK: JSY	DW: FDN	CK: CAL

REVISIONS
8-99
1-12

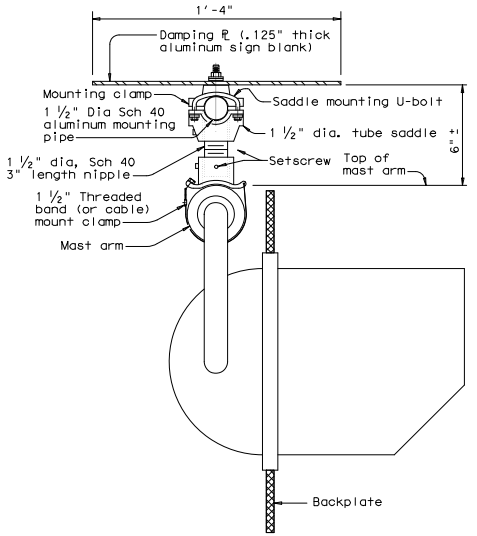
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.
HOU	FORT BEND		170

DATE:
FILE:



DAMPING PLATE MOUNTING DETAILS

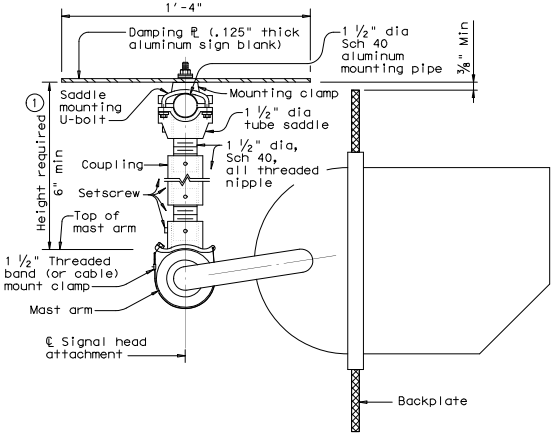
(Showing alternate placement of signal head)



SECTION A-A

(Showing standard placement of signal head)

(Mounting clamp U-bolt is not shown for clarity)



SECTION A-A

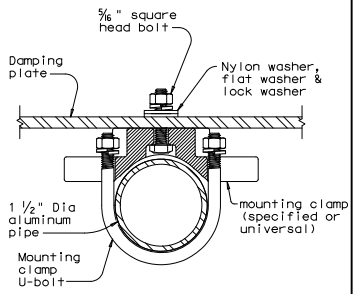
(Showing alternate placement of signal head)

(Mounting clamp U-bolt is not shown for clarity)

① Recommended supporting assemblies to achieve required height for horizontal section heads			
Height required	One nipple each length	Two nipples each length plus	One coupling each length
6"-6 ¾"	3"	-	-
7"-8 ½"	4"	-	-
9"-10 ½"	6"	-	-
11"-15 ½"	-	4"	5"
16"-24"	-	6"	10"

GENERAL NOTES:

1. In accordance with the findings of TxDOT sponsored research, the installation of a damping plate in accordance with the details shown here at the end of signal mast arms of SMA and DMA standard structures reduces excessive harmonic vertical vibration, and thus fatigue damage. Any deviation from these details may reduce the effectiveness of this damping device.
2. Aluminum sign blank for damping plate will conform to Departmental Material Specifications DMS-7110. Materials for mast arm mounting clamp and tube saddle will be aluminum castings or aluminum alloys as in accordance with manufacturers' stipulations. Mounting pipe, pipe nipple and coupling will be aluminum alloy 6061-T6 or 6063-T6. Damping plate mounting clamp and u-bolt assemblies will conform to Standard sheet SMD(GEN). U-bolts for saddle mounting will have a minimum yield strength of 36 ksi.
3. Damping plate will be mounted horizontally. Position centerline of damping plate to align with centerline of mast arm or horizontal signal head assembly. Vertical clearance between signal head (with or without backing plate)and bottom of damping plate will be maintained as shown. The attachments shown here are examples only, other supporting details which meet both alignment and vertical clearance requirements are also acceptable.
4. Unless stipulated by the manufacturers, all steel parts will be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".
5. Contractor will verify applicable field dimensions before the installation.
6. Backplates are optional for traffic signals. When backplates are used, Backplates will have a 2-inch fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 "Sign Face Materials." See Sheet TS-BP-20 for backplate details.



SECTION B-B

(Showing damping plate attachment)

Texas Department of Transportation

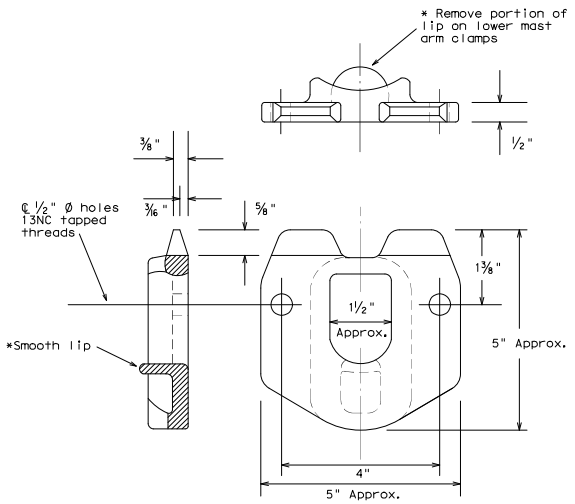
Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

