

FINAL PLANS

NAME OF CONTRACTOR: _____
 DATE OF LETTING: _____
 DATE WORK BEGAN: _____
 DATE WORK COMPLETED: _____
 DATE WORK ACCEPTED: _____
 SUMMARY OF CHANGE ORDERS:

STATE OF TEXAS DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NO.: F 2022(844)

US 180 PARKER COUNTY

LIMITS: FROM: FM 730 TO: CENTER POINT ROAD
 LENGTH OF PROJECT = 3,850.00FT = 0.729 MI
 FOR THE CONSTRUCTION OF LANDSCAPE & SCENIC ENHANCEMENT
 WORK CONSISTING OF PLANTING, IRRIGATION & MONUMENT
 IMPROVEMENTS

| DESIGN | FED. RD. DIV. NO. | FEDERAL AID PROJECT NO. | | HIGHWAY NO. |
|----------|-------------------|-------------------------|--------|-------------|
| GRAPHICS | 6 | F 2022(844) | | US 180 |
| CHECK | STATE | DISTRICT | COUNTY | SHEET NO. |
| CHECK | TEXAS | FTW | PARKER | |
| | CONTROL | SECTION | JOB | 001 |
| | 0008 | 03 | 134 | |

DESIGN SPEED = 50 MPH

BEGIN PROJECT
 US 180 STA 00+00.000
 CSJ: 0008-03-134
 TRM: 550+1.268



PARKER COUNTY
 FORT WORTH DISTRICT

END PROJECT
 US 180 STA 38+50.000
 CSJ: 0008-03-134
 TRM: 552+0.001



EXCEPTIONS: NONE
 EQUATIONS: NONE
 RAILROADS: NONE



SUBMITTED FOR LETTING: 05/06/2022
Jonathan Witmeyer, R.L.A.
 CONSULTANT DESIGN ENGINEER OR PROJECT MANAGER

NOTE:
 SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014, AND THE CONTRACT PROVISIONS LISTED AND DATED AS FOLLOWS SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 1, 2012)



WORK WAS COMPLETED ACCORDING
 TO THE PLANS AND CONTRACT.

Final Plans Only _____, P.E.
 Signature of Registrant & Date



CONCURRENCE FOR LETTING: May 11, 2022
James Hotopp
 CITY OF WEATHERFORD

RECOMMENDED FOR LETTING: 6/2/2022
Carl L. Johnson, P.E.
 DIRECTOR OF TP&D

SUBMITTED FOR LETTING: 5/31/2022
William J. Pitt, P.E.
 AREA ENGINEER

APPROVED FOR LETTING: 6/3/2022
Carl L. Johnson, P.E.
 DISTRICT ENGINEER

INDEX OF SHEETS

SHEET NO. DESCRIPTION

I. GENERAL

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 002 INDEX OF SHEETS
 003 GENERAL LAYOUT OVERVIEW
 004 ,4A-4C GENERAL NOTES
 005 ESTIMATES AND QUANTITIES
 006 QUANTITY SUMMARY
 006a ASSET MAINTENANCE

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 008 * BC (2)-21
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 010 * BC (4)-21
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 012 * BC (7)-21
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SHEET NO. DESCRIPTION

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 040 -042 EROSION CONTROL
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 055 -059 IRRIGATION PLAN
 060 IRRIGATION DETAILS
 060 LANDSCAPE AMENITY DETAILS FUTURE, NOT IN CONTRACT
 061 -063 T223 (1) FUTURE, NOT IN CONTRACT
 064 TRF FUTURE, NOT IN CONTRACT

E0.1 ELECTRICAL DETAILS & SCHEDULES
 E1.1 ELECTRICAL PLAN
 E2.1 ELECTRICAL SPECIFICATIONS
 S0.0 LANDSCAPE AMENITY STRUCTURAL FUTURE, NOT IN CONTRACT
 S1.0 LANDSCAPE AMENITY STRUCTURAL FUTURE, NOT IN CONTRACT

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

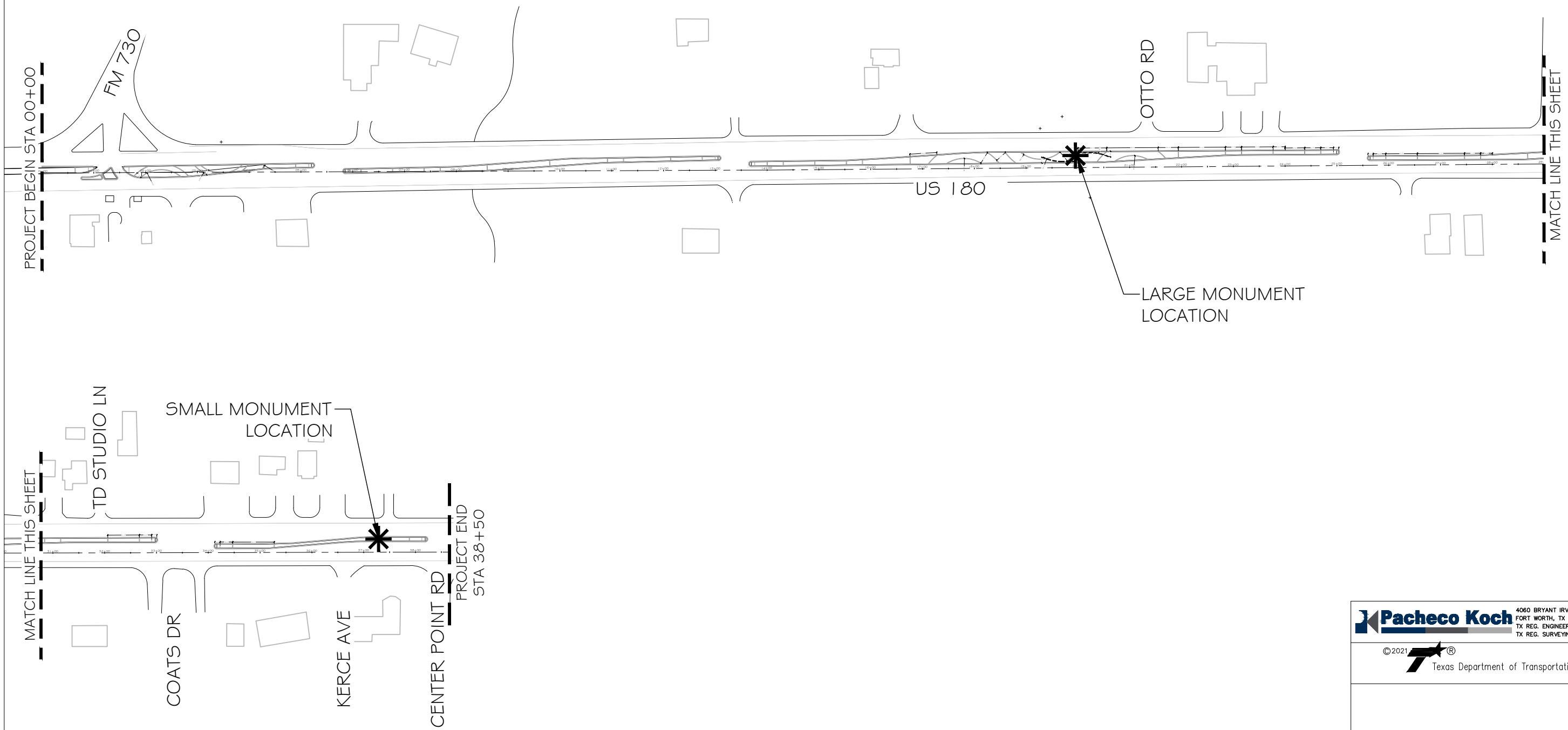
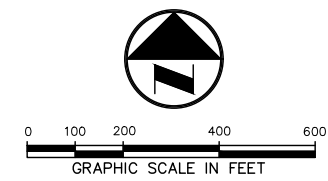
Mark C. Schulte 05/06/2022
 MARK C. SCHULTER, PE DATE

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 M:\DWG-FY 2022-2023\DWG\LANDSCAPE FX 2018\SHEETS\COVER-INDEX.DWG



| | | | |
|---|-------------------------|---|------------|
| Pacheco Koch | | 4060 BRYANT IRVIN ROAD FORT WORTH, TX 76109 817.412.7155 TX REG. ENGINEERING FIRM F-469 TX REG. SURVEYING FIRM LS-10008001 | |
| ©2022 Texas Department of Transportation | | | |
| INDEX OF SHEETS | | | |
| FED. RD. DIV. NO. | FEDERAL AID PROJECT NO. | SHEET NO. | |
| 6 | F 2022(844) | 002 | |
| STATE | DISTRICT | COUNTY | |
| TEXAS | FTW | TARRANT | |
| CONTROL | SECTION | JOB | HIGHWAY NO |
| 0008 | 03 | 134 | US 180 |

MAY 2022 - 100% PS&E SUBMITTAL



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 4060 BRYANT IRVIN ROAD
 FORT WORTH, TX 76109 817.412.7155
 TX REG. ENGINEERING FIRM F-469
 TX REG. SURVEYING FIRM LS-10008001

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GENERAL LAYOUT OVERVIEW

| | | | |
|-------------------|-------------------------|---------|------------|
| FED. RD. DIV. NO. | FEDERAL AID PROJECT NO. | | SHEET NO. |
| 6 | F 2022(844) | | 003 |
| STATE | DISTRICT | COUNTY | |
| TEXAS | FTW | TARRANT | |
| CONTROL | SECTION | JOB | HIGHWAY NO |
| 0008 | 03 | 134 | US 180 |

MAY 2022 - 100% PS&E SUBMITTAL

Project Number: F 2022(844)

County: PARKER

Control: 0008-03-134

Highway: US 180

Special Notes

Electronic files containing answered pre-letting questions and other project related design information will be placed in the following FTP site periodically.

Check this site for new information. Notices of new postings will not be sent out by the Engineer.

The data located in these files is for non-construction purposes only and can be found at

TxDOT's public FTP site at [https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/](https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/).

Access is read-only.

All files in the FTP site are subject to the License Agreement shown on the FTP site.

To obtain a copy of the project plans free of charge, submit a request from the following site: <http://www.txdot.gov/business/letting-bids/plans-online.html>

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

Area Engineer's Email: Klinton.Kuntz@txdot.gov
Assistant Area Engineer's Email: Gary.Beck@txdot.gov
Design Manager's Email: Chadwick.Dabbs@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals.

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address: [https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses](https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/)

All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

Single lane closures, except as otherwise shown in the plans, will be restricted to off-peak hours as defined in the following table:

Project Number: F 2022(844)

County: PARKER

Control: 0008-03-134

Highway: US 180

| Peak Hours | | Off-Peak Hours | |
|---------------------------------------|---------------------------------------|---|--------------------------------|
| 6 to 9 AM Monday through Friday | 3 to 7 PM Monday through Friday | 9 AM to 3 PM and 7 PM to 6 AM Monday through Friday | All day Saturday and Sunday |

Work that requires closure of multiple travel lanes in the same direction, except as otherwise shown in the plans, are restricted to night hours between 9 PM and 6 AM.

Existing storm sewers and utilities are shown from the best available information. Verify the location of all underground facilities prior to starting work.

Remove any obstruction to existing drainage due to contractor's operations, as required, at the contractor's expense.

For dimensions of right-of-way not shown on the plans, see right-of-way map on file at the TxDOT District Office.

Modifications to Lane Closure / Work Restrictions:

Submit a request in writing for approval by the Engineer a minimum of 10 days in advance of implementing a change to lane closure restrictions.

When deemed necessary, the Engineer will lengthen, shorten, or otherwise modify lane closure restrictions as traffic conditions warrant.

Special Events/ Special Situations will be handled on a case-by-case basis. No work restricting lane closures is allowed from 3 PM a day before to 9 AM the day after the Special Event or Special Situation.

Item 4 – Scope of Work

Reimbursement for project overhead will not be considered until project completion has extended beyond the original Contract Time.

Item 5. Control of the Work

When supplementary shop drawings, shop details, erection drawings, working drawings, forming plans, or other drawings are required, prepare and submit drawings on sheets 8-1/2 by 11 inches, 17 by 22 inches, or full size drawings reduced to half scale if completely legible. If, in the opinion of the Engineer, the drawings are not completely legible, prepare and submit on sheets 22 by 34 inches, with a 1-1/2 inch left margin, and 1/2 inch top, right, and bottom margins.

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Highway: US 180

Submit all sheets with a title in the lower right hand corner. The title must include the sheet index data shown on the lower right corner of the project plans, name of the structure or element or stream, sheet numbering for the shop drawings, name of the fabricator and the name of the Contractor.

Standard Operating Procedure for Alternate Precast Proposal Submission" found online at <https://www.txdot.gov/inside-txdot/forms-publications-consultants-contractors-publications-bridge.html#design>. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Item 7. Legal Relations and Responsibilities

The total area disturbed for this project is .77 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the right of way. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer and to the local government that operates a separate storm sewer system.

Prevention of Migratory Bird Nesting

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

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items.

The following Holiday/Event lane closure restriction requirements apply to this project:
No work that restricts or interferes with traffic shall be allowed between 3 PM on the day preceding a Holiday or Event and 9 AM on the day after the Holiday or Event.

| Holiday Lane Closure Restrictions | |
|-----------------------------------|---|
| New Year's Eve and New Year's Day | 3 PM December 30 through 9 AM January 2 |

Project Number: F 2022(844)

County: PARKER

Control: 0008-03-134

Highway: US 180

| | |
|---|---|
| (December 31 through January 1) | |
| Easter Holiday Weekend (Friday through Sunday) | 3PM Thursday through 9 AM Monday |
| Memorial Day Weekend (Friday through Monday) | 3 PM Thursday through 9 AM Tuesday |
| Independence Day (July 3 through July 5) | 3 PM July 2 through 9 AM July 6 |
| Labor Day Weekend (Friday through Monday) | 3 PM Thursday through 9 AM Tuesday |
| Thanksgiving Holiday (Wednesday through Sunday) | 3 PM Tuesday through 9 AM Monday |
| Christmas Holiday (December 23 through December 26) | 3 PM December 22 through 9 AM December 27 |

Plan work schedules around the appropriate dates above to ensure productive work is performed without lane closures.

| Event Lane Closure Restrictions | | | |
|---|--|--|--|
| 3 PM the day before Event to 9 AM the day after the Event | | | |
| Weatherford Peach Festival | | | |

Item 8. Prosecution and Progress

Working days will be computed and charged in accordance with Section 8.3.1.1, 'Five-Day Workweek.'

Item 100. Preparing Right of Way

This pay item shall include the removal of concrete pavement in accordance with Item 104, "Removing Concrete" except that this work will not be paid for directly, but will be subsidiary to Item 100, "Preparing Right of Way." Work under this item to include, weed removal and continued maintenance in all existing medians work area and the following:

Mow all existing vegetation in the work area to a height of no more than 6". One to two weeks following this mowing, apply general non-selective herbicide to all vegetation within the work area per manufacturer's recommendations. When vegetation has died, drag or otherwise strip and remove the dead surface vegetation without removing topsoils in place. Following dead vegetation removal, wait a minimum of two weeks, then re-apply non-selective herbicide to all new vegetation. Following visible die off, work may begin in the area to be improved per the plans.

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County: PARKER

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Highway: US 180

Item 161. Compost

Place approximately 4" of compost manufactured topsoil (CMT) in areas indicated, then till in to a minimum of 6" existing soil to create a 10" minimum profile.

Salvage suitable topsoil from areas shown on plans. Maximum salvage depth is 4-in. Place approximately 4 inches of topsoil on areas shown to compost if existing soil is not suitable for 10" minimum profile.

Where "blended on-site" CMT is specified, produce the compost manufactured topsoil by incorporating 4" of compost with 6" of furnished topsoil as shown on the plans.

Item 170. Irrigation System

Contact Chad Marbut @ 817-598-4006 for installation of the water meter for the project. The Contractor is to pay for the installation & fees. Irrigation system under this pay item is defined as the total system from the outlet of the water meter.

Electrical connection for power source by licensed electrician is subsidiary to this item. The Contractor is to pay for the installation of the water meter & fees.

Item 192. Landscape Planting

No planting shall occur between June 1st and September 15th without written approval from the Landscape Architect. Per special provision 192.001 plant material requiring replacement will be at the cost of the contractor.

All plant material to be full and matching per species.

Item 502. Barricades, Signs, and Traffic Handling

The contractor force account 'safety contingency' that has been established for this project is intended to be utilized for work zone enhancements to improve the effectiveness of the traffic control plan that could typically not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's responsible person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Permanent signs may be installed when construction in an area is complete and they will not conflict with the traffic control plan for the remainder of the job.

Existing signs are to remain as long as they do not interfere with construction and they do not conflict with the traffic control plan.

General Notes

Project Number: F 2022(844)

County: PARKER

Control: 0008-03-134

Highway: US 180

Any sign not detailed in the plans but called for in the layout will be as shown in the current "Standard Highway Sign Designs for Texas".

When traffic is obstructed, arrange warning devices in accordance with the latest edition of the "Texas Manual on Uniform Traffic Control Devices".

Cover or remove any work zone signs when work or condition referenced is not occurring.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets. Provide access to all driveways during all phases of construction unless otherwise noted in the plans or as directed.

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

Remove accumulated sediment or replace SW3P controls when the capacity has been reduced by 50% or when the depth of sediment at the control structure exceeds one foot.

Item 528. Colored Textured Concrete and Landscape Pavers

Prepare for approval a 9 sq.ft., 4 in. thick specimen for each color pattern, and texture required before beginning work.

Prepare the subgrade, base, or both in accordance with the plans and pertinent Items. Place and screen concrete to the proper grade and wood-float to a uniform surface, in accordance with Item 420, "Concrete Substructures."

Apply colorant in accordance with manufacturer's recommendations. Apply dry-shake color hardener, if used, evenly to the plastic surface, following the manufacturer's directions. Use at least 65 lb. per 12 square yard. Apply in 2 separate applications and wood-float after each application. Trowel only after the final floating.

Place dies with a repetitive pattern on the concrete surface and hand-tamp to create the required texture or imprint shown on the plans. Use a brick pattern if no texture is specified. Apply colored curing and finish compound in accordance with the manufacturer's directions.

This pay item shall include the reinforcement for concrete in accordance with Item 440, except that this work will not be paid for directly, but will be subsidiary to Item 528, "Colored Textured Concrete and Landscape Pavers."

General Notes

Sheet 4B

Project Number: F 2022(844)

County: PARKER

Control: 0008-03-134

Highway: US 180

Item 6001. Portable Changeable Message Signs

Provide all portable changeable message signs and arrow panels with a photoelectric device to allow for automatic dimming of operations to approximately 50% of their normal brightness when ambient light drops to approximately five footcandles, and then increase back again for daytime operations.

(1) electronic portable changeable message sign unit(s) will be required. Individual or collective use of signs will be required by the Engineer when deemed necessary to supplement the traffic control plan.

Each sign must have programmed in its permanent memory the following 15 messages:

1. Exit Closed Ahead
2. Use Other Routes
3. Right Lane
4. Left Lane
5. Closed Ahead
6. Two Lane
7. Detour Ahead
8. Thru Traffic
9. Prepare To Stop
10. Merging Traffic
11. Expect 15 Minute Delay
12. Max Speed ** MPH
13. Merge Right
14. Merge Left
15. No Exit Next ** Miles



CONTROLLING PROJECT ID 0008-03-134

DISTRICT Fort Worth
HIGHWAY US 180

COUNTY Parker

Estimate & Quantity Sheet

| CONTROL SECTION JOB | | | | 0008-03-134 | | TOTAL EST. | TOTAL FINAL |
|---------------------|-----------|--|------|-------------|-------|------------|-------------|
| PROJECT ID | | | | A00185064 | | | |
| COUNTY | | | | Parker | | | |
| HIGHWAY | | | | US 180 | | | |
| ALT | BID CODE | DESCRIPTION | UNIT | EST. | FINAL | | |
| | 100-6001 | PREPARING ROW | AC | 1.000 | | 1.000 | |
| | 104-6021 | REMOVING CONC (CURB) | LF | 5,872.000 | | 5,872.000 | |
| | 110-6001 | EXCAVATION (ROADWAY) | CY | 335.000 | | 335.000 | |
| | 161-6017 | COMPOST MANUF TOPSOIL (4") | SY | 3,756.000 | | 3,756.000 | |
| | 170-6001 | IRRIGATION SYSTEM | LS | 1.000 | | 1.000 | |
| | 192-6003 | PLANT MATERIAL (3-GAL) | EA | 3,196.000 | | 3,196.000 | |
| | 192-6004 | PLANT MATERIAL (5-GAL) | EA | 536.000 | | 536.000 | |
| | 192-6013 | MULCH | SY | 2,020.000 | | 2,020.000 | |
| | 192-6024 | PLANT MATERIAL (30 GAL) (TREE) | EA | 17.000 | | 17.000 | |
| | 192-6068 | LANDSCAPE EDGE (TYPE II) | LF | 1,297.000 | | 1,297.000 | |
| | 193-6001 | PLANT MAINTENANCE | MO | 12.000 | | 12.000 | |
| | 193-6007 | IRRIGATION SYSTEM OPER AND MAINT | MO | 12.000 | | 12.000 | |
| | 500-6001 | MOBILIZATION | LS | 1.000 | | 1.000 | |
| | 502-6001 | BARRICADES, SIGNS AND TRAFFIC HANDLING | MO | 5.000 | | 5.000 | |
| | 506-6040 | BIODEG EROSN CONT LOGS (INSTL) (8") | LF | 425.000 | | 425.000 | |
| | 506-6043 | BIODEG EROSN CONT LOGS (REMOVE) | LF | 425.000 | | 425.000 | |
| | 528-6001 | COLORED TEXTURED CONC (4") | SY | 116.000 | | 116.000 | |
| | 529-6007 | CONC CURB & GUTTER (TY I) | LF | 5,870.000 | | 5,870.000 | |
| | 618-6047 | CONDT (PVC) (SCH 80) (2") (BORE) | LF | 269.000 | | 269.000 | |
| | 618-6059 | CONDT (PVC) (SCH 80) (4") (BORE) | LF | 231.000 | | 231.000 | |
| | 628-6004 | ELC SRV TY A 120/240 060(NS)AL(E)SP(O) | EA | 2.000 | | 2.000 | |
| | 1005-6001 | LOOSE AGGR FOR GROUNDCOVER (TYPE I) | CY | 166.000 | | 166.000 | |
| | 1005-6002 | LOOSE AGGR FOR GROUNDCOVER (TYPE II) | CY | 42.000 | | 42.000 | |
| | 1005-6003 | LOOSE AGGR FOR GROUNDCOVER (TYPE III) | CY | 43.000 | | 43.000 | |
| | 6001-6001 | PORTABLE CHANGEABLE MESSAGE SIGN | DAY | 121.000 | | 121.000 | |
| 18 | | EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART) | LS | 1.000 | | 1.000 | |
| | | SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING) | LS | 1.000 | | 1.000 | |

| | | | |
|------------|--------|-------------|-------|
| DISTRICT | COUNTY | CCSJ | SHEET |
| Fort Worth | Parker | 0008-03-134 | 5 |

| SUMMARY OF ITEMS | | | | |
|------------------|---------------|--------------|--|----------------------------------|
| LOCATION | 100-6001 | 500-6001 | 502-6001 | 6001-6001 |
| | PREPARING ROW | MOBILIZATION | BARRICADES, SIGNS AND TRAFFIC HANDLING | PORTABLE CHANGEABLE MESSAGE SIGN |
| | AC | LS | MO | DAY |
| GENERAL | 0.77 | 1 | 5 | 121 |

| SUMMARY OF ITEMS | | |
|-------------------------------|-------------------------------------|---------------------------------|
| LOCATION | 506-6040 | 506-6043 |
| | BIODEG EROSN CONT LOGS (INSTL) (8") | BIODEG EROSN CONT LOGS (REMOVE) |
| | LF | LF |
| EROSION CONTROL PLAN (1 OF 3) | 318 | 318 |
| EROSION CONTROL PLAN (2 OF 3) | 107 | 107 |
| EROSION CONTROL PLAN (3 OF 3) | 30 | 30 |
| TOTAL | 455 | 455 |

| SUMMARY OF ITEMS - CITY FUNDED | | |
|--------------------------------|----------------------|----------------------|
| LOCATION | 104-6021 | 110-6001 |
| | REMOVING CONC (CURB) | EXCAVATION (ROADWAY) |
| | LF | SF |
| DEMOLITION PLAN (1 OF 5) | 1,548 | 2,368 |
| DEMOLITION PLAN (2 OF 5) | 1,024 | 2,256 |
| DEMOLITION PLAN (3 OF 5) | 2,073 | 2,401 |
| DEMOLITION PLAN (4 OF 5) | 1,495 | 2,568 |
| DEMOLITION PLAN (5 OF 5) | 1,034 | 1,254 |
| TOTAL | 7,174 | 10,847 |

| SUMMARY OF ITEMS | | | | |
|----------------------|--------------------------|-------------------------------------|--------------------------------------|---------------------------------------|
| LOCATION | 192-6068 | 1005-6001 | 1005-6002 | 1005-6003 |
| | LANDSCAPE EDGE (TYPE II) | LOOSE AGGR FOR GROUNDCOVER (TYPE I) | LOOSE AGGR FOR GROUNDCOVER (TYPE II) | LOOSE AGGR FOR GROUNDCOVER (TYPE III) |
| | LF | CY | CY | CY |
| LAYOUT PLAN (1 OF 5) | 320 | 38 | 7 | 5 |
| LAYOUT PLAN (2 OF 5) | 88 | 44 | 4 | 3 |
| LAYOUT PLAN (3 OF 5) | 421 | 39 | | 24 |
| LAYOUT PLAN (4 OF 5) | 77 | 23 | 4 | 5 |
| LAYOUT PLAN (5 OF 5) | 48 | 6 | 17 | 2 |
| TOTAL | 954 | 150 | 32 | 39 |

| SUMMARY OF ITEMS - CITY FUNDED | | | | | |
|--------------------------------|-----------------------------|---------------------------|------------------------------------|------------|-----------------|
| LOCATION | 528-6001 | 529-6007 | 1002 6001 | 450-6006 | 420-6066 |
| | TEXTURING CONCRETE PAVEMENT | CONC CURB & GUTTER (TY I) | LANDSCAPE AMENITY (BOTH LOCATIONS) | T223 RAIL | RAIL FOUNDATION |
| | SY | LF | LS | LF | CY |
| LAYOUT PLAN (1 OF 5) | 83 | 1,114 | | | |
| LAYOUT PLAN (2 OF 5) | 14 | 1,465 | | | |
| LAYOUT PLAN (3 OF 5) | | 2,286 | X | 150 | 11 |
| LAYOUT PLAN (4 OF 5) | 14 | 1,491 | | | |
| LAYOUT PLAN (5 OF 5) | 22 | 830 | X | | |
| TOTAL | 133 | 7,186 | 1 | 150 | 11 |

| SUMMARY OF ITEMS | | | | | | |
|-------------------|----------------------------|----------------------------|----------------------------|-----------------------------------|--------------------------------|-------------------|
| LOCATION | 161-6017 | 192-6003 | 192-6004 | 192-6013 | 192-6024 | 193-6001 |
| | COMPOST MANUF TOPSOIL (4") | LANDSCAPE PLANTING (3 GAL) | LANDSCAPE PLANTING (5 GAL) | LANDSCAPE PLANTING (MULCH) (BARK) | PLANT MATERIAL (30 GAL) (TREE) | PLANT MAINTENANCE |
| | SY | EA | EA | SY | EA | MO |
| PLANTING (1 OF 5) | 670 | 590 | 100 | 254 | | |
| PLANTING (2 OF 5) | 631 | 294 | 168 | 300 | | |
| PLANTING (3 OF 5) | 1,321 | 1,291 | 180 | 736 | 6 | |
| PLANTING (4 OF 5) | 607 | 287 | 65 | 348 | | |
| PLANTING (5 OF 5) | 271 | 237 | 32 | 98 | | |
| TOTAL | 3,500 | 2,699 | 545 | 1,736 | 6 | 12 |

| SUMMARY OF ITEMS | | | | |
|---------------------|-------------------|--------------------------|-----------------------------------|-----------------------------------|
| LOCATION | 170-6001 | 193-6007 | 618-6047 | 618-6059 |
| | IRRIGATION SYSTEM | IRRIG SYS OPER AND MAINT | COND T (PVC) (SCH 80) (2") (BORE) | COND T (PVC) (SCH 80) (4") (BORE) |
| | LS | MO | LF | LF |
| IRRIGATION (1 OF 5) | | | 112 | 112 |
| IRRIGATION (2 OF 5) | | | 59 | 59 |
| IRRIGATION (3 OF 5) | | | | |
| IRRIGATION (4 OF 5) | | | 105 | 105 |
| IRRIGATION (5 OF 5) | | | 113 | 113 |
| TOTAL | 1 | 12 | 389 | 389 |

| SUMMARY OF ITEMS | | |
|---------------------------|---|-----------------------------------|
| LOCATION | 628-6004 | 618-6024 |
| | ELC SRV TY A 120/240 100 (NS) SS E SF U | COND T (PVC) (SCH 40) (2") (BORE) |
| | EA | LF |
| ELECTRICAL PLANS (1 OF 1) | 2 | 80 |
| TOTAL | 2 | 80 |

LANDSCAPE AMENITY, T223 RAIL & FOUNDATION FUTURE, NOT IN CONTRACT

SHOWN FOR COORDINATION PURPOSES ONLY



QUANTITY SUMMARY

| | | | |
|-------------------|-------------------------|-----------|------------|
| FED. RD. DIV. NO. | FEDERAL AID PROJECT NO. | SHEET NO. | |
| 6 | F 2022(844) | 006 | |
| STATE | DISTRICT | COUNTY | |
| TEXAS | FTW | TARRANT | |
| CONTROL | SECTION | JOB | HIGHWAY NO |
| 0008 | 03 | 134 | US 180 |



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MAY 2022 - 100% PS&E SUBMITTAL

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DATE:
 FILE:

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:


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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

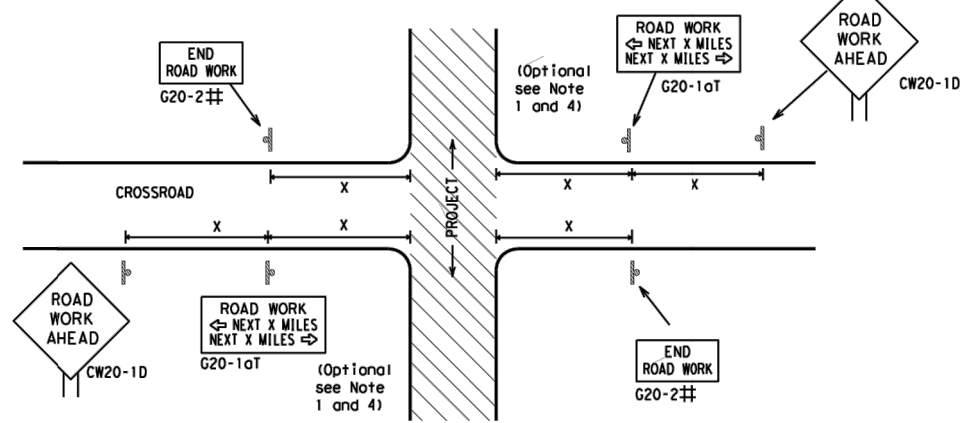
| |
|---|
| THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov |
| COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD) |
| DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) |
| MATERIAL PRODUCER LIST (MPL) |
| ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)" |
| STANDARD HIGHWAY SIGN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

SHEET 1 OF 12

| | | | |
|--|---------------|---|---------|
|  | | <i>Traffic Safety Division Standard</i> | |
| BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS | | | |
| BC(1)-21 | | | |
| FILE: | bc-21.dgn | DW: | TxDOT |
| © TxDOT | November 2002 | CONT SECT: | 0008 03 |
| REVISIONS: | | JOB: | 134 |
| 4-03 | 7-13 | HIGHWAY: | US 180 |
| 9-07 | 8-14 | DIST: | |
| 5-10 | 5-21 | COUNTY: | |
| | | SHEET NO.: | 007 |
| | | FTW: | PARKER |

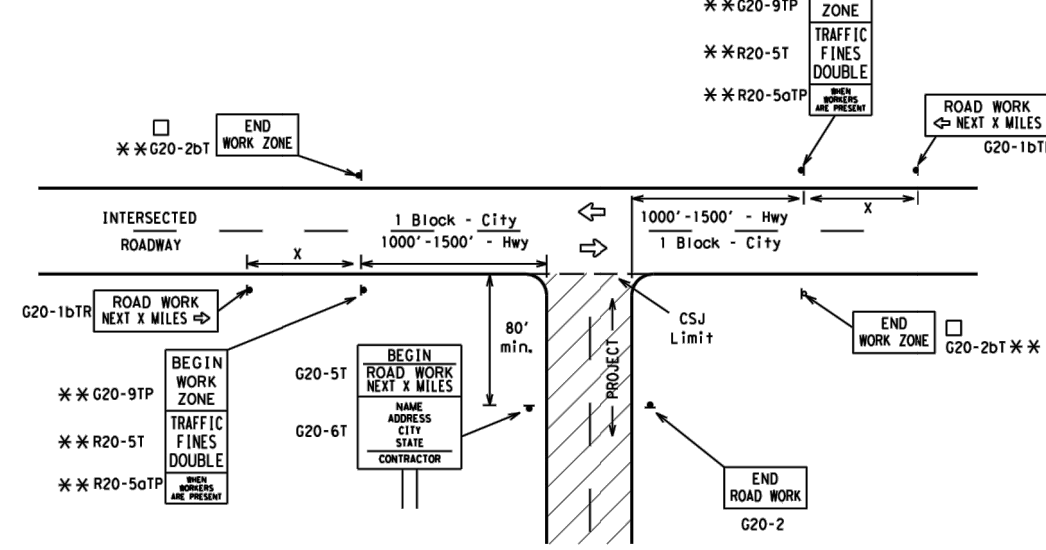
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TYPICAL LOCATION OF CROSSROAD SIGNS



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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING^{1,5,6}

| Sign Number or Series | SIZE | | SPACING | |
|---|-------------------|--------------------|--------------|--------------------|
| | Conventional Road | Expressway/Freeway | Posted Speed | Sign Δ Spacing "X" |
| CW20 ⁴ CW21 CW22 CW23 CW25 | 48" x 48" | 48" x 48" | MPH | Feet (Apprx.) |
| | | | 30 | 120 |
| | | | 35 | 160 |
| | | | 40 | 240 |
| | | | 45 | 320 |
| CW1, CW2, CW7, CW8, CW9, CW11, CW14 | 36" x 36" | 48" x 48" | 50 | 400 |
| | | | 55 | 500 ² |
| | | | 60 | 600 ² |
| | | | 65 | 700 ² |
| CW3, CW4, CW5, CW6, CW8-3, CW10, CW12 | 48" x 48" | 48" x 48" | 70 | 800 ² |
| | | | 75 | 900 ² |
| | | | 80 | 1000 ² |
| | | | * | * ³ |

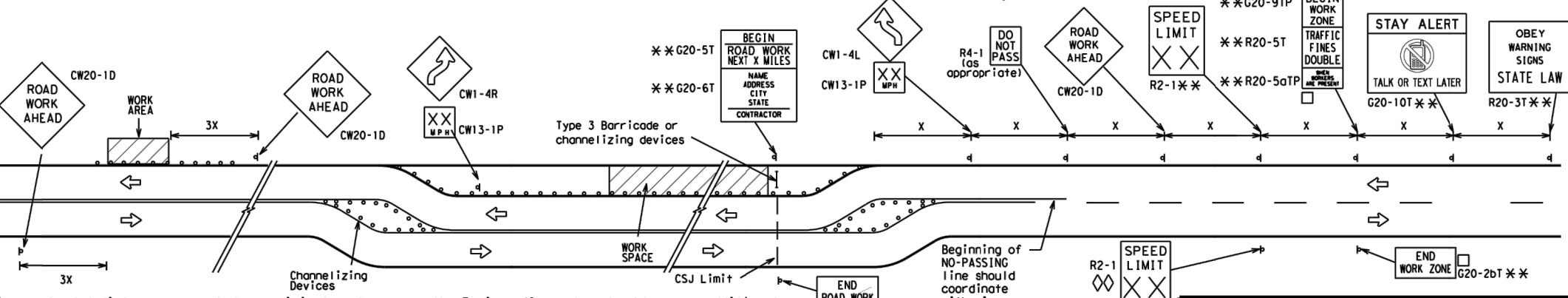
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

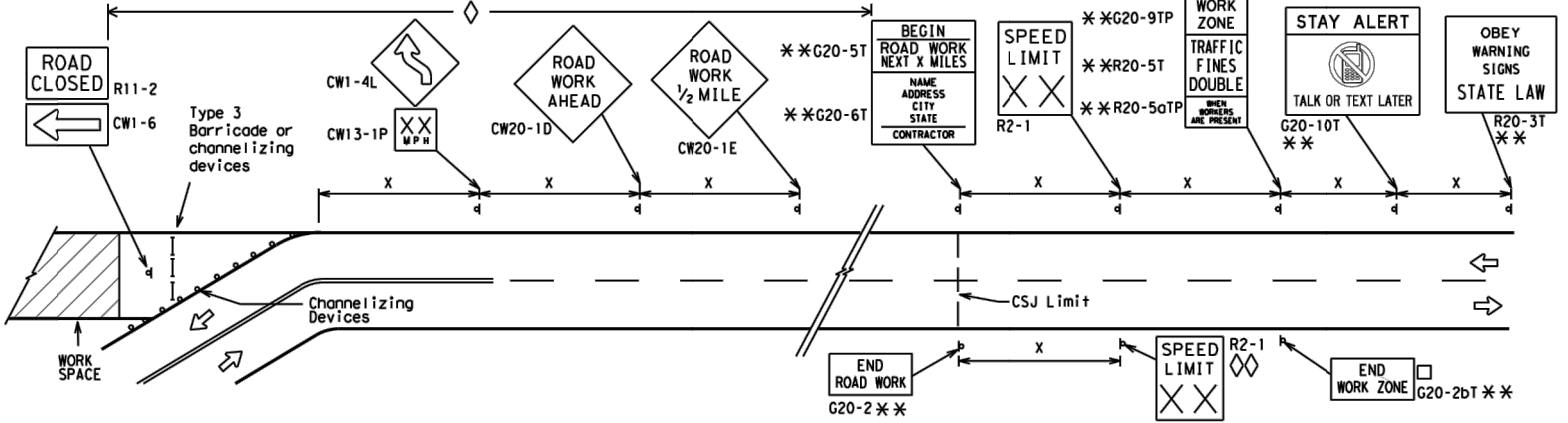
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



NOTES

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

LEGEND

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

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

| | | | | | | | | | |
|---------|---------------|------|--------|-----------|---------|-----|-------|-----|-------|
| FILE# | bc-21.dgn | DWG | TxDOT | CHK | TxDOT | DWG | TxDOT | CHK | TxDOT |
| © TxDOT | November 2002 | COMT | SECT | JOB | HIGHWAY | | | | |
| | REVISIONS | 0008 | 03 | 134 | US 180 | | | | |
| 9-07 | 8-14 | DIST | COUNTY | SHEET NO. | | | | | |
| 7-13 | 5-21 | FTW | PARKER | 008 | | | | | |

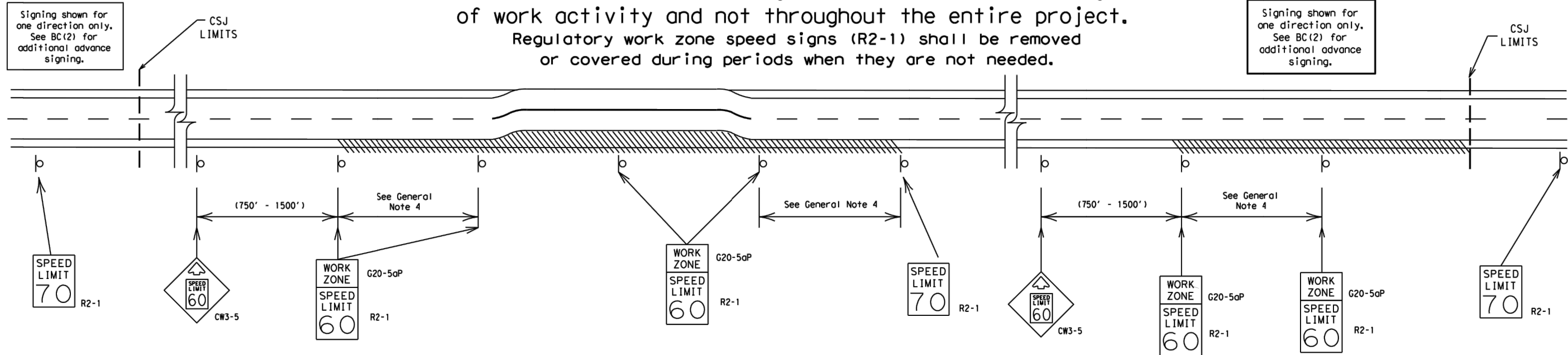
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present.

Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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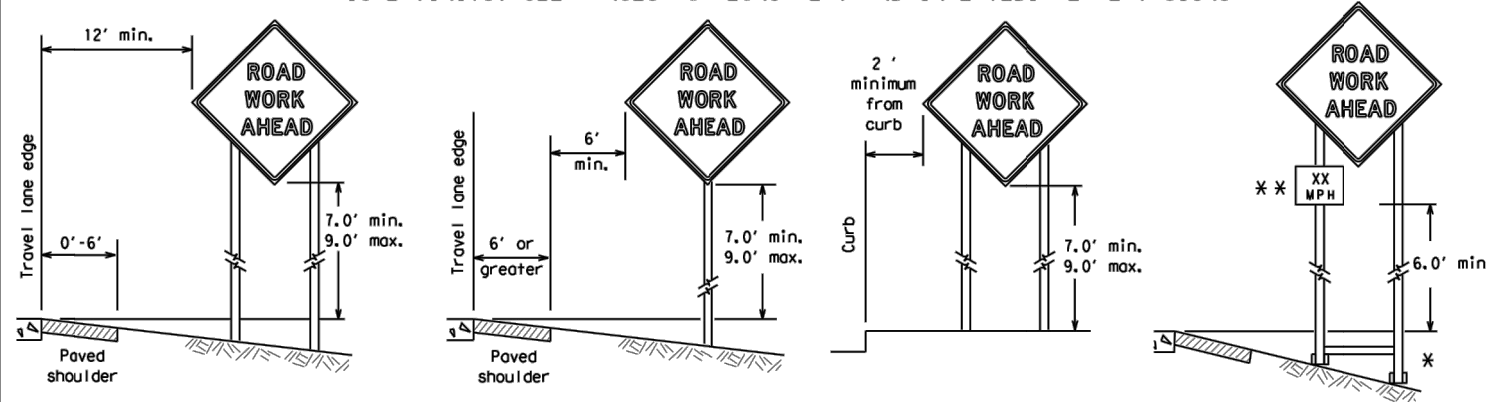
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SHEET 3 OF 12

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|---|-----------|----------------------------------|--------|
| | | Traffic Safety Division Standard | |
| <h2>BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT</h2> | | | |
| <h3>BC (3) - 21</h3> | | | |
| FILE# | bc-21.dgn | DN# | TxDOT |
| © | TxDOT | NOVEMBER | 2002 |
| REVISIONS | 0008 | 03 | 134 |
| 9-07 | 8-14 | | US 180 |
| 7-13 | 5-21 | | |
| DIST | COUNTY | SHEET NO. | |
| FTW | PARKER | 009 | |

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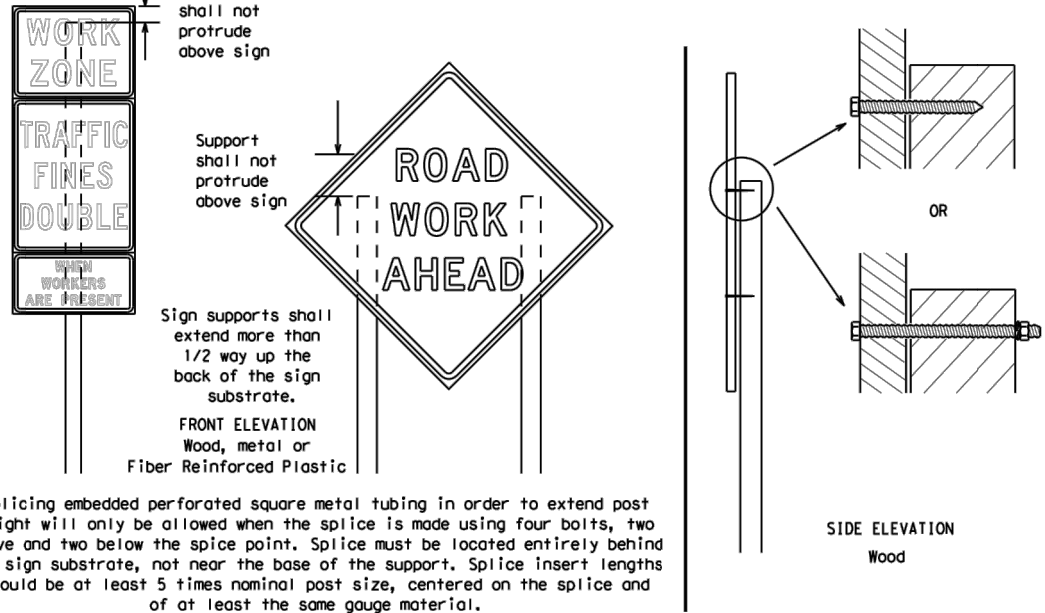
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

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

ATTACHMENT FOR SIGN SUPPORTS



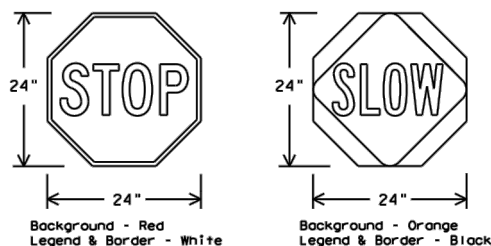
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

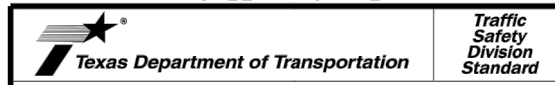
- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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



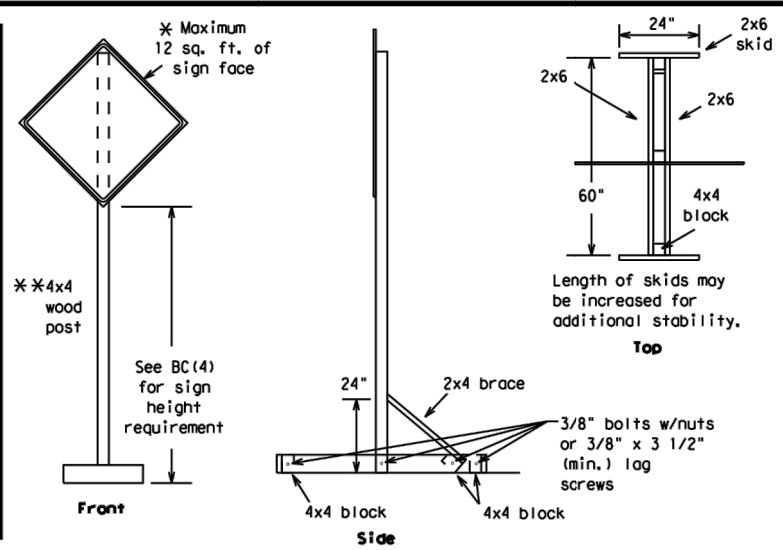
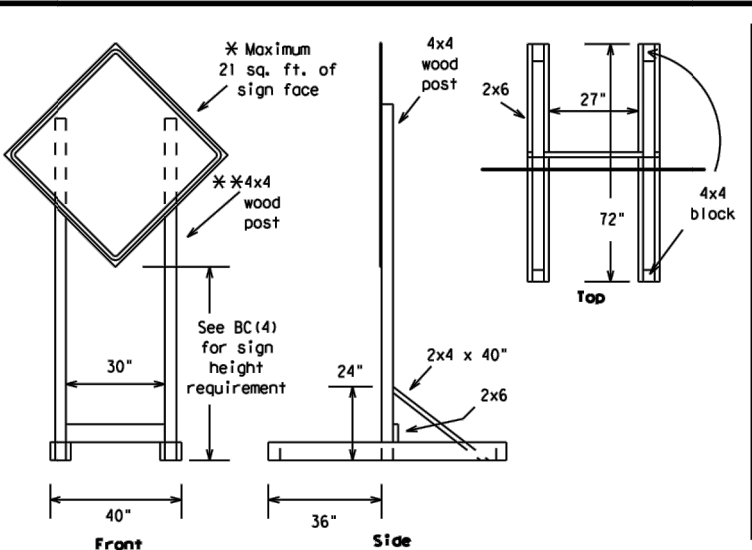
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

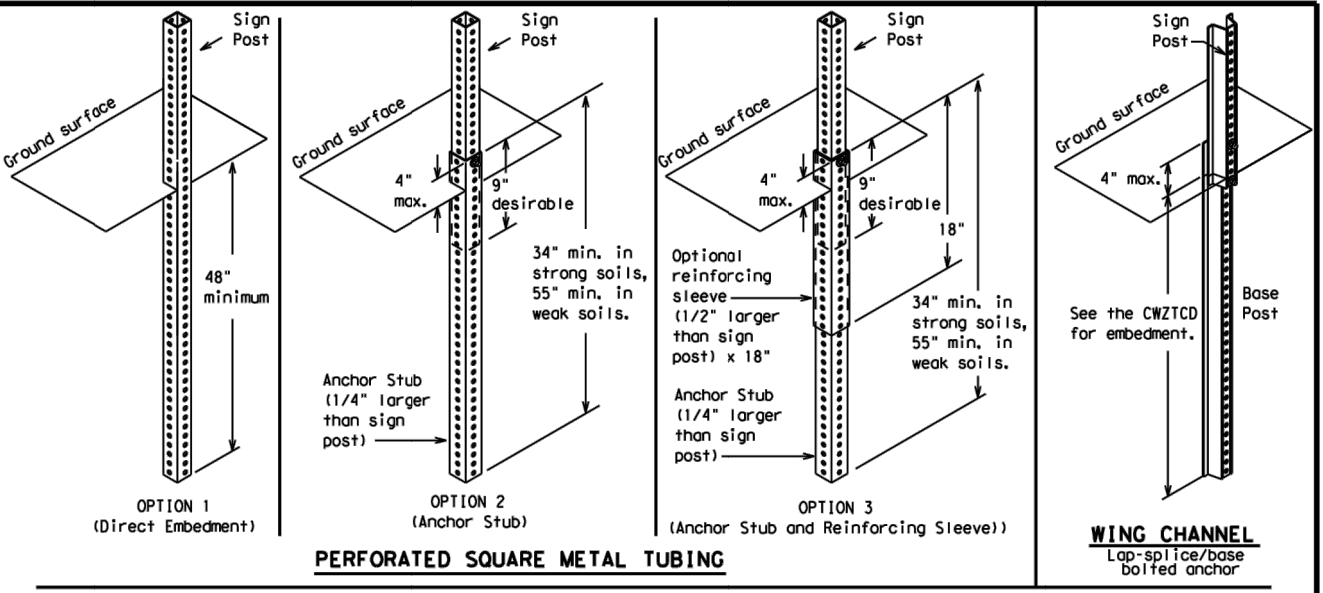
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| © TxDOT | November 2002 | COM | SECT | JOB | US 180 | DIST | COUNTY | SHEET NO. | |
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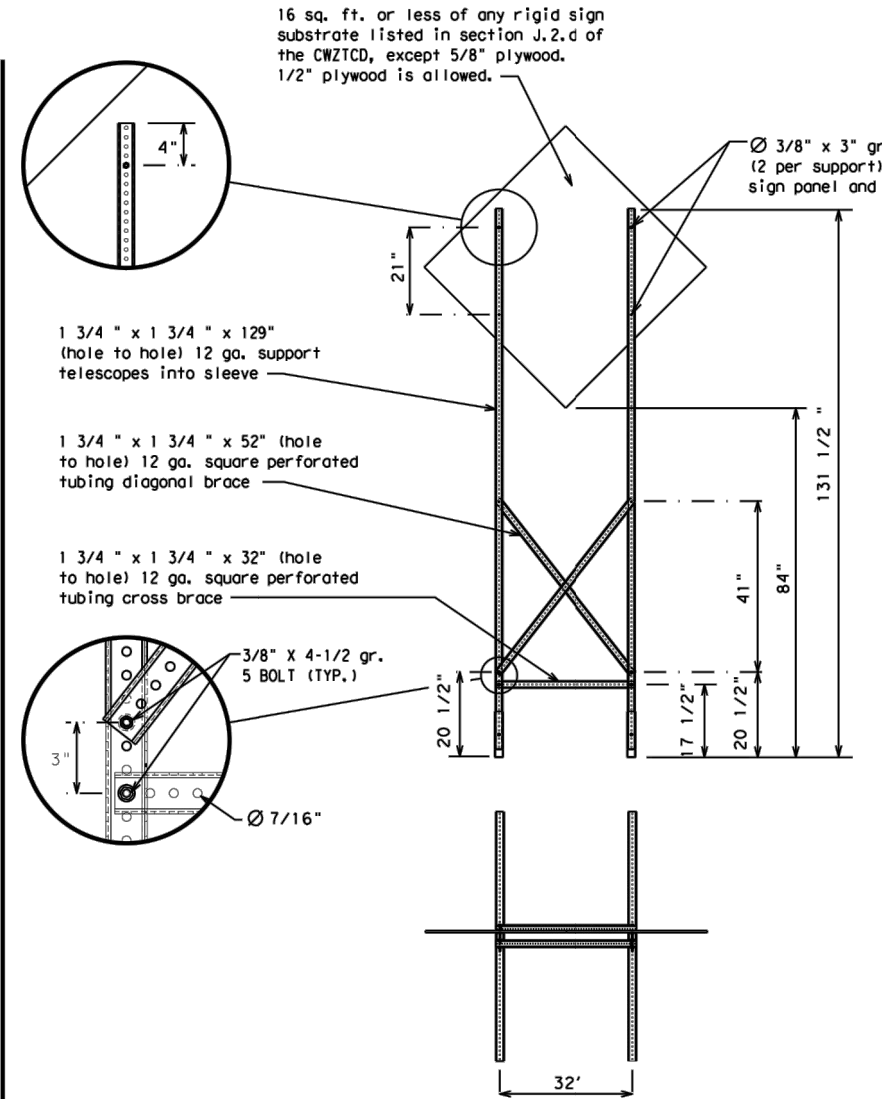
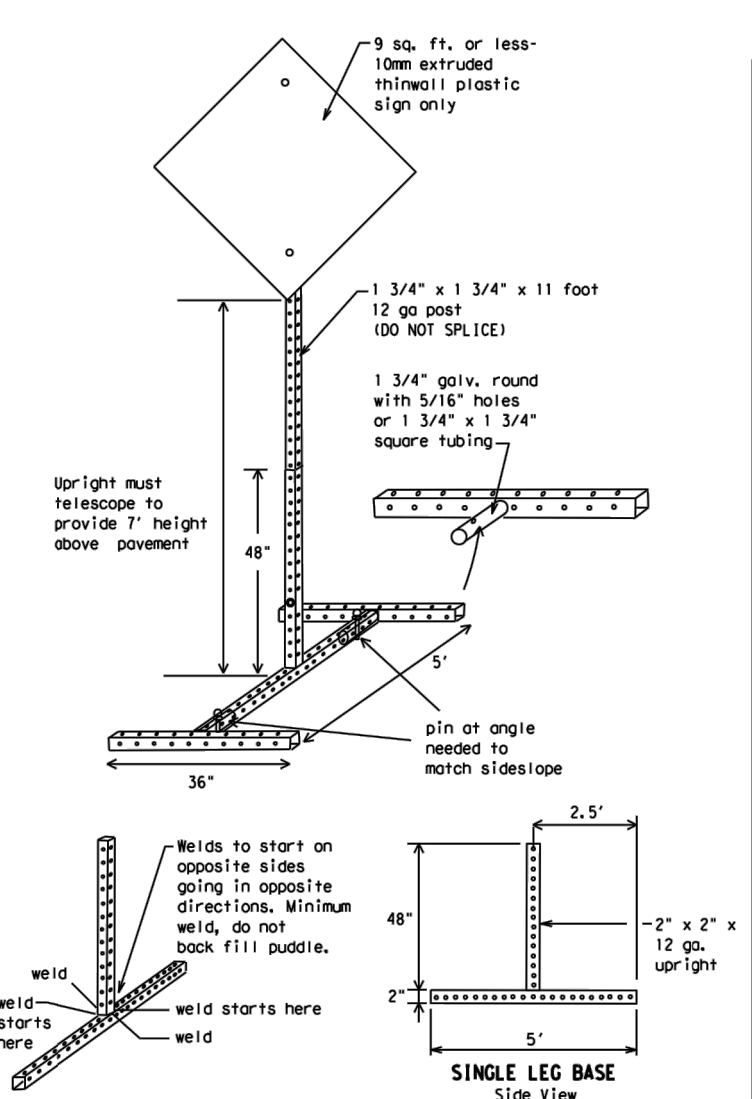
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SKID MOUNTED WOOD SIGN SUPPORTS
 * LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS



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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS
 * LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

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

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

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

**BARRICADE AND CONSTRUCTION
 TYPICAL SIGN SUPPORT**

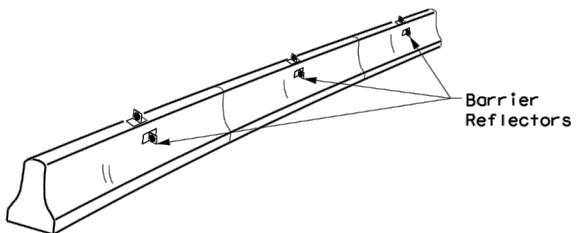
BC(5)-21

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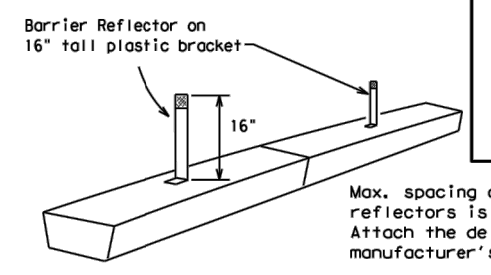
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



CONCRETE TRAFFIC BARRIER (CTB)

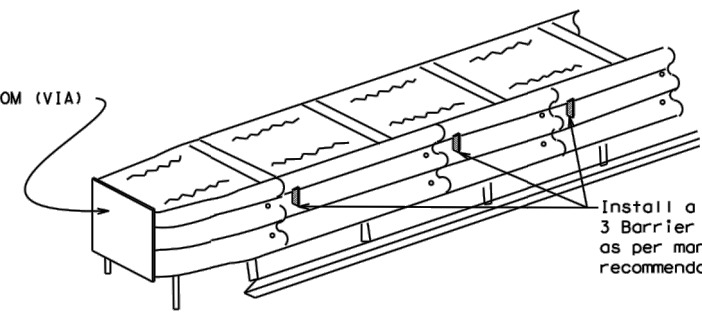


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES
 LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

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

LOW PROFILE CONCRETE BARRIER (LPCB)

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



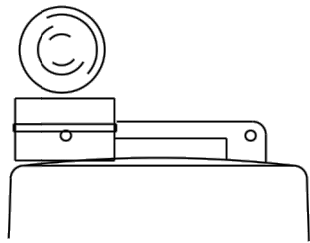
DELINEATION OF END TREATMENTS

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

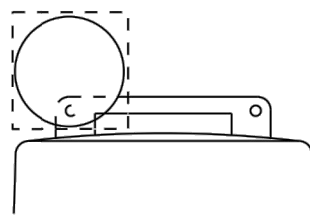
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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



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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

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



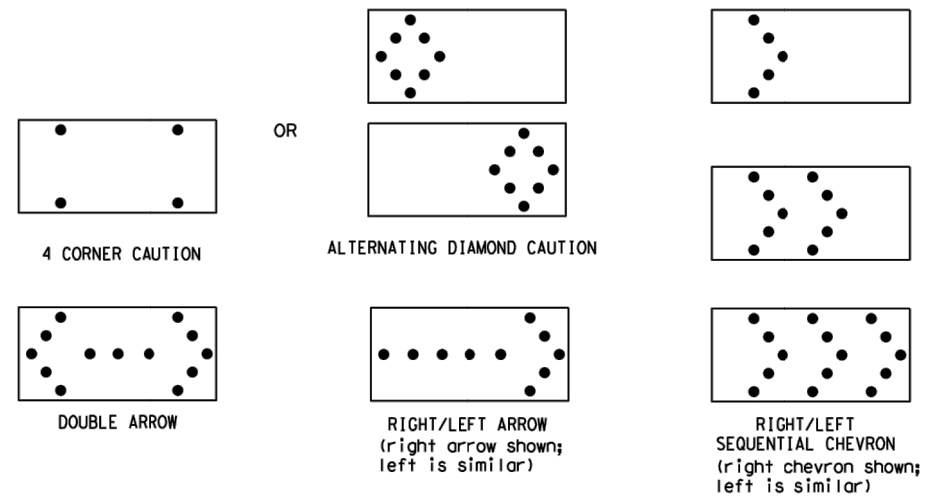
Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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

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

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

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



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

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

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

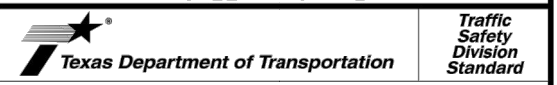
WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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



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

BC (7) - 21

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| FILE# | bc-21.dgn | DATE | TxDOT | CHK | TxDOT | DATE | TxDOT | CHK | TxDOT |
| © TxDOT | November 2002 | COMT | SECT | JOB | HIGHWAY | | | | |
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

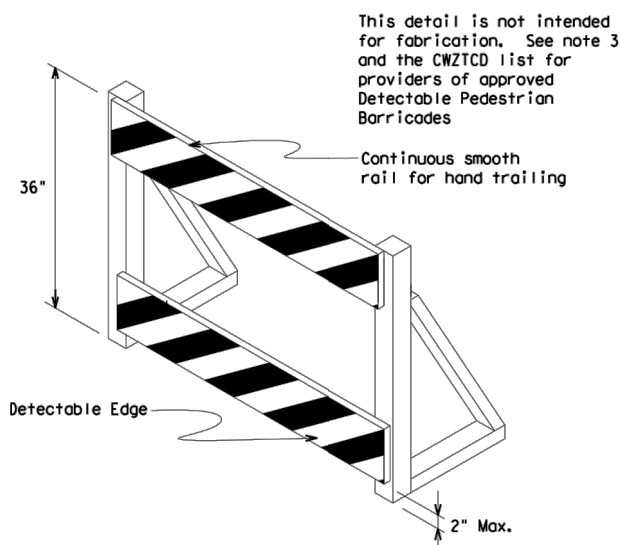
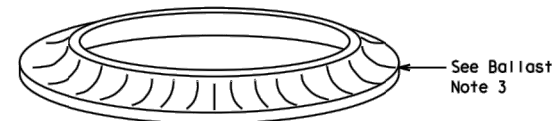
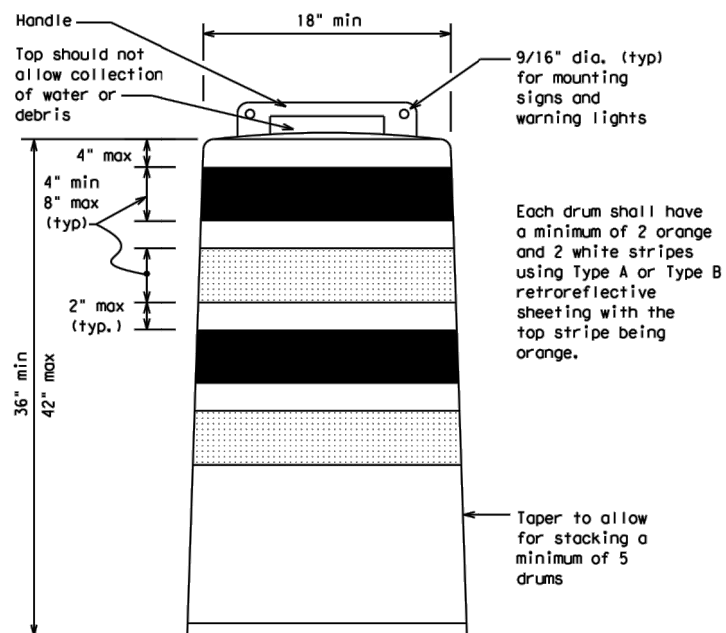
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

RETROREFLECTIVE SHEETING

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

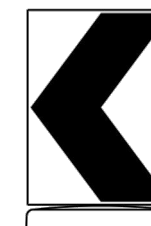
BALLAST

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

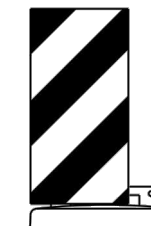


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

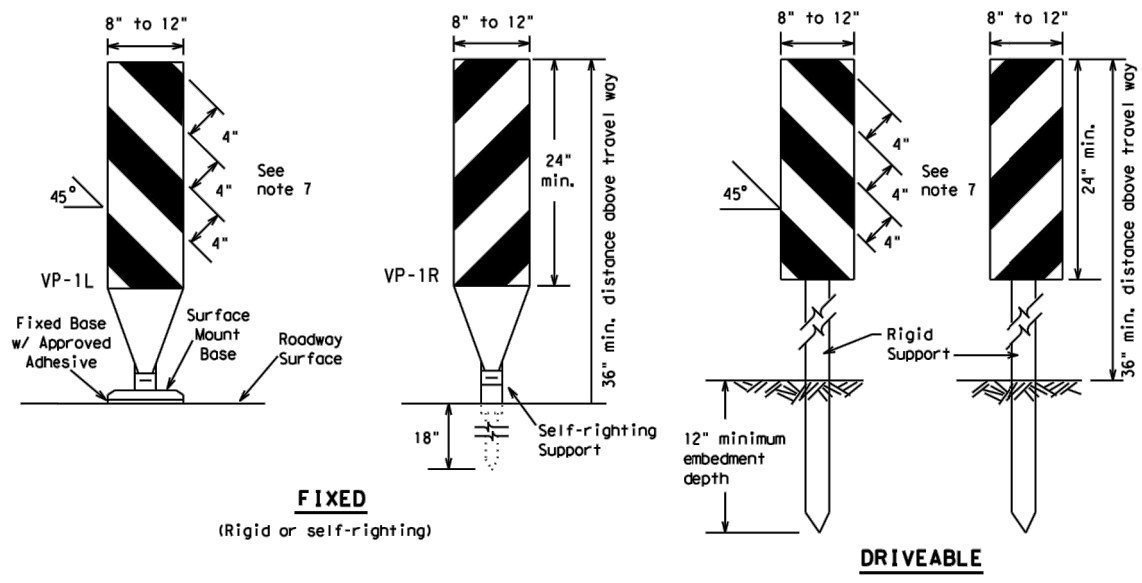
SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12

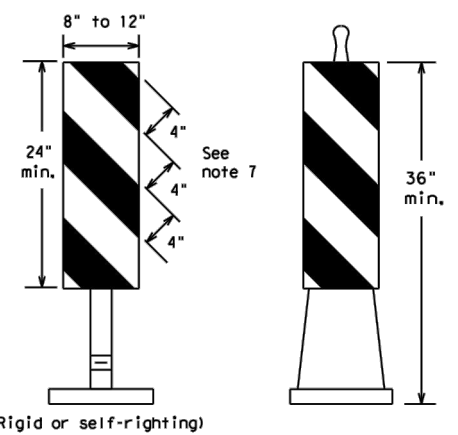
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| | | Traffic Safety Division Standard | |
| BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES | | | |
| BC (8) - 21 | | | |
| FILE# | bc-21.dgn | DATE | TxDOT |
| © | TxDOT | November 2002 | |
| REVISIONS | 0008 | 03 | 134 |
| 4-03 | 8-14 | | US 180 |
| 9-07 | 5-21 | | |
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| DIST | FTW | COUNTY | PARKER |
| | | SHEET NO. | 013 |

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FIXED
(Rigid or self-righting)

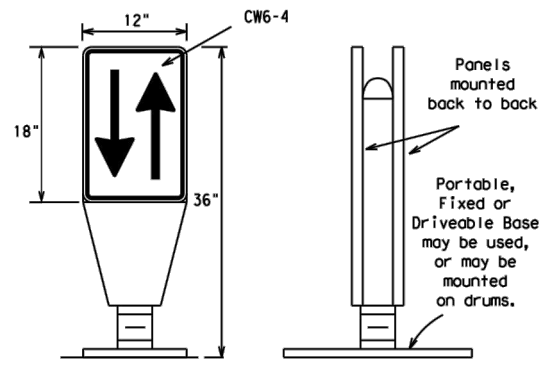
DRIVEABLE



PORTABLE

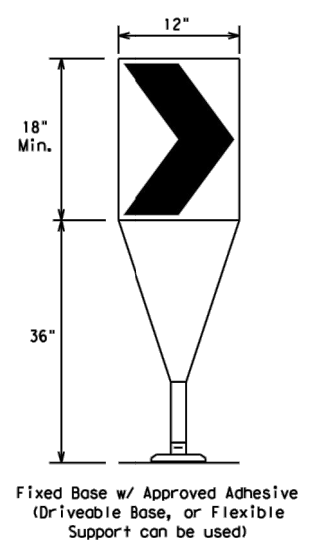
VERTICAL PANELS (VPs)

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



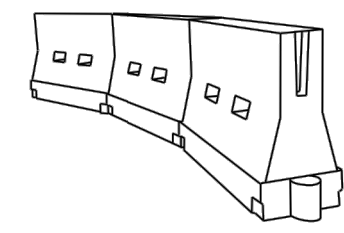
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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



CHEVRONS

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

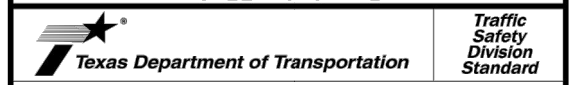
GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

| | | | | | | | | | |
|-------|-----------|-----------|-------|------|--------|-----|-----------|-----|-------|
| FILE# | bc-21.dgn | DN# | TxDOT | CK# | TxDOT | DW# | TxDOT | CK# | TxDOT |
| © | TxDOT | November | 2002 | COM# | SECT | JOB | HIGHWAY | | |
| | | REVISIONS | | 0008 | 03 | 134 | US 180 | | |
| 9-07 | 8-14 | | | DIST | COUNTY | | SHEET NO. | | |
| 7-13 | 5-21 | | | FTW | PARKER | | 014 | | |

DATE: FILE:

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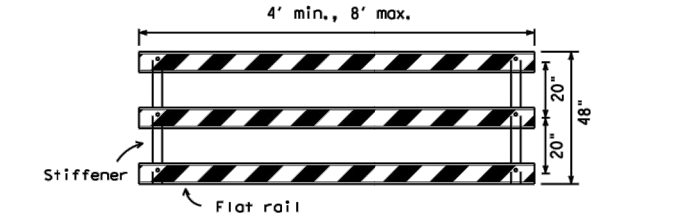
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road, striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

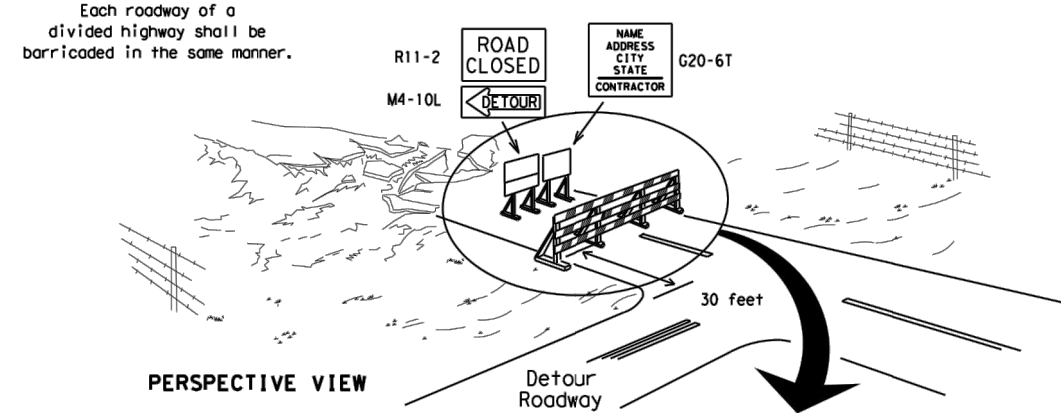
Barricades shall NOT be used as a sign support.



TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

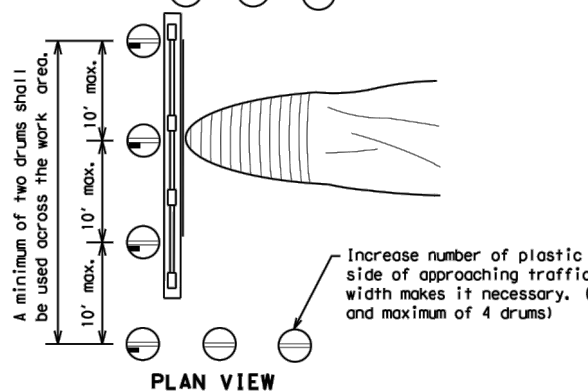
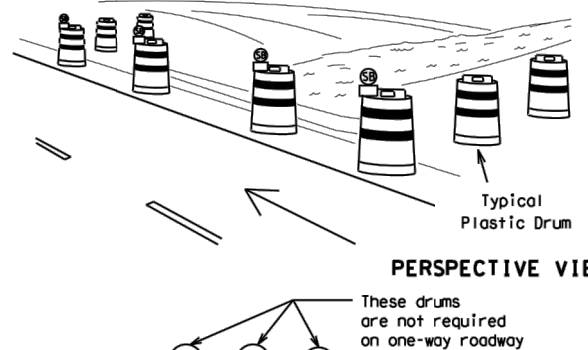


Each roadway of a divided highway shall be barricaded in the same manner.

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

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

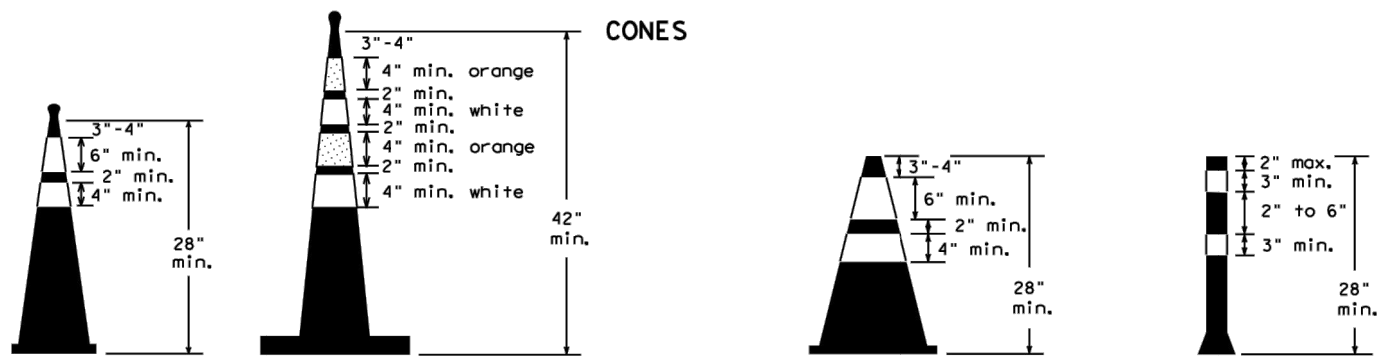
TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



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

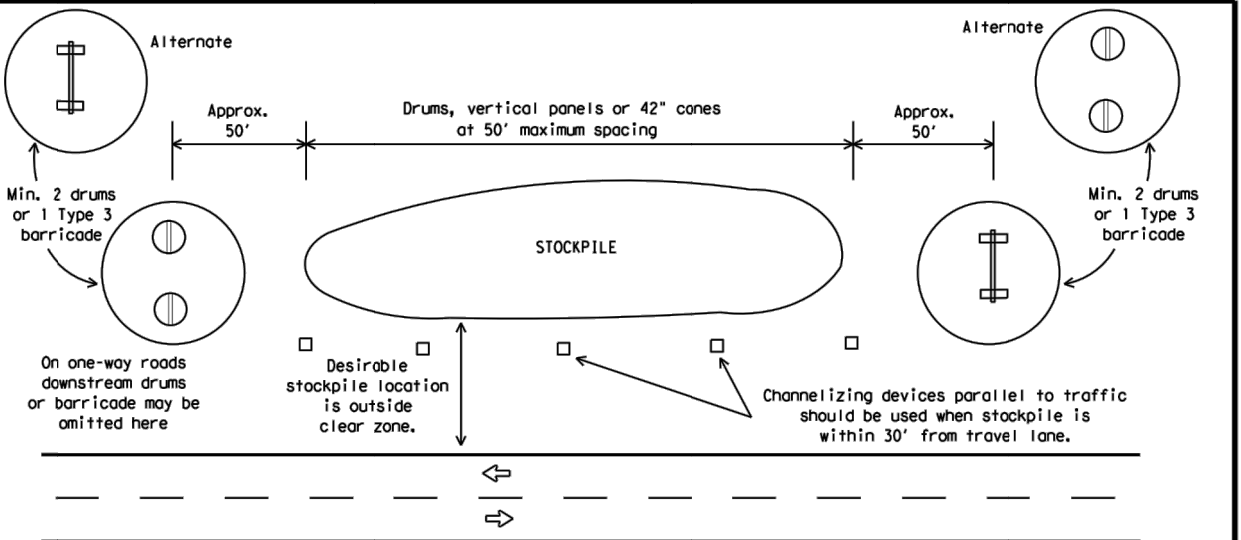
| LEGEND | |
|--------|---|
| | Plastic drum |
| | Plastic drum with steady burn light or yellow warning reflector |
| | Steady burn warning light or yellow warning reflector |

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones, One-Piece cones, Tubular Marker

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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

Texas Department of Transportation
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) -21

| | | | | | | | | | |
|-----------|---------------|------|--------|-----------|---------|-----|-------|-----|-------|
| FILE# | bc-21.dgn | DW: | TxDOT | CK: | TxDOT | DW: | TxDOT | CK: | TxDOT |
| ©TxDOT | November 2002 | CONT | SECT | JOB | HIGHWAY | | | | |
| REVISIONS | | 0008 | 03 | 134 | US 180 | | | | |
| 9-07 | 8-14 | DIST | COUNTY | SHEET NO. | | | | | |
| 7-13 | 5-21 | FTW | PARKER | 015 | | | | | |

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DATE:
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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

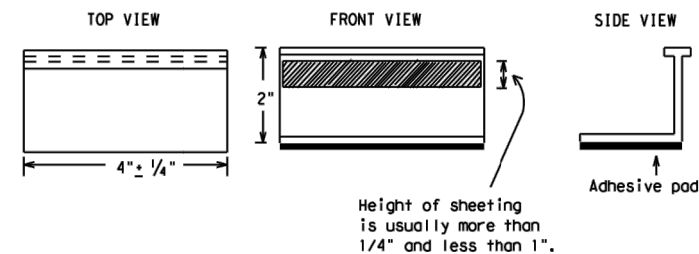
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

DEPARTMENTAL MATERIAL SPECIFICATIONS

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

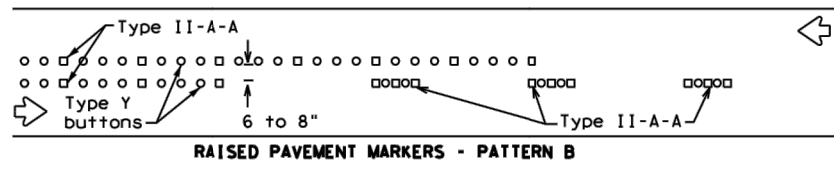
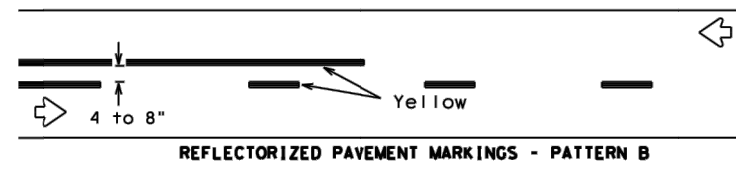
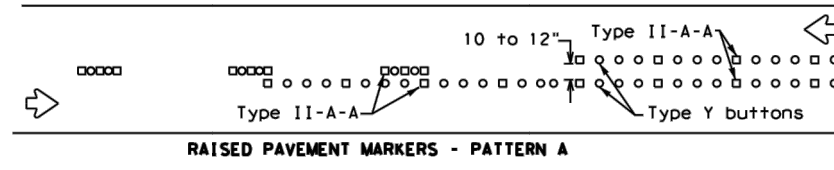
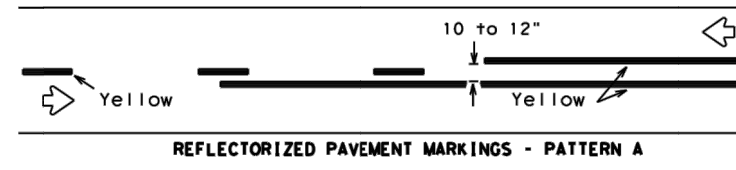
A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

SHEET 11 OF 12

| | |
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| Texas Department of Transportation | Traffic Safety Division Standard |
| <h2 style="margin: 0;">BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS</h2> <h3 style="margin: 0;">BC(11) - 21</h3> | |
| FILE: bc-21.dgn © TxDOT February 1998 | DN: TxDOT CONT SECT: 0008 03 JOB: 134 DIST: FTW COUNTY: PARKER HIGHWAY: US 180 SHEET NO.: 016 |

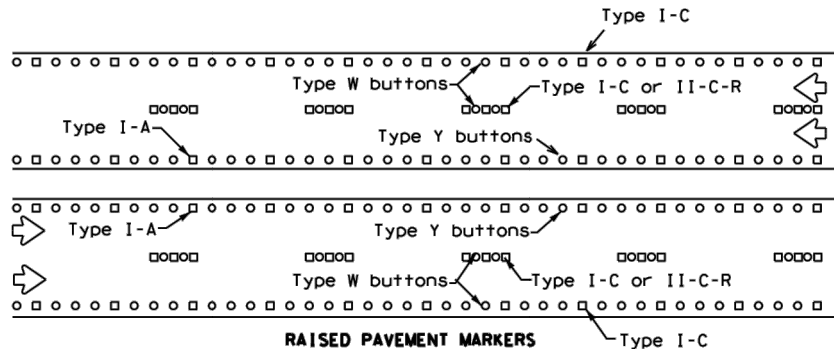
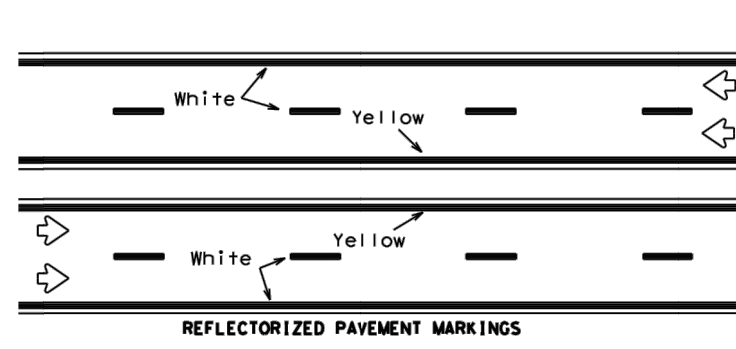
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PAVEMENT MARKING PATTERNS



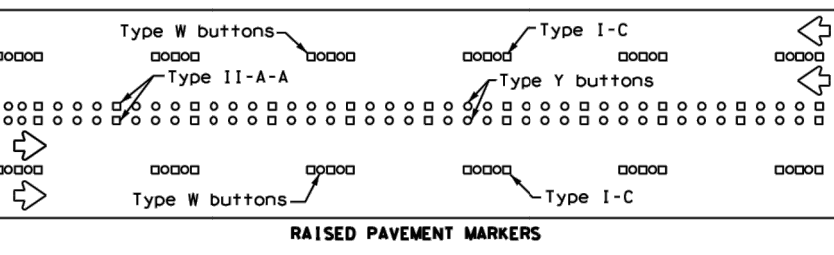
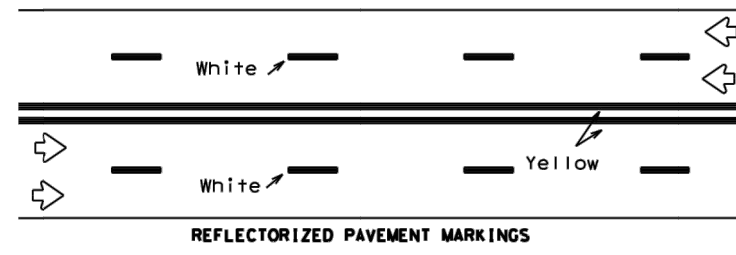
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.

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



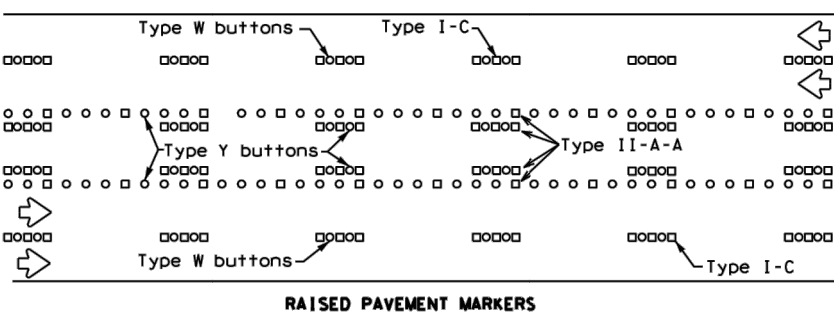
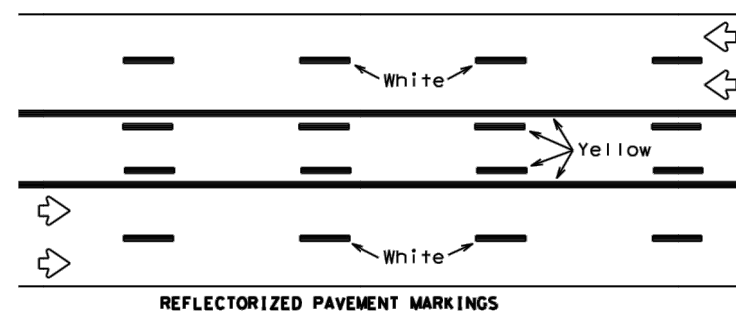
Prefabricated markings may be substituted for reflectORIZED pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectORIZED pavement markings.

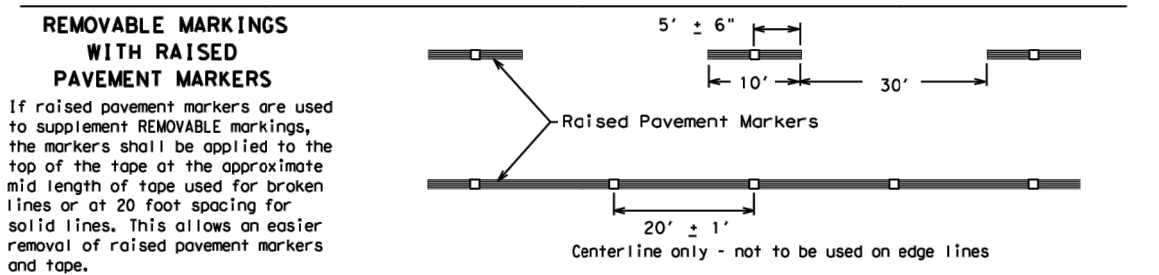
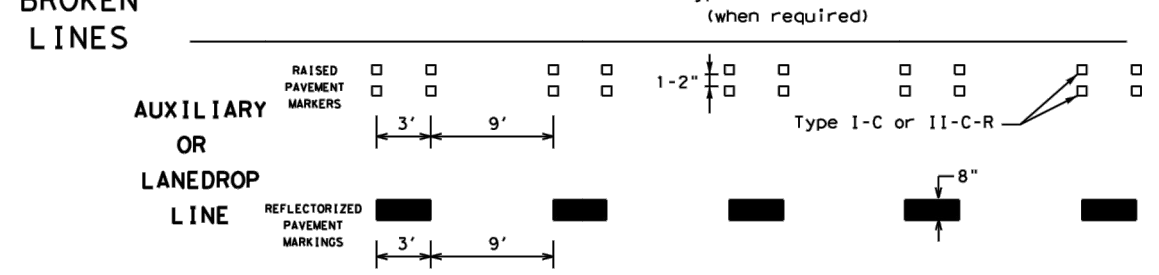
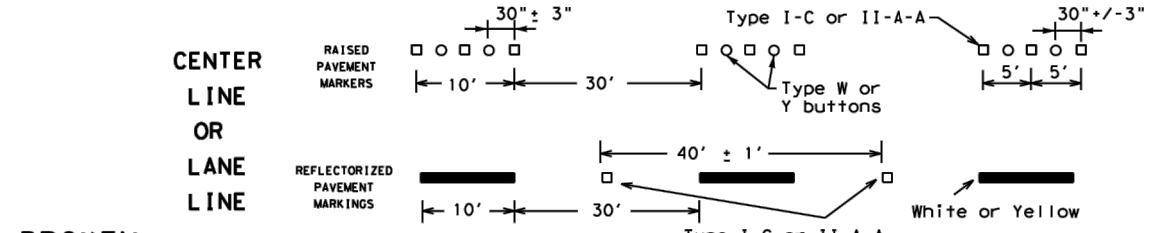
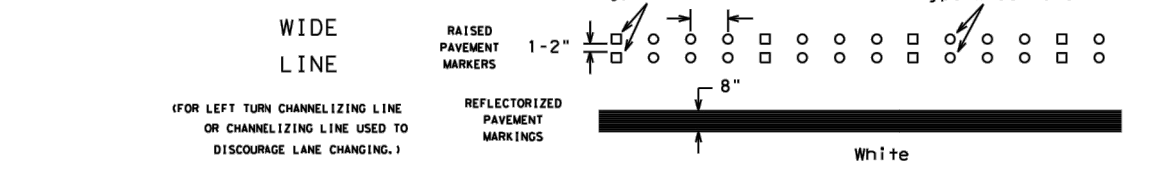
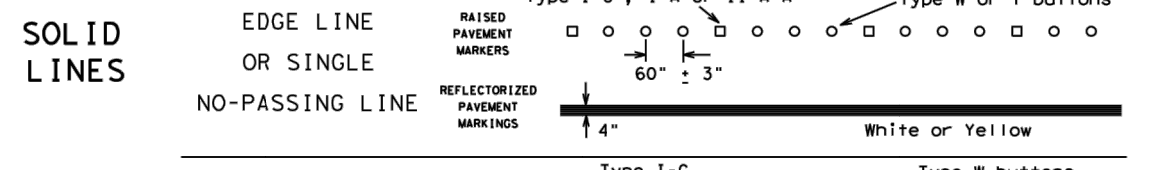
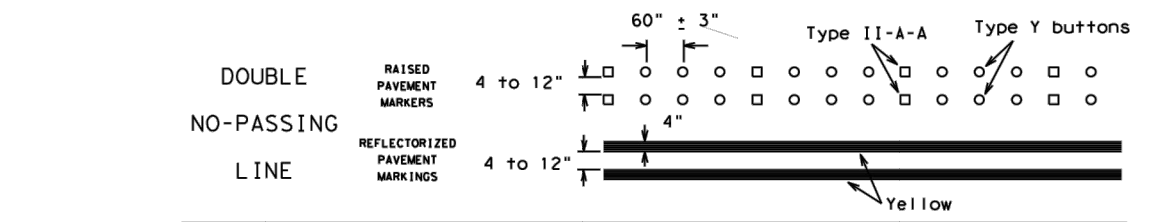
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



Prefabricated markings may be substituted for reflectORIZED pavement markings.

TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



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

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

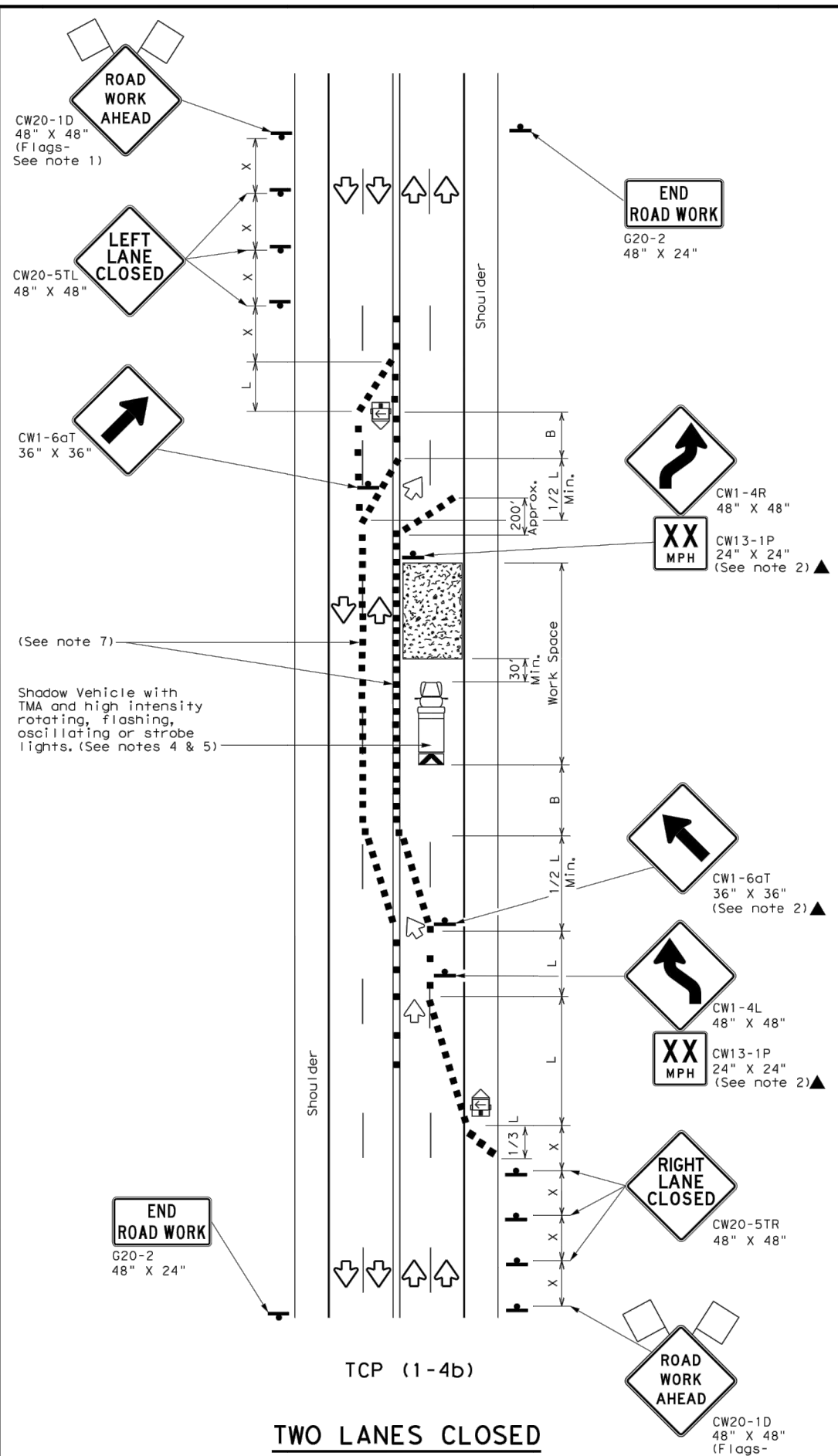
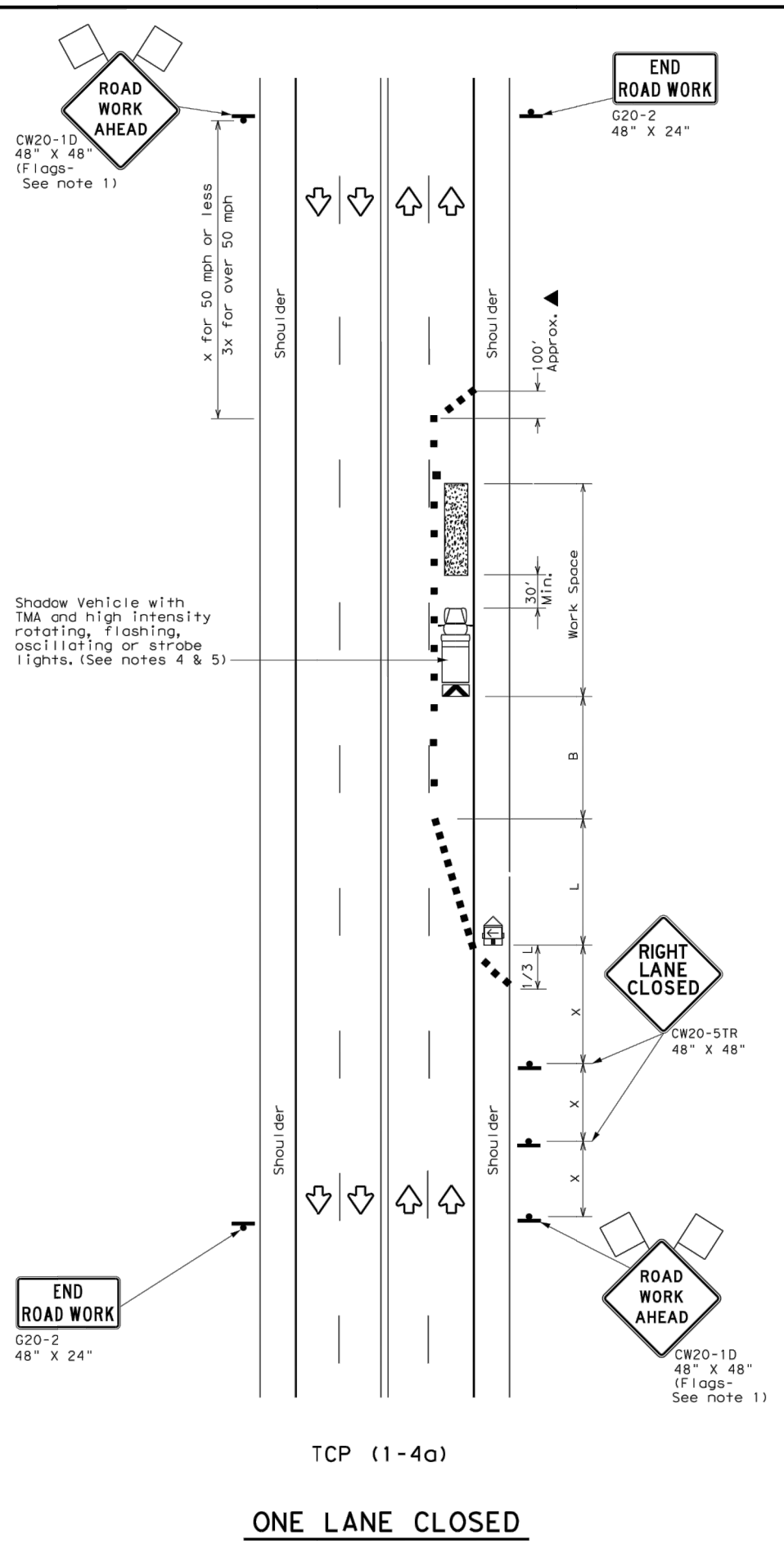
BC(12)-21

| | | | | |
|-----------------------|-----------|-----------|-----------|-----------|
| FILE: bc-21.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT |
| © TxDOT February 1998 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | 0008 | 03 | 134 | US 180 |
| 1-97 9-07 5-21 | DIST | COUNTY | SHEET NO. | |
| 2-98 7-13 | FTW | PARKER | 017 | |
| 11-02 8-14 | | | | |

DATE: FILE:

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DATE: FILE:



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

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
- TCP (1-4a)**
- If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.
- TCP (1-4b)**
- Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation Traffic Operations Division Standard

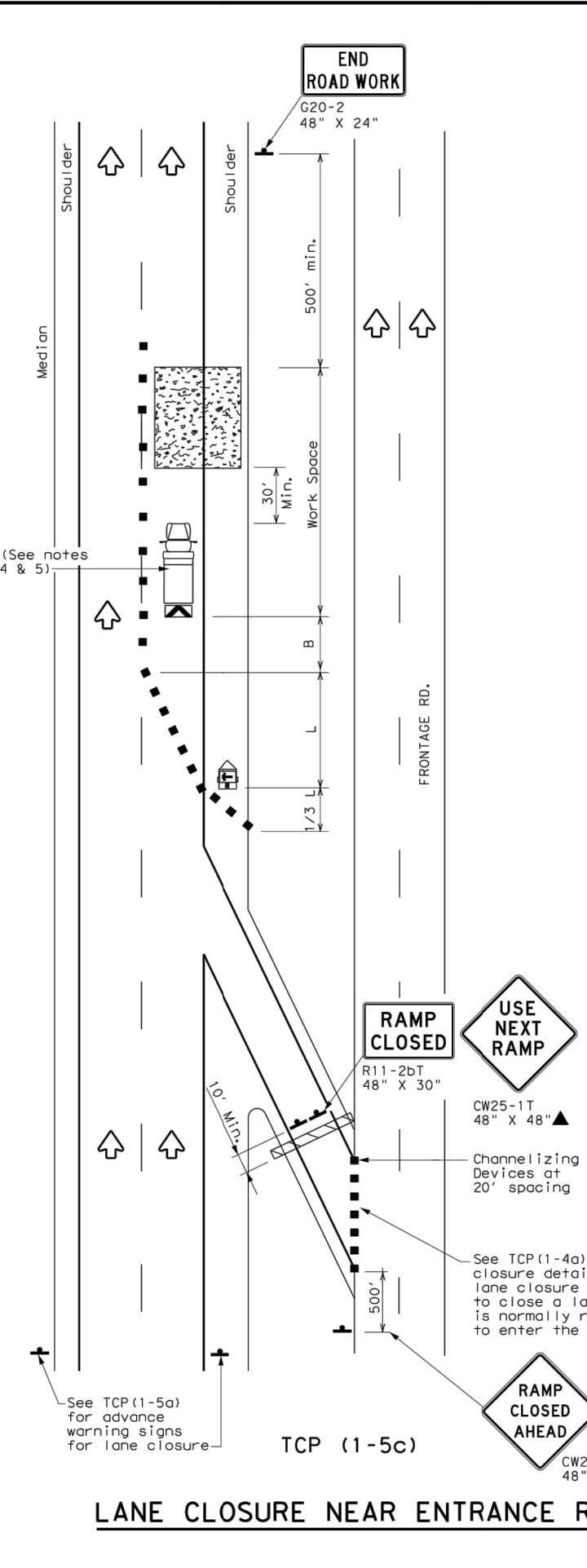
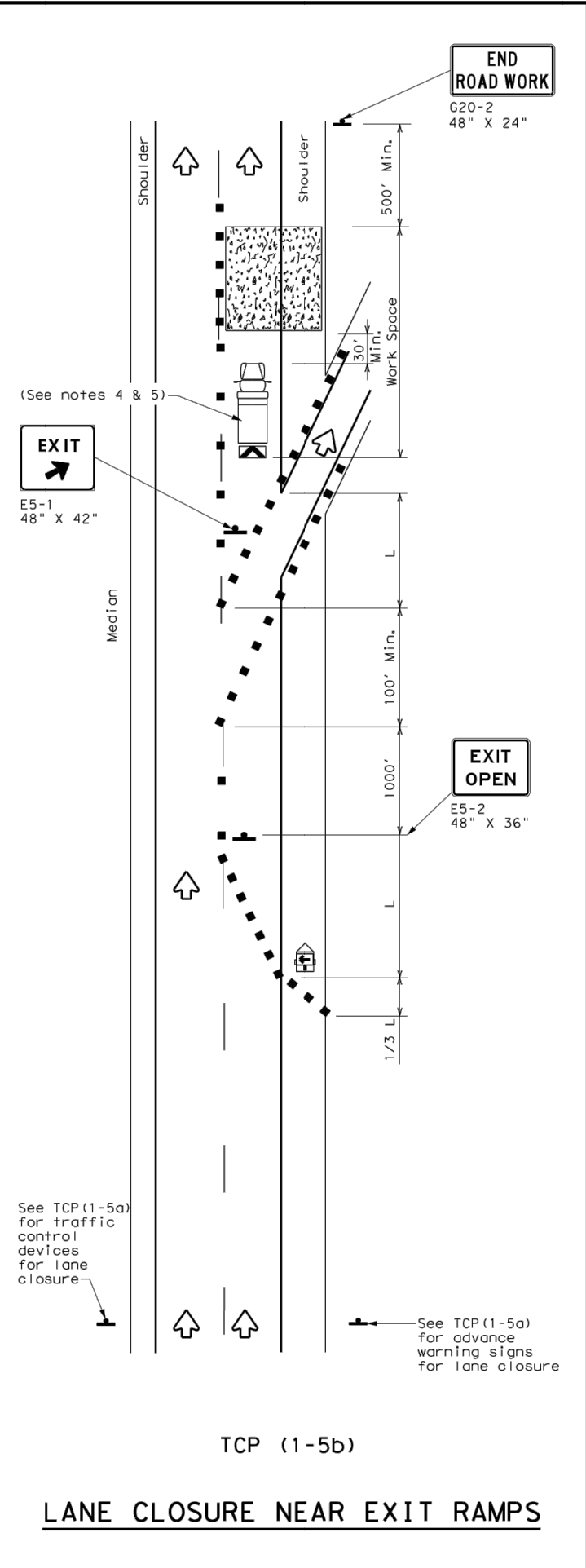
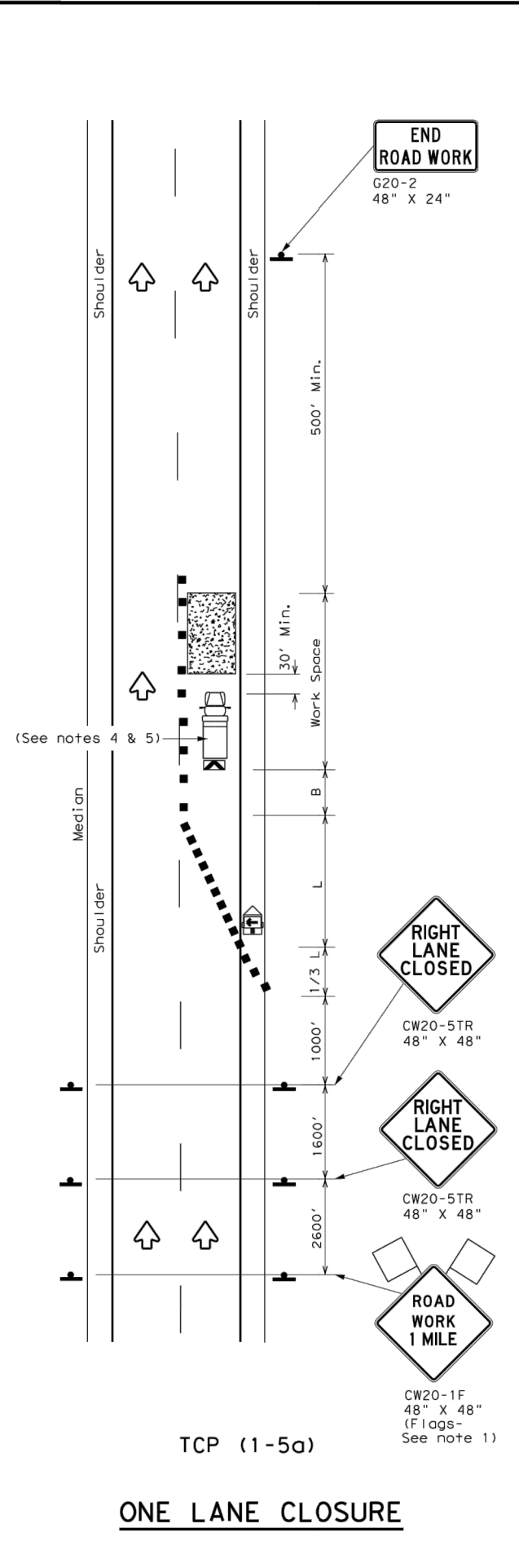
TRAFFIC CONTROL PLAN
LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP (1-4) - 18

| | | | | | | | | | |
|-----------|---------------|------|--------|-----------|---------|-----|--|-----|--|
| FILE# | tcp1-4-18.dgn | DN# | | CK# | | DW# | | CK# | |
| © TxDOT | December 1985 | COM# | SECT | JOB | HIGHWAY | | | | |
| REVISIONS | | 0008 | 03 | 134 | US 180 | | | | |
| 2-94 | 4-98 | DIST | COUNTY | SHEET NO. | | | | | |
| 8-95 | 2-12 | FTW | PARKER | 018 | | | | | |
| 1-97 | 2-18 | | | | | | | | |

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DATE: FILE:



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

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

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

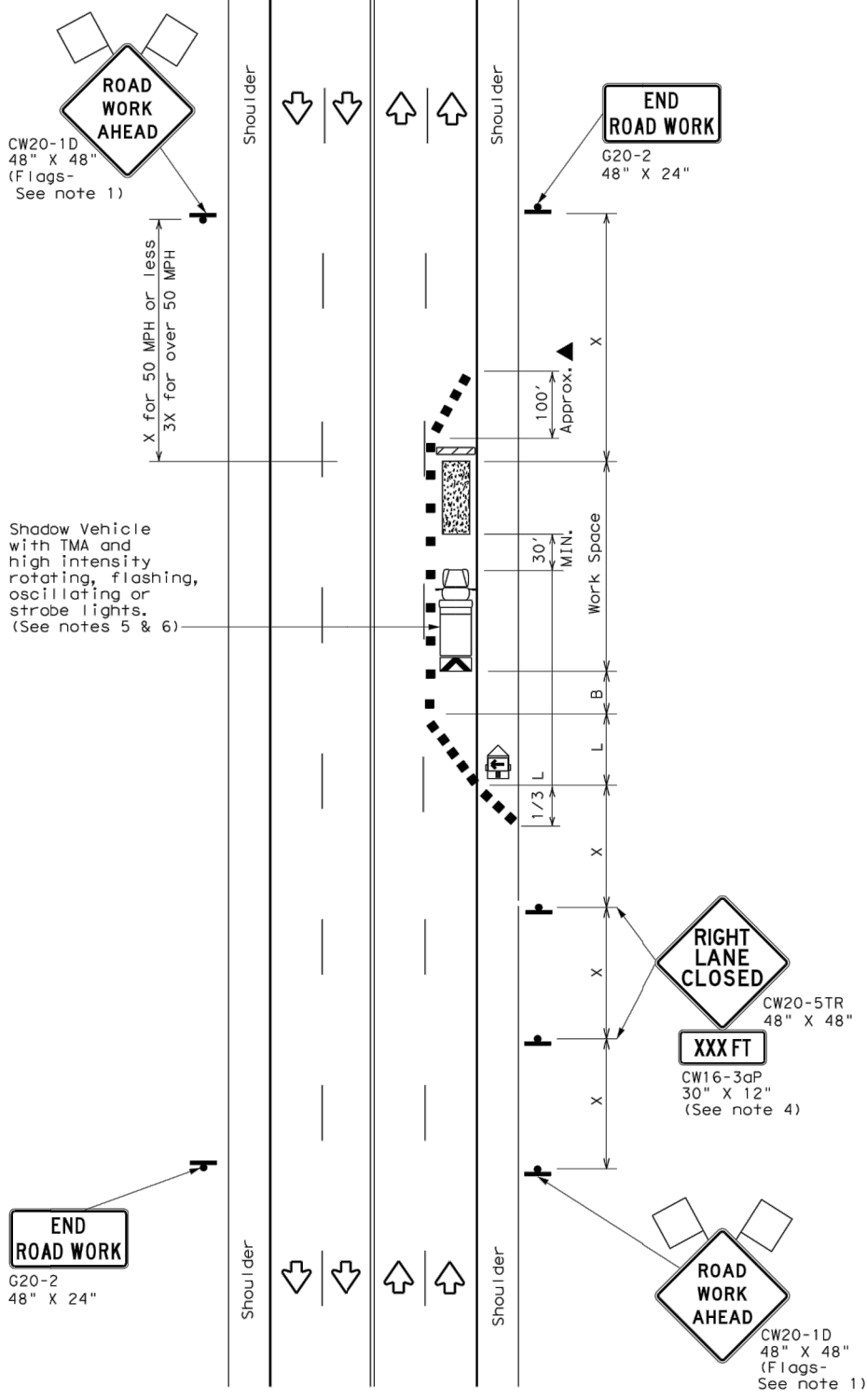
| TYPICAL USAGE | | | | |
|---------------|----------------|-----------------------|------------------------------|----------------------|
| MOBILE | SHORT DURATION | SHORT TERM STATIONARY | INTERMEDIATE TERM STATIONARY | LONG TERM STATIONARY |
| | | ✓ | | |

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
 - Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

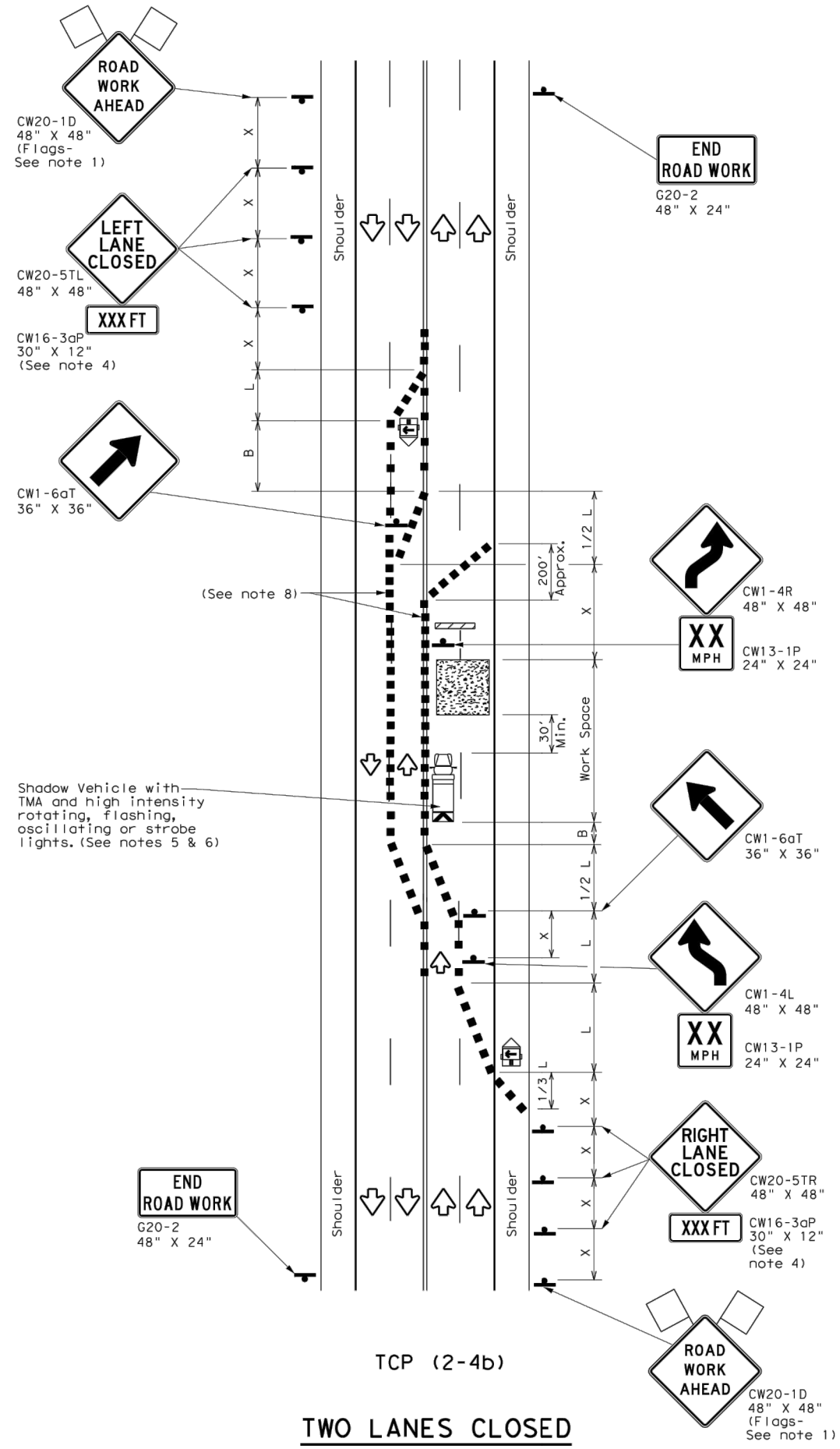
TRAFFIC CONTROL PLAN
LANE CLOSURES FOR
DIVIDED HIGHWAYS
TCP (1-5) - 18

| | | | | | |
|---------------------|---------------------|----------------|----------------|----------|-----------------|
| FILE: tcp1-5-18.dgn | DATE: February 2012 | CHK: 0008 | DWG: 03 | JOB: 134 | HIGHWAY: US 180 |
| © TxDOT | REVISIONS | 0008 | 03 | 134 | US 180 |
| 2-18 | DIST: FTW | COUNTY: PARKER | SHEET NO.: 019 | | |

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TCP (2-4a)
ONE LANE CLOSED



TCP (2-4b)
TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

- Flags attached to signs where shown, are REQUIRED.
 - All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
 - The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
 - For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
 - A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
 - Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
- TCP (2-4a)**
- If this TCP is used for a left lane closure, CW20-5TL "LEFT LANE CLOSED" signs shall be used and channelizing devices shall be placed on the centerline to protect the work space from opposing traffic with the arrow board placed in the closed lane near the end of the merging taper.
- TCP (2-4b)**
- For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.



**TRAFFIC CONTROL PLAN
 LANE CLOSURES ON MULTILANE
 CONVENTIONAL ROADS**

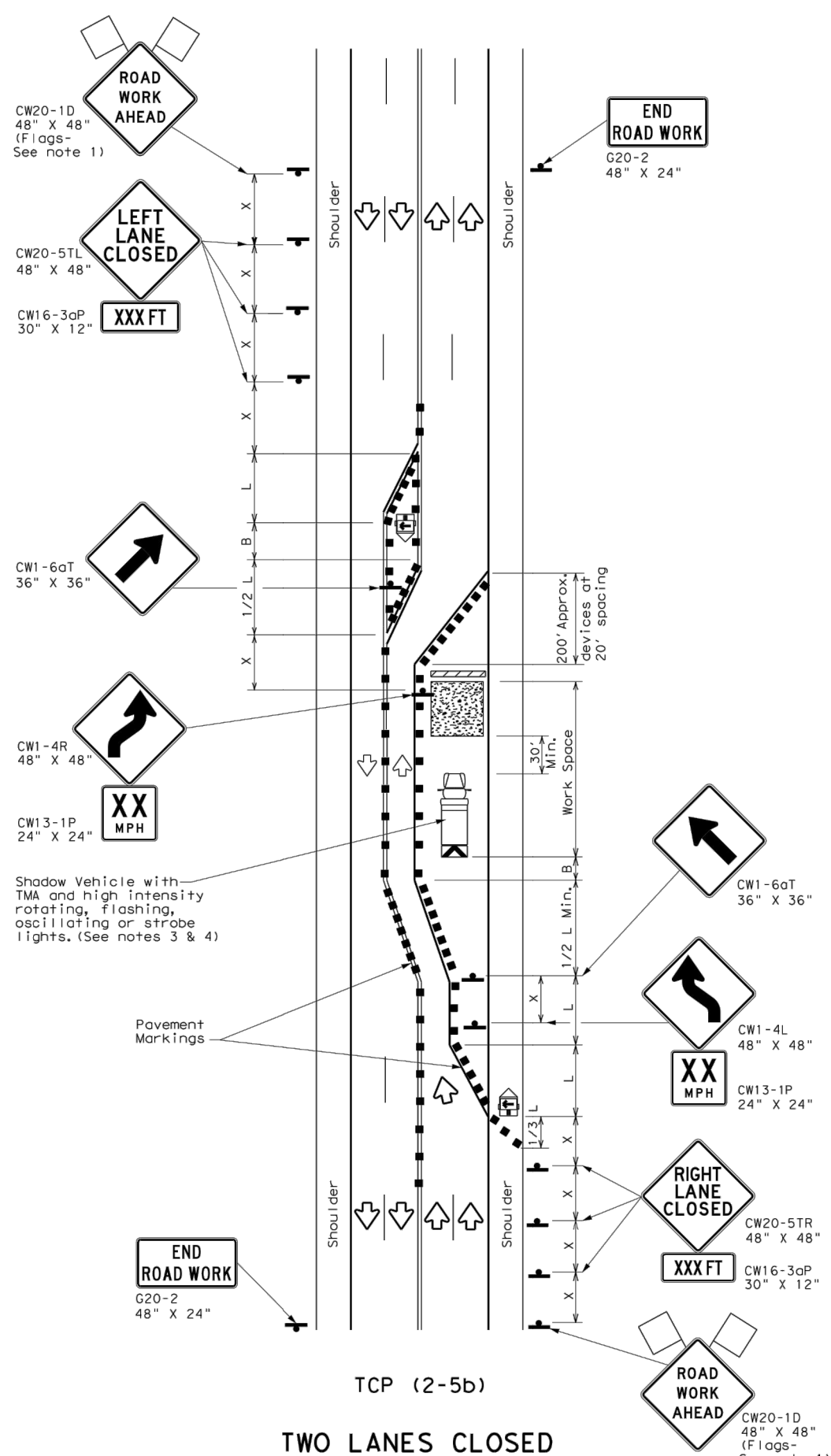
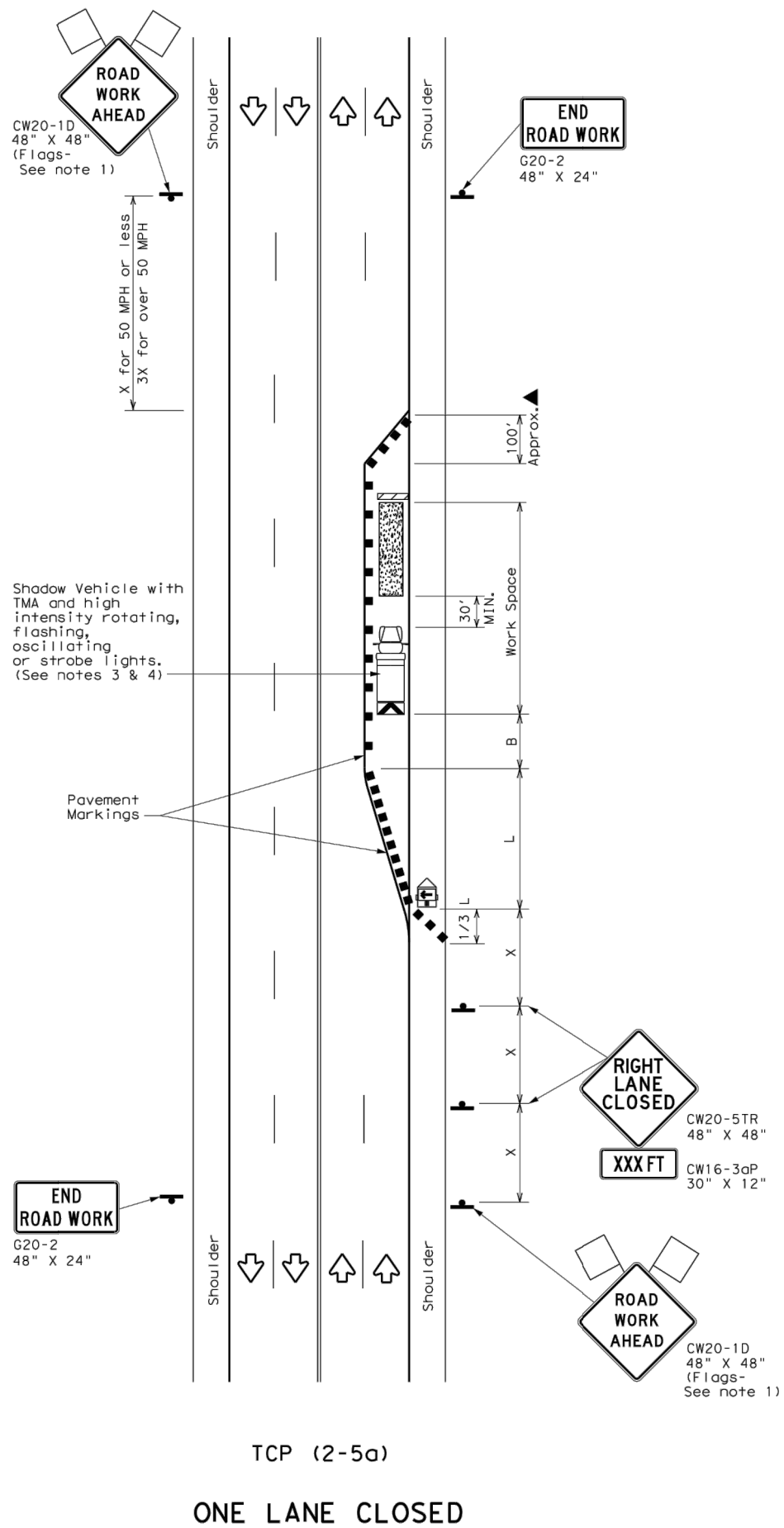
TCP (2-4) - 18

| | | | | | | |
|---------|---------------|------|--------|-----|-----------|-----|
| FILE# | tcp2-4-18.dgn | DN# | | CK# | DW# | CK# |
| © TxDOT | December 1985 | CONT | SECT | JOB | HIGHWAY | |
| 8-95 | 3-03 | 0008 | 03 | 134 | US 180 | |
| 1-97 | 2-12 | DIST | COUNTY | | SHEET NO. | |
| 4-98 | 2-18 | FTW | PARKER | | 020 | |

DATE:
FILE:

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DATE: FILE:



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

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

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

| TYPICAL USAGE | | | | |
|---------------|----------------|-----------------------|------------------------------|----------------------|
| MOBILE | SHORT DURATION | SHORT TERM STATIONARY | INTERMEDIATE TERM STATIONARY | LONG TERM STATIONARY |

GENERAL NOTES

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

TCP (2-5a)

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

TCP (2-5b)

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

Texas Department of Transportation Traffic Operations Division Standard

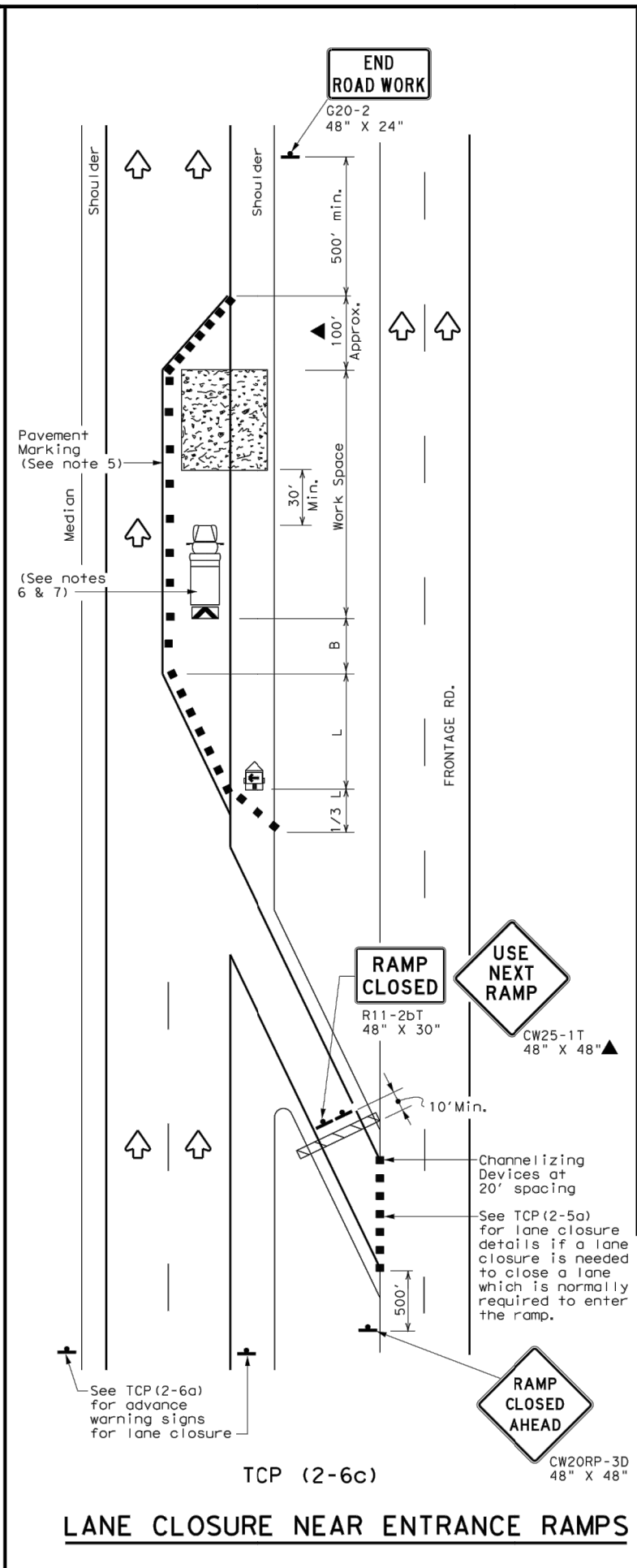
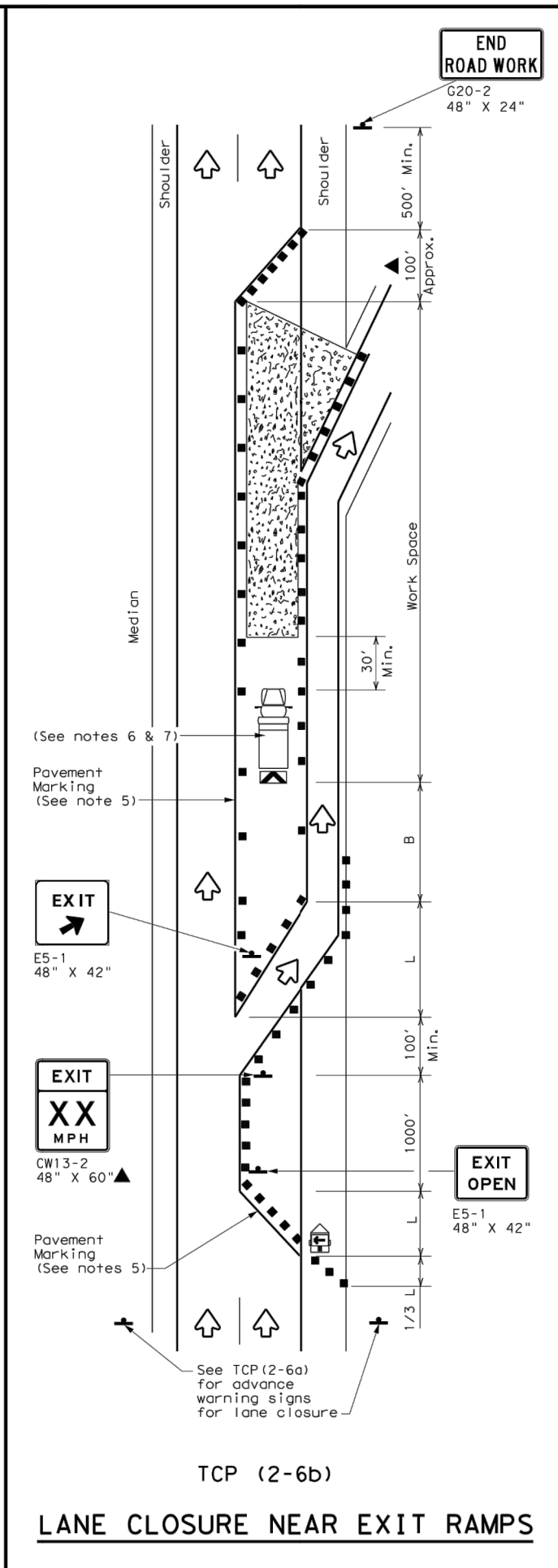
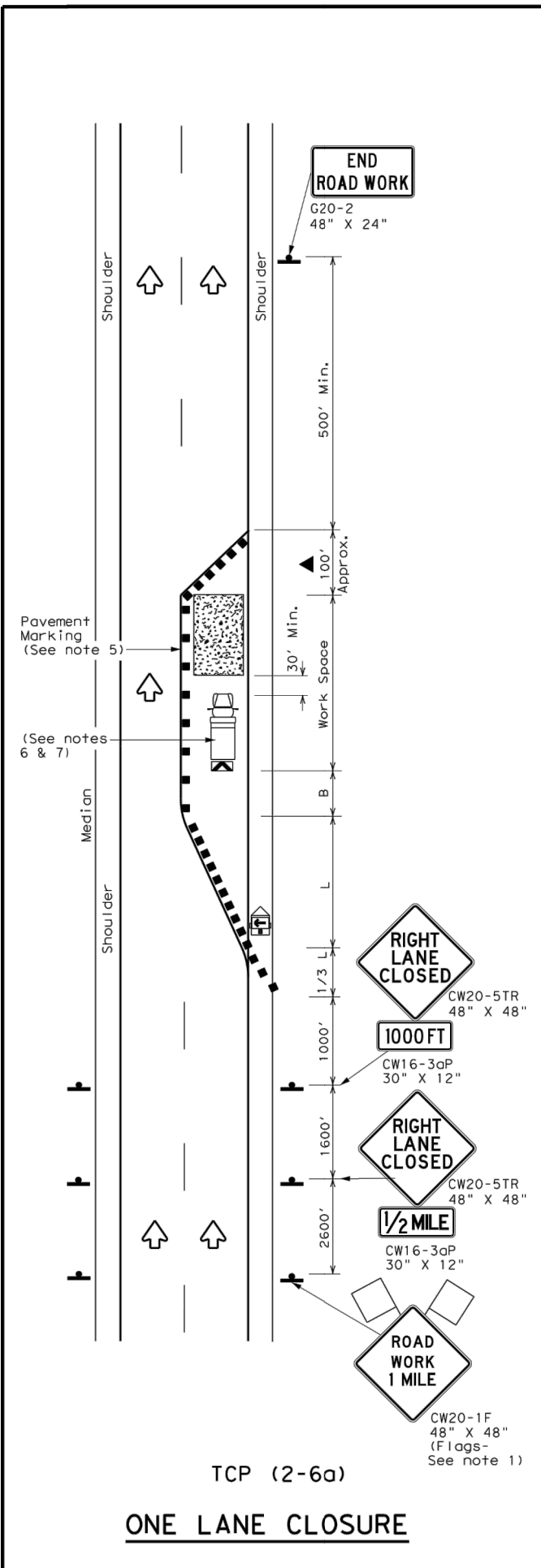
TRAFFIC CONTROL PLAN
LONG TERM LANE CLOSURES
MULTILANE CONVENTIONAL RDS.

TCP (2-5) - 18

| | | | | | |
|---------------------|--------------------|-----------|---------|---------|----------------|
| FILE# tcp2-5-18.dgn | DATE December 1985 | COMT 0008 | SECT 03 | JOB 134 | HIGHWAY US 180 |
| 8-95 2-12 | REVISIONS | 1-97 3-03 | DIST | COUNTY | SHEET NO. |
| 4-98 2-18 | | FTW | PARKER | | 021 |

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DATE: FILE:



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

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

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

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

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

Texas Department of Transportation
 Traffic Operations Division Standard

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

TCP (2-6) - 18

| | | | | |
|-----------------------|-------|---------|-----------|----------|
| FILE# tcp2-6-18.dgn | DWG# | CK# | DWG# | CK# |
| © TxDOT December 1985 | CON# | SECT# | JOB# | HIGHWAY# |
| 2-94 4-98 | 0008 | 03 | 134 | US 180 |
| 8-95 2-12 | DIST# | COUNTY# | SHEET NO. | |
| 1-97 2-18 | FTW | PARKER | 022 | |

166

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DATE: FILE:

GENERAL NOTES FOR ALL ELECTRICAL WORK

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

CONDUIT

A. MATERIALS

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


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

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

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

B. CONSTRUCTION METHODS

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

| | | | | | |
|---|------------|---|--------------|---|--------|
|  | | Texas Department of Transportation | | Traffic Operations Division Standard | |
| <h1>ELECTRICAL DETAILS CONDUITS & NOTES</h1> | | | | | |
| <h2>ED(1)-14</h2> | | | | | |
| FILE: | ed1-14.dgn | DATE: | October 2014 | JOB: | US 180 |
| © TxDOT | REVISIONS | 0008 | 03 | 134 | US 180 |
| | DIST: | COUNTY: | | SHEET NO. | |
| | FTW | PARKER | | 023 | |

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

- 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.
- 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.
- 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.
- 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

- 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.
- 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.
- 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.
- Size and install gel-filled insulating splice covers according to manufacturer's specifications when used in place of heat shrink tubing.
- 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.
- Support conductors in illumination poles with a J-hook at the top of the pole.
- 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.
- Replace conductors and cables that are damaged beyond repair or that fail an insulation resistance test at no additional cost to the department.
- Do not repair damaged conductors with duct tape, electrical tape, or wire nuts. Use only approved splicing methods.
- 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 listing allowed.
- 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.

- 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

- Install temporary conductors and electrical equipment in accordance with the NEC article "Temporary Installations" and Department standard sheets.
- 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.
- Use listed wire nuts with factory applied sealant for temporary wiring where approved.
- 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.
- Protect and when necessary repair any existing electrical conduits uncovered during the construction process in a timely manner and in conformance with the NEC.

