AGENDA ITEM A11

AGENDA PLACEMENT FORM

(Submission Deadline – Monday, 5:00 PM before Regular Court Meetings)

Date: January 31,2025

Meeting Date: February 10, 2025

Submitted By: Julie Edmiston

Department: Public Works

Signature of Elected Official/Department Head:

Court Decision:
This section to be completed by County Judge's Office

Johnson County ★ APPROVED ★ Commissioners Court

2-10-25

Description:

Consideration to approve an agreement titled "Participation For County Road Expansion" between Johnson County and Lennar Homes of Texas Land & Construction, LTD. (for Wright Farms/Frontier) to contract for the construction of certain road improvements such as widening existing County Road 904 for approximately .5 miles adjacent to the Wright Farms/Frontier Phases 1A and 1B Development, installing a storm drain system, and replacing signage on County Road 904 with a cost of materials and labor valued at $2,107,089.00. Located in Precinct 1.

(May attach additional sheets if necessary)

Person to Present: Jennifer VanderLaan

(Presenter must be present for the item unless the item is on the Consent Agenda)

Supporting Documentation: (check one) ☑ PUBLIC ☐ CONFIDENTIAL

(PUBLIC documentation may be made available to the public prior to the Meeting)

Estimated Length of Presentation: 10 minutes

Session Requested: (check one)

☑ Action Item ☐ Consent ☐ Workshop ☐ Executive ☐ Other _____

Check All Departments That Have Been Notified:

☑ County Attorney ☐ IT ☐ Purchasing ☐ Auditor

☐ Personnel ☑ Public Works ☐ Facilities Management

Other Department/Official (list) Engineering

Please List All External Persons Who Need a Copy of Signed Documents In Your Submission Email

PARTICIPATION FOR COUNTY ROAD EXPANSION

KNOW ALL MEN BY THESE PRESENTS:

Comes now Lennar Homes of Texas Land & Construction, LTD., hereafter known as "Participant" and Johnson County, Texas, hereafter known as "Johnson County".

Whereas Participant is extensively utilizing the roads of Johnson County, Texas for the economic benefit of Participant; and

Whereas Participant is developing property in Johnson County Texas that requires certain road characteristics including widening existing County Road 904 for approximately .5 miles adjacent to the Wright Farms/Frontier Phases 1A and 1B Development, installing a storm drain system, and replacing signage on County Road 904 in Johnson County, Texas; and

Whereas Johnson County is a political subdivision of the State of Texas which maintains certain roads within Johnson County; and

Whereas Johnson County has limited resources for the expansion and improvements of such roads; and

Whereas Johnson County is authorized to act and does act as shown by signature below, by and through the Commissioners Court of Johnson County, pursuant to V.T.C. A., Local Government Code Section 81.032 and V.T.C.A., Transportation Code Section 252.214 to accept the materials and labor provided by way of Lennar Homes of Texas Land & Construction, LTD., contracting for the construction of certain road improvements such as widening existing County Road 904 for approximately .5 miles adjacent to the Wright Farms/Frontier Phases 1A and 1B Development, installing a storm drain system, and replacing signage on County Road 904 in Johnson County, Texas.

THEREFORE:

Lennar Homes of Texas Land & Construction, LTD. will contract with a Construction Company approved by the Commissioner of Precinct No. 1, Rick Bailey, to widen existing County Road 904 for approximately .5 miles adjacent to the Wright Farms/Frontier Phases 1A and 1B Development, installing a storm drain system, and replacing signage on County Road 904 in Precinct Number 1 of Johnson County, Texas as shown in the attached Exhibit A.

The above-described action, subsequent to being offered, is subject to acceptance and approval by the Commissioners Court of Johnson County in an open session of the Commissioners Court of Johnson County.

Participant, by executing this Participation for County Road Expansion agrees and understands that this document contains all terms of the transfer of construction services and materials or payment of funds to a Construction Company for the purpose of building turn lanes as described.

Participant understands this is a memorialization of Participants action to provide for the expansion and improvement of a portion of a County Road and this is not a contract.

Lennar Homes of Texas Land & Construction, LTD.

Jennifer Eller
Printed Name of Participant's Authorized Agent

Jennifer Eller
Signature of Participant
or Participant's Authorized Agent Date: 02/03/2025

Approved and Accepted by:
Commissioners Court Date: 2-10-25

Christopher Boedeker, Johnson County Judge
Voted: ✓ yes, ___ no, ____ abstained

Rick Bailey, Comm. Pct. #1
Voted: ✓ yes, ___ no, ___ abstained

Kenny Howell, Comm. Pct. #2
Voted: ✓ yes, ___ no, ___ abstained

Mike White, Comm. Pct. #3
Voted:___ yes,____ no,___ abstained

Larry Woolley, Comm. Pct. #4
Voted:✓ yes, ___ no, ___ abstained

ATTEST: April Long
April Long, County Clerk

COMMISSIONERS COURT JOHNSON COUNTY, TEXAS

WRIGHT FARMS - CR 904
PAVING BID FORM

Item Number	Item Description	Unit	Approx. Quantity	Unit Price	Total Amount
Phase 1A CR904 Paving Items					
1	Demo Existing Asphalt Pavement	Square Yard	4,390	$ 11.00	$ 48,290.00
2	Demo Existing Barbed-Wire Fence	Linear Foot	1,827	$ 3.00	$ 5,481.00
3	Demo and Relocate Existing Barbed-Wire Fence	Linear Foot	148	$ 12.00	$ 1,776.00
4	Demo and Relocated Existing Fence Gate	Each	1	$ 2,100.00	$ 2,100.00
5	Demo Existing Asphalt Driveway	Square Yard	303	$ 13.00	$ 3,939.00
6	Relocate Existing Signs	Each	3	$ 900.00	$ 2,700.00
7	Site/Right-of-Way Prep	Acres	3	$ 13,000.00	$ 40,300.00
8	Grading Improvements	Lump Sum	1	$ 90,000.00	$ 90,000.00
9	8-Inch Thick Reinforced 3,600 psi Concrete Street Pavement w/ 6-Inch Standard Curb	Square Yard	3,457	$ 73.00	$ 252,361.00
10	8-Inch Thick Reinforced 3,600 psi Concrete Street Pavement w/o 6-Inch Standard Curb	Square Yard	1,540	$ 73.00	$ 112,420.00
11	10-Inch Lime-Stabilized Subgrade(Permanent)	Square Yard	5,410	$ 5.00	$ 27,050.00
12	Full Depth Saw Cut	Linear Foot	25	$ 9.00	$ 225.00
13	Connect to Existing Asphalt Pavement	Each	1	$ 900.00	$ 900.00
14	Connect to Existing Concrete Pavement	Each	1	$ 1,200.00	$ 1,200.00
15	3.5-Inch Thick Type 'D" HMAC (Surface)	Square Yard	485	$ 85.00	$ 41,225.00
16	12-Inch Thick Flexible Base, Type A, GR-1-2	Square Yard	535	$ 50.00	$ 26,750.00
17	10-Inch Thick Lime Stabilized Subgrade(Temporary Asphalt Transition)	Square Yard	535	$ 5.00	$ 2,675.00
18	Lime (45 lb/sy)	Ton	125	$ 410.00	$ 51,250.00
19	Extend Existing Gravel Driveway to Proposed Road With Flexbase. Contractor to keep existing width and tie in to Propose top of pavement of CR904.	Square Yard	399	$ 24.00	$ 9,576.00
20	6-Ft Developer Sidewalk (4-Inch Thick)	Square Yard	893	$ 68.00	$ 60,724.00
21	Barrier Free Ramps	Each	4	$ 2,500.00	$ 10,000.00
22	24" Stop Bar	Each	1	$ 425.00	$ 425.00

WRIGHT FARMS - CR 904
PAVING BID FORM

Item Number	Item Description	Unit	Approx. Quantity	Unit Price	Total Amount
23	6" Solid White Line	Linear Foot	2,945	$ 3.00	$ 8,835.00
24	6" Solid Double Yellow Line	Linear Foot	1,564	$ 6.50	$ 10,166.00
25	18" Solid White Line	Linear Foot	127	$ 14.00	$ 1,778.00
26	"Road May Flood" Sign (W8-18)	Each	4	$ 115.00	$ 460.00
27	Flood Gauge (W8-19)	Each	4	$ 325.00	$ 1,300.00
28	Sign Pole	Each	4	$ 600.00	$ 2,400.00
29	Type III Street Barricade	Each	1	$ 2,600.00	$ 2,600.00
30	Street Header	Each	1	$ 750.00	$ 750.00
31	Traffic Control-Produce a Traffic Control Plan along guidelines laid out in plans and Maintain Plan throughout Construction, including signs, barricades, temporary pavement, flexbase, and other materials necessary to meet the guidelines.	Lump Sum	1	$ 16,500.00	$ 16,500.00
Phase 1A CR904 Paving Items Subtotal				***$***	***836,156.00***

WRIGHT FARMS - CR 904
PAVING BID FORM

Item Number	Item Description	Unit	Approx. Quantity	Unit Price	Total Amount
Phase 1B CR904 Paving Items					
1	Demo Existing Asphalt Pavement	Square Yard	3,500	$ 11.00	$ 38,500.00
2	Demo Existing Barbed-Wire Fence	Linear Foot	1,378	$ 3.00	$ 4,134.00
3	Relocate Existing Signs	Each	1	$ 12.00	$ 12.00
4	Site/Right-of-Way Prep	Acres	3	$ 13,000.00	$ 39,000.00
5	Grading Improvements	Lump Sum	1	$ 60,000.00	$ 60,000.00
6	8-Inch Thick Reinforced 3,600 psi Concrete Street Pavement w/ 6-Inch Standard Curb	Square Yard	2,839	$ 73.00	$ 207,247.00
7	8-Inch Thick Reinforced 3,600 psi Concrete Street Pavement w/ 6-Inch Standard Curb on 1 Side	Square Yard	951	$ 73.00	$ 69,423.00
8	10-Inch Lime-Stabilized Subgrade(Permanent)	Square Yard	4,296	$ 5.00	$ 21,480.00
9	Full-Depth Sawcut	Linear Foot	22	$ 9.00	$ 198.00
10	Connect to Existing Asphalt Pavement	Each	1	$ 900.00	$ 900.00
11	3.5-Inch Thick Type 'D" HMAC (Surface)	Square Yard	489	$ 85.00	$ 41,565.00
12	12-Inch Thick Flexible Base, Type A, GR-1-2	Square Yard	527	$ 50.00	$ 26,350.00
13	10-Inch Thick Lime Stabilized Subgrade(Temporary Asphalt Transition)	Square Yard	527	$ 5.00	$ 2,635.00
14	Lime (45 lb/sy)	Ton	109	$ 410.00	$ 44,690.00
15	Extend Existing Gravel Driveway to Proposed Road With Flexbase. Contractor to keep existing width and tie in to Propose top of pavement of CR904.	Square Yard	308	$ 24.00	$ 7,392.00
16	6-Ft Developer Sidewalk (4-Inch Thick)	Square Yard	860	$ 68.00	$ 58,480.00
17	Barrier Free Ramps	Each	2	$ 2,500.00	$ 5,000.00
18	6" Solid White Line	Linear Foot	2,379	$ 3.00	$ 7,137.00
19	6" Solid Double Yellow Line	Each	1,270	$ 6.50	$ 8,255.00
20	18" Solid White Line	Each	362	$ 14.00	$ 5,068.00
21	Type III Street Barricade	Each	2	$ 2,600.00	$ 5,200.00
22	Street Header	Each	2	$ 750.00	$ 1,500.00
23	12" Temporary Rock RIPRAP (D50=8") W/6" Bedding & Filter Fabric (If Required)	Square Yard	72	$ 65.00	$ 4,680.00
24	Traffic Control-Produce a Traffic Control Plan along guidelines laid out in plans and Maintain Plan throughout Construction, including signs, barricades, temporary pavement, flexbase, and other materials necessary to meet the guidelines.	Lump Sum	1	$ 16,500.00	$ 16,500.00
Phase 1B CR904 Paving Items Subtotal				***$***	***675,346.00***

WRIGHT FARMS - CR 904
PAVING BID FORM

Item Number	Item Description	Unit	Approx. Quantity	Unit Price	Total Amount
	Miscellaneous Items				
1	Mobilization	Lump Sum	1	$ 50,000.00	$ 50,000.00
2	Performance and Payment Bonds and Insurance for 100% of Contract Amount	Lump Sum	1	$ 15,000.00	$ 15,000.00
3	Maintenance Bond, 2-Year, 100% of Contract Amount	Lump Sum	1	$ 5,000.00	$ 5,000.00
Miscellaneous Items Subtotal				***$***	***70,000.00***
Paving Bid Total				**$**	**1,581,502.00**
	Alternate Items				
1	Asphalt Pavement Driveway	Square Yard	707	$ 125.00	$ 88,375.00
Alternate Items Subtotal				***$***	***88,375.00***

Earliest Mobilization Date: _____

FRONTIER - COUNTY ROAD 904
UTILITIES BID FORM

Item No.	Item Description	Unit	Approx. Quantity	Unit Price	Total Amount
	Phase 1A CR904 Drainage Items				
1	18-Inch Reinforced Concrete Pipe (RCP), C76, Class III, All Depths, Complete in Place	Linear Foot	17	$ 93.00	$ 1,581.00
2	Rubber Gasketed 18-Inch Reinforced Concrete Pipe (RCP), C76, Class III, All Depths, Complete in Place	Linear Foot	17	$ 106.00	$ 1,802.00
3	21-Inch Reinforced Concrete Pipe (RCP), C76, Class III, All Depths, Complete in Place	Linear Foot	14	$ 110.00	$ 1,540.00
4	Rubber Gasketed 24-Inch Reinforced Concrete Pipe (RCP), C76, Class III, All Depths, Complete in Place	Linear Foot	17	$ 122.00	$ 2,074.00
5	24-Inch Reinforced Concrete Pipe (RCP), C76, Class III, All Depths, Complete in Place	Linear Foot	594	$ 105.00	$ 62,370.00
6	Rubber Gasketed 24-Inch Reinforced Concrete Pipe (RCP), C76, Class III, All Depths, Complete in Place	Linear Foot	27	$ 122.00	$ 3,294.00
7	Rubber Gasketed 36-Inch Reinforced Concrete Pipe (RCP), C76, Class III, All Depths, Complete in Place	Linear Foot	300	$ 190.00	$ 57,000.00
8	Rubber Gasketed 6'x4' Reinforced Conrete Box (RCB), C76, Class IV, All Depths, Complete in Place	Linear Foot	23	$ 525.00	$ 12,075.00
9	Rubber Gasketed 7'x4' Reinforced Conrete Box (RCB), C76, Class IV, All Depths, Complete in Place	Linear Foot	288	$ 620.00	$ 178,560.00
10	5' x 5' Junction Box/ Manhole Complete in Place	Each	2	$ 8,500.00	$ 17,000.00
11	8' x 8' Junction Box/ Manhole Complete in Place	Each	1	$ 19,000.00	$ 19,000.00
12	10' x 10' Junction Box/ Manhole Complete in Place	Each	1	$ 24,000.00	$ 24,000.00
13	Recessed 10-Foot Curb Inlet	Each	2	$ 9,000.00	$ 18,000.00
14	Recessed 15-Foot Curb Inlet	Each	1	$ 13,000.00	$ 13,000.00
15	Recessed 20-Foot Curb Inlet	Each	1	$ 17,000.00	$ 17,000.00
16	12" Thick (D50=6") Rip-Rap w/ 6" Thick Bedding w/ Filter Fabric	Square Yard	30	$ 110.00	$ 3,300.00
17	Concrete Headwall (TxDOT FW-S) (7'x4' RCB)	Each	1	$ 25,000.00	$ 25,000.00
18	Re-Grade Retention Pond After Installing Headwall (Initial Grading of Retention Pond to be Done by Others)	Lump Sum	1	$ 2,800.00	$ 2,800.00
19	5" Concrete Rip-Rap W/#3 Bars @ 18" O.C.E.W. Outfall Structure	Square Yard	3	$ 525.00	$ 1,575.00
20	Post-CCTV Inspection	Linear Foot	1,297	$ 2.50	$ 3,242.50
21	Trench Safety	Linear Foot	1,297	$ 1.00	$ 1,297.00
22	Remove and Dispose of Existing abandoned 12" Water Line as needed for Storm Drain Installation	Lump Sum	1	$ 1,550.00	$ 1,550.00
23	Adjust Existing Water Valve to Finished Grade	Each	1	$ 1,600.00	$ 1,600.00
Drainage Items Subtotal				**$**	**468,660.50**
	Phase 1B CR904 Drainage Items				
1	24-Inch Reinforced Concrete Pipe (RCP), C76, Class IV, All Depths, Complete in Place	Linear Foot	49	$ 115.00	$ 5,635.00
2	Recessed 15-Foot Curb Inlet	Each	1	$ 13,000.00	$ 13,000.00
3	12" Thick (D50=8") Rip-Rap w/ 6" Thick Bedding w/ Filter Fabric	Square Yard	37	$ 110.00	$ 4,070.00
4	Concrete Headwall (TxDOT SETP-CD) (24" RCP)	Each	1	$ 2,500.00	$ 2,500.00
5	Post-CCTV Inspection	Linear Foot	49	$ 2.50	$ 122.50
6	Trench Safety	Linear Foot	49	$ 1.00	$ 49.00
7	Remove and Dispose of Existing abandoned 12" Water Line as needed for Storm Drain Installation	Lump Sum	1	$ 1,550.00	$ 1,550.00
Drainage Items Subtotal				**$**	**26,926.50**

Miscellaneous Items					
1	Mobilization	Lump Sum	1	$ 20,000.00	$ 20,000.00
2	Performance and Payment Bonds and Insurance for 100% of Contract Amount	Lump Sum	1	$ 8,000.00	$ 8,000.00
3	Maintenance Bond, 2-Year, 100% of Contract Amount	Lump Sum	1	$ 2,000.00	$ 2,000.00
Miscellaneous Items Subtotal				**$**	**30,000.00**
Utilities Bid Total				***$***	***525,587.00***
Alternate Item					
1	18" Driveway Culvert with SET	Each	8	$ 48,000.00	$ 48,000.00
Utilities Bid Total					
Earliest Mobilization Date: _____					

PAPE-DAWSON ENGINEERS

TO: Colt M. Friedrich, P.E.
County Engineer
Johnson County

RE: Wright Farms/Frontier CR 904
Memorandum of Donation
Description of Work

DATE: January 24, 2025

Project Description

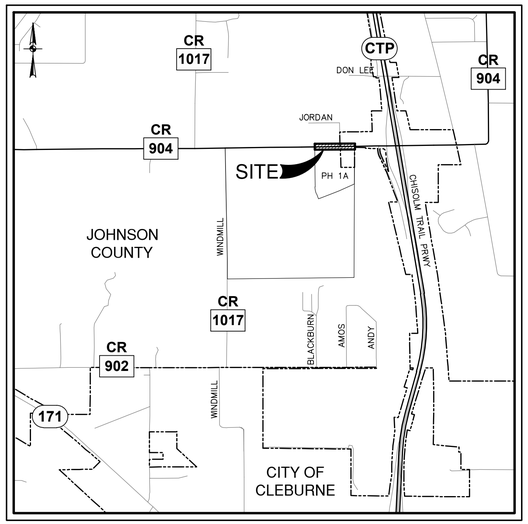
The project improvements of County Road 904 PH-1A and 1B are located near the intersection of CR 904 and Chisholm Trail Pkwy southbound frontage road. These improvements propose building half of an ultimate 4 lane divided minor arterial roadway adjacent to the Wright Farms/Frontier Phases 1A and 1B development. The proposed improvements transition back to existing CR 904 at the property line of Phase 1B to the west and the NTTA ROW limits to the east. The scope of work includes approximately 8,800 square yards of concrete pavement & 1,400 linear feet of storm drain. No Water and sewer improvements are proposed with this project. The storm drain system is planned to tie into a proposed pond, and stub outs are proposed for the future expansion of CR904.