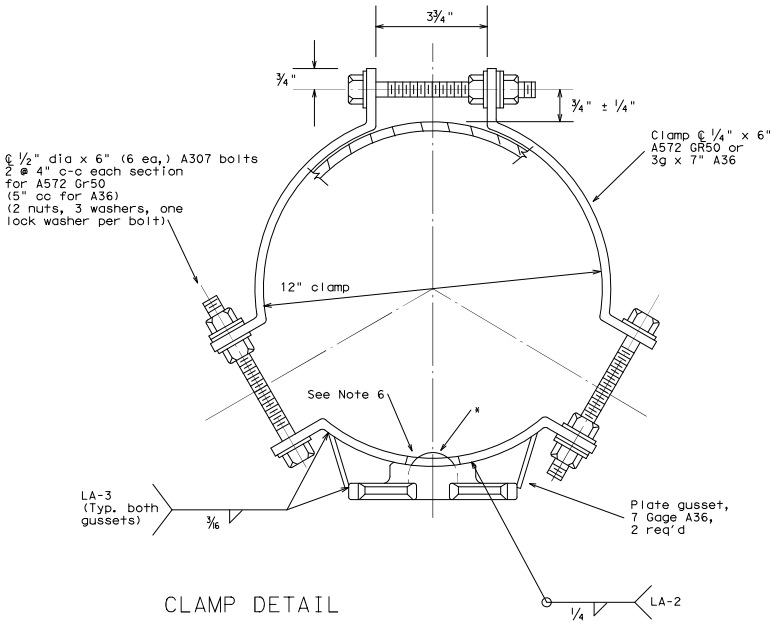
MA-DPD-20

FILE: ma-dpd-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 6-20				
	DIST	COUNTY		SHEET NO.
				171

134



POLE SIMPLEX DETAILS



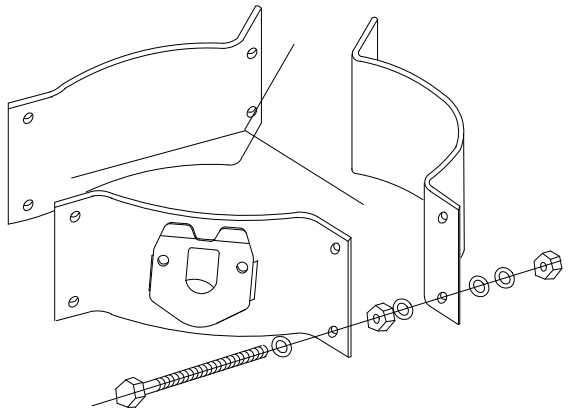
CLAMP DETAIL

OTHER MATERIALS:

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

GENERAL NOTES:

1. Materials and fabrication shall be in accordance with Standard Sheet "MA-C" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
2. All parts shall be galvanized after fabrication in accordance with Item 445, "Galvanizing". The throat of the Simplex shall be made free of all rough or sharp edges resulting from the galvanizing process.
3. Each simplex fitting shall be supplied with 2 ASTM A325 bolts, ½in. X 1½in. and 2 lock washers. The bolts and lock washers shall be secured to the clamp with the other hardware items. The Fabricator shall ship clamp assembly together in a single package, including all bolts, nuts, and washers required for the clamp and simplex fitting.
4. Design conforms to 1994 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals" and interim revisions thereto. Design Wind Speed equals 80 mph plus a 1.3 gust factor. Clamps are designed to support a 60 lb. luminaire having an effective projected area (actual area times drag coefficient) of 1.6 sq.ft.,12 ft. maximum arm length.
5. Each assembly shall consist of one upper piece simplex fitting having a smooth lip and one lower piece simplex fitting with the lip removed.
6. Approximately 2 in. diameter hole in upper mast arm clamp.