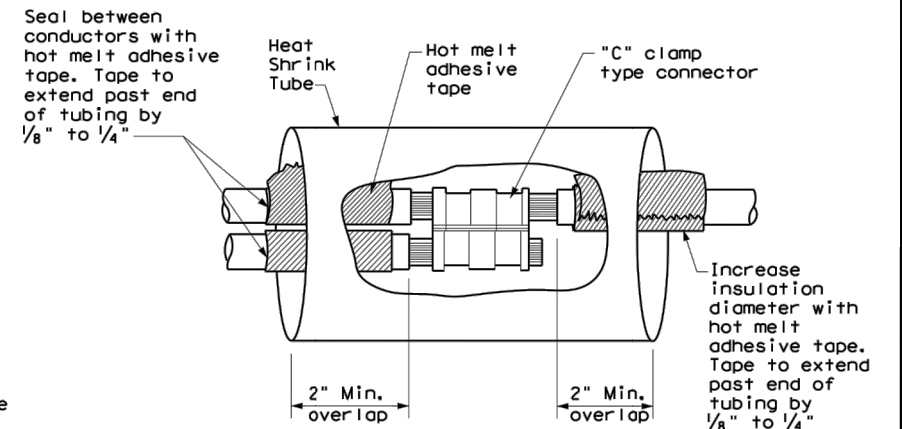
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

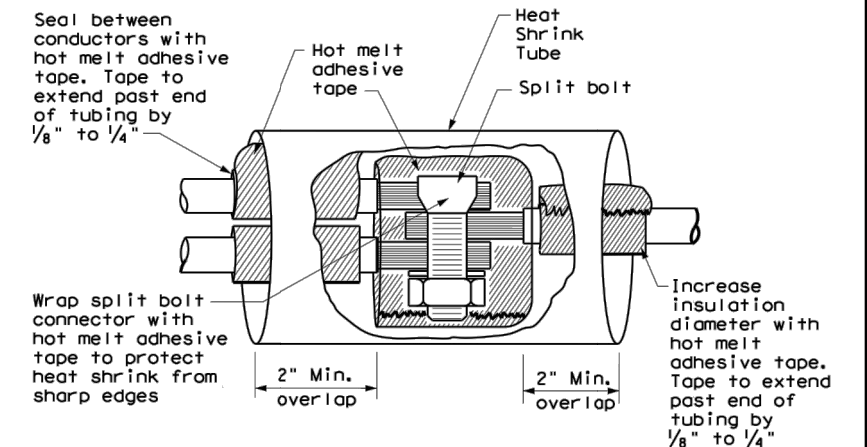
- Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in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

B. CONSTRUCTION METHODS

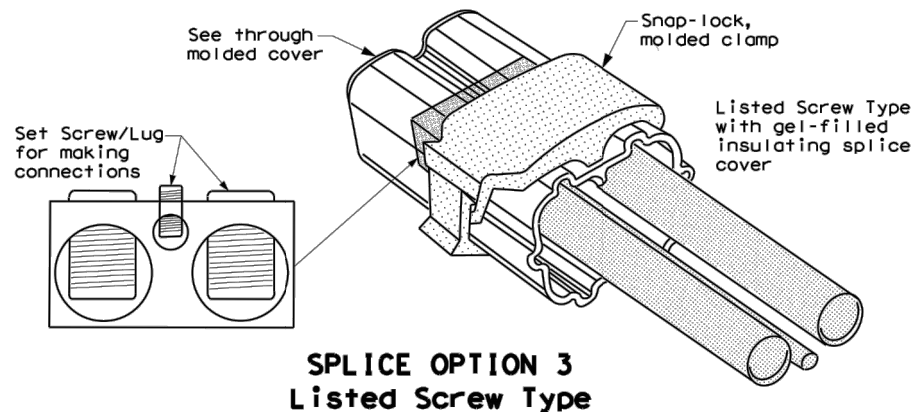
- Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil, ensure that the upper end is between 2 to 4 in. below finished grade.
- Do not place ground rods in the same drilled hole as a timber pole.
- Install ground rods so the imprinted part number is at the upper end of the rod.
- Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.
- 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.
- 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.
- Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



**SPLICE OPTION 1
Compression Type**



**SPLICE OPTION 2
Split Bolt Type**



**SPLICE OPTION 3
Listed Screw Type**

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| | | Texas Department of Transportation | | Traffic Operations Division Standard | |
| <h2>ELECTRICAL DETAILS CONDUCTORS</h2> | | | | | |
| <h3>ED(3)-14</h3> | | | | | |
| FILE# | ed3-14.dgn | DN# | TxDOT | CK# | TxDOT |
| COM# | October 2014 | SECT | JOB | HIGHWAY | |
| REVISIONS | | 0008 | 03 | 134 | US 180 |
| DIST | COUNTY | SHEET NO. | | | |
| FTW | PARKER | 024 | | | |

ELECTRICAL SERVICES NOTES

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

SERVICE ASSEMBLY ENCLOSURE

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

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

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

PHOTOELECTRIC CONTROL

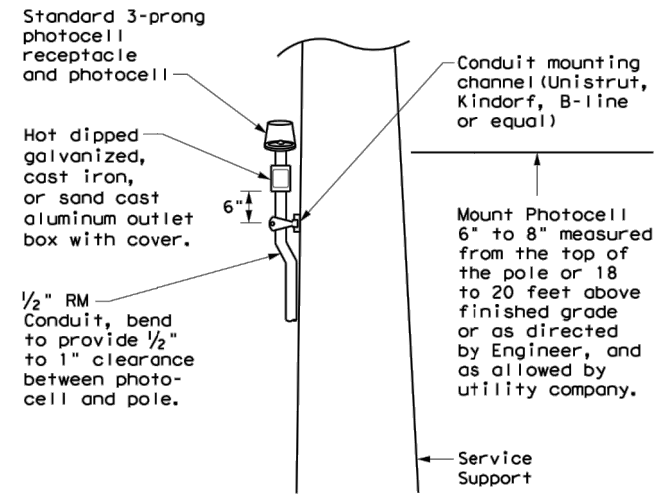
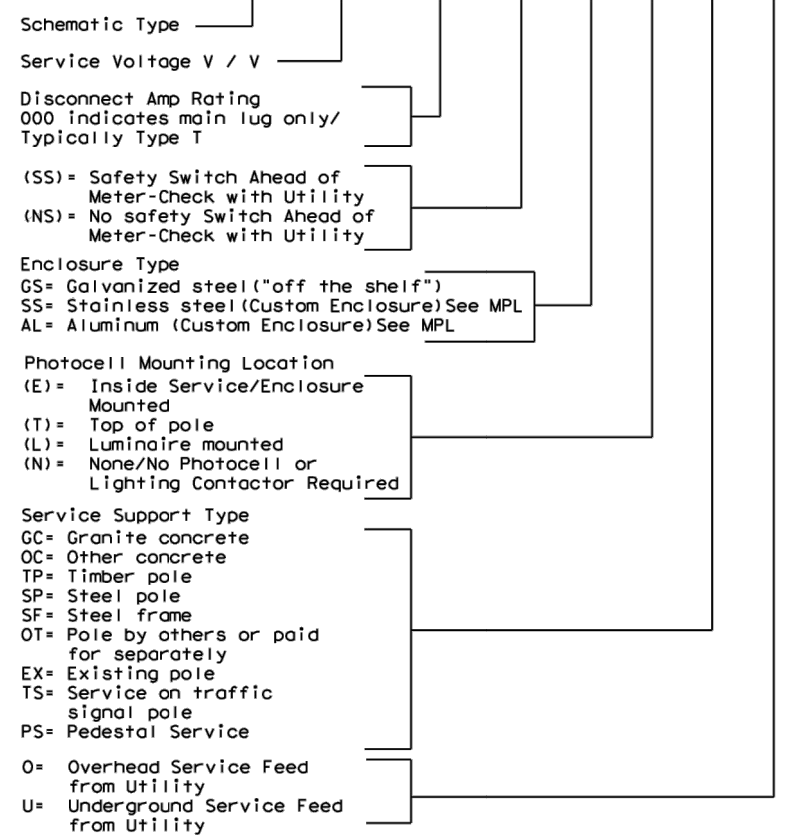
- Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

| * ELECTRICAL SERVICE DATA | | | | | | | | | | | | | |
|---------------------------|-------------------|--|------------------------|-----------------------------|--------------------|--------------------------|--------------------------|--------------------------------|-------------------|----------------------------|---------------------|----------|--|
| Elec. Service ID | Plan Sheet Number | Electrical Service Description | Service Conduit **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 1/4" | 3/#6 | N/A | 2P/60 | | 100 | Sig. Controller | 1P/30 | 23 | 5.3 | |
| | | | | | | | 30 | | Luminaire | 2P/20 | 9 | | |
| | | | | | | | | | CCTV | 1P/20 | 3 | | |
| 2nd & Main | 58 | ELC SRV TY T 120/240 000(NS)GS(N)SP(O) | 1 1/4" | 3/#6 | N/A | N/A | N/A | 70 | Flashing Beacon 1 | 1P/20 | 4 | 1.0 | |
| | | | | | | | | | Flashing Beacon 2 | 1P/20 | 4 | | |

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

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

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



TOP MOUNTED PHOTOCELL

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

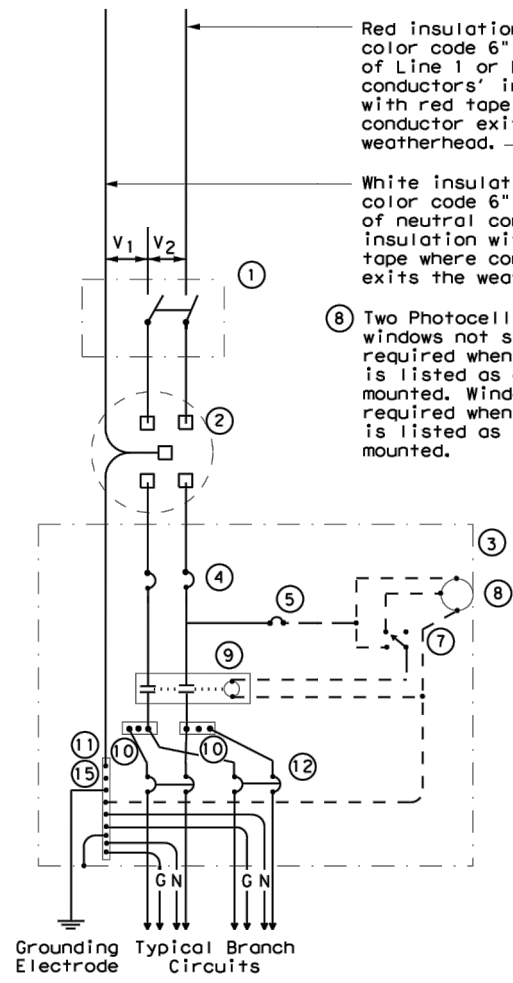
Texas Department of Transportation Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

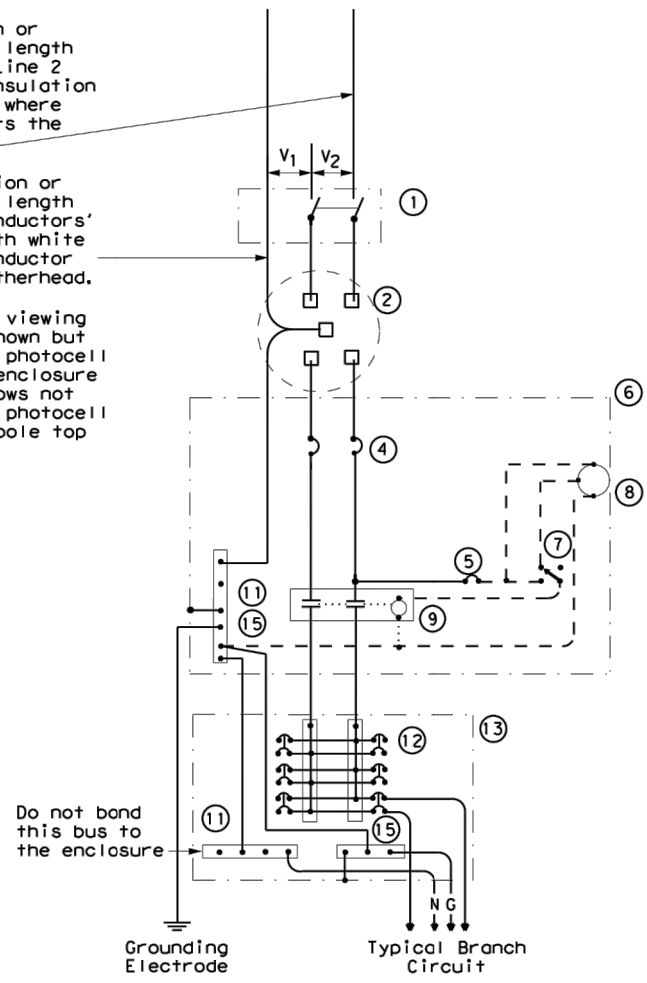
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| ©TxDOT | October 2014 | CONT | SECT | JOB | HIGHWAY | | | | |
| REVISIONS | | 0008 | 03 | 134 | US 180 | | | | |
| DIST | COUNTY | SHEET NO. | | | | | | | |
| FTW | PARKER | 025 | | | | | | | |

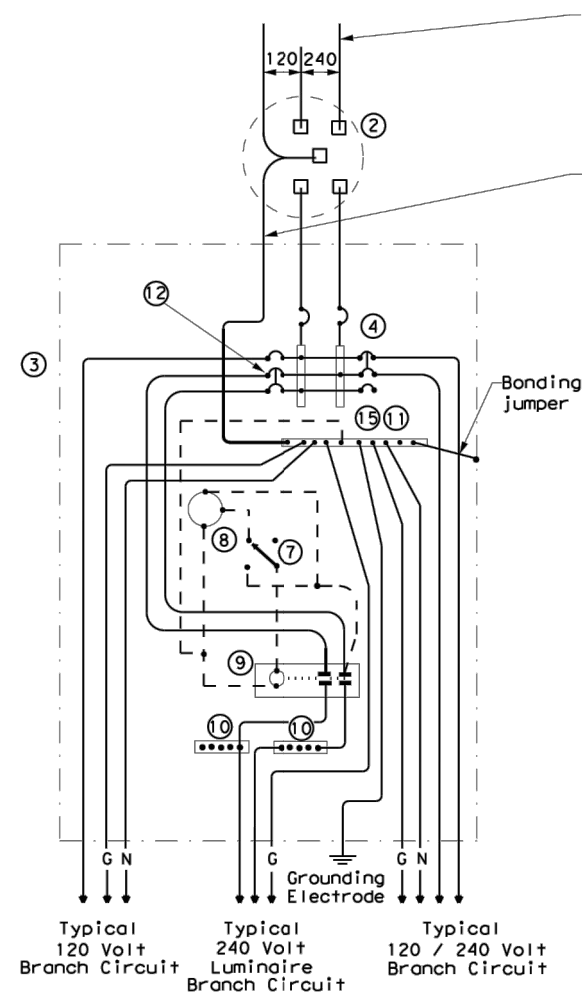
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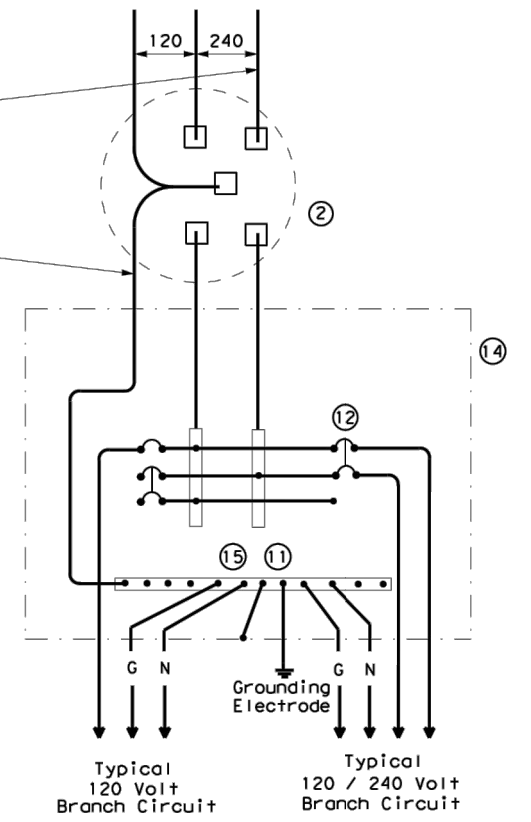
**SCHEMATIC TYPE A
THREE WIRE**



**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 |

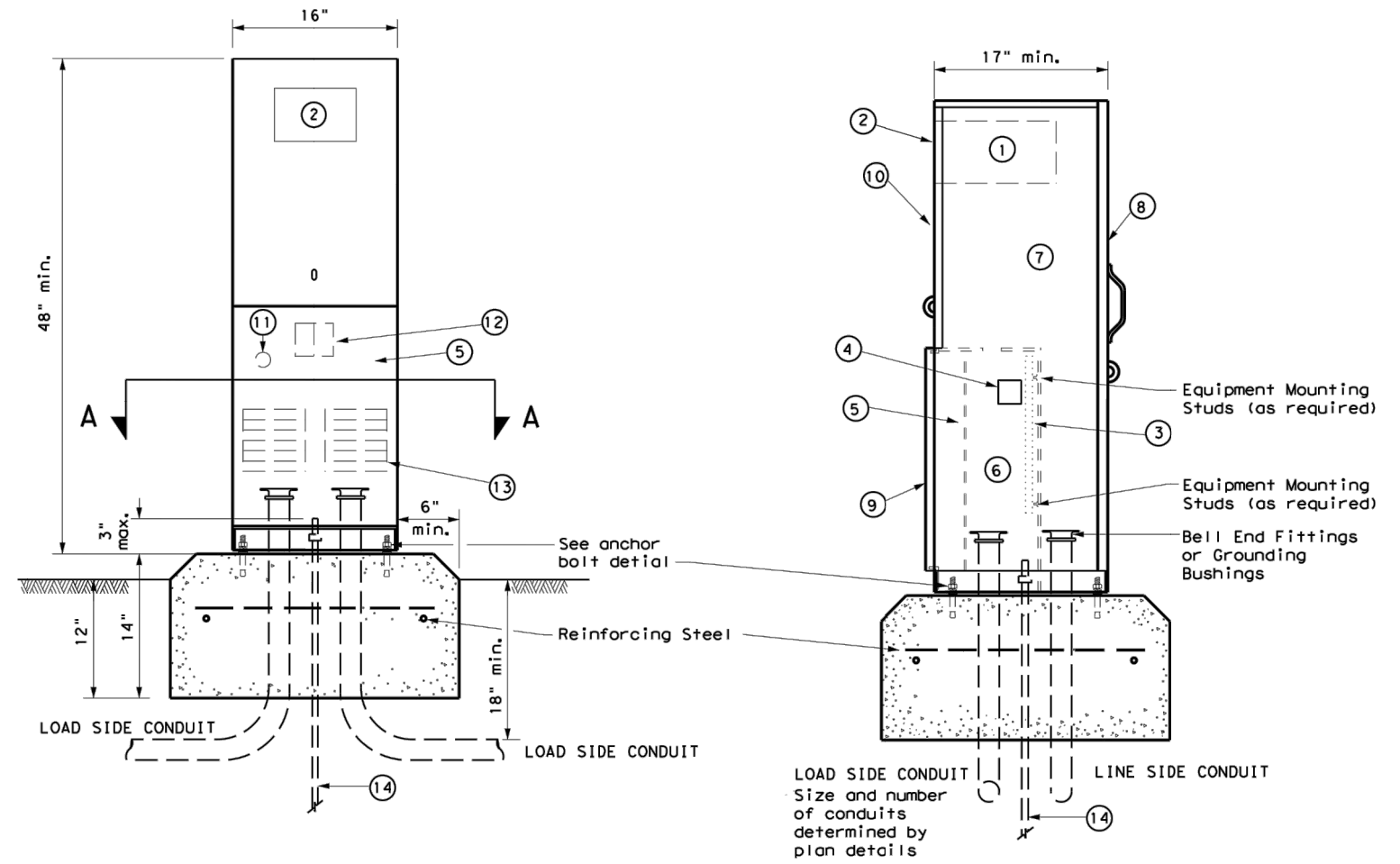
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| | | Traffic Operations Division Standard | |
| ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES | | | |
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| FILE: ed6-14.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT |
| © TxDOT October 2014 | CONT SECT | JOB | HIGHWAY |
| REVISIONS | 0008 03 | 134 | US 180 |
| DIST | COUNTY | SHEET NO. | |
| FTW | PARKER | 026 | |

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DATE: FILE:

PEDESTAL SERVICE NOTES

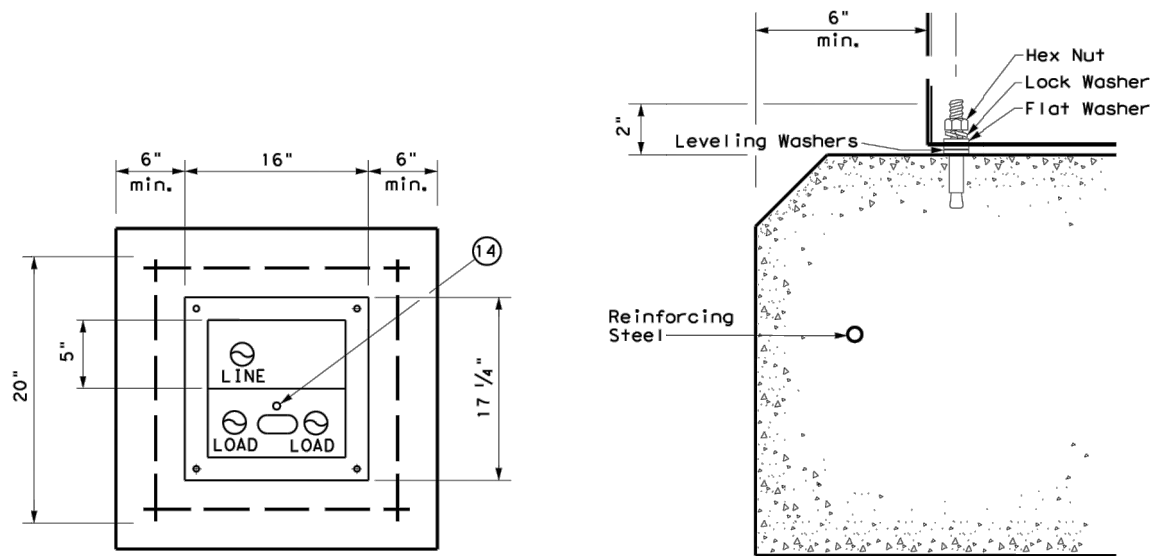
1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS) 11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services." Provide pedestal electrical services as listed on the Material Producers list (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.
2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.
3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."
5. Install 1/2 in. X 2 1/8 in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a 1/2 in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than 1/8 in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of 1/8 in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within 1/4 in. Repair rocking or movement of the service enclosure at no additional cost to the department.
7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.
8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.



FRONT VIEW

SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A

ANCHOR BOLT DETAIL

LEGEND

| | |
|----|--|
| 1 | Meter Socket, (when required) |
| 2 | Meter Socket Window, (when required) |
| 3 | Equipment Mounting Panel |
| 4 | Photo Electric Control Window, (When required) |
| 5 | Hinged Deadfront Trim |
| 6 | Load Side Conduit Trim |
| 7 | Line Side Conduit Area |
| 8 | Utility Access Door, with handle |
| 9 | Pedestal Door |
| 10 | Hinged Meter Access |
| 11 | Control Station (H-O-A Switch) |
| 12 | Main Disconnect |
| 13 | Branch Circuit Breakers |
| 14 | Copper Clad Ground Rod - 5/8" X 10' |

| | | | |
|---|----------------|--------------------------------------|------------|
| | | Traffic Operations Division Standard | |
| ELECTRICAL DETAILS ELECTRICAL SERVICE SUPPORT PEDESTAL SERVICE TYPE PS | | | |
| ED(9) - 14 | | | |
| FILE: ed9-14.dgn | DWG: TxDOT | CHK: TxDOT | DWG: TxDOT |
| © TxDOT October 2014 | CONT: 0008 | SECT: 03 | JOB: 134 |
| REVISIONS | | HIGHWAY: US 180 | |
| DIST: FTW | COUNTY: PARKER | SHEET NO.: 027 | |

I. STORMWATER POLLUTION PREVENTION—CLEAN WATER ACT SECTION 402

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

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

1. CITY OF WEATHERFORD

- 2. No Action Required Required Action

Action No.

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

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

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

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

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

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

- 1.
- 2.
- 3.
- 4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

- No Action Required Required Action

Action No.

- 1.

IV. VEGETATION RESOURCES

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

- No Action Required Required Action

Action No.

- 1.1. Executive Order 13112 on Invasive Species and Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds. No landscaping would be a part of the proposed project. Disturbed areas would be re-vegetated according to TxDOT5/32s standard practices for rural area, which to the extent practical, is in compliance with EO 13112 on Invasive Species and the Executive Memorandum on Beneficial Landscaping (04/26/94).
- 1.2. Vegetation Disturbance. During construction, efforts would be taken to avoid and minimizing disturbance of vegetation and soils. Areas within the existing ROW, but outside the limits of construction, would not be disturbed. Every effort would be made to preserve trees where they would neither compromise safety nor substantially interfere with the proposed projects.

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

- No Action Required Required Action

Action No.

- 12.1. Migratory Bird Treaty Act (MBTA). Between October 1 and February 15, the contractor would remove all old migratory bird nests from any structure that would be affected by the proposed project, and complete any bridge work/demolition and /or vegetation clearing. In addition, the contractor would be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, between February 15 and October 1. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young would be avoided.
- 2.2. Bird BMP and Bald & Golden Eagle Protection Act. The contractor would be prepared to take appropriate measures to avoid disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season. Avoid the removal of unoccupied, inactive nests, as practicable. As necessary, take appropriate measures to prevent the establishment of active nests during the nesting season on facilities and structures proposed for replacement or repair. Collecting, capturing, relocation, or transporting birds, eggs, young, or active nests without a permit is prohibited. The Bald and Golden Eagle Protection Act prohibits the taking or possession of and commerce in eagles, parts, feathers, nests, or eggs with limited exceptions. The definition of take includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. Eagles may not be taken for any purpose unless a permit is issued prior to the taking.
- 2.3. Threatened and Endangered Species: Whooping Crane. The contractor and/or TxDOT personnel would be advised of potential for Whooping Cranes to occur within the project limits. Construction personnel will be advised to avoid adverse impacts to this species and to report any sightings to TxDOT District Environmental staff. Drainage modifications will be limited to the extent practical to accommodate the additional paved surface needed to bring the roadway up to current TxDOT safety standards. The construction personnel will report all sightings to TxDOT Fort Worth District Environmental staff. Reports should include the time, date and location and any available photos.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

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

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

- Yes No

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

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

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

- Yes No

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

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

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

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

- No Action Required Required Action

Action No.

- 1.
- 2.
- 3.

VII. OTHER ENVIRONMENTAL ISSUES

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


- No Action Required Required Action

Action No.

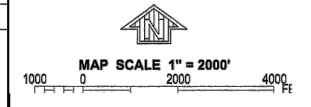
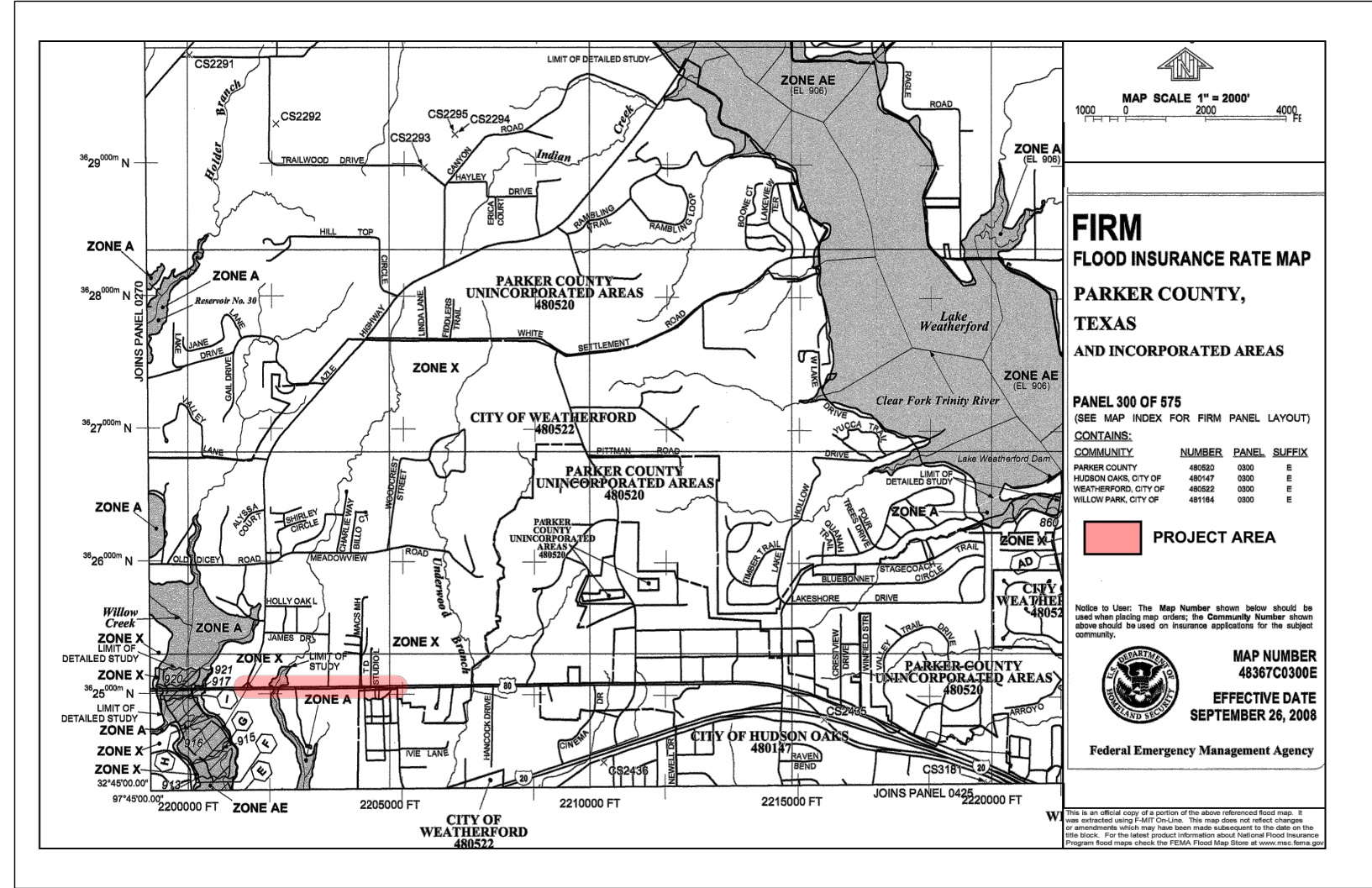
- 1.

GENERAL NOTE:

Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities as additional environmental clearance may be required.

| | | | | |
|---|-----------|---------------------------------|-----------|--------|
|  | | <i>Design Division Standard</i> | | |
| ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC | | | | |
| FILE: epic.dgn | DN: TxDOT | CK: RG | DW: VP | CK: AR |
| ©TxDOT: February 2015 | CONT SECT | JOB | HIGHWAY | |
| 12-12-2011 (DS) REVISIONS | 0008/03 | 134 | US 180 | |
| 05-07-14 ADDED NOTE SECTION IV. | DIST | COUNTY | SHEET NO. | |
| 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES. | FTW | PARKER | 028 | |

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**FIRM
FLOOD INSURANCE RATE MAP
PARKER COUNTY,
TEXAS
AND INCORPORATED AREAS**

PANEL 300 OF 575
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

| COMMUNITY | NUMBER | PANEL SUFFIX |
|----------------------|--------|--------------|
| PARKER COUNTY | 480820 | 0300 E |
| HUDSON OAKS, CITY OF | 480147 | 0300 E |
| WEATHERFORD, CITY OF | 480522 | 0300 E |
| WILLOW PARK, CITY OF | 481164 | 0300 E |

PROJECT AREA

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER
48367C0300E**
**EFFECTIVE DATE
SEPTEMBER 26, 2008**

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

NOTES:
CROSS-HATCHED AREA DEPICTS LIMITS OF PERMITTED (BOTH NOTES) IMPACT TO USACE JURISDICTIONAL WATERS.

FOR THIS LOCATION, THE AREA OF IMPACT IS ESTIMATED AS 3,800 LF AND .77 ACRES

THE IMPACTS DESCRIBED AT THIS LOCATION ARE AUTHORIZED UNDER USACE NATIONWIDE PERMIT NO(S): N/A

GENERAL NOTE:
Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities as additional environmental clearance may be required.

Texas Department of Transportation
FORT WORTH DISTRICT

**ENVIRONMENTAL PERMITS,
ISSUES AND COMMITMENTS**

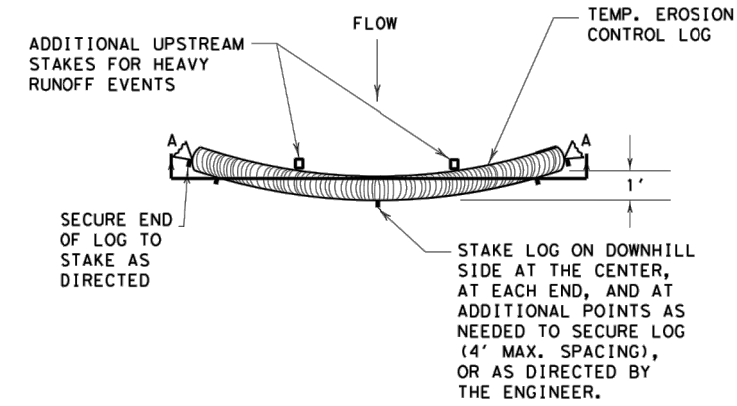
EPIC (FW)

SHEET 2 OF 2 SHEETS

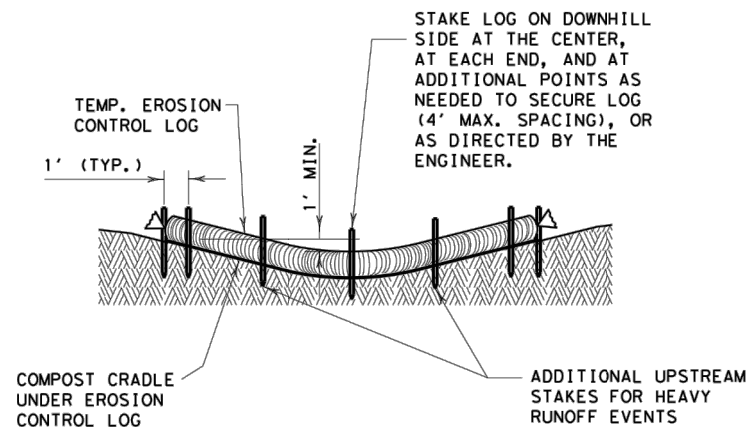
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| ORIG.: DEC. 2003 | DIST.: | FED. RD. DIV. NO.: | PROJECT NO.: | HIGHWAY |
| REVISIONS: | FTW | 6 | C365-1-51 | JS 180 |
| | COUNTY | CONT. | SECT. | JOB SHEET |
| | PARKER | 0008 | 03 | 134 029 |

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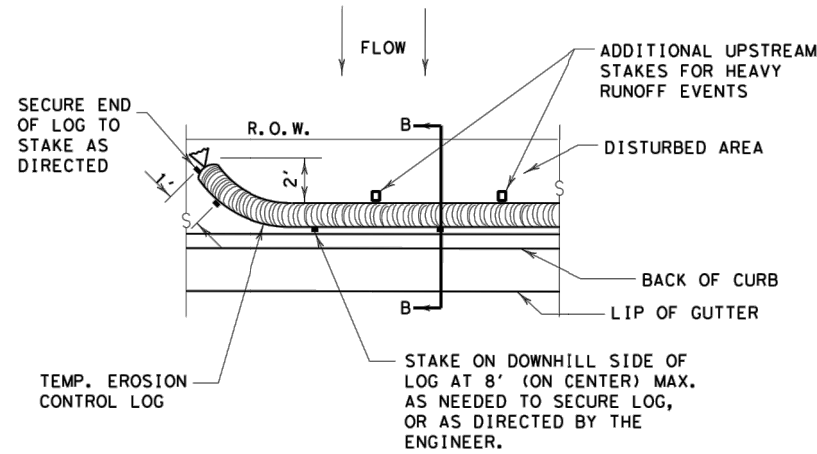
PLAN VIEW



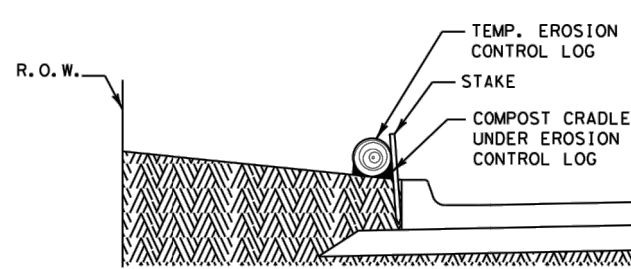
SECTION A-A

EROSION CONTROL LOG DAM

CL-D



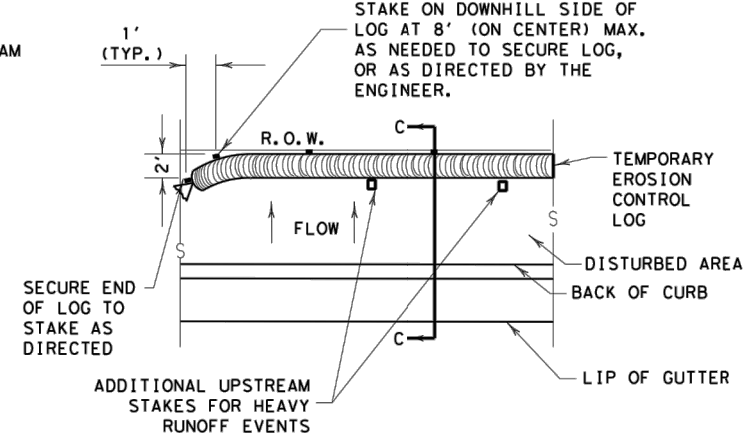
PLAN VIEW



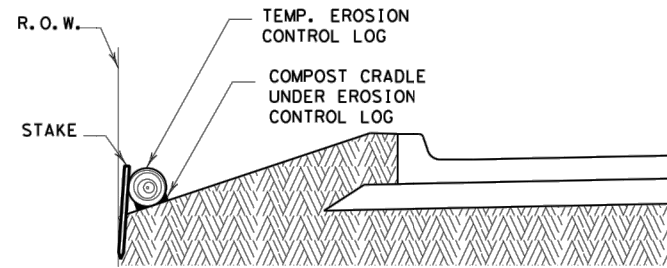
SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



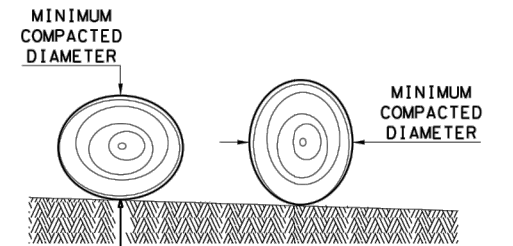
PLAN VIEW



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SHEET 1 OF 3

| | | | |
|---|----------------|--------------------------|-----------|
| | | Design Division Standard | |
| TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16 | | | |
| FILE: ec916 | DN: TxDOT | CK: KM | DW: LS/PT |
| © TxDOT: JULY 2016 | CONT: 0008 | SECT: 03 | JOB: 134 |
| REVISIONS | | HIGHWAY: US 180 | |
| DIST: FTW | COUNTY: PARKER | SHEET NO.: 032 | |

SEDIMENT BASIN & TRAP USAGE GUIDELINES

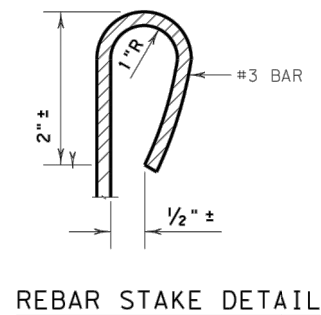
An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

- Control logs should be placed in the following locations:
1. Within drainage ditches spaced as needed or min. 500' on center
 2. Immediately preceding ditch inlets or drain inlets
 3. Just before the drainage enters a water course
 4. Just before the drainage leaves the right of way
 5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

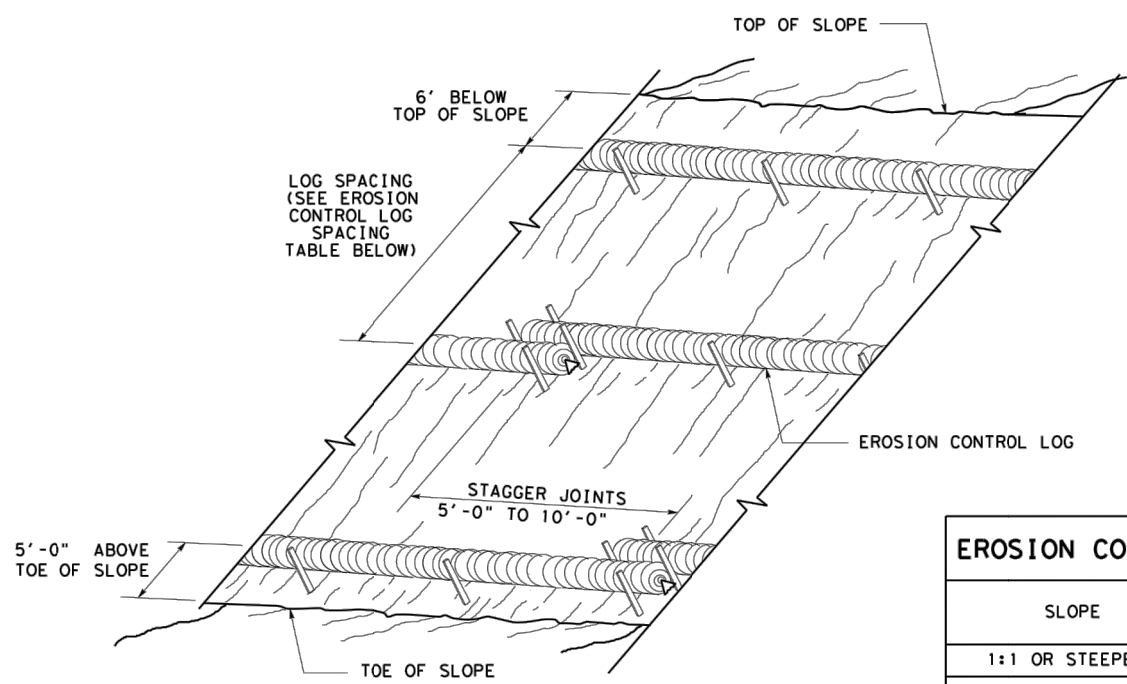


REBAR STAKE DETAIL

- LEGEND
- CL-D EROSION CONTROL LOG DAM
 - CL-BOC EROSION CONTROL LOG AT BACK OF CURB
 - CL-ROW EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
 - CL-SST EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
 - CL-SSL EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
 - CL-DI EROSION CONTROL LOG AT DROP INLET
 - CL-CI EROSION CONTROL LOG AT CURB INLET
 - CL-GI EROSION CONTROL LOG AT CURB & GRATE INLET

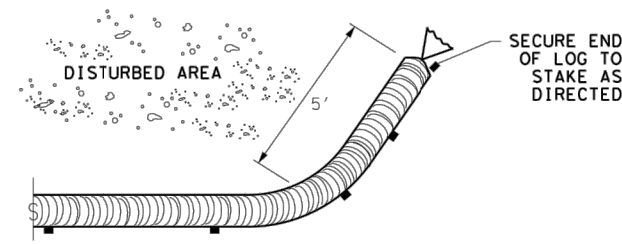
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DATE:
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**EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING**

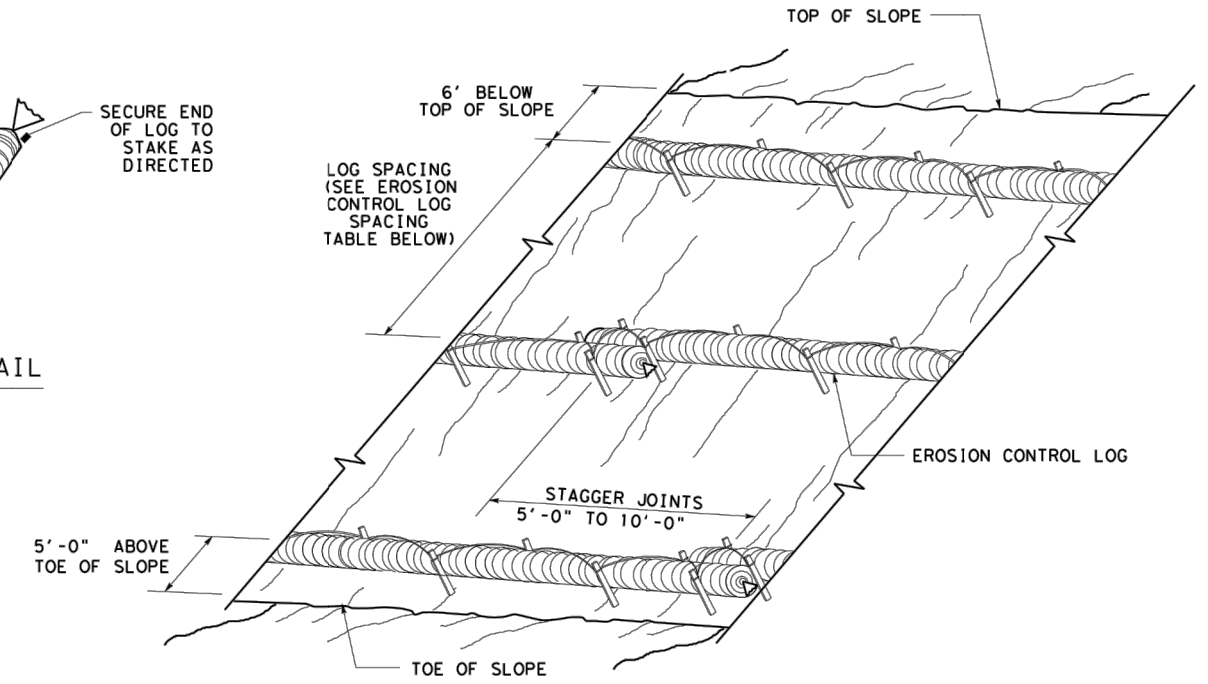
CL-SST



END SECTION RAP DETAIL

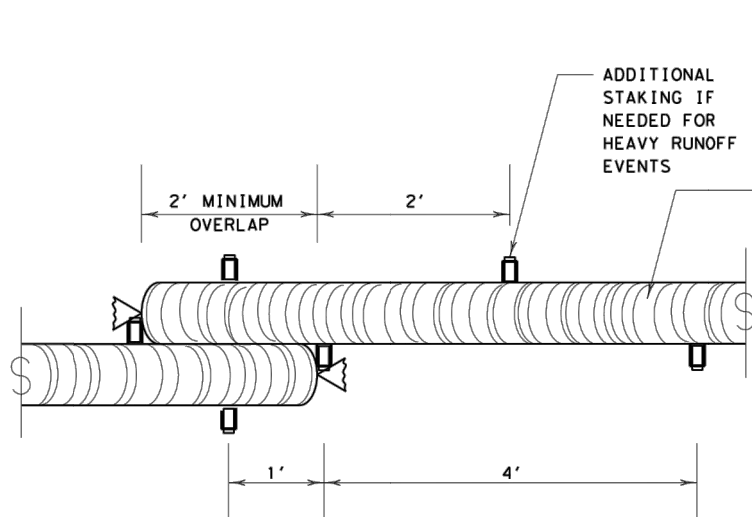
| SLOPE | LOG DIAMETER | | | |
|----------------|--------------|-----|-----|-----|
| | 6" | 8" | 12" | 18" |
| 1:1 OR STEEPER | 5' | 10' | 15' | 20' |
| 2:1 | 10' | 20' | 30' | 40' |
| 3:1 | 15' | 30' | 45' | 60' |
| 4:1 OR FLATTER | 20' | 40' | 60' | 80' |

* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



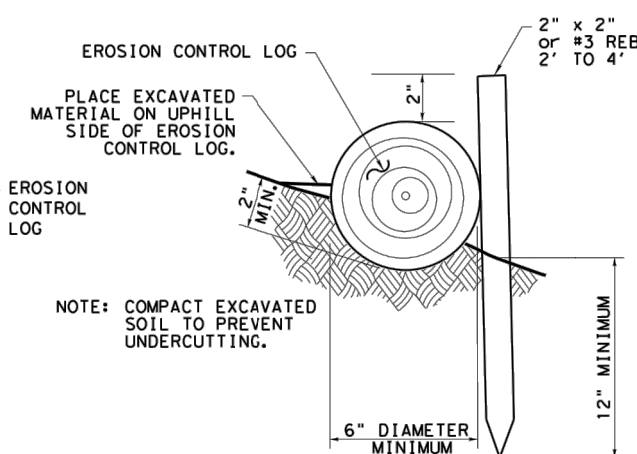
**EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING**

CL-SSL



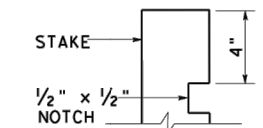
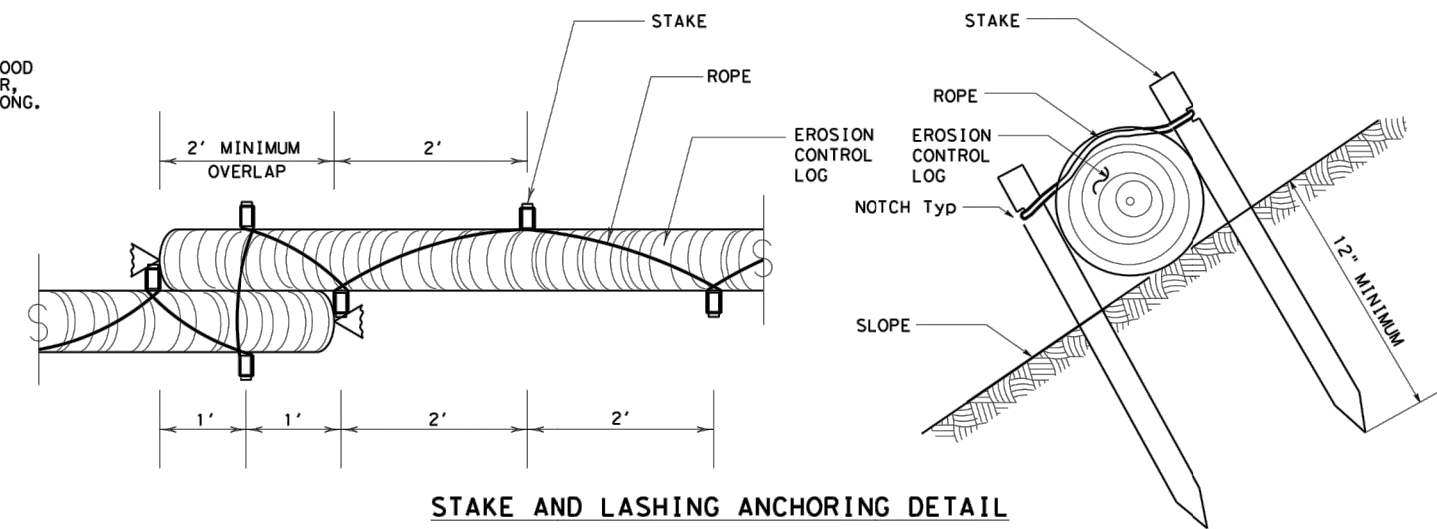
STAKE AND TRENCHING ANCHORING DETAIL

CL-SST



STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

| TRENCH DEPTH TABLE | |
|--------------------|-------|
| LOG DIAMETER | DEPTH |
| 6" | 2" |
| 8" | 3" |
| 12" | 4" |
| 18" | 5" |

SHEET 2 OF 3

Texas Department of Transportation Design Division Standard

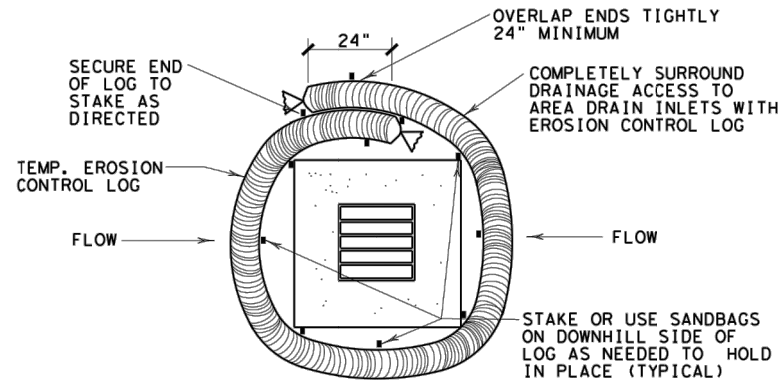
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

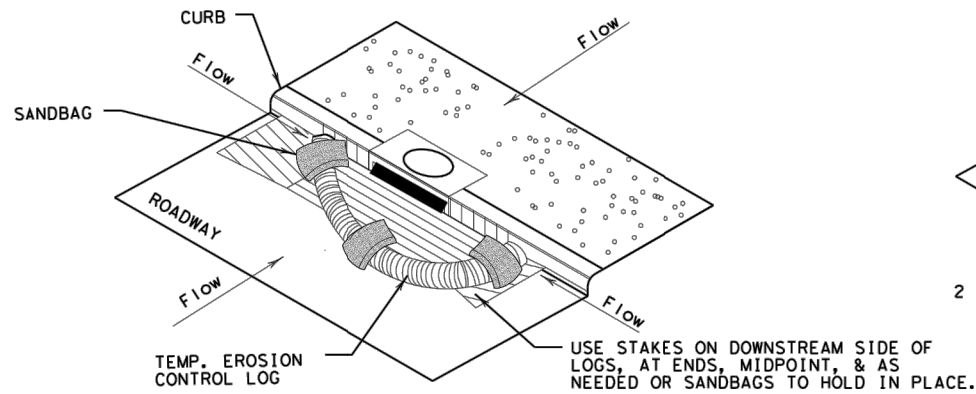
| | | | | |
|--------------------|-----------|--------|-----------|---------|
| FILE: ec116 | DN: TxDOT | CK: KM | DW: LS/PT | CK: LS |
| © TxDOT: JULY 2016 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | 0008 | 03 | 134 | US 180 |
| | DIST | COUNTY | SHEET NO. | |
| | FTW | PARKER | 033 | |

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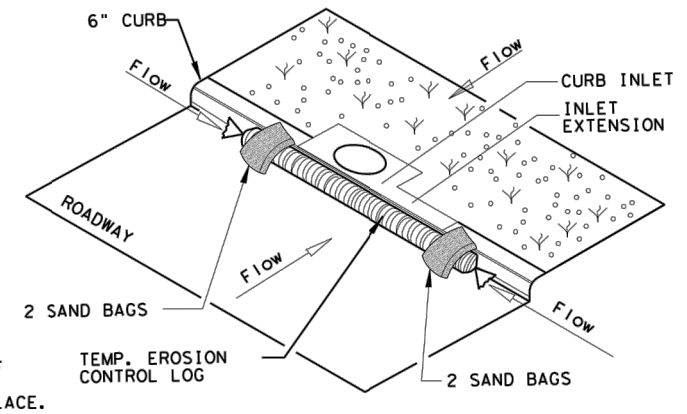
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

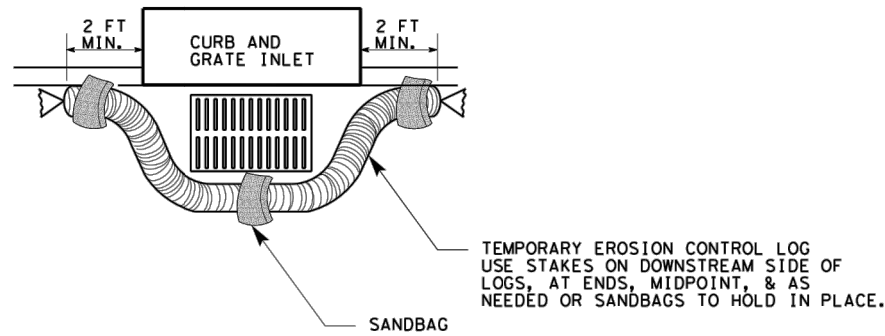
CL-CI



EROSION CONTROL LOG AT CURB INLET

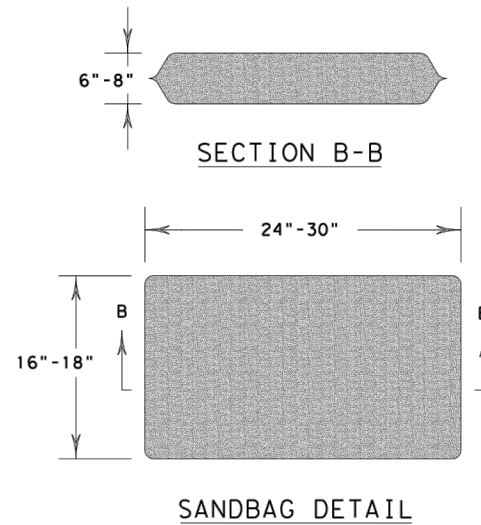
CL-CI

NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

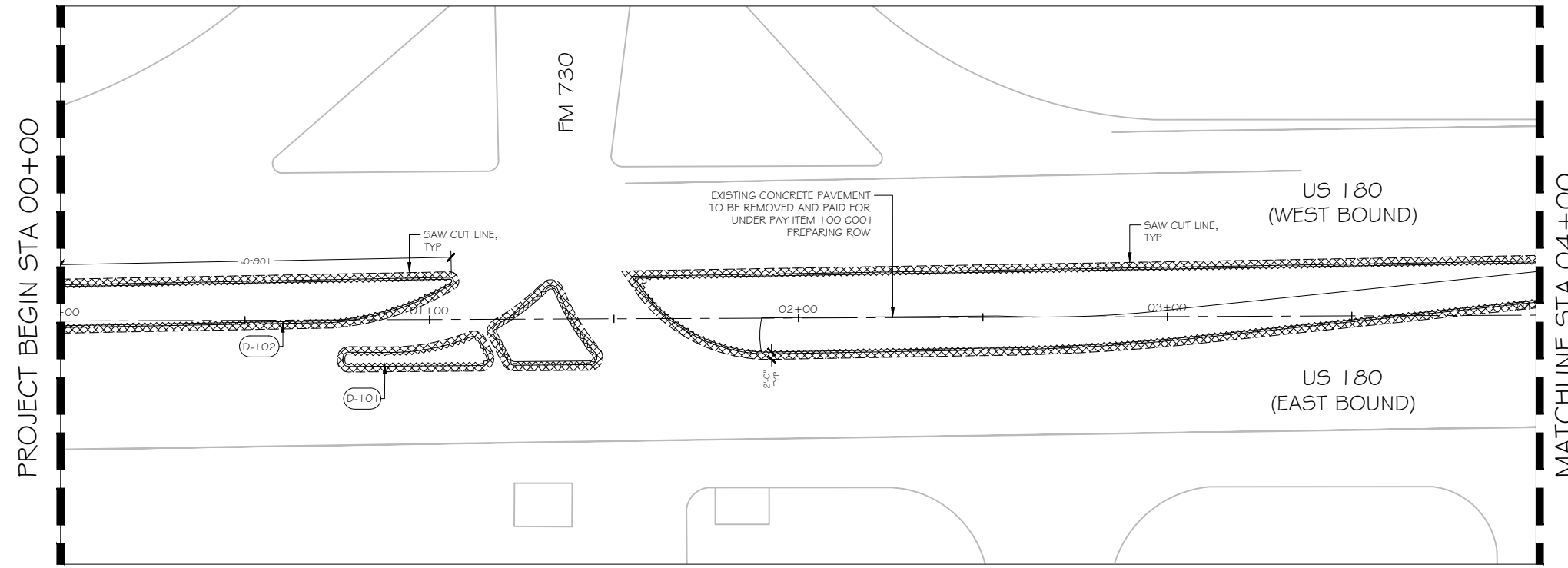
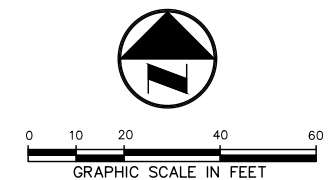
CL-GI



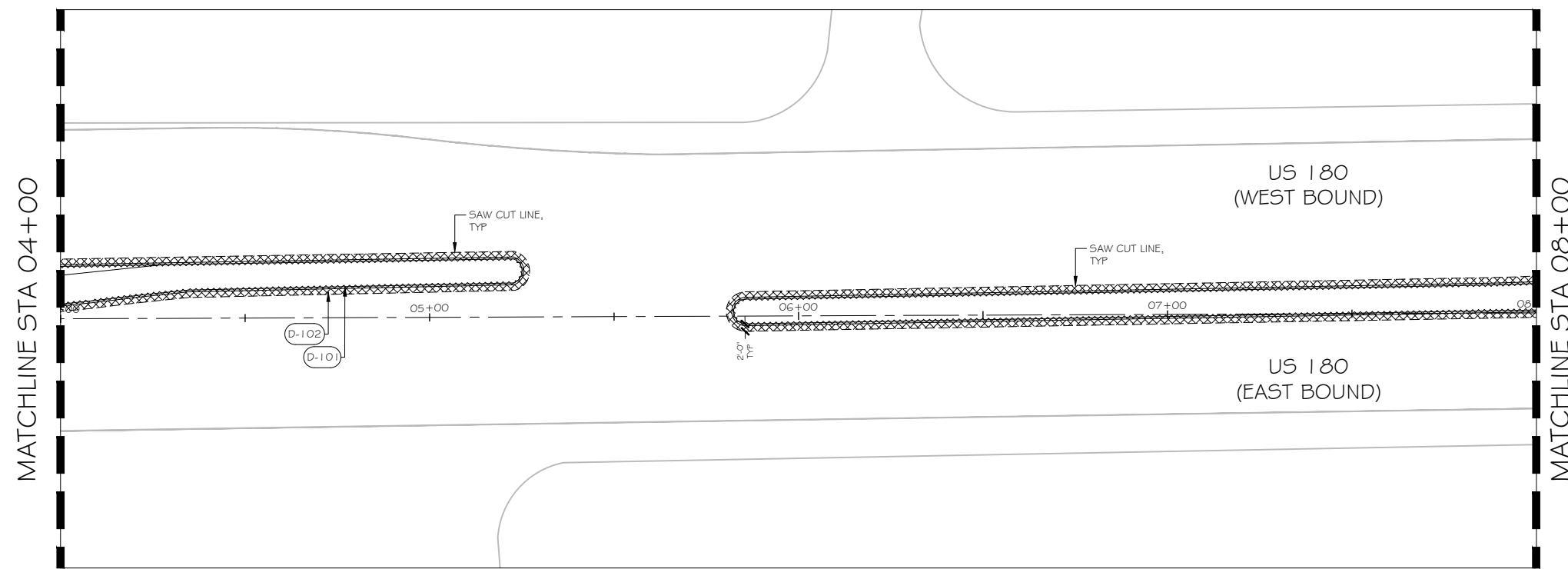
SHEET 3 OF 3

| | | | |
|---|----------------|---------------------------------|-----------|
| | | <i>Design Division Standard</i> | |
| TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16 | | | |
| FILE: ec916 | DN: TxDOT | CK: KM | DW: LS/PT |
| © TxDOT: JULY 2016 | CONT: 0008 | SECT: 03 | JOB: 134 |
| REVISIONS | | HIGHWAY: US 180 | |
| DIST: FTW | COUNTY: PARKER | SHEET NO.: 034 | |

DATE:
FILE:



1 STA 00+00 - STA 04+00
1" = 20'-0"



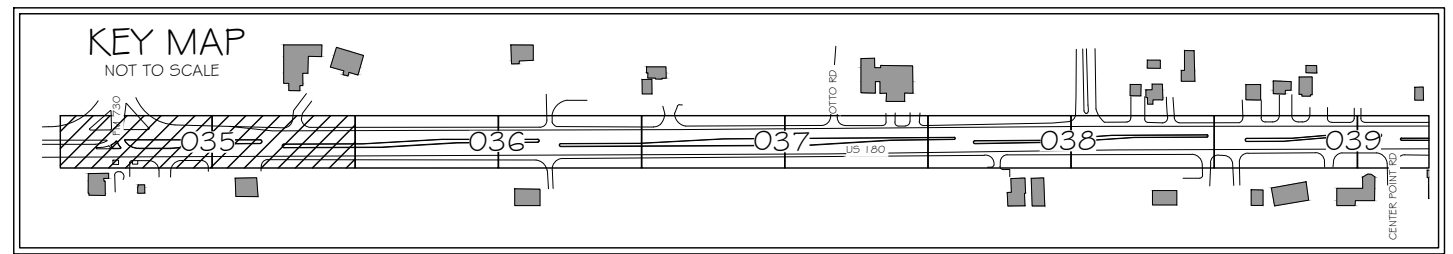
2 STA 04+00 - STA 08+00
1" = 20'-0"

GENERAL NOTES

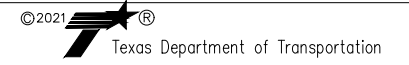
1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.
3. CALL TXDOT TRAFFIC MANAGEMENT CENTER (817-370-3661) FOR TXDOT LOCATES WHEN WORKING NEAR EXISTING TXDOT MAINTAINED TRAFFIC SIGNAL AND ITS SYSTEMS.

REFERENCE NOTES SCHEDULE 1

| SYMBOL | DEMOLITION DESCRIPTION | QTY | DETAIL |
|---------|-------------------------------|----------|--------|
| (D-101) | 104 6021 CURB REMOVAL | 1,548 LF | |
| (D-102) | 110 6001 EXCAVATION (ROADWAY) | 2,368 SF | |



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



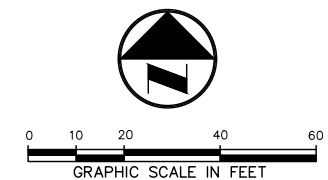
DEMOLITION PLAN
STA 00+00 - STA 08+00



| | | |
|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 035 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

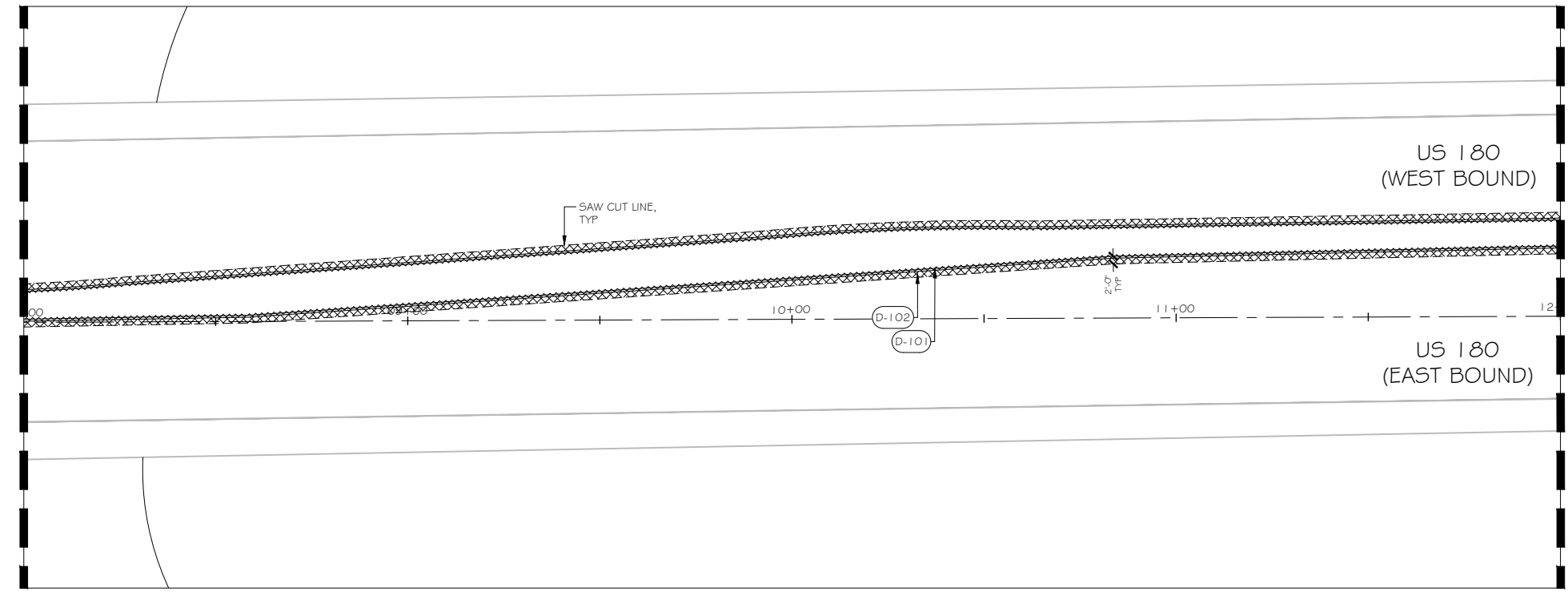
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MAY 2022 - 100% PS&E SUBMITTAL



MATCHLINE STA 08+00

MATCHLINE STA 12+00



GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.

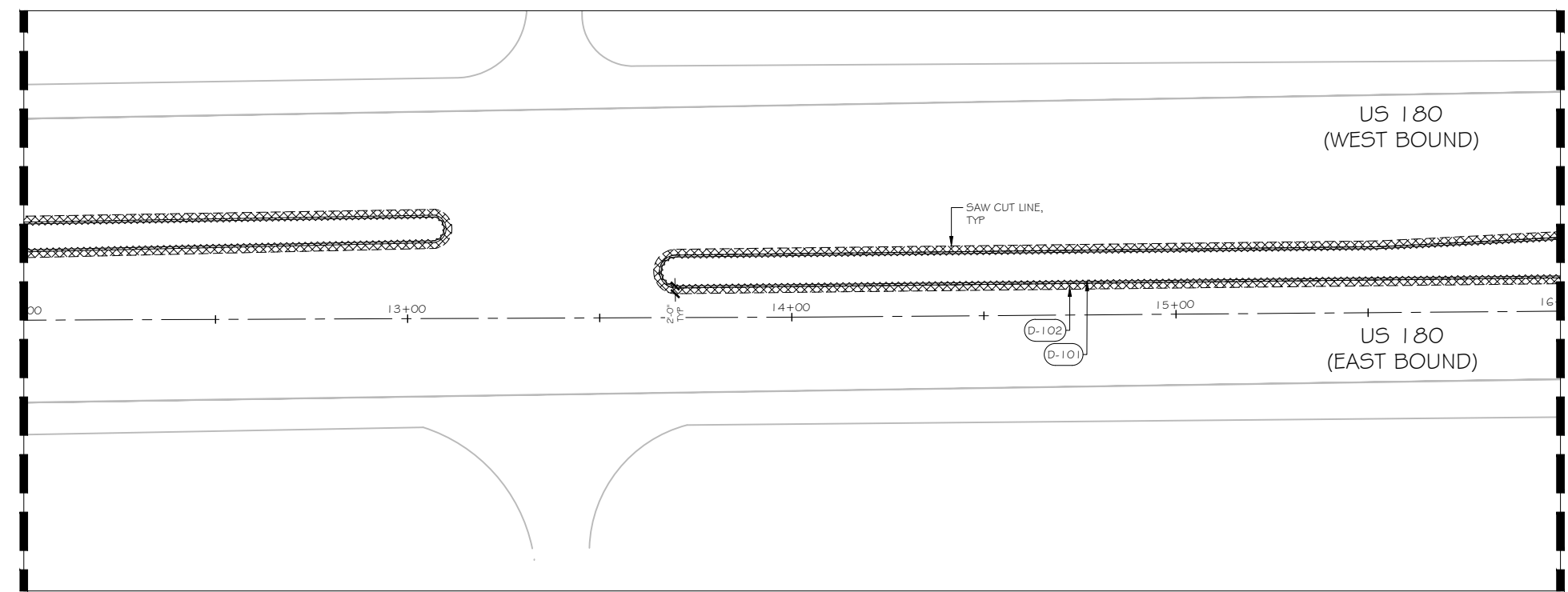
REFERENCE NOTES SCHEDULE 2

| SYMBOL | DEMOLITION DESCRIPTION | QTY | DETAIL |
|---------|-------------------------------|----------|--------|
| (D-101) | 104 6021 CURB REMOVAL | 1,024 LF | |
| (D-102) | 110 6001 EXCAVATION (ROADWAY) | 2,256 SF | |

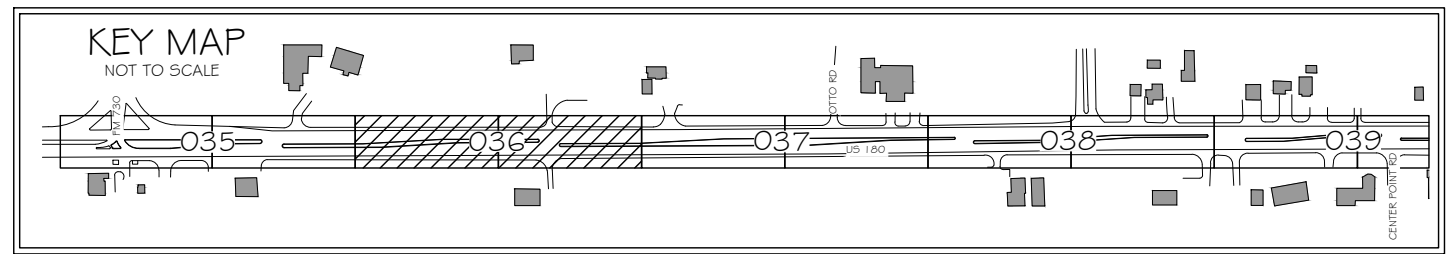
1 STA 08+00 - STA 12+00
1" = 20'-0"

MATCHLINE STA 12+00

MATCHLINE STA 16+00



2 STA 12+00 - STA 16+00
1" = 20'-0"



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



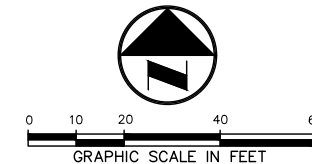
DEMOLITION PLAN
STA 08+00 - STA 16+00



| | | |
|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 036 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

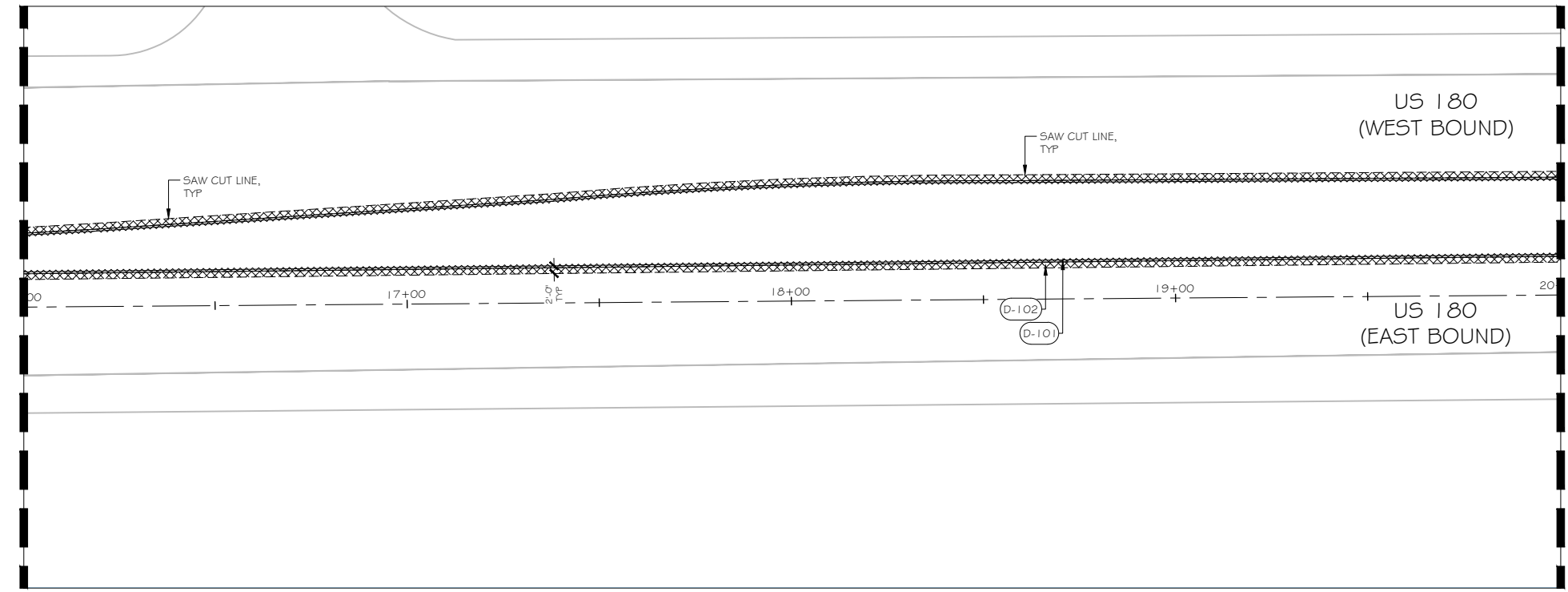
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MATCHLINE STA 16+00

MATCHLINE STA 20+00



GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
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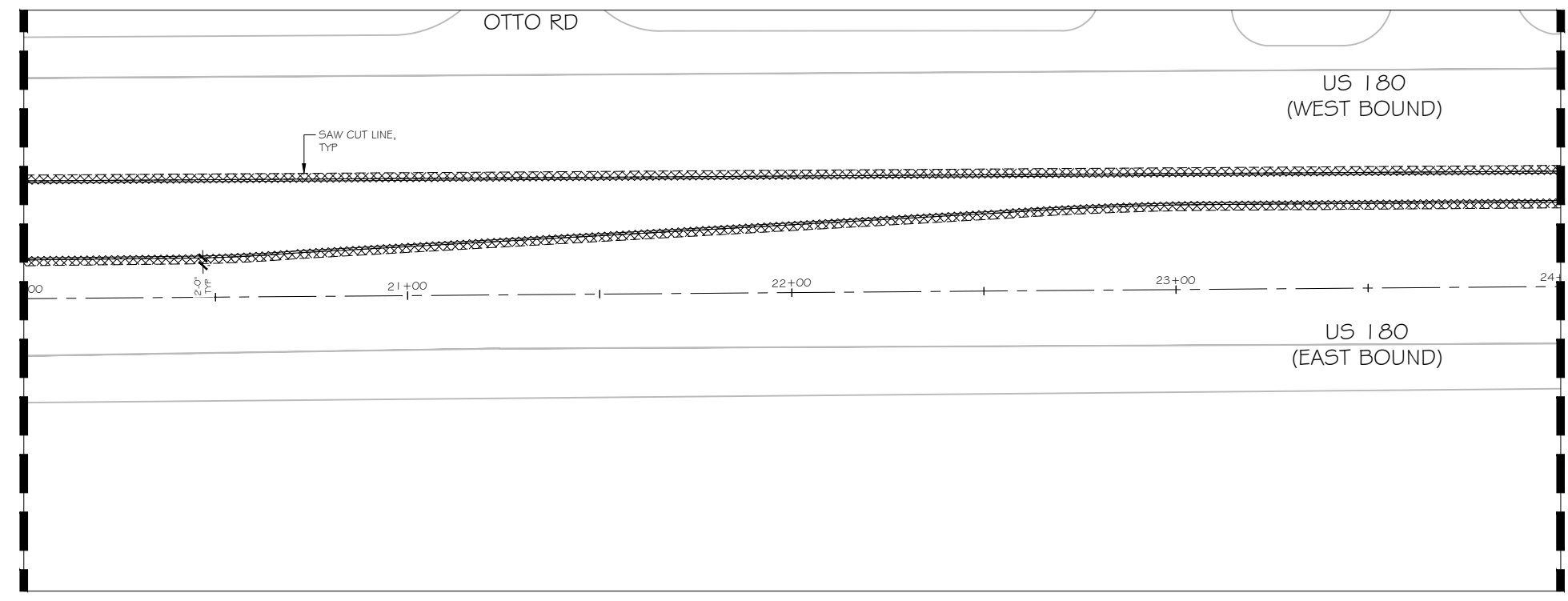
REFERENCE NOTES SCHEDULE 3

| SYMBOL | DEMOLITION DESCRIPTION | QTY | DETAIL |
|---------|-------------------------------|----------|--------|
| (D-101) | 104 6021 CURB REMOVAL | 2,073 LF | |
| (D-102) | 110 6001 EXCAVATION (ROADWAY) | 2,401 SF | |

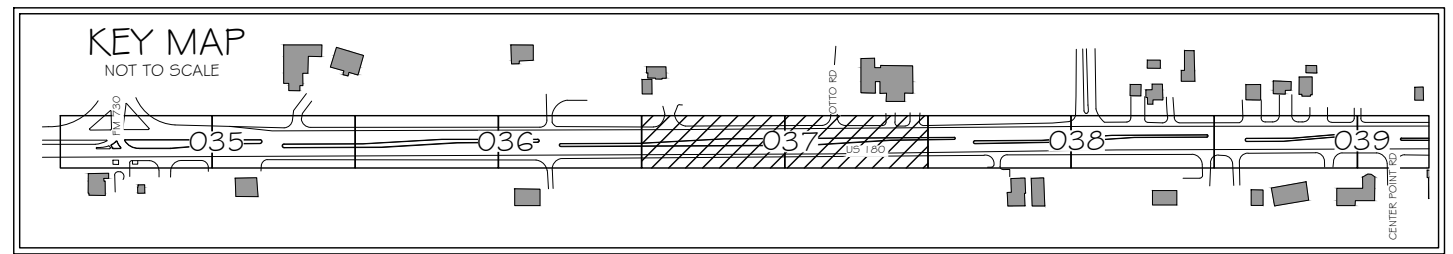
1 STA 16+00 - STA 20+00
1" = 20'-0"

MATCHLINE STA 20+00

MATCHLINE STA 24+00



2 STA 20+00 - STA 24+00
1" = 20'-0"



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



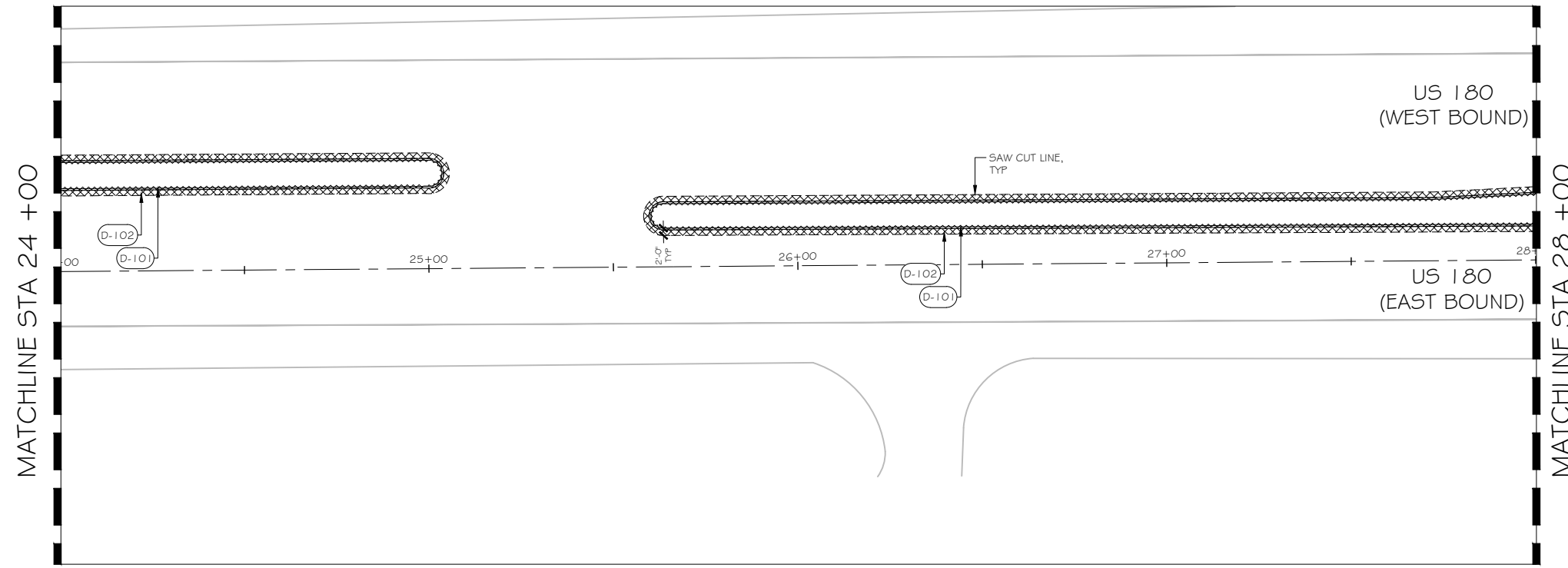
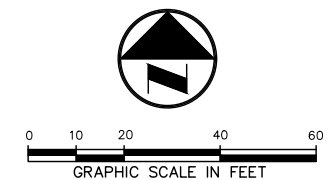
DEMOLITION PLAN
STA 16+00 - STA 24+00



| | | |
|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 037 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

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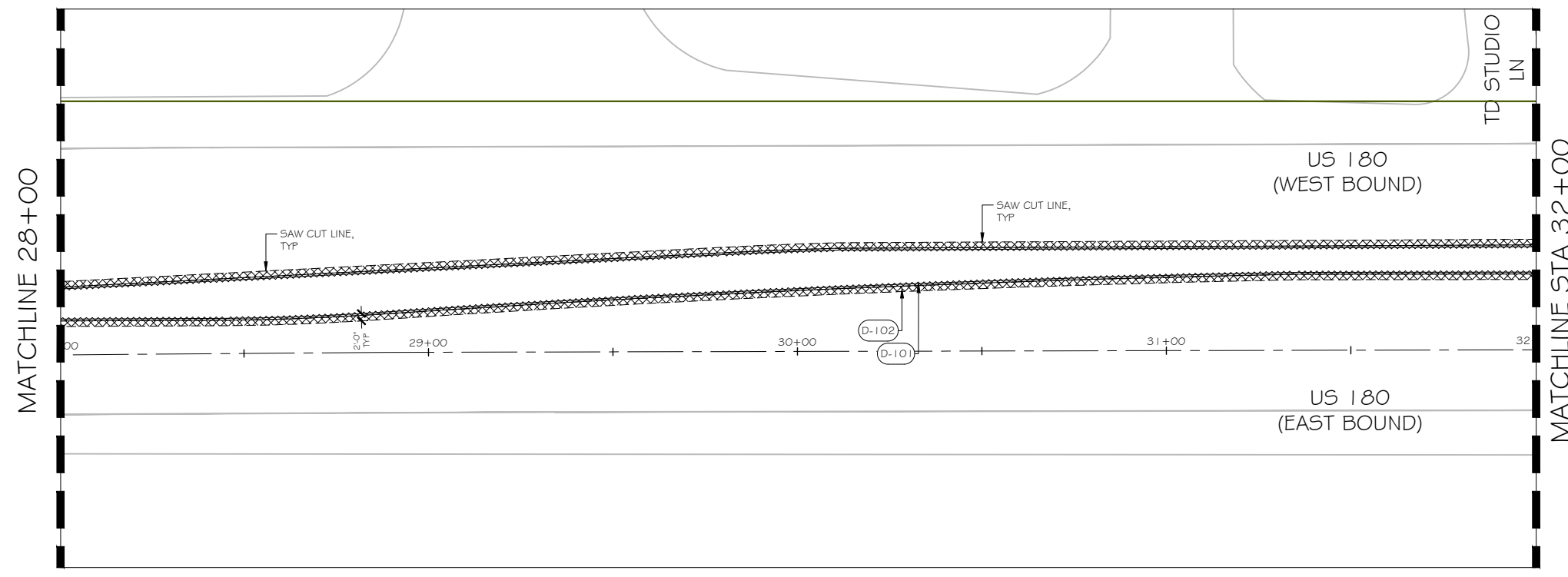
GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.