Sincerely,

AJ Roscoe, P.E.
Project Manager

FRONTIER

COUNTY ROAD 904 IMPROVEMENTS (PHASE 1A)
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS
CIVIL CONSTRUCTION PLANS



LOCATION MAP
NOT-TO-SCALE

SHEET INDEX

OWNED/DEVELOPED BY:

LENNAR HOMES OF TEXAS, INC.
1231 GREENWAY DR, SUITE 800
IRVING, TX 75038

JANUARY 2025

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

STATE OF TEXAS
DUSTIN E. WENTZ
118894
LICENSED PROFESSIONAL ENGINEER
1/28/25

CONTACT: AJ ROSCOE, P.E.
AROSCOE@PAPE-DAWSON.COM

ALL GRADING OPERATIONS SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT NO. W232725-2 BY UES ON JUNE 4, 2024.

811 Know what's below. Call before you dig.

SHEET 1

PD JOB NO. 61405-01 FRONTIER COUNTY ROAD 904 IMPROVEMENTS (PHASE 1A)

Date: Jan 29, 2025, 2:31pm User ID: AROSCOE
File: S:\projects\614\05\01\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\CS-6140501.dwg

ISSUED FOR CONSTRUCTION SET

GENERAL NOTES

1. STANDARDS AND SPECIFICATIONS: ALL MATERIALS, CONSTRUCTION METHODS, WORKMANSHIP, EQUIPMENT, SERVICES AND TESTING FOR ALL PUBLIC IMPROVEMENTS SHALL BE IN ACCORDANCE WITH THE GOVERNING AUTHORITIES' ORDINANCES, REGULATIONS, REQUIREMENTS, STATUTES, SPECIFICATIONS AND DETAILS. LATEST PRINTING AND AMENDMENTS THERETO THE GOVERNING AUTHORITIES' PUBLIC WORKS AND WATER DEPARTMENT REQUIREMENTS, PLUMBING CODES, AND FIRE DEPARTMENT REGULATIONS SHALL TAKE PRECEDENT FOR ALL PRIVATE IMPROVEMENTS WHERE APPLICABLE. ALL OTHER PRIVATE CONSTRUCTION NOT REGULATED BY THE GOVERNING AUTHORITY SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS, LATEST PRINTING AND AMENDMENTS THERETO, EXCEPT AS MODIFIED BY THE PROJECT CONTRACT DOCUMENTS.
2. EXAMINATION OF PLANS: PRIOR TO COMMENCING ANY CONSTRUCTION, THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS. FAILURE ON THE PART OF THE CONTRACTOR TO FAMILIARIZE HIMSELF WITH ALL STANDARDS AND SPECIFICATIONS PERTAINING TO THE WORK SHALL IN NO WAY RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PERFORMING THE WORK IN ACCORDANCE WITH ALL SUCH APPLICABLE STANDARDS AND SPECIFICATIONS.
3. EXAMINATION OF SITE: THE CONTRACTOR SHALL BE RESPONSIBLE FOR INVESTIGATING AND SATISFYING HIMSELF AS TO THE CONDITIONS AFFECTING THE WORK, INCLUDING BUT NOT RESTRICTED TO THE BEARING UPON TRANSPORTATION, DISPOSAL, HANDLING AND STORAGE OF MATERIALS, AVAILABILITY OF LABOR, WATER, ELECTRIC POWER, ROADS AND UNCERTAINTIES OF WEATHER OR SIMILAR PHYSICAL CONDITIONS AT THE SITE, CONDITIONS OF THE GROUND, AND THE EQUIPMENT AND FACILITIES NEEDED PRELIMINARY TO AND DURING THE PERFORMANCE OF THE WORK. FAILURE BY THE CONTRACTOR TO ACQUAINT HIMSELF WITH THE AVAILABLE INFORMATION WILL NOT RELIEVE HIM OF RESPONSIBILITY FOR ESTIMATING THE DIFFICULTY OR COST OF SUCCESSFULLY PERFORMING THE WORK.
4. SUBSURFACE INVESTIGATION: SUBSURFACE EXPLORATION TO ASCERTAIN THE NATURE OF SOILS HAS BEEN PERFORMED BY THE GEOTECHNICAL ENGINEER OF RECORD ON THE PROJECT. THE SUBSURFACE INFORMATION WILL BE MADE AVAILABLE FOR THE CONTRACTORS USE. THE ENGINEER DISCLAIMS ANY RESPONSIBILITY FOR THE ACCURACY, TRUE LOCATION, AND EXTENT OF THE SOILS INFORMATION PREPARED BY OTHERS.
5. TOPOGRAPHY SURVEY: TOPOGRAPHIC SURVEY INFORMATION SHOWN ON THE PLANS IS PROVIDED FOR INFORMATIONAL PURPOSES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE INFORMATION SHOWN IS CORRECT AND SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY ERRORS, DISCREPANCIES, OR OMISSIONS TO THE SURVEY INFORMATION PROVIDED.
6. COMPLIANCE WITH LAWS: THE CONTRACTOR SHALL FULLY COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS. INCLUDING ALL CODES, ORDINANCES, AND REGULATIONS APPLICABLE TO THIS CONTRACT AND THE WORK TO BE DONE THEREUNDER WHICH EXIST OR MAY BE ENACTED LATER BY GOVERNMENTAL BODIES HAVING JURISDICTION OR AUTHORITY FOR SUCH ENACTMENT. ALL WORK REQUIRED UNDER THIS CONTRACT SHALL COMPLY WITH ALL REQUIREMENTS OF LAW, REGULATION, PERMIT OR LICENSE. IF THE CONTRACTOR FINDS THAT THERE IS A VARIANCE, HE SHALL IMMEDIATELY REPORT THIS TO THE OWNER FOR RESOLUTION.
7. PUBLIC CONVENIENCE AND SAFETY: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. MATERIALS STORED ON THE WORK SITE SHALL BE PLACED AND THE WORK SHALL AT ALL TIMES BE SO CONDUCTED AS TO CAUSE NO GREATER OBSTRUCTION TO THE TRAVELING PUBLIC THAN IS CONSIDERED ACCEPTABLE BY THE GOVERNING AUTHORITIES AND THE DEVELOPER AND NOT TO PREVENT FREE UNINTERRUPTED ACCESS TO ALL FIRE HYDRANTS, WATER VALVES, GAS VALVES, MANHOLES AND FIRE ALARM OR POLICE CALL BOXES IN THE VICINITY.
8. STORM WATER POLLUTION PREVENTION PLAN (SWPPP): THE CONTRACTOR SHALL COMPLY WITH THE CONDITIONS OF THE SWPPP WHILE CONDUCTING HIS ACTIVITIES ON THE PROJECT.
9. PERMITS AND LICENSES: THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND LICENSES NECESSARY FOR THE EXECUTION OF THE WORK AND SHALL FULLY COMPLY WITH ALL THEIR TERMS AND CONDITIONS. WHENEVER THE WORK UNDER THIS CONTRACT REQUIRES OBTAINING PERMITS FROM GOVERNING AUTHORITIES, THE CONTRACTOR SHALL FURNISH DUPLICATE COPIES OF SUCH PERMITS TO THE DEVELOPER BEFORE THE WORK COVERED THEREBY IS STARTED. NO WORK WILL BE ALLOWED TO PROCEED BEFORE SUCH PERMITS HAVE BEEN OBTAINED. COSTS ASSOCIATED WITH PERMITS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
10. APPROVED PLANS: THE CONTRACTOR SHALL HAVE AT LEAST ONE SET OF APPROVED PLANS ON-SITE AT ALL TIMES.
11. BONDS: PERFORMANCE, PAYMENT, AND MAINTENANCE BONDS MAY BE REQUIRED FROM THE CONTRACTOR FOR "PUBLIC" IMPROVEMENTS. IF REQUIRED, THE CONTRACTOR SHALL PROVIDE THE BONDS IN THE FORM AND IN THE AMOUNTS AS REQUIRED BY THE GOVERNING AUTHORITIES. COSTS ASSOCIATED WITH PROVIDING THE BONDS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
12. INSPECTION AND TESTING: THE GOVERNING AUTHORITIES AND/OR THE DEVELOPER WILL PROVIDE INSPECTION AND TESTING OF THE PROPOSED CONSTRUCTION AT THEIR EXPENSE. THE CONTRACTOR SHALL PROVIDE SUFFICIENT NOTICE WELL IN ADVANCE OF PENDING CONSTRUCTION ACTIVITIES TO THE GOVERNING AUTHORITIES AND/OR OWNER FOR SCHEDULING OF INSPECTION/TESTING SERVICES. IN THE EVENT THE RESULTS OF THE INITIAL TESTING DO NOT COMPLY WITH THE PLANS AND SPECIFICATIONS, SUBSEQUENT TESTS NECESSARY TO DETERMINE THE ACCEPTABILITY OF MATERIALS OR CONSTRUCTION SHALL BE AT THE CONTRACTOR'S EXPENSE.
13. SHOP DRAWINGS: THE CONTRACTOR SHALL PREPARE, REVIEW, AND SUBMIT ALL SHOP DRAWINGS, PRODUCT DATA AND SAMPLES REQUIRED BY THE GOVERNING AUTHORITIES AND THE PROJECT CONTRACT DOCUMENTS.
14. SURVEYING: ALL SURVEYING REQUIRED FOR CONSTRUCTION STAKING WILL BE PROVIDED BY THE DEVELOPER ONE TIME ONLY. ALL RESTAKING SHALL BE AT THE CONTRACTOR'S EXPENSE.
15. PROTECTION OF PROPERTY CORNERS AND BENCHMARKS: THE CONTRACTOR SHALL PROTECT ALL PROPERTY CORNERS, MARKERS, AND BENCHMARKS. WHEN ANY SUCH MARKERS OR MONUMENTS ARE IN DANGER OF BEING DISTURBED, THEY SHALL BE PROPERLY REFERENCED AND IF DISTURBED SHALL BE RESET BY A REGISTERED PROFESSIONAL LAND SURVEYOR AT THE EXPENSE OF THE CONTRACTOR.
16. EXISTING STRUCTURES: THE PLANS SHOW THE LOCATION OF ALL KNOWN SURFACE AND SUBSURFACE STRUCTURES. HOWEVER, THE DEVELOPER AND ENGINEER ASSUME NO RESPONSIBILITY FOR THE FAILURE TO SHOW ANY OR ALL OF THESE STRUCTURES ON THE PLANS OR TO SHOW THEM IN THEIR EXACT LOCATION. SUCH FAILURE SHALL NOT BE CONSIDERED SUFFICIENT BASIS FOR CLAIMS FOR ADDITIONAL COMPENSATION FOR EXTRA WORK OR FOR INCREASING THE PAY QUANTITIES IN ANY MANNER WHATSOEVER, UNLESS THE OBSTRUCTION ENCOUNTERED IS SUCH AS TO REQUIRE CHANGES IN THE LINES OR GRADES OR REQUIRE THE CONSTRUCTION OF SPECIAL WORK FOR WHICH PROVISIONS ARE NOT MADE IN THE PLANS.
17. PROTECTION OF EXISTING UTILITIES: AS REQUIRED BY "THE TEXAS UNDERGROUND FACILITY DAMAGE PREVENTION AND SAFETY ACT", TEXAS ONE CALL SYSTEM MUST BE CONTACTED (800-245-4545) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION OPERATIONS BEING PERFORMED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT TEXAS ONE CALL SYSTEM. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLANS ARE BASED ON THE BEST RECORDS AND/OR FIELD INFORMATION AVAILABLE AND ARE NOT GUARANTEED BY THE DEVELOPER OR ENGINEER TO BE ACCURATE AS TO THE LOCATION AND DEPTH. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY LOCATIONS OF ADJACENT AND/OR CONFLICTING UTILITIES SUFFICIENTLY IN ADVANCE OF HIS ACTIVITIES IN ORDER THAT HE MAY NEGOTIATE SUCH LOCAL ADJUSTMENTS AS NECESSARY IN THE CONSTRUCTION PROCESS TO PROVIDE ADEQUATE CLEARANCES. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL EXISTING UTILITIES, SERVICES, AND STRUCTURES ENCOUNTERED WHETHER OR NOT THEY ARE ON THE PLANS. ANY DAMAGE TO UTILITIES RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED AT HIS EXPENSE. TO AVOID UNNECESSARY INTERFERENCES OR DELAYS, THE CONTRACTOR SHALL COORDINATE ALL UTILITY REMOVALS, REPLACEMENTS, AND CONSTRUCTION WITH THE APPROPRIATE GOVERNING AUTHORITIES. THE DEVELOPER WILL NOT BE LIABLE FOR DAMAGES DUE TO DELAY BECAUSE OF THE ABOVE.
18. DAMAGE TO EXISTING FACILITIES: ALL EXISTING UTILITIES, PAVEMENT, SIDEWALKS, WALLS, FENCES, ETC. DAMAGED DURING CONSTRUCTION ACTIVITIES SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE TO A CONDITION EQUAL TO OR BETTER THAN THE CONDITIONS PRIOR TO STARTING THE WORK.
19. FIRE AND LIFE SAFETY SYSTEMS: THE CONTRACTOR SHALL NOT REMOVE, DISABLE, OR DISRUPT EXISTING FIRE OR LIFE SAFETY SYSTEMS WITHOUT RECEIVING PRIOR WRITTEN PERMISSION FROM THE GOVERNING AUTHORITY.
20. TRENCH SAFETY: THE CONTRACTOR IS RESPONSIBLE FOR HAVING A TRENCH SAFETY PLAN PREPARED IN ACCORDANCE WITH OSHA REQUIREMENTS BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS FOR THE IMPLEMENTATION OF TRENCH SAFETY CONTROL MEASURES THAT WILL BE IN EFFECT DURING THE CONSTRUCTION OF THE PROJECT. THE COSTS FOR PREPARATION OF THE TRENCH SAFETY PLAN SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
21. TRAFFIC CONTROL: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DEVELOP AND SUBMIT FOR APPROVAL BY THE GOVERNING AUTHORITIES A TRAFFIC CONTROL PLAN PREPARED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS OUTLINING TRAFFIC MANAGEMENT PROCEDURES TO BE PROVIDED DURING CONSTRUCTION. THE COSTS ASSOCIATED WITH THE PREPARATION AND IMPLEMENTATION OF THE TRAFFIC CONTROL PLAN SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
22. ACCESS TO ADJACENT PROPERTIES: ACCESS TO ADJACENT PROPERTIES SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE DIRECTED BY THE GOVERNING AUTHORITIES AND/OR OWNER.
23. ACCESS ROUTES, STAGING AREAS AND STORAGE AREAS: ALL PRIVATE HAUL ROADS AND ACCESS ROUTES AND THE LOCATION OF ALL STAGING AREAS AND STORAGE AREAS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND REPAIRING ROADS AND OTHER FACILITIES USED DURING CONSTRUCTION. UPON COMPLETION OF THE PROJECT, ALL HAUL ROADS, ACCESS ROADS, STAGING AREAS AND STORAGE AREAS SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN THE CONDITIONS PRIOR TO STARTING THE WORK.
24. PARKING OF CONSTRUCTION EQUIPMENT: AT NIGHT AND DURING ALL PERIODS OF TIME WHEN EQUIPMENT IS NOT BEING ACTIVELY USED FOR CONSTRUCTION WORK. THE CONTRACTOR SHALL PARK THE EQUIPMENT AT LOCATIONS WHICH ARE APPROVED BY THE OWNER. DURING THE CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL COMPLY WITH THE PRESENT ZONING REQUIREMENTS OF THE GOVERNING AUTHORITIES IN THE USE OF VACANT PROPERTY FOR STORAGE PURPOSES. THE CONTRACTOR SHALL ALSO PROVIDE ADEQUATE BARRICADES, MARKERS, AND LIGHTS TO PROTECT THE OWNER, THE GOVERNING AUTHORITIES, THE PUBLIC, AND THE WORK. ALL BARRICADES, LIGHTS, AND MARKERS MUST MEET THE REQUIREMENTS OF THE GOVERNING AUTHORITIES' REGULATIONS.
25. WATER FOR CONSTRUCTION: THE CONTRACTOR SHALL MAKE THE NECESSARY ARRANGEMENTS FOR PURCHASING WATER FROM THE GOVERNING AUTHORITY FOR HIS USE ON THE PROJECT SITE. COST ASSOCIATED WITH THIS SERVICE SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
26. TEMPORARY ELECTRIC AND COMMUNICATIONS FOR CONSTRUCTION: THE CONTRACTOR SHALL MAKE THE NECESSARY ARRANGEMENTS FOR THE INSTALLATION AND PURCHASING OF TEMPORARY ELECTRIC AND COMMUNICATIONS SERVICES FROM THE GOVERNING AUTHORITIES FOR HIS USE ON THE PROJECT SITE. COSTS ASSOCIATED WITH THIS SERVICE SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
27. FENCES: ALL FENCES ENCOUNTERED AND REMOVED DURING CONSTRUCTION, EXCEPT THOSE DESIGNATED TO BE REMOVED OR RELOCATED, SHALL BE RESTORED TO THE ORIGINAL OR BETTER THAN CONDITION UPON COMPLETION OF THE PROJECT. WHERE WIRE FENCING, EITHER WIRE MESH OR BARBED WIRE, IS NOT TO BE CROSSED, THE CONTRACTOR SHALL SET CROSS-BRACED POSTS ON EITHER SIDE OF THE CROSSING. TEMPORARY FENCING SHALL BE ERECTED IN PLACE OF THE FENCING REMOVED WHENEVER THE WORK IS NOT IN PROGRESS AND WHEN THE SITE IS VACATED OVERNIGHT AND/OR AT ALL TIMES TO PREVENT PERSONS AND/OR LIVESTOCK FROM ENTERING THE CONSTRUCTION AREA. THE COST OF FENCE REMOVAL, TEMPORARY CLOSURES, AND REPLACEMENT SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
28. COORDINATION WITH OTHERS: IN THE EVENT THAT OTHER CONTRACTORS ARE DOING WORK IN THE SAME AREA SIMULTANEOUSLY WITH THE PROJECT, THE CONTRACTOR SHALL COORDINATE HIS PROPOSED CONSTRUCTION WITH THAT OF THE OTHER CONTRACTORS.
29. CONDITION OF THE SITE DURING CONSTRUCTION: THE CONTRACTOR SHALL KEEP THE SITE OF THE WORK AND ADJACENT PREMISES AS FREE FROM MATERIAL, DEBRIS, AND RUBBISH AS IS PRACTICAL. THE CONTRACTOR SHALL REMOVE MATERIAL DEBRIS AND RUBBISH FROM ANY PORTION OF THE SITE IF, IN THE OPINION OF THE DEVELOPER, SUCH MATERIAL, DEBRIS, AND RUBBISH CONSTITUTES A NUISANCE OR IS OBJECTIONABLE.
30. EXISTING ROADWAYS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE CLEANLINESS OF EXISTING PAVED ROADS. COSTS ASSOCIATED WITH MAINTAINING THE CLEANLINESS OF EXISTING ROADS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
31. DUST CONTROL: THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO CONTROL DUST ON THE PROJECT SITE BY THE SPRINKLING OF WATER OR ANY OTHER METHODS APPROVED BY THE GOVERNING AUTHORITIES. COSTS ASSOCIATED WITH DUST CONTROL SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
32. CLEAN UP FOR FINAL ACCEPTANCE: THE CONTRACTOR SHALL MAKE A FINAL CLEAN UP OF ALL PARTS OF THE WORK BEFORE ACCEPTANCE BY THE OWNER. THIS CLEAN UP SHALL INCLUDE REMOVAL OF ALL OBJECTIONABLE MATERIALS AND, IN GENERAL, PREPARING THE SITE OF THE WORK IN AN ORDERLY MANNER OF APPEARANCE.
33. REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK: ALL WORK, WHICH HAS BEEN REJECTED OR CONDEMNED, SHALL BE REPAIRED, OR IF IT CANNOT BE REPAIRED SATISFACTORILY, SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. DEFECTIVE MATERIALS SHALL BE IMMEDIATELY REMOVED FROM THE WORK SITE. WORK DONE NOT IN CONFORMITY WITH THE GRADES SHOWN ON THE DRAWINGS OR AS WRITTEN AUTHORITY AND PRIOR AGREEMENT IN WRITING AS TO PRICES, SHALL BE AT THE CONTRACTOR'S RISK, AND WILL BE CONSIDERED UNAUTHORIZED, AND AT THE OPTION OF THE OWNER MAY NOT BE MEASURED AND PAID FOR AND MAY BE ORDERED REMOVED AT THE CONTRACTOR'S EXPENSE. UPON FAILURE OF THE CONTRACTOR TO REPAIR SATISFACTORILY OR TO REMOVE AND REPLACE THE DIRECTED, REJECTED, UNAUTHORIZED, OR CONDEMNED WORK OR MATERIALS IMMEDIATELY AFTER RECEIVING NOTICE FROM THE OWNER, THE OWNER WILL, AFTER GIVING WRITTEN NOTICE TO THE CONTRACTOR, HAVE THE AUTHORITY TO CAUSE UNAUTHORIZED WORK TO BE REMEDIED OR REMOVED AND REPLACED OR TO CAUSE UNAUTHORIZED WORK TO BE REMOVED AND TO DEDUCT THE COST THEREOF ANY MONIES DUE OR TO BECOME DUE TO THE CONTRACTOR.
34. DISPOSITION AND DISPOSAL OF EXCESS AND UNSUITABLE MATERIALS: ALL MATERIALS TO BE REMOVED FROM THE SITE INCLUDED BUT NOT LIMITED TO EXCESS MATERIAL AND UNSUITABLE MATERIALS SUCH AS CONCRETE, ASPHALT, LARGE ROCKS, REFUSE, AND OTHER DEBRIS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OUTSIDE THE LIMITS OF THE PROJECT. CONTRACTOR SHALL ALSO COMPLY WITH ALL APPLICABLE LAWS GOVERNING SPILLAGE OF DEBRIS WHILE TRANSPORTING TO A DISPOSAL SITE. COSTS ASSOCIATED WITH THE DISPOSAL OF EXCESS AND UNSUITABLE MATERIALS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
35. RECORD DRAWINGS: THE CONTRACTOR SHALL MAINTAIN AN ACCURATE RECORD OF THE INSTALLATION OF ALL MATERIALS AND SYSTEM COVERED BY THE PROJECT CONTRACT DOCUMENTS. THE COMPLETE SET OF "RECORD DRAWINGS" MUST BE DELIVERED TO THE OWNER AND/OR ENGINEER BEFORE REQUESTING FINAL PAYMENT.