PROJECTION

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

Texas Department of Transportation
Traffic Operations Division

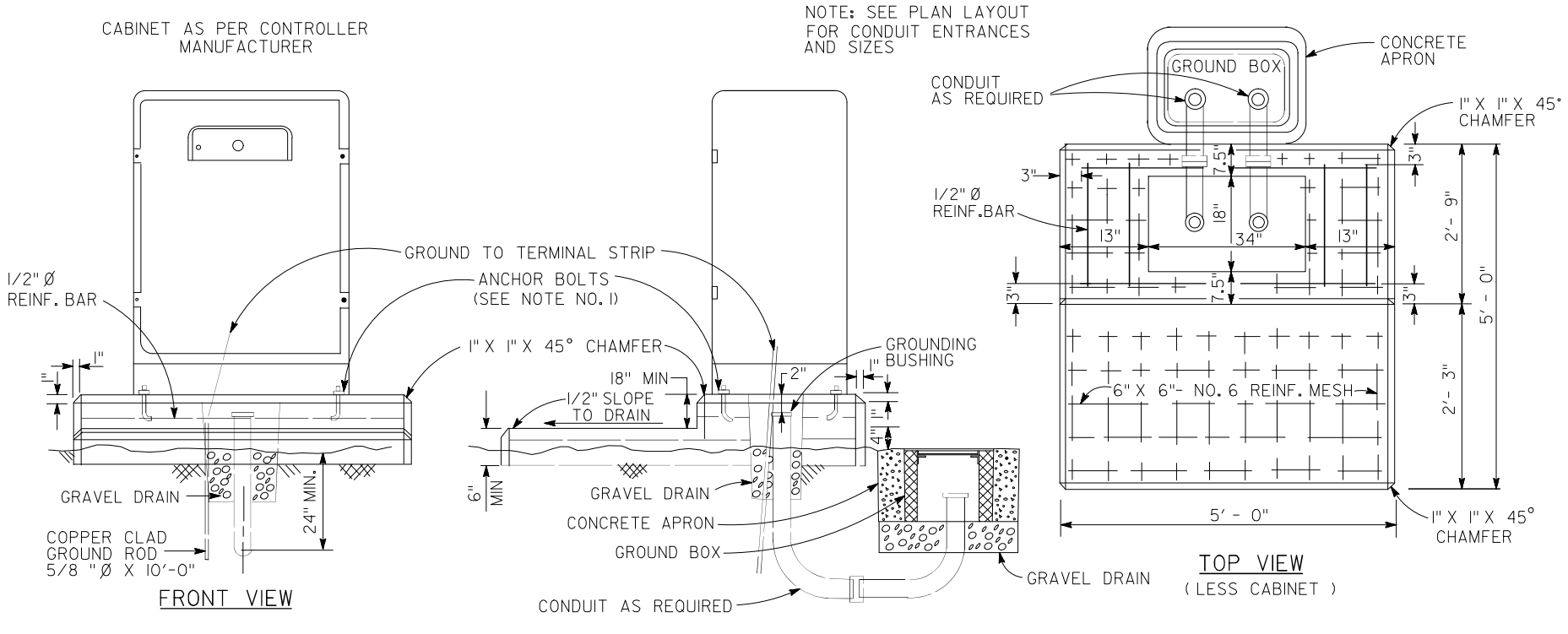
CLAMP ON FITTING ASSEMBLY FOR LUMINAIRE MAST ARM

CFA-12

© TxDOT	DN: KAB	CK: RES	DW: FDN	CK: CAL
REVISIONS	CONT	SECT	JOB	HIGHWAY
11-99	HOU			
1-12	DIST	COUNTY		SHEET NO.
		FORT BEND		172

130

DATE:
FILE:



NOTES:

1. CABINET MANUFACTURER TO PROVIDE DETAILS OF ANCHOR BOLT LOCATION.
2. MODIFY DIMENSIONS FOR CONCRETE BASE TO FIT EQUIPMENT FURNISHED, IF NECESSARY.
3. PROVIDE GRAVEL DRAIN FOR CONTROLLER AND ALL GROUND BOXES.
4. FURNISH CLASS "B" OR CLASS "C" CONCRETE.
5. SET CONTROLLER FOUNDATION LEVEL WITH THE PAVEMENT SURFACE OR AS APPROVED BY THE ENGINEER.
6. FURNISH AT NO COST TO THE DEPARTMENT ANY ADDITIONAL CONCRETE WHICH MAY BE NECESSARY TO STABILIZE THE FOUNDATION AT UNUSUAL LOCATIONS.
7. PLACE REINFORCING BARS AS DIRECTED.
8. UPON INSTALLING THE CONTROLLER CABINET, APPLY A SILICON-BASED CAULKING COMPOUND AROUND THE BASE OF THE CONTROLLER CABINET.

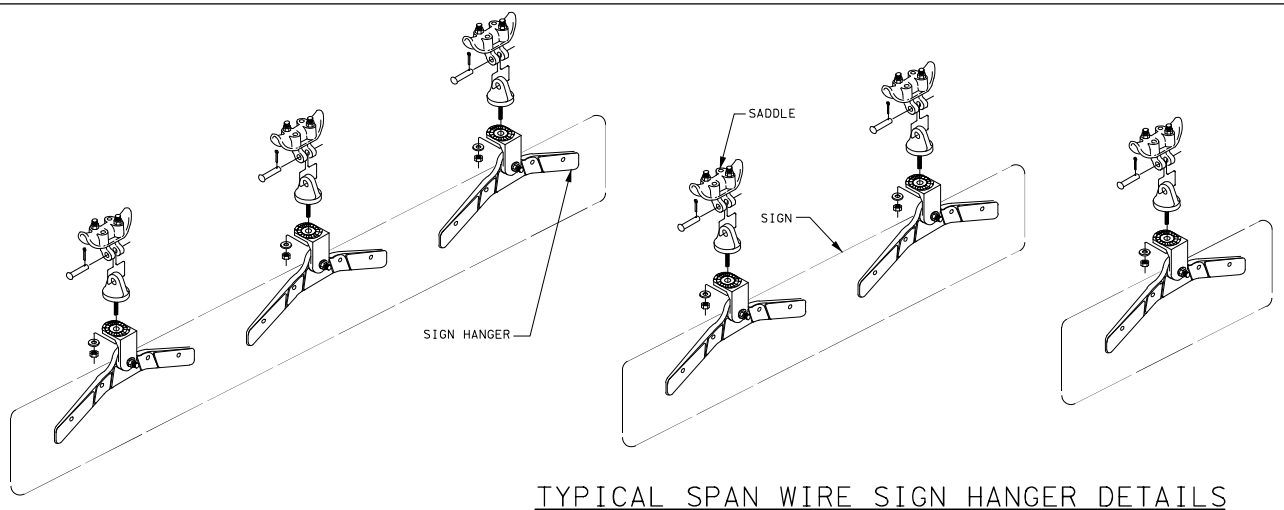
Texas Department of Transportation
Houston District