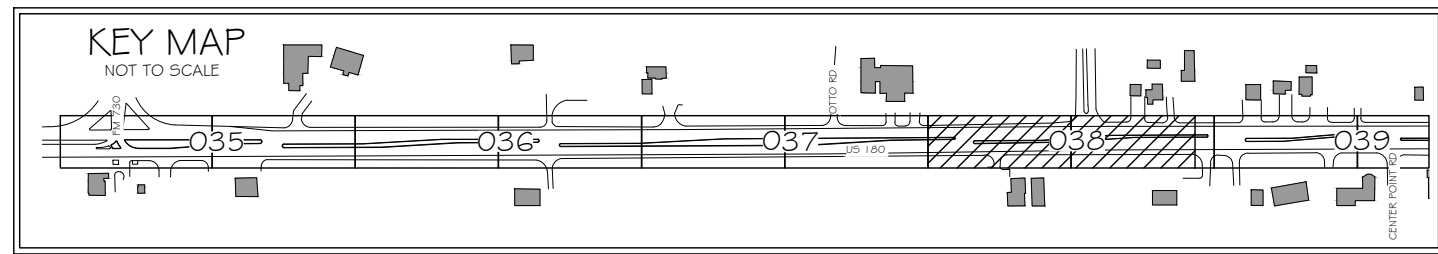
REFERENCE NOTES SCHEDULE 4

| SYMBOL | DEMOLITION DESCRIPTION | QTY | DETAIL |
|---------|-------------------------------|----------|--------|
| (D-101) | 104 6021 CURB REMOVAL | 1,495 LF | |
| (D-102) | 110 6001 EXCAVATION (ROADWAY) | 2,568 SF | |

1 STA 24+00 - STA 28+00
1" = 20'-0"



2 STA 28+00 - STA 32+00
1" = 20'-0"



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



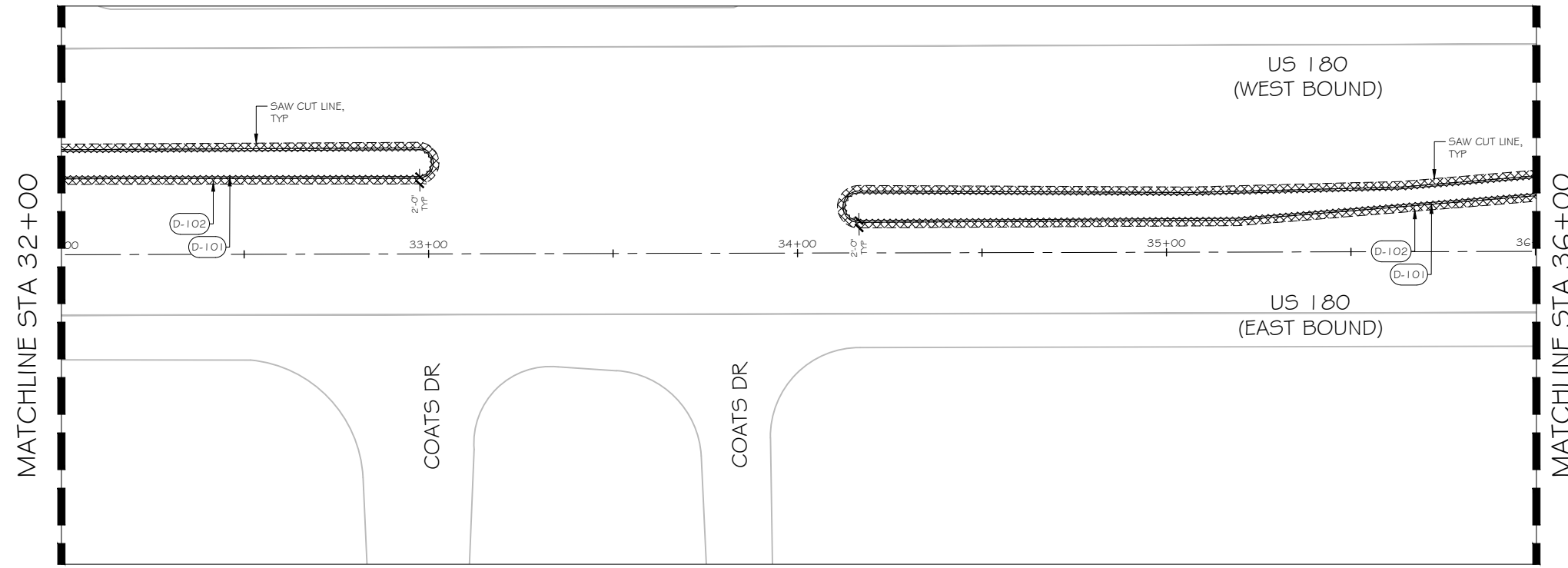
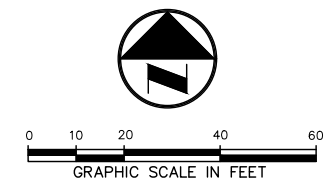
DEMOLITION PLAN
STA 24+00 - STA 34+00



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|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 038 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

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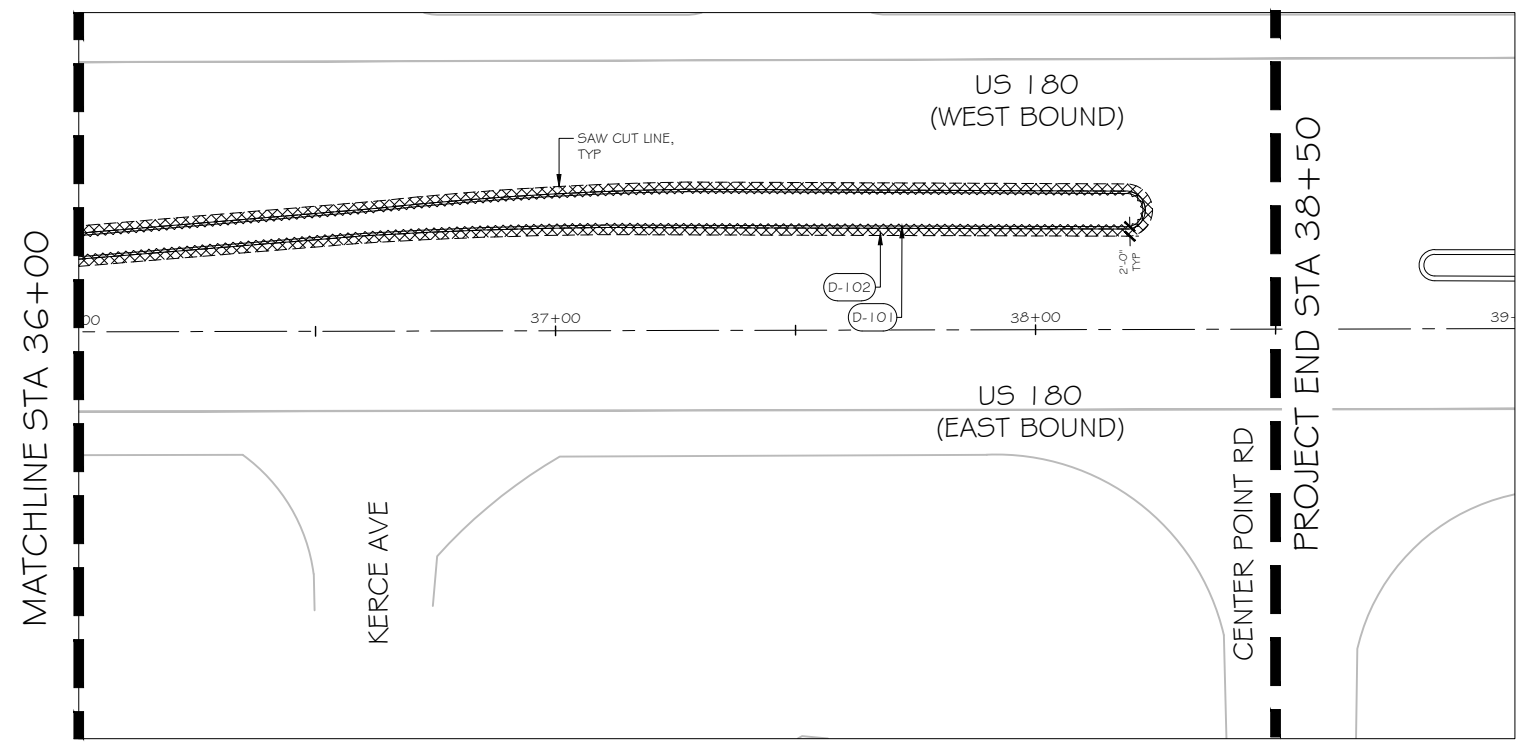
GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.
3. CALL TXDOT TRAFFIC MANAGEMENT CENTER (817-370-3661) FOR TXDOT LOCATES WHEN WORKING NEAR EXISTING TXDOT MAINTAINED TRAFFIC SIGNAL AND ITS SYSTEMS.

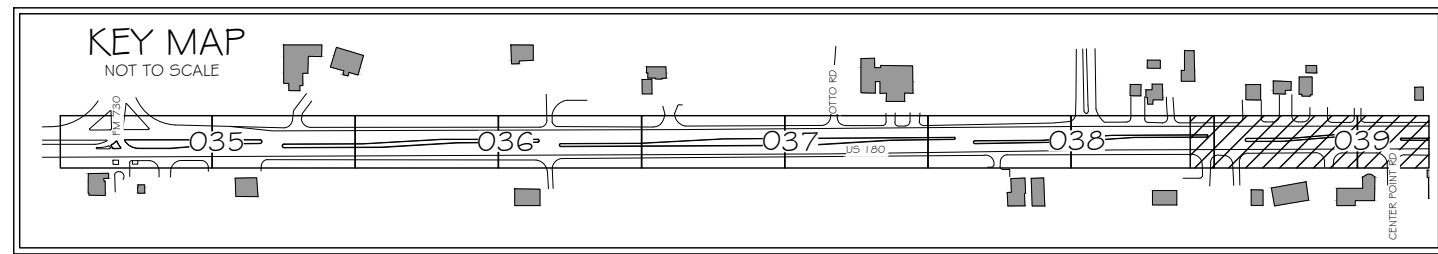
REFERENCE NOTES SCHEDULE 5

| SYMBOL | DEMOLITION DESCRIPTION | QTY | DETAIL |
|---------|-------------------------------|----------|--------|
| (D-101) | 104 6021 CURB REMOVAL | 1,034 LF | |
| (D-102) | 110 6001 EXCAVATION (ROADWAY) | 1,254 SF | |

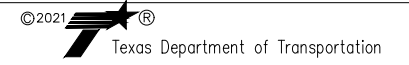
1 STA 32+00 - STA 36+00
1" = 20'-0"



2 STA 36+00 - STA 38+50
1" = 20'-0"



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



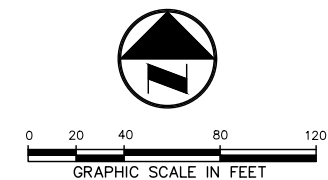
DEMOLITION PLAN
STA 32+00 - STA 38+50



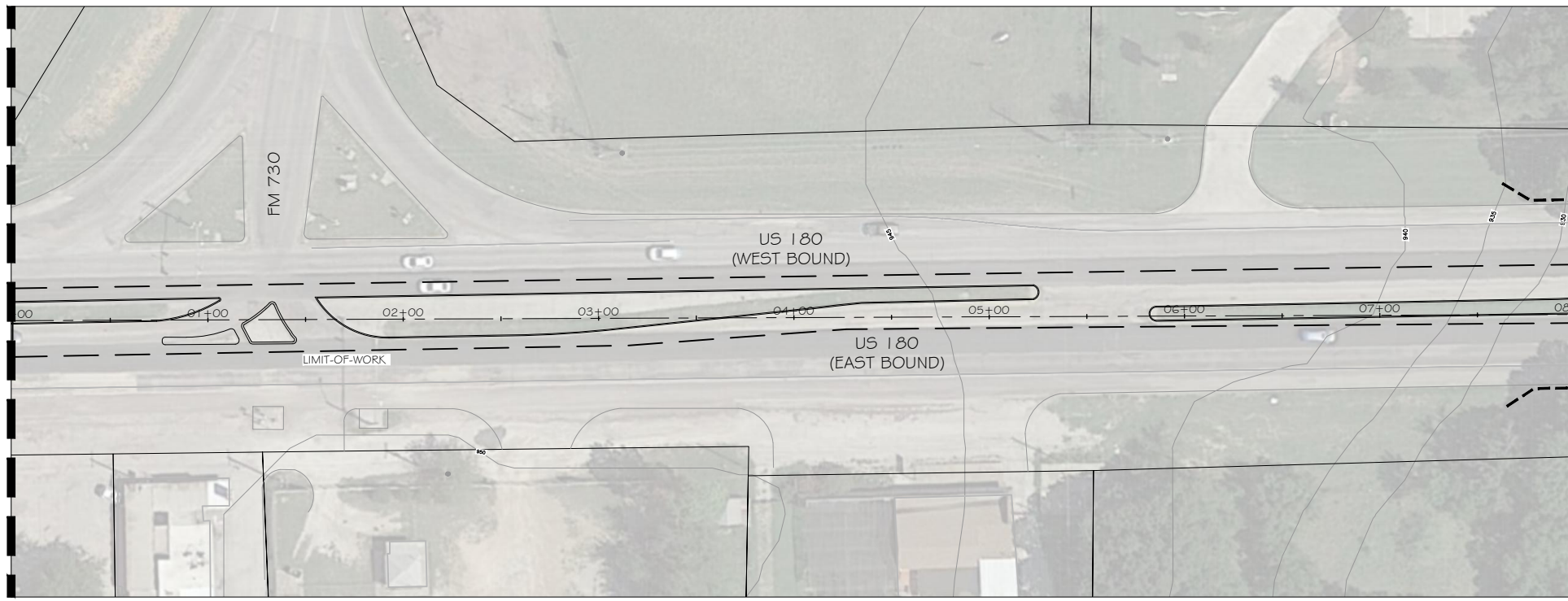
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| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 039 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

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PROJECT BEGIN STA 01+00



MATCHLINE STA 08+00

GENERAL NOTES

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3. CALL TXDOT TRAFFIC MANAGEMENT CENTER (817-370-3661) FOR TXDOT LOCATES WHEN WORKING NEAR EXISTING TXDOT MAINTAINED TRAFFIC SIGNAL AND ITS SYSTEMS.

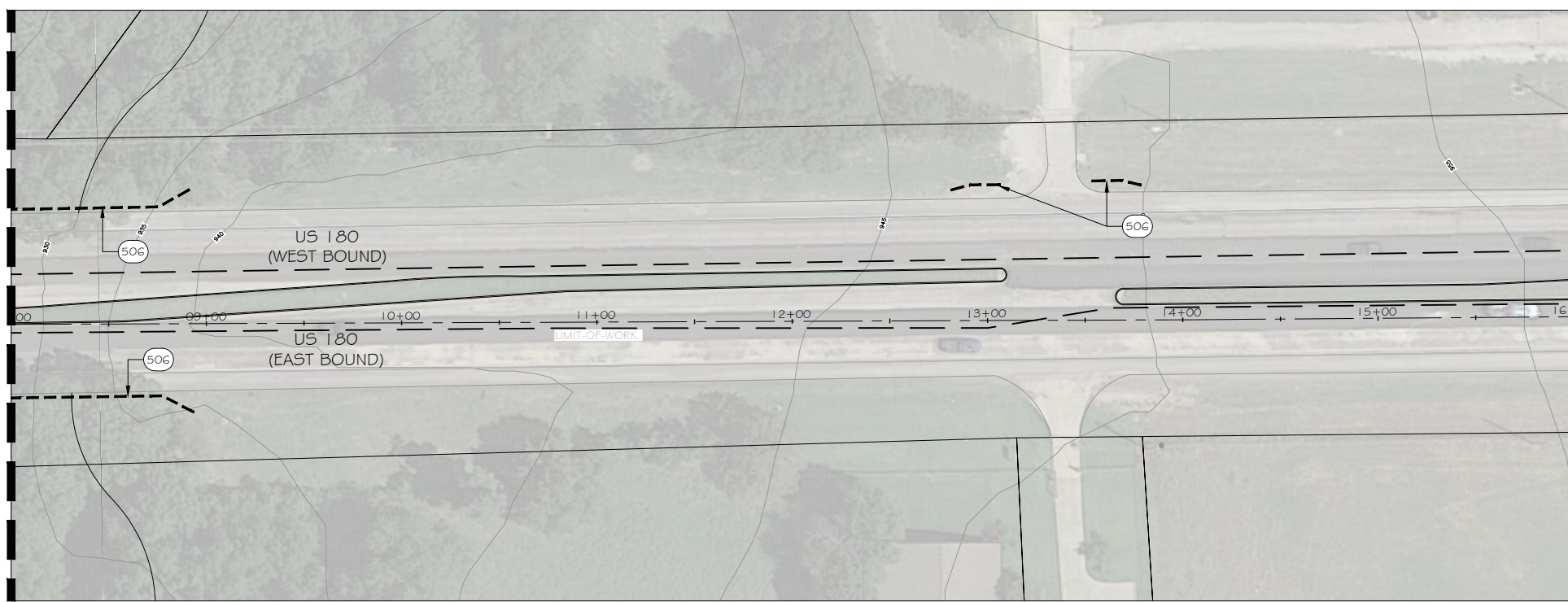
GRADING NOTES

1. FINISHED GRADE SHALL BE TO A SMOOTH, FLOWING CONTOUR, MAINTAINING FLOW PATTERNS THAT ALLOW EXCESS WATER TO FLOW FROM PLANTED AREAS ACROSS PAVED AREAS TO DRAINAGE COLLECTION POINTS AS IS EXISTING.
2. ALL FINAL PAVING AND MOW CURBS SHALL BE AT AN EQUAL HEIGHT WITH EXISTING PAVERS TO REMAIN AND MEDIAN CURBS PLUS OR MINUS 0.03 FOOT.

REFERENCE NOTES SCHEDULE I

| SYMBOL | DESCRIPTION | QTY |
|--------|--|--------|
| 506 | BIODEG EROSN CONT LOGS - 8" 506-G040 - (INSTL) 506-G043 - (REMOVE) | 318 LF |

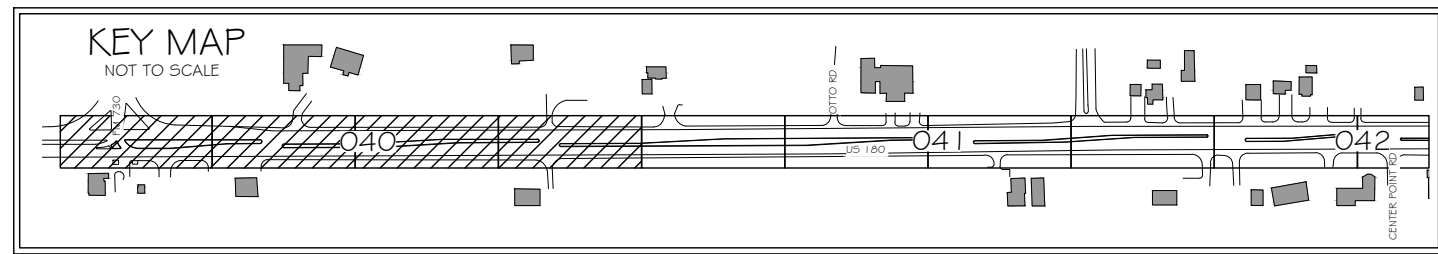
MATCHLINE STA 08+00



MATCHLINE STA 16+00

1 STA 01+00 - STA 08+00
1" = 40'-0"

2 STA 08+00 - STA 16+00
1" = 40'-0"



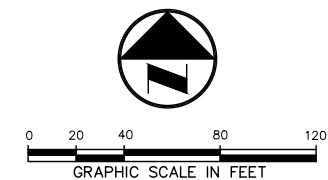
EROSION CONTROL
STA 01+00 - STA 16+00



| | | | |
|------------------------|--|-------------------|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 040 | |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT | |
| CONTROL 0008 | SECTION 03 | JOB 134 | HIGHWAY NO US 180 |

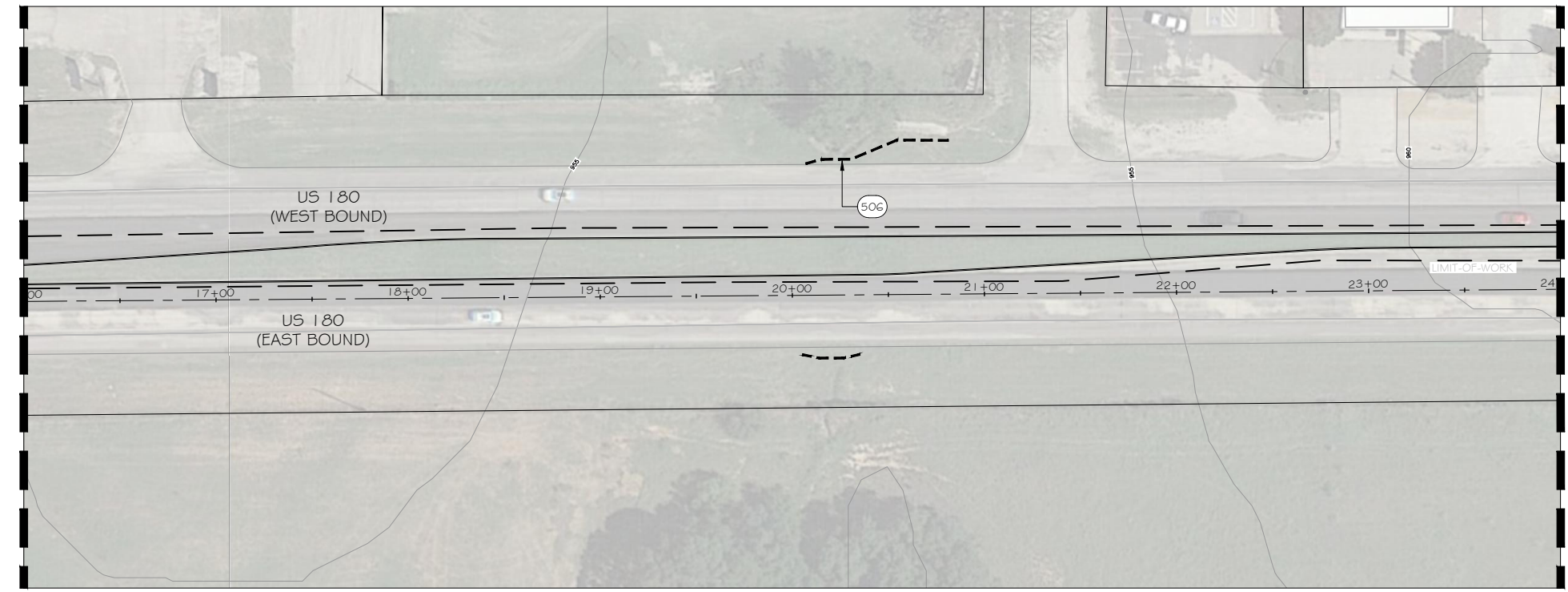
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MATCHLINE STA 16+00

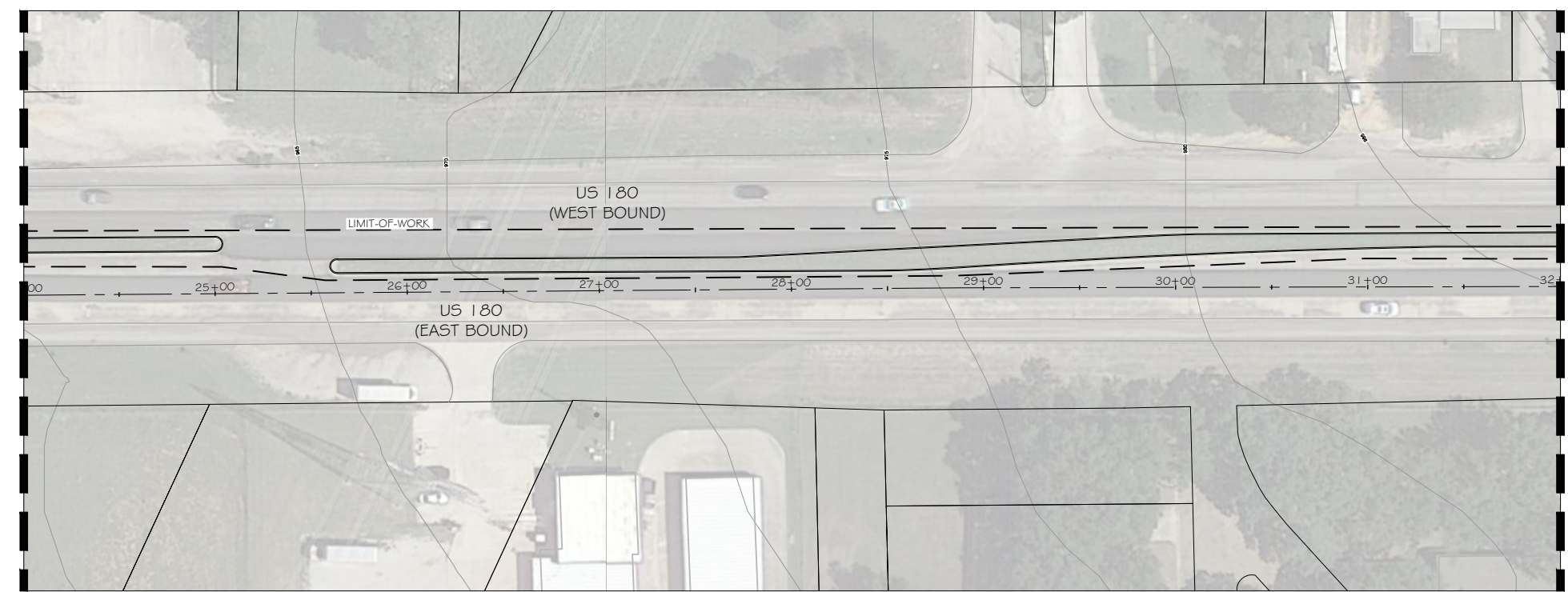
MATCHLINE STA 24+00



1 STA 16+00 - STA 24+00
1" = 40'-0"

MATCHLINE STA 24+00

MATCHLINE STA 32+00



2 STA 24+00 - STA 32+00
1" = 40'-0"

GENERAL NOTES

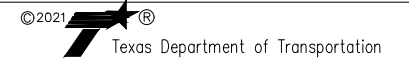
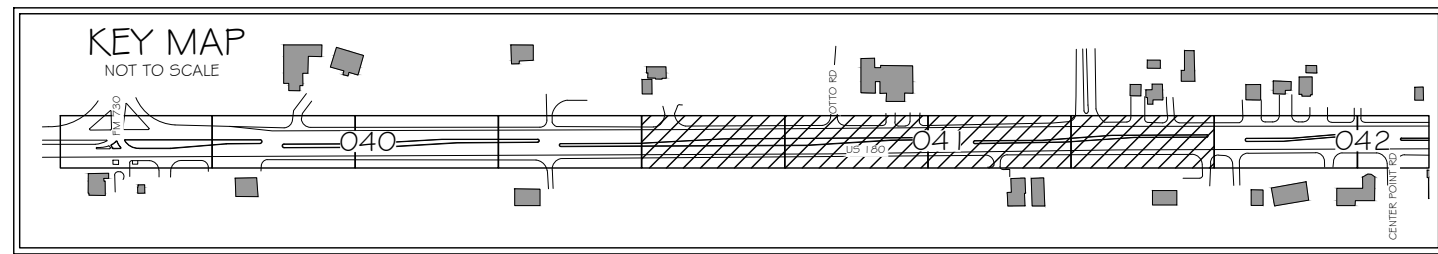
1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.

GRADING NOTES

1. FINISHED GRADE SHALL BE TO A SMOOTH, FLOWING CONTOUR, MAINTAINING FLOW PATTERNS THAT ALLOW EXCESS WATER TO FLOW FROM PLANTED AREAS ACROSS PAVED AREAS TO DRAINAGE COLLECTION POINTS AS IS EXISTING.
2. ALL FINAL PAVING AND MOW CURBS SHALL BE AT AN EQUAL HEIGHT WITH EXISTING PAVERS TO REMAIN AND MEDIAN CURBS PLUS OR MINUS 0.03 FOOT.

REFERENCE NOTES SCHEDULE 2

| SYMBOL | DESCRIPTION | QTY |
|--------|--|---------|
| (506) | BIODEG EROSN CONT LOGS - 8" 506-6040 - (INSTL) 506-6043 - (REMOVE) | 1 07 LF |

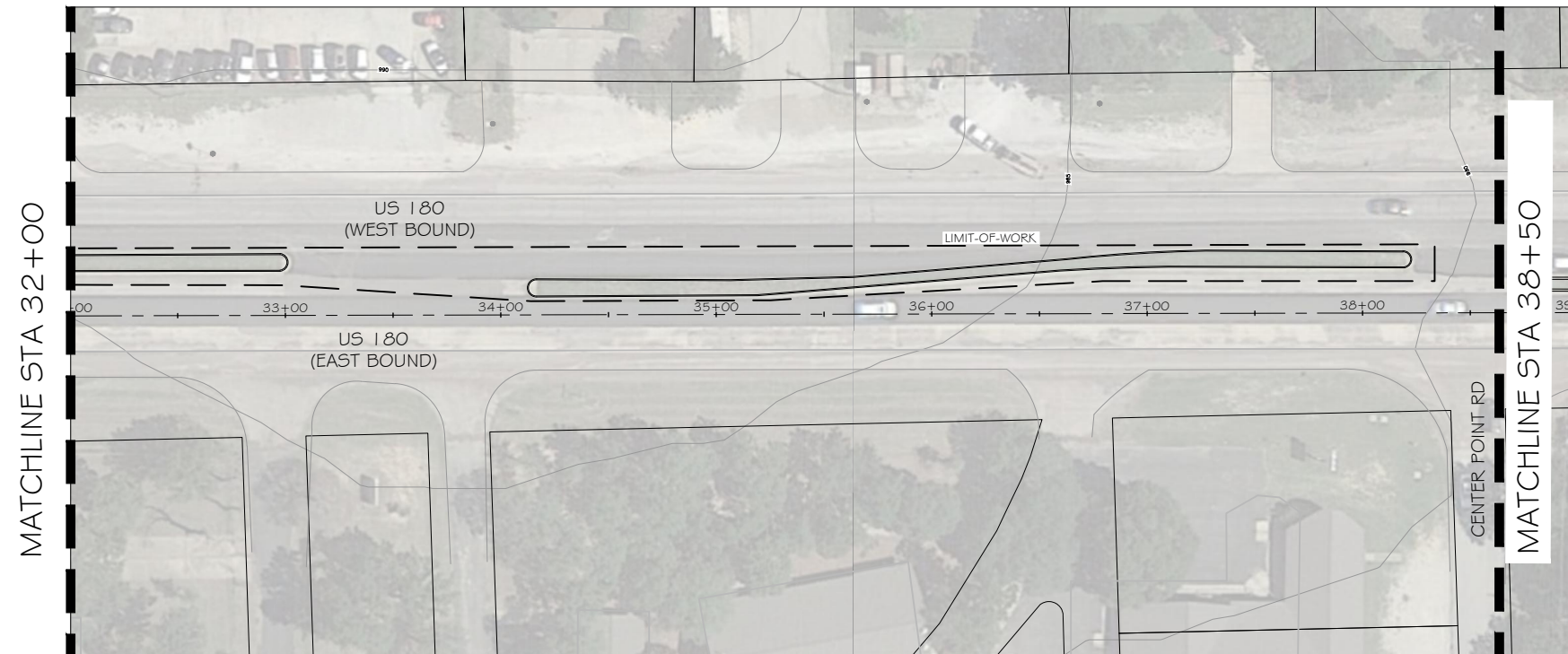
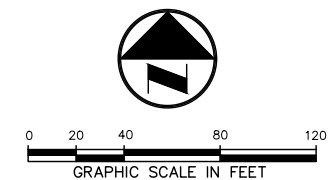


EROSION CONTROL
STA 16+00 - STA 32+00

| | | |
|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 041 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

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05/06/2022 8:53AM
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GENERAL NOTES

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3. CALL TXDOT TRAFFIC MANAGEMENT CENTER (817-370-3661) FOR TXDOT LOCATES WHEN WORKING NEAR EXISTING TXDOT MAINTAINED TRAFFIC SIGNAL AND ITS SYSTEMS.

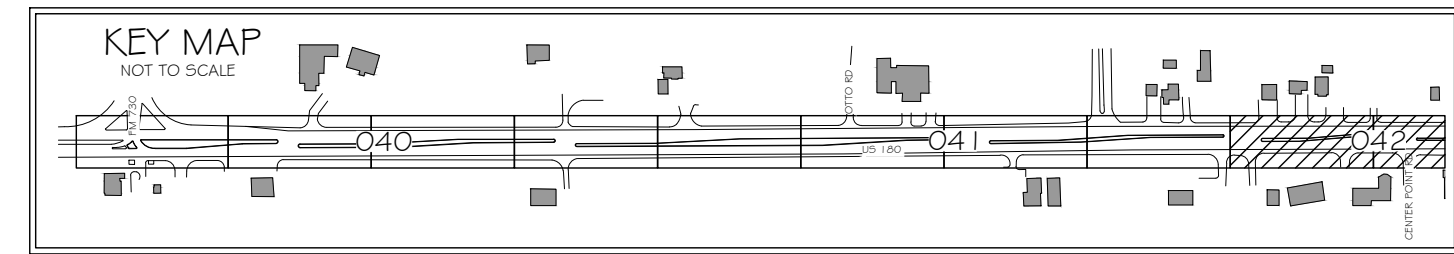
GRADING NOTES

1. FINISHED GRADE SHALL BE TO A SMOOTH, FLOWING CONTOUR, MAINTAINING FLOW PATTERNS THAT ALLOW EXCESS WATER TO FLOW FROM PLANTED AREAS ACROSS PAVED AREAS TO DRAINAGE COLLECTION POINTS AS IS EXISTING.
2. ALL FINAL PAVING AND MOW CURBS SHALL BE AT AN EQUAL HEIGHT WITH EXISTING PAVERS TO REMAIN AND MEDIAN CURBS PLUS OR MINUS 0.03 FOOT.

REFERENCE NOTES SCHEDULE 3

| SYMBOL | DESCRIPTION | QTY |
|--------|--|-------|
| (506) | BIODEG EROSN CONT LOGS - 8" 506-GO40 - (INSTL) 506-GO43 - (REMOVE) | 30 LF |

1 STA 32+00 - STA 38+50
1" = 40'-0"



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



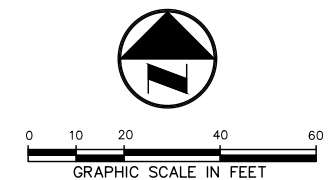
EROSION CONTROL
STA 32+00 - STA 38+50



| | | |
|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 042 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

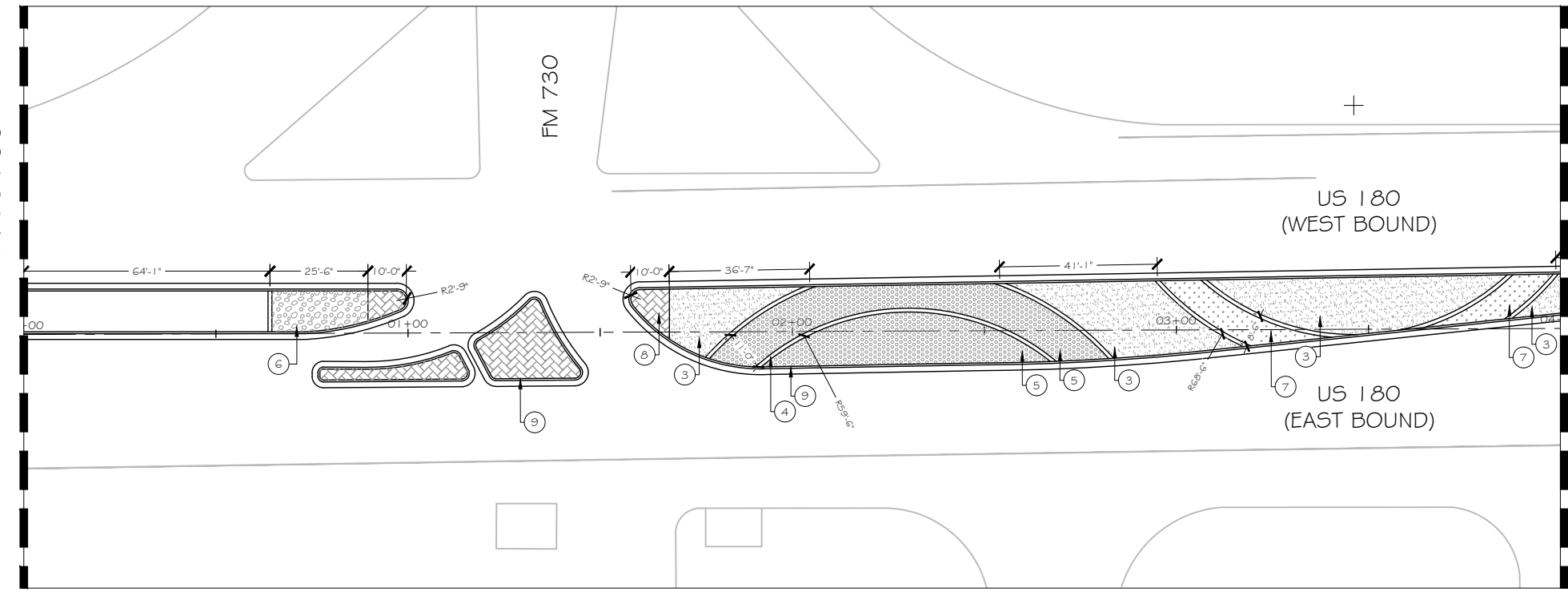
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MAY 2022 - 100% PS&E SUBMITTAL



PROJECT BEGIN STA 00+00

MATCHLINE STA 04+00



GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.

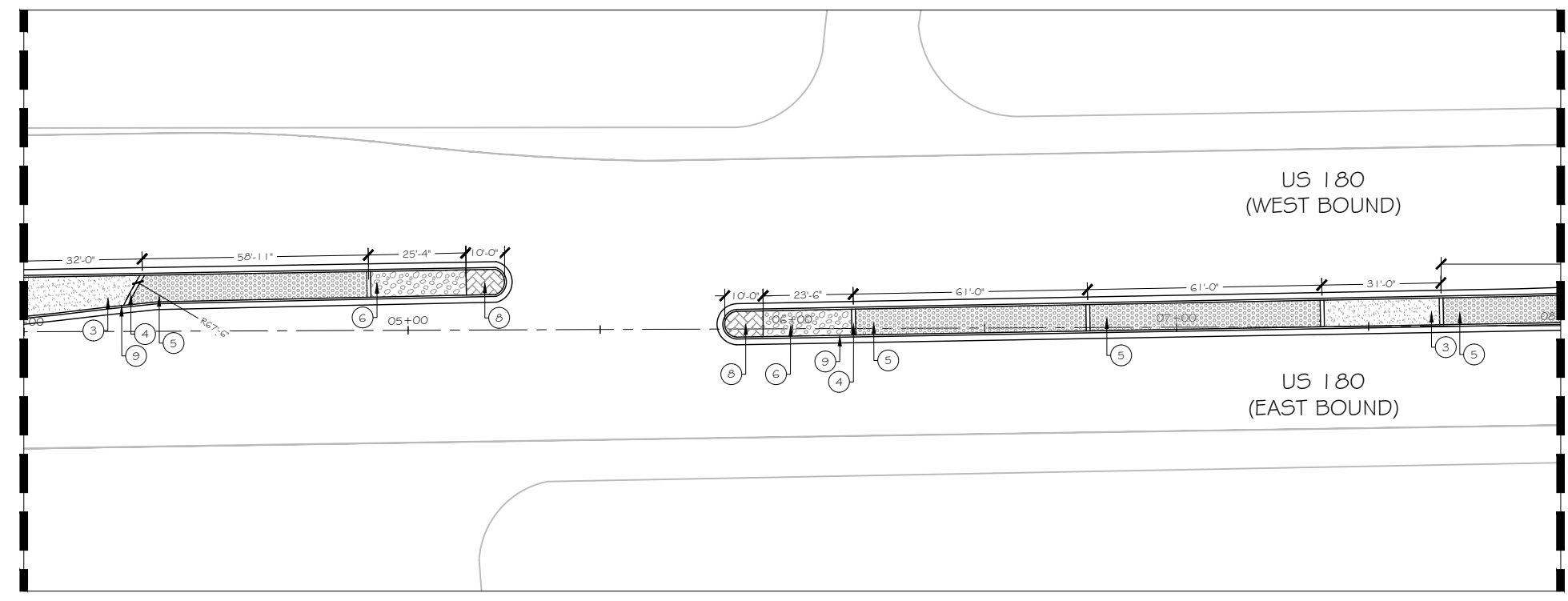
REFERENCE NOTES SCHEDULE I

| CODE | DESCRIPTION | QTY |
|------|---|----------|
| 4 | 192 GOG8 - LANDSCAPE EDGE (TYP II) (1 2" WIDTH) | 320 LF |
| 5 | 1005-6001 LOOSE AGGR FOR GROUNDCOVER (TYPE I) TYPE: DECOMPOSED GRANITE - WHIZ-Q STONE | 37.39 CY |
| 6 | 1005-6002 LOOSE AGGR FOR GROUNDCOVER (TYPE II) TYPE: BRAZOS RIVER ROCK, SIZE: 2" - 4" - WHIZ-Q STONE | 7.02 CY |
| 7 | 1005-6003 LOOSE AGGR FOR GROUNDCOVER (TYPE III) TYPE: ARIZONA SUNBURST - WHIZ-Q STONE SIZE: 2" - 4" | 4.94 CY |
| 8 | 528-6001 TEXTURING CONCRETE PAVEMENT (STAMPED CONCRETE: HERRINGBONE PATTERN, COLOR: MEXICAN TILE - CITY CONTRACT) | 750 SF |
| 9 | 529 6007 - CONC CURB & GUTTER (TY II) | 1,114 LF |

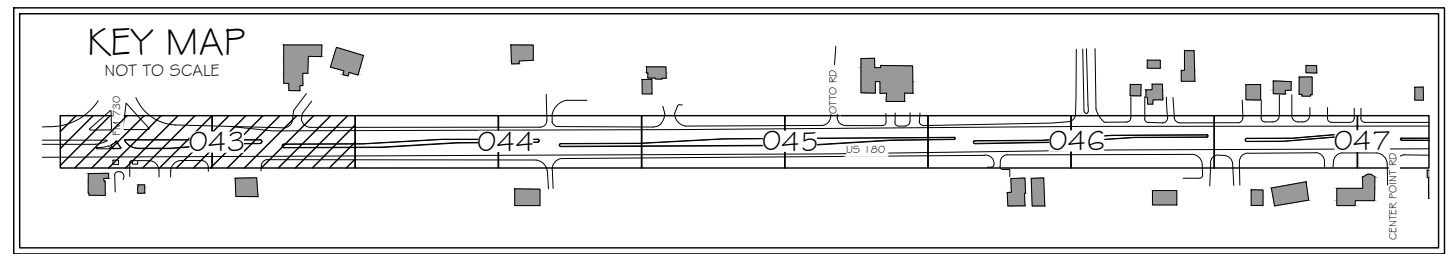
1 STA 00+00 - STA 04+00
1" = 20'-0"

MATCHLINE STA 04+00

MATCHLINE STA 08+00



2 STA 04+00 - STA 08+00
1" = 20'-0"



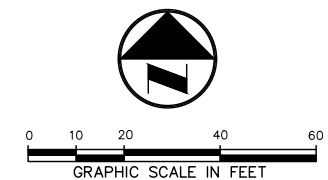
LAYOUT PLAN
STA 00+00 - STA 08+00



| | | |
|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 043 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

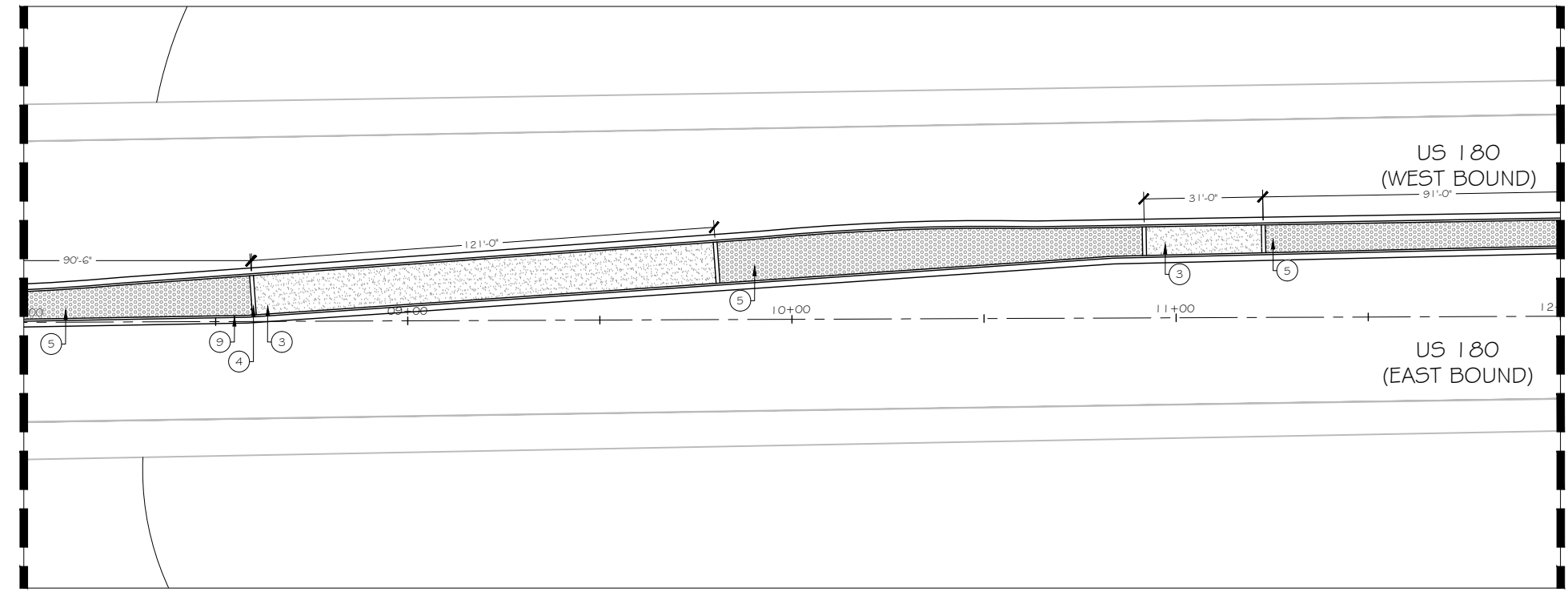
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MAY 2022 - 100% PS&E SUBMITTAL



MATCHLINE STA 08+00

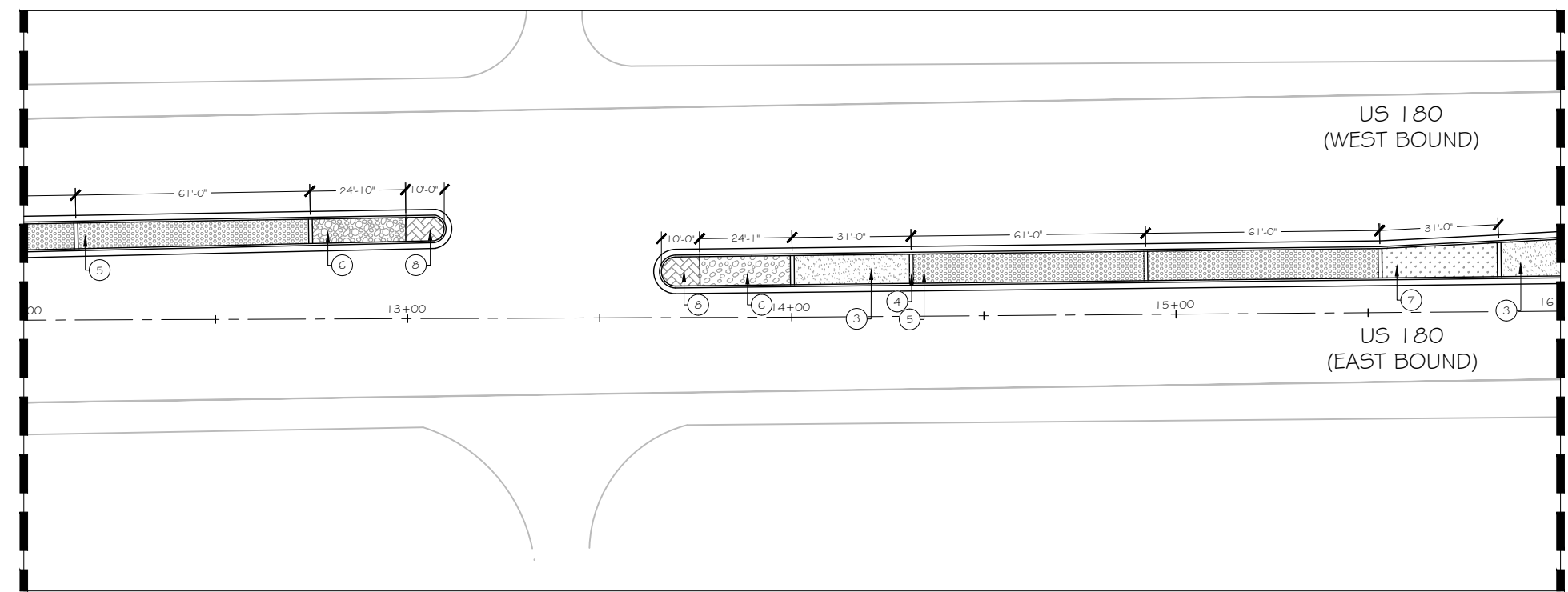
MATCHLINE STA 12+00



1 STA 08+00 - STA 12+00
1" = 20'-0"

MATCHLINE STA 12+00

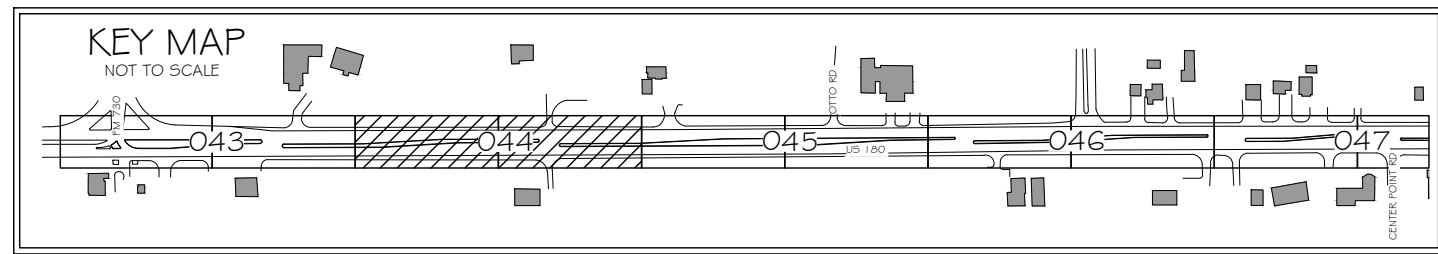
MATCHLINE STA 16+00



2 STA 12+00 - STA 16+00
1" = 20'-0"

REFERENCE NOTES SCHEDULE 2

| CODE | DESCRIPTION | QTY |
|------|---|----------|
| 4 | 192 6068 - LANDSCAPE EDGE (TYP II) (12" WIDTH) | 88 LF |
| 5 | 1005-6001 LOOSE AGGR FOR GROUNDCOVER (TYPE I) TYPE: DECOMPOSED GRANITE - WHIZ-Q STONE | 43.49 CY |
| 6 | 1005-6002 LOOSE AGGR FOR GROUNDCOVER (TYPE II) TYPE: BRAZOS RIVER ROCK, SIZE: 2" - 4" - WHIZ-Q STONE | 4.09 CY |
| 7 | 1005-6003 LOOSE AGGR FOR GROUNDCOVER (TYPE III) TYPE: ARIZONA SUNBURST - WHIZ-Q STONE SIZE: 2" - 4" | 3.06 CY |
| 8 | 528-6001 TEXTURING CONCRETE PAVEMENT (STAMPED CONCRETE: HERRINGBONE PATTERN, COLOR: MEXICAN TILE - CITY CONTRACT) | 127 SF |
| 9 | 529 6007 - CONC CURB & GUTTER (TY II) | 1,465 LF |



GENERAL NOTES

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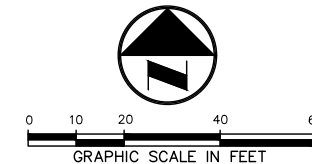


LAYOUT PLAN
STA 08+00 - STA 16+00

| | | |
|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 044 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

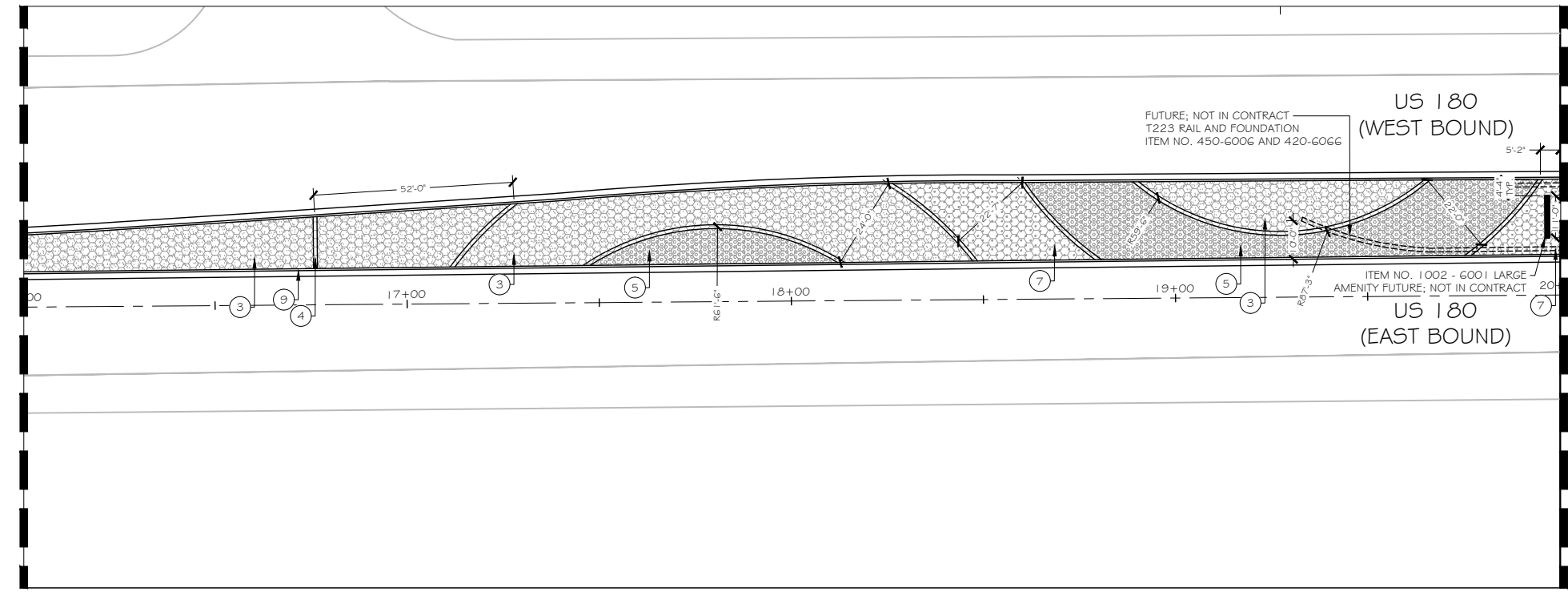
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MAY 2022 - 100% PS&E SUBMITTAL



MATCHLINE STA 16+00

MATCHLINE STA 20+00



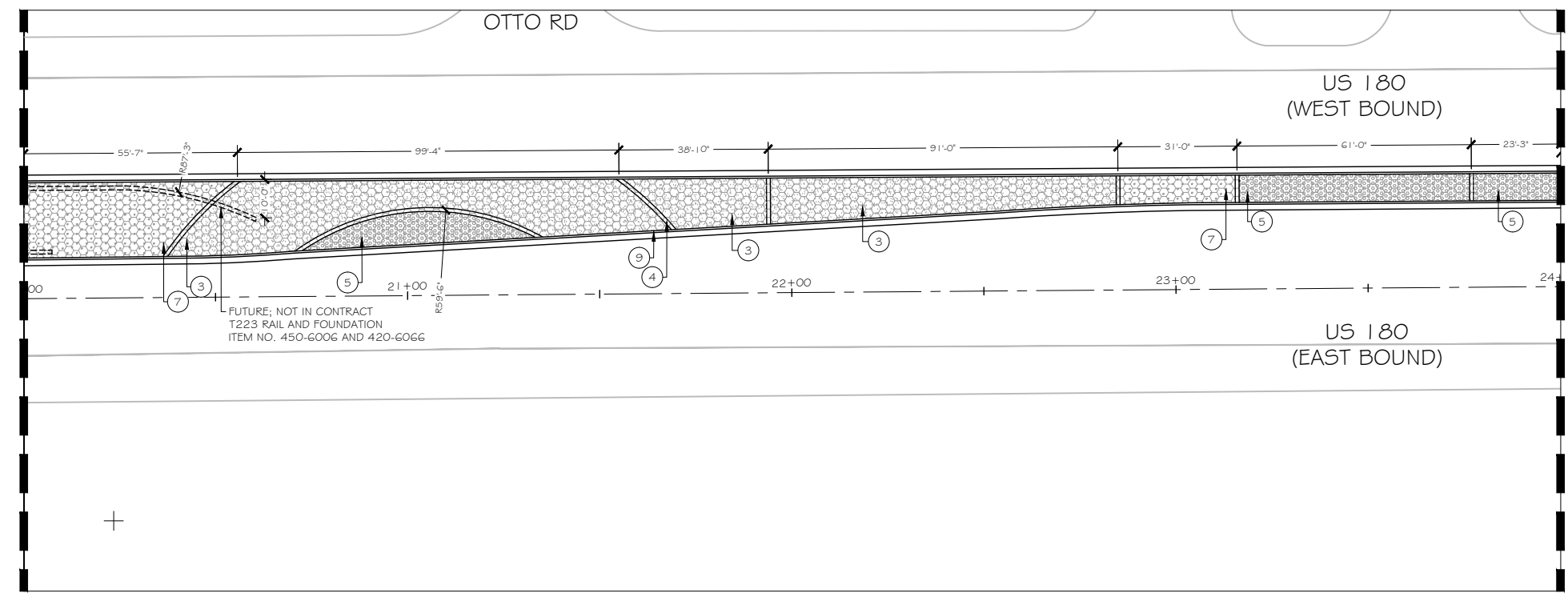
REFERENCE NOTES SCHEDULE 3

| CODE | DESCRIPTION | QTY |
|------|---|----------|
| 4 | 192 6068 - LANDSCAPE EDGE (TYP II) (12" WIDTH) | 421 LF |
| 5 | 1005-6001 LOOSE AGGR FOR GROUNDCOVER (TYPE I) TYPE: DECOMPOSED GRANITE - WHIZ-Q STONE | 38.9 CY |
| 7 | 1005-6003 LOOSE AGGR FOR GROUNDCOVER (TYPE III) TYPE: ARIZONA SUNBURST - WHIZ-Q STONE SIZE: 2" - 4" | 23.89 CY |
| 9 | 529 6007 - CONC CURB & GUTTER (TY II) | 2,286 LF |

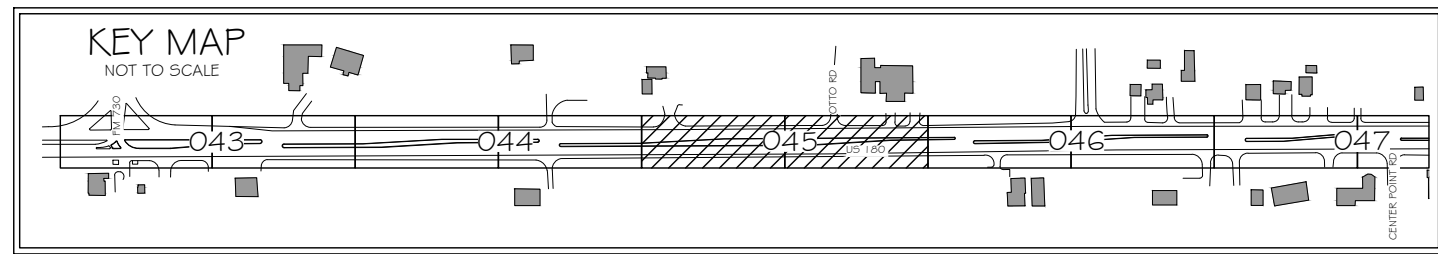
1 STA 16+00 - STA 20+00
1" = 20'-0"

MATCHLINE STA 20+00

MATCHLINE STA 24+00



2 STA 20+00 - STA 24+00
1" = 20'-0"



GENERAL NOTES

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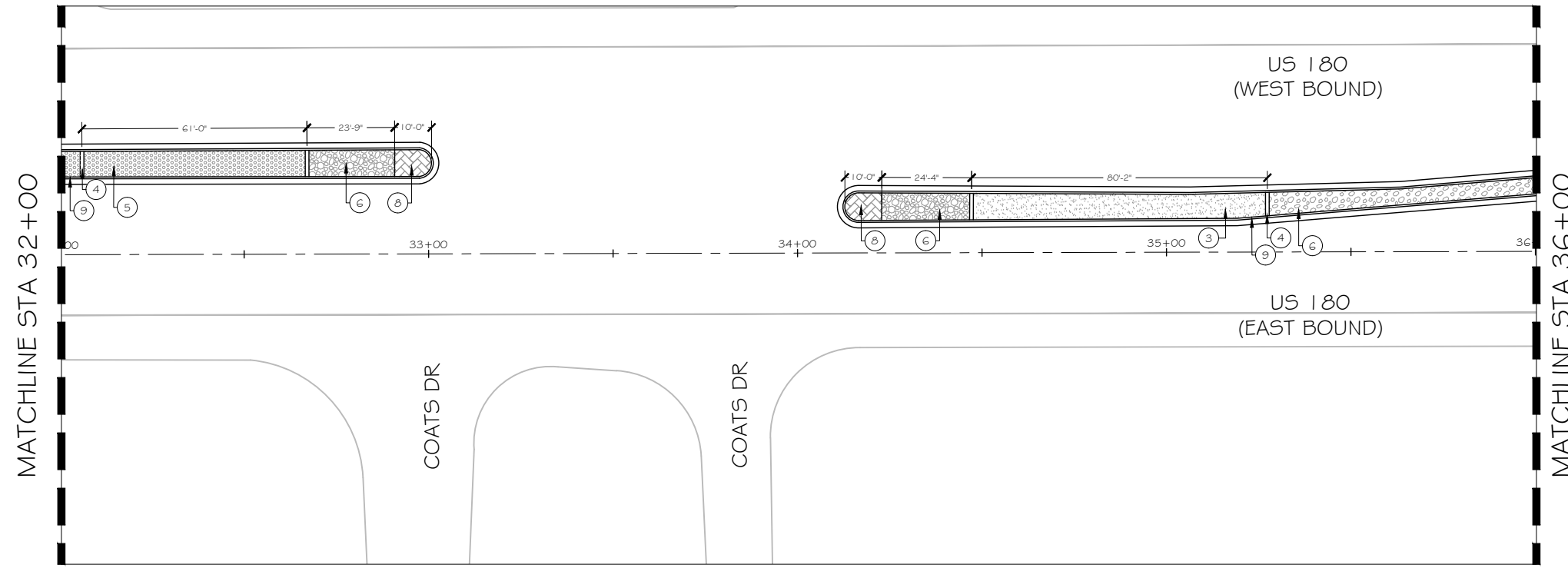
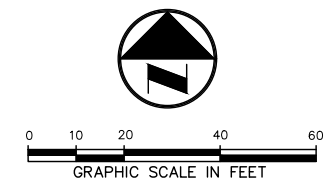


LAYOUT PLAN
STA 16+00 - STA 24+00

| | | |
|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 045 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

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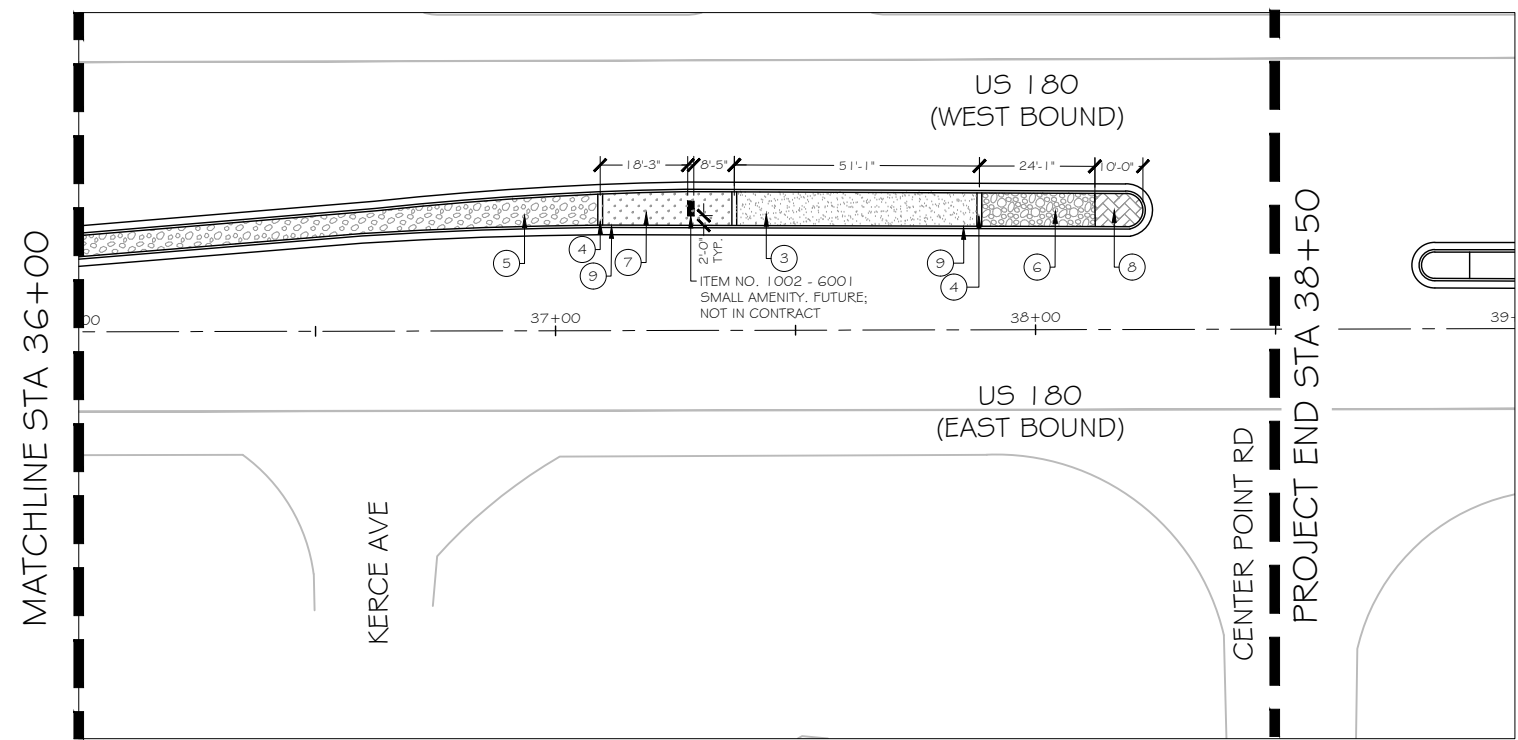
GENERAL NOTES

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2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.
3. CALL TXDOT TRAFFIC MANAGEMENT CENTER (817-370-3661) FOR TXDOT LOCATES WHEN WORKING NEAR EXISTING TXDOT MAINTAINED TRAFFIC SIGNAL AND ITS SYSTEMS.