GRADING NOTES

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH PROVISIONS OUTLINED IN F.H.A. DATA SHEET 79G AND/OR THE SPECIFICATIONS PREPARED BY THE SOILS ENGINEER.

36. *ALL CLAY SOIL USED AS FILL SHOULD BE COMPACTED TO AT LEAST 95% AND NOT EXCEEDING 105 PERCENT OF STANDARD PROCTOR DENSITY AS DETERMINED BY A.S.T.M. D-698. THE COMPACTED MOISTURE CONTENT OF THE CLAYS DURING PLACEMENT SHOULD BE AT LEAST OPTIMUM AND NOT EXCEEDING FIVE (5) PERCENTAGE POINTS ABOVE OPTIMUM.
37. *LIMESTONE OR OTHER ROCK-LIKE MATERIALS USED AS FILL SHOULD BE COMPACTED TO AT LEAST 95 PERCENT AND NOT EXCEEDING 105 PERCENT OF STANDARD PROCTOR DENSITY AS DETERMINED BY A.S.T.M. D-698/ THE COMPACTED MOISTURE CONTENT DURING PLACEMENT SHOULD BE WITHIN PLUS OR MINUS THREE (3) PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT. NO ROCK LARGER THAN SIX INCHES IN ITS GREATEST DIMENSION SHALL BE USED IN FILL WHEN THE FILL IS PLACED UNDER PADS, STREETS OR ANY OTHER AREAS THAT WILL HAVE ANY TYPE OF STRUCTURES.
38. COMPACTION SHOULD BE ACCOMPLISHED BY PLACING THE FILL IN SIX INCH THICK LOOSE LIFTS AND COMPACTING EACH LIFT TO AT LEAST THE SPECIFIED MINIMUM DRY DENSITY. PARTICLE SIZES USED IN FILL SHALL BE LESS THAN SIX (6) INCHES DIAMETER.
39. GRADING CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OFF-SITE OF ALL EXCAVATED AND CLEARED MATERIAL, WHICH SOILS LAB DECLARES UNSUITABLE FOR USE ON-SITE.
40. CONTRACTOR TO SLOPE THE ADJACENT GROUND AWAY FROM BUILDING PAD TO ACHIEVE POSITIVE SURFACE DRAINAGE.
41. INITIAL SITE GRADING SHALL BE COMPLETED TO A TOLERANCE OF PLUS OR MINUS ONE TENTH OF ONE FOOT IN STREETS AND PLUS OR MINUS THREE TENTHS OF ONE FOOT FOR THE BUILDING PADS. FINAL BUILDING PAD GRADING, TO BE DONE UPON COMPLETION OF PAVING AND UTILITY FACILITIES, SHALL BE PROVIDED TO A TOLERANCE OF PLUS OR MINUS TWO TENTHS OF ONE FOOT AT ALL FOUR CORNERS AND CENTER OF BUILDING PAD, IN ALL SWALES, AND LOT CORNERS.
42. CONTRACTOR SHALL REPLACE ANY EROSION CONTROL MATERIALS AT THE END OF EACH WORK DAY IF SAID MATERIALS WERE REMOVED DURING THE DAY FOR EASE OF CONSTRUCTION OR ACCESS.
43. IF ROCK IS ENCOUNTERED IN THE STREET SUBGRADE, THE ROCK SHALL BE EXCAVATED TO A DEPTH OF SIX INCHES, REMOVED FROM THE STREET, AND NON-ROCK MATERIAL SHALL BE REPLACED FOR THE STREET SUBGRADE. ROCK IN THE STREET PARKWAYS SHALL BE REMOVED AND REPLACED WITH SIX INCHES OF TOP SOIL. THIS SHALL BE ACCOMPLISHED BY THE EXCAVATION CONTRACTOR, SUBSIDIARY TO THIS CONTRACT.
44. NO PART OF ANY RETAINING WALL SHALL BE WITHIN CITY RIGHT-OF-WAY, OR CITY PROPERTY (I.E. PARK) INCLUDING FOOTING.

* APPLIES TO ALL AREAS OUTSIDE OF PUBLIC R.O.W. ONLY. REFER TO PAVING GENERAL CONSTRUCTION NOTES FOR DENSITY/MOISTURE REQUIREMENTS IN R.O.W.

PAVING NOTES

1. UTILITY DATA IS PROVIDED FOR INFORMATION ONLY. ALTHOUGH THIS DATA IS SHOWN AS ACCURATELY AS POSSIBLE, THE CONTRACTOR IS CAUTIONED THAT THE OWNER AND THE ENGINEER NEITHER ASSUMES NOR IMPLIES ANY RESPONSIBILITY FOR THE ACCURACY OF THIS DATA.
2. CONTRACTOR WILL BE RESPONSIBLE FOR FIELD VERIFYING THE LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO HIS OPERATIONS.
3. SEE UTILITY PLANS FOR LOCATION OF WATER LINES, SANITARY SEWER LINES, STORM DRAINS, AND UTILITY CROSSING.
4. ALL MATERIAL AND CONSTRUCTION SHALL CONFORM TO APPLICABLE CITY STANDARD SPECIFICATIONS AND CONSTRUCTION DETAILS.
5. ALL FILL SHALL BE COMPACTED AS SPECIFIED IN THE GEOTECHNICAL REPORT. DENSITY TEST RESULTS WILL BE REQUIRED AT THE PRE-CONSTRUCTION MEETING FOR ALL FILL AREAS IN EXCESS OF 2.0' UNDERNEATH PROPOSED PAVING.
6. STREET CURB RADII AT STREET INTERSECTIONS SHALL BE 20' (MEASURED FROM BACK OF CURB) UNLESS OTHERWISE NOTED. ALL PAVING DIMENSIONS ARE TO BACK OF CURB, UNLESS OTHERWISE NOTED.
7. TYPICAL PAVEMENT SECTION IS TO TRANSITION FROM CROWN SECTION TO TRANSVERSE SECTION WITHIN A DISTANCE OF 50' OF WHERE A VALLEY GUTTER CROSSES A STREET INTERSECTION.
8. SEE PAVEMENT CONSTRUCTION DETAILS SHEET FOR PAVEMENT SECTIONS AND CONSTRUCTION DETAILS.
9. BLUE REFLECTOR TO BE INSTALLED 1.0' OFFSET FROM CENTERLINE OF STREET ON FIRE HYDRANT SIDE, FOR PURPOSES OF QUICK HYDRANT LOCATION AT NIGHT.

STORM DRAIN NOTES

1. WATER AND SANITARY SEWER LINES ARE SHOWN FOR REFERENCE ONLY. REFER TO WATER AND SANITARY SEWER PLANS FOR EXACT LOCATION.
2. ALL STORM DRAIN LINES TO BE R.C.P. CLASS III UNLESS OTHERWISE NOTED.
3. ALL CURVED STORM DRAIN IS TO BE CONSTRUCTED WITH RADIUS PIPE OR IS TO BE DEFLECTED AT JOINTS (PER MANUFACTURER'S SPECIFICATIONS) AND GROUTED AS NECESSARY. IT SHALL BE THE CONTRACTOR'S OPTION AS TO WHICH METHOD TO USE (NO SEPARATE PAY).
4. ALL AREA DISTURBED BY CHANNEL EXCAVATION SHALL BE RE-VEGETATED AS SET FORTH IN THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) WHICH WAS PREPARED SPECIFICALLY FOR THIS PROJECT, OR OTHERWISE PROTECTED AGAINST EROSION BY THE USE OF RIP-RAP, GABIONS, OR GEOTEXTILES.

EROSION & SEDIMENT CONTROL NOTES

1. CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL ORDINANCES THAT APPLY.
2. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY THE GOVERNING AUTHORITIES AND ALL PERIMETER EROSION CONTROL DEVICES HAVE BEEN INSTALLED.
3. THIS EROSION CONTROL PLAN IS A SUPPLEMENT TO THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) PREPARED BY OTHERS. REFER TO THE SWPPP FOR ADDITIONAL REQUIREMENTS.
4. THE GENERAL CONTRACTOR, AS THE TCEQ DEFINES "OPERATOR," SHALL PERFORM ALL REQUIRED INSPECTIONS OF STORM WATER CONTROLS AND PRACTICES AT FREQUENCIES OUTLINED IN THE TPDES GENERAL PERMIT AND SHALL FILL OUT APPROPRIATE INSPECTION FORMS (AS PROVIDED IN THE SWPPP) UNLESS OTHERWISE DIRECTED BY THE OWNER.
5. THE GENERAL CONTRACTOR (AND ALL SUBCONTRACTORS INVOLVED WITH ANY CONSTRUCTION ACTIVITIES RELATED TO EARTHWORK, EROSION CONTROL, ETC. OR WHICH UTILIZE POSSIBLE POLLUTANTS AS DEFINED IN THE TPDES GENERAL PERMIT) SHALL REVIEW AND ADHERE TO THE SWPPP FOR THE PROJECT, AS WELL AS ALL THE TCEQ REQUIREMENTS SET FORTH IN THE TPDES GENERAL PERMIT.
6. ADDITIONAL EROSION CONTROL DEVICES AND/OR ADJUSTMENT OF LOCATIONS FOR EROSION CONTROL MAY BE IMPLEMENTED BY THE CONTRACTOR AT HIS DISCRETION AND/OR IN THE OPINION OF THE CITY INSPECTOR, AT NO ADDITIONAL EXPENSE TO THE OWNER. THE ADDITION OR DELETION OF ANY EROSION CONTROL MEASURE MAY REQUIRE THAT THE SWPPP BE MODIFIED IN ACCORDANCE WITH THE TCEQ'S TPDES GENERAL PERMIT GUIDELINES.
   a. EXCAVATION CONTRACTOR TO BE RESPONSIBLE FOR INSTALLATION OF SILT BARRIERS, CHECK DAMS, AND CONSTRUCTION ENTRANCE/EXIT.
   b. UTILITY CONTRACTOR (WATER, SEWER & STORM DRAIN) TO BE RESPONSIBLE FOR INSTALLATION OF STAGE 1 AND STAGE 2 INLET PROTECTION.
   c. OWNER TO BE RESPONSIBLE FOR SEEDING AND FINAL REMOVAL OF EROSION CONTROLS.
7. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EROSION CONTROL DEVICES ALREADY IN PLACE. CONTRACTOR SHALL REMOVE AND REPLACE EROSION CONTROL AS NEEDED FOR CONSTRUCTION OR ACCESS. ALL EROSION CONTROL MUST BE IN PLACE AT THE END OF EACH DAY.
8. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO USE WHATEVER MEANS ARE NECESSARY TO CONTROL AND LIMIT SILT AND SEDIMENT LEAVING THE SITE. SPECIFICALLY, THE CONTRACTOR SHALL PROTECT ALL PUBLIC STREETS, ALLEYS, STREAMS, STORM DRAIN SYSTEMS, INLETS, AND ADJACENT PROPERTY FROM EROSION DEPOSITS. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGE TO ADJACENT PROPERTIES AND/OR PUBLIC RIGHT OF WAY RESULTING FROM FAILURE TO FULLY IMPLEMENT AND EXECUTE ALL EROSION CONTROL PROCEDURES SHOWN AND NOTED IN THESE PLANS AND THE SWPPP.
9. ALL EROSION CONTROL DEVICES TO BE INSPECTED, CLEANED, AND/OR REPLACED AFTER EACH STORM.
10. USE OF ON-SITE FUEL STORAGE TANKS IS DISCOURAGED. HOWEVER, IF USED, THE PREVENTION OF HAZARDS TO THE GROUND WATER IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR UTILIZING SAID STORAGE. SEE N.C.T.C.O.G. CONSTRUCTION BMP MANUAL SECTION 4 – HAZARDOUS WASTE MANAGEMENT.
11. A CENTRALIZED PIT/WASH BASIN SHALL BE CONSTRUCTED ON-SITE FOR THE PURPOSE OF CONCRETE TRUCK WASHING. SEE N.C.T.C.O.G. CONSTRUCTION BMP MANUAL SECTION 4 – CONCRETE WASTE MANAGEMENT.
12. CONTRACTORS SHALL PARK, STORE EQUIPMENT AND MATERIALS AND SERVICE VEHICLES AT THE "PARKING AND STORAGE AREA". THE LOCATION OF SAID AREA IS TO BE APPROVED BY THE OWNER OR HIS REPRESENTATIVE.
13. CONSTRUCTION ENTRANCES ARE TO BE INSTALLED AT ALL POINTS WHERE EQUIPMENT ENTERS OR LEAVES THE SITE. THE LOCATION OF SAME IS TO BE APPROVED BY THE OWNER OR HIS REPRESENTATIVE.
14. EROSION CONTROLS TO REMAIN IN PLACE AND TO BE MAINTAINED UNTIL DISTURBED AREAS ARE STABILIZED.
15. EROSION CONTROL MEASURES MAY ONLY BE PLACED IN FRONT OF INLET OR IN CHANNELS, DRAINAGEWAYS OR BORROW DITCHES AT RISK OF CONTRACTOR. CONTRACTOR SHALL REMAIN LIABLE FOR ANY DAMAGE CAUSED BY MEASURES, INCLUDING FLOOD DAMAGE WHICH MAY OCCUR DUE TO BLOCKED DRAINAGE AT THE CONCLUSION OF ANY PROJECT. ALL CHANNELS, DRAINAGEWAYS AND BORROW DITCHES IN THE WORK ZONE SHALL BE DREDGED OF ANY SEDIMENT GENERATED BY THE PROJECT AS A RESULT OF EROSION CONTROL MEASURES.
16. ALL WASH WATER SHALL BE DISPOSED OF IN A MANNER THAT PREVENTS CONTACT BETWEEN WASH WATER POLLUTANTS AND STORM RUNOFF DISCHARGED FROM THIS SITE.
17. DISTURBED AREAS ON THE SITE WHERE CONSTRUCTION ACTIVITY HAS CEASED FOR AT LEAST 14 DAYS SHALL BE TEMPORARILY PLANTED AND/OR SEEDED AND WATERED.
18. DISTURBED AREAS ON THE SITE WHERE CONSTRUCTION ACTIVITY HAS PERMANENTLY CEASED AND AREAS WHERE FINAL GRADE HAS BEEN ACHIEVED SHALL BE PERMANENTLY PLANTED AND/OR SEEDED WITHIN 14 DAYS.
19. PLANTING AND/OR SEEDING OF VEGETATED AREAS TO ACCOMPLISH STABILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH THE LANDSCAPING PLAN. AREAS BEYOND THE LIMITS OF THE LANDSCAPING PLAN (OR WHEN A LANDSCAPING PLAN DOES NOT EXIST) SHALL BE HYDROMULCHED WITH HIGHWAY MIX AND WATERED WITH TEMPORARY ABOVE GROUND IRRIGATION UNTIL THE VEGETATION IS ESTABLISHED.
20. THE CONTRACTOR SHALL REMOVE ALL ACCUMULATED SILT IN ANY STORM SEWER INLETS AND PIPES, AND ALONG SILT FENCES, WITHIN 48 HOURS AFTER INSPECTIONS OF DEVICES REVEALS THE PRESENCE OF EXCESS SILTATION.
21. SILT FENCES SHALL BE PLACED AROUND STOCKPILES USED ON THE SITE.
22. THE CONTRACTOR SHALL MODIFY THIS PLAN TO SHOW LOCATIONS OF TEMPORARY WASHDOWN AREA, PORTABLE TOILETS, EQUIPMENT MAINTENANCE/REPAIR AREAS, STOCKPILE AREAS, FUEL STORAGE AREAS, ETC. AND POLLUTANT CONTROLS FOR EACH.