SIGNAL DETAILS/STANDARDS CONTROLLER FOUNDATION DETAIL

SD/SCFD

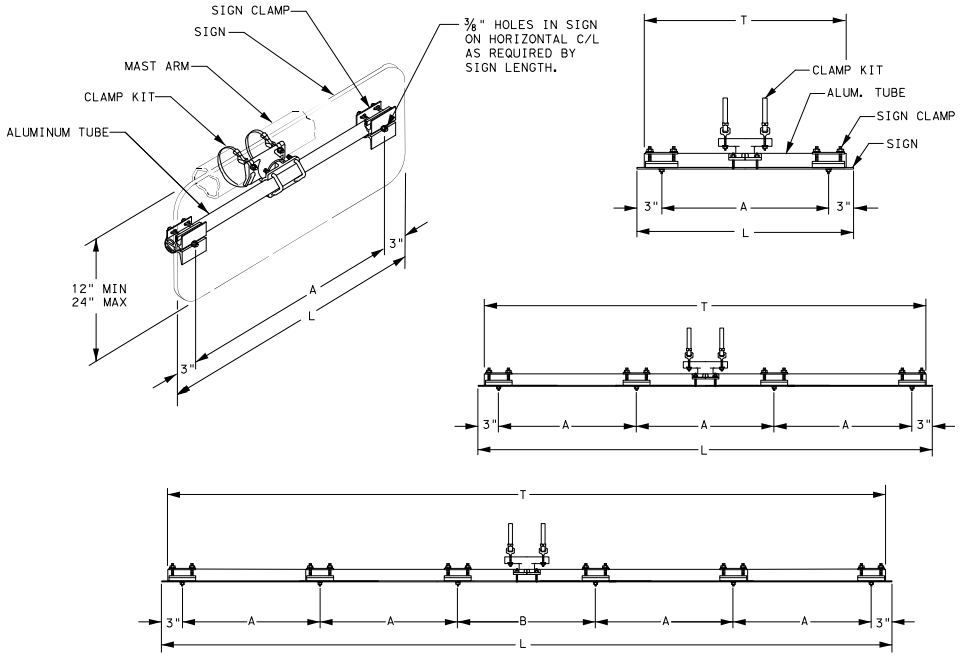
FILE:	DN:	CK:	DW:	CK:
© TxDOT 2007	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS 08-04 03-07	HOU	6		173
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	FORT BEND				

STD-M1



1. USE PELCO PARTS OR APPROVED EQUAL.
2. FURNISH HARDWARE FOR A COMPLETE INSTALLATION.
3. ATTACH THE 90* SPAN WIRE CLAMPS (SADDLES) TO TETHERS (SWAY CABLES).
4. FURNISH 1 ADJUSTABLE FREE SWINGING SIGN HANGER PER STREET NAME SIGN SMALLER THAN 3 FT. - 0 IN. SIGNS 3 FT - 0 IN. TO 6 FT.- 0 IN. REQUIRE 2 HANGERS. SIGNS LARGER THAN 6 FT. - 0 IN. REQUIRE 3 HANGERS.

TYPICAL SPAN WIRE SIGN HANGER DETAILS



SIGNS (1'-6" to 3'-0" Long)

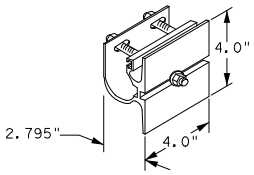
SIGN LENGTH (L)	TUBE LENGTH (T)	A
1'-6"	16"	12"
2'-0"	22"	18"
2'-6"	28"	24"
3'-0"	34"	30"

SIGNS (3'-6" to 8'-0" Long)

SIGN LENGTH (L)	TUBE LENGTH (T)	A
3'-6"	40"	12"
4'-0"	46"	14"
4'-6"	52"	16"
5'-0"	58"	18"
5'-6"	64"	20"
6'-0"	70"	22"
6'-6"	76"	24"
7'-0"	82"	26"
7'-6"	88"	28"
8'-0"	94"	30"

SIGNS (8'-6" to 10'-0" Long)

SIGN LENGTH (L)	TUBE LENGTH (T)	A	B
8'-6"	100"	19"	20"
9'-0"	106"	20"	22"
9'-6"	112"	21"	24"
10'-0"	118"	22"	26"