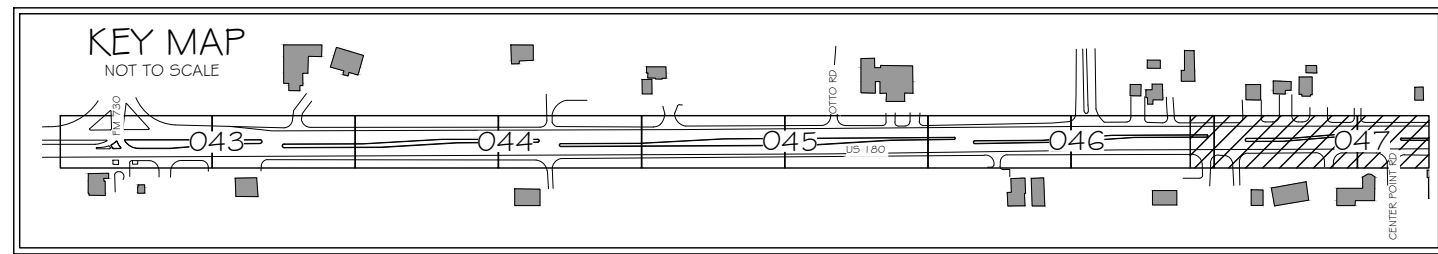
REFERENCE NOTES SCHEDULE 5

| CODE | DESCRIPTION | QTY |
|------|---|----------|
| 4 | 192 6068 - LANDSCAPE EDGE (TYP II) (12" WIDTH) | 48 LF |
| 5 | 1005-6001 LOOSE AGGR FOR GROUNDCOVER (TYPE I) TYPE: DECOMPOSED GRANITE - WHIZ-Q STONE | 5.66 CY |
| 6 | 1005-6002 LOOSE AGGR FOR GROUNDCOVER (TYPE II) TYPE: BRAZOS RIVER ROCK, SIZE: 2" - 4" - WHIZ-Q STONE | 17.17 CY |
| 7 | 1005-6003 LOOSE AGGR FOR GROUNDCOVER (TYPE III) TYPE: ARIZONA SUNBURST - WHIZ-Q STONE SIZE: 2" - 4" | 2.28 CY |
| 8 | 528-6001 TEXTURING CONCRETE PAVEMENT (STAMPED CONCRETE: HERRINGBONE PATTERN, COLOR: MEXICAN TILE - CITY CONTRACT) | 199 SF |
| 9 | 529 6007 - CONC CURB & GUTTER (TY II) | 830 LF |

1 STA 32+00 - STA 36+00
1" = 20'-0"



2 STA 36+00 - STA 38+50
1" = 20'-0"



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



LAYOUT PLAN
STA 32+00 - STA 38+50



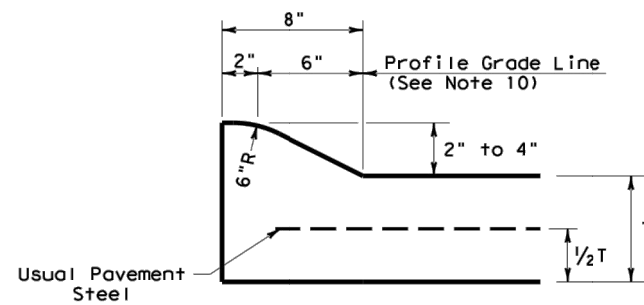
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|------------------------|--|----------------------|
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| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

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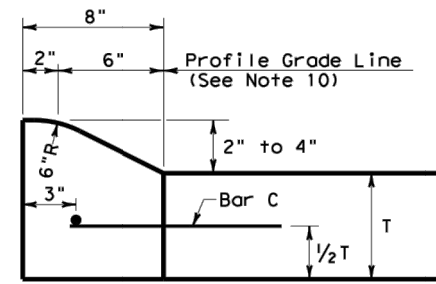
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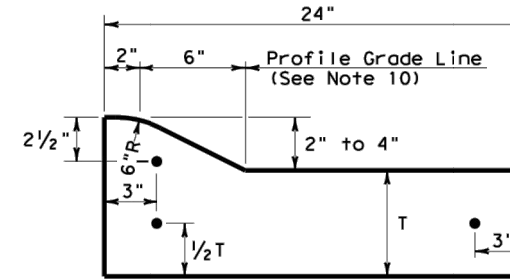
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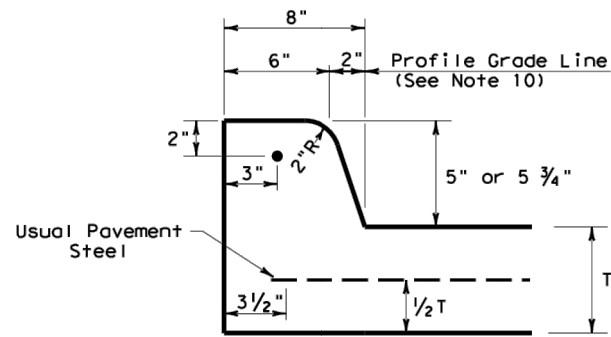
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



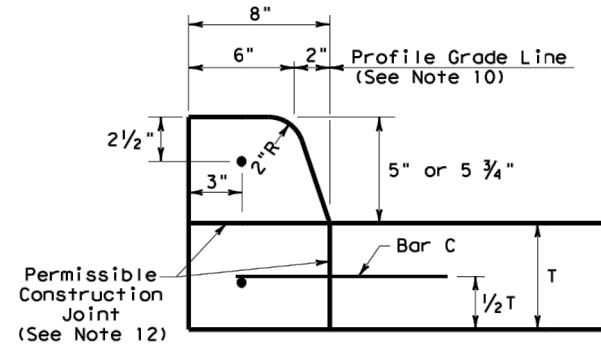
TYPE I CURB
2" - 4" HEIGHT



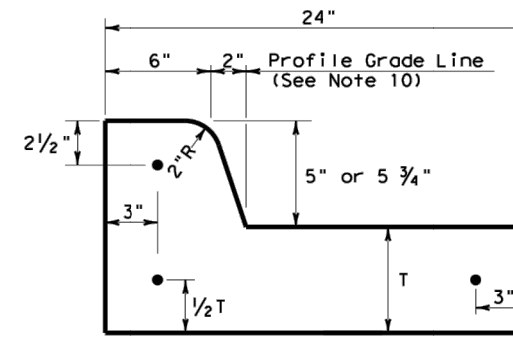
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



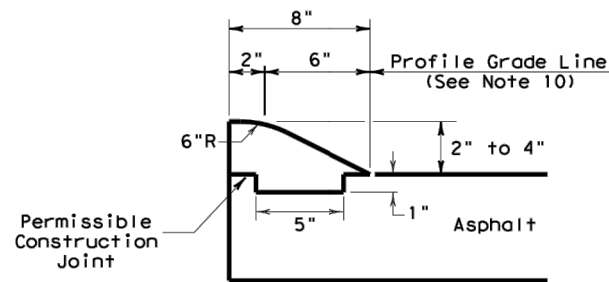
TYPE II CURB (MONOLITHIC)
5" - 5 3/4" HEIGHT



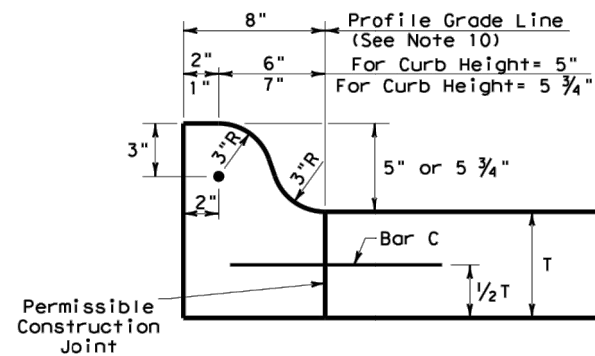
TYPE II CURB
5" - 5 3/4" HEIGHT



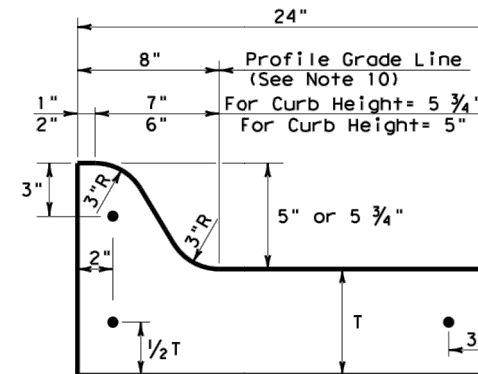
TYPE II CURB AND GUTTER
5" - 5 3/4" HEIGHT



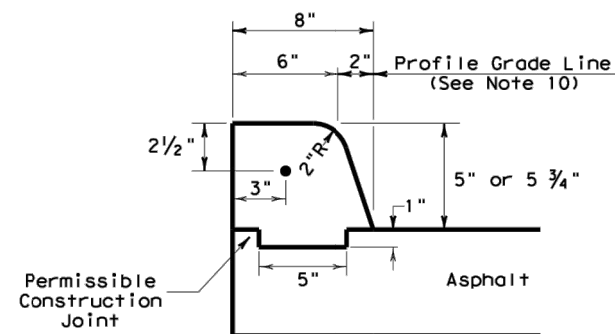
TYPE III CURB (KEYED)
2" - 4" HEIGHT



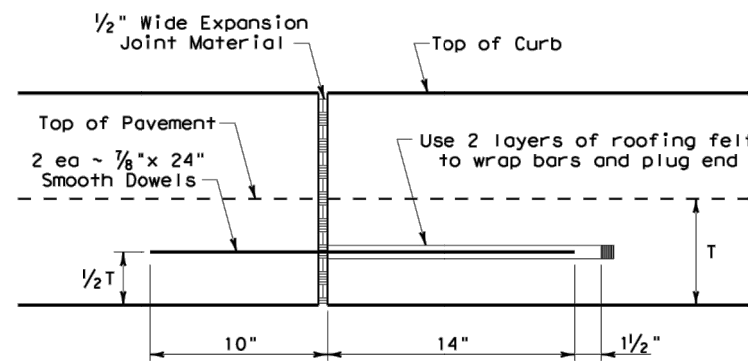
TYPE IIa CURB
5" - 5 3/4" HEIGHT



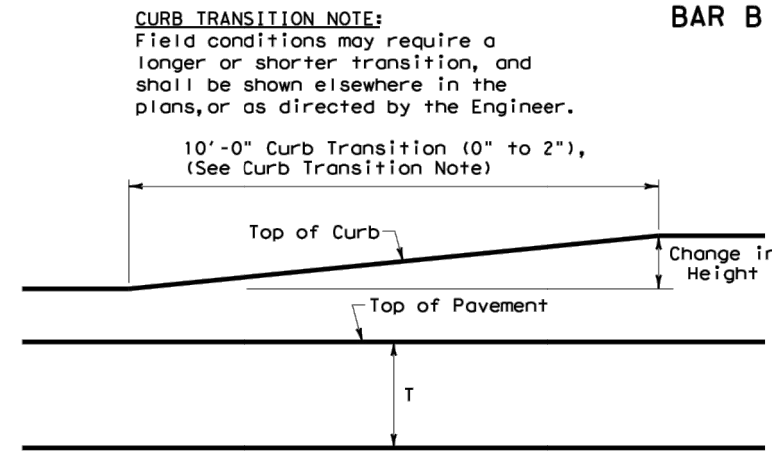
TYPE IIa CURB AND GUTTER
5" - 5 3/4" HEIGHT



TYPE IV CURB (KEYED)
5" - 5 3/4" HEIGHT



EXPANSION JOINT DETAIL

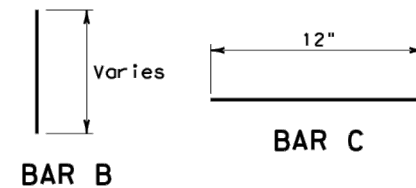


CURB TRANSITION

Note: To be paid for as Highest Curb

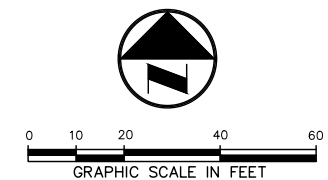
GENERAL NOTES

- All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
- Concrete shall be Class A.
- When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
- Round exposed sharp edges with a rounding tool, to a minimum radius of 1/4 inch.
- All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
- Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and the grouted in place, or may be inserted into fresh concrete.
- Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
- Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C-C.
- Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
- Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
- One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
- When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
- Bar B used as needed to support curb reinforcing steel during concrete placement.



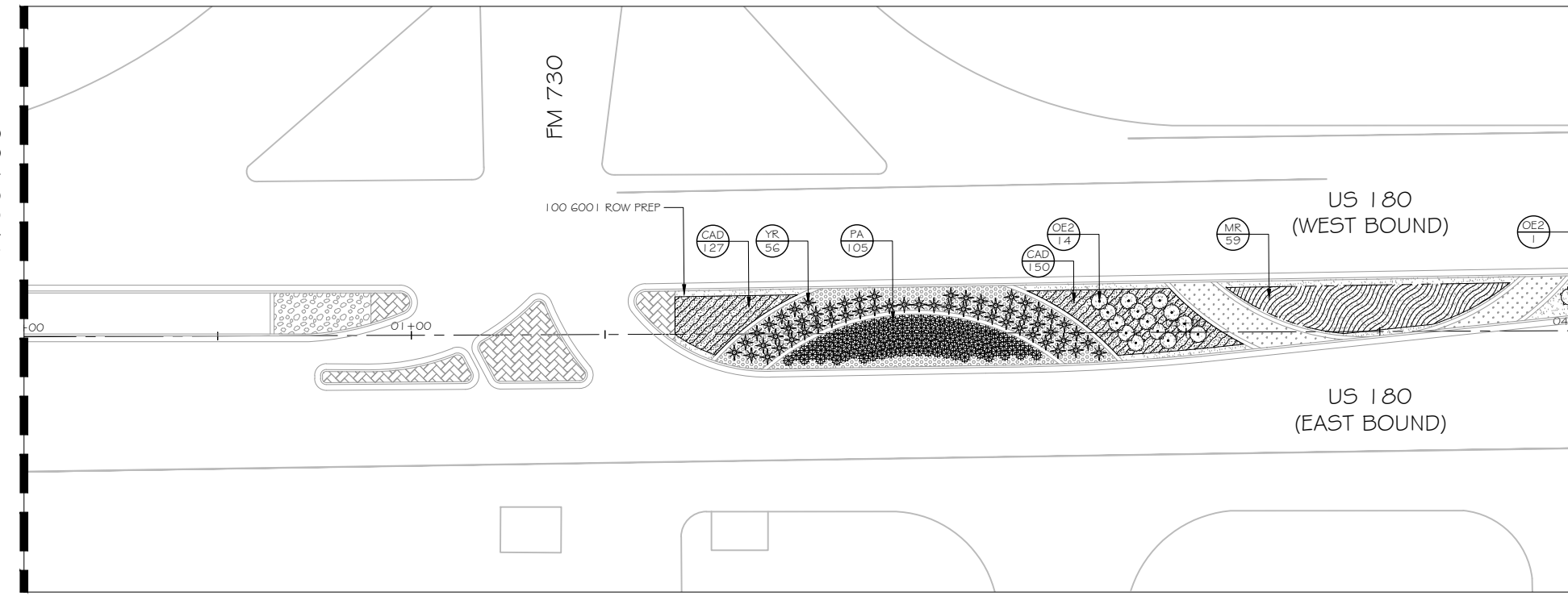
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.

| | | | | | |
|---------------------------------|------------|----------|-----------|---------------------------------|----------------|
| | | | | Design Division Standard | |
| CONCRETE CURB AND GUTTER | | | | | |
| CCCG-21 | | | | | |
| FILE: cccg21.dgn | DW: TxDOT | CK: AN | DW: SS | CK: KM | |
| © TxDOT: FEBRUARY 2021 | CONT: 0008 | SECT: 03 | JOB: 134 | HIGHWAY: US 180 | |
| REVISIONS | | | DIST: FTW | COUNTY: PARKER | SHEET NO.: 048 |



PROJECT BEGIN STA 00+00

MATCHLINE STA 04+00



GENERAL NOTES

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PLANT SCHEDULE I

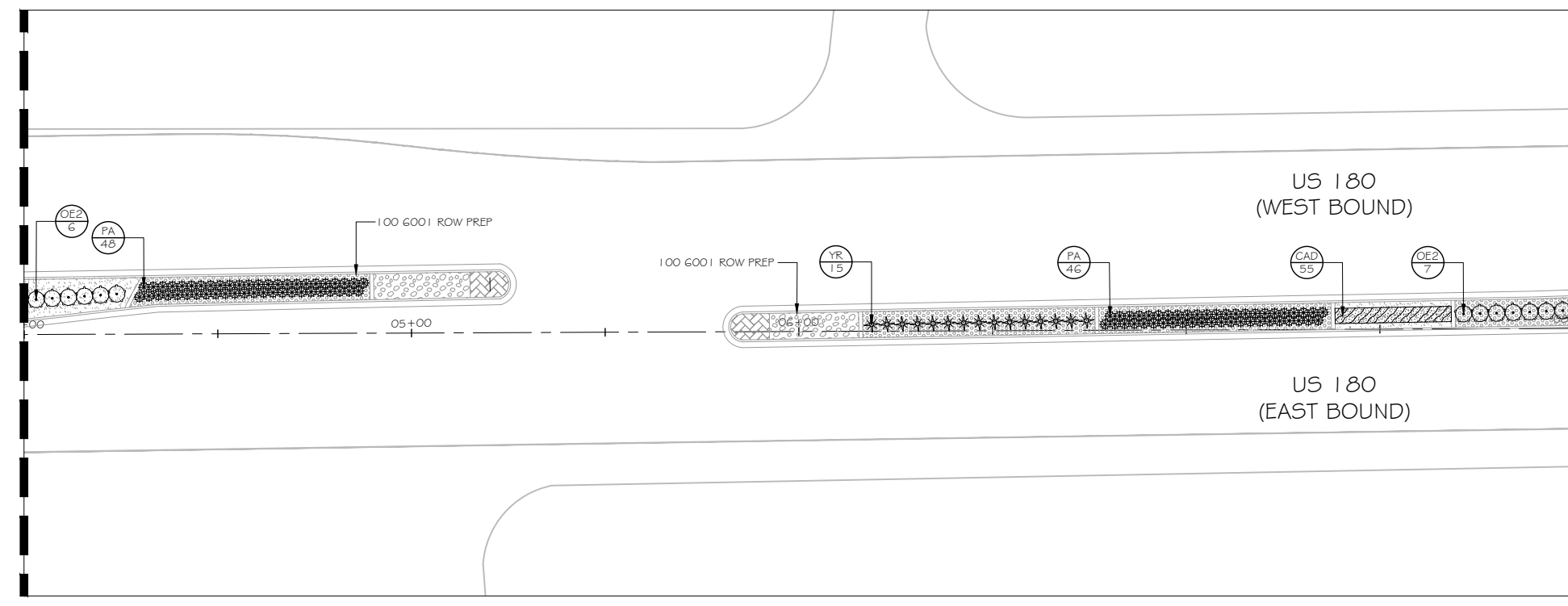
| SHRUBS | QTY | BOTANICAL / COMMON NAME | REMARKS |
|-------------|-----|--|-------------------------------------|
| OE2 | 28 | OPUNTIA ELLISIANA SPINELESS PRICKLY PEAR | 192 6004 LANDSCAPE PLANTING (5 GAL) |
| PA | 199 | PEROVSKIA ATRIPLICIFOLIA RUSSIAN SAGE | 192 6003 LANDSCAPE PLANTING (3 GAL) |
| YR | 72 | YUCCA RECURVIFOLIA SOFT LEAF YUCCA | 192 6004 LANDSCAPE PLANTING (5 GAL) |
| SHRUB AREAS | QTY | BOTANICAL / COMMON NAME | REMARKS |
| CAD | 332 | CAREX DIVULSA BERKELEY SEDGE | 192 6003 LANDSCAPE PLANTING (3 GAL) |
| MR | 59 | MUHLENBERGIA CAPILLARIS 'REGAL MIST' PINK MUHLY | 192 6003 LANDSCAPE PLANTING (3 GAL) |

REFERENCE NOTES SCHEDULE I

| CODE | DESCRIPTION | QTY |
|------|---|----------|
| 2 | 161 6017 COMPOST MANUF TOPSOIL (4") | 6,026 SF |
| 3 | 192-6013 - LANDSCAPE PLANTING MULCH (SHREDDED BARK) | 2,293 SF |

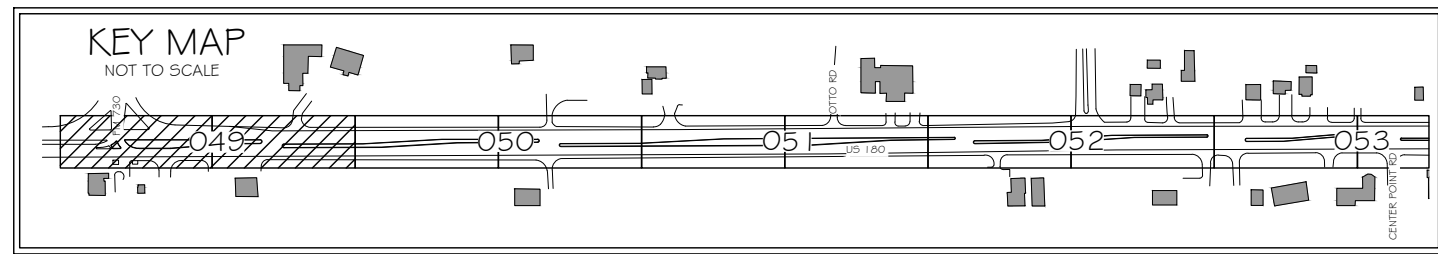
MATCHLINE STA 04+00

MATCHLINE STA 08+00



1 STA 00+00 - STA 04+00
1" = 20'-0"

2 STA 04+00 - STA 08+00
1" = 20'-0"



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



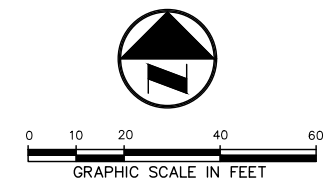
PLANTING PLAN
STA 00+00 - STA 08+00



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|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 049 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

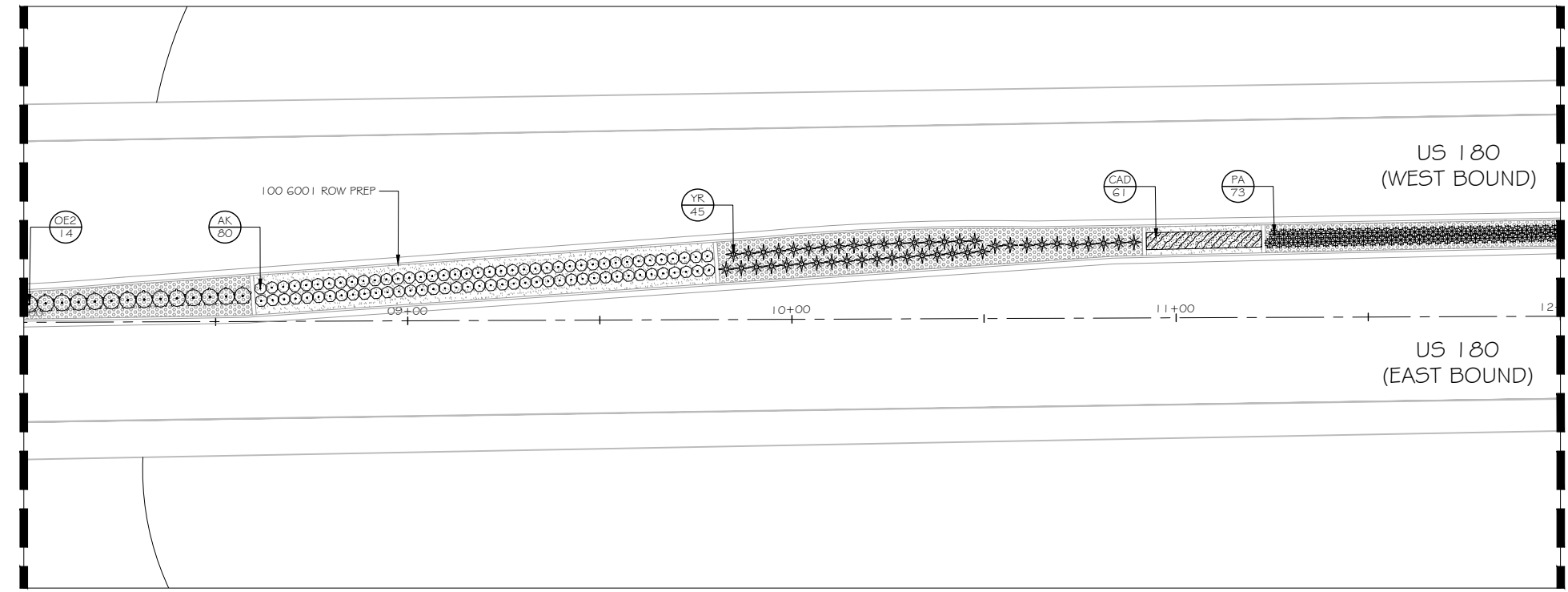
D. W. MEYER
05/06/2022 8:54AM
M:\106-4714782-20337\DWG\LANDSCAPE\FX 2018\SHEETS\PLANTING PLAN.DWG

MAY 2022 - 100% PS&E SUBMITTAL



MATCHLINE STA 08+00

MATCHLINE STA 12+00



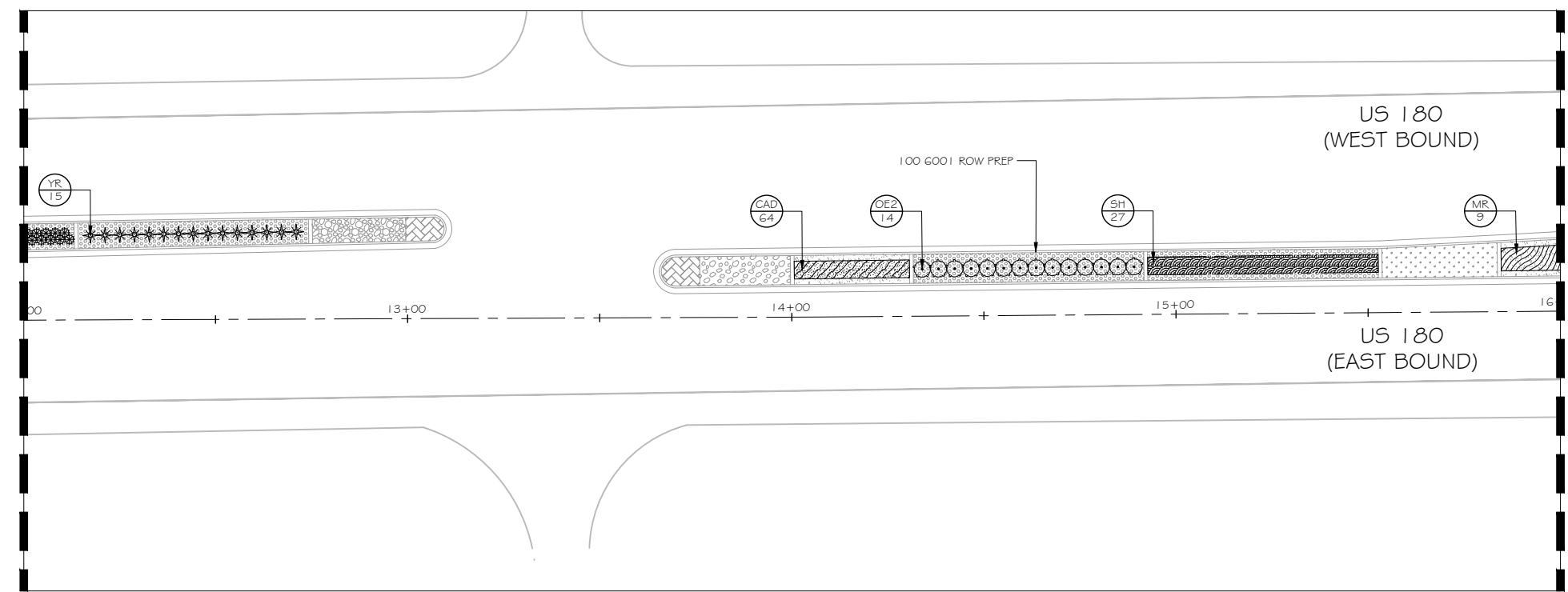
GENERAL NOTES

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1 STA 08+00 - STA 12+00
1" = 20'-0"

MATCHLINE STA 12+00

MATCHLINE STA 16+00



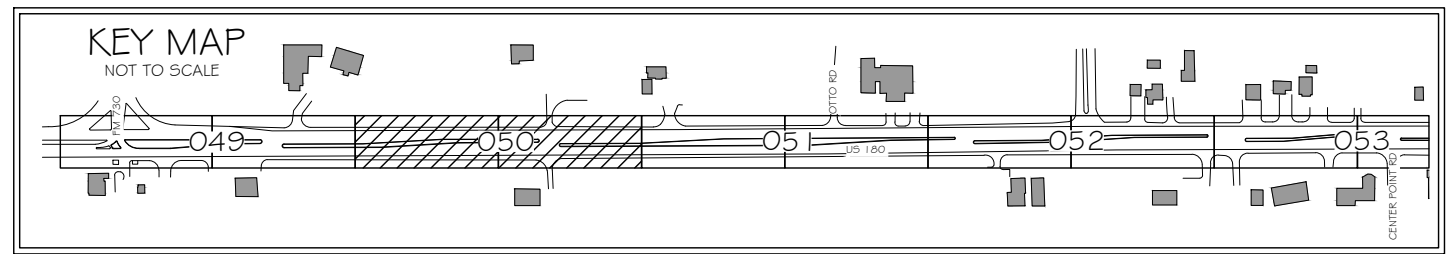
2 STA 12+00 - STA 16+00
1" = 20'-0"

PLANT SCHEDULE 2

| SHRUBS | QTY | BOTANICAL / COMMON NAME | REMARKS |
|-------------|-----|---|-------------------------------------|
| AK | 80 | ABELIA X GRANDIFLORA 'KALEIDOSCOPE' KALEIDOSCOPE GLOSSY ABELIA | 192 6004 LANDSCAPE PLANTING (5 GAL) |
| OE2 | 28 | OPUNTIA ELLISIANA SPINELESS PRICKLY PEAR | 192 6004 LANDSCAPE PLANTING (5 GAL) |
| PA | 73 | PEROVSKIA ATRIPLICIFOLIA RUSSIAN SAGE | 192 6003 LANDSCAPE PLANTING (3 GAL) |
| YR | 60 | YUCCA RECURVIFOLIA SOFT LEAF YUCCA | 192 6004 LANDSCAPE PLANTING (5 GAL) |
| SHRUB AREAS | QTY | BOTANICAL / COMMON NAME | REMARKS |
| CAD | 125 | CAREX DIVULSA BERKELEY SEDGE | 192 6003 LANDSCAPE PLANTING (3 GAL) |
| MR | 69 | MUHLENBERGIA CAPILLARIS 'REGAL MIST' PINK MUHLY | 192 6003 LANDSCAPE PLANTING (3 GAL) |
| SH | 27 | SALVIA GREGGII 'HEATWAVE BLAZE' HEATWAVE BLAZE SALVIA | 192 6003 LANDSCAPE PLANTING (3 GAL) |

REFERENCE NOTES SCHEDULE 2

| CODE | DESCRIPTION | QTY |
|------|---|----------|
| 2 | 161 6017 COMPOST MANUF TOPSOIL (4") | 5,683 SF |
| 3 | 192-6013 - LANDSCAPE PLANTING MULCH (SHREDDED BARK) | 2,706 SF |



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



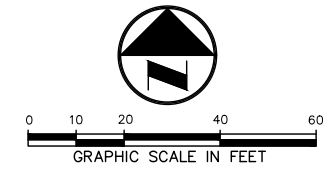
PLANTING PLAN
STA 08+00 - STA 16+00



| | | |
|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 050 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

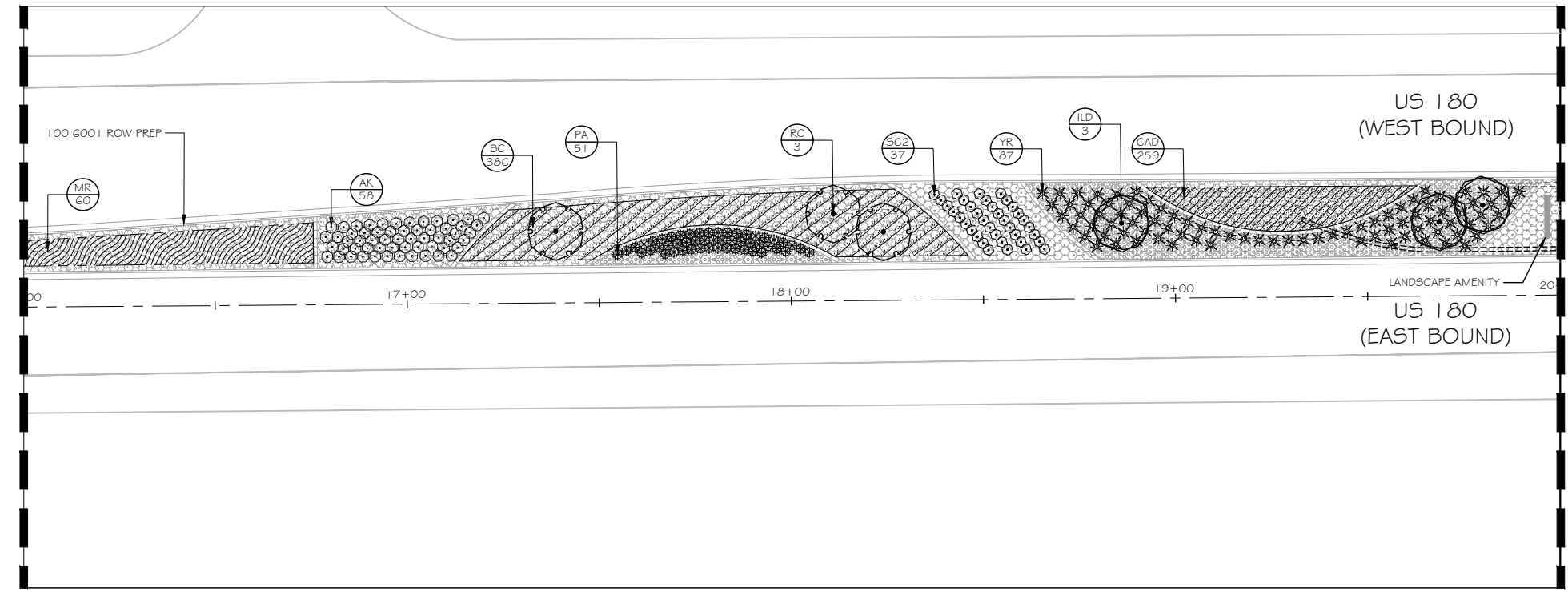
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MAY 2022 - 100% PS&E SUBMITTAL



MATCHLINE STA 16+00

MATCHLINE STA 20+00



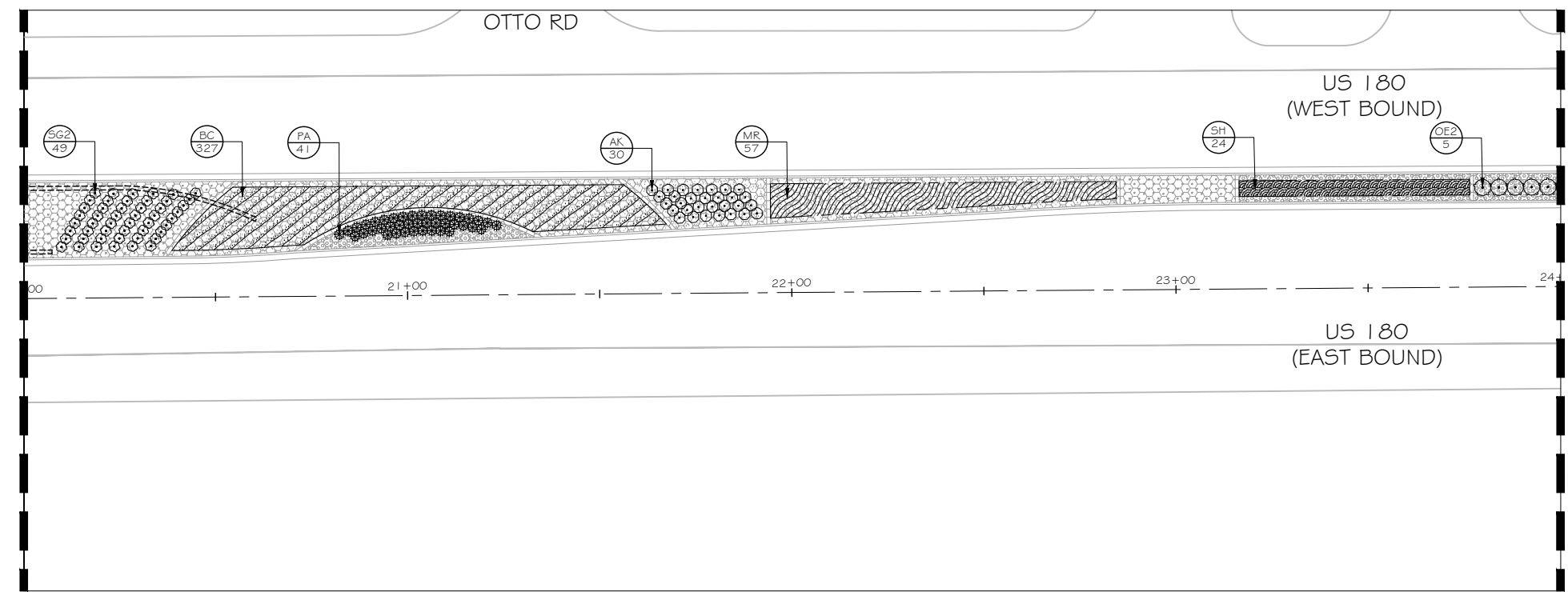
GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.

1 STA 16+00 - STA 20+00
1" = 20'-0"

MATCHLINE STA 20+00

MATCHLINE STA 24+00



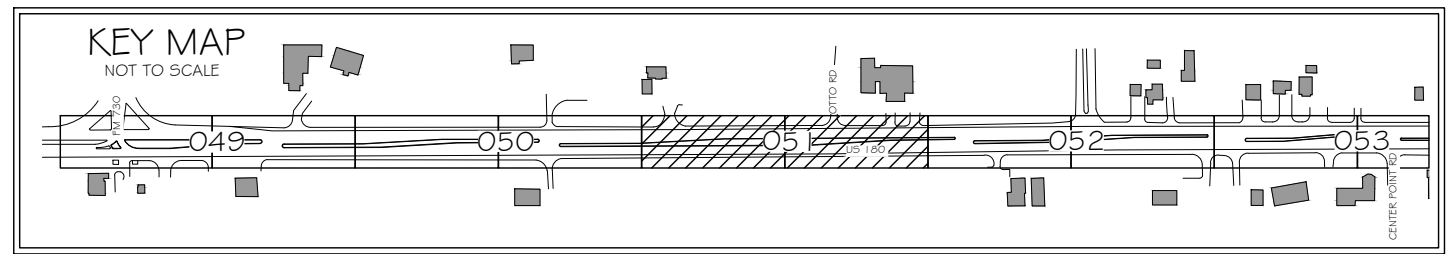
2 STA 20+00 - STA 24+00
1" = 20'-0"

PLANT SCHEDULE 3

| TREES | QTY | BOTANICAL / COMMON NAME | REMARKS |
|-------------|-----|---|--|
| ILD | 3 | ILEX DECIDUA POSSUMHAW HOLLY | 192 6024 PLANT MATERIAL (30 GAL) (TREE) |
| RC | 3 | RHUS COPALLINA `FLAMELEAF` FLAMELEAF SUMAC | 192 6024 PLANT MATERIAL (30 GAL) (TREE) |
| SHRUBS | QTY | BOTANICAL / COMMON NAME | REMARKS |
| AK | 88 | ABELIA X GRANDIFLORA `KALEIDOSCOPE` KALEIDOSCOPE GLOSSY ABELIA | 192 6004 LANDSCAPE PLANTING (5 GAL) |
| OE2 | 5 | OPUNTIA ELLISIANA SPINELESS PRICKLY PEAR | 192 6004 LANDSCAPE PLANTING (5 GAL) |
| PA | 92 | PEROVSKIA ATRIPLICIFOLIA RUSSIAN SAGE | 192 6003 LANDSCAPE PLANTING (3 GAL) |
| SG2 | 86 | SALVIA GREGGII AUTUMN SAGE | FULL, MATCHING |
| YR | 87 | YUCCA RECURVIFOLIA SOFT LEAF YUCCA | 192 6004 LANDSCAPE PLANTING (5 GAL) |
| SHRUB AREAS | QTY | BOTANICAL / COMMON NAME | REMARKS |
| BC | 713 | BOUTELOUA CURTIPENDULA SIDE OATS GRAMA | 192 6003 LANDSCAPE PLANTING (3 GAL) |
| CAD | 259 | CAREX DIVULSA BERKELEY SEDGE | 192 6003 LANDSCAPE PLANTING (3 GAL) |
| MR | 117 | MUHLENBERGIA CAPILLARIS `REGAL MIST` PINK MUHLY | 192 6003 LANDSCAPE PLANTING (3 GAL) |
| SH | 24 | SALVIA GREGGII `HEATWAVE BLAZE` HEATWAVE BLAZE SALVIA | 192 6003 LANDSCAPE PLANTING (3 GAL) |

REFERENCE NOTES SCHEDULE 3

| CODE | DESCRIPTION | QTY |
|------|---|-----------|
| 2 | 161 6017 COMPOST MANUF TOPSOIL (4") | 11,892 SF |
| 3 | 192-6013 - LANDSCAPE PLANTING MULCH (SHREDDED BARK) | 6,632 SF |



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



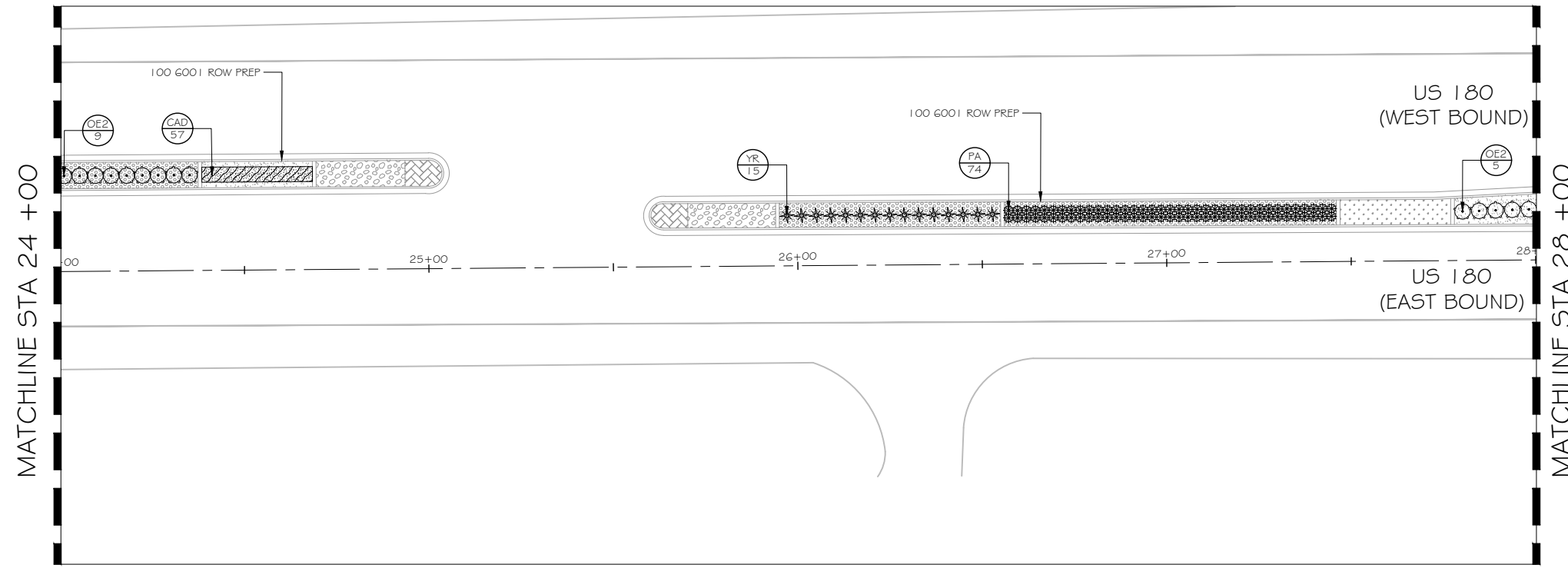
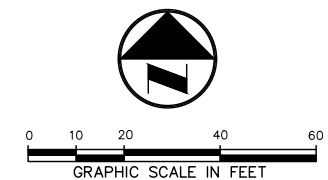
PLANTING PLAN
STA 16+00 - STA 24+00



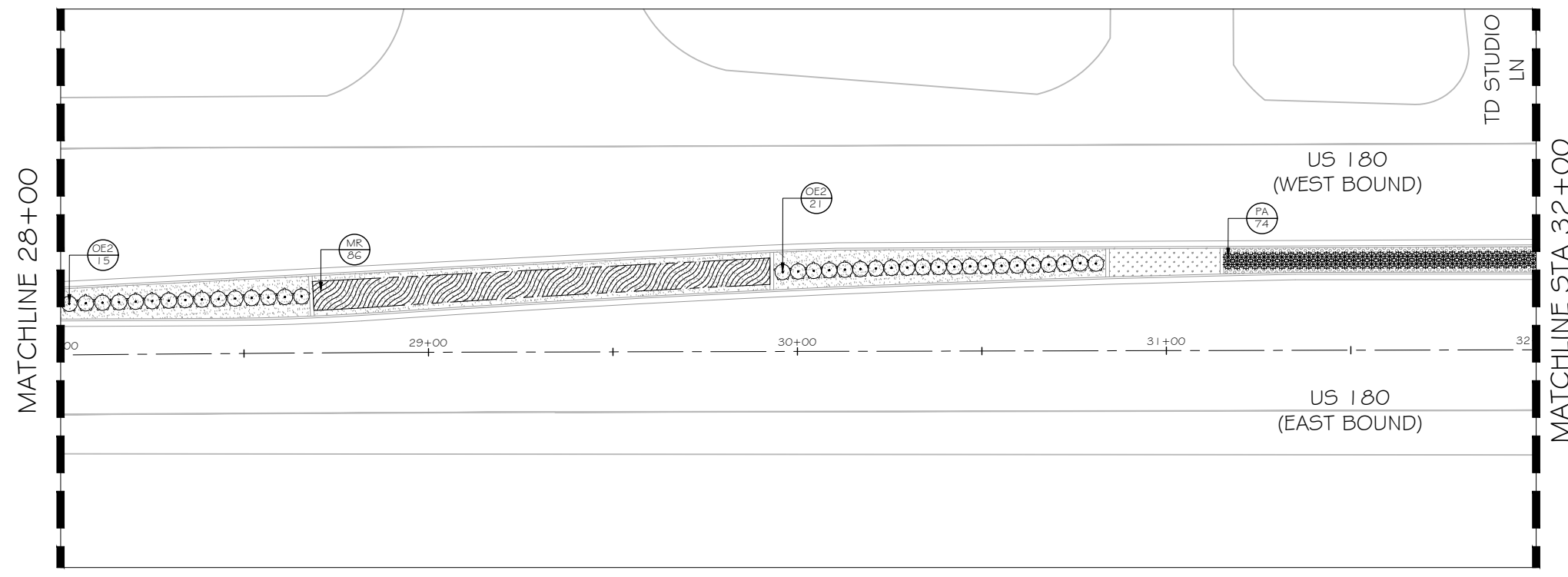
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|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 051 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

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MAY 2022 - 100% PS&E SUBMITTAL



1 STA 24+00 - STA 28+00
1" = 20'-0"



2 STA 28+00 - STA 32+00
1" = 20'-0"

GENERAL NOTES

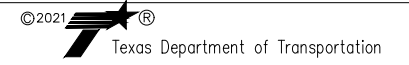
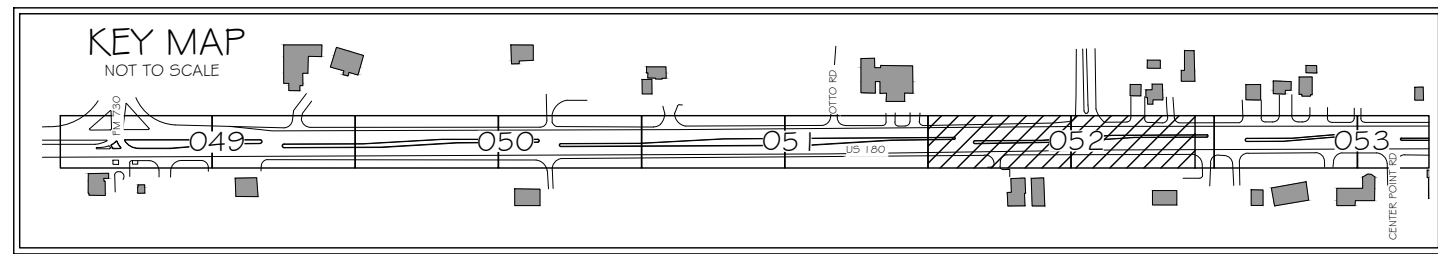
1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.

PLANT SCHEDULE 4

| SHRUBS | QTY | BOTANICAL / COMMON NAME | REMARKS |
|-------------|-----|--|--------------------------------------|
| OE2 | 50 | OPUNTIA ELLISIANA SPINELESS PRICKLY PEAR | 1 92 6004 LANDSCAPE PLANTING (5 GAL) |
| PA | 144 | PEROVSKIA ATRIPLICIFOLIA RUSSIAN SAGE | 1 92 6003 LANDSCAPE PLANTING (3 GAL) |
| YR | 15 | YUCCA RECURVIFOLIA SOFT LEAF YUCCA | 1 92 6004 LANDSCAPE PLANTING (5 GAL) |
| SHRUB AREAS | QTY | BOTANICAL / COMMON NAME | REMARKS |
| CAD | 57 | CAREX DIVULSA BERKELEY SEDGE | 1 92 6003 LANDSCAPE PLANTING (3 GAL) |
| MR | 86 | MUHLENBERGIA CAPILLARIS 'REGAL MIST' PINK MUHLY | 1 92 6003 LANDSCAPE PLANTING (3 GAL) |

REFERENCE NOTES SCHEDULE 4

| CODE | DESCRIPTION | QTY |
|------|---|----------|
| 2 | 161 6017 COMPOST MANUF TOPSOIL (4") | 5,459 SF |
| 3 | 192-GO13 - LANDSCAPE PLANTING MULCH (SHREDDED BARK) | 3,133 SF |



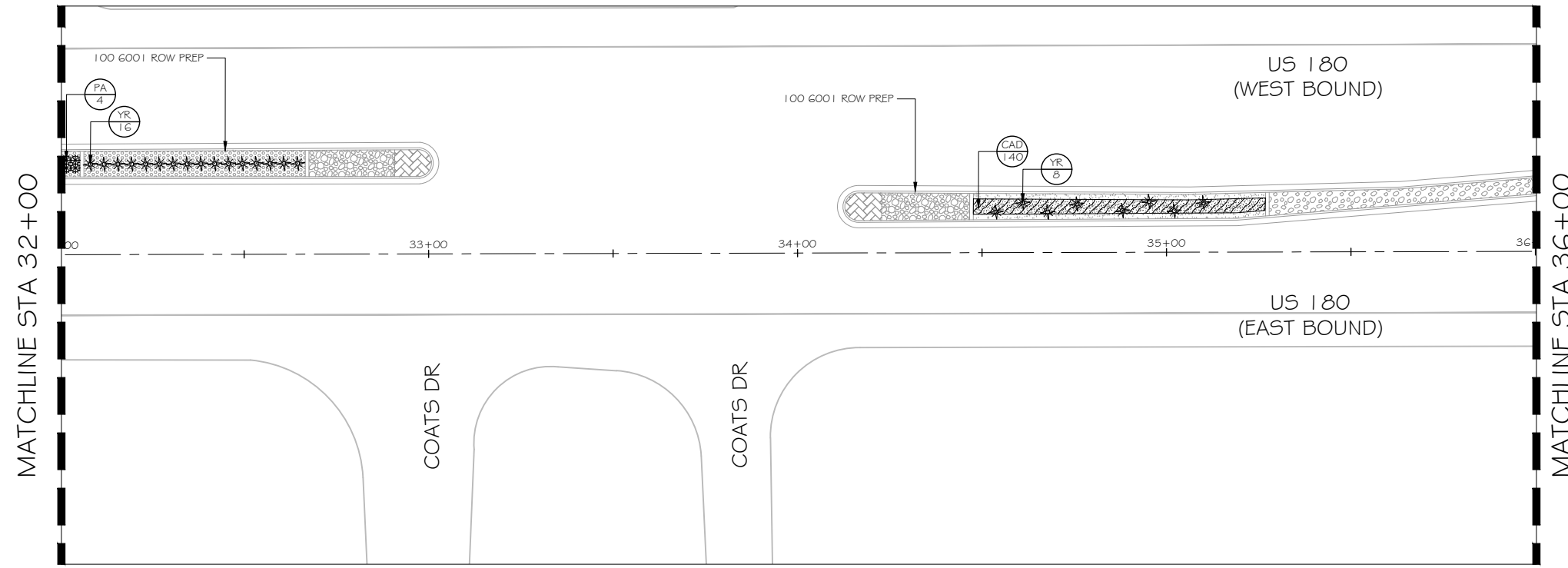
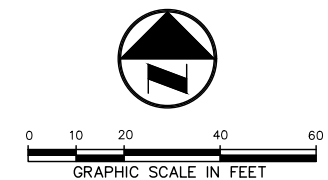
PLANTING PLAN
STA 24+00 - STA 34+00



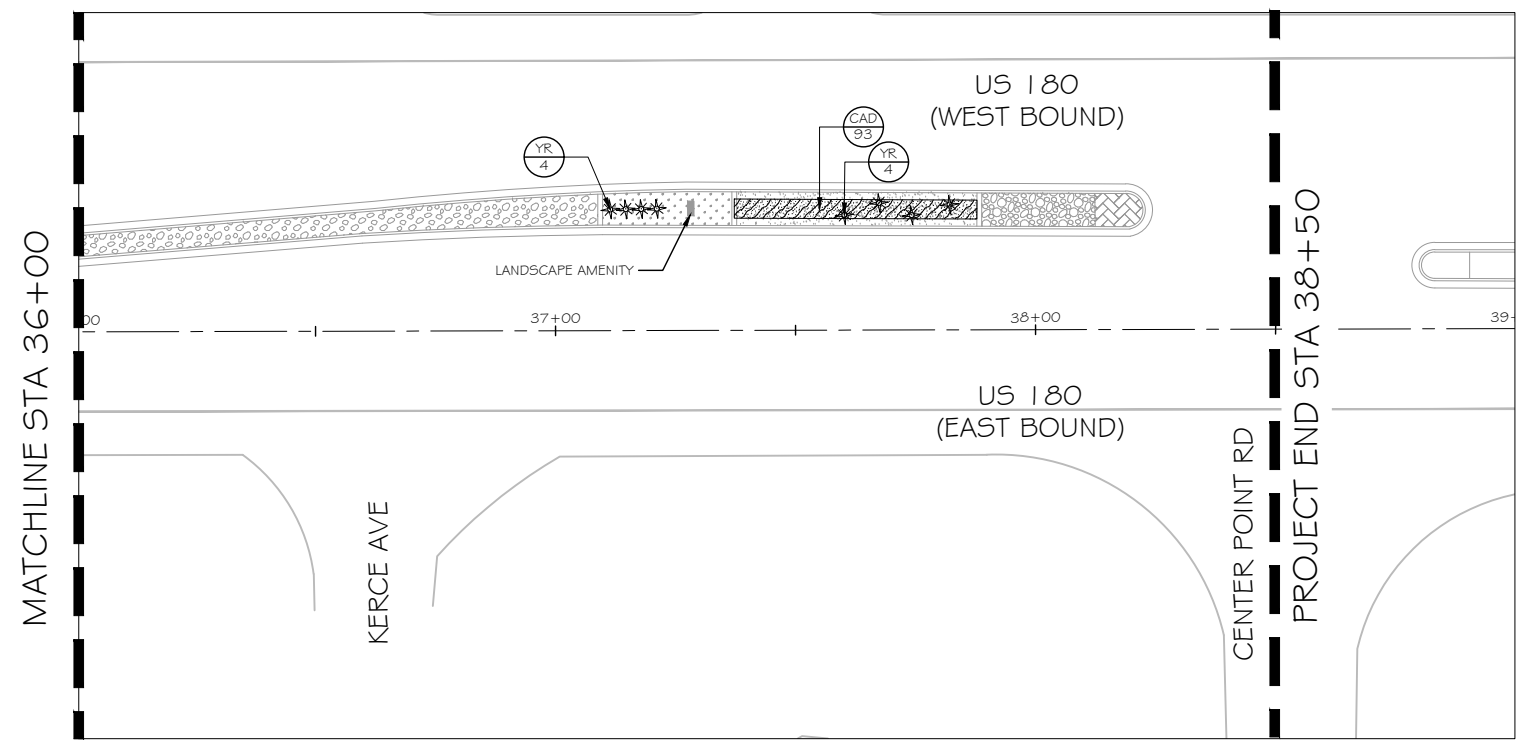
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| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 052 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

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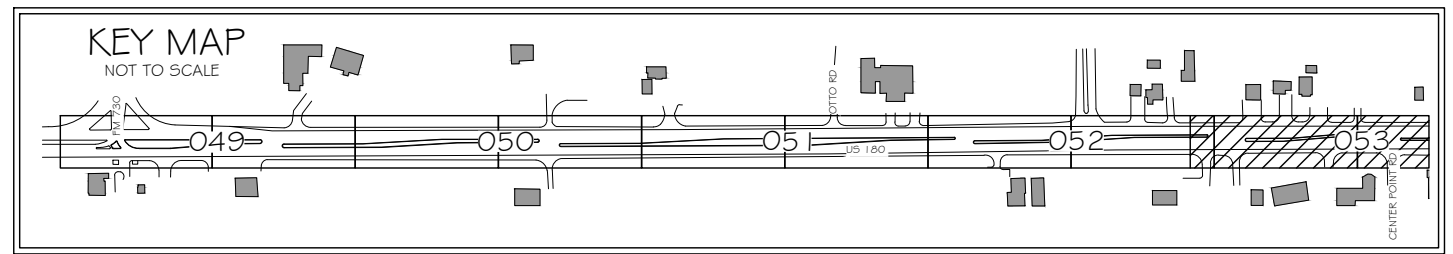
MAY 2022 - 100% PS&E SUBMITTAL



1 STA 32+00 - STA 36+00
1" = 20'-0"



2 STA 36+00 - STA 38+50
1" = 20'-0"



GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.
3. CALL TXDOT TRAFFIC MANAGEMENT CENTER (817-370-3661) FOR TXDOT LOCATES WHEN WORKING NEAR EXISTING TXDOT MAINTAINED TRAFFIC SIGNAL AND ITS SYSTEMS.