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

GENERAL CONSTRUCTION NOTES

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 2

Date: Jan 29, 2025, 2:31pm User ID: AROSCOE
File: S:\projects\614\05\01\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\NT-6140501.dwg

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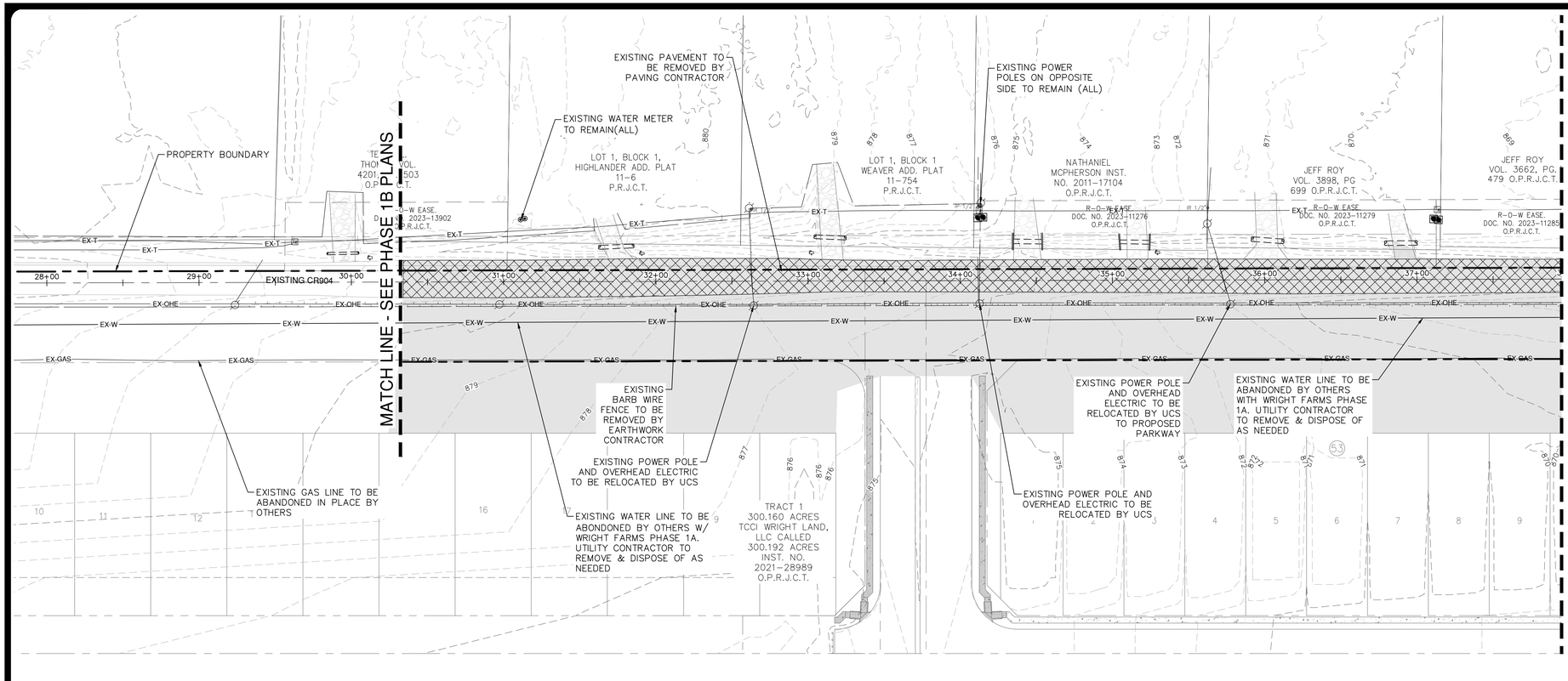
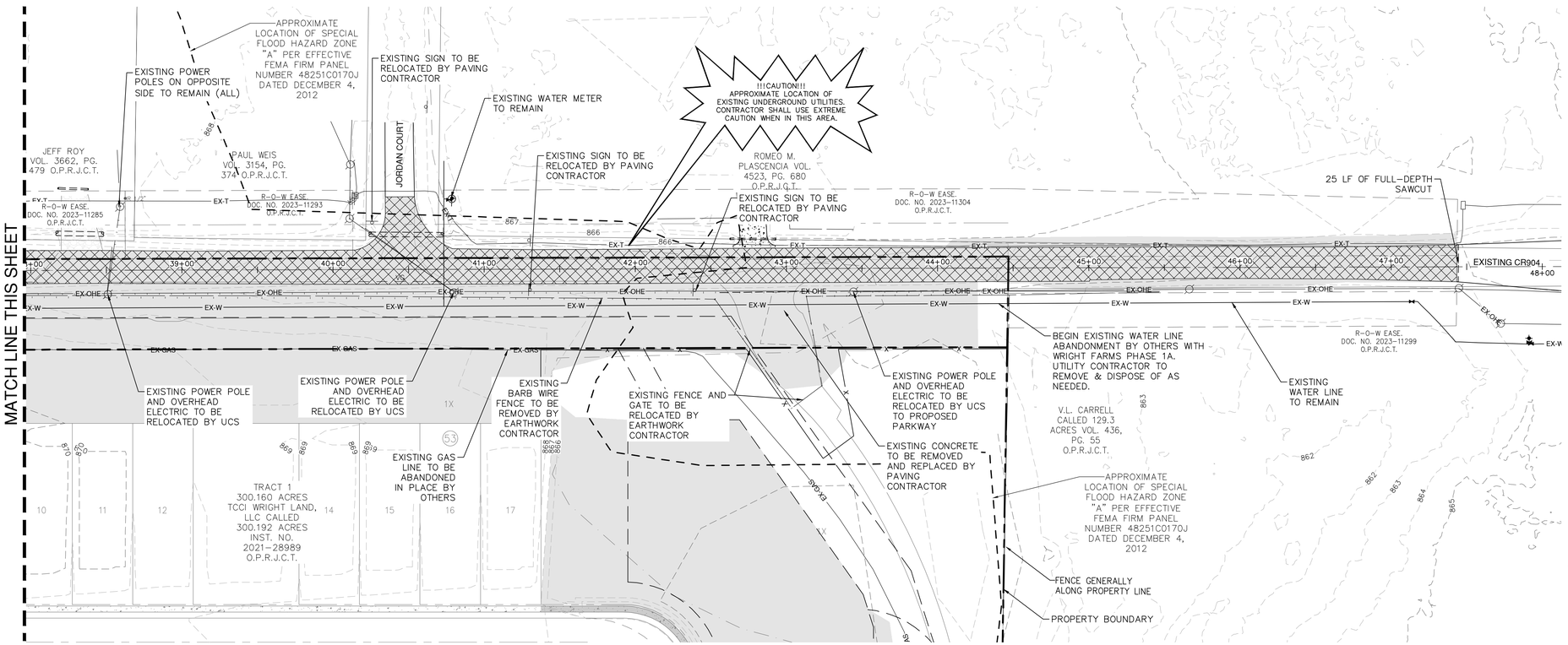


BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- 700 — EXISTING CONTOUR
- AREA OF DISTURBANCE
- DEMOLITION OF EXISTING CR 904
- REMOVE EXISTING FENCE OR UTILITIES



UTILITY NOTE

THE EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED FROM VARIOUS SOURCES AND ARE INTENDED TO SHOW THE GENERAL EXISTENCE AND LOCATION OF THE UTILITY INFORMATION ON THE PLANS. THE CONTRACTOR SHALL CONTACT A UTILITY LOCATING SERVICE 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND OF ALL EXISTING UTILITIES AND DETERMINE IF THERE ARE ANY CONFLICTS WITH THE PROPOSED FACILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY WHEN CONFLICTS WITH EXISTING UTILITIES ARE DISCOVERED.

NO.	REVISION	DATE

STATE OF TEXAS — ANNA JANE ROSCOE — 142544 — LICENSED PROFESSIONAL ENGINEER

1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

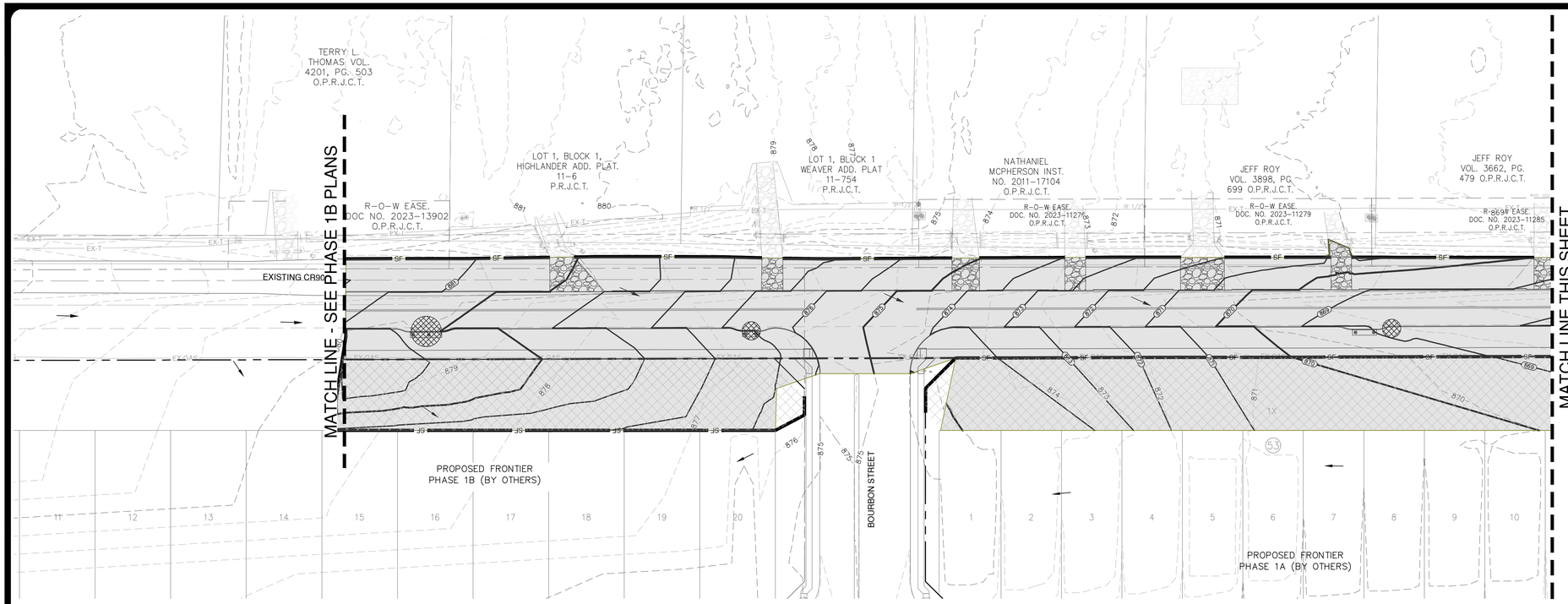
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

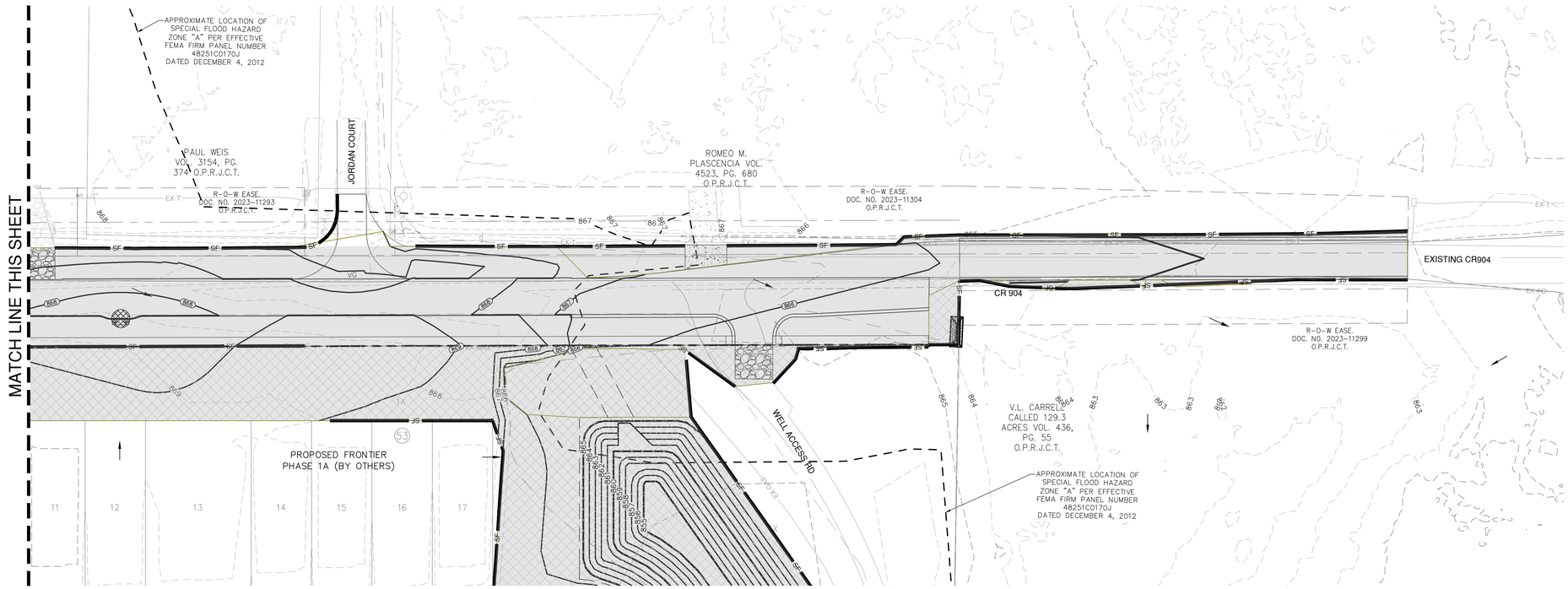
DEMOLITION PLAN

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 3

Date: Jan 29, 2025, 2:32pm User ID: ARDSOE
Files: S:\Projects\61405\01\20 Design\24 Civil\2.4.3 Plan Sheets\DW-61405(01.dwg

ISSUED FOR CONSTRUCTION SET





SCALE: 1"= 40'

0' 40' 80' 120'

BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- 700 — EXISTING CONTOUR
- PROPOSED CONTOUR
- FLOW ARROW
- SF — SILT FENCE
- LIMITS OF DISTURBANCE
- INLET PROTECTION
- CONSTRUCTION ENTRANCE
- ROCK CHECK DAM
- STONE OVERFLOW STRUCTURE
- SLOPE STABILIZATION BLANKET
- GRAVEL PAVEMENT

UTILITY NOTE

THE EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED FROM VARIOUS SOURCES AND ARE INTENDED TO SHOW THE GENERAL EXISTENCE AND LOCATION OF THE UTILITY INFORMATION ON THE PLANS. THE CONTRACTOR SHALL CONTACT A UTILITY LOCATING SERVICE 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND OF ALL EXISTING UTILITIES AND DETERMINE IF THERE ARE ANY CONFLICTS WITH THE PROPOSED FACILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY WHEN CONFLICTS WITH EXISTING UTILITIES ARE DISCOVERED.

NO.	REMISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

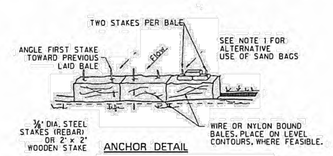
COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

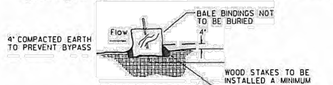
EROSION CONTROL PLAN

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 4

ISSUED FOR CONSTRUCTION SET



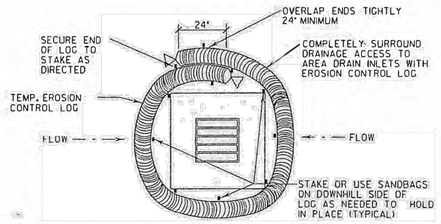
ANCHOR DETAIL



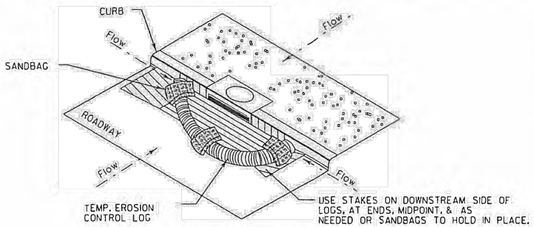
EMBEDMENT DETAIL

HAY BALE DIKE

NTS

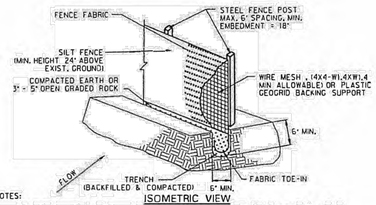


EROSION CONTROL LOG AT DROP INLET



EROSION CONTROL LOG AT CURB INLET

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'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.