SIGN CLAMP DETAIL

GUSSETED TUBE CROSS SECTION

TYPICAL MAST ARM SIGN MOUNT DETAILS

Texas Department of Transportation
Houston District

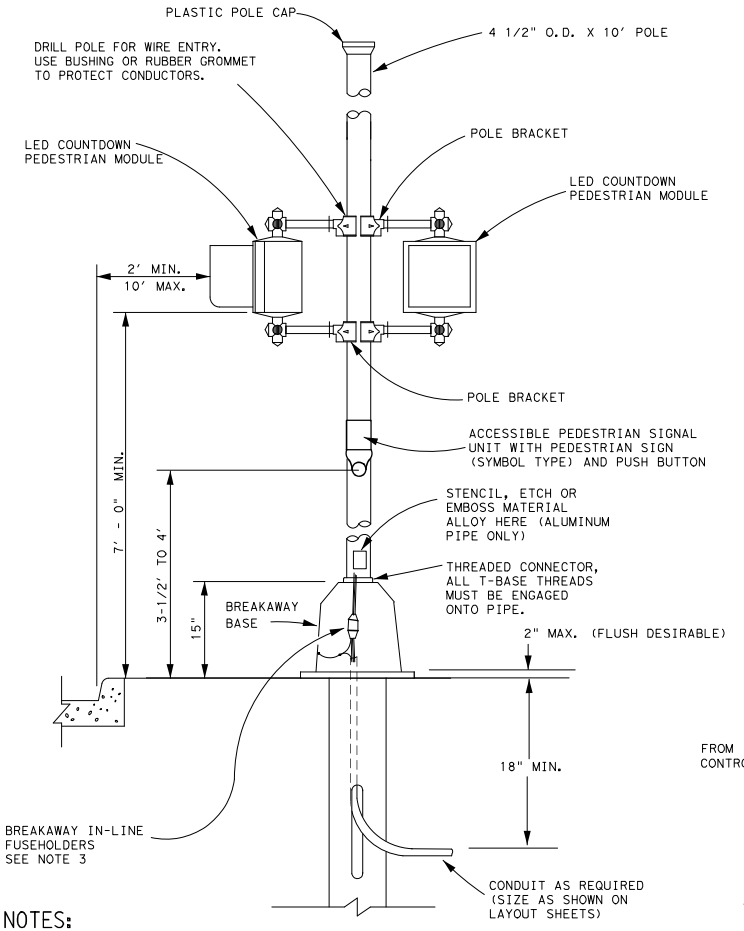
SIGNAL DETAILS/STANDARDS
OVERHEAD STREET NAME SIGN MOUNTING DETAILS

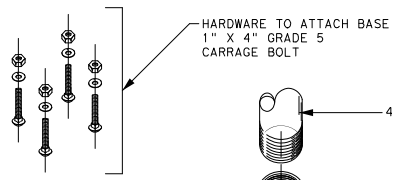
OSNS/MD

	DN:	CK:	DW:	CK:	
©TxDOT 2004	DIST	FED REG	PROJECT NO.		SHEET
	HOU	6			174
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	FORT BEND					

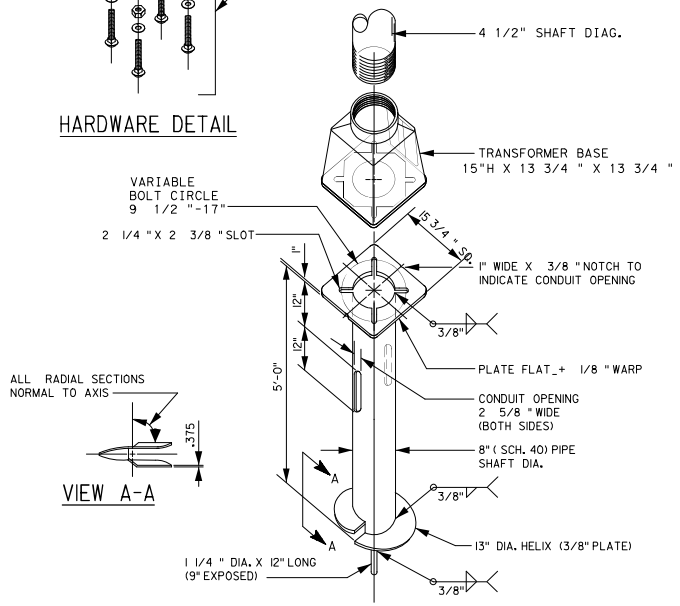
STD-M12

FILE: Overhead-Sign-mount-det-sp04.dgn



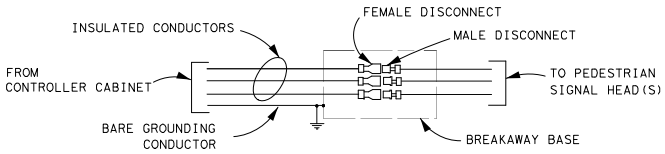


HARDWARE DETAIL



VIEW A-A

SCREW ANCHOR FOUNDATION DETAIL



BREAKAWAY IN-LINE FUSE HOLDERS

NOTES:

1. DETAILS DEPICTED ON THIS SHEET SHOW A TYPICAL PEDESTAL POLE ASSEMBLY WITH A PEDESTRIAN SIGNAL HEAD WITH SIGN AND PUSH BUTTON.
2. THE PEDESTAL POLE ASSEMBLY DEPICTED ON THIS SHEET IS DESIGNED FOR SIGNAL HEADS WHERE ELECTRICAL POWER IS NEEDED WITH A BREAKAWAY POLE.
3. FOR PED POLES AND FLASHING BEACONS WITHIN THE PROJECT, PROVIDE SINGLE-POLE BREAKAWAY DISCONNECTS. USE BUSSMAN HEBW, LITTLEFUSE LEB, FERRAZ-SHAWMUT FEB, OR EQUAL ON UNGROUNDED CONDUCTORS. FOR ALL GROUNDED CONDUCTORS, USE BUSSMAN HET, LITTLEFUSE LET, FERRAZ-SHAWMUT FEBN, OR EQUAL; THESE BREAKAWAY CONNECTORS HAVE A WHITE COLORED MARKING AND A PERMANENTLY INSTALLED SOLID NEUTRAL.
4. UNLESS OTHERWISE SHOWN ON THE PLANS, PROVIDE POLE SHAFT AND BREAKAWAY BASE IN ACCORDANCE WITH THE REQUIREMENTS LISTED IN STANDARD SPECIFICATION ITEM "PEDESTAL POLE ASSEMBLIES".
5. SEE SPECIAL SPECIFICATION, "SCREW-IN TYPE ANCHOR FOUNDATIONS" FOR FURTHER REQUIREMENTS.
6. PROVIDE SIGNAL HEADS AND MOUNTING AS SHOWN ELSEWHERE ON THE PLANS OR, WHEN NO OTHER DETAILS ARE SHOWN, PROVIDE SIGNAL HEADS AND MOUNTING AS SHOWN ON THIS SHEET OR AS OTHERWISE APPROVED BY THE ENGINEER.
7. CONDUIT IN FOUNDATION AND WITHIN 6 IN. OF FOUNDATION IS SUBSIDIARY TO STANDARD SPECIFICATION ITEM, "PEDESTAL POLE ASSEMBLIES".
8. SEE SPECIAL SPECIFICATION, "ACCESSIBLE PEDESTRIAN SIGNAL UNITS" FOR INSTALLATION AND FURTHER REQUIREMENTS.

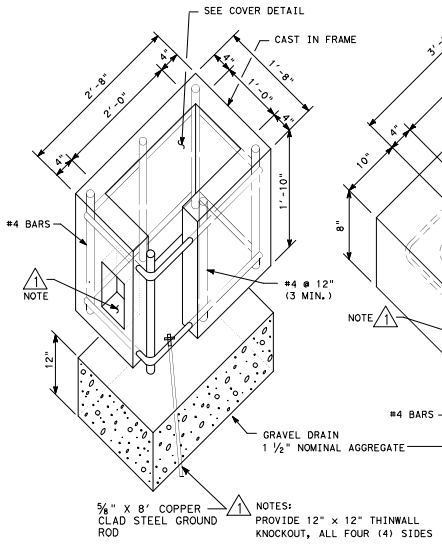
Texas Department of Transportation
Houston District

SIGNAL DETAILS/STANDARDS CONSTRUCTION DETAILS FOR POLE MOUNTED (APS) PEDESTRIAN SIGNALS

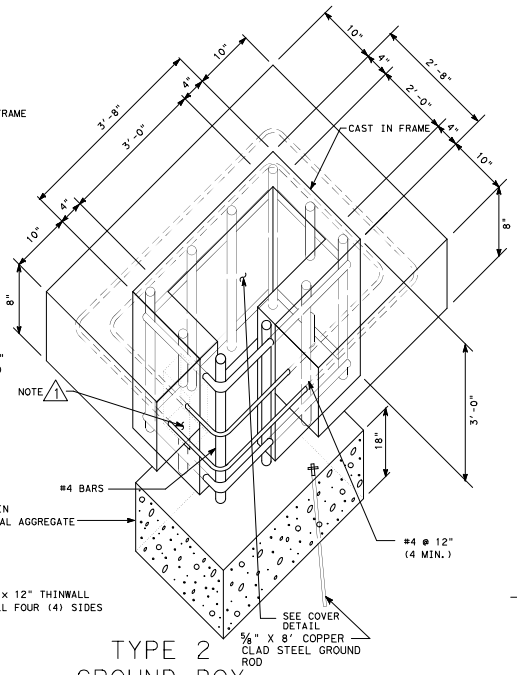
CD/PM(APS)PS

FILE:	DN:	CK:	DW:	CK:
© TxDOT 2012	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS	HOU	6		175
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	FORT BEND				