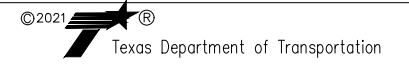
PLANT SCHEDULE 5

| SHRUBS | QTY | BOTANICAL / COMMON NAME | REMARKS |
|-------------|-----|--|-------------------------------------|
| PA | 4 | PEROVSKIA ATRIPLICIFOLIA RUSSIAN SAGE | 192 6003 LANDSCAPE PLANTING (3 GAL) |
| YR | 32 | YUCCA RECURVIFOLIA SOFT LEAF YUCCA | 192 6004 LANDSCAPE PLANTING (5 GAL) |
| SHRUB AREAS | QTY | BOTANICAL / COMMON NAME | REMARKS |
| CAD | 233 | CAREX DIVULSA BERKELEY SEDGE | 192 6003 LANDSCAPE PLANTING (3 GAL) |

REFERENCE NOTES SCHEDULE 5

| CODE | DESCRIPTION | QTY |
|------|---|----------|
| 2 | 161 6017 COMPOST MANUF TOPSOIL (4") | 2,441 SF |
| 3 | 192-6013 - LANDSCAPE PLANTING MULCH (SHREDDED BARK) | 888 SF |

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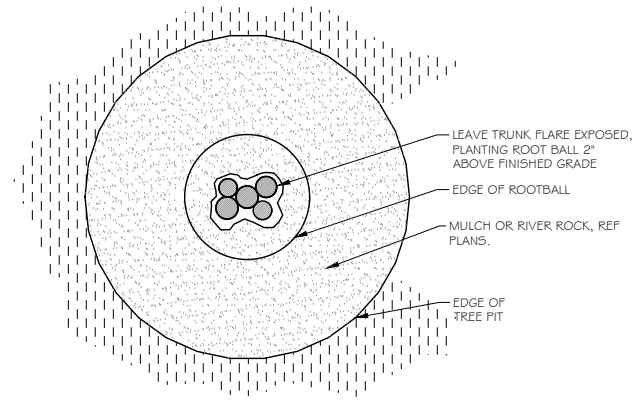


PLANTING PLAN
STA 32+00 - STA 38+50

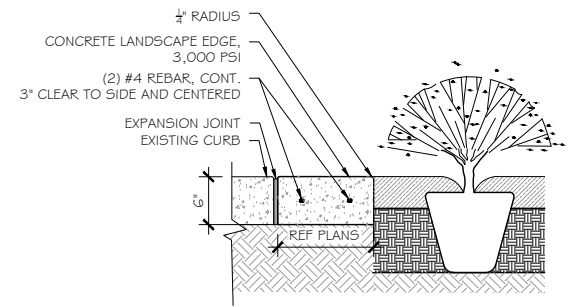
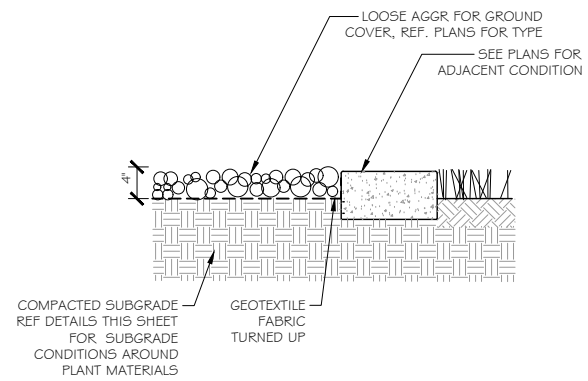
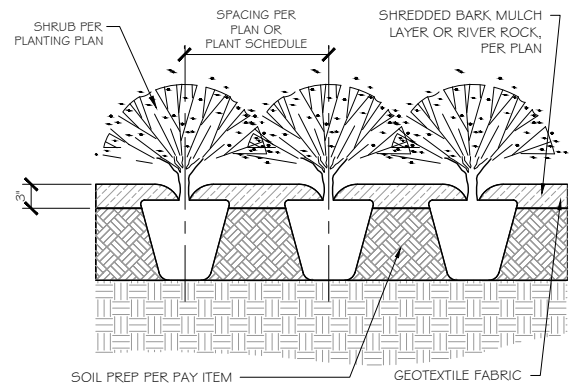


| | | |
|------------------------|--|----------------------|
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| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

MAY 2022 - 100% PS&E SUBMITTAL



NOTE: DO NOT CREATE WATERING RING (SAUCER) AROUND TREE PIT

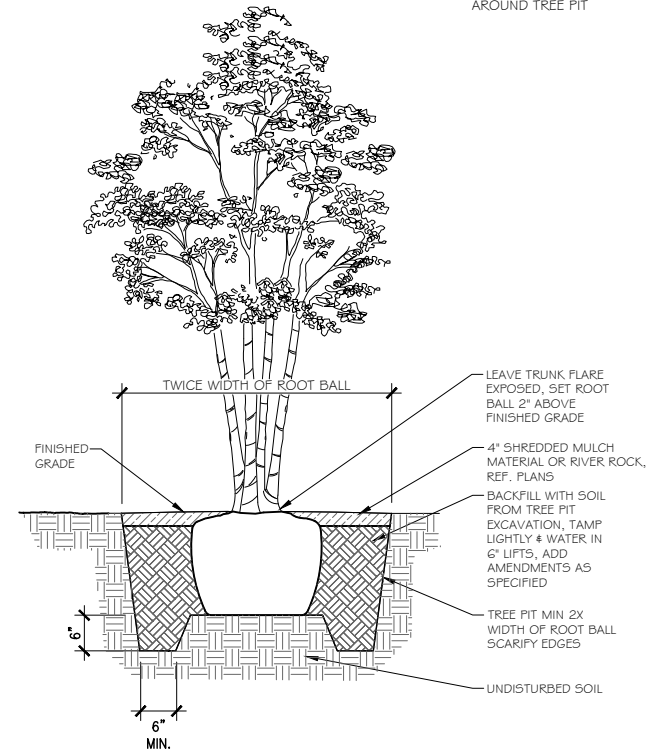


NOTE: CONTROL JOINTS @ 10' O.C. SEALED EXPANSION JOINTS @ 30' O.C. MEDIUM BROOM FINISH

2 TYP. SHRUB PLANTING
1" = 1'-0"

3 LOOSE AGGR FOR GOUNDCOVER (TYP I, II & III)
1" = 1'-0"

4 CONCRETE LANDSCAPE EDGE (18" & 12")
1" = 1'-0"



1 ORNAMENTAL TREE PLANTING
3/4" = 1'-0"

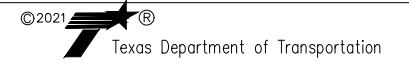
PLANT SCHEDULE WHOLE SITE

| TREES | QTY | BOTANICAL / COMMON NAME | SIZE/COND. | REMARKS | |
|-------------|-------|---|------------|---|-------------------------------------|
| ILD | 3 | ILEX DECIDUA POSSUMHAW HOLLY | 30 GAL | 192 G024 PLANT MATERIAL (30 GAL) (TREE) | |
| RC | 3 | RHUS COPALLINA 'FLAMELEAF' FLAMELEAF SUMAC | 30 GAL | 192 G024 PLANT MATERIAL (30 GAL) (TREE) | |
| SHRUBS | QTY | BOTANICAL / COMMON NAME | SIZE | SPACING | REMARKS |
| AK | 168 | ABELIA X GRANDIFLORA 'KALEIDOSCOPE' KALEIDOSCOPE GLOSSY ABELIA | 5 GAL | 36" o.c. | 192 G004 LANDSCAPE PLANTING (5 GAL) |
| OE2 | 111 | OPUNTIA ELLISIANA SPINELESS PRICKLY PEAR | 5 GAL | 54" o.c. | 192 G004 LANDSCAPE PLANTING (5 GAL) |
| PA | 512 | PEROVSKIA ATRIPLICIFOLIA RUSSIAN SAGE | 3 GAL | 33" o.c. | 192 G003 LANDSCAPE PLANTING (3 GAL) |
| SG2 | 86 | SALVIA GREGGII AUTUMN SAGE | 3 GAL | 33" o.c. | FULL, MATCHING |
| YR | 266 | YUCCA RECURVIFOLIA SOFT LEAF YUCCA | 5 GAL | 48" o.c. | 192 G004 LANDSCAPE PLANTING (5 GAL) |
| SHRUB AREAS | QTY | BOTANICAL / COMMON NAME | SIZE | SPACING | REMARKS |
| BC | 713 | BOUTELOUA CURTIPENDULA SIDE OATS GRAMA | 3 GAL | 24" o.c. | 192 G003 LANDSCAPE PLANTING (3 GAL) |
| CAD | 1,006 | CAREX DIVULSA BERKELEY SEDGE | 3 GAL | 18" o.c. | 192 G003 LANDSCAPE PLANTING (3 GAL) |
| MR | 271 | MUHLENBERGIA CAPILLARIS 'REGAL MIST' PINK MUHLY | 3 GAL | 40" o.c. | 192 G003 LANDSCAPE PLANTING (3 GAL) |
| SH | 51 | SALVIA GREGGII 'HEATWAVE BLAZE' HEATWAVE BLAZE SALVIA | 3 GAL | 40" o.c. | 192 G003 LANDSCAPE PLANTING (3 GAL) |

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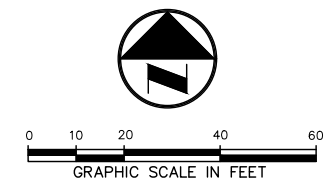
Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



PLANTING DETAILS
STA 01+00 - STA 08+00

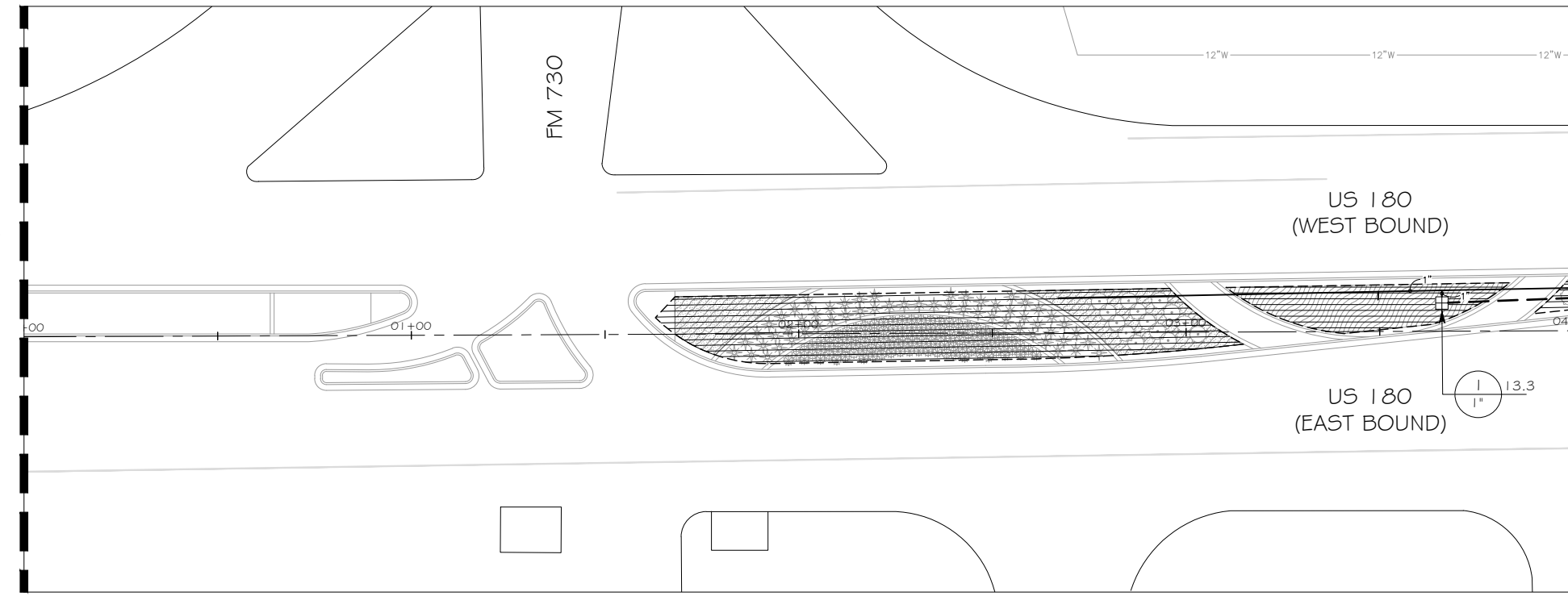
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| FED. RD. DIV. NO. | FEDERAL AID PROJECT NO. | SHEET NO. | |
| 6 | F 2022(844) | 054 | |
| STATE | DISTRICT | COUNTY | |
| TEXAS | FTW | TARRANT | |
| CONTROL | SECTION | JOB | HIGHWAY NO |
| 0008 | 03 | 134 | US 180 |

MAY 2022 - 100% PS&E SUBMITTAL



PROJECT BEGIN STA 01+00

MATCHLINE STA 04+00



IRRIGATION SCHEDULE

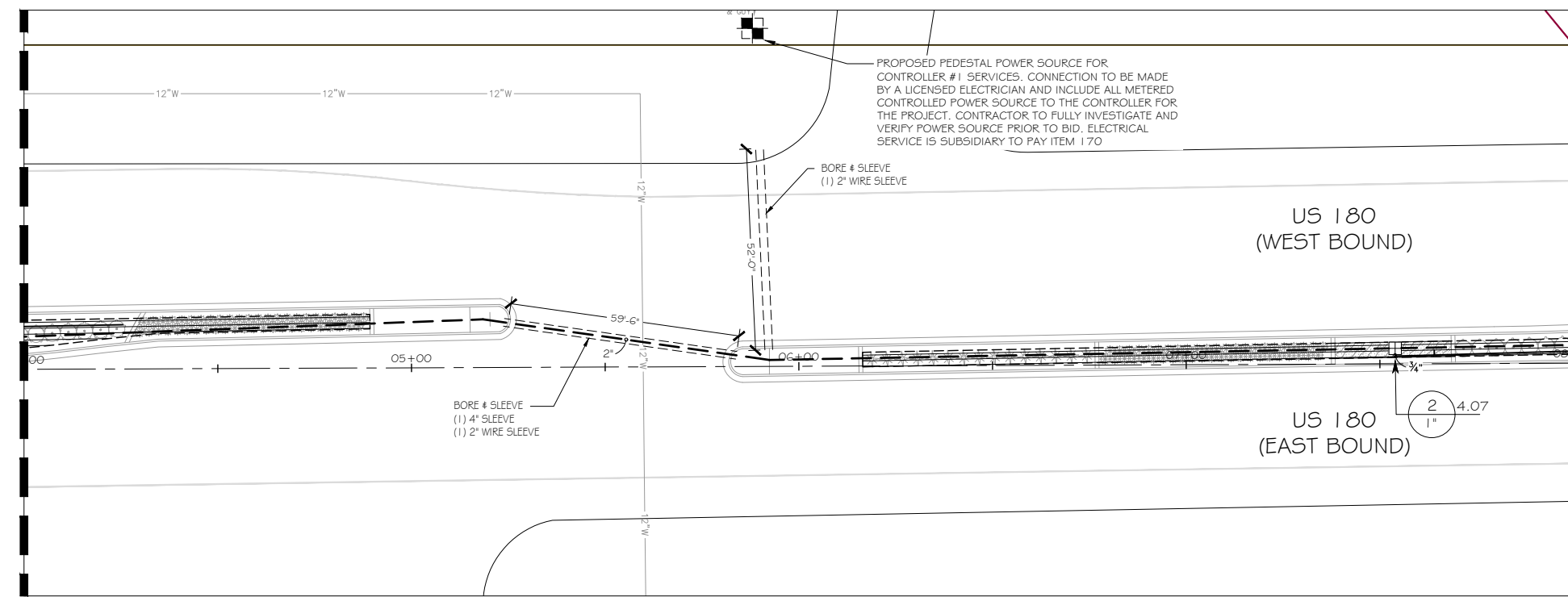
| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION |
|----------|--|
| [Symbol] | RAIN BIRD XCZ-100-PRB-COM WIDE FLOW DRIP CONTROL KIT FOR COMMERCIAL APPLICATIONS. 1" BALL VALVE WITH 1" PESB VALVE AND 1" PRESSURE REGULATING 40PSI QUICK-CHECK BASKET FILTER. 0.3GPM TO 20GPM. |
| [Symbol] | RAIN BIRD OPERIND DRIP SYSTEM OPERATION INDICATOR, STEM RISES 6" FOR CLEAR VISIBILITY WHEN DRIP SYSTEM IS CHARGED TO A MINIMUM OF 20PSI. INCLUDES 16" OF 1/4" DISTRIBUTION TUBING WITH CONNECTION FITTING PRE-INSTALLED. |
| [Symbol] | AREA TO RECEIVE DRIPLINE NETAFIM TLHCVXR-CS-053-18 TECHLINE HCVR-CS PRESSURE COMPENSATING LANDSCAPE DRIPLINE WITH COPPER STRIPE, CHECK VALVE AND ANTI-SIPHON FEATURE. 0.53 GPH EMITTERS AT 18" O.C. DRIPLINE LATERALS SPACED AT 18" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. 1.7MM. |

| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION |
|----------|---|
| [Symbol] | RAIN BIRD PEB-PR5-D 1-1/2" 1", 1-1/2", 2" PLASTIC INDUSTRIAL VALVES. LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION, WITH PRESSURE REGULATOR MODULE. |
| [Symbol] | FEBCO 850 1-1/2" DOUBLE CHECK BACKFLOW PREVENTION, 1/2" TO 2" |
| [Symbol] | RAIN BIRD ESP12LXMEF-LXMM55 WITH (01) ESPLXMSM12 24 STATION COMMERCIAL CONTROLLER. STAINLESS STEEL PEDESTAL. FLOW SENSING. ESP12LXMEF-LXMM55-LXMM55PED WITH (01) ESPLXMSM12 |
| [Symbol] | RAIN BIRD WR2-RFC WIRELESS RAIN AND FREEZE SENSOR COMBO. INCLUDES 1 RECEIVER AND 1 RAIN/FREEZE SENSOR TRANSMITTER. |
| [Symbol] | RAIN BIRD FS-150-P 1-1/2" FLOW SENSOR FOR USE WITH RAIN BIRD MAXICOM, SITECONTROL, AND ESP-LXD CENTRAL CONTROL SYSTEMS. PLASTIC (PVC) MODEL. SUGGESTED OPERATING RANGE OF 5.0 GPM TO 100.0 GPM. SENSORS SHOULD BE SIZED FOR FLOW RATHER THAN PIPE SIZE. |
| [Symbol] | WATER METER 2" |
| [Symbol] | IRRIGATION MAINLINE: PVC CLASS 200 SDR 21 |
| [Symbol] | PIPE SLEEVE: PVC CLASS 200 SDR 21 2 SIZES LARGER THAN PIPE WITHIN. |
| [Symbol] | Valve Callout # Valve Number # Valve Flow # Valve Size |

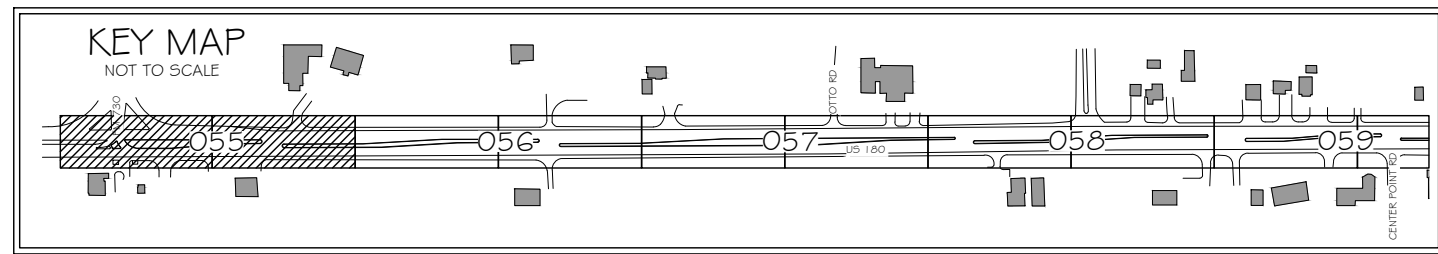
1 STA 01+00 - STA 04+00
1" = 20'-0"

MATCHLINE STA 04+00

MATCHLINE STA 08+00



2 STA 04+00 - STA 08+00
1" = 20'-0"

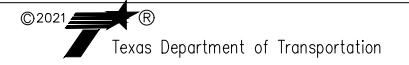


GENERAL NOTES

- THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINEWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
- ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.
- CALL TXDOT TRAFFIC MANAGEMENT CENTER (817-370-3661) FOR TXDOT LOCATES WHEN WORKING NEAR EXISTING TXDOT MAINTAINED TRAFFIC SIGNAL AND ITS SYSTEMS.



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001

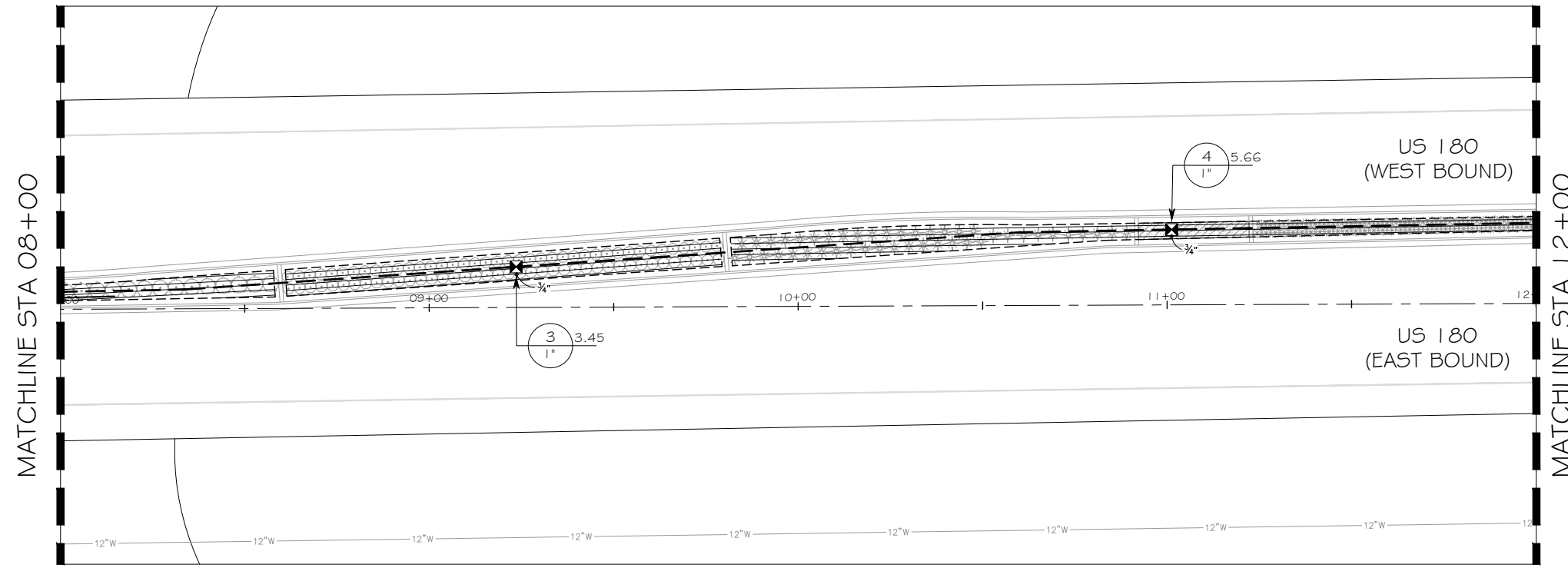
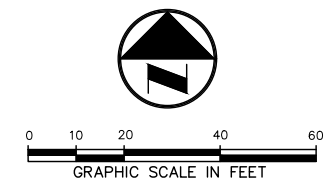


IRRIGATION PLAN
STA 01+00 - STA 08+00

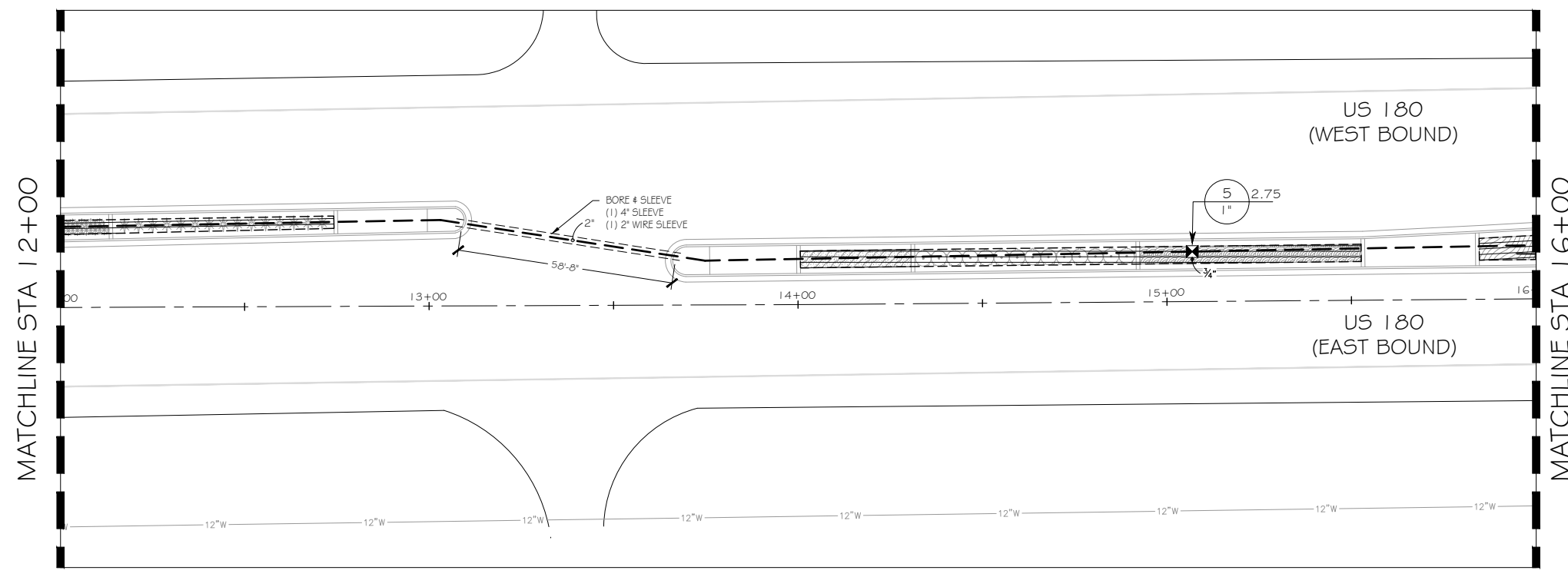
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| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

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MAY 2022 - 100% PS&E SUBMITTAL



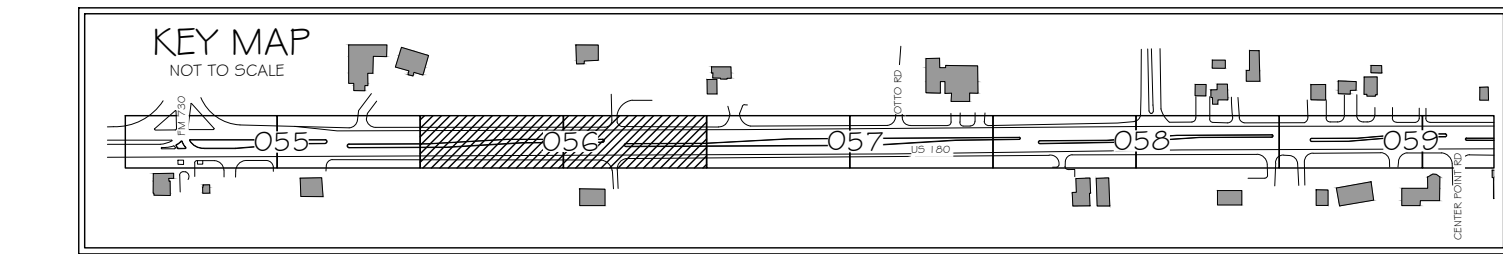
1 STA 08+00 - STA 12+00
1" = 20'-0"



2 STA 12+00 - STA 16+00
1" = 20'-0"

IRRIGATION SCHEDULE

| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION |
|----------|--|
| [Symbol] | RAIN BIRD XCZ-100-PRB-COM WIDE FLOW DRIP CONTROL KIT FOR COMMERCIAL APPLICATIONS. 1" BALL VALVE WITH 1" PESB VALVE AND 1" PRESSURE REGULATING 40PSI QUICK-CHECK BASKET FILTER. 0.3GPM TO 20GPM. |
| [Symbol] | RAIN BIRD OPERIND DRIP SYSTEM OPERATION INDICATOR, STEM RISES 6" FOR CLEAR VISIBILITY WHEN DRIP SYSTEM IS CHARGED TO A MINIMUM OF 20PSI. INCLUDES 16' OF 1/4" DISTRIBUTION TUBING WITH CONNECTION FITTING PRE-INSTALLED. |
| [Symbol] | AREA TO RECEIVE DRIPLINE NETAFIM TLHCVXR-CS-053-18 TECHLINE HCVR-CS PRESSURE COMPENSATING LANDSCAPE DRIPLINE WITH COPPER STRIPE, CHECK VALVE AND ANTI-SIPHON FEATURE. 0.53 GPH EMITTERS AT 18" O.C. DRIPLINE LATERALS SPACED AT 18" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. 1.7MM. |
| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION |
| [Symbol] | RAIN BIRD PEB-PR5-D 1-1/2" 1", 1-1/2", 2" PLASTIC INDUSTRIAL VALVES. LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION. WITH PRESSURE REGULATOR MODULE. |
| [Symbol] | FEBCO 850 1-1/2" DOUBLE CHECK BACKFLOW PREVENTION, 1/2" TO 2" |
| [Symbol] | RAIN BIRD ESP12LXMEF-LXMM55 WITH (01) ESPLXMSM12 24 STATION COMMERCIAL CONTROLLER. STAINLESS STEEL PEDESTAL. FLOW SENSING. ESP12LXMEF-LXMM55-LXMM55PED WITH (01) ESPLXMSM12 |
| [Symbol] | RAIN BIRD WR2-RFC WIRELESS RAIN AND FREEZE SENSOR COMBO. INCLUDES 1 RECEIVER AND 1 RAIN/FREEZE SENSOR TRANSMITTER. |
| [Symbol] | RAIN BIRD FS-150-P 1-1/2" FLOW SENSOR FOR USE WITH RAIN BIRD MAXICOM, SITECONTROL, AND ESP-LXD CENTRAL CONTROL SYSTEMS. PLASTIC (PVC) MODEL. SUGGESTED OPERATING RANGE OF 5.0 GPM TO 100.0 GPM. SENSORS SHOULD BE SIZED FOR FLOW RATHER THAN PIPE SIZE. |
| [Symbol] | WATER METER 2" |
| [Symbol] | IRRIGATION MAINLINE: PVC CLASS 200 SDR 21 |
| [Symbol] | PIPE SLEEVE: PVC CLASS 200 SDR 21 2 SIZES LARGER THAN PIPE WITHIN. |
| [Symbol] | Valve Callout # Valve Number # Valve Flow # Valve Size |



GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.



Pacheco Koch 4060 BRYANT IRVIN ROAD FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469 TX REG. SURVEYING FIRM LS-10008001

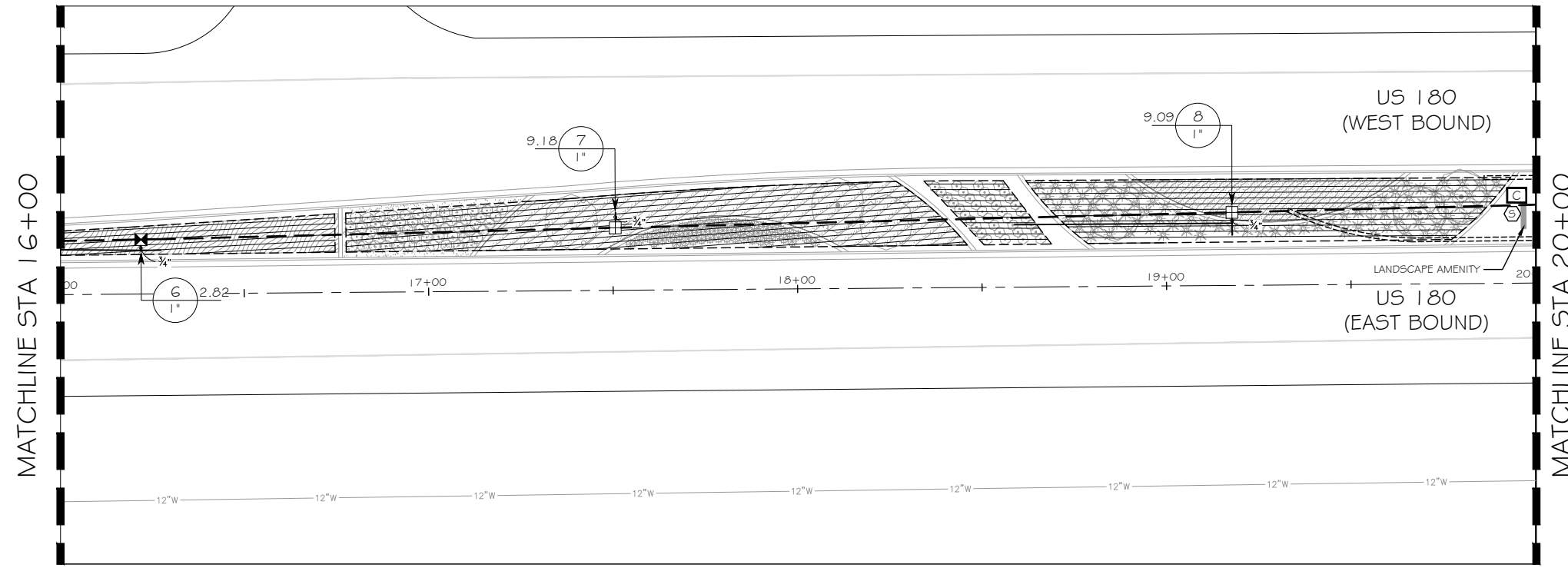
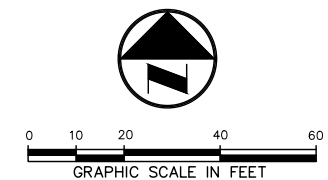


IRRIGATION PLAN
STA 08+00 - STA 16+00

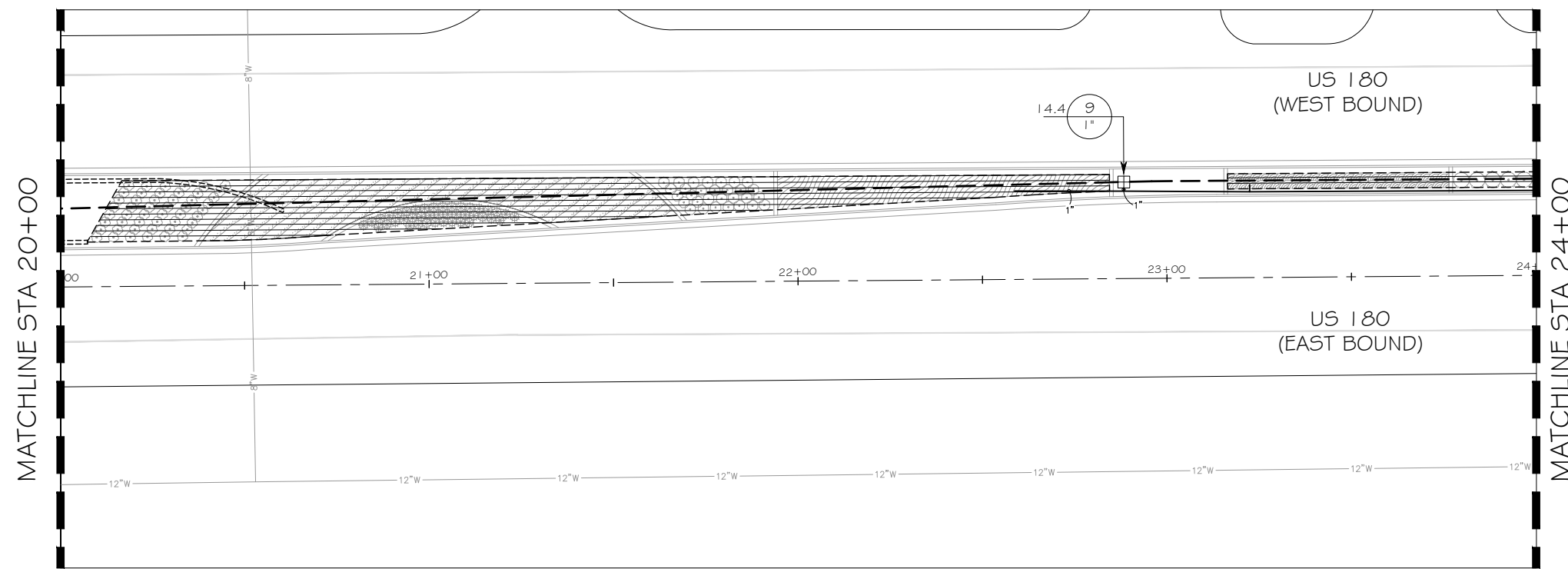
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| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

D.W. MEYER 8:55AM 05/06/2022 M:\DING-471\4782-20337\DWG\LANDSCAPE_FX_2018\SHEETS\IRRIGATION_PLAN.DWG

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1 STA 16+00 - STA 20+00
1" = 20'-0"

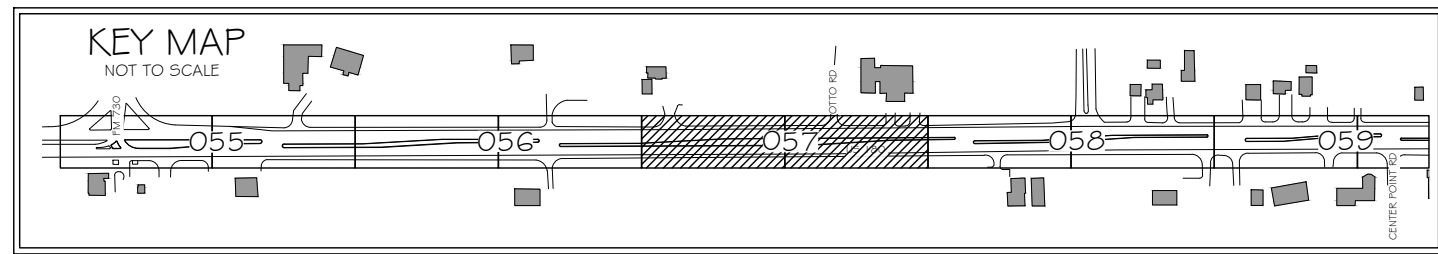


2 STA 20+00 - STA 24+00
1" = 20'-0"

IRRIGATION SCHEDULE

| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION |
|-----------------------|--|
| [Grid Symbol] | RAIN BIRD XCZ-100-PRB-COM WIDE FLOW DRIP CONTROL KIT FOR COMMERCIAL APPLICATIONS. 1" BALL VALVE WITH 1" PESB VALVE AND 1" PRESSURE REGULATING 40PSI QUICK-CHECK BASKET FILTER. 0.3GPM TO 20GPM. |
| [Dial Symbol] | RAIN BIRD OPERIND DRIP SYSTEM OPERATION INDICATOR, STEM RISES 6" FOR CLEAR VISIBILITY WHEN DRIP SYSTEM IS CHARGED TO A MINIMUM OF 20PSI. INCLUDES 16' OF 1/4" DISTRIBUTION TUBING WITH CONNECTION FITTING PRE-INSTALLED. |
| [Hatched Area Symbol] | AREA TO RECEIVE DRIPLINE NETAFIM TLHCVXR-CS-053-18 TECHLINE HCVR-CS PRESSURE COMPENSATING LANDSCAPE DRIPLINE WITH COPPER STRIPE, CHECK VALVE AND ANTI-SIPHON FEATURE. 0.53 GPH EMITTERS AT 18' O.C. DRIPLINE LATERALS SPACED AT 18" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. 1.7MM. |

| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION |
|-------------------------|---|
| [Valve Symbol] | RAIN BIRD PEB-PR5-D 1-1/2" 1", 1-1/2", 2" PLASTIC INDUSTRIAL VALVES. LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION. WITH PRESSURE REGULATOR MODULE. |
| [BF Symbol] | FEBCO 850 1-1/2" DOUBLE CHECK BACKFLOW PREVENTION, 1/2" TO 2" |
| [C Symbol] | RAIN BIRD ESP12LXMEF-LXMM55 WITH (01) ESPLXMSM12 24 STATION COMMERCIAL CONTROLLER. STAINLESS STEEL PEDESTAL. FLOW SENSING. ESP12LXMEF-LXMM55-LXMM55PED WITH (01) ESPLXMSM12 |
| [S Symbol] | RAIN BIRD WR2-RFC WIRELESS RAIN AND FREEZE SENSOR COMBO. INCLUDES 1 RECEIVER AND 1 RAIN/FREEZE SENSOR TRANSMITTER. |
| [FS Symbol] | RAIN BIRD FS-150-P 1-1/2" FLOW SENSOR FOR USE WITH RAIN BIRD MAXICOM, SITECONTROL, AND ESP-LXD CENTRAL CONTROL SYSTEMS. PLASTIC (PVC) MODEL. SUGGESTED OPERATING RANGE OF 5.0 GPM TO 100.0 GPM. SENSORS SHOULD BE SIZED FOR FLOW RATHER THAN PIPE SIZE. |
| [M Symbol] | WATER METER 2" |
| [Solid Line] | IRRIGATION MAINLINE: PVC CLASS 200 SDR 21 |
| [Dashed Line] | PIPE SLEEVE: PVC CLASS 200 SDR 21 2 SIZES LARGER THAN PIPE WITHIN. |
| [Valve Callout Symbols] | Valve Callout # Valve Number # Valve Flow # Valve Size |



GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.

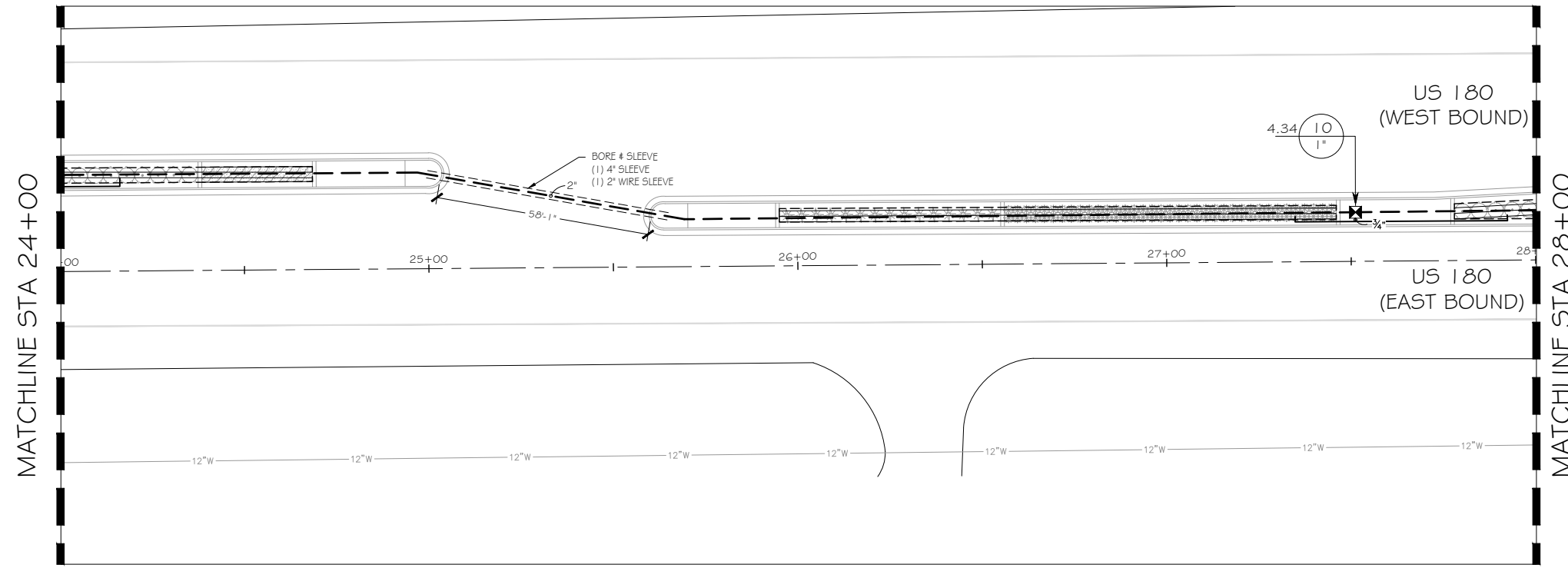
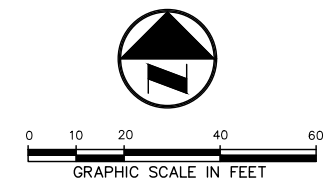


IRRIGATION PLAN
STA 16+00 - STA 24+00

| | | |
|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 057 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

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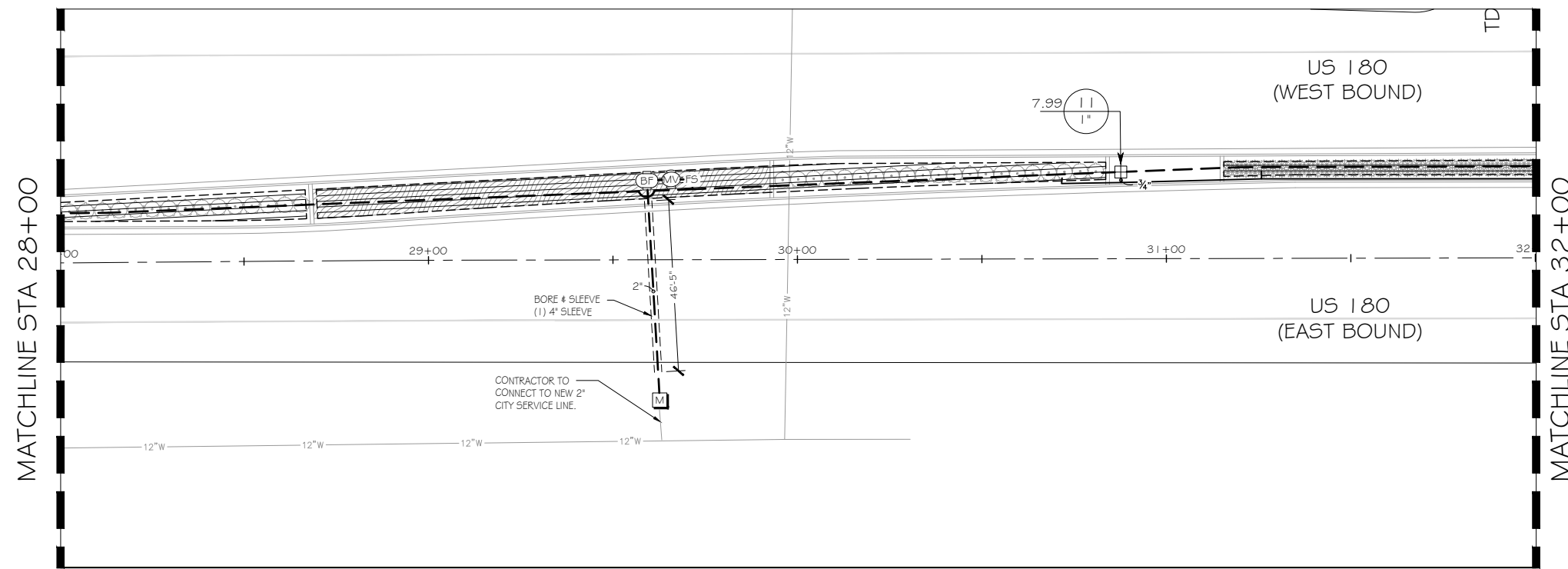


IRRIGATION SCHEDULE

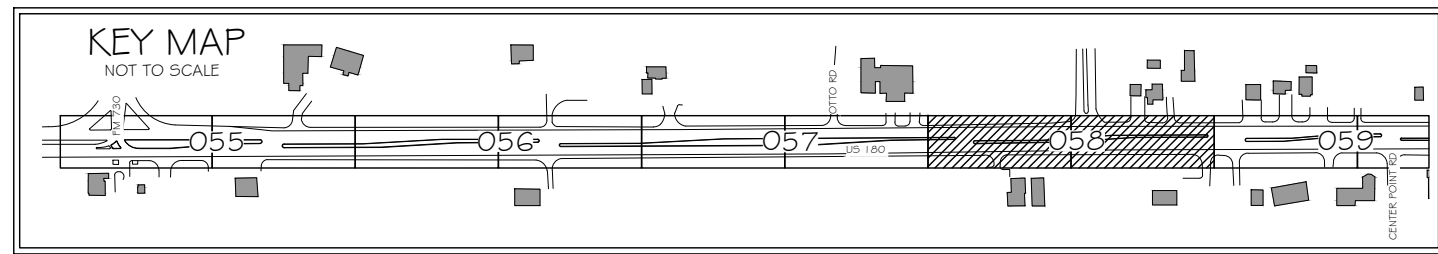
| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION |
|--------|--|
| | RAIN BIRD XCZ-100-PRB-COM WIDE FLOW DRIP CONTROL KIT FOR COMMERCIAL APPLICATIONS. 1" BALL VALVE WITH 1" PESB VALVE AND 1" PRESSURE REGULATING 40PSI QUICK-CHECK BASKET FILTER. 0.3GPM TO 20GPM. |
| | RAIN BIRD OPERIND DRIP SYSTEM OPERATION INDICATOR, STEM RISES 6" FOR CLEAR VISIBILITY WHEN DRIP SYSTEM IS CHARGED TO A MINIMUM OF 20PSI. INCLUDES 16' OF 1/4" DISTRIBUTION TUBING WITH CONNECTION FITTING PRE-INSTALLED. |
| | AREA TO RECEIVE DRIPLINE NETAFIM TLHCVXR-CS-053-18 TECHLINE HCVR-CS PRESSURE COMPENSATING LANDSCAPE DRIPLINE WITH COPPER STRIPE, CHECK VALVE AND ANTI-SIPHON FEATURE. 0.53 GPH EMITTERS AT 18" O.C. DRIPLINE LATERALS SPACED AT 18" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. 1.7MM. |

| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION |
|--------|---|
| | RAIN BIRD PEB-PR5-D 1-1/2" 1", 1-1/2", 2" PLASTIC INDUSTRIAL VALVES. LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION. WITH PRESSURE REGULATOR MODULE. |
| | FEBCO 850 1-1/2" DOUBLE CHECK BACKFLOW PREVENTION, 1/2" TO 2" |
| | RAIN BIRD ESP12LXMEF-LXMM5S WITH (01) ESPLXMSM12 24 STATION COMMERCIAL CONTROLLER. STAINLESS STEEL PEDESTAL. FLOW SENSING. ESP12LXMEF-LXMM5S-LXMM5SPED WITH (01) ESPLXMSM12 |
| | RAIN BIRD WR2-RFC WIRELESS RAIN AND FREEZE SENSOR COMBO. INCLUDES 1 RECEIVER AND 1 RAIN/FREEZE SENSOR TRANSMITTER. |
| | RAIN BIRD FS-150-P 1-1/2" FLOW SENSOR FOR USE WITH RAIN BIRD MAXICOM, SITECONTROL, AND ESP-LXD CENTRAL CONTROL SYSTEMS. PLASTIC (PVC) MODEL. SUGGESTED OPERATING RANGE OF 5.0 GPM TO 100.0 GPM. SENSORS SHOULD BE SIZED FOR FLOW RATHER THAN PIPE SIZE. |
| | WATER METER 2" |
| | IRRIGATION MAINLINE: PVC CLASS 200 SDR 21 |
| | PIPE SLEEVE: PVC CLASS 200 SDR 21 2 SIZES LARGER THAN PIPE WITHIN. |
| | Valve Callout # Valve Number # Valve Flow # Valve Size |

1 STA 24+00 - STA 28+00
1" = 20'-0"



2 STA 28+00 - STA 32+00
1" = 20'-0"

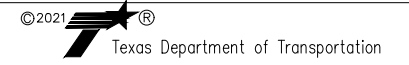


GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.



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TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001

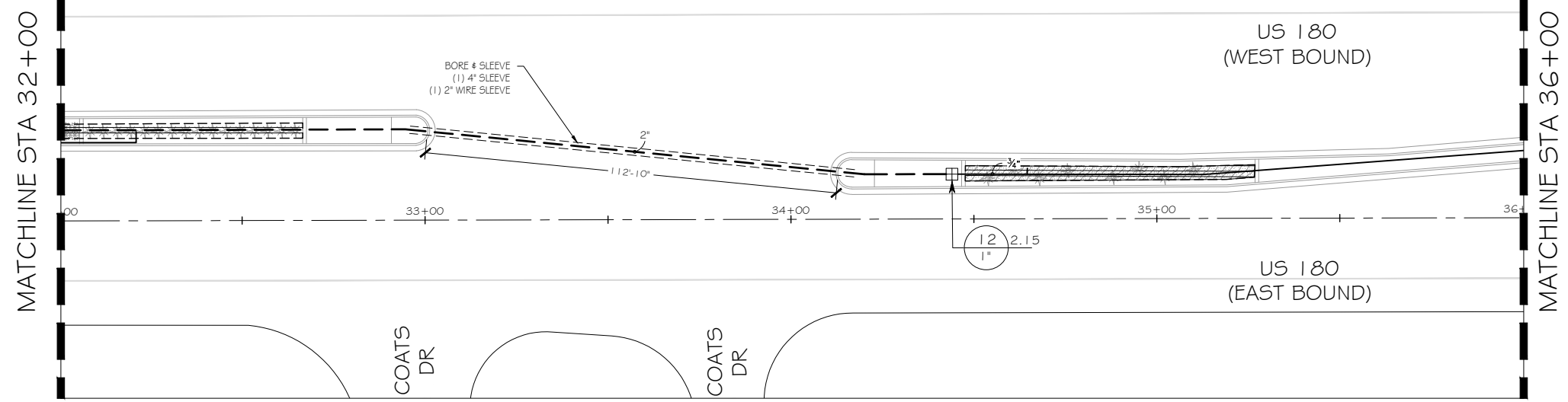
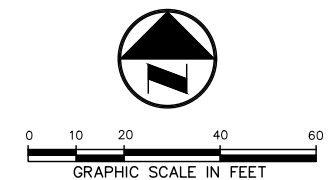


IRRIGATION PLAN
STA 24+00 - STA 32+00

| | | |
|------------------------|--|----------------------|
| FED. RD. DIV. NO. 6 | FEDERAL AID PROJECT NO. F 2022(844) | SHEET NO. 058 |
| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

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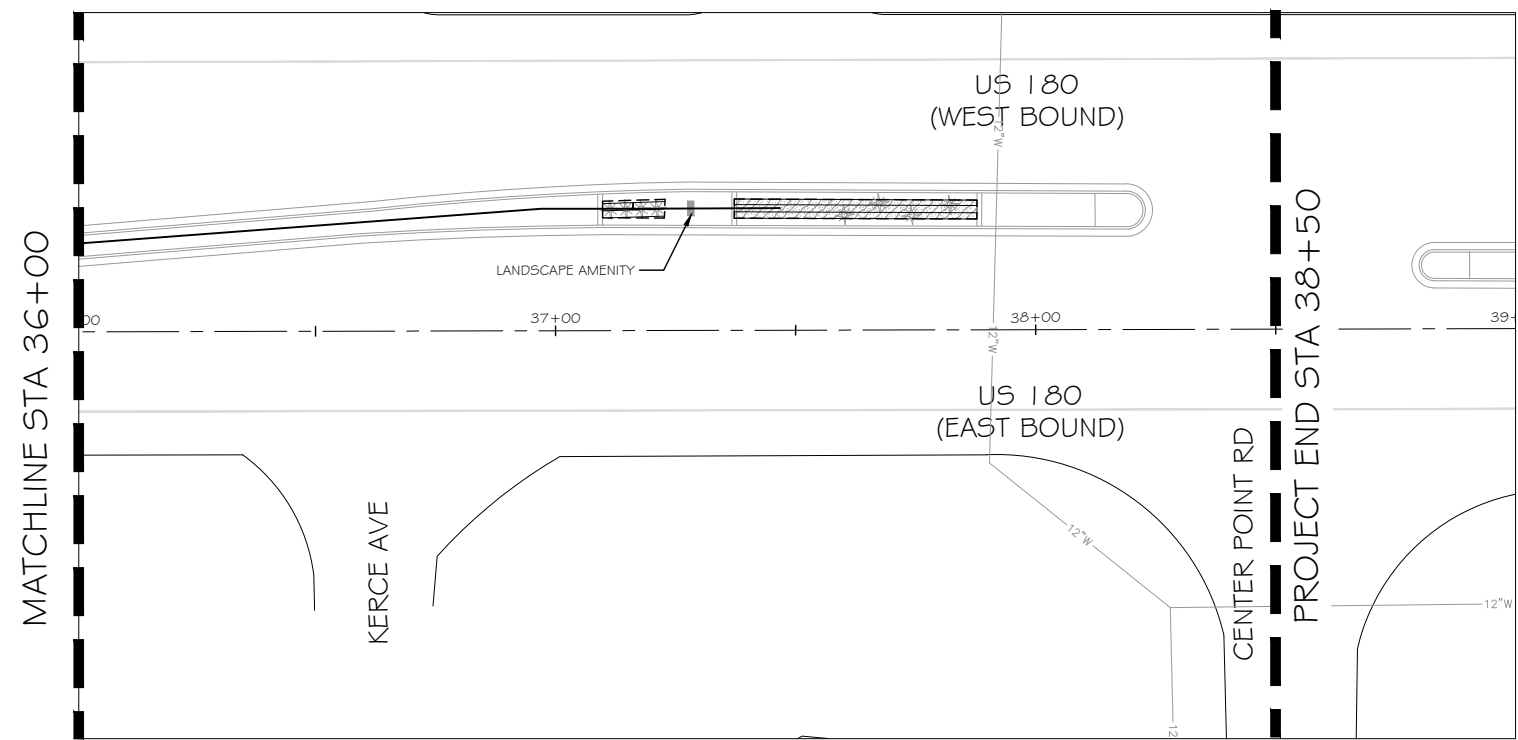


IRRIGATION SCHEDULE

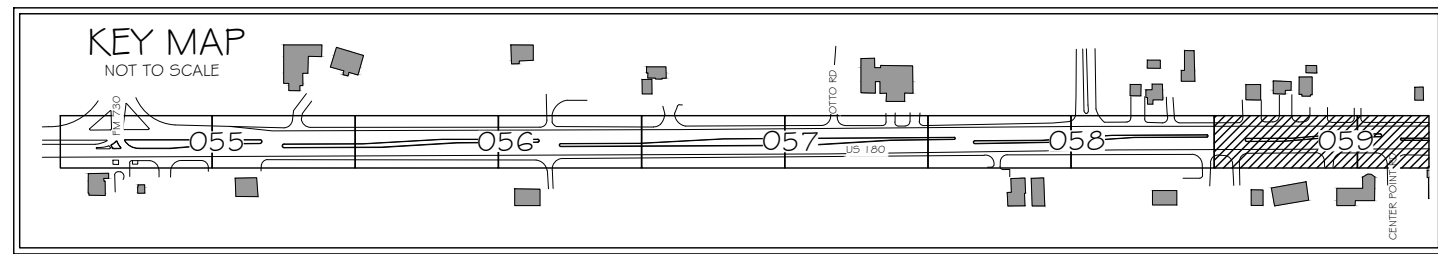
| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION |
|--------|---|
| | RAIN BIRD XZ-100-PRB-COM WIDE FLOW DRIP CONTROL KIT FOR COMMERCIAL APPLICATIONS. 1" BALL VALVE WITH 1" PESB VALVE AND 1" PRESSURE REGULATING 40PSI QUICK-CHECK BASKET FILTER. 0.3GPM TO 20GPM. |
| | RAIN BIRD OPERIND DRIP SYSTEM OPERATION INDICATOR, STEM RISES 6" FOR CLEAR VISIBILITY WHEN DRIP SYSTEM IS CHARGED TO A MINIMUM OF 20PSI. INCLUDES 16' OF 1/4" DISTRIBUTION TUBING WITH CONNECTION FITTING PRE-INSTALLED. |
| | AREA TO RECEIVE DRIPLINE NETAFIM TLHCVXR-CS-053-18 TECHLINE HCVXR-CS PRESSURE COMPENSATING LANDSCAPE DRIPLINE WITH COPPER STRIPE, CHECK VALVE AND ANTI-SIPHON FEATURE. 0.53 GPH EMITTERS AT 18" O.C. DRIPLINE LATERALS SPACED AT 18" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. 1.7MM. |

| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION |
|--------|---|
| | RAIN BIRD PEB-PR5-D 1-1/2" 1", 1-1/2", 2" PLASTIC INDUSTRIAL VALVES. LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION. WITH PRESSURE REGULATOR MODULE. |
| | FEBCO 850 1-1/2" DOUBLE CHECK BACKFLOW PREVENTION, 1/2" TO 2" |
| | RAIN BIRD ESP 12LXMEF-LXMM55 WITH (01) ESPLXMSM 12 24 STATION COMMERCIAL CONTROLLER. STAINLESS STEEL PEDESTAL. FLOW SENSING. ESP 12LXMEF-LXMM55-LXMM55PED WITH (01) ESPLXMSM 12 |
| | RAIN BIRD WR2-RFC WIRELESS RAIN AND FREEZE SENSOR COMBO. INCLUDES 1 RECEIVER AND 1 RAIN/FREEZE SENSOR TRANSMITTER. |
| | RAIN BIRD FS-150-P 1-1/2" FLOW SENSOR FOR USE WITH RAIN BIRD MAXICOM, SITECONTROL, AND ESP-LXD CENTRAL CONTROL SYSTEMS. PLASTIC (PVC) MODEL. SUGGESTED OPERATING RANGE OF 5.0 GPM TO 100.0 GPM. SENSORS SHOULD BE SIZED FOR FLOW RATHER THAN PIPE SIZE. |
| | WATER METER 2" |
| | IRRIGATION MAINLINE: PVC CLASS 200 SDR 21 |
| | PIPE SLEEVE: PVC CLASS 200 SDR 21 2 SIZES LARGER THAN PIPE WITHIN. |
| | Valve Callout # Valve Number # Valve Flow # Valve Size |

1 STA 32+00 - STA 36+00
1" = 20'-0"



2 STA 36+00 - STA 38+50
1" = 20'-0"

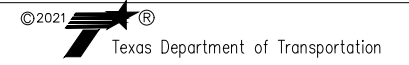


GENERAL NOTES

1. THE ENTIRE LIMITS OF IMPROVEMENTS WERE NOT SURVEYED. ALL LINWORK IS APPROXIMATE AND SHOULD BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. ALL UTILITIES SHOWN ON PLANS ARE APPROXIMATE IN NATURE AND DO NOT RELIEVE THE CONTRACTOR FROM ANY RESPONSIBILITY TO COORDINATE WITH APPROPRIATE AUTHORITIES.
3. CALL TXDOT TRAFFIC MANAGEMENT CENTER (817-370-3661) FOR TXDOT LOCATES WHEN WORKING NEAR EXISTING TXDOT MAINTAINED TRAFFIC SIGNAL AND ITS SYSTEMS.



Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001



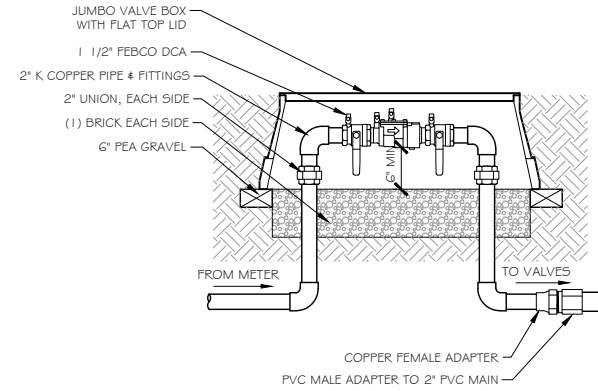
IRRIGATION PLAN STA 32+00 - STA 38+50

| | | |
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| STATE TEXAS | DISTRICT FTW | COUNTY TARRANT |
| CONTROL 0008 | SECTION 03 | JOB 134 |
| | | HIGHWAY NO US 180 |

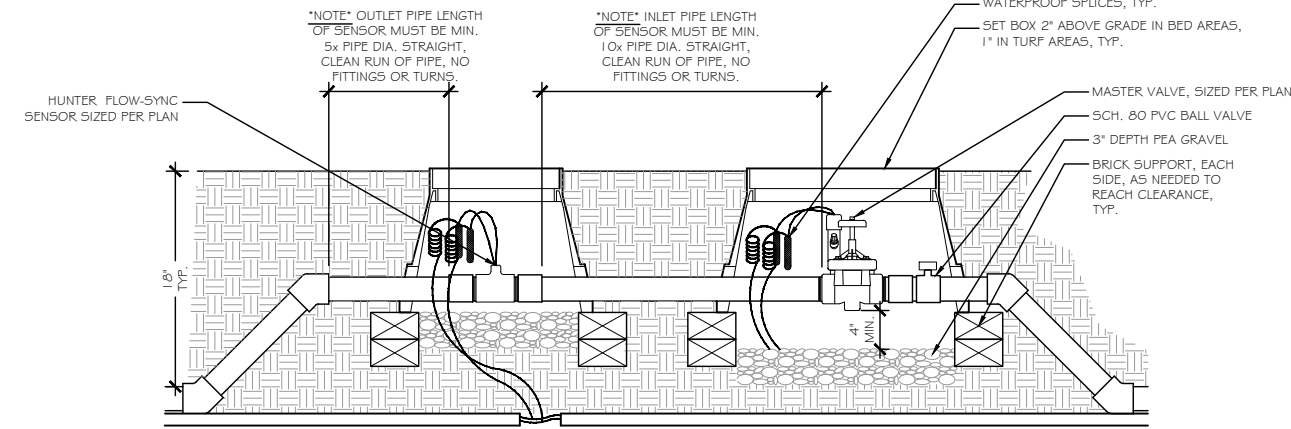
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MAY 2022 - 100% PS&E SUBMITTAL

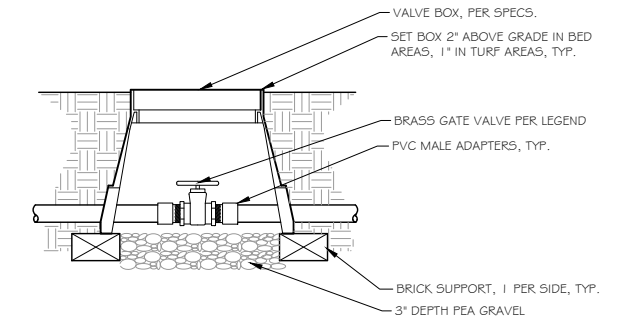
NOTE:
CONTRACTOR SHALL INSTALL Y STRAINER PER TCEQ REQUIREMENTS WITH DCA



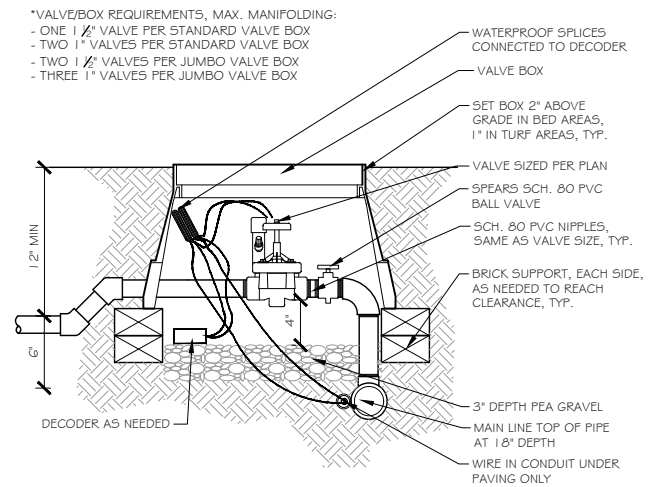
1 DOUBLE CHECK ASSEMBLY
1" = 1'-0"



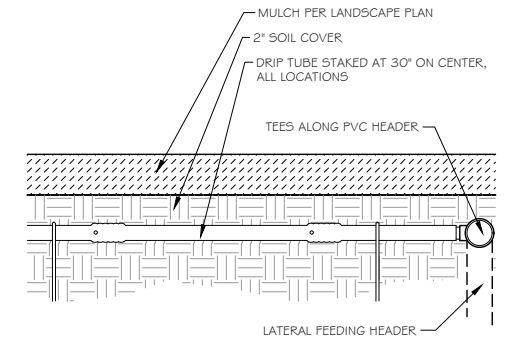
2 MASTER VALVE AND FLOW METER
1 1/2" = 1'-0"



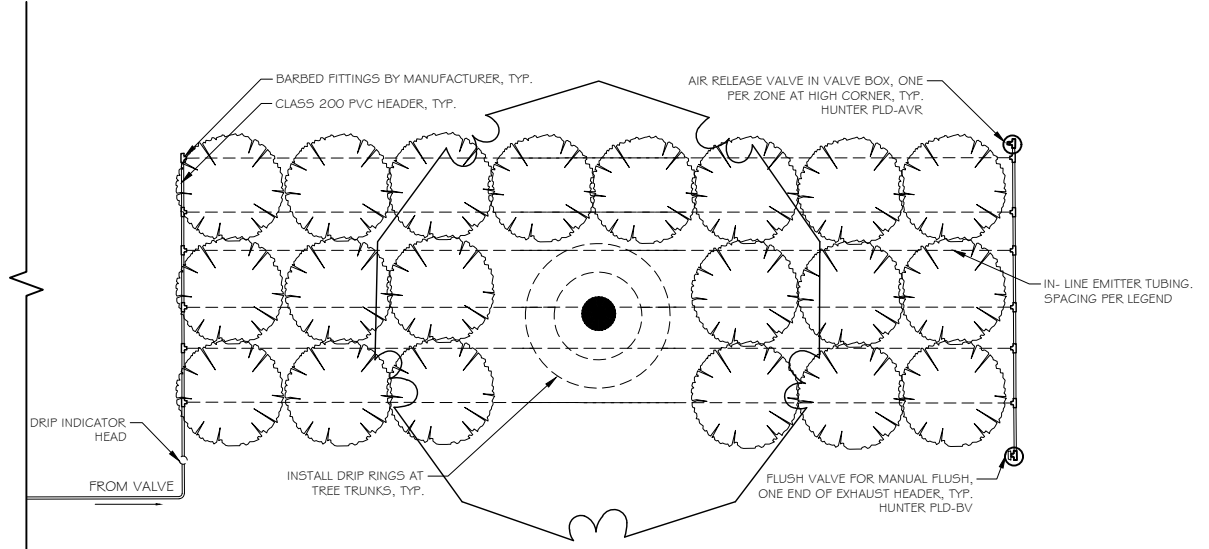
3 BRASS ISOLATION VALVE
1 1/2" = 1'-0"



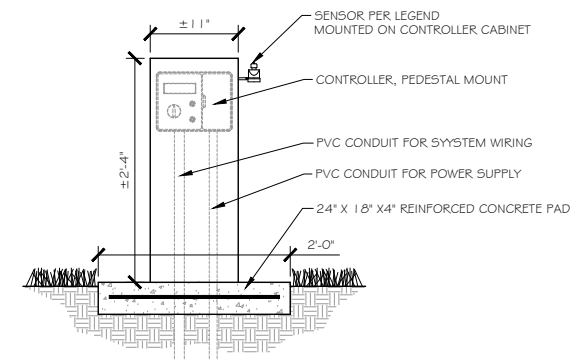
4 AUTOMATIC SYSTEM VALVE WITH DECODER
1 1/2" = 1'-0"



5 DRIP TUBE INSTALLATION - AT GRADE
3" = 1'-0"



6 DRIP ZONE TYPICAL ENLARGEMENT
3/8" = 1'-0"



7 IRRIGATION CONTROLLER & SENSOR
1" = 1'-0"

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Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001

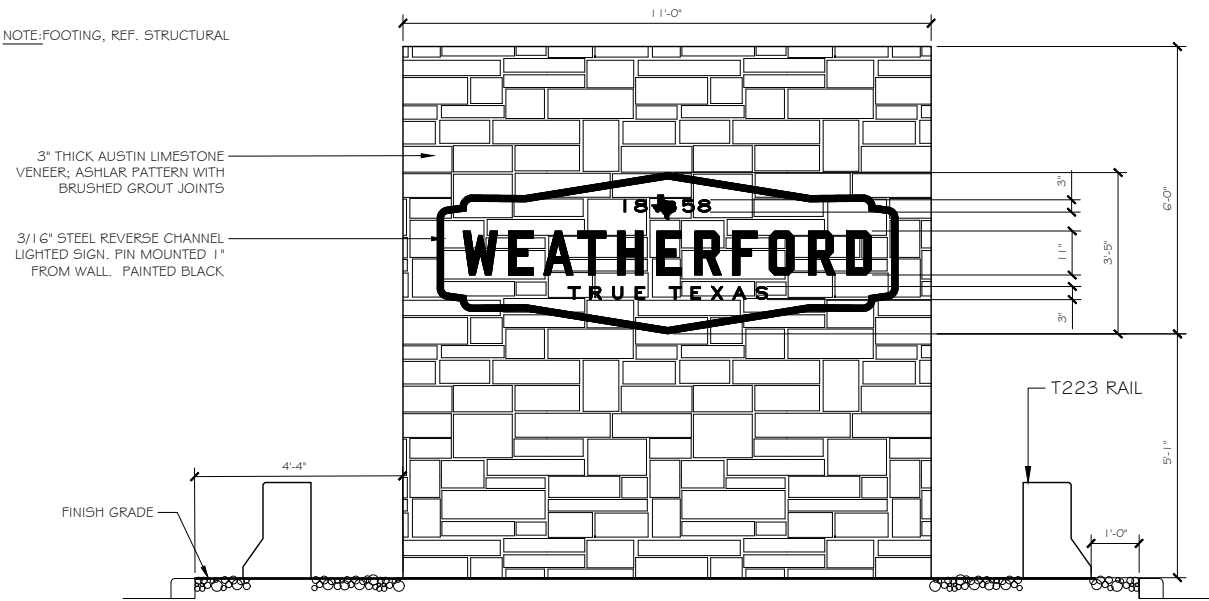
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IRRIGATION DETAILS
STA 01+00 - STA 08+00

| | | |
|-------------------|-------------------------|------------|
| FED. RD. DIV. NO. | FEDERAL AID PROJECT NO. | SHEET NO. |
| 6 | F 2022(844) | 060 |
| STATE | DISTRICT | COUNTY |
| TEXAS | FTW | TARRANT |
| CONTROL | SECTION | JOB |
| 0008 | 03 | 134 |
| | | HIGHWAY NO |
| | | US 180 |

MAY 2022 - 100% PS&E SUBMITTAL

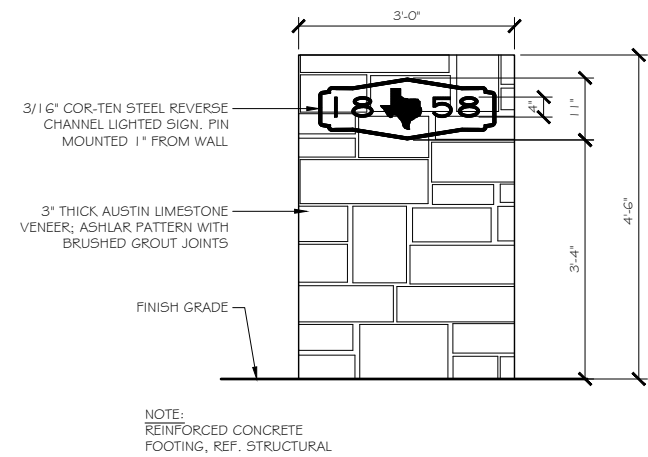
NOTE: FOOTING, REF. STRUCTURAL



1 LARGE LANDSCAPE AMENITY ELEVATION - 11'

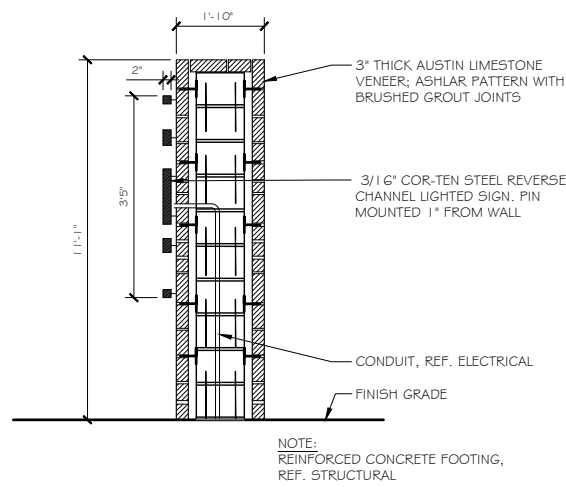
1/2" = 1'-0"

P-GR-WEA-97



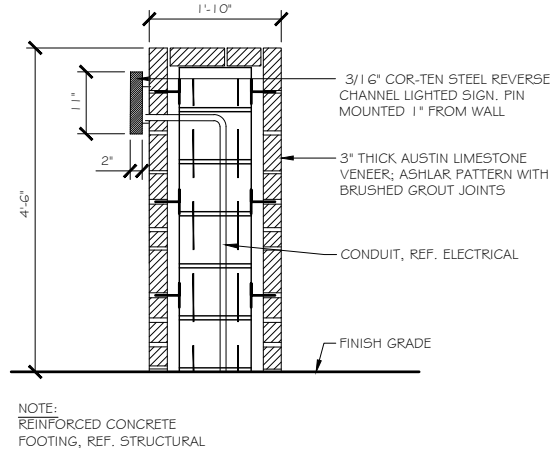
2 SMALL LANDSCAPE AMENITY ELEVATION

3/4" = 1'-0"



3 LARGE LANDSCAPE AMENITY SECTION

N.T.S.



4 SMALL LANDSCAPE AMENITY SECTION

3/4" = 1'-0"

LANDSCAPE AMENITY & T223 RAIL
FUTURE, NOT IN CONTRACT

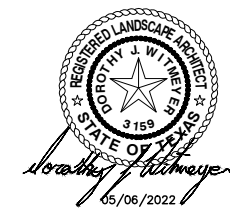
SHOWN FOR COORDINATION
PURPOSES ONLY

Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX REG. SURVEYING FIRM LS-10008001

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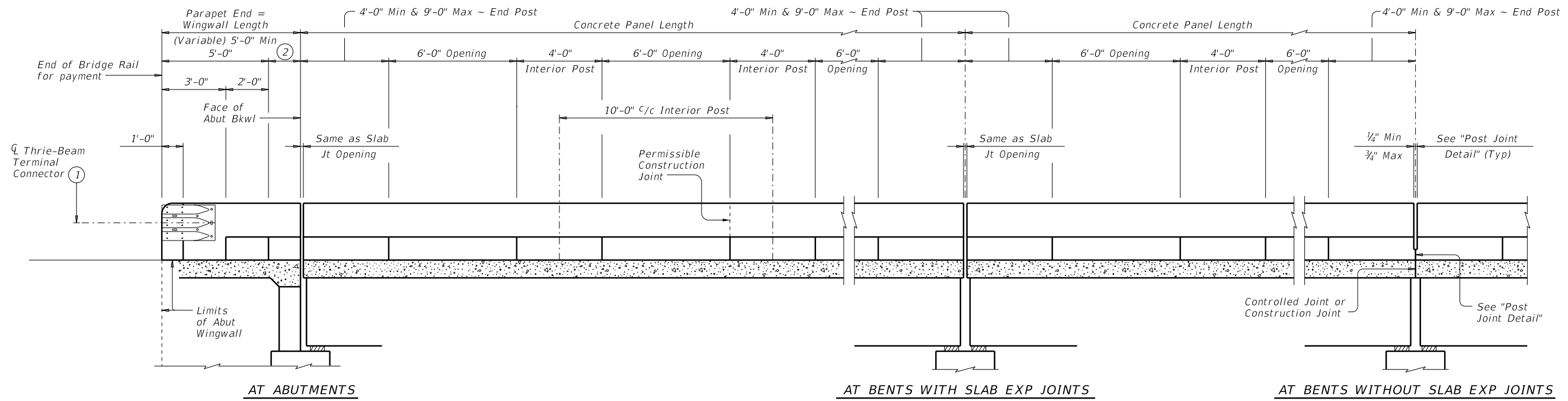
LANDSCAPE AMENITY DETAILS

| | | | |
|-------------------|-------------------------|-----------|------------|
| FED. RD. DIV. NO. | FEDERAL AID PROJECT NO. | SHEET NO. | |
| 6 | F 2022(844) | 060 | |
| STATE | DISTRICT | COUNTY | |
| TEXAS | FTW | TARRANT | |
| CONTROL | SECTION | JOB | HIGHWAY NO |
| 0008 | 03 | 134 | US 180 |

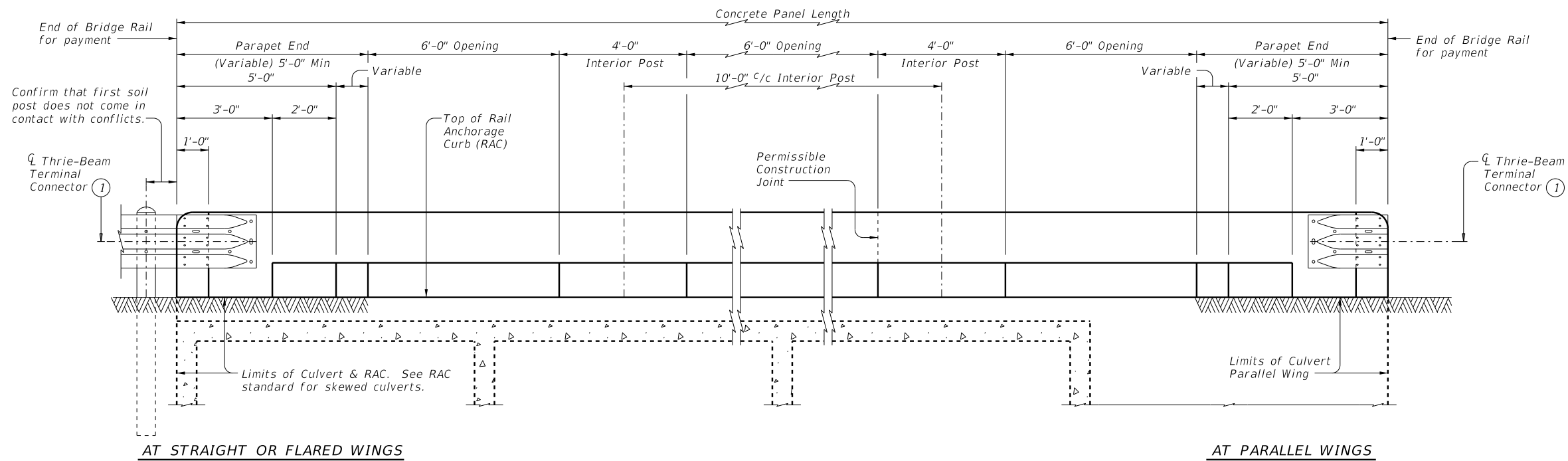


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DATE:
FILE:



ROADWAY ELEVATION OF RAIL ON BRIDGE



ROADWAY ELEVATION OF RAIL ON BOX CULVERTS

Showing 0° skew culvert. Skewed culverts similar. See RAC standard for details not shown. Vertical joints in concrete rail are not required, unless shown elsewhere.

- ① Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- ② Wingwall Length minus 5'-0" (Varies)

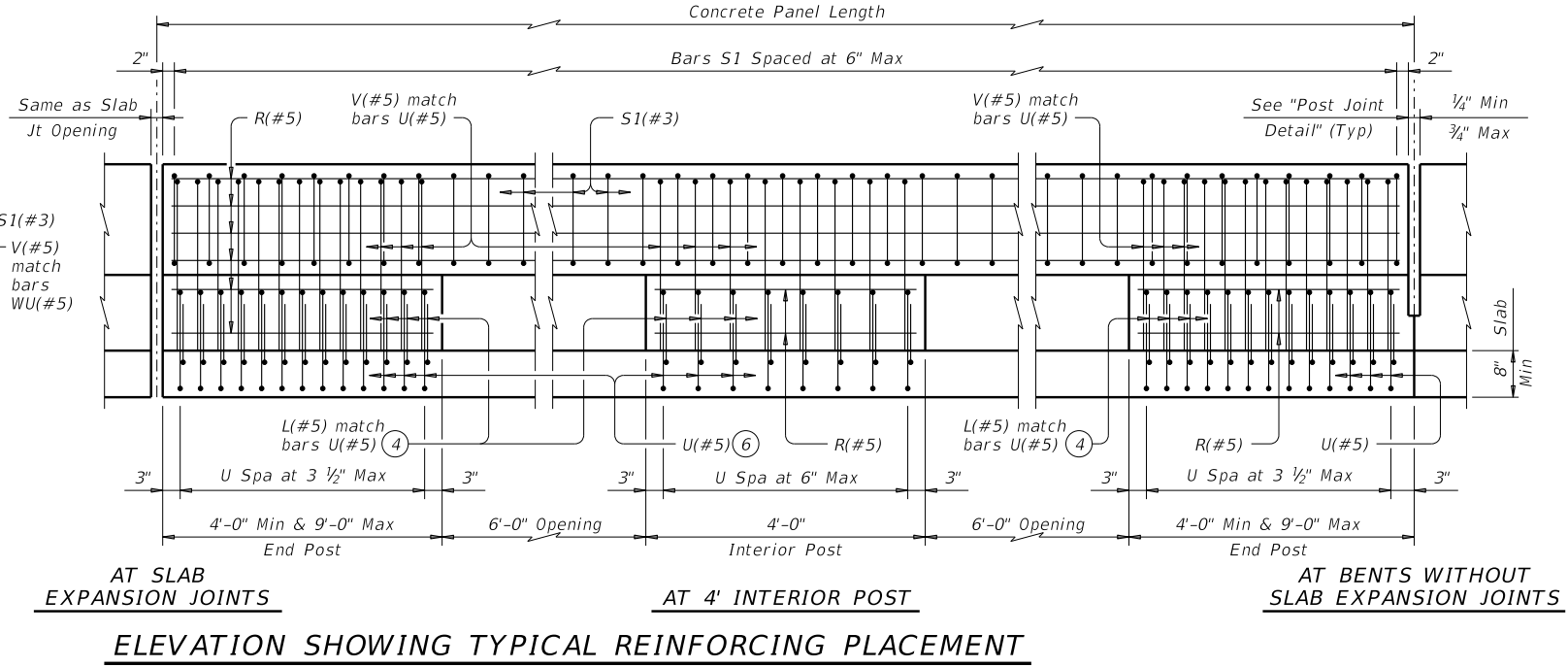
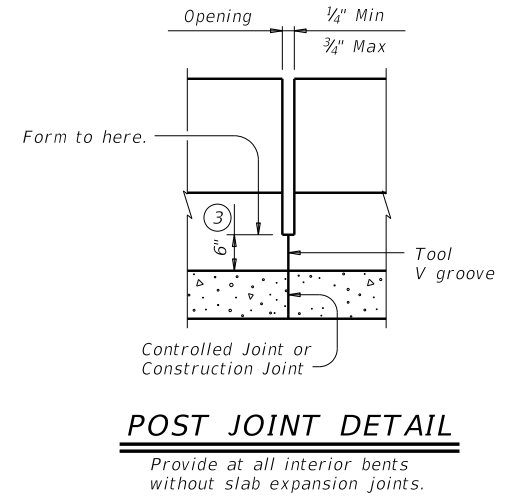
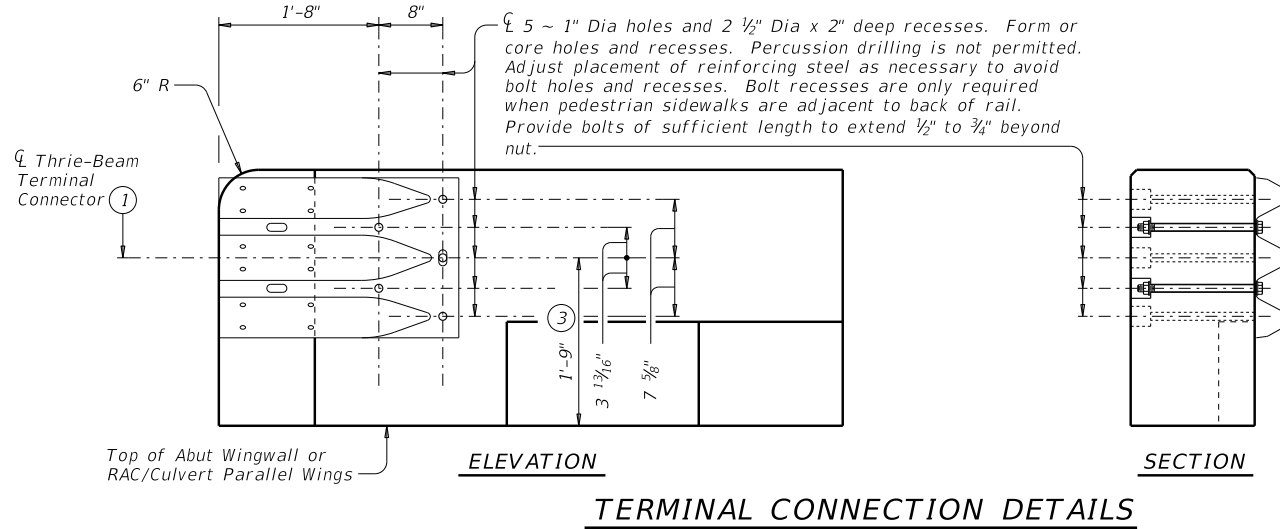
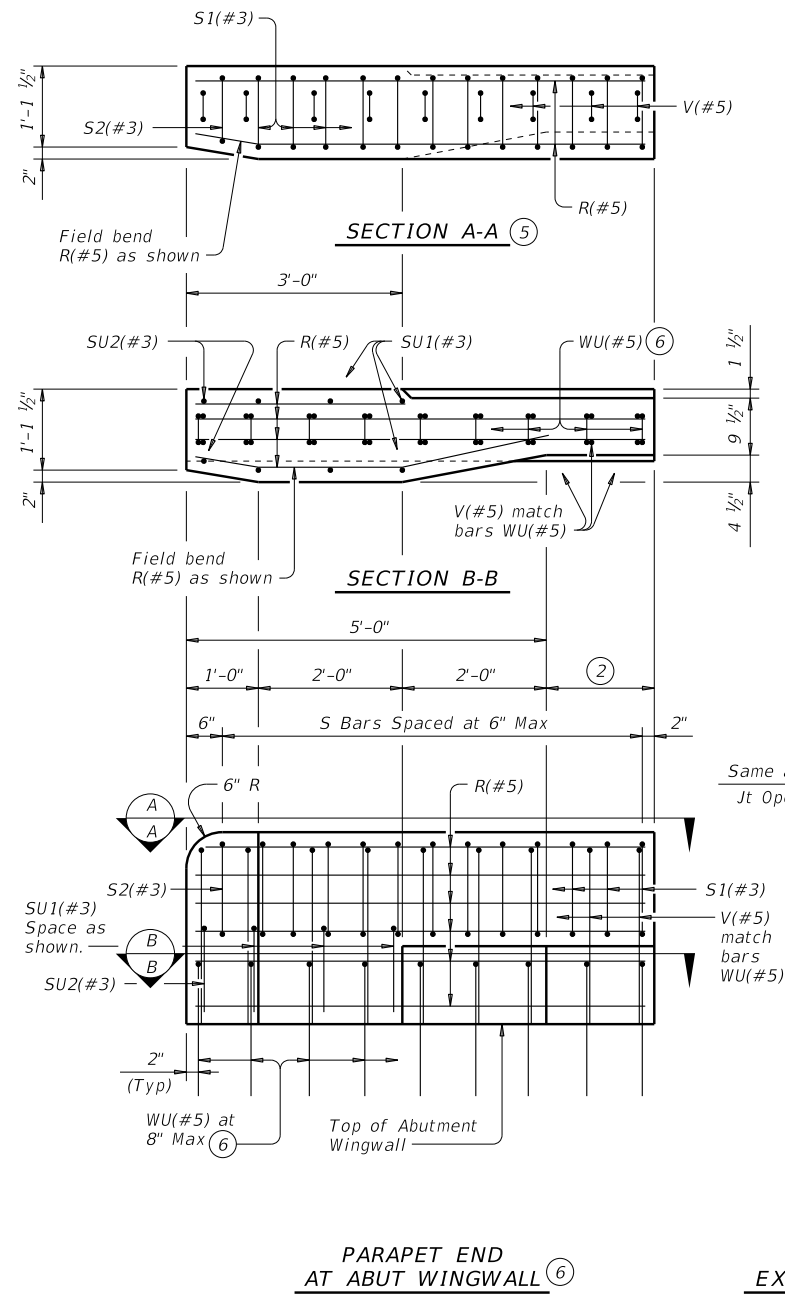
TRAFFIC RAIL

TYPE T223

| | | | | |
|-----------------------|-----------|-----------|-----------|---------|
| FILE: r1std005-19.dgn | DN: TxDOT | CK: TxDOT | DW: JTR | CK: AES |
| ©TxDOT September 2019 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | 0008 | 03 | 134 | US 180 |
| | DIST | COUNTY | SHEET NO. | |
| | FTW | PARKER | 061 | |

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DATE:
FILE:



- ① Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- ② Wingwall Length minus 5'-0" (Varies)
- ③ Increase 2" for structures with overlay.
- ④ Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.
- ⑤ Bars SU1(#3), SU2(#3) and WU(#5) not shown for clarity.
- ⑥ Substitute Bars U(#5) for Bars WU(#5) when parapeet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

SHEET 2 OF 3

Texas Department of Transportation
Bridge Division Standard

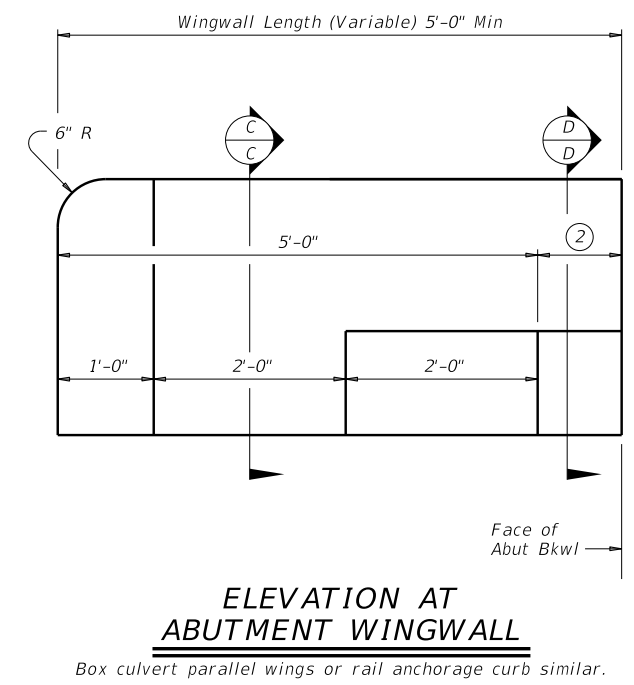
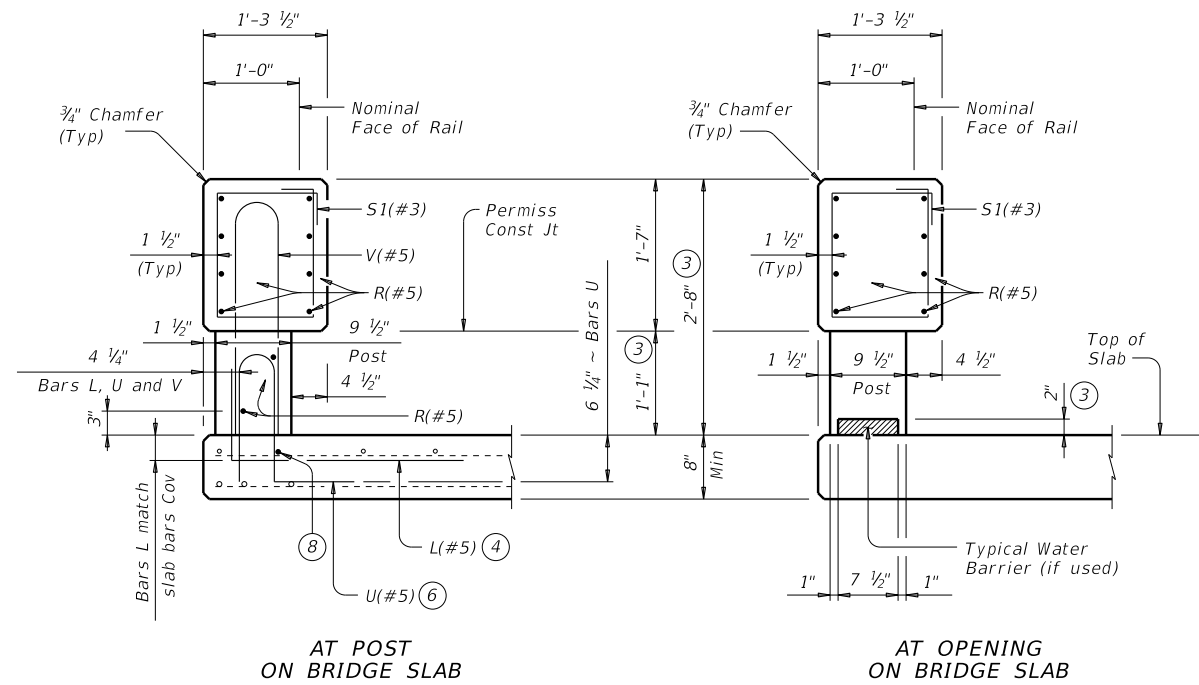
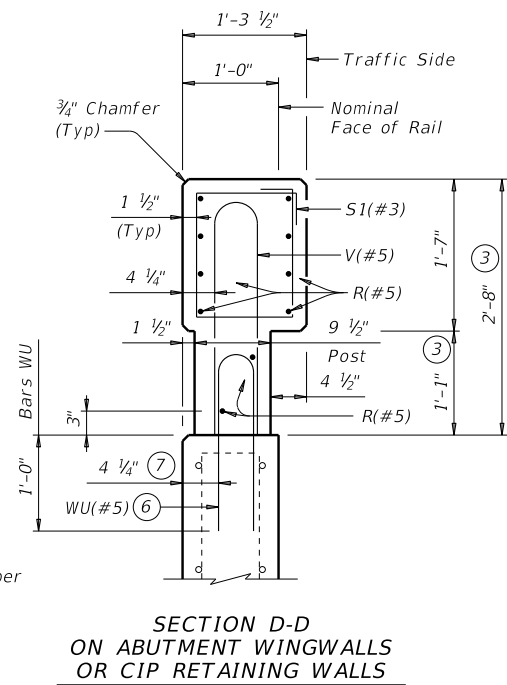
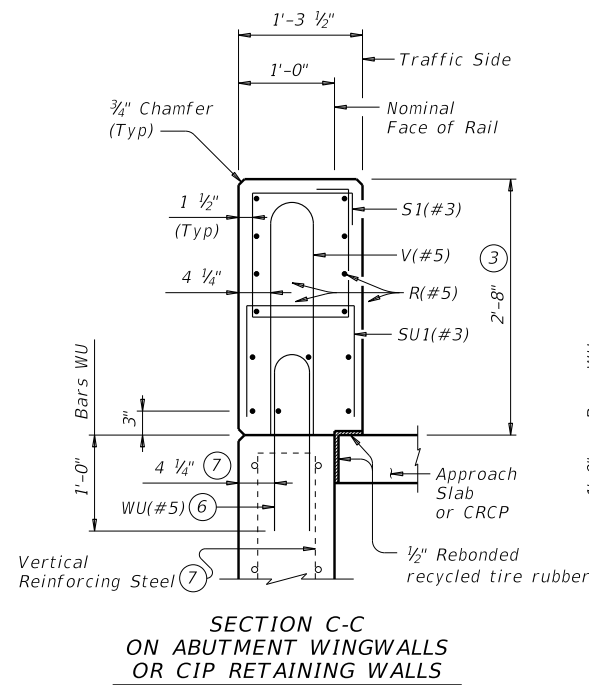
TRAFFIC RAIL

TYPE T223

| | | | | |
|-----------------------|-----------|-----------|-----------|---------|
| FILE: r1std005-19.dgn | DN: TxDOT | CK: TxDOT | DW: JTR | CK: AES |
| ©TxDOT September 2019 | CONT | SECT | JOB | HIGHWAY |
| REVISIONS | 0008 | 03 | 134 | US 180 |
| | DIST | COUNTY | SHEET NO. | |
| | FTW | PARKER | 062 | |

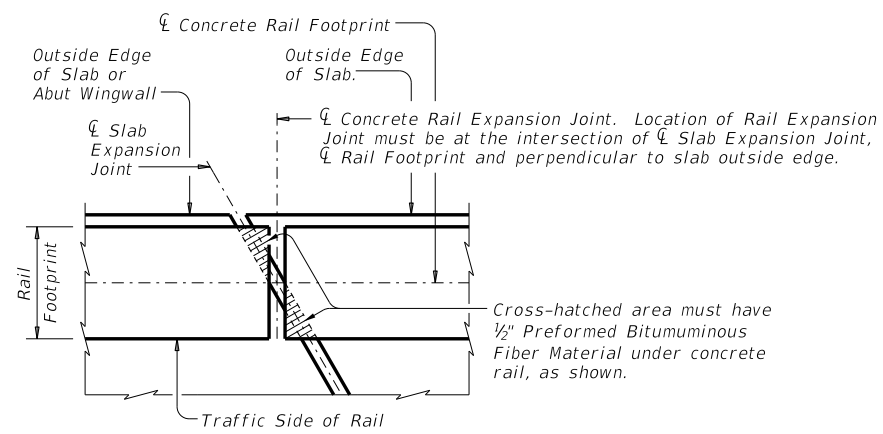
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: FILE:



SECTIONS THRU RAIL
Sections on box culverts similar.

- ② Wingwall Length minus 5'-0" (Varies)
- ③ Increase 2" for structures with overlay.
- ④ Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.
- ⑥ Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.
- ⑦ When vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls on traffic side of wall, move the horizontal wingwall/retaining wall reinforcing to the inside of Bars WU where bars conflict.
- ⑧ Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.
- ⑨ At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5 1/4" above the roadway surface without overlay.



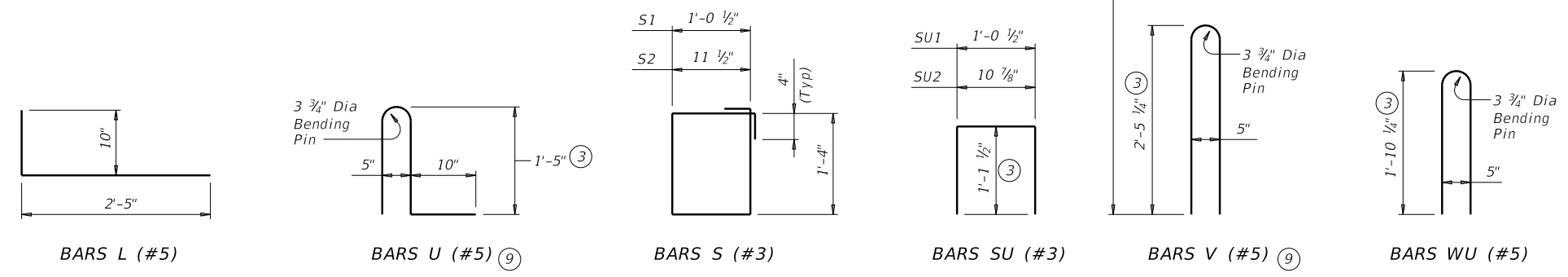
PLAN OF RAIL AT EXPANSION JOINTS
Example showing Slab Expansion Joints without breakbacks.

CONSTRUCTION NOTES:
Face of rail and parapet must be vertical transversely unless otherwise shown in the plans or approved by the Engineer.
Provide water barriers at openings draining onto undercrossing roadways and sidewalks. They may be cast-in-place or precast in convenient lengths and bonded to the bridge deck with an approved epoxy cement.
Chamfer all exposed corners.

MATERIAL NOTES:
Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.
Provide Grade 60 reinforcing steel.
Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.
Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U, V, and WU unless noted otherwise. Provide the same laps as required for reinforcing bars.
Provide bar laps, where required, as follows:
Uncoated or galvanized ~ #5 = 2'-0"
Epoxy coated ~ #5 = 3'-0"

GENERAL NOTES:
This rail has been evaluated by full-scale crash test to meet MASH TL-3 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.
Do not use this railing on bridges with expansion joints providing more than 5" movement.
Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.
Shop drawings are not required for this rail.
Average weight of railing with no overlay is 358 plf.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

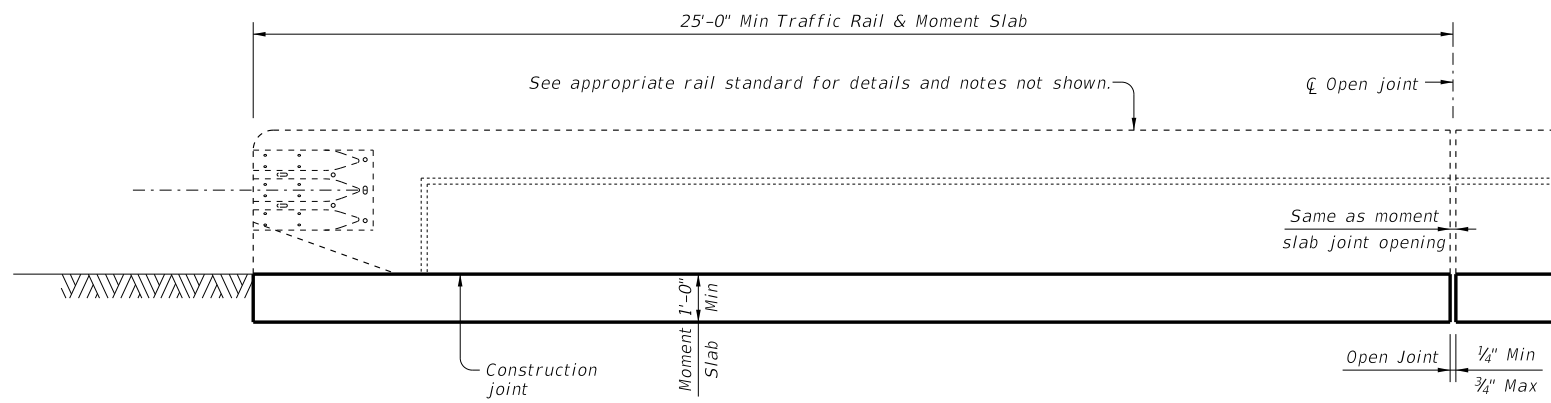


SHEET 3 OF 3

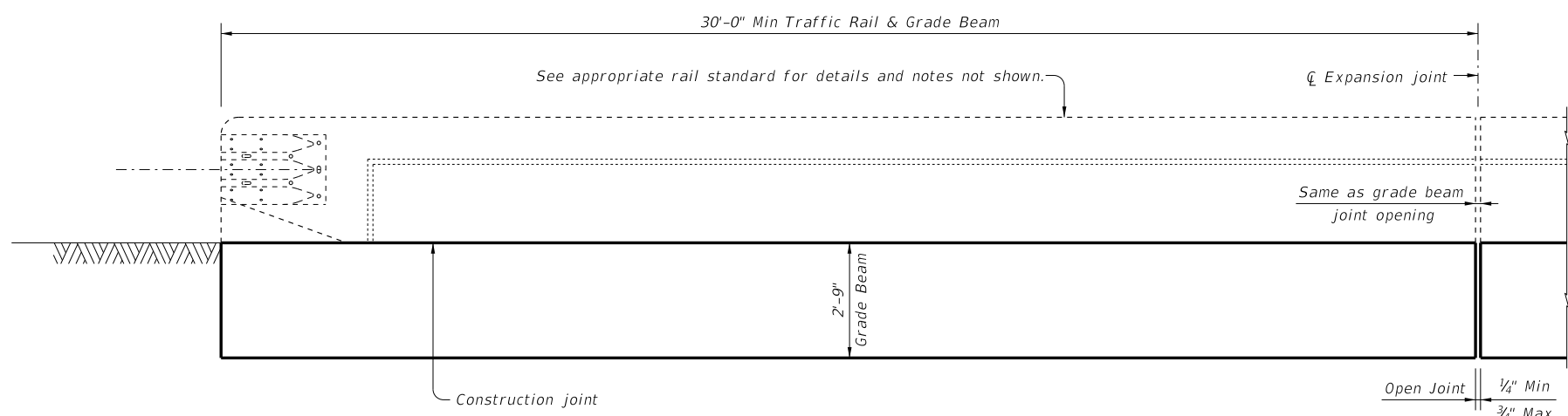
| | | | |
|-----------------------|----------------|---------------------------------|-----------------|
| | | Bridge Division Standard | |
| <h1>TRAFFIC RAIL</h1> | | | |
| <h2>TYPE T223</h2> | | | |
| FILE: r1std005-19.dgn | DN: TxDOT | CK: TxDOT | DW: JTR |
| CON: 0008 | SECT: 03 | JOB: 134 | HIGHWAY: US 180 |
| DIST: FTW | COUNTY: PARKER | SHEET NO. 063 | |

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DATE: FILE:

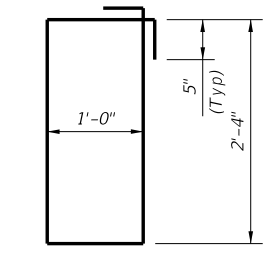


ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)
 (Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)

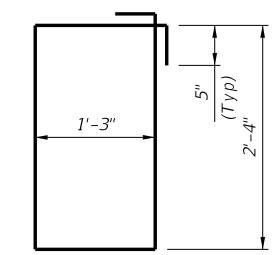


ROADWAY ELEVATION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)
 (Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)

- ① See applicable bridge rail standard.
- ② MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 1/2" longitudinally from outside edge of moment slab).
- ③ Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.
- ④ S1(#4) or S2(#4) spaced longitudinally along grade beam at 8" Max. (Spaced 2 1/2" longitudinally from outside edge of grade beam).
- ⑤ Use bar S1(#4) with 1'-4" grade beam width and bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS. Approximate grade beam concrete = 0.14 CY/LF and reinforcement = 13.8 LB/LF. Use bar S2(#4) with 1'-7" grade beam width and bridge rail types: T66 and C66. Approximate grade beam concrete = 0.16 CY/LF and reinforcement = 14.2 LB/LF.
- ⑥ 1'-6" for bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS. 1'-9" bridge rail types: T66 and C66.
- ⑦ Modify reinforcing on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically into traffic rail



BARS S1(#4)



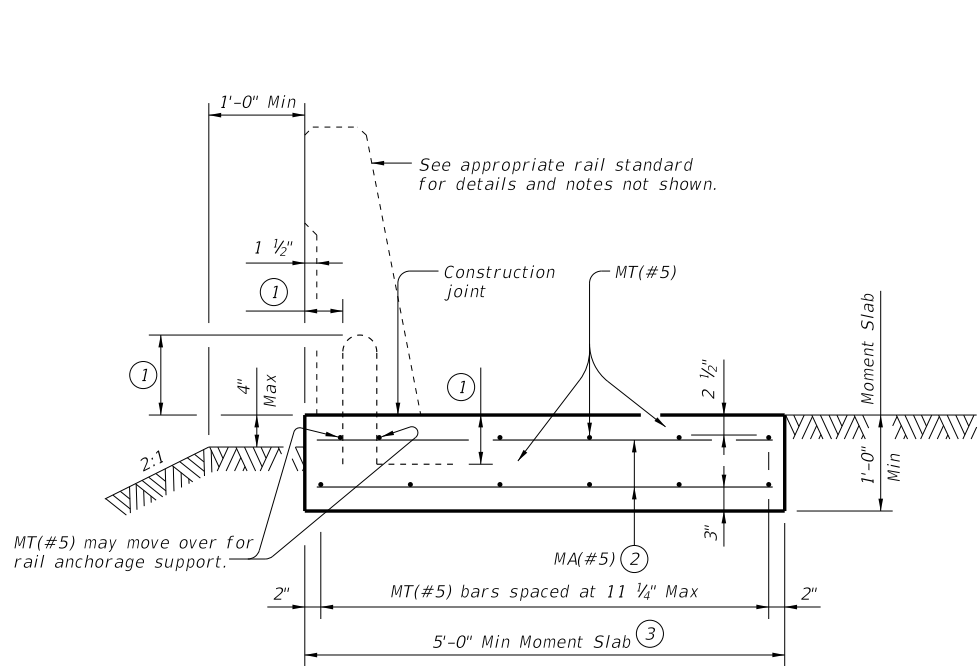
BARS S2(#4)

CONSTRUCTION NOTES:
 Align moment slab (TRF-MS) or grade beam (TRF-GB) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) or grade beam (TRF-GB) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

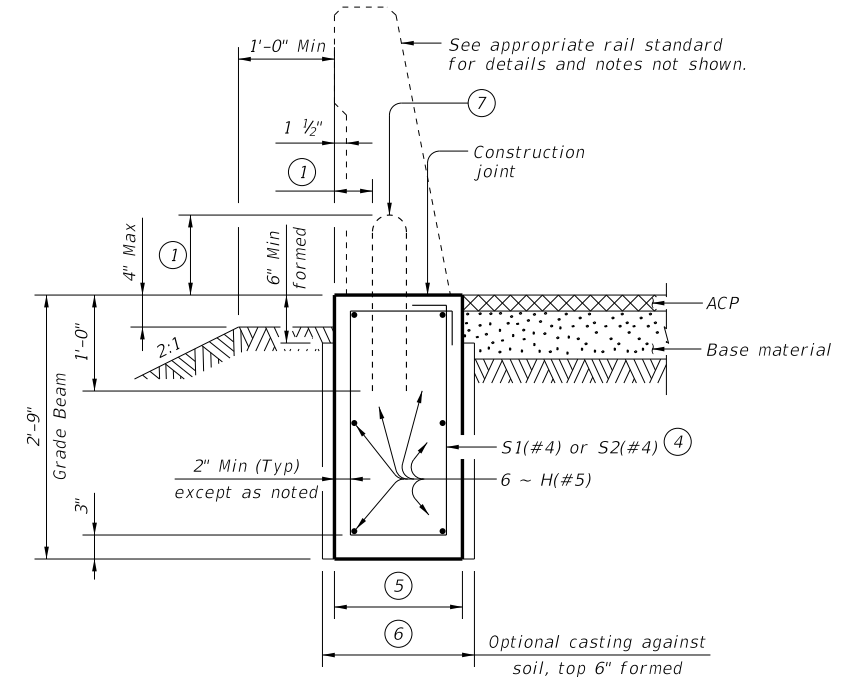
MATERIAL NOTES:
 Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.
 Provide Grade 60 reinforcing steel.
 Epoxy coat or galvanize all reinforcing steel if required elsewhere.
 Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for bars S1(#4), S2(#4) and H(#5) unless noted otherwise. Provide the same laps as required for reinforcing bars.
 Provide bar laps, where required, as follows:
 Uncoated or galvanized ~ #5 = 2'-4"
 Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:
 Use of these details will result in a moment slab (TRF-MS) or grade beam (TRF-GB) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.
 See elsewhere in the plans for selected options between moment slab (TRF-MS) and/or grade beam (TRF-GB).
 The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.
 See appropriate rail standard for details and notes not shown. This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.
 Payment for moment slab (TRF-MS) and/or grade beam (TRF-GB) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.
 The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.
 Excavation will be subsidiary to other items.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.



SECTION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)
 (Showing SSTR rail other rails are similar.)



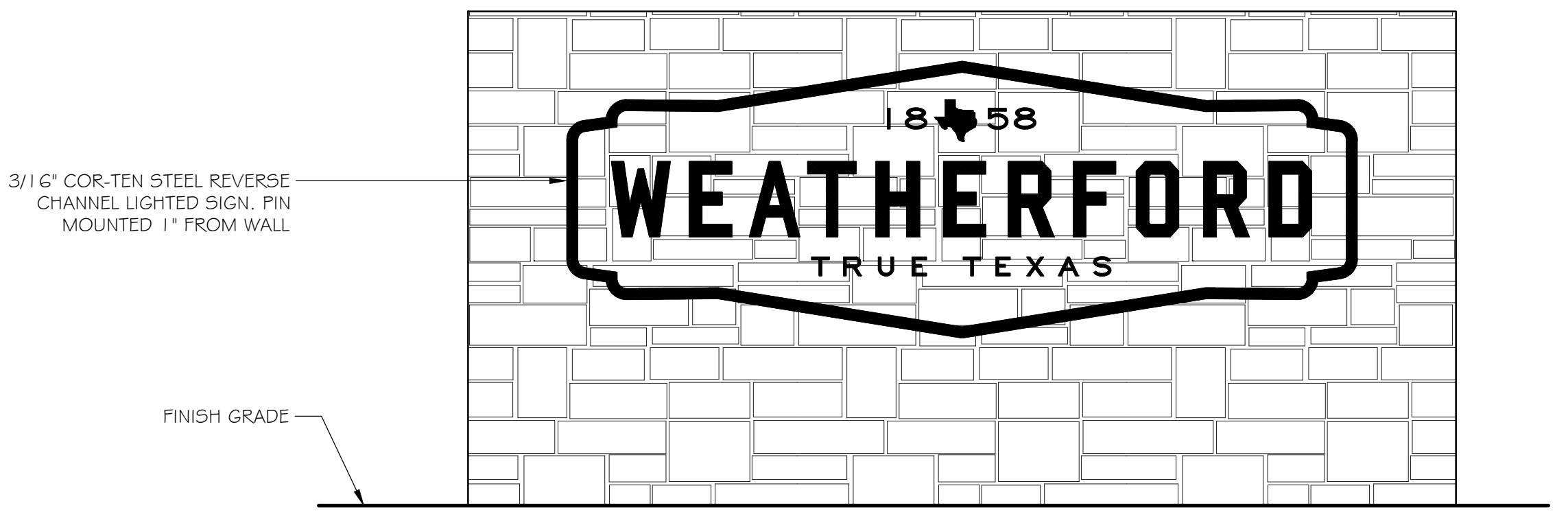
SECTION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)
 (Showing SSTR rail other rails are similar.)

| | | | |
|---|-----------|---------------------------------|---------|
| | | Bridge Division Standard | |
| TRAFFIC RAIL FOUNDATIONS FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS | | | |
| TRF | | | |
| FILE: r1std027-20.dgn | DN: TxDOT | CK: TAR | DW: JTR |
| REVISIONS | CONTRACT | SECTION | JOB |
| 07-20: Added moment slab with rail foundation lengths. | 0008 | 03 | 134 |
| DIST | COUNTY | SHEET NO. | |
| FTW | PARKER | 064 | |

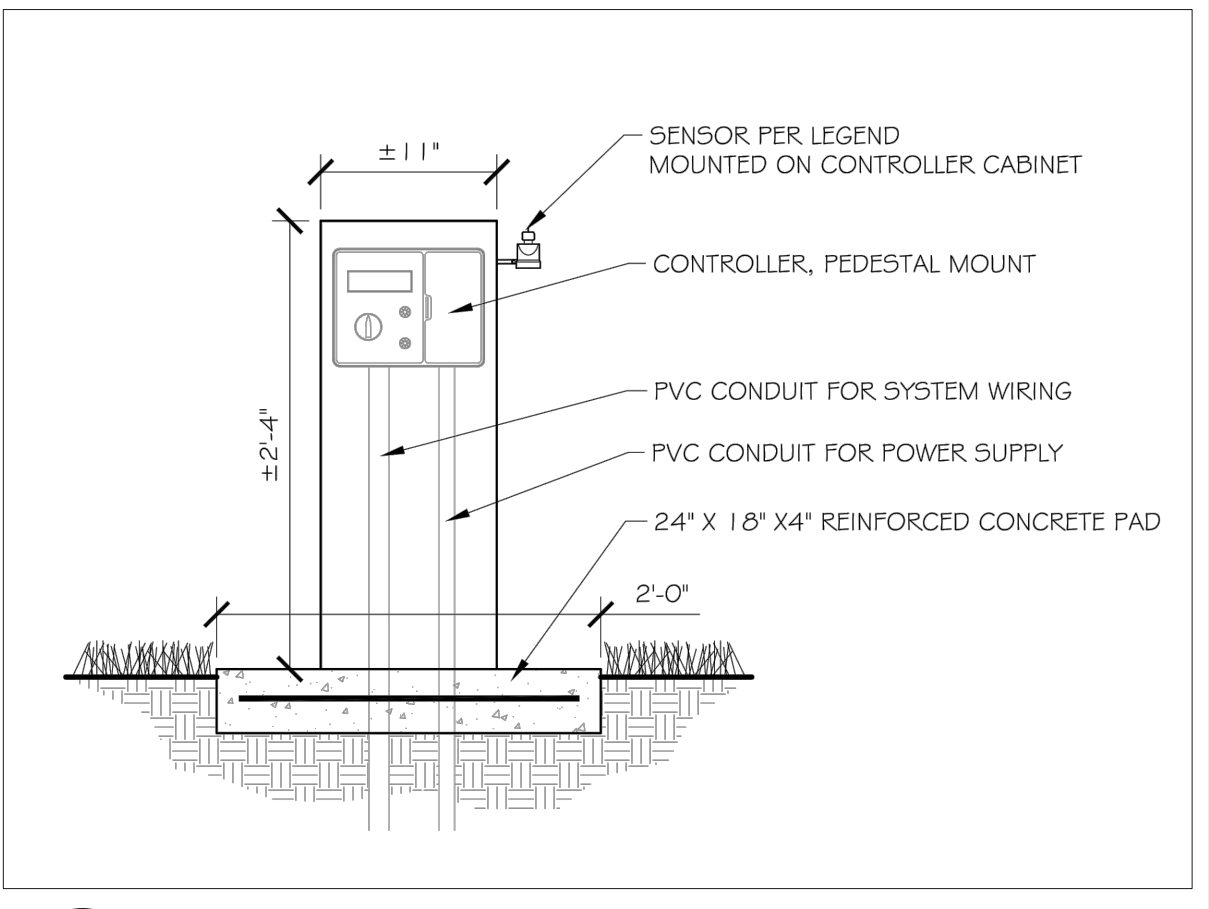
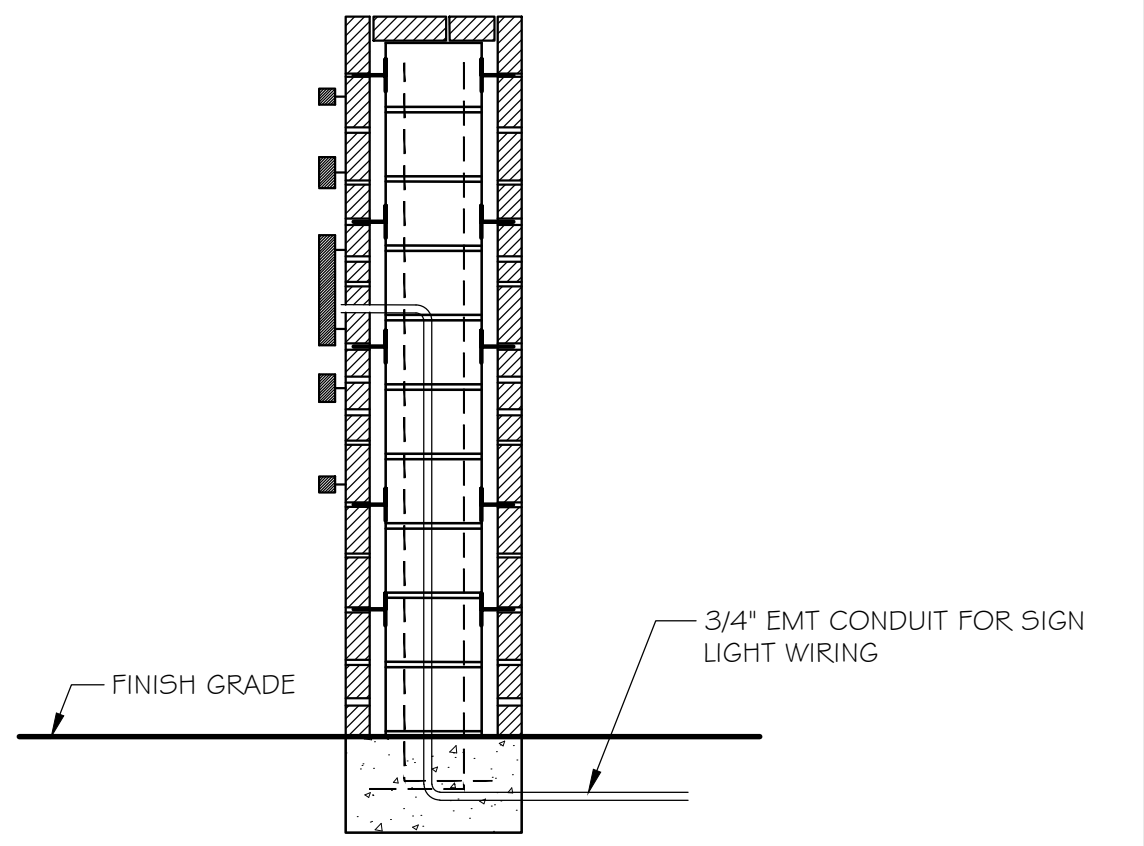
ELECTRICAL SYMBOL LEGEND

| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|--------|--|----------------------|---|
| \$ | WALL SWITCH S.P.S.T. MNTD. 48" AFF UNLESS NOTED | SD | DUCT SMOKE DETECTOR |
| \$o | WALL SWITCH; LETTER DENOTES FIXTURE CONTROLLED | HD | HEAT DETECTOR |
| \$3 | 3-WAY WALL SWITCH MNTD. 48" AFF UNLESS NOTED | FS | FLOW SWITCH APPLIED TO FIRE SPRINKLER LINE |
| \$M | 120V MANUAL MOTOR STARTER w/ OVERLOAD HEATER | TS | TAPER SWITCH APPLIED TO FIRE SPRINKLER LINE |
| \$P | WALL SWITCH WITH PILOT LIGHT MNTD. 48" AFF UNLESS NOTED | F | FIRE ALARM PULL STATION NOM. MNTD. 48" AFF PER ADA |
| \$D | WALL DIMMER SWITCH MNTD. 48" AFF UNLESS NOTED | FV | FIRE ALARM VISUAL STATION (STROBE) MNTD. 80" AFF PER ADA |
| \$L | LOW VOLTAGE SWITCH MNTD. 48" AFF UNLESS NOTED [PROVIDE POWER PACKS FOR COMPLETE SYSTEM] | FV2 | FIRE ALARM AUDIO/VISUAL STATION (HORN/STROBE) MNTD. 80" AFF PER ADA |
| \$os | LOW VOLTAGE SWITCH WITH OCCUPANCY SENSOR (AUTO ON / AUTO OFF); MNTD. 48" AFF UNLESS NOTED [PROVIDE POWER PACKS FOR COMPLETE SYSTEM] | FACP | FIRE ALARM CONTROL PANEL |
| \$vs | LOW VOLTAGE SWITCH WITH VACANCY SENSOR (MANUAL ON / AUTO OFF); MNTD. 48" AFF UNLESS NOTED [PROVIDE POWER PACKS FOR COMPLETE SYSTEM] | ANN | ANNUNCIATOR |
| OS | CEILING MOUNTED OCCUPANCY SENSOR; 180° COVERAGE UNLESS NOTED | DP | DISTRIBUTION PANEL LOCATION |
| VS | CEILING MOUNTED VACANCY SENSOR; 180° COVERAGE UNLESS NOTED | LP | LIGHTING/POWER PANEL LOCATION |
| RR | CEILING MOUNTED 2-POLE OCCUPANCY SENSOR w/ 360° DEGREE FIELD OF VISION. | TB | TELEPHONE PANEL BACKBOARD |
| ▽ | COMPUTER/DATA JACK IN 2x4 BOX WITH FACEPLATE AND 3/4" CONDUIT TO ACCESSIBLE CEILING WITH PULL STRING [(1) DATA JACK UNLESS NOTED] | TR | TRANSFORMER |
| ▽ | PHONE/VOICE JACK IN 2x4 BOX WITH FACEPLATE AND 3/4" CONDUIT TO ACCESSIBLE CEILING WITH PULL STRING [(1) VOICE JACK UNLESS NOTED] | ⊕ | MOTOR LOCATION - NUMBER INSIDE DENOTES HORSE POWER |
| ▽ | COMBINED DATA/VOICE JACK IN 2x4 BOX w/ FACEPLATE AND 3/4" CONDUIT TO ACCESSIBLE CEILING WITH PULL STRING [(2) DATA JACK AND (1) VOICE JACK UNLESS NOTED; IF NOTED, D = DATA & V = VOICE; E.G. 3DIV = (3) DATA AND (1) VOICE] | ⊖ | GROUND ROD |
| ⊕ | FLUSH FLOOR DATA/VOICE JACK WITH COVER [(1) DATA JACK AND (1) VOICE JACK UNLESS NOTED] | — | HOME RUN |
| ⊖ | SIMPLEX RECEPTACLE; NEMA 5-20R MNTD. 18" AFF UNLESS NOTED | — | BURIED, UNDERGROUND CABLE |
| ⊖ | DUPLEX RECEPTACLE; NEMA 5-20R MNTD. 18" AFF UNLESS NOTED | ABBREVIATIONS | |
| ⊖ | DUPLEX RECEPTACLE; NEMA 5-20R MNTD. ABOVE COUNTER TOP | A | AMPERES |
| ⊖ | QUAD RECEPTACLE; NEMA 5-20R MNTD. 18" AFF UNLESS NOTED | ABV | ABOVE |
| ⊖ | QUAD RECEPTACLE; NEMA 5-20R MNTD. ABOVE COUNTER TOP | AC | ALTERNATING CURRENT |
| ⊖ | SPECIAL PURPOSE RECEPTACLE; PROVIDE PER NAMEPLATE OF EQUIPMENT. MNTD. 18" AFF UNLESS NOTED. | AFF | ABOVE FINISHED FLOOR - DESIGNATES MOUNTING HEIGHT |
| ⊖ | FLUSH FLOOR MNTD. DUPLEX RECEPTACLE WITH COVER | AFG | ABOVE FINISHED GRADE |
| ⊖ | FLUSH FLOOR MNTD. QUAD RECEPTACLE WITH COVER | C | CONDUIT |
| ⊖ | PLUGMOLD AS NOTED | CLG | CEILING |
| ⊖ | JUNCTION BOX; 4" SQ. OR 4" OCT. UNLESS NOTED | DFA | DOWN FROM ABOVE |
| ⊖ | DISCONNECT SWITCH; NEMA 3R IF SHOWN OUTDOORS | EC | EMPTY CONDUIT |
| ⊖ | FUSED DISCONNECT SWITCH; NEMA 3R IF SHOWN OUTDOORS | EMT | ELECTRICAL METALLIC TUBING CONDUIT |
| ⊖ | PUSHBUTTON | G / GND | GROUND |
| ⊖ | TIMECLOCK | GFCI | GROUND FAULT CIRCUIT INTERRUPTER |
| ⊖ | PHOTOCELL | IG | ISOLATED GROUND |
| ⊖ | CEILING SPEAKER ASSEMBLY | NEC | NATIONAL ELECTRIC CODE |
| ⊖ | TELEVISION OUTLET | NFPA | NATIONAL FIRE PROTECTION ASSOCIATION |
| ⊖ | SMOKE DETECTOR | NL | NIGHT LIGHT |
| | | OC | ON CENTER |
| | | PVC | POLYVINYL CHLORIDE CONDUIT |
| | | RGS | RIGID GALVANIZED STEEL CONDUIT |
| | | RMS | ROOT MEAN SQUARED - DESIGNATES ABSOLUTE CURRENT (AC) |
| | | SPST | SINGLE POLE SINGLE THROW |
| | | SU | STUB-UP |
| | | SYM | SYMMETRICAL CURRENT FAULT COMPONENT |
| | | UNO | UNLESS NOTED OTHERWISE |
| | | V | VOLTS |
| | | W | WATTS |
| | | WP | WEATHER PROOF |
| | | XFMR | TRANSFORMER |
| | | 60HZ | HERTZ - DESIGNATES FREQUENCY (E.G. 60 CYCLES PER SECOND) |

NOTE: ALL SYMBOLS ARE NOT NECESSARILY USED



1 LARGE LANDSCAPE AMENITY DETAIL (FUTURE - NIC)
NOT TO SCALE



2 SMALL LANDSCAPE AMENITY DETAIL (FUTURE - NIC)
NOT TO SCALE

3 IRRIGATION CONTROLLER DETAIL
NOT TO SCALE

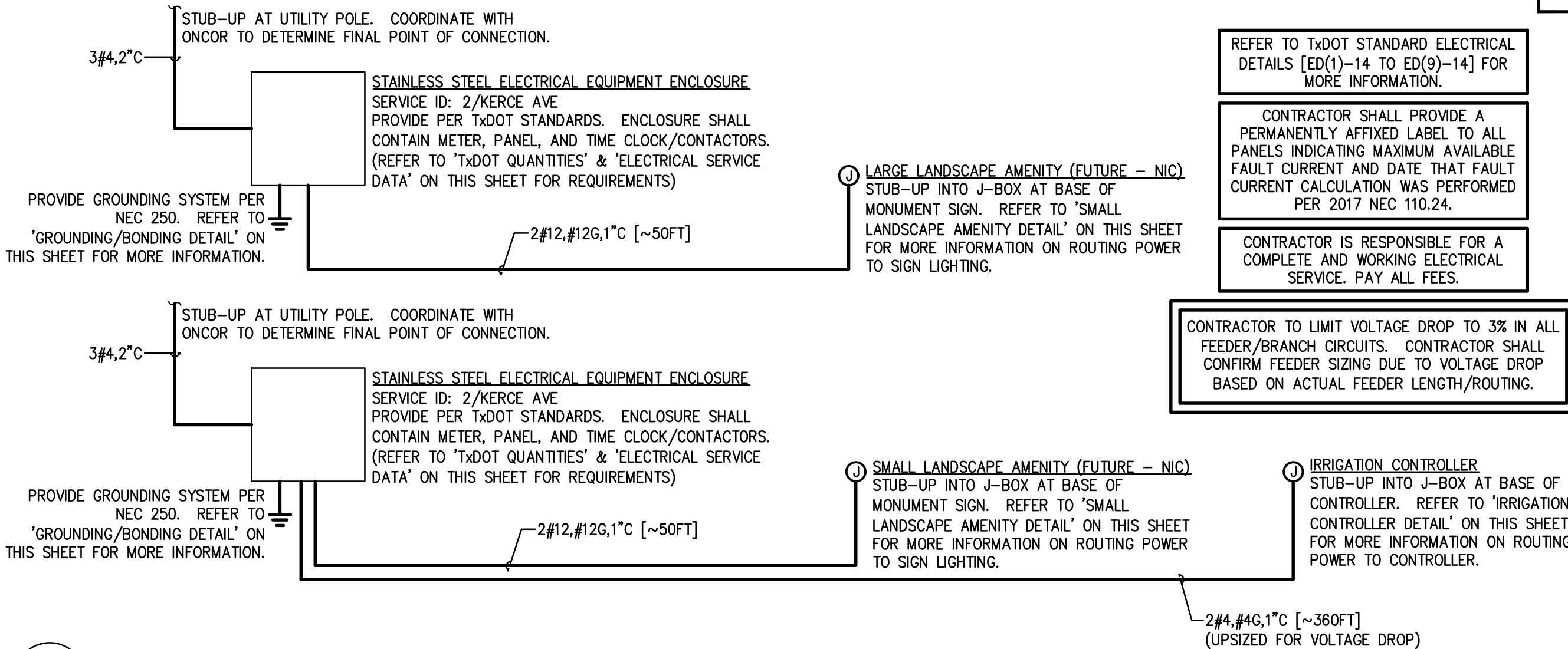
ELECTRICAL SERVICE DATA

| Elec. Service ID | Plan Sheet Number | Electrical Service Description | Service Conduit *Size | Service Conductors No./Size | Safety Switch Amp | Main Ckt. Bkr. Pole/Amps | Panelbd/Loadcenter Amp Rating | KVA Load | Branch Circuit No./Description | Branch Ckt. Bkr. Pole/Amps | Branch Circuit Amps | 1-Pole Contactor Amps |
|------------------|-------------------|--|-----------------------|-----------------------------|-------------------|--------------------------|-------------------------------|----------|---|----------------------------|---------------------|-----------------------|
| 1/OTTO RD | | ELEC SERV TY D 120/240 060(NS)SS(E)PS(U) | 2" | 3/#4 | N/A | 2P/60 | 100 | 0.5 | 1/Time Clock 2/Monument Sign Lighting | 1P/20 1P/20 | 4.2 4.2 | N/A 4.2 |
| 2/KERCE AVE | | ELEC SERV TY D 120/240 060(NS)SS(E)PS(U) | 2" | 3/#4 | N/A | 2P/60 | 100 | 0.5 | 1/Irrigation Controller 2/Time Clock 3/Monument Sign Lighting | 1P/20 1P/20 1P/20 | 4.2 4.2 4.2 | N/A 4.2 4.2 |

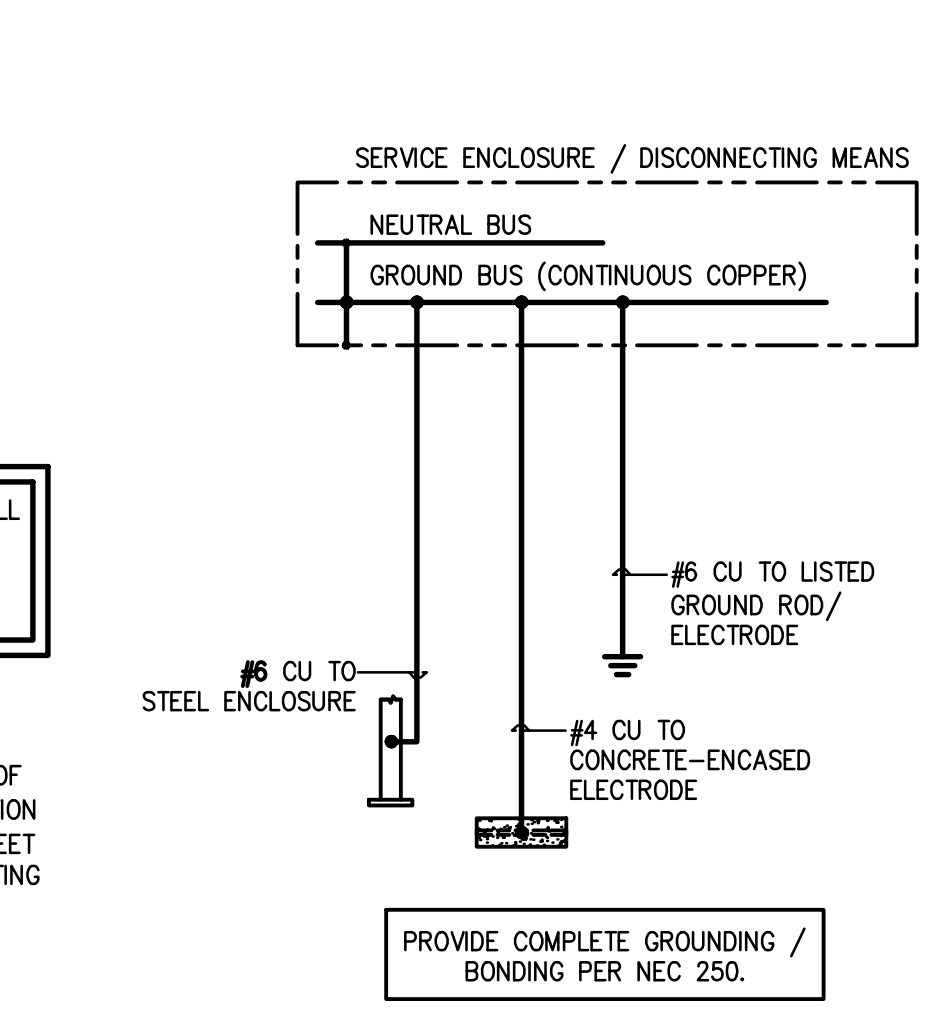
*Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National Electrical Code.

LIGHT FIXTURE SCHEDULE

| MANUFACTURER | CATALOG NUMBER / DESCRIPTION | LAMP TYPE | WATTS | VOLTS | COMMENTS |
|--------------|---------------------------------|-----------|---------|-------|---|
| Q-TRIN | SW24/1.5 WET / LINEAR LED STRIP | LED | 1.5W/FT | 120V | PROVIDE WITH "IQ-PH-80-120/24" POWER SUPPLY AND ALL OTHER REQUIRED ACCESSORIES FOR A COMPLETE SYSTEM. |



4 ONE-LINE DIAGRAM
NOT TO SCALE



5 GROUNDING/BONDING DETAIL
NOT TO SCALE

| ITEM NO | DESCRIPTION | UNIT | TOTAL |
|-----------|--|------|-------|
| 0618 6014 | COND (PVC) (SCH 40) (3/4") | LF | |
| 0618 6023 | COND (PVC) (SCH 40) (2") | LF | |
| 0618 6024 | COND (PVC) (SCH 40) (2") (BORE) | LF | |
| 0620 6004 | ELECT COND (NO.12) INSULATED | LF | |
| 0620 6014 | ELECT COND (NO.4) INSULATED | LF | |
| 1002 6001 | SMALL LANDSCAPE AMENITY (MONUMENT SIGN) | EA | 1 |
| 1002 6001 | LARGE LANDSCAPE AMENITY (MONUMENT SIGN) | EA | 1 |
| 0628 6008 | ELEC SERV TY D 120/240 060(NS)SS(E)PS(U) | EA | 2 |

JFTE James F. Turner Engineers, LP
Consulting Engineers
8340 Meadow Road
Suite 160
Dalllas, TX 75231
Tel.: 214.750.2900
TX Firm # 13339 Job # 94022

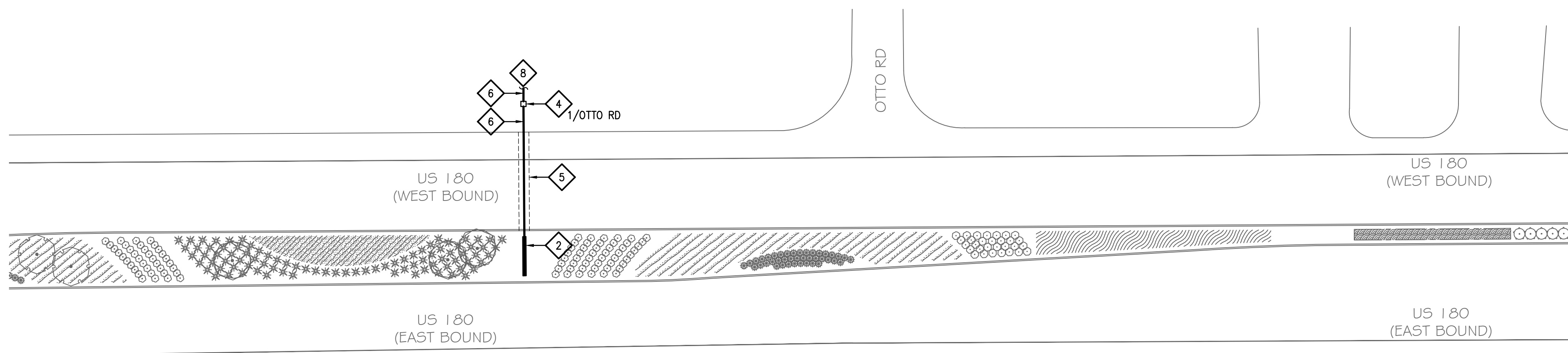
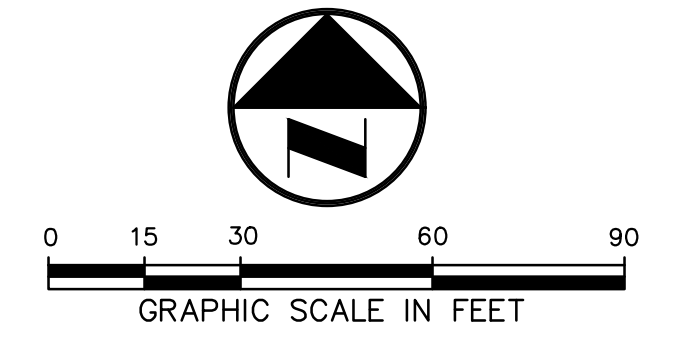
Pacheco Koch 4060 BRYANT IRVIN ROAD
FORT WORTH, TX 76109 817.412.7155
TX REG. ENGINEERING FIRM F-469
TX Firm # 13339

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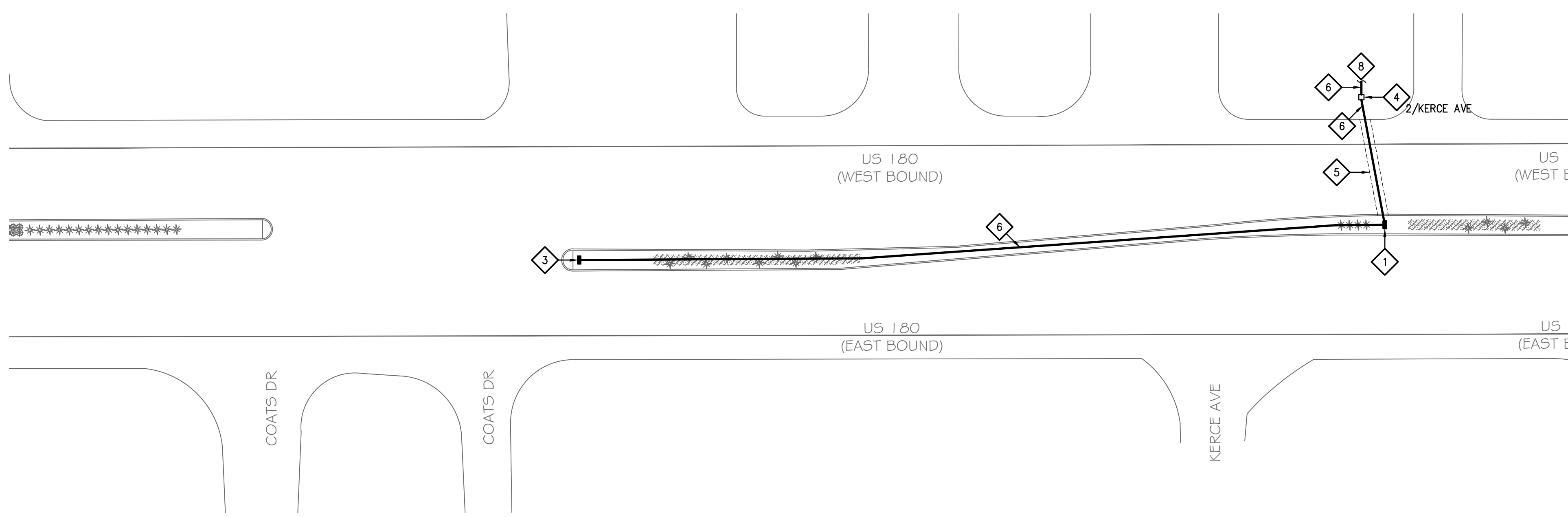
| FED. RD. DIV. NO. | | FEDERAL AID PROJECT NO. | SHEET NO. |
|-------------------|----------|-------------------------|------------|
| 6 | | F 2022(844) | E0.1 |
| STATE | DISTRICT | COUNTY | |
| TEXAS | FTW | TARRANT | |
| CONTROL | SECTION | JOB | HIGHWAY NO |
| 0081 | 02 | 076 | US 180 |

NOTES BY SYMBOL "◆"/ THIS SHEET

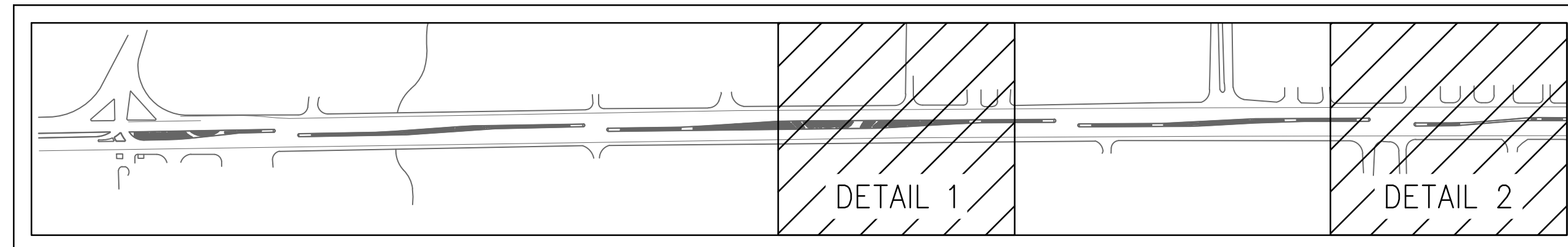
- ◆1 SMALL LANDSCAPE AMENITY (FUTURE - NIC). REFER TO 'ELECTRICAL DETAILS & SCHEDULES' SHEET FOR MORE INFORMATION / PROVIDE CIRCUIT PER 'ELECTRICAL SERVICE DATA' AND 'ONE-LINE DIAGRAM'.
- ◆2 LARGE LANDSCAPE AMENITY (FUTURE - NIC). REFER TO 'ELECTRICAL DETAILS & SCHEDULES' SHEET FOR MORE INFORMATION / PROVIDE CIRCUIT PER 'ELECTRICAL SERVICE DATA' AND 'ONE-LINE DIAGRAM'.
- ◆3 PROPOSED LOCATION FOR IRRIGATION CONTROLLER. REFER TO 'ELECTRICAL DETAILS & SCHEDULES' SHEET FOR MORE INFORMATION / PROVIDE CIRCUIT PER 'ELECTRICAL SERVICE DATA' AND 'ONE-LINE DIAGRAM'.
- ◆4 STAINLESS STEEL WEATHERPROOF EQUIPMENT ENCLOSURE PER TxDOT STANDARDS. REFER TO 'TxDOT QUANTITIES' AND 'ELECTRICAL SERVICE DATA' ON 'ELECTRICAL DETAILS & SCHEDULES' SHEET FOR ELECTRICAL SERVICE/EQUIPMENT REQUIREMENTS (ELECTRICAL SERVICE ID DENOTED NEXT TO KEYNOTE). REFER TO TxDOT ELECTRICAL DETAILS ED(1)-14 THROUGH ED(9)-14 FOR MORE INFORMATION. COORDINATE FINAL LOCATION WITH OWNER PRIOR TO ROUGH-IN.
- ◆5 ROUTE ELECTRICAL CONDUITS THROUGH BORE UNDER ROAD. INSTALL IN CONCORDANCE WITH IRRIGATION PLAN. CONFIRM EXACT LOCATION WITH OWNER AND CIVIL PRIOR TO CONSTRUCTION.
- ◆6 ELECTRICAL CONDUIT ROUTED BELOW GRADE - REFER TO 'ONE-LINE DIAGRAM' ON 'ELECTRICAL DETAILS & SCHEDULES' SHEET FOR MORE INFORMATION. CONFIRM EXACT ROUTING WITH OWNER AND CIVIL ENGINEER.
- ◆7 COORDINATE WITH ONCOR TO DETERMINE FINAL POINT OF CONNECTION FOR NEW ELECTRIC SERVICE (ELECTRIC SERVICE ID DENOTED NEXT TO KEYNOTE). PAY ALL COSTS TO ONCOR, INCLUDING PROVIDING ALL MATERIALS AND LABOR NOTED AS "CUSTOMER FURNISHED", ASSOCIATED WITH NEW 60A 120/240V 1Ø, 3W SERVICE.