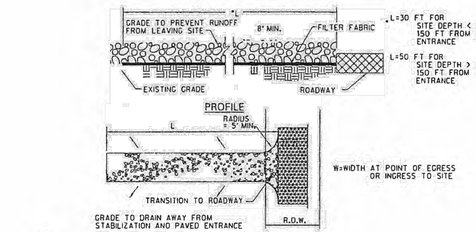
ISOMETRIC VIEW

GENERAL NOTES:

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED WITH A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 18".
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE, AS NECESSARY, TO PREVENT FLOW UNDER FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO BACKING SUPPORT, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. FABRIC SHALL OVERLAP AT ABUTTING ENDS A MINIMUM OF 3 FEET AND SHALL BE JOINED SUCH THAT NO BYPASS OR LEAKAGE OCCURS.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

SILT FENCE DETAILS

NTS



PROFILE

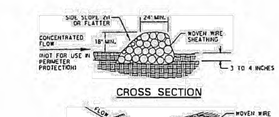
PLAN VIEW

GENERAL NOTES

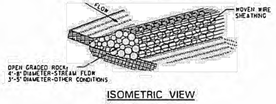
1. THE ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
2. STONE SHALL BE 3 TO 5 INCH DIAMETER CRUSHED ROCK OR ACCEPTABLE CRUSHED PORTLAND CEMENT CONCRETE

STABILIZED CONSTRUCTION ENTRANCE

NTS



CROSS SECTION



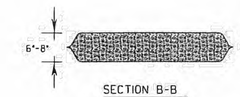
ISOMETRIC VIEW

GENERAL NOTES:

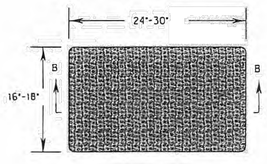
1. WOVEN WIRE SHEATHING SHALL HAVE MAXIMUM OPENING OF ONE (1) INCH AND A MINIMUM WIRE SIZE OF 20 GAUGE AND SHALL BE SECURED WITH 5/8OAT RINGS.
2. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN AND SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION PROPERLY.
3. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD OF THE HEIGHT OF THE BERM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF BY AN APPROVED MANNER.
4. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

ROCK BERM DETAILS

NTS



SECTION B-B



SANDBAG DETAIL

CITY OF CLEBURNE

EROSION CONTROL DETAILS

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

EROSION CONTROL DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 5

ISSUED FOR CONSTRUCTION SET

Date: Jan 29, 2025, 2:33pm User ID: AROSCOE
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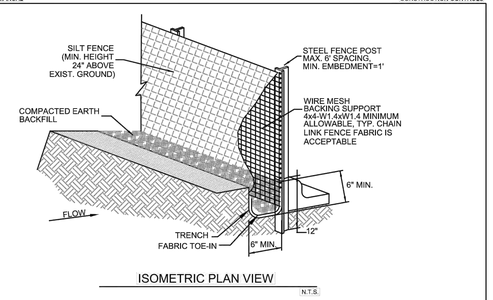
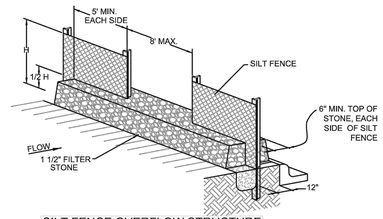
PLOT DATE: 1/29/2025 ARDSCOE
38 46 Erosion Control Details.dgn



ISOMETRIC PLAN VIEW

N.T.S.



SILT FENCE OVERFLOW STRUCTURE

N.T.S.

FIGURE 3.28 STANDARD CONSTRUCTION DETAIL - FOR SILT FENCE (1 OF 2)

SILT FENCE GENERAL NOTES:

1. DESIGN SHALL SHOW ON THE DRAWINGS THE LOCATIONS WHERE OVERFLOW STRUCTURES SHALL BE INSTALLED. OVERFLOW STRUCTURES ARE REQUIRED AT ALL LOW POINTS AND AT A SPACING OF APPROXIMATELY 300 FEET WHERE NO LOW POINT IS APPARENT.

2. DESIGNER SHALL SHOW ON THE DRAWINGS THE LOCATIONS WHERE SILT FENCE IS TO BE TURNED UPSLOPE AT THE ENDS. UPSLOPE LENGTHS SHALL BE A MINIMUM OF 10 FEET.

3. POST WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF ONE FOOT.

4. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.

5. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.

6. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH SUPPORT POST OR TO WIRE BACKING, WHICH IN TURN IS ATTACHED TO THE FENCE POST. THERE SHALL BE A 3 FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.

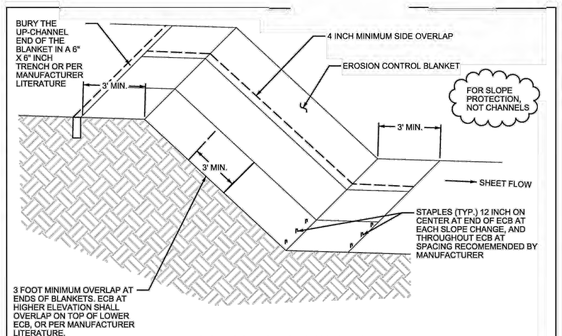
7. INSPECTION SHALL BE AS SPECIFIED IN THE SWPPP, REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

8. SILT FENCE SHALL BE REMOVED WHEN FINAL STABILIZATION IS ACHIEVED OR ANOTHER EROSION OR SEDIMENT CONTROL DEVICE IS EMPLOYED.

9. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF HALF THE HEIGHT OF THE FENCE. THE SILT SHALL BE DISPOSED OF AT AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

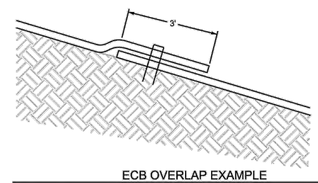
10. SEE NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.5

FIGURE 3.28 NOTES FOR SILT FENCE (2 OF 2)



ECB ISOMETRIC PLAN VIEW

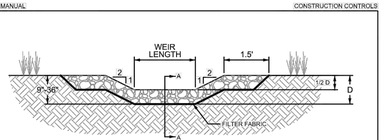
N.T.S.



ECB OVERLAP EXAMPLE

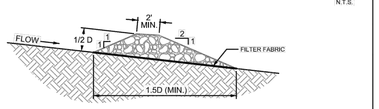
N.T.S.

FIGURE 2.7 STANDARD CONSTRUCTION DETAIL - TEMPORARY EROSION CONTROL BLANKETS (1 OF 2)



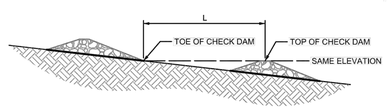
ROCK CHECK DAM VIEW LOOKING UPSTREAM

N.T.S.



CROSS SECTION A-A

N.T.S.



SPACE BETWEEN ROCK CHECK DAMS

N.T.S.

NOTES:
ACTUAL DIMENSIONS OF THE CHECK DAMS SHALL BE DESIGNED BASED ON FLOW CONDITIONS IN THE DRAINAGE SWALE OR DITCH. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS USED TO DESIGN THE CHECK DAM.

-HEIGHT OF CHECK DAMS (D) BASED ON SWALE OR DITCH DIMENSIONS AND FLOW CONDITIONS

-SPACING OF CHECK DAMS BASED ON GRADE OF THE SWALE OR DITCH. TOP OF DOWNSTREAM DAM SHALL BE AT THE SAME ELEVATION AS TOE OF UPSTREAM DAM

FIGURE 2.1 STANDARD CONSTRUCTION DETAIL - ROCK CHECK DAMS (1 OF 2)

ROCK CHECK DAM GENERAL NOTES:

1. SEE NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.9 CHECK DAM (ROCK).

2. STONE SHALL BE WELL GRADED WITH SIZE RANGE FROM 1 1/2 TO 3 1/2 INCHES IN DIAMETER DEPENDING ON EXPECTED FLOWS.

3. THE CHECK DAM SHALL BE INSPECTED AS SPECIFIED IN THE SWPPP AND SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD OF THE HEIGHT OF THE CHECK DAM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF PROPERLY.

5. WHEN THE SITE HAS ACHIEVED FINAL STABILIZATION OR ANOTHER EROSION OR SEDIMENT CONTROL DEVICE IS EMPLOYED, THE CHECK DAM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

FIGURE 2.1 NOTES ON ROCK CHECK DAM (2 OF 2)

EROSION CONTROL BLANKETS GENERAL NOTES:

1. SEE NCTCOG STANDARD SPECIFICATIONS (2017) SECTION 202.15.

2. PRIOR TO THE INSTALLATION OF ANY EROSION CONTROL BLANKETS, ALL ROCKS, DIRT CLODS, STUMPS, ROOTS, TRASH AND ANY OTHER OBSTRUCTIONS THAT WOULD PREVENT THE BLANKET FROM LYING IN DIRECT CONTACT WITH THE SOIL SHALL BE REMOVED. ANCHOR TRENCHING SHALL BE LOCATED ALONG THE ENTIRE PERIMETER OF THE INSTALLATION AREA, EXCEPT FOR SMALL AREAS WITH LESS THAN 2% SLOPE.

3. INSTALLATION AND ANCHORING SHALL CONFORM TO THE RECOMMENDATIONS SHOWN WITHIN THE MANUFACTURER'S PUBLISHED LITERATURE FOR THE APPROVED EROSION CONTROL BLANKET. PARTICULAR ATTENTION MUST BE PAID TO JOINTS AND OVERLAPPING MATERIAL.

4. IN ABSENCE OF MANUFACTURE'S LITERATURE, A MINIMUM 11-GUAGE WIRE STAPLES, 6-INCHES IN LENGTH AND 1-INCH WIDTH WILL BE USED.

5. AFTER APPROPRIATE INSTALLATION, THE BLANKETS SHOULD BE CHECKED FOR UNIFORM CONTACT WITH THE SOIL, SECURITY OF THE LAP JOINTS, AND FLUSHNESS OF THE STAPLES WITH THE GROUND.

6. INSPECTION SHALL BE AS SPECIFIED IN THE SWPPP.

FIGURE 2.7 NOTES ON TEMPORARY EROSION CONTROL BLANKETS (2 OF 2)

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.5404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #100288-00

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

EROSION CONTROL DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 6

Date: Jan 29, 2025, 2:33pm User ID: ARDSCOE
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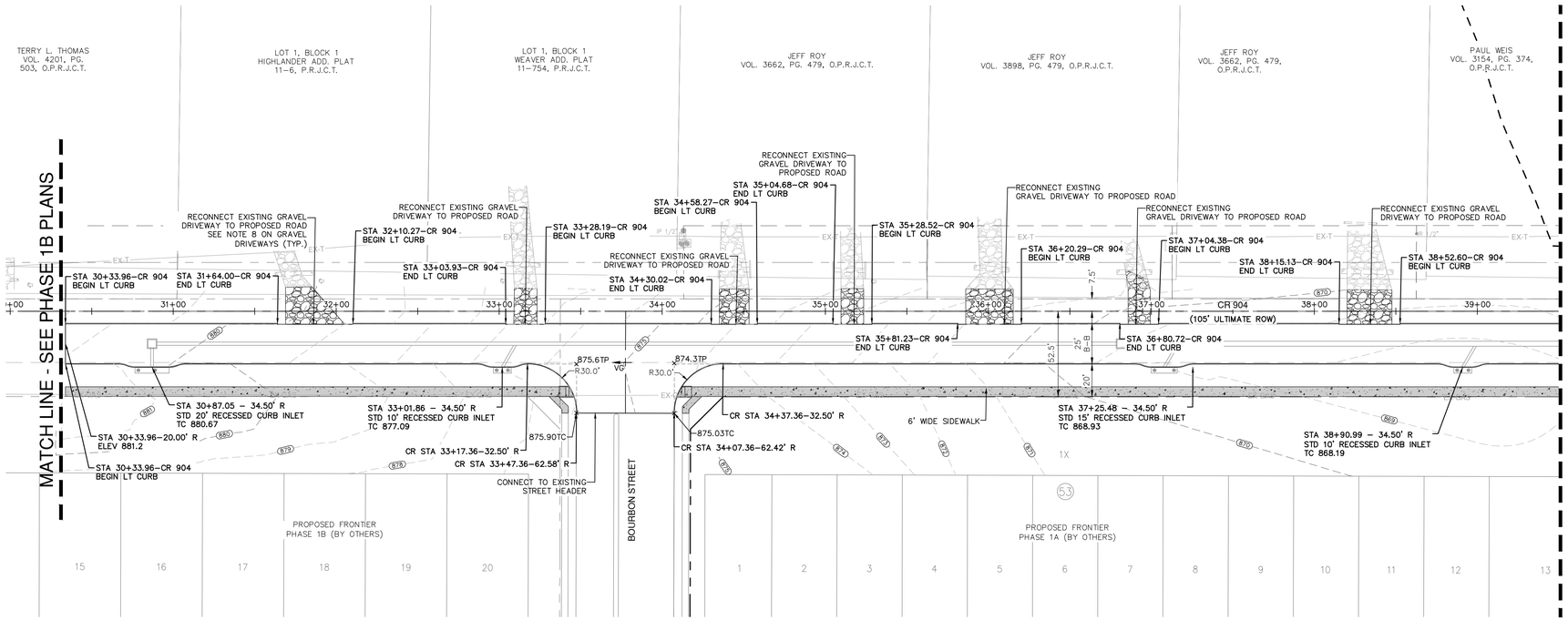
ISSUED FOR CONSTRUCTION SET



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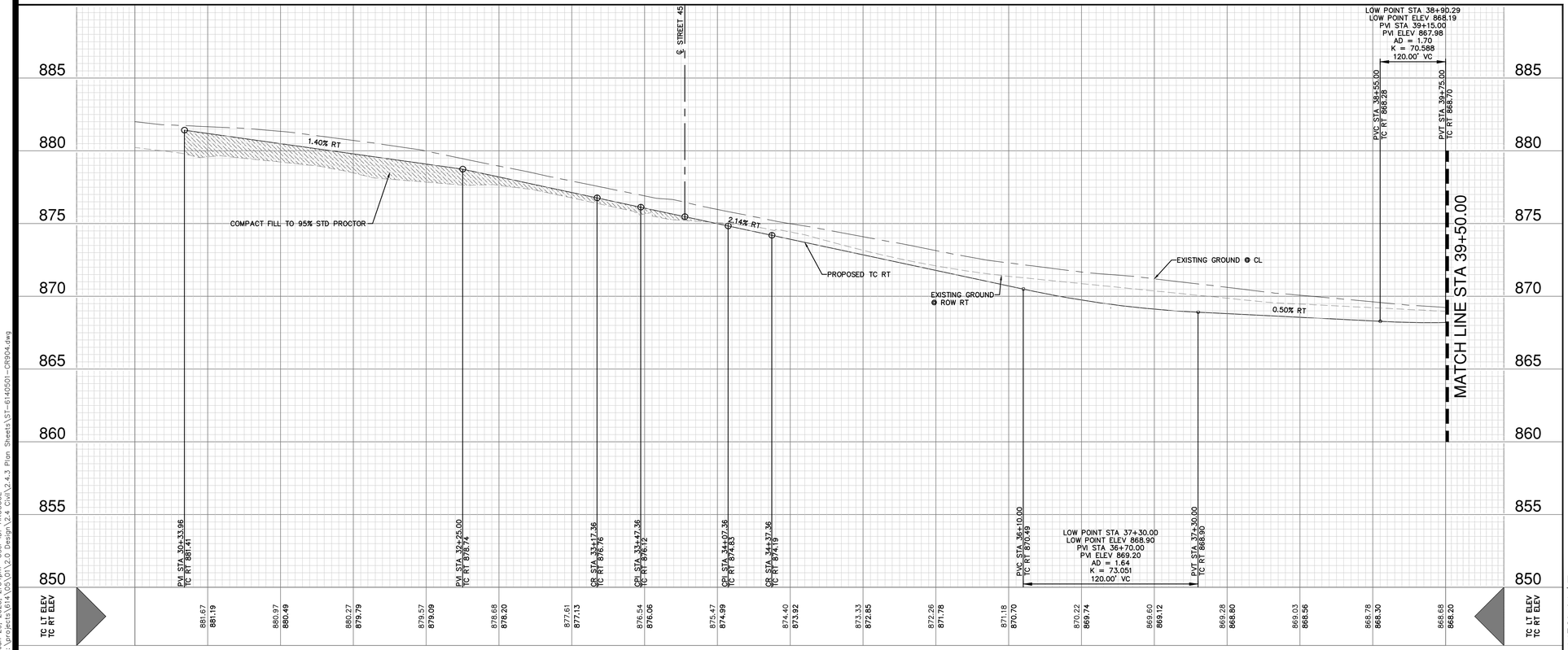
VERT. SCALE: 1" = 4'



BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- PROPOSED CONCRETE SIDEWALK BY DEVELOPER (THIS CONTRACT)
- VG — VALLEY GUTTER
- GRAVEL PAVEMENT

NOTES

1. ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE AND WILL BE CONFIRMED BY CONTRACTOR PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL PROTECT ALL EXISTING TREES, FENCES, RETAINING WALLS AND STRUCTURES UNLESS OTHERWISE NOTED.
3. ALL CURB RADII SHALL BE 30' TO BACK OF CURB UNLESS OTHERWISE NOTED.
4. SIDEWALK/TRAILS IN COMMON AREAS SHALL BE BUILT AT TIME OF PUBLIC IMPROVEMENTS.
5. CONCRETE PAVEMENT SHALL BE MACHINE PLACED EITHER BY MECHANICAL VIBRATORY SCREED OR SLIP FORM PAVER UNLESS OTHERWISE APPROVED BY CITY.
6. CONTRACTOR TO TURNDOWN CURB AND CONNECT TO EXISTING DRIVEWAY LOCATIONS (SEE DETAIL ON SHEET 22)
7. AT LEAST SIX (6) INCHES OF FLEXIBLE BASE MATERIAL TO BE INSTALLED FOR THE GRAVEL PRIVATE DRIVEWAYS. PRIOR TO PLACEMENT OF THE FLEXIBLE BASE MATERIAL, THE EXPOSED SUBGRADE SHOULD BE SCARIFIED TO A DEPTH OF AT LEAST 6 INCHES AND COMPACTED TO AT LEAST 95 PERCENT OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D 698) AND WITHIN THE RANGE OF 0 TO 4 PERCENTAGE POINTS ABOVE THE MATERIAL'S OPTIMUM MOISTURE CONTENT. (UES REPORT NO. W232725-2-REV1, 01/22/25)
8. FOR THE CONCRETE TRANSITIONS AND PRIVATE DRIVEWAYS CONSISTING OF UNREINFORCED CONCRETE, RECOMMEND AT LEAST 6 INCHES OF PORTLAND CEMENT CONCRETE. PCC SHOULD HAVE A MINIMUM 3,600 PSI COMPRESSIVE STRENGTH AT 28 DAYS. PRIOR TO PLACEMENT OF THE PCC, THE EXPOSED SUBGRADE SHOULD BE SCARIFIED TO A DEPTH OF AT LEAST 6 INCHES AND COMPACTED TO AT LEAST 95 PERCENT OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D 698) AND WITHIN THE RANGE OF 0 TO 4 PERCENTAGE POINTS ABOVE THE MATERIAL'S OPTIMUM MOISTURE CONTENT. (UES REPORT NO. W232725-2-REV1, 01/22/25)

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
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1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