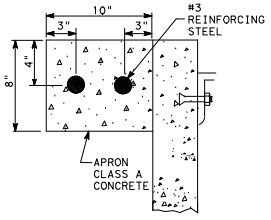
STD-M19



TYPE 1
GROUND BOX



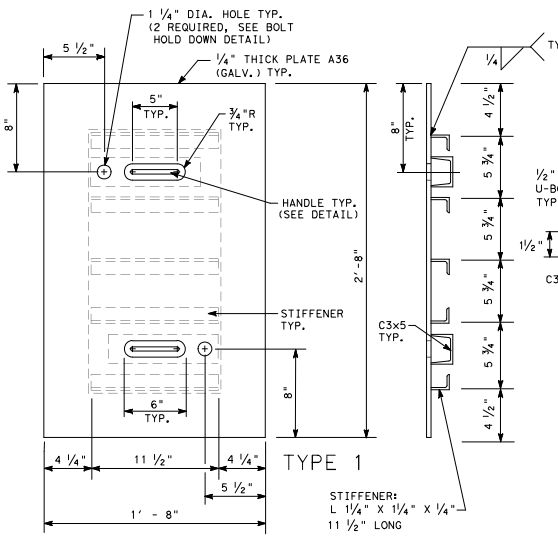
TYPE 2
GROUND BOX
W/APRON



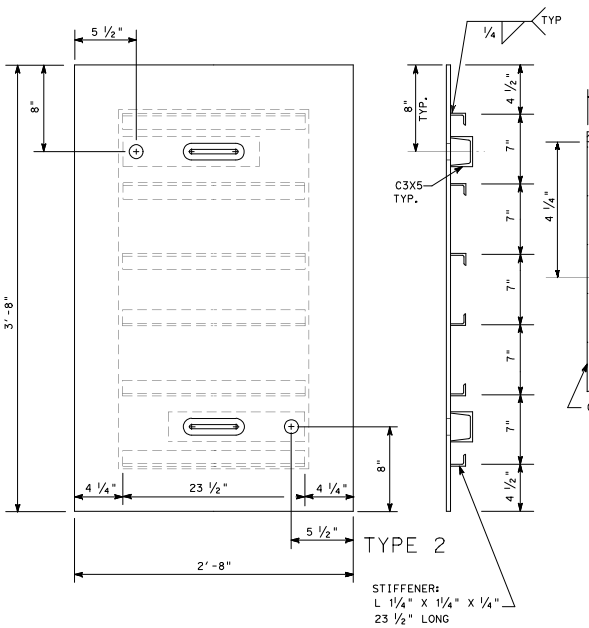
CONCRETE APRON

NOTES:

1. FURNISH REINFORCED CONCRETE GROUND BOXES CONSTRUCTED TO THE APPROXIMATE DIMENSIONS SHOWN ON THIS SHEET.
2. FURNISH GALVANIZED STEEL CHECKERED FLOOR PLATE GROUND BOX COVERS WITH 1 IN. RAISED LETTERS READING "TRAFFIC SIGNALS" OR "F. O. CABLE". SECURE COVERS TO THE GROUND BOX AS SHOWN ON THIS SHEET WITH ⅜ IN. DIA. (MIN.) BOLTS.
3. PROVIDE A GROUNDING LUG FOR STEEL COVERS WITH ½"-13 UNC FEMALE THREADS ON THE UNDERSIDE OF THE COVER.
4. FURNISH FLEXIBLE METAL BRAID TYPE GROUNDING STRAP. ENSURE THE STRAP IS NO LESS THAN 1 IN. IN WIDTH AND 5 FT. MIN. IN LENGTH TO ALLOW FOR GROUND BOX COVER REMOVAL FROM THE BOX WITHOUT DISCONNECTING THE GROUND STRAP.
5. AFTER PLACING GROUND BOX, FURNISH AND INSTALL BACKFILL FOR THE EXCAVATED AREA AND COMPACT THE FILL TO THE DENSITY OF THE SURROUNDING GROUND AS APPROVED BY THE ENGINEER.
6. AFTER INSTALLING CONDUIT THROUGH KNOCKOUT, GROUT REMAINING OPENING OF KNOCKOUT.
7. PLACE GROUND BOXES AS SHOWN ON LAYOUT SHEET. FURNISH ADDITIONAL GROUND BOXES IF REQUIRED.
8. PLACE TYPE 1 GROUND BOXES AT 350 FT. MAXIMUM SPACING. PLACE TYPE 2 GROUND BOXES AT 1,000 FT. MAXIMUM SPACING OR AS DIRECTED BY THE ENGINEER.
9. FURNISH CLASS "A" CONCRETE.

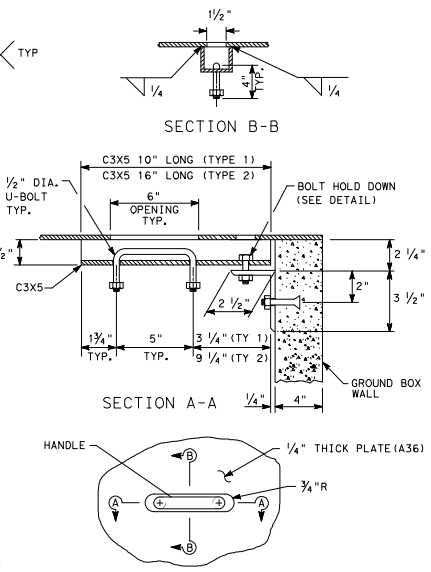


TYPE 1

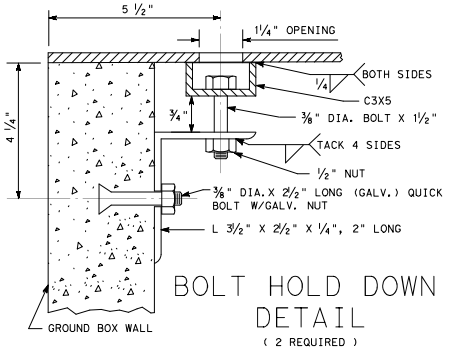


TYPE 2

COVER DETAIL



HANDLE DETAIL



BOLT HOLD DOWN
DETAIL
(2 REQUIRED)