1 ELECTRICAL PLAN (OTTO RD)
1" = 30'-0"



2 ELECTRICAL PLAN (KERCE AVE)
1" = 30'-0"



3 KEY PLAN
NOT TO SCALE

JFTE James F. Turner Engineers, LP
Consulting Engineers
8340 Meadow Road
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ELECTRICAL PLANS

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|-------------------|-------------------------|-----------|------------|
| FED. RD. DIV. NO. | FEDERAL AID PROJECT NO. | SHEET NO. | |
| 6 | F 2022(844) | E1.1 | |
| STATE | DISTRICT | COUNTY | |
| TEXAS | FTW | TARRANT | |
| CONTROL | SECTION | JOB | HIGHWAY NO |
| 0081 | 02 | 076 | US 180 |

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APRIL 2022 - 100%

SECTION 16000 – ELECTRICAL SPECIFICATIONS

GENERAL

1. GENERAL CONDITIONS:
 - a. THE GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS AND SPECIAL CONDITIONS ARE A PART OF THIS CONTRACT AND APPLY TO THIS SECTION AS FULLY AS IF REPEATED HEREIN.
2. SCOPE:
 - a. THIS SECTION OF SPECIFICATIONS INCLUDES BUT IS NOT LIMITED TO:
 - b. ALL LABOR, TOOLS, APPLIANCES, MATERIALS, AND EQUIPMENT REQUIRED TO FURNISH AND INSTALL THE COMPLETE INSTALLATION SHOWN ON THE DRAWINGS FOR THIS SECTION OF THE WORK AND/OR IN THE FOLLOWING SPECIFICATIONS, INCLUDING THAT WHICH IS REASONABLY INFERRED.
3. CODES AND REGULATIONS:
 - a. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF PUBLIC AUTHORITIES HAVING JURISDICTION AND UTILITIES FURNISHING SERVICES.
 - b. CODES GOVERNING THIS WORK INCLUDE BUT ARE NOT LIMITED TO THE LATEST APPROVED EDITION OF THE FOLLOWING:
 - b.a. NATIONAL FIRE PROTECTION ASSOCIATION'S NATIONAL ELECTRICAL CODE (NEC).
 - b.b. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).
 - b.c. LOCAL ORDINANCES AND REGULATIONS.
4. MATERIALS:
 - a. ELECTRICAL MATERIAL AND EQUIPMENT SHALL HAVE BEEN TESTED AND LISTED OR LABELED AS CONFIRMING TO APPROVED PUBLISHED STANDARDS BY UNDERWRITERS LABORATORIES WHERE SUCH LISTING OR LABELING SERVICE IS AVAILABLE FOR THE CLASS OF MATERIALS OR EQUIPMENT. WHERE APPLICABLE, LISTING OR LABELING SHALL APPLY TO THE COMPLETE ASSEMBLED EQUIPMENT AND NOT TO THE COMPONENTS ALONE.
5. SUBMITTALS:
 - a. ELECTRONIC (PDF) MATERIALS LIST, SHOP DRAWINGS, AND DATA SHEETS SHALL BE SUBMITTED TO OWNER'S CONSTRUCTION MANAGER FOR REVIEW. SUBMITTALS SHALL BE MADE AND FAVORABLE REVIEW SECURED BEFORE MATERIAL AND EQUIPMENT IS INSTALLED.
 - b. MATERIALS LIST SHALL INCLUDE FIXTURES, SWITCHGEAR, PANELS, DEVICES, WIREWAYS, LIGHT FIXTURES, AND ALL OTHER SPECIFIED OR UNSPECIFIED STANDARD CATALOGED MATERIALS TO BE USED. THE LIST SHALL INCLUDE MANUFACTURER, TYPE, AND SUCH OTHER DESCRIPTIVE DATA AS MAY BE REQUIRED TO DETERMINE THE ACCEPTABILITY OF EACH ITEM.
 - c. SHOP DRAWINGS AND DATA SHEETS FOR EQUIPMENT AND SYSTEMS SHALL BE SUBMITTED WHERE REQUIRED IN THE SPECIFICATION FOR THOSE ITEMS. INCLUDE INFORMATION ON EACH COMPONENT, WIRING DIAGRAMS, LAYOUTS, DIMENSIONS AND SUFFICIENT OTHER DATA TO ESTABLISH COMPLIANCE WITH THE SPECIFICATIONS AND ACCEPTABILITY OF THE EQUIPMENT OR SYSTEM.
6. PERMITS AND DRAWINGS:
 - a. PERMITS AND INSPECTIONS SHALL BE BY THE GENERAL CONTRACTOR.
 7. AS-BUILT DRAWINGS:
 - a. ON A SET OF CONTRACT DRAWINGS, KEPT AT THE SITE DURING CONSTRUCTION, MARK ALL WORK THAT IS INSTALLED DIFFERENTLY FROM THAT SHOWN, INCLUDING ANY REVISED CIRCUITRY, MATERIAL, OR EQUIPMENT. UPON CONCLUSION OF WORK, DELIVER TO OWNER'S CONSTRUCTION MANAGER A SET OF SIGNED AND DATED "AS-BUILT" DRAWINGS.
8. GUARANTEE:
 - a. ALL WORK SHALL BE GUARANTEED FOR A MINIMUM PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER. THE GUARANTEE PERIOD FOR CERTAIN ITEMS SHALL BE LONGER AS INDICATED IN THE SPECIFICATION FOR THOSE ITEMS.
 - b. SHOULD ANY MALFUNCTION DEVELOP DURING THE GUARANTEE TIME PERIOD DUE TO DEFECTIVE MATERIAL, FAULTY WORKMANSHIP, OR NONCOMPLIANCE WITH PLANS, SPECIFICATIONS, CODES, OR DIRECTIONS OF THE OWNER, ARCHITECT, ENGINEER, OR INSPECTOR, THE CONTRACTOR SHALL FURNISH ALL NECESSARY LABOR AND MATERIALS TO CORRECT THE MALFUNCTION WITHOUT ADDITIONAL CHARGES.

PRODUCTS

1. PANELBOARDS:
 - a. PANELBOARDS SHALL BE FACTORY ASSEMBLED CIRCUIT BREAKER TYPE BY SQUARE-D OR EQUAL. THE NUMBER OF POLES, TYPE, VOLTAGE, AND AMPERE RATINGS SHALL BE AS INDICATED ON THE DRAWINGS. BUSSING SHALL BE ALUMINUM.
 - b. NEUTRAL WIRES SHALL BE CONNECTED TO A COMMON NEUTRAL BUS WITH BINDING SCREWS OR LUGS. THE NEUTRAL BUS SHALL BE INSULATED FROM THE CABINET. GROUND WIRES SHALL BE CONNECTED TO A COMMON EQUIPMENT GROUND BUS WITH BINDING SCREWS OR LUGS. THE GROUND BUS SHALL BE BONDED TO THE CABINET.
 - c. CABINETS SHALL BE FLUSH MOUNTED, UNLESS OTHERWISE NOTED. CABINETS SHALL BE CONSTRUCTED OF GALVANIZED STEEL CONFORMING TO UL AND NEC STANDARDS.
 - d. FRONTS OF CABINETS SHALL BE NOT LESS THAN 12 GAUGE STEEL FASTENED WITH SCREWS IN COUNTERSUNK WASHERS, OR WITH APPROVED CONGEALED SPRING CLAMPS. CABINET FRONTS SHALL HAVE HINGED LOCKABLE DOORS WITH MILLED KEYS (ALL PANELS SHALL BE KEYS ALIKE) AND CIRCUIT SCHEDULE HOLDERS WITH CLEAR PLASTIC WINDOWS. PROVIDE TYPEWRITTEN SCHEDULE IN HOLDERS AND SUBMIT COPIES FOR RECORD PURPOSES. DOORS SHALL BE FASTENED TO TRIM WITH FULL LENGTH FLUSH HINGES. PANEL FRONTS SHALL BE SHOP PAINTED WITH 2 COATS OF PRIMER AND A FINISH COAT OF GRAY ENAMEL.
 - e. SPECIAL PANELBOARD CONSTRUCTION OR FEATURES SHALL BE AS SHOWN ON DRAWINGS. FOR CIRCUIT BREAKERS, CONTACTORS, AND OTHER EQUIPMENT TO BE INCLUDED AS AN ASSEMBLED PART OF THE PANELBOARD, REFER TO THE PARAGRAPH WHERE THOSE ITEMS ARE SPECIFIED.
 - f. ALL CONDUCTOR TERMINALS AND EQUIPMENT ENCLOSURES SHALL BE UL LISTED FOR USE WITH MINIMUM 75-DEGREE C RATED CONDUCTORS.
 - g. AFTER SUBSTANTIAL COMPLETION, CONDUCT LOAD-BALANCING MEASUREMENTS AND MAKE CIRCUIT CHANGES TO BALANCE LOADS BETWEEN PHASES. PERFORM MEASUREMENTS DURING PERIOD OF NORMAL WORKING LOAD. PERFORM LOAD-BALANCING CIRCUIT CHANGES OUTSIDE NORMAL OCCUPANCY/WORKING SCHEDULE OF THE FACILITY, MAKE SPECIAL ARRANGEMENTS WITH OWNER TO AVOID DISRUPTING CRITICAL SERVICES. RECHECK LOADS AFTER CIRCUIT CHANGES DURING NORMAL LOAD PERIOD. RECORD ALL LOAD READINGS BEFORE AND AFTER CHANGES AND SUBMIT TEST RECORDS. DIFFERENCE EXCEEDING 20 PERCENT BETWEEN PHASE LOADS, WITHIN A PANELBOARD, IS NOT ACCEPTABLE – REBALANCE AND RECHECK AS REQUIRED TO MEET THIS MINIMUM REQUIREMENT.
 - h. PANELBOARD DIRECTORY FOR EACH PANEL SHALL BE NEATLY TYPED INDICATING ACTUAL LOAD FOR EACH BRANCH CIRCUIT. REVERSE DIRECTORY TO REFLECT CIRCUITING CHANGES TO BALANCE PHASE LOADS.
 - i. PROVIDE ENGRAVED NAMEPLATE FOR EACH PANEL MOUNTED TO EXTERIOR PANEL DOOR. NAMEPLATE TO BE LAMINATED THREE-LAYER PLASTIC LABEL WITH ENGRAVED BLACK LETTERS ON WHITE CONTRASTING BACKGROUND COLOR.
 - j. LEAVE SPARE CIRCUIT BREAKERS IN THE OFF POSITION.
 - k. PROVIDE SIGNAGE FOR ALL PANELBOARDS AND SWITCHBOARDS WARNING QUALIFIED PERSONS OF POTENTIAL FLASH HAZARD AS REQUIRED IN NEC 110.16.
2. CIRCUIT BREAKERS SHALL BE BY THE SAME MANUFACTURER THAT FURNISHES THE MAIN SERVICE EQUIPMENT AND PANELBOARDS.
 - a. BREAKERS SHALL BE MOLDED CASE BOLT-ON TYPE. CLAMP-ON, PUSH-ON, OR PLUG-IN TYPES ARE NOT ACCEPTABLE. REMOVABLE HANDLE TIES AND DUAL, QUAD, OR TANDEM BREAKERS ARE NOT ACCEPTABLE. MOUNTING HARDWARE, ACCESSORIES, FACEPLATES, AND ENCLOSURES SHALL BE PROVIDED AS NECESSARY FOR THE INTENDED USE.
 - b. SHORT CIRCUIT INTERRUPTING CAPACITY SHALL BE AS INDICATED ON THE PLANS AND SHALL IN NO CASE BE LESS THAN 10,000RMS SYMMETRICAL AMPS AT THE APPLIED VOLTAGE.
 3. DISCONNECT SWITCHES:
 - a. SWITCHES SHALL BE BY SQUARE-D OR EQUAL.
 - b. SWITCHES AND ENCLOSURES SHALL BE GENERAL DUTY. THEY SHALL BE EXTERNALLY OPERATED, QUICK-MAKE, BLADE TYPE, OR NUMBERS OF POLES AND RATING INDICATED OR REQUIRED.
 - c. ENCLOSURES SHALL BE NEMA 1 FOR DRY, INTERIOR LOCATIONS AND NEMA 3R FOR DAMP, WET, OR EXTERIOR LOCATIONS. FINISH SHALL BE ANSI 61. COVERS SHALL HAVE A DEFATABLE INTERLOCK. OPERATING HANDLES SHALL BE PAD-LOCKABLE.
 - d. SHORT CIRCUIT WITHSTAND RATINGS SHALL BE 200,000 RMS SYMMETRICAL AMPS.
 - e. SWITCHES SHALL ACCEPT FUSES OF THE RATING AND UL OR NEMA CLASS INDICATED.

- f. SUBMIT DATA SHEETS OF THE DISCONNECT SWITCHES AS REQUIRED UNDER "SUBMITTALS".
- g. ALL CONDUCTOR TERMINALS AND EQUIPMENT ENCLOSURES SHALL BE UL LISTED FOR USE WITH MINIMUM 75-DEGREE C RATED CONDUCTORS.
4. MANUAL MOTOR STARTERS:
 - a. WHERE SHOWN ON THE PLANS, FRACTIONAL HORSEPOWER MOTORS SHALL HAVE TOGGLE TYPE MANUAL STARTERS WITH THERMAL OVERLOAD PROTECTION IN EACH PHASE. WHERE THE MOTOR IS OUT OF SIGHT OF THE SWITCH PROVIDE A PILOT LIGHT IN THE COVER TO INDICATE SWITCH IS CLOSED.
 - b. SUBMIT DATA ON STARTERS AS REQUIRED UNDER "SUBMITTALS".
5. SNAP SWITCHES:
 - a. AS GENERAL USE SNAP SWITCHES SHALL BE TOGGLE HANDLE, QUIET OPERATING, PREMIUM OR HEAVY DUTY SPECIFICATION GRADE, UL LISTED AND VERIFIED TO MEET FEDERAL SPECIFICATION W-S-896-D AND NEMA HEAVY DUTY TESTS. COLOR SHALL BE WHITE.
 - b. ALL SWITCHES SHALL BE RATED 120/277 VOLTS. FOR THE 20 AMP SIZE, HP RATING SHALL BE 1 FOR 120V AND 2 FOR 240V.
 - c. SWITCHES SHALL BE AS LISTED BELOW:
 - c.a. 20A SPST – HUBBELL 1221, LEVITON 1221, OR P&S 521.
 - d. SWITCHES REQUIRED BUT NOT LISTED SHALL HAVE EQUIVALENT QUALITY AS THOSE LISTED ABOVE.
6. RECEPTACLE OUTLETS:
 - a. RECEPTACLE OUTLETS SHALL BE STANDARD NEMA CONFIGURATION, GROUNDING TYPE.
 - b. GENERAL CONVENIENCE OUTLETS SHALL BE 20 AMP, 125 VOLT, 2 POLE, 3 WIRE GROUNDING. OUTLETS SHALL BE UL LISTED AND VERIFIED TO MEET FEDERAL SPECIFICATION W-C-595-C AND NEMA HEAVY DUTY PERFORMANCE TESTS.
 - c. CONVENIENCE OUTLET FRONTS SHALL BE COLOR AS SPECIFIED BY ARCHITECT.
 - d. OUTLETS SHALL BE AS LISTED BELOW: (NUMBERS DO NOT INCLUDE COLOR DESIGNATION OR OPTIONS).
 - d.a. 20A CONVENIENCE – HUBBELL 5352, LEVITON 5362, OR P&S 5362.
 - e. RECEPTACLE OUTLETS FOR POS SYSTEMS (WHERE APPLICABLE) SHALL BE TYPE NEMA 5-15R SINGLE OR DUPLEX ISOLATED GROUND AS INDICATED ON PLANS.
 - f. SPECIAL OUTLETS, NOT LISTED ABOVE, SHALL BE STANDARD NEMA CONFIGURATION FOR THE APPLICATION SHOWN AND SHALL BE OF EQUIVALENT GRADE AND QUALITY TO THOSE LISTED ABOVE. AN APPROVED CORB CAP AND PLUG SHALL BE FURNISHED WITH EACH RECEPTACLE OUTLET EXCEPT GENERAL CONVENIENCE TYPE. PLUG SHALL BE OF THE SAME GRADE, QUALITY, AND MANUFACTURER AS THE OUTLET.
7. DEVICE AND BOX COVER PLATES:
 - a. PROVIDE A PLATE FOR EACH OUTLET, RECEPTACLE, SWITCH, DEVICE, AND BOX.
 - b. PLATES FOR FLUSH INTERIOR GENERAL USE SHALL BE PLASTIC, COLOR PER ARCHITECT. PLATES FOR THE KITCHEN, SERVICE, GALLEY, AND STORAGE AREAS SHALL BE STAINLESS STEEL.
 - c. ALL PLATES FOR INTERIOR USE SHALL BE LISTED AND LABELED "SUITABLE FOR WET LOCATION WHILE IN USE".
 - d. GANGED DEVICES SHALL HAVE GANG PLATES EXACTLY MATCHING THE ARRANGEMENT AND QUANTITY OF DEVICES.
 - e. SPECIAL PLATES, ENGRAVING, OR APPLICATION SHALL BE AS INDICATED ON THE DRAWINGS OR OTHERWISE SPECIFIED.
 - f. ALL ELECTRICAL OUTLETS AND LIGHTING CIRCUITS ARE TO BE PROPERLY IDENTIFIED WITH LABEL INDICATING PANEL AND CIRCUIT NUMBER, LOCATED ON BACK SIDE OF EACH COVER PLATE.
8. OUTLET AND JUNCTION BOXES:
 - a. THE SIZE OF EACH OUTLET OR JUNCTION BOX SHALL BE DETERMINED BY THE NUMBER AND SIZES OF CONDUITS ENTERING THE BOX, PER NEC, BUT SHALL NOT BE LESS THAN 4-INCH SQUARE AND 1-1/2-INCHES DEEP UNLESS OTHERWISE NOTED.
 - b. OUTLETS AND JUNCTION BOXES FOR INTERIOR USE SHALL BE GALVANIZED, ONE-PIECE PRESSED OR WELDED STEEL, KNOCKOUT TYPE, EXCEPT WHERE OTHER TYPES OF BOXES ARE INDICATED OR SPECIFIED. IN MASONRY OR CONCRETE CONSTRUCTION, WATERPROOF BOXES MANUFACTURED FOR THAT PURPOSE SHALL BE USED. PLASTIC, FIBER, OR COMPOSITION BOXES WILL NOT BE PERMITTED.
 - c. OUTLET AND JUNCTION BOXES FOR SURFACE EXTERIOR USE SHALL BE CAST BOXES, CROUSE-HINDS FS TYPE, OR APPROVED EQUIVALENT.
9. CONDUITS AND FITTINGS:
 - a. STANDARD WEIGHT RIGID METAL CONDUIT SHALL BE HOT DIPPED GALVANIZED. ALL FITTINGS SHALL BE OF THE SCREW THREAD TYPE. COUPLINGS, LOCKNUTS, BUSHINGS, ETC., SHALL BE HOT DIPPED GALVANIZED.
 - b. ELECTRICAL METALLIC TUBING (EMT) SHALL BE GALVANIZED. COUPLINGS AND CONNECTORS SHALL BE GALVANIZED. FITTINGS SHALL BE COMPRESSION TYPE WITH GLAND SEALING RINGS OR SET SCREW TYPE.
 - c. FLEXIBLE CONDUIT SHALL BE GALVANIZED STEEL OR ALUMINUM. WHERE USED IN DAMP OR WET LOCATIONS, FLEXIBLE CONDUIT SHALL BE OF THE LIQUID-TIGHT TYPE WITH OUTER NEOPRENE JACKET AND SUITABLE LIQUID-TIGHT FITTINGS.
 - d. RIGID NONMETALLIC CONDUIT SHALL BE PVC SCHEDULE 40, UL APPROVED.
10. WIRE AND CABLE:
 - a. WIRE AND CABLE FOR USE ON SYSTEMS OF 50 VOLTS TO 600 VOLTS SHALL BE 600 VOLT RATED TYPE THW OR THHN FOR BRANCH CIRCUITS. FEEDERS SHALL BE THHN.
 - b. WIRE AND CABLE FOR USE ON SYSTEMS OF 50 VOLTS SHALL BE 300 VOLT PVC INSULATED AND SUITABLE FOR THE CLASS OF WIRING EXCEPT AS OTHERWISE INDICATED OR SPECIFIED.
 - c. ALL CONDUCTORS SHALL BE COPPER.
 - d. MC CABLE MAY BE USED WHERE ALLOWED BY CODE AND AUTHORITY HAVING JURISDICTION; APPLICATIONS SHALL BE LIMITED TO DRY CONCEALED AREAS WITHIN 6FT OF RECEPTACLE OUTLETS, AS 6FT LIGHTING WHIPS, AND CONNECTIONS TO EQUIPMENT SUBJECT TO VIBRATION. IT SHALL BE LISTED FOR THE ENVIRONMENT IT IS INSTALLED IN. MC CABLE SHALL CONFORM TO REQUIREMENTS OF NFPA 70 (NEC) TYPE MC. MC CABLE SHALL BE SOUTHWIRE OR APPROVED EQUAL AND HAVE COPPER CONDUCTORS AND GREEN INSULATED GROUNDING CONDUCTOR.
11. LIGHTING FIXTURES AND LAMPS:
 - a. FIXTURES SHALL BE COMPLETE WITH ALL REQUIRED ACCESSORIES AND EQUIPMENT, INCLUDING LAMPS, NECESSARY FOR A COMPLETE INSTALLATION. CONTRACTOR SHALL RECEIVE, UNPACK, ASSEMBLE, AND INSTALL FIXTURES INDICATED AS BEING FURNISHED BY OTHERS.
 - b. VERIFY THE CEILING OR WALL CONSTRUCTION, VOLTAGE, AND THE MOUNTING REQUIREMENTS OF EACH FIXTURE AND PROVIDE PLASTER FRAMES, SPECIAL FLANGES, CONCRETE POUR HOUSINGS, BOXES, BRACKETS, ADAPTERS, HANGERS, STEMS, CANOPIES, SPECIAL BALLASTS OR LENSES, AND OTHER MATERIALS NECESSARY TO PROPERLY PURCHASE AND MOUNT THE FIXTURE.
12. SUBMIT SHOP DRAWINGS ON ALL FIXTURES AS REQUIRED UNDER "SUBMITTALS". "SHOP DRAWINGS" MAY BE CATALOG DATA SHEETS IF COMPLETE INFORMATION INCLUDING MOUNTING HARDWARE IS SHOWN AND IDENTIFIED. SHOP DRAWINGS SHALL INCLUDE MOUNTING DETAILS AND SHOW COMPATIBILITY WITH THE CEILING OR OTHER EQUIPMENT.
13. NAMEPLATES AND LABELS:
 - a. NAMEPLATES SHALL BE PROVIDED FOR CIRCUIT BREAKERS IN THE MAIN SWITCHBOARD, SWITCHES, AND TO IDENTIFY EACH PANELBOARD AND SIMILAR ITEMS WHICH ARE FURNISHED OR INSTALLED UNDER THIS SECTION.
 - b. NAMEPLATES SHALL BE ENGRAVED LAMINATED PLASTIC WITH CHARACTERS CUT THROUGH THE BLACK TOP LAYER TO WHITE LAYER BELOW.
14. PHOTO ELECTRIC SWITCHES:
 - a. PHOTO ELECTRIC SWITCHES AND PHOTO CONTROLLERS SHALL BE HONEYWELL TYPE OF MOUNTING, POLES, VOLTAGE, WATTAGE RATINGS, AND ARRANGEMENT SHALL BE AS SHOWN ON PLANS.
 - b. SUBMIT SHOP DRAWINGS AS REQUIRED UNDER "SUBMITTALS". CATALOG SHEETS WILL BE ADEQUATE IF ALL INFORMATION IS SHOWN.
15. TIME SWITCHES:
 - a. TIME SWITCHES SHALL BE TORK. TYPE OF MOUNTING, POLES, VOLTAGE, AMPACITY, AND ARRANGEMENT SHALL BE AS SHOWN ON DRAWINGS OR REQUIRED BY CONDITIONS. TIME SWITCHES CONTROLLING LIGHTING SHALL HAVE SPRING WOUND CARRY OVER AND ANY OTHER FEATURES SHOWN ON THE PLANS OR REQUIRED FOR PROPER OPERATION.
 - b. ENCLOSURES SHALL BE NEMA 1 FOR INTERIOR, DRY LOCATIONS.

15. MAGNETIC MOTOR STARTERS:
 - a. MOTOR STARTERS SHALL BE HORSEPOWER RATED NON-REVERSING, FULL VOLTAGE OF TYPE REQUIRED BY MOTOR WITH OVERLOAD THERMAL PROTECTION.
 - b. SUBMIT SHOP DRAWINGS AS REQUIRED UNDER "SUBMITTALS".
16. RELAYS:
 - a. RELAYS FOR MOTOR CONTROL SHALL BE HEAVY-DUTY INDUSTRIAL TYPE, MAGNETICALLY HELD, WITH BOTH NORMALLY OPEN AND CLOSED CONTACTS.
 - b. SUBMIT SHOP DRAWINGS AS REQUIRED UNDER "SUBMITTALS".
- EXECUTION
 1. INSTALLATION AND CONNECTION OF ELECTRICAL EQUIPMENT:
 - a. EQUIPMENT FURNISHED BY OTHERS SHALL BE COMPLETELY CONNECTED TO THE ELECTRICAL SYSTEM EXCEPT AS NOTED ON THE DRAWINGS. ALL FUSES, BREAKERS, AND DISCONNECTS SHALL BE PROVIDED AS NECESSARY FOR PROPER PROTECTION. PROVIDE ALL FLEXIBLE CONDUIT, BOXES, FITTINGS, RECEPTACLES, CORDS, PLUGS, AND OTHER MATERIAL REQUIRED FOR PROPER INSTALLATION. REFER TO MANUFACTURER'S DIRECTIONS WHERE APPLICABLE.
 2. WORK ON HVAC AND PLUMBING SYSTEMS
 - a. COMPLETE POWER CIRCUITS, INCLUDING BREAKERS, SWITCHES, DISCONNECTS, WIRE AND CONDUIT, OUTLETS, AND CONNECTIONS TO HVAC AND PLUMBING EQUIPMENT SHALL BE PROVIDED UNDER THIS SECTION.
 - b. STARTERS AND CONTROLLERS SHALL BE PROVIDED UNDER THIS SECTION EXCEPT WHERE PART OF A PACKAGE UNIT OR PANEL SPECIFIED IN DIVISION 15.
 - c. HVAC AND PLUMBING CONTROL AND INTERLOCK WIRING REGARDLESS OF VOLTAGE, AND CONDUITS FOR SAME, WILL BE WIRED AND CONNECTED UNDER THIS SECTION.
 3. INSTALLATION OF CONDUIT:
 - a. STANDARD WEIGHT RIGID METAL CONDUIT SHALL BE USED WHERE EXPOSED TO THE WEATHER, PLACED UNDERGROUND BELOW CONCRETE SLAB, IN CONCRETE OR MASONRY CONSTRUCTION IN CONTACT WITH EARTH, AND WHERE SHOWN ON THE PLANS.
 - b. GALVANIZED STEEL ELECTRICAL METALLIC TUBING SHALL BE USED IN ABOVE GROUND, INTERIOR, DRY LOCATIONS PROTECTED FROM WEATHER AND PHYSICAL DAMAGE, AND MAY BE USED IN CONCRETE OR MASONRY CONSTRUCTION NOT IN CONTACT WITH EARTH.
 - c. FLEXIBLE METALLIC CONDUIT "MC" SHALL BE USED WHERE SHOWN ON THE PLANS AND TO CONNECT CONDUIT SYSTEMS TO MOTORS, DIRECT WIRE AND VIBRATING EQUIPMENT AND AS A FINAL CONNECTION TO LIGHTING FIXTURES (6' MAX) IN ACCESSIBLE CEILING. IT MAY BE USED AS A WIRING SYSTEM INSTEAD OF EMT IN INTERIOR WALLS ONLY (DRY FRAME OR STUD CONSTRUCTION).
 - d. LIQUIDTIGHT FLEXIBLE METAL CONDUIT SHALL BE USED FOR FINAL ELECTRICAL CONNECTIONS TO ROOF TOP OR OTHER EQUIPMENT EXPOSED TO THE ENVIRONMENT.
 - e. RIGID NONMETALLIC CONDUIT MAY BE USED FOR ALL UNDERSLAB OR UNDERGROUND WORK IN PLACE OF STANDARD WEIGHT RIGID METAL AND WHERE SPECIFICALLY SPECIFIED. ALL RUNS OF RIGID NONMETALLIC CONDUIT SHALL CONTAIN A SEPARATE GREEN GROUND WIRE ADEQUATELY SIZED FOR SERVICE INTENDED. WHERE REQUIRED TO CONTINUE ABOVE SLAB, STUB NONMETALLIC CONDUIT 6" ABOVE SLAB THEN MAKE PROPER TRANSITION TO METAL CONDUIT.
 - f. ALL RIGID STEEL CONDUIT INSTALLED IN THE GROUND SHALL BE WRAPPED WITH HUNT'S PROCESS NO. 3, PVC COATED OR ENCASED IN 3" CONCRETE ON ALL SIDES.
 - g. THE MINIMUM SIZES OF CONDUIT SHALL BE CODE SIZE FOR THE NUMBER AND SIZE OF CONDUCTORS, UNLESS A LARGER SIZE IS SHOWN, IN WHICH CASE SUCH LARGER SIZE SHALL BE USED.
 - h. ALL FINAL CONNECTIONS TO MOTORS SHALL BE FLEXIBLE METAL CONDUIT AND AS SHOWN ON DRAWINGS.
 - i. WHERE PORTIONS OF RACEWAYS OR SLEEVES ENTER AREAS SUCH AS COLD STORAGE OR WHERE PASSING FROM THE INTERIOR TO THE EXTERIOR OF A BUILDING, THE RACEWAY OR SLEEVE SHALL BE FILLED WITH AN APPROVED MATERIAL TO PREVENT THE CIRCULATION OF WARM AIR TO A COOLER SECTION OF THE RACEWAY OR SLEEVE.
 4. INSTALLATION AND CONNECTION OF WIRING:
 - a. NO "BX" TYPE CONDUCTOR/FLEX CONDUIT OR ROMEX CABLE WILL BE PERMITTED. ALL WIRING SHALL BE INSTALLED IN CONDUIT, WIREWAYS, OR GUTTERS, EXCEPT WHERE OTHER RACEWAY SYSTEMS OR METHODS ARE SPECIFICALLY SHOWN.
 - b. CLEAN OUT AND DRY ALL CONDUIT AND WIREWAYS BEFORE PULLING ANY WIRES. USE NO LUBRICANT EXCEPT AS RECOMMENDED BY THE WIRE OR CABLE MANUFACTURER.
 - c. MAKE ALL CONNECTIONS AND SPLICES NECESSARY TO PROPERLY COMPLETE THE ELECTRICAL WIRING. CONNECTIONS AND SPLICES SHALL BE MADE ONLY IN PULL, JUNCTION, OR OUTLET BOXES, OR IN SWITCHBOARDS, WIREWAYS, OR PANELS HAVING SUFFICIENT CODE SIZED GUTTER SPACE. CONNECTIONS AND SPLICES IN WIRES SMALLER THAN NO. 6 AWG SHALL BE MADE WITH SPRING TYPE CONNECTORS, AND IN WIRES NO. 6 AWG AND LARGER SHALL BE MADE WITH COMPRESSION, VISE TYPE, OR SPLIT BOLT SOLDERLESS CONNECTORS, INSULATED AND TAPED.
 - d. CONNECTIONS FOR THE POWER WIRING OF THE POS SYSTEM SHALL BE SOLDERED ONLY, NO SOLDERLESS CONNECTIONS WILL BE ALLOWED. WIRE NUT CONNECTIONS AFTER SOLDERING.
 5. TELEPHONE SYSTEM:
 - a. FURNISH AND INSTALL COMPLETE CONDUIT AND TERMINAL SYSTEM FOR TELEPHONE SERVICES AS INDICATED ON DRAWINGS.
 - b. INSTALL A 1/8-INCH POLYETHYLENE PULL-IN WIRE IN EACH CONDUIT RUN.
 - c. TELEPHONE WALL OUTLETS SHALL BE 4-11/16 INCH SQUARE BY 2-1/8 INCH DEEP METAL BOXES, WITH PLASTER RING AND SINGLE BUSHED OUTLET FLUSH TELEPHONE PLATE.
 - d. FURNISH AND INSTALL 3/4-INCH CONDUIT FROM THE TELEPHONE EQUIPMENT ROOM MAIN TELEPHONE BACKBOARD TO NEAREST ACCESSIBLE COLD WATER GROUND. THIS CONDUIT SHOULD BE TERMINATED IN SUCH A MANNER THAT ACCESS TO GROUNDING DEVICE MAY BE HAD AT ANY TIME IN THE FUTURE. –*PER NEC 250 & NEC 800
 6. GROUNDING:
 - a. MAKE GOOD MECHANICAL AND ELECTRICAL CONTACT AT ALL POLES, PANELBOARDS, SWITCHBOARDS, OUTLET BOXES, JUNCTION BOXES, AND WHEREVER THE CONDUIT RUN IS CONNECTED. PERMANENTLY AND EFFECTIVELY GROUND ALL CONDUIT, FIXTURES, MOTORS, AND OTHER EQUIPMENT AS REQUIRED BY ALL APPLICABLE CODES, REGULATIONS, AND STANDARDS.
 7. CLEANING AND PROTECTION OF PRODUCTS AND PREMISES:
 - a. AT FREQUENT INTERVALS DURING THE TIME OF CONSTRUCTION, THE CONTRACTOR SHALL CLEAN UP AFTER HIS WORK AND REMOVE HIS DEBRIS FROM THE PREMISES, LEAVING THE BUILDING AND GROUNDS CLEAN TO THE OWNER'S SATISFACTION.
 - b. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT ALL MATERIALS, EQUIPMENT, AND PROPERTY, WHETHER ELECTRICAL OR NOT, FROM DAMAGE AS A RESULT OF HIS WORK.
 8. CHECKING AND TESTING OF EQUIPMENT AND SYSTEMS:
 - a. PANELS, DISCONNECTS, STARTERS, AND OTHER EQUIPMENT INSTALLED UNDER THIS SECTION SHALL BE INSPECTED FOR DEFECTS AND TESTED FOR PROPER OPERATION.
 - b. SYSTEMS SHALL BE TESTED FOR SHORT CIRCUITS, OPEN CIRCUITS, AND WRONG CONNECTIONS AND SHALL BE FREE FROM MECHANICAL AND ELECTRICAL DEFECTS. CIRCUITS SHALL BE TESTED FOR PROPER NEUTRAL AND GROUND CONNECTIONS.
 9. TEMPORARY CONSTRUCTION POWER & TELEPHONE:
 - a. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL LABOR, COST, AND MATERIALS REQUIRED FOR INSTALLATION AND MAINTENANCE OF TEMPORARY CONSTRUCTION POWER AND TELEPHONE. CONSTRUCTION POWER SHALL BE MINIMUM OF 100A, 120/208V/1-PHASE, 4W, WITH PROVISIONS FOR ONE 50A, 208V, 2P, 4W GROUNDING RECEPTACLE AND FOUR 120V, 20A, 1P RECEPTACLES.
 10. SUBSTITUTIONS:
 - a. ALTERNATIVE MANUFACTURER'S WILL BE CONSIDERED FOR ELECTRICAL DEVICES, SWITCHES, OUTLETS, ETC. NOT PROVIDED BY OWNER.
 - b. CATALOGS, DATA SHEETS, OR SHOP DRAWINGS SHALL BE SUBMITTED TO THE CONSTRUCTION MANAGER FOR ALL ALTERNATIVE MANUFACTURED EQUIPMENT AS REQUIRED IN "SUBMITTALS".

2015 IECC (International Energy Conservation Code) Commissioning Requirements

Prior to final inspection, Electrical Contractor to provide Engineer (as a submittal sent through the Architect/Builder) a signed letter on company letterhead stating that any/all applicable items/systems listed in 2015 IECC section C408.3 (and all subheadings) have been tested and comply with the code. For reference:

C408.3 Lighting system functional testing. Controls for automatic lighting systems shall comply with this section.

C408.3.1 Functional testing. Prior to passing final inspection, the registered design professional shall provide evidence that the lighting control systems have been tested to ensure that control hardware and software are calibrated, adjusted, programmed and in proper working condition in accordance with the construction documents and manufacturer's instructions. Functional testing shall be in accordance with Sections C408.3.1.1 and C408.3.1.2 for the applicable control type.

C408.3.1.1 Occupant sensor controls. Where occupant sensor controls are provided, the following procedures shall be performed:

1. Certify that the occupant sensor has been located and aimed in accordance with manufacturer recommendations.
2. For projects with seven or fewer occupant sensors, each sensor shall be tested.

3. For projects with more than seven occupant sensors, testing shall be done for each unique combination of sensor type and space geometry. Where multiples of each unique combination of sensor type and space geometry are provided, not less than 10 percent, but in no case less than one, of each combination shall be tested unless the code official or design professional requires a higher percentage to be tested. Where 30 percent or more of the tested controls fail, all remaining identical combinations shall be tested.

For occupant sensor controls to be tested, verify the following:

- 3.1. Where occupant sensor controls include status indicators, verify correct operation.
- 3.2. The controlled lights turn off or down to the permitted level within the required time.
- 3.3. For auto-on occupant sensor controls, the lights turn on to the permitted level when an occupant enters the space.
- 3.4. For manual-on occupant sensor controls (i.e. vacancy sensors), the lights turn on only when manually activated.
- 3.5. The lights are not incorrectly turned on by movement in adjacent areas or by HVAC operation.

C408.3.1.2 Time-switch controls. Time-switches to be (at a minimum) 7-day programmable with holiday scheduling and a 10 hour back-up battery, unless noted more specifically elsewhere in these drawings. Where time-switch controls are provided, the following procedures shall be performed:

1. Confirm that the time-switch control is programmed with accurate weekday, weekend and holiday schedules.
2. Provide documentation to the owner of time-switch controls programming including weekday, weekend, holiday schedules, and set-up and preference program settings.
3. Verify the correct time and date in the time switch.
4. Verify that any battery back-up is installed and energized.
5. Verify that the override time limit is set to not more than 2 hours.
6. Simulate occupied condition. Verify and document the following:
 - 6.1. All lights can be turned on and off by their respective area control switch.
 - 6.2. The switch only operates lighting in the enclosed space in which the switch is located.
7. Simulate unoccupied condition. Verify and document the following:
 - 7.1. Nonexempt lighting turns off.
 - 7.2. Manual override switch allows only the lights in the enclosed space where the override switch is located to turn on or remain on until the next scheduled shutoff occurs.
8. Additional testing as specified by the registered design professional.

C408.3.1.3 Daylight responsive controls. Where daylight responsive controls are provided, the following shall be verified:

1. Control devices have been properly located, field calibrated and set for accurate setpoints and threshold light levels.
2. Daylight controlled lighting loads adjust to light level set points in response to available daylight.
3. The locations of calibration adjustment equipment are readily accessible only to authorized personnel.

C408.3.2 Documentation requirements. The construction documents shall specify that documents certifying that the installed lighting controls meet documented performance criteria of Section C405 are to be provided to the building owner within 90 days from the date of receipt of the certificate of occupancy.

| | | | |
|-------|-----|--|------|
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| | | 8340 Meadow Road Suite 160 Dallas, TX 75231 Tel.: 214.750.2900 TX Firm # 13359 | |
| DRAWN | JBJ | DESIGN | JBJ |
| | | OC | APPD |
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TX REG. SURVEYING FIRM LS-10008001

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| ELECTRICAL SPECIFICATIONS | | | |
| FED. RD. DIV. NO. | FEDERAL AID PROJECT NO. | SHEET NO. | |
| 6 | F 2022(844) | E2.1 | |
| STATE | DISTRICT | COUNTY | |
| TEXAS | FTW | TARRANT | |
| CONTROL | SECTION | JOB | HIGHWAY NO |
| 0081 | 02 | 076 | US 180 |

DESIGN DATA

- 1. **BUILDING CODE**
- A. BUILDING CODE 2009 IBC
- 2. **GRAVITY LOADS**
- A. DEAD LOADS 94 PSF
- 12" CMU 40 PSF
- VENEER
- 3. **LATERAL LOADS**
- A. WIND LOADS 90 MPH
- 1. BASIC WIND SPEED (3-SECOND GUST) I
- SERVICE WIND SPEED C
- 2. RISK CATEGORY
- 3. WIND EXPOSURE CATEGORY

GENERAL

- 1. DEAD LOADS HAVE BEEN CALCULATED TO INCLUDE THE ACTUAL WEIGHT OF ALL WORK SHOWN ON THE STRUCTURAL, MECHANICAL, ELECTRICAL AND ARCHITECTURAL DRAWINGS. NO OTHER EQUIPMENT SHALL BE PLACED ON OR HUNG FROM THE ROOF SYSTEM WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER. ROOF-MOUNTED HVAC UNITS SHALL BE PLACED WITHIN THE DESIGNATED AREAS SHOWN ON THE FRAMING PLANS.
- 2. CONTRACT DOCUMENTS: THE GENERAL CONTRACTOR SHALL OBTAIN ALL CONTRACT DOCUMENTS AND LATEST ADDENDA AND SUBMIT SUCH DOCUMENTS TO ALL SUBCONTRACTORS AND MATERIAL SUPPLIERS PRIOR TO THE SUBMITTAL OF SHOP DRAWINGS, FABRICATION OF ANY STRUCTURAL MEMBERS, AND ERECTION IN THE FIELD.
- 3. COMPLETE SHOP DRAWINGS FOR THE STRUCTURAL WORK SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW PRIOR TO COMMENCEMENT OF CONSTRUCTION, IN ACCORDANCE WITH THE SPECIFICATIONS. CONTRACTOR SHALL REVIEW AND STAMP ALL SHOP DRAWINGS PRIOR TO SUBMITTING. **STRUCTURAL ENGINEER SHALL HAVE TEN FULL BUSINESS WORKING DAYS FOR REVIEWS.** SUCH REVIEW BY THE ARCHITECT/ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF FULL RESPONSIBILITY FOR CORRECT FABRICATION AND CONSTRUCTION OF THE WORK.
- 4. ELECTRONIC FILES OR REPRODUCTIONS OF THESE CONTRACT DOCUMENTS BY ANY CONTRACTOR, SUBCONTRACTOR, ERECTOR, FABRICATOR, OR MATERIAL SUPPLIER IN LIEU OF PREPARATION OF SHOP DRAWINGS SIGNIFIES THEIR ACCEPTANCE OF ALL INFORMATION SHOWN HEREON AS CORRECT, AND OBLIGATES THEMSELVES TO ANY JOB EXPENSE, REAL OR IMPLIED, ARISING DUE TO ANY ERRORS THAT MAY OCCUR HEREON.
- 5. ANY DEVIATION FROM ADDITION TO, SUBSTITUTION FOR, OR MODIFICATION TO THE STRUCTURE OR ANY PART OF THE STRUCTURE DETAILED ON THESE DRAWINGS SHALL BE SUBMITTED IN WRITING TO THE ARCHITECT FOR REVIEW. SHOP DRAWINGS THAT ARE SUBMITTED FOR REVIEW DO NOT CONSTITUTE "IN-WRITING" UNLESS IT IS CLEARLY NOTED THAT SPECIFIC CHANGES ARE BEING SUGGESTED.
- 6. THE CONTRACTOR SHALL REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATIONS NOT SHOWN AND FOR EXACT LOCATIONS OF ALL ARCHITECTURAL DETAILS. THE CONTRACTOR SHALL COMPARE THE STRUCTURAL SECTIONS WITH THE ARCHITECTURAL SECTIONS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO COMPLETION OF THE SHOP DRAWINGS.
- 7. THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS AT THE SITE AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BETWEEN THE ACTUAL CONDITIONS AND INFORMATION SHOWN ON THE DRAWINGS BEFORE PROCEEDING WITH THE WORK.
- 8. THE STRUCTURAL DRAWINGS ARE NOT TO BE SCALED FOR DETERMINATION OF QUANTITIES, LENGTHS, OR FIT OF MATERIALS.
- 9. RESPONSIBILITY OF THE CONTRACTOR FOR STABILITY OF THE STRUCTURE DURING CONSTRUCTION: ALL STRUCTURAL ELEMENTS OF THE PROJECT HAVE BEEN DESIGNED BY THE STRUCTURAL ENGINEER TO RESIST THE REQUIRED CODE VERTICAL AND LATERAL FORCES THAT COULD OCCUR IN THE FINAL COMPLETED STRUCTURE ONLY. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED BRACING AND SHORING DURING CONSTRUCTION TO MAINTAIN THE STABILITY AND SAFETY OF ALL STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PROCESS UNTIL THE STABILITY-PROVIDING SYSTEM IS COMPLETELY INSTALLED AND THE STRUCTURE IS COMPLETELY TIED TOGETHER.
- 10. CONFLICTS IN STRUCTURAL REQUIREMENTS: WHERE CONFLICT EXISTS AMONG THE VARIOUS PARTS OF THE STRUCTURAL CONTRACT DOCUMENTS, STRUCTURAL DRAWINGS, GENERAL NOTES, AND SPECIFICATIONS, THE STRICTEST REQUIREMENTS, AS INDICATED BY THE ENGINEER, SHALL GOVERN.
- 11. STABILITY AND BRACING OF MASONRY WALLS DURING CONSTRUCTION: THE CONTRACTOR SHALL ADEQUATELY BRACE AND SHORE ALL MASONRY WALLS AT ALL STAGES OF CONSTRUCTION TO RESIST ERECTION LOADS AND LATERAL LOADS THAT COULD POSSIBLY BE APPLIED PRIOR TO COMPLETION OF CONSTRUCTION.
- 12. CONTRACTOR SUBSTITUTIONS: MATERIALS OR PRODUCTS SUBMITTED FOR APPROVAL THAT DIFFER FROM THE MATERIAL OR PRODUCTS SPECIFIED IN THE STRUCTURAL CONTRACT DOCUMENTS WILL BE APPROVED ONLY IF THE FOLLOWING CRITERIA ARE SATISFIED: A. A COST SAVINGS TO THE OWNER IS DOCUMENTED AND SUBMITTED WITH REQUEST. B. THE MATERIAL OR PRODUCT COMPLIES WITH THE SAME ASTM SPECIFICATIONS
- 13. SITE OBSERVATION BY THE STRUCTURAL ENGINEER: THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE, AND, EXCEPT WHERE SPECIFICALLY SHOWN, DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES AND SEQUENCE. THE ENGINEER SHALL NOT HAVE CONTROL NOR CHARGE OF, AND SHALL NOT BE RESPONSIBLE FOR, CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES, FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK, FOR THE ACTS OR OMISSION OF THE CONTRACTOR, SUBCONTRACTOR, OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. PERIODIC SITE OBSERVATION BY FIELD REPRESENTATIVES OF JFTE, L.P. IS SOLELY FOR THE PURPOSE OF DETERMINING IF THE WORK OF THE CONTRACTOR PROCEEDS IN ACCORDANCE WITH THE STRUCTURAL CONTRACT DOCUMENTS. THIS LIMITED SITE OBSERVATION SHOULD NOT BE CONSTRUED AS EXHAUSTIVE OR CONTINUOUS TO CHECK THE QUALITY OR QUANTITY OF THE WORK, BUT RATHER PERIODIC IN AN EFFORT TO GUARD THE OWNER AGAINST DEFECTS OR DEFICIENCIES IN THE WORK OF THE CONTRACTOR.
- 14. MAINTENANCE STATEMENT: PERIODIC MAINTENANCE IS REQUIRED TO ENSURE STRUCTURAL INTEGRITY FROM EXPOSURE TO ENVIRONMENT. A PLANNED PROGRAM OF MAINTENANCE SHALL INCLUDE, BUT IS NOT LIMITED TO, SUCH ITEMS AS, PAINTING OF STRUCTURAL STEEL, PROTECTIVE COATING FOR CONCRETE, SEALANTS, CAULKED JOINTS, EXPANSION JOINTS, CONTROL JOINTS, SPALLS AND CRACKS IN CONCRETE.

CAST IN PLACE REINFORCED CONCRETE

- 1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE MOST RECENT EDITION OF A.C.I. 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
- 2. MIXES SHALL BE DESIGNED TO PROVIDE CONCRETE WITH A 28 DAY COMPRESSIVE STRENGTH AS NOTED BELOW (NO CALCIUM CHLORIDE SHALL BE PERMITTED).
(a) UNLESS NOTED OTHERWISE, ALL CONCRETE $f_c = 3,000$ P.S.I.
- 3. PORTLAND CEMENT SHALL BE A SINGLE BRAND CONFORMING TO ASTM C-150, E 1/1L
- 4. NORMAL WEIGHT (150 P.C.F. CONCRETE) AGGREGATES SHALL CONFORM TO ASTM C-33 AND SHALL BE FROM A SINGLE SOURCE FOR EXPOSED CONCRETE. ALL CONCRETE SHALL UTILIZE NORMAL WEIGHT AGGREGATE UNLESS NOTED OTHERWISE.
- 5. ALL ADDITIVES FOR AIR ENTRAINMENT, WATER REDUCTION, AND SET CONTROL SHALL BE USED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS, PROJECT SPECIFICATIONS, AND WEATHER CONDITIONS.
- 6. THE MAXIMUM NOMINAL SIZES OF COURSE AGGREGATE BE AS FOLLOWS:
FOOTINGS.....1 1/2"
ALL OTHER CONCRETE.....1"
- 7. CONCRETE SLUMPS SHALL BE FOUR (4) INCH TO SIX (6) INCH MAXIMUM.
- 8. CONCRETE SHALL BE CONSOLIDATED WITH A MECHANICAL VIBRATOR WITH A MINIMUM 3/4" DIAMETER HEAD. "RODDING" IS NOT ALLOWED.
- 9. ALL EXTERIOR CONCRETE SHALL BE AIR ENTRAINED. AIR CONTENT SHALL BE 4 1/2% +/- 1 1/2%. INTERIOR SLABS SHALL NOT HAVE AIR-ENTRAINMENT.
- 10. MILD STEEL REINFORCING BARS SHALL CONFORM TO ASTM A-615, WELDABLE REINFORCING SHALL CONFORM TO ASTM A-706. No. 3 BARS SHALL BE GRADE 40. No. 4 BARS AND LARGER SHALL BE GRADE 60. WELDING OF REINFORCING BARS SHALL CONFORM TO THE ANSI/AWS D1.4 WELDING CODE.
- 11. WELDED STEEL WIRE FABRIC SHALL CONFORM TO ASTM A-185. ALL WELDED STEEL WIRE FABRIC SHALL BE SUPPLIED IN FLAT SHEETS, NOT IN ROLLS.
- 12. MILD STEEL REINFORCEMENT AND ACCESSORIES SHALL BE DETAILED AND FABRICATED IN ACCORDANCE WITH ACI SP-66.
- 13. MILD STEEL REINFORCEMENT SHALL BE PLACED AND SECURED IN ACCORDANCE WITH CRSI "RECOMMENDED PRACTICE FOR PLACING REINFORCING BARS".
- 14. CONCRETE PROTECTION FOR REINFORCEMENT SHALL BE AS FOLLOWS:
FOOTINGS.....3" ALL SURFACES
- 15. THE TESTING LABORATORY SHALL BE NOTIFIED AFTER THE MILD STEEL REINFORCEMENT AND EMBEDS ARE POSITIONED PRIOR TO EACH CONCRETE PLACEMENT. NO CONCRETE SHALL BE PLACED UNTIL THESE ITEMS ARE CHECKED AND APPROVED BY THE TESTING LABORATORY.
- 16. EACH AREA OF CONCRETE WORK SHALL BE FINISHED AND CURED IN ACCORDANCE WITH THE SPECIFICATIONS. CHAMFERS SHALL BE PROVIDED IN ACCORDANCE WITH THE ARCHITECTURAL DRAWINGS.
- 17. CURING OF CONCRETE WORK: ALL CONCRETE WORK FORMED AND UNFORMED SHALL BE WET CURED FOR A MINIMUM PERIOD OF SEVEN DAYS.
- 18. WATERSTOPS SHALL BE 4" P.V.C. DUMBBELL OR CENTER-BULB E CONFORMING TO CORPS OF ENGINEERS C.R.D.-C-572. WATERSTOPS SHALL BE EMPLOYED AT ALL JOINTS BELOW FINISHED GRADE EXCEPT FOR INTERIOR JOINTS IN SLABS-ON-GRADE. WATERSTOPS SHALL BE PROPERLY INSTALLED TO PREVENT COLLAPSE DURING CONCRETE PLACEMENT.
- 19. REINFORCING BARS No. 11 AND SMALLER SHALL BE CONTACT LAP SPLICED AS INDICATED IN BAR LAP SCHEDULE, UNLESS SHOWN OTHERWISE. WELDED WIRE FABRIC SHALL BE SPLICED BY LAPPING ONE FULL MESH AND LACING THE SPLICES WITH WIRE. ALL SPLICES SHALL BE STAGGERED

| LAP SPLICED SCHEDULE | | | |
|----------------------|--------|----------|-------|
| BAR SIZE | LAP | BAR SIZE | LAP |
| 3 | 1'-10" | 7 | 3'-9" |
| 4 | 2'-3" | 8 | 4'-9" |
| 5 | 2'-8" | 9 | 6'-1" |
| 6 | 3'-2" | | |

- 20. PROVIDE 90° STANDARD HOOKS WHERE SHOWN IN DETAILS MINIMUM LENGTH SHALL BE 12db, WHERE db IS DIAMETER OF BAR.
- 21. SAMPLES FOR STRENGTH TESTS OF EACH CLASS OF CONCRETE SHALL BE TAKEN NOT LESS THAN THE FOLLOWING:
 - a) ONCE PER DAY
 - b) ONCE PER EVERY 150 CUBIC YARDS
 - c) ONCE PER EVERY 5000 SQUARE FEET OF SURFACE AREA FOR SLABS OR WALLS
- 22. IF TOTAL VOLUME OF CONCRETE IS SUCH THAT FREQUENCY OF TESTING REQUIRED BY NOTE ABOVE WOULD PROVIDE LESS THAN 5 STRENGTH TESTS FOR EACH CLASS OF CONCRETE, TESTS SHALL BE MADE FROM AT LEAST 5 RANDOMLY SELECTED BATCHES OR FROM EACH BATCH IF FEWER THAN 5 BATCHES ARE USED.

EARTHWORK AND FOUNDATIONS

- 1. THE FOUNDATION DESIGN IS BASED ON A SUBSURFACE EXPLORATION AND REPORT BY _____
- 2. THE EARTHWORK AND FOUNDATION NOTES CONTAINED HERE ARE INTENDED TO PROVIDE A SUMMARY OF THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT. CONTRACTOR SHALL READ AND BE THOROUGHLY FAMILIAR WITH ALL RECOMMENDATIONS OF THE REPORT. OMISSIONS OR RESTATEMENTS DO NOT RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH THE REPORT.
- 3. FOUNDATIONS SHALL BE SHALLOW SPREAD FOOTINGS FOUNDED APPROXIMATELY 3 FEET BELOW EXISTING OR FINAL GRADE (WHICH EVER IS DEEPER) AND BEAR WITHIN _____ BEARING PRESSURE IS 2000 PSF.
- 4. STANDARD PROCEDURES OF FROST PROTECTION FOR FOUNDATIONS AND EXCAVATIONS SHALL BE EMPLOYED FOR WINTER CONSTRUCTION. BACKFILLING OF EXCAVATIONS SHALL BE DONE AS SOON AS POSSIBLE TO PROTECT FOUNDATIONS FROM FROST.
- 5. AFTER THE FOOTINGS HAVE BEEN EXCAVATED AND BEFORE REINFORCING STEEL PLACEMENT, A GEOTECHNICAL ENGINEER SHALL VERIFY SOILS OF THE DESIGN BEARING CAPACITY HAVE BEEN ENCOUNTERED. A WRITTEN REPORT OF THE INSPECTION, SHALL BE PROVIDED TO THE STRUCTURAL ENGINEER OF RECORD.
- 6. EXISTING SUBGRADE SHALL BE REMOVED AND REPLACED PER THE GEOTECHNICAL ENGINEERS RECOMMENDATIONS GIVEN IN THE REPORT NOTED ABOVE TO ACHIEVE A MAXIMUM THEORETICAL PVR OF 1 INCH.

MASONRY

- 1. CONCRETE MASONRY UNITS SHALL MEET ASTM SPECIFICATION C 90. THE SPECIFIED DESIGN COMPRESSIVE STRENGTH OF CONCRETE MASONRY (F_m) SHALL BE 1,500 PSI AND SHALL MEET LATEST REQUIREMENTS OF ACI 530 AND 530.1.
- 2. MORTAR SHALL MEET THE PROPORTION SPECIFICATIONS OF ASTM C 270 E "S" MORTAR. MASONRY CEMENT SHALL NOT BE USED FOR MORTAR. NO CALCIUM CHLORIDE OR FLY ASH SHALL BE PERMITTED IN MORTAR MIX.
- 3. GROUT SHALL MEET ASTM SPECIFICATION C 476, HAVE A 3/8" MAXIMUM AGGREGATE SIZE, AND HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2,000 PSI.
- 4. GROUT SHALL BE MECHANICALLY CONSOLIDATED USING A VIBRATOR WITH A MAXIMUM 3/4" DIAMETER HEAD.
- 5. HORIZONTAL JOINT REINFORCEMENT SHALL BE 9 GAGE LADDER. JOINT REINFORCEMENT SHALL BE SPACED AT 16" O.C..
- 6. CONCRETE MASONRY SHALL BE LAID IN RUNNING (COMMON) BOND.
- 7. CONCRETE MASONRY BELOW GRADE SHALL BE NORMAL WEIGHT UNITS AND HAVE ALL CELLS FULLY GROUTED. CONCRETE MASONRY ABOVE GRADE SHALL BE LIGHT WEIGHT OR NORMAL WEIGHT AND SHALL BE GROUTED ONLY AT REINFORCED CELLS AND BOND BEAMS, UNO
- 8. REFER TO CMU WALL DETAILS, FOUNDATION DETAILS, AND FRAMING DETAILS FOR ADDITIONAL BOND BEAM LOCATIONS AND EMBEDDED ITEMS.
- 9. PROVIDE HORIZONTAL REINFORCEMENT AS INDICATED IN THE CMU WALL REINFORCING DIAGRAM. USE OPEN KNOCK OUT BOND BEAM BLOCK. DO NOT USE TROUGH E BLOCKS FOR BOND BEAMS. DO NOT CONTINUE BOND BEAM REINFORCING THROUGH CONTROL JOINTS, UNO
- 10. MASONRY CONSTRUCTION REQUIRES SPECIAL INSPECTION. REF. SPECIFICATIONS FOR REQUIREMENTS.

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Tel. 214.750.2500
TX Firm # 10468 Job # 94022

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| DRAWN | DESIGN | QC | APPD |
| 98 | 98 | 98 | 98 |

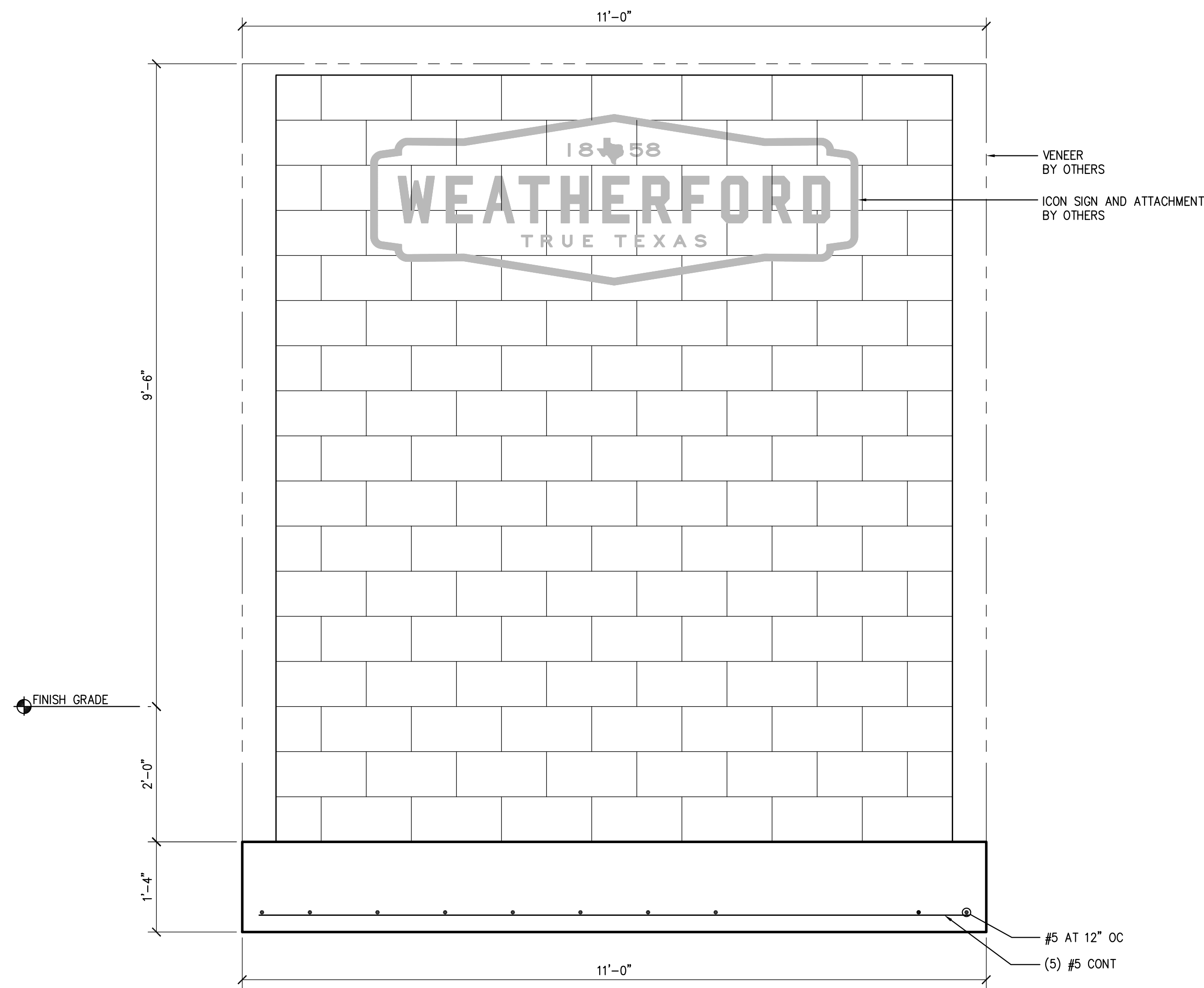
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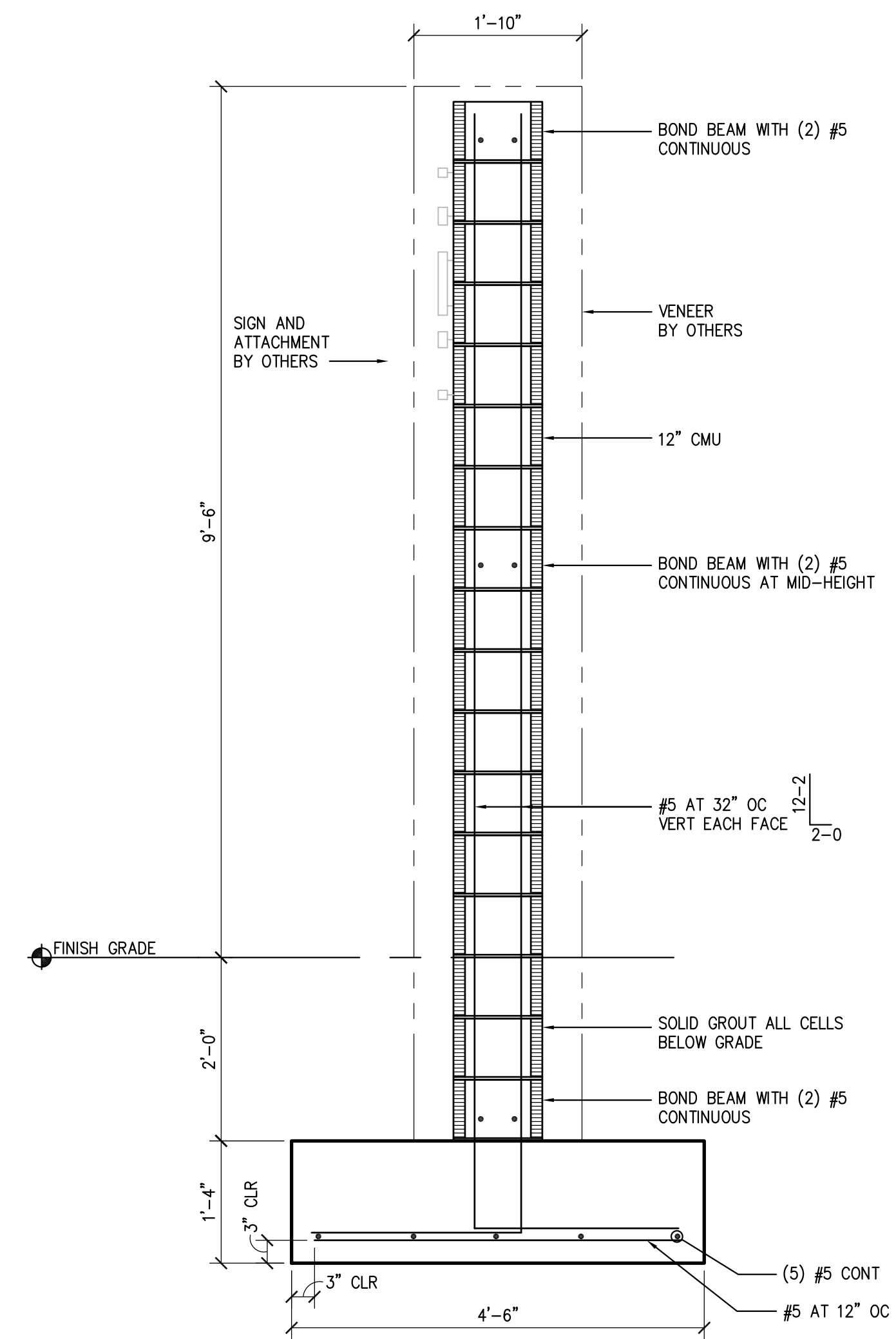
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LANDSCAPE AMENITY STRUCTURAL

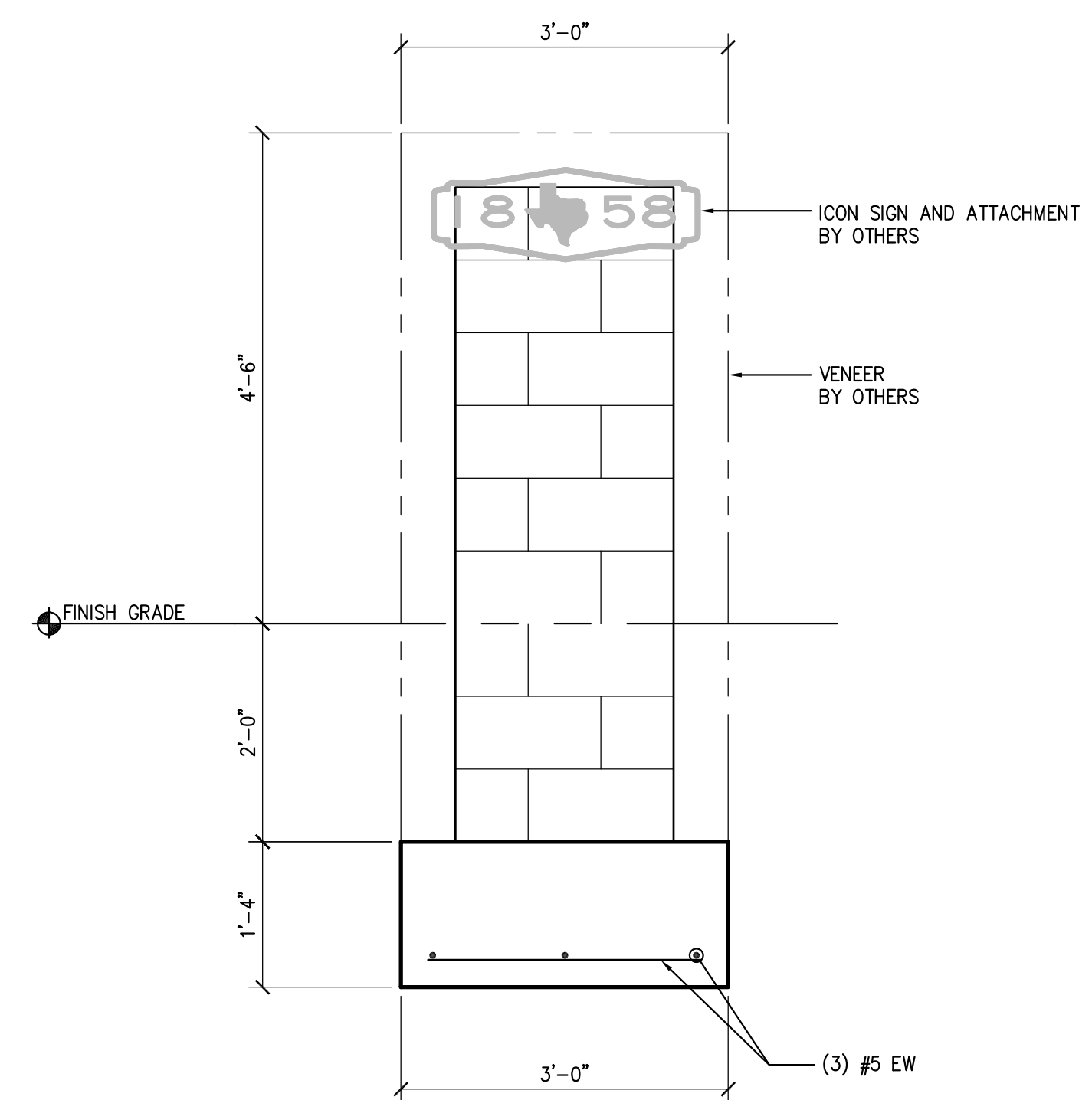
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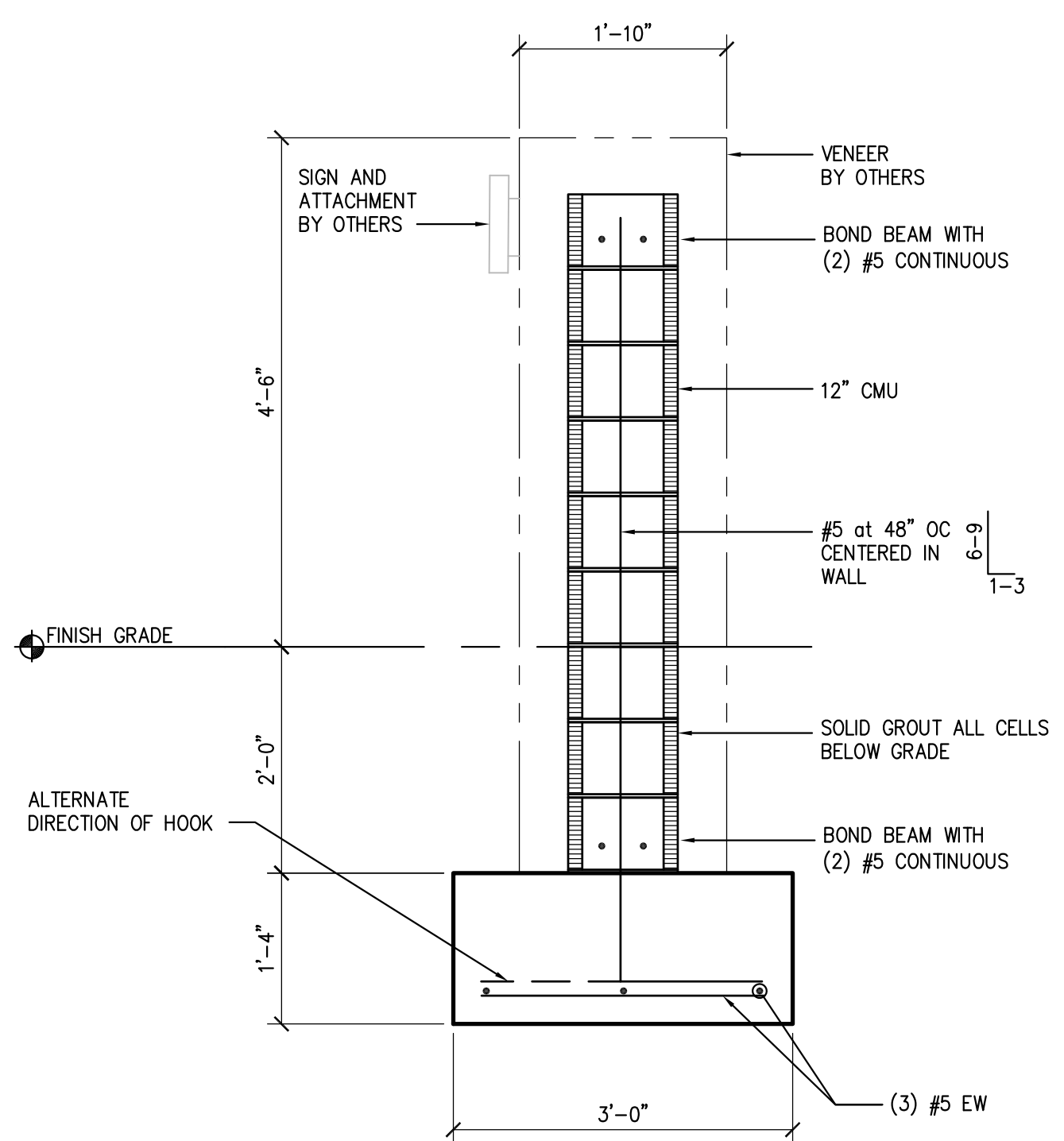
01 LARGE LANDSCAPE AMENITY ELEVATION
3/4" = 1'-0"



02 LARGE LANDSCAPE AMENITY SECTION
3/4" = 1'-0"



03 SMALL LANDSCAPE AMENITY ELEVATION
3/4" = 1'-0"



04 SMALL LANDSCAPE AMENITY SECTION
3/4" = 1'-0"

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