PAVING PLAN & PROFILE
CR 904

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 7

Date: Jan 29, 2025, 7:34pm User ID: ARGSOE
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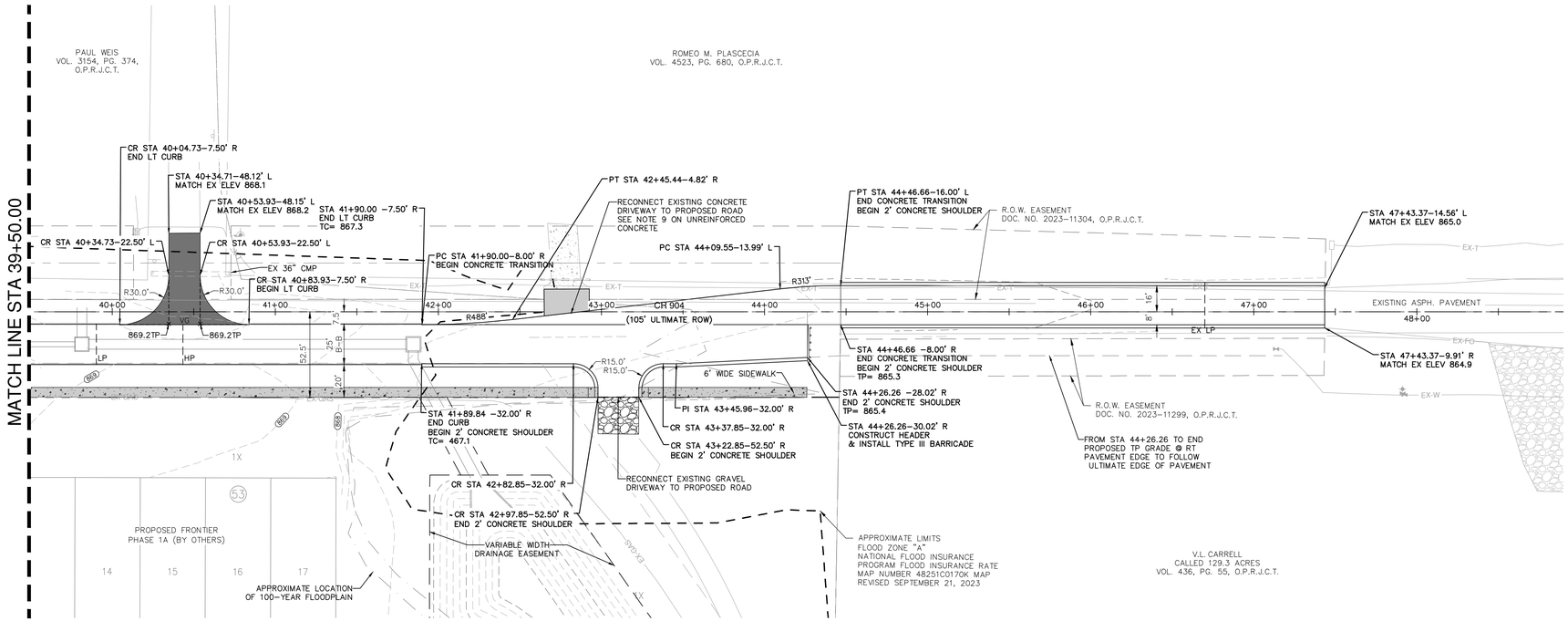

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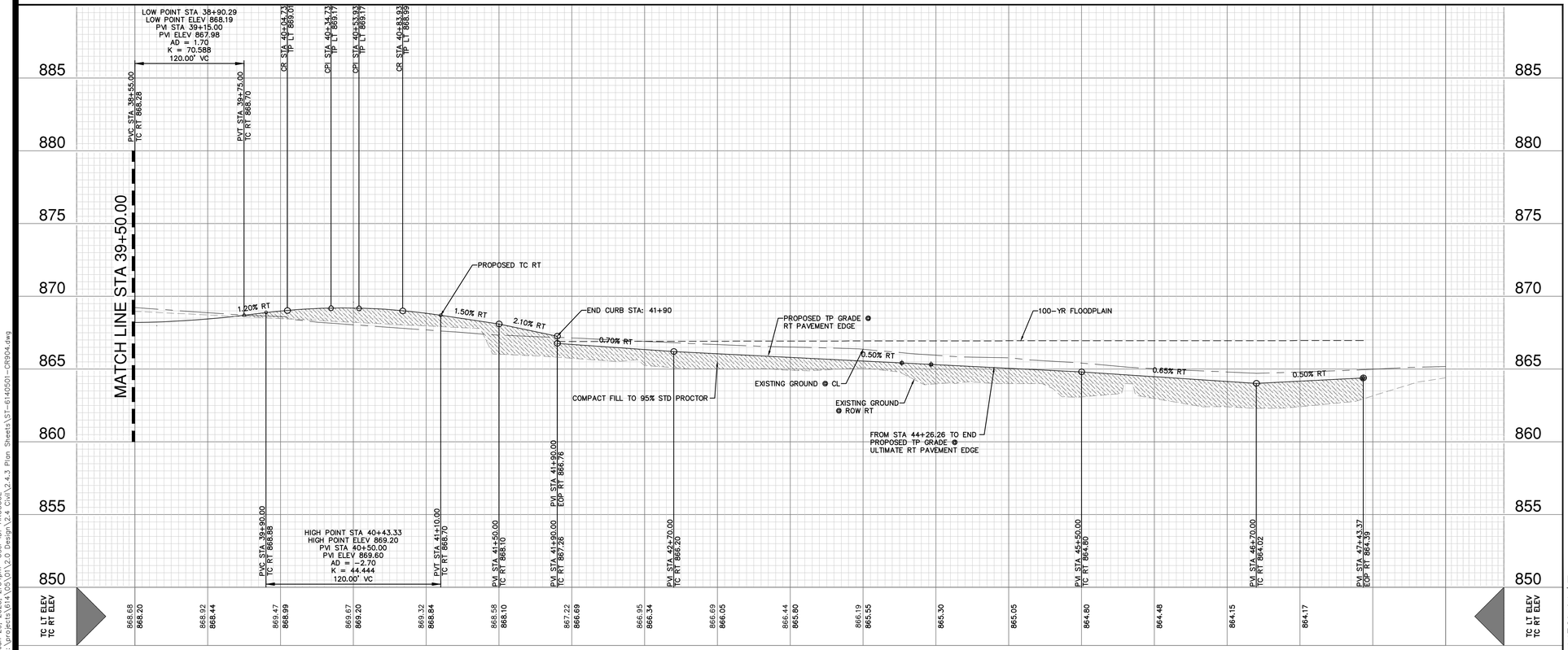
CR 904
(STA 39+50.00 TO END)

HORIZ. SCALE: 1" = 40'
VERT. SCALE: 1" = 4'



BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- PROPOSED CONCRETE SIDEWALK BY DEVELOPER (THIS CONTRACT)
- PROPOSED ASPHALT PAVEMENT (THIS CONTRACT)
- PROPOSED UNREINFORCED CONCRETE PAVEMENT (THIS CONTRACT)
- VALLEY GUTTER
- GRAVEL PAVEMENT

NOTES

1. ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE AND WILL BE CONFIRMED BY CONTRACTOR PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL PROTECT ALL EXISTING TREES, FENCES, RETAINING WALLS AND STRUCTURES UNLESS OTHERWISE NOTED.
3. ALL CURB RADII SHALL BE 30' TO BACK OF CURB UNLESS OTHERWISE NOTED.
4. SIDEWALK/TRAILS IN COMMON AREAS SHALL BE BUILT AT TIME OF PUBLIC IMPROVEMENTS.
5. CONCRETE PAVEMENT SHALL BE MACHINE PLACED EITHER BY MECHANICAL VIBRATORY SCREED OR SLIP FORM PAVER UNLESS OTHERWISE APPROVED BY CITY.
6. CONTRACTOR TO TURNDOWN CURB AND CONNECT To EXISTING DRIVEWAY LOCATIONS (SEE DETAIL ON SHEET 22)
7. PER CITY DIRECTION ROADWAY IS NOT DESIGNED TO MEET CITY DRAINAGE CRITERIA FROM STA 41+90.00 TO END. THIS SECTION OF ROADWAY TO MATCH EXISTING DRAINAGE CONDITIONS.
8. AT LEAST SIX (6) INCHES OF FLEXIBLE BASE MATERIAL TO BE INSTALLED FOR THE GRAVEL PRIVATE DRIVEWAYS. PRIOR TO PLACEMENT OF THE FLEXIBLE BASE MATERIAL, THE EXPOSED SUBGRADE SHOULD BE SCARIFIED TO A DEPTH OF AT LEAST 6 INCHES AND COMPACTED TO AT LEAST 95 PERCENT OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D 698) AND WITHIN THE RANGE OF 0 TO 4 PERCENTAGE POINTS ABOVE THE MATERIAL'S OPTIMUM MOISTURE CONTENT. (UES REPORT NO. W232725–2–REV1, 01/22/25)
9. FOR THE CONCRETE TRANSITIONS AND PRIVATE DRIVEWAYS CONSISTING OF UNREINFORCED CONCRETE, RECOMMEND AT LEAST 6 INCHES OF PORTLAND CEMENT CONCRETE. PCC SHOULD HAVE A MINIMUM 3,600 PSI COMPRESSIVE STRENGTH AT 28 DAYS. PRIOR TO PLACEMENT OF THE PCC, THE EXPOSED SUBGRADE SHOULD BE SCARIFIED TO A DEPTH OF AT LEAST 6 INCHES AND COMPACTED TO AT LEAST 95 PERCENT OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D 698) AND WITHIN THE RANGE OF 0 TO 4 PERCENTAGE POINTS ABOVE THE MATERIAL'S OPTIMUM MOISTURE CONTENT. (UES REPORT NO. W232725–2–REV1, 01/22/25)

UTILITY NOTE

THE EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED FROM VARIOUS SOURCES AND ARE INTENDED TO SHOW THE GENERAL EXISTENCE AND LOCATION OF THE UTILITY INFORMATION ON THE PLANS. THE CONTRACTOR SHALL CONTACT A UTILITY LOCATING SERVICE 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND OF ALL EXISTING UTILITIES AND DETERMINE IF THERE ARE ANY CONFLICTS WITH THE PROPOSED FACILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY WHEN CONFLICTS WITH EXISTING UTILITIES ARE DISCOVERED.

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5454
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

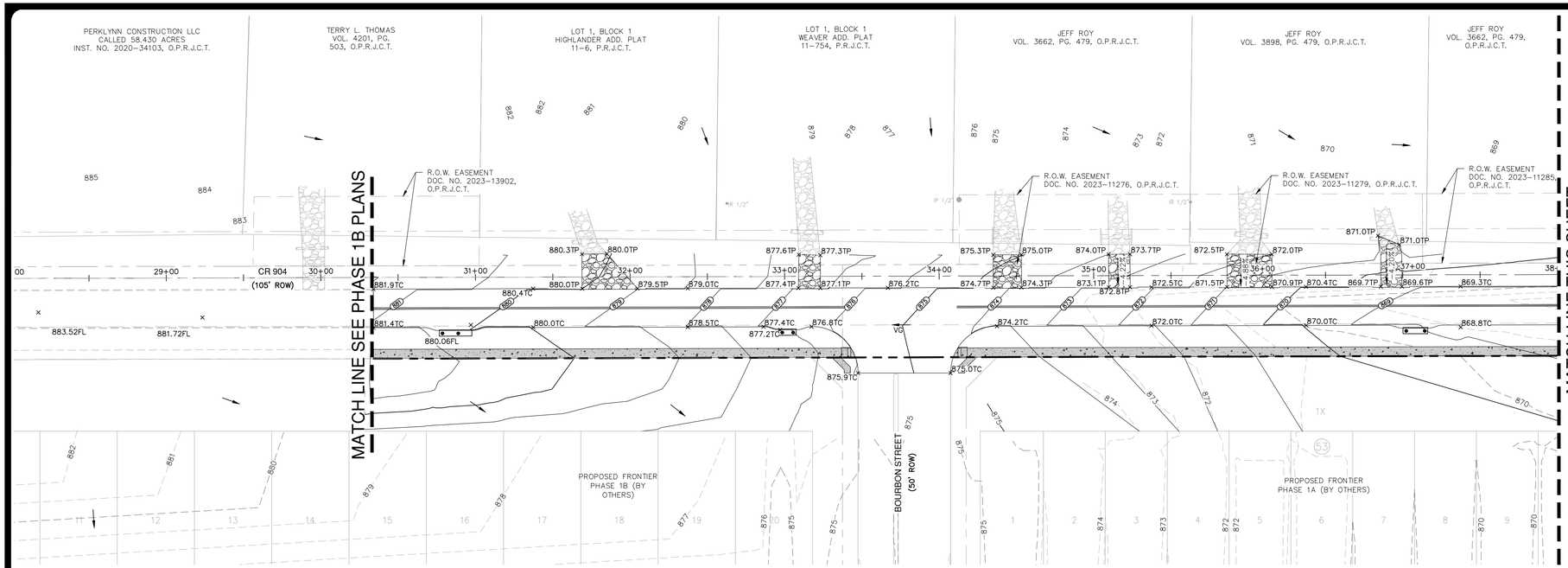
COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

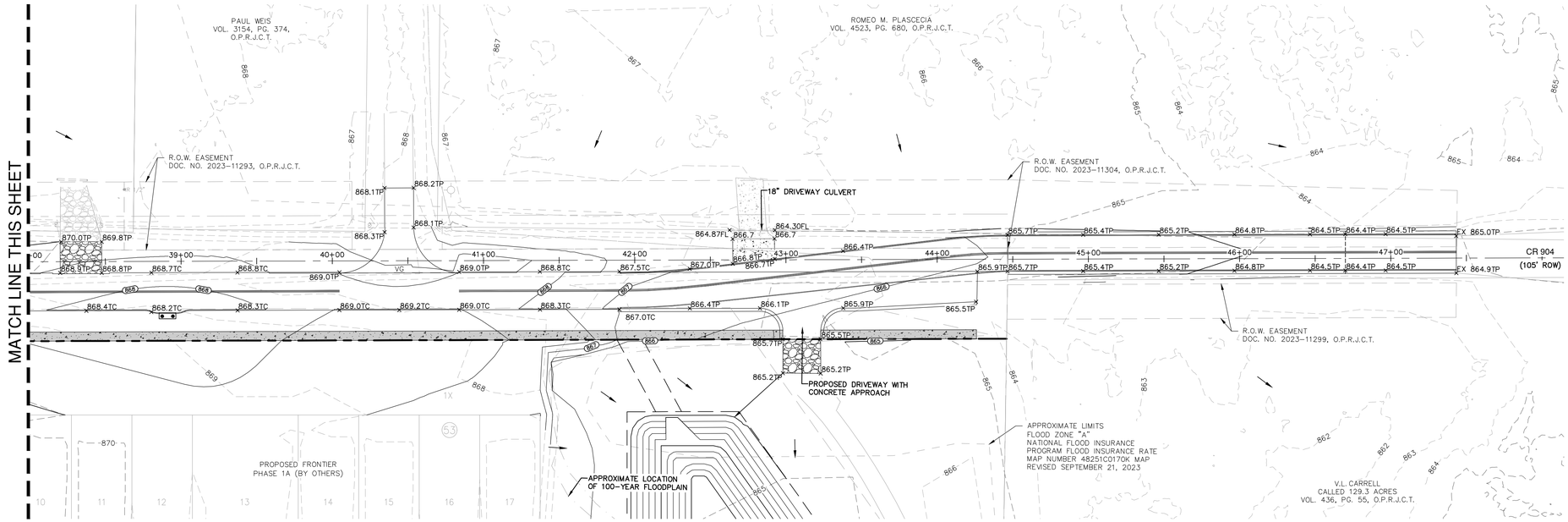
PAVING PLAN & PROFILE
CR 904

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 8

Date: Jan 29, 2025, 7:34pm User ID: ARGSOE
Files: S:\projects\61405\001\20 Design\24 Civil\2.4.3 Plan Sheets\ST-61405-01-CR904.dwg

ISSUED FOR CONSTRUCTION SET





SCALE: 1"= 40'

0' 40' 80' 120'

BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

600	PROPOSED CONTOUR
600	EXISTING CONTOUR
	PROPOSED RETAINING WALL
VG	VALLEY GUTTER
	FLOW ARROW
FG	FINISHED GRADE
TC	TOP OF CURB
TP	TOP OF PAVEMENT
FL	FLOW LINE
	GRAVEL PAVEMENT

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.5404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

GRADING PLAN

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 9

ISSUED FOR CONSTRUCTION SET

Date: Jan 29, 2025, 2:35pm User ID: AROSCOE
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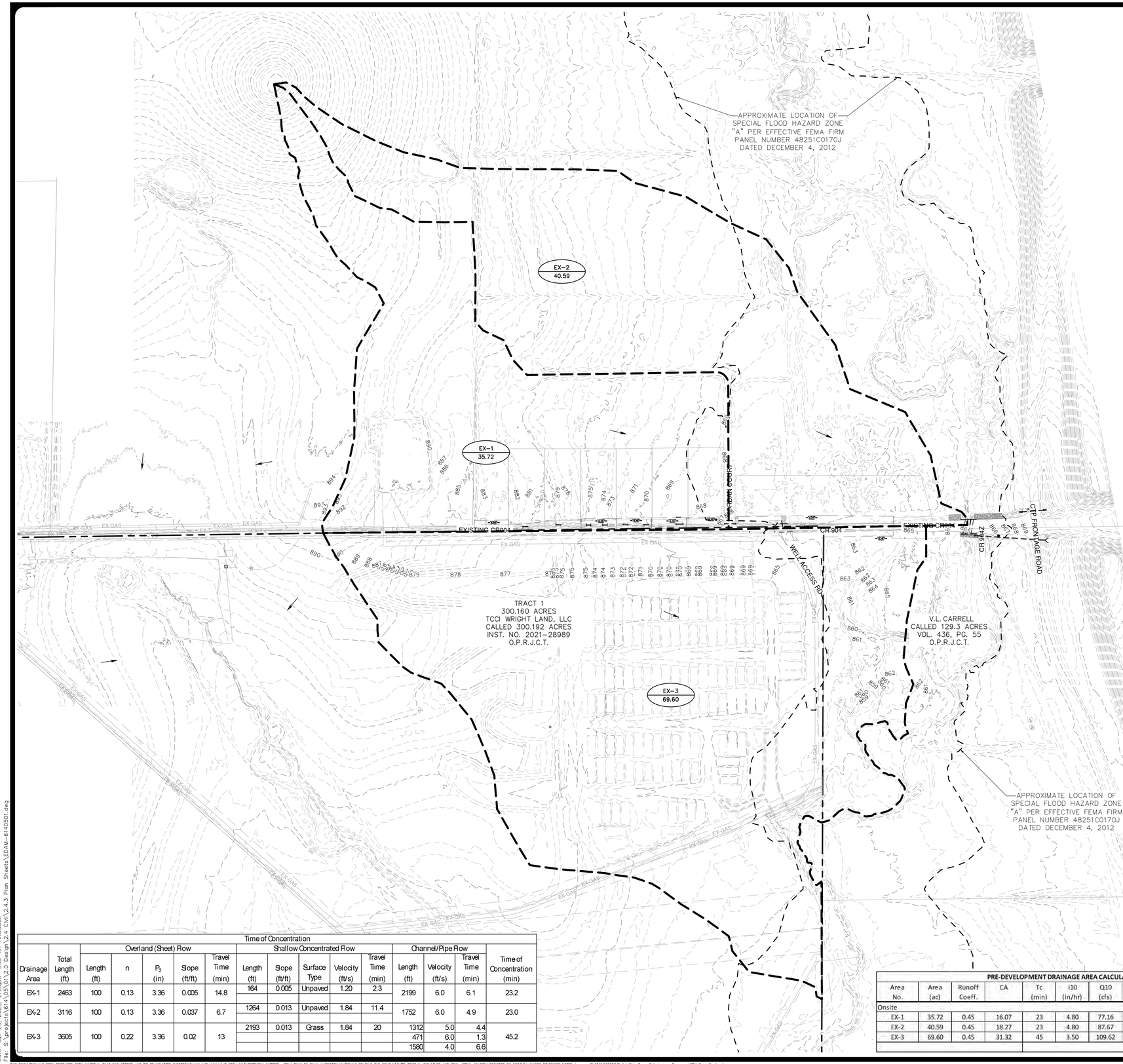