Texas Department of Transportation
Houston District

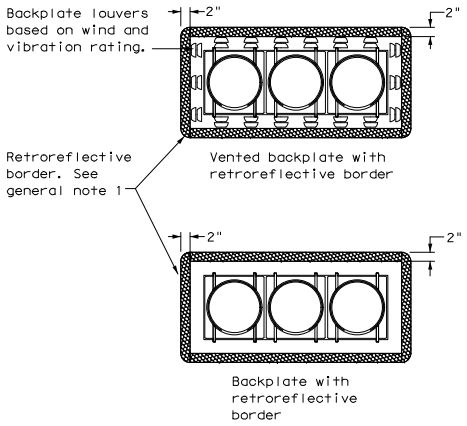
SIGNAL DETAILS/STANDARDS
GROUND BOX DETAILS
INSTALLATIONS

GBDI

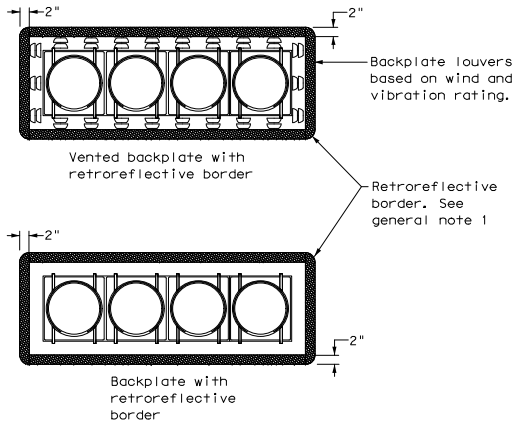
FILE:	DN:	CK:	DW:	CK:
© TxDOT 2004	DIST	FED REG	PROJECT NO.	SHEET
08-04 REVISIONS	HOU	6		176
04-17 REVISIONS	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	FORT BEND				

STD-M2

DATE:
FILE:



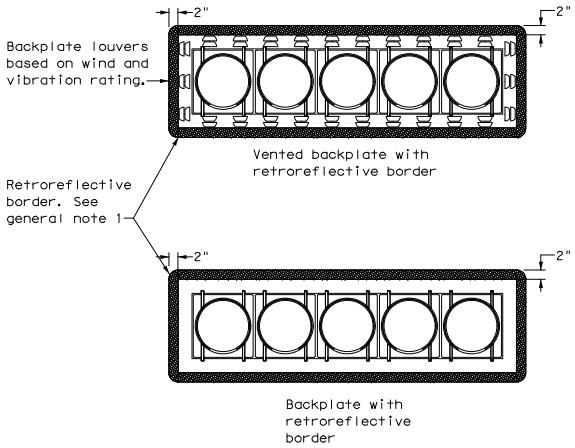
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



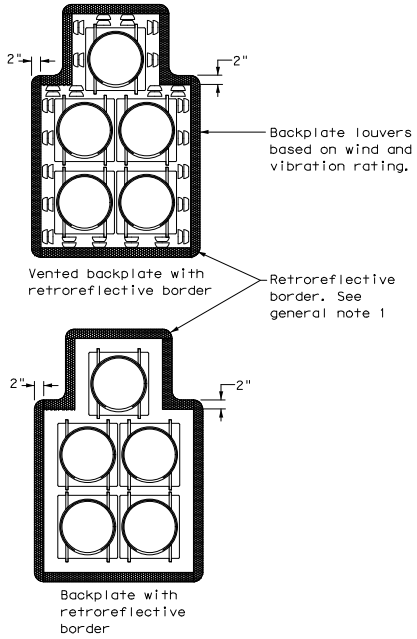
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL

GENERAL NOTES:

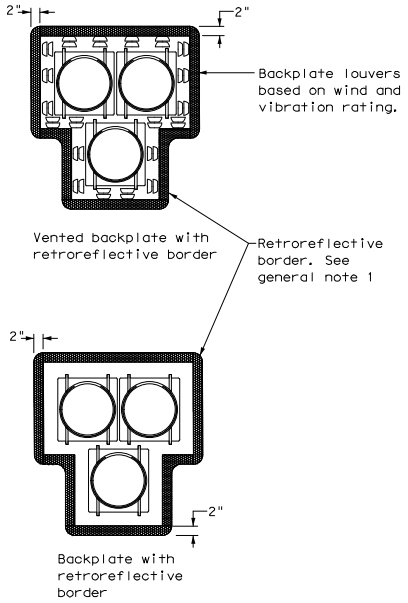
1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatability must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
   - Pole mounted
   - Overhead mounted
   - Span wire mounted
   - Mast arm mounted
   - Vertical signal heads
   - Horizontal signal heads
   - Clustered signal heads
   - Pedestrian hybrid beacons



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

Texas Department of Transportation | Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE

TS-BP-20

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
	HOU	FORT BEND		177

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Electronic Record and Signature Disclosure: Accepted: 4/23/2019 9:10:49 AM ID: c0ad758e-4d7f-441a-a9f6-b34ea86a36c4		
Carlos M. Zepeda Jr., P.E. Carlos.Zepeda@txdot.gov Area Engineer TxDOT - Ft. Bend/Waller AO Security Level: Email, Account Authentication (Optional)	Signed by: Carlos M. Zepeda Jr., P.E. 999EB2AF5ACE472... Signature Adoption: Pre-selected Style Using IP Address: 204.64.21.251	Sent: 1/29/2025 2:56:51 PM Viewed: 1/30/2025 1:09:22 PM Signed: 1/30/2025 1:09:36 PM
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Carbon Copy Events	Status	Timestamp
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Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
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Envelope Updated	Security Checked	10/17/2024 9:45:10 AM
Certified Delivered	Security Checked	1/30/2025 1:09:22 PM
Signing Complete	Security Checked	1/30/2025 1:09:36 PM
Completed	Security Checked	1/30/2025 1:09:55 PM

Payment Events	Status	Timestamps

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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.

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