SCALE: 1" = 200'

0' 200' 400' 600'

BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- DRAINAGE DIVIDE
- A-1 / 1.00 — DRAINAGE AREA / ACRES
- FLOW ARROW
- 600 — PROPOSED CONTOUR
- 600 — EXISTING CONTOUR
- PROPOSED STORM DRAIN

NOTES:

1. EASTERN DRAINAGE BOUNDARY FOR EX-1 IS BASED ON FINAL DRAINAGE REPORT COMPLETED ON 10/18/2024

Time of Concentration														
		Overland (Sheet) Flow					Shallow Concentrated Flow					Channel/Pipe Flow			
Drainage Area	Total Length (ft)	Length (ft)	n	P_2 (in)	Slope (ft/ft)	Travel Time (min)	Length (ft)	Slope (ft/ft)	Surface Type	Velocity (ft/s)	Travel Time (min)	Length (ft)	Velocity (ft/s)	Travel Time (min)	Time of Concentration (min)
EX-1	2463	100	0.13	3.36	0.005	14.8	164	0.005	Unpaved	1.20	2.3	2199	6.0	6.1	23.2
EX-2	3116	100	0.13	3.36	0.037	6.7	1264	0.013	Unpaved	1.84	11.4	1752	6.0	4.9	23.0
EX-3	3605	100	0.22	3.36	0.02	13	2193	0.013	Grass	1.84	20	1312	5.0	4.4	45.2
												471	6.0	1.3	
												1580	4.0	6.6	

PRE-DEVELOPMENT DRAINAGE AREA CALCULATIONS										
Area No.	Area (ac)	Runoff Coeff.	CA	Tc (min)	I10 (in/hr)	Q10 (cfs)	I25 (in/hr)	Q25* (cfs)	I100 (in/hr)	Q100* (cfs)
Onsite										
EX-1	35.72	0.45	16.07	23	4.80	77.16	5.75	92.43	6.75	108.50
EX-2	40.59	0.45	18.27	23	4.80	87.67	5.75	105.03	6.75	123.29
EX-3	69.60	0.45	31.32	45	3.50	109.62	4.25	133.11	5.00	156.60
				SOIL GROUP CLASSIFICATION GROUP D						

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE PIGSCOCK
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

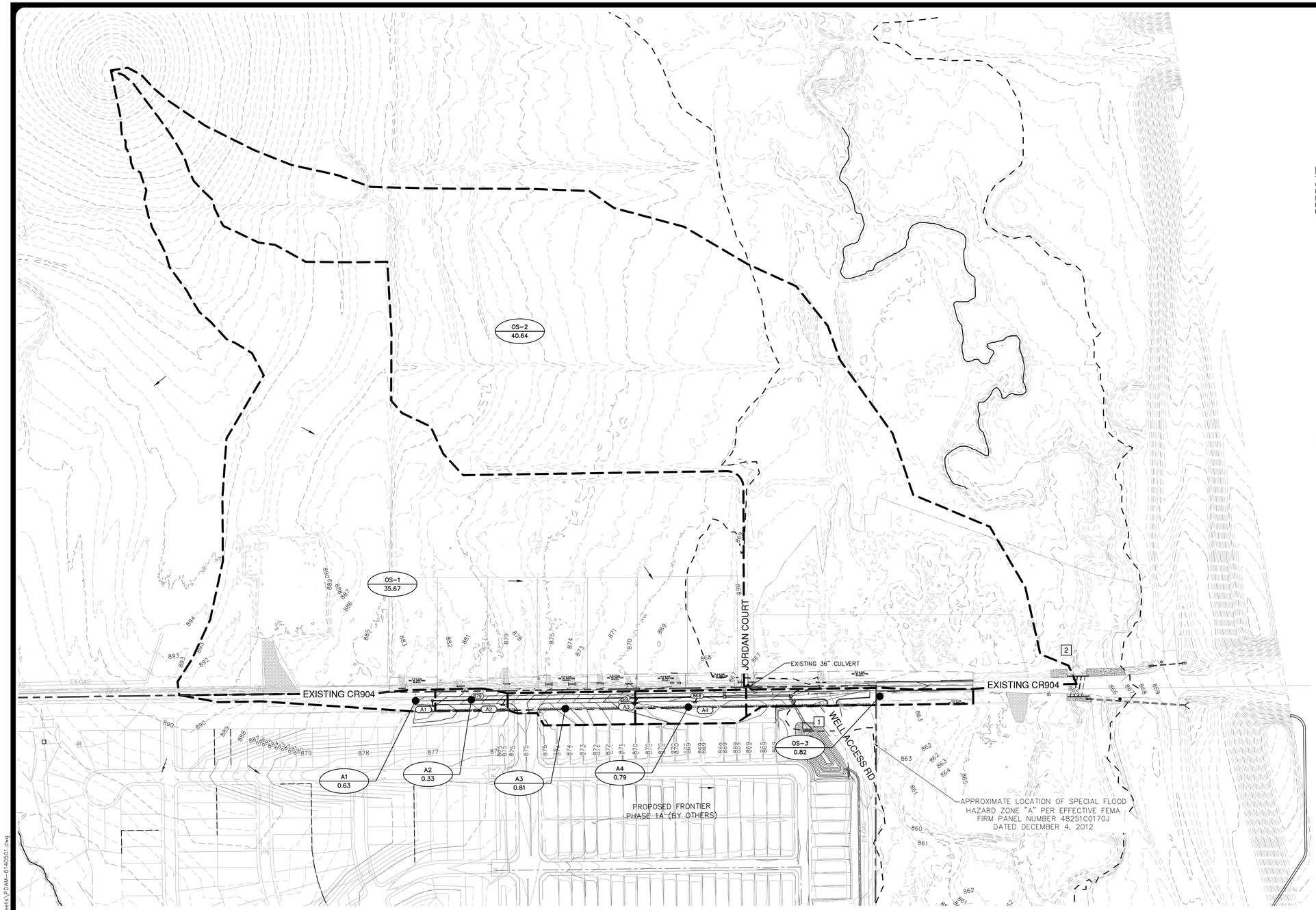
COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

EXISTING DRAINAGE AREA MAP

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 10

ISSUED FOR CONSTRUCTION SET



SCALE: 1"= 150'

0' 150' 300' 450'

BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- DRAINAGE DIVIDE
- A-1 / 1.00 — DRAINAGE AREA / ACRES
- 1 — DESIGN POINT
- FLOW ARROW
- 600 — PROPOSED CONTOUR
- 600 — EXISTING CONTOUR
- PROPOSED STORM DRAIN

NOTES:

1. CALCULATIONS FOR TC FOUND ON ULTIMATE DA MAP ON SHEET 12.

POST-DEVELOPMENT DRAINAGE AREA CALCULATIONS

Design Point	Area No.	Area (ac)	Runoff Coeff.	CA	Tc (min)	I5 (in/hr)	Q5 (cfs)	I10 (in/hr)	Q10 (cfs)	I25 (in/hr)	Q25* (cfs)	I100 (in/hr)	Q100* (cfs)	Receiving
	Onsite													
1	A1	0.63	0.90	0.57	10	6.00	3.40	6.60	3.74	7.60	4.31	9.00	5.10	Proposed Inlet
	A2	0.33	0.90	0.30	10	6.00	1.78	6.60	1.96	7.60	2.26	9.00	2.67	Proposed Inlet
	A3	0.81	0.90	0.73	10	6.00	4.37	6.60	4.81	7.60	5.54	9.00	6.56	Proposed Inlet
	A4	0.79	0.90	0.71	10	6.00	4.27	6.60	4.69	7.60	5.40	9.00	6.40	Proposed Inlet
2	OS-1	35.67	0.45	16.05	23	4.30	69.02	4.80	77.05	5.75	92.30	6.75	108.35	Existing 36" CMP
	OS-2	40.63	0.45	18.28	23	4.30	78.62	4.80	87.76	5.75	105.13	6.75	123.41	Existing Stream
	OS-3	0.82	0.90	0.74	10	6.00	4.43	6.60	4.87	7.60	5.61	9.00	6.64	
	Design Point 1	2.56	0.90	2.30	10	6.00	13.82	6.60	15.21	7.60	17.51	9.00	20.74	
	Design Point 2	76.30	0.45	34.34	23	4.30	147.64	4.80	164.81	5.75	197.43	6.75	231.76	
	TOTAL	78.86							180.01		214.94		0.00	

SOIL GROUP CLASSIFICATION GROUP D

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

PROPOSED DRAINAGE AREA MAP

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 11

ISSUED FOR CONSTRUCTION SET

Date: Jan 29, 2025, 2:36pm User ID: AROSCOE
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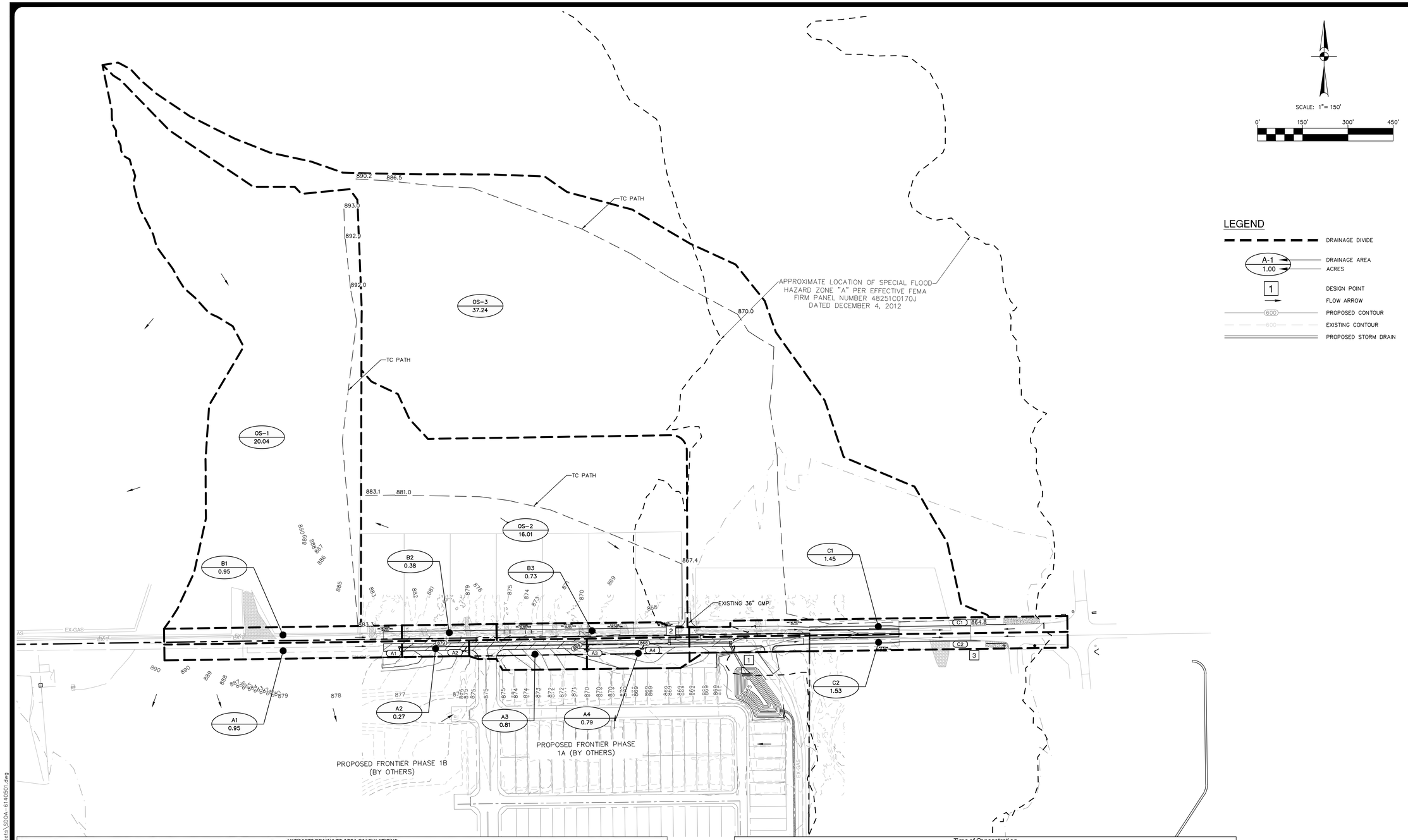

ULTIMATE DRAINAGE AREA CALCULATIONS

Design Point	Area No.	Area (ac)	Runoff Coeff.	CA	Tc (min)	I5 (in/hr)	Q5 (cfs)	I10 (in/hr)	Q10 (cfs)	I25 (in/hr)	Q25* (cfs)	I50 (in/hr)	Q50* (cfs)	I100 (in/hr)	Q100* (cfs)	Receiving
	Onsite															
1	A1	0.95	0.90	0.86	10	6.00	5.13	6.60	5.64	7.60	6.50	8.40	7.18	9.00	7.70	Proposed Inlet
	A2	0.27	0.90	0.24	10	6.00	1.46	6.60	1.60	7.60	1.85	8.40	2.04	9.00	2.19	Proposed Inlet
	A3	0.81	0.90	0.73	10	6.00	4.37	6.60	4.81	7.60	5.54	8.40	6.12	9.00	6.56	Proposed Inlet
	A4	0.79	0.90	0.71	10	6.00	4.27	6.60	4.69	7.60	5.40	8.40	5.97	9.00	6.40	Proposed Inlet
2	B1	0.95	0.90	0.86	10	6.00	5.13	6.60	5.64	7.60	6.50	8.40	7.18	9.00	7.70	Future Inlet
	B2	0.38	0.90	0.34	10	6.00	2.05	6.60	2.26	7.60	2.60	8.40	2.87	9.00	3.08	Future Inlet
	B3	0.73	0.90	0.66	10	6.00	3.94	6.60	4.34	7.60	4.99	8.40	5.52	9.00	5.91	Future Inlet
3	C1	1.45	0.90	1.31	10	6.00	7.83	6.60	8.61	7.60	9.92	8.40	10.96	9.00	11.75	Future Inlet
	C2	1.53	0.90	1.38	10	6.00	8.26	6.60	9.09	7.60	10.47	8.40	11.57	9.00	12.39	Future Inlet
2	OS-1	20.04	0.45	9.02	20	4.60	41.48	5.20	46.88	6.10	55.01	6.80	59.52	7.20	64.93	Future Inlet
2	OS-2	16.01	0.45	7.20	17	5.00	36.02	5.50	39.62	6.50	46.83	7.00	50.43	7.70	55.47	Future Inlet
3	OS-3	37.24	0.45	16.76	23	4.30	72.06	4.80	80.44	5.75	96.36	6.25	104.74	6.75	113.12	Existing Stream
	Design Point 1	40.03	0.50	20.61	23	4.30	88.64	4.80	98.95	5.75	118.53	6.25	128.84	6.75	139.15	
	Design Point 2	38.11	0.47	18.08	22	4.30	77.73	4.80	86.77	5.75	103.94	6.25	112.98	6.75	122.02	
	Design Point 3	40.22	0.48	19.44	17	5.00	97.20	5.50	106.92	6.50	126.36	7.00	136.08	7.70	149.69	
	TOTAL	78.04							185.72		222.47				261.16	

SOIL GROUP CLASSIFICATION GROUP D

Drainage Area	Total Length (ft)	Time of Concentration: Overland (Sheet) Flow: Length (ft)	n	P_2 (in)	Slope (ft/ft)	Travel Time (min)	Shallow Concentrated Flow: Length (ft)	Slope (ft/ft)	Surface Type	Velocity (ft/s)	Travel Time (min)	Channel/Pipe Flow: Length (ft)	Velocity (ft/s)	Travel Time (min)	Time of Concentration (min)
OS-1	1382	100	0.13	3.36	0.005	14.8	164	0.005	Unpaved	1.20	2.3	1118	6.0	3.1	20.2
OS-2	1273	100	0.13	3.36	0.021	8.4	988	0.014	Unpaved	1.89	8.7	185	6.0	0.5	17.6
OS-3	3116	100	0.13	3.36	0.037	6.7	1264	0.013	Unpaved	1.84	11.4	1752	6.0	4.9	23.0

CALCULATIONS DONE ACCORDING TO THE RATIONAL METHOD

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

ULTIMATE DRAINAGE AREA MAP

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 12

Date: Jan 29, 2025, 2:37pm User ID: AROSCOE
File: C:\Projects\61405\001\03 Design\2.4 Civil\2.4.3 Plan Sheets\SDOA-6140501.dwg

ISSUED FOR CONSTRUCTION SET

STORM DRAIN HYDRAULIC CALCULATIONS TABLE

FROM Sta	TO Sta	Pipe Length (ft)	Drainage Area Incremental No.	Drainage Area Incremental Area (ac)	Drainage Area Total Area (ac)	Runoff "c"	incr. cA	Total cA	Time of Concentration Inlet (min)	Time of Concentration Travel (min)	Time of Concentration Total (min)	50-year Intensity (in/hr)	100-year Intensity (in/hr)	Q50 Runoff (cfs)	Q100 Runoff (cfs)	Inlet Bypass (cfs)	Q Pipe (cfs)	Qcap Pipe (cfs)	No. of Barrels	Pipe Size (in)	Box Culvert Width (ft)	Box Culvert Height (ft)	Depth (ft)	Manning n	Sf (ft/ft)	HGL (50-YEAR) US Elev	HGL (50-YEAR) DS Elev	Head Loss Calculations V1 (in) (ft/s)	Head Loss Calculations V2 (out) (ft/s)	Head Loss Calculations $V1^2/2G$ (ft)	Head Loss Calculations $V2^2/2G$ (ft)	Head Loss Calculations Kj	Head Loss Calculations $K_j V1^2/2G$ (ft)	Head Loss Calculations Hk (ft)	Design HGL Elev	Invert Elev. FROM (ft)	Invert Elev. TO (ft)	Crown Elev. FROM (ft)	Crown Elev. TO (ft)	Prop. Grade Elev (ft)	Froude Number	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19a	19b	19c	19d	19e	20	21	22	23	24	25	25	27	28	29	30	31	32	33	33a	33b	34	34a	
* After V1(in) & V2(out) implies the velocities calculated for partial flow																																									
Storm Drain Line SD-A1 (50-YEAR CALCULATIONS)																																									
12+06.01	11+91.51	14.50	A1	0.95	0.95	0.90	0.86	0.86	10.00		10.00	8.31	9.00	7.1	7.7		7.1	11.2	1	21			1.75	0.013	0.0020	877.52	877.49	*	4.54	*	0.32	1.25	0.00	0.40	877.92	876.38	876.31	878.13	878.06	880.56		
11+91.51	9+68.32	223.19			0.95			0.86	10.00	0.05	10.00	8.31	9.00	7.1	7.7		7.1	31.6	1	24			2.00	0.013	0.0010	876.79	873.00	4.54	* 7.52	*	0.32	0.88	0.55	0.18	0.70	877.49	876.11	871.76	878.11	873.76	880.26		
9+68.32	5+97.11	371.21	A2	0.27	1.22	0.90	0.24	1.10	10.00	0.49	10.55	8.16	8.89	9.0	9.8		9.0	31.6	1	24			2.00	0.013	0.0016	872.53	867.42	7.52	* 8.00	*	0.88	0.99	0.6	0.53	0.47	873.00	871.76	864.52	873.76	866.52	876.56		
5+97.11	5+62.26	34.85			1.22			1.10	10.00	0.77	10.55	8.16	8.89	9.0	9.8		9.0	47.2	1	36			3.00	0.013	0.0002	867.32	867.31	8.00	1.27		0.99	0.02	0.6	0.60	0.10	867.42	863.51	863.34	866.51	866.34	869.37		
5+62.26	3+79.20	183.06	A3	0.81	2.03	0.90	0.73	1.83	10.00	0.46	11.78	7.85	8.64	14.3	15.8		14.3	47.2	1	36			3.00	0.013	0.0005	867.21	867.13	1.27	2.03		0.02	0.06	0.15	0.00	0.10	867.31	863.34	862.42	866.34	865.42	869.27		
3+79.20	2+97.11	82.09	A4	0.79	2.82	0.90	0.71	2.54	10.00	1.50	13.28	7.51	8.34	19.1	21.2		19.1	47.2	1	36			3.00	0.013	0.0008	867.03	866.96	2.03	2.70		0.06	0.11	0.6	0.04	0.10	867.13	862.42	862.01	865.42	865.01	867.99		
2+97.11	0+93.90	203.21	Line B	24.48	27.30	0.58	14.20	16.74	22.00	0.51	22.51	5.97	7.10	99.9	118.8		99.9	147.1	1		6	4	4.00	0.015	0.0014	866.72	866.44	2.70	4.16		0.11	0.27	0.25	0.03	0.24	866.96	860.97	860.36	864.97	864.36	867.59		
0+93.90	0+83.90	10.00			27.30			16.74	22.00	0.81	22.51	5.97	7.10	99.9	118.8		99.9	147.1	1		6	4	4.00	0.015	0.0014	866.34	866.33	4.16	4.16		0.27	0.27	0.85	0.23	0.10	866.44	860.36	860.33	864.36	864.33	867.04		
0+83.90	0+00.00	83.90			27.30			16.74	23.00	0.04	22.51	5.97	7.10	99.9	118.8		99.9	147.1	1		6	4	4.00	0.015	0.0014	866.23	866.11	4.16	4.16		0.27	0.27	0.2	0.05	0.10	866.33	860.33	860.08	864.33	864.08	867.04		
Storm Drain Line SD-A1 (100-YEAR CALCULATIONS)																																									
2+97.11	0+93.90	203.21	Line B	24.48	27.30	0.58	14.20	16.74	22.00	0.45	22.45	5.98	7.11	100.1	118.9		118.9	147.1	1		6	4	4.00	0.015	0.0020	867.18	866.78	3.02	4.96		0.44	0.38	0.25	0.11	0.27	867.45	860.97	860.36	864.97	864.36	867.59		
0+93.90	0+83.90	10.00			27.30			16.74	22.00	0.68	22.45	5.98	7.11	100.1	118.9		118.9	147.1	1		6	4	4.00	0.015	0.0020	866.68	866.66	4.96	4.96		0.38	0.38	0.85	0.32	0.10	866.78	860.36	860.33	864.36	864.33	867.04		
0+83.90	0+00.00	83.90			27.30			16.74	23.00	0.03	22.45	5.98	7.11	100.1	118.9		118.9	147.1	1		6	4	4.00	0.015	0.0020	866.56	866.40	4.96	4.96		0.38	0.38	0.2	0.08	0.10	866.66	860.33	860.08	864.33	864.08	867.04		
Storm Drain Line SD-A2																																									
0+16.74	0+00.00	16.74	A2	0.27	0.27	0.90	0.24	0.24	10.00	0.00	10.00	5.71	9.00	1.4	2.2		2.2	27.4	1	18			1.50	0.013	0.0004	873.01	873.00	*	9.31	*	0.00	1.35	1.25	0.00	1.68	874.69	872.95	871.81	874.45	873.31	869.20		
Storm Drain Line SD-A3																																									
0+16.74	0+00.00	16.74	A3	0.81	0.81	0.90	0.73	0.73	10.00	0.00	10.00	5.71	9.00	4.2	6.6		6.6	29.1	1	21			1.75	0.013	0.0017	867.34	867.31	*	2.73	*	0.00	0.12	1.25	0.00	0.14	867.49	865.78	865.22	867.53	866.97	877.82		
Storm Drain Line SD-A4																																									
0+16.74	0+00.00	16.74	A4	0.79	0.79	0.90	0.71	0.71	10.00	0.00	10.00	5.71	9.00	4.1	6.4		6.4	19.7	1	18			1.50	0.013	0.0037	867.60	867.54		3.62		0.00	0.20	1.25	0.00	0.25	867.85	864.33	863.74	865.83	865.24	869.20		
Storm Drain Line SD-B1																																									
0+23.00	0+00.00	23.00	Line B	24.48	24.48	0.58	14.20	14.20	10.00	0.00	10.00	5.71	9.00	81.1	127.8		127.8	147.1	1		6	4	4.00	0.015	0.0023	867.51	867.45		5.32		0.00	0.44	1.25	0.00	0.55	868.06	861.03	860.96	865.03	864.96	877.82		

ON-GRADE DEPRESSED CURB INLET CAPACITY CALCULATION TABLE

Inlet Design Point	Inlet Inlet No.	Inlet Station	Drainage Area No	Drainage Area Area (ac)	Drainage Area Runoff Coeff "C"	Drainage Area Time of Concen. (min)	Long Slope "S" (ft/ft)	Cross Slope of Pavement "Sx" (ft/ft)	Cross Slope of Gutter "Sx" (ft/ft)	Depth of Flow "Yo" (ft)	Spread of Flow "T" (ft)	Equivalent Cross Slope "Se" (ft/ft)	Street Section (type)	Manning's Coefficient Pavement n	5 Year Intensity (in/hr)	5 Year Runoff Flow (cfs)	5 Year Carry Over Flow (cfs)	5 Year Gutter Flow "Q" (cfs)	Full Width Street Capacity (cfs)	100 Year Intensity (in/hr)	100 Year Runoff Flow (cfs)	100 Year Carry Over Flow (cfs)	100 Year Gutter Flow "Q" (cfs)	Full Width R.O.W. Capacity (cfs)	Design Storm (5 yr or 100 yr)	Length Required "L_T" (ft)	Length Provided "L" (ft)	"L/L_T"	Efficiency "E"	Inlet Capacity "Qi" (cfs)	5 Year Carry Over Flow "q" (cfs)	100 Year Carry Over Flow "q" (cfs)	Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	
1	A1		A1	0.95	0.90	10.0	0.050	0.02	0.18	0.18	9.1	0.10	Major Arterial (105)	0.013	6.00	5.1		5.1	129.9	9.00	7.7		7.7	326.9	100	30.54	20	0.65	85%	6.6	0.0	1.1	20' Curb Inlet
1	A2		A2	0.27	0.90	10.0	0.022	0.02	0.18	0.13	6.6	0.13	Major Arterial (105)	0.013	6.00	1.5		1.5	86.2	9.00	2.2	1.1	3.3	216.9	100	14.85	10	0.67	87%	2.9	0.0	0.4	10' Curb Inlet
1	A3		A3	0.81	0.90	10.0	0.008	0.02	0.18	0.24	12.1	0.09	Major Arterial (105)	0.013	6.00	4.4		4.4	52.0	9.00	6.6	0.4	7.0	130.8	100	18.95	15	0.79	94%	6.6	0.0	0.4	15' Curb Inlet

CAPACITY OF CURB OPENING INLETS AND DROP INLETS IN SUMPS

Design Point	Inlet Inlet No.	Station	Drainage Area No	Drainage Area Area (ac.)	Drainage Area Runoff Coeff "C"	Drainage Area Time of Concen. (min.)	Long Slope "So" (ft./ft.)	Cross Slope of Pavement "Sx" (ft./ft.)	Cross Slope of Gutter "S'x" (ft./ft.)	100 Year Intensity (in./hr.)	100 Year Runoff Flow (c.f.s.)	100 Year Carry Over Flow (c.f.s.)	100 Year Gutter Flow "Q" (c.f.s.)	5 Yr Depth of Flow "Yo" (ft.)	5 Yr Spread of Flow "Sp" (ft)	Manning Coefficient for Pavement "n"	Design Storm (25 yr or 100 yr)	Depth of Depression "a" (ft.)	Depth of Flow at Opening "y" (ft.)	50% Clogging applied apacity of Inle foot of Length "Q/L" (c.f.s./ft.)	50% Clogging applied Length of Inlet Opening "L" (ft.)	50% Clogging applied Capacity of Inlet "Q" (c.f.s.)	50% Clogging applied Carry Over Into Over Flow (c.f.s.)	50% Clogging applied Percent 100 Year Flow Captured by Inlet	Comments
	1						2	3					4	5	6			7	8	9	10	11	12	13	14
1	A4		A4	0.79	0.90	10.0	0.0095	0.02	0.18	9.00	6.4	0.4	6.8	0.23	11.4	0.013	100	0.33	0.61	0.71	10	7.1	0.0	100.0%	10' Curb Inlet

Date: Jan 29, 2025, 2:37pm User ID: ARGSCOE
Files: S:\Projects\61405\001\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\SD0A-614050I.dwg

NO. | REVISION | DATE

ANNA JANE ROSCOE 142544 LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

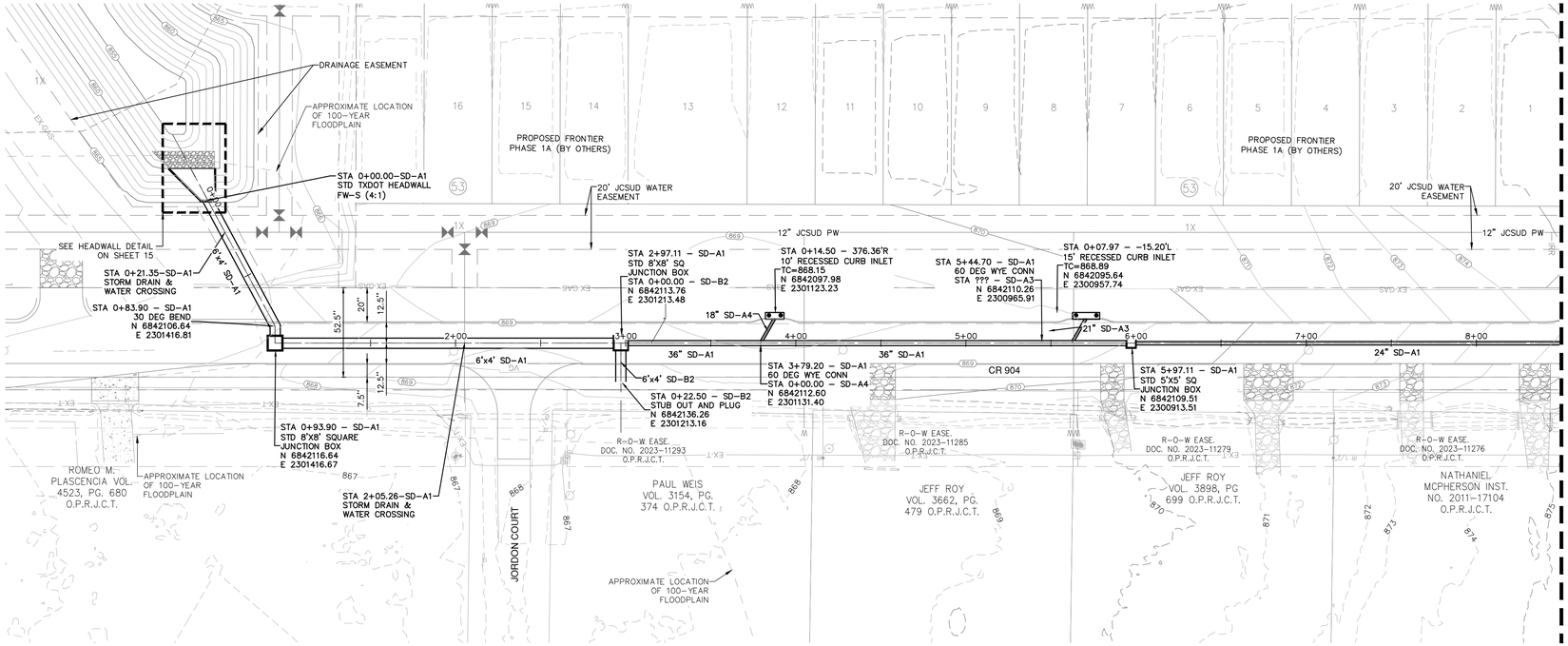
DRAINAGE & HYDRAULIC CALCULATIONS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 13

ISSUED FOR CONSTRUCTION SET

RIPRAP GRADATION 12" THICKNESS OF RIPRAP	
SIEVE SIZE SQUARE MESH	PERCENT PASSING
15 INCH	100
12 INCH	70 – 100
8 INCH	45 – 75
6 INCH	30 – 55
3 INCH	10 – 30
1–1/2 INCH	0 – 10

BEDDING GRADATIONS 6" THICKNESS OF BEDDING	
SIEVE SIZE SQUARE MESH	PERCENT PASSING
3 INCH	100
1–1/2 INCH	55 – 100
3/4 INCH	25 – 60
3/8 INCH	5 – 30
NO. 4	0 – 10



SCALE: 1" = 40'

0' 40' 80' 120'

LEGEND

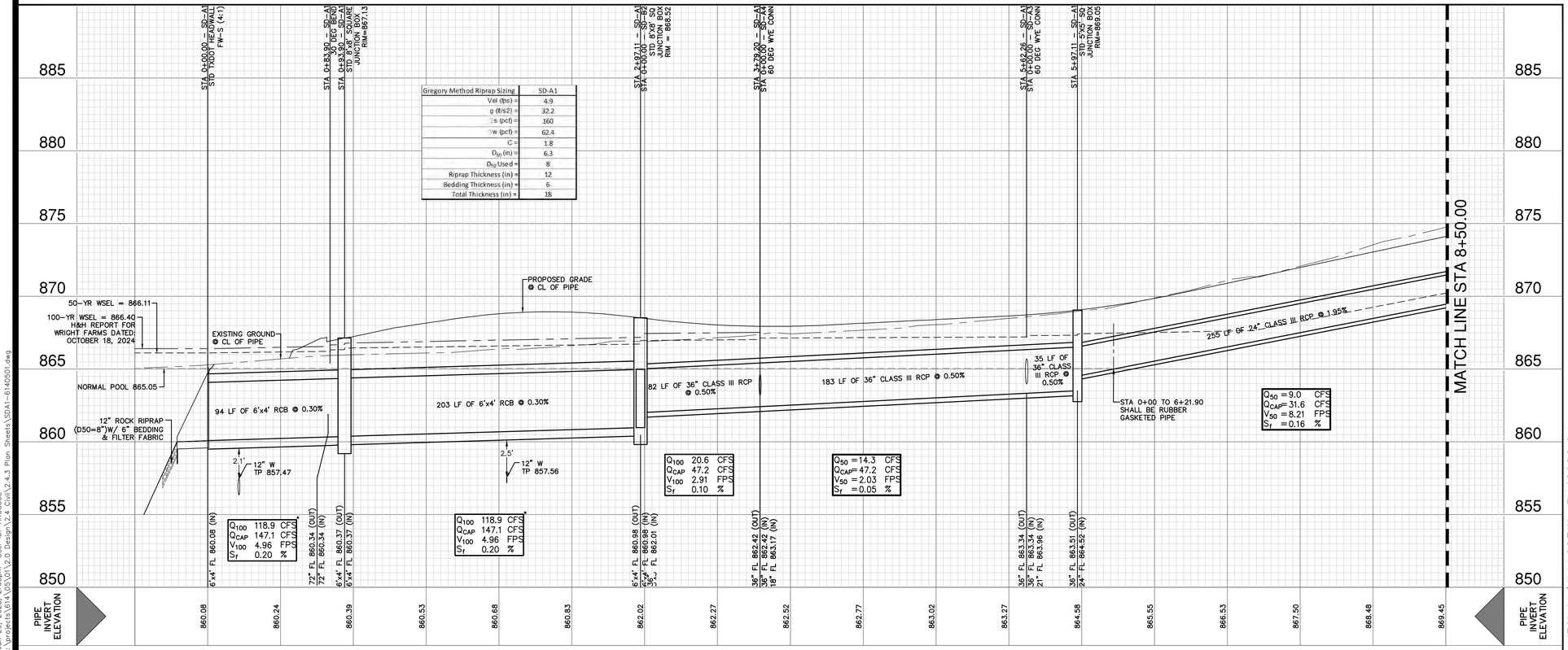
- PROPOSED WATER LINE
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED SANITARY SEWER LINE
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED STORM DRAIN
- PROPOSED CURB INLET
- PROPOSED JUNCTION BOX

NOTES:
1. NO DETENTION IS REQUIRED PER PAPE–DAWSON PRELIMINARY DRAINAGE & FLOODPLAIN STUDY DATED AUGUST 11,2022.
2. 100 & 50–YR WSEL BASED ON PAPE–DAWSON DRAINAGE & FLOODPLAIN STUDY DATED OCTOBER 18, 2024.
3. JUNCTION BOX SPACING SET BASED ON JOHNSON COUNTY CRITERIA.

*FLOWS ARE BASED ON ULTIMATE CONDITIONS

SD-A1
STA 0+00.00 TO STA 8+50.00

HORIZ. SCALE: 1" = 40'
VERT. SCALE: 1" = 4'



TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/ GEOTECHNICAL/ SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND /OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

UTILITY NOTE

THE EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED FROM VARIOUS SOURCES AND ARE INTENDED TO SHOW THE GENERAL EXISTENCE AND LOCATION OF THE UTILITY INFORMATION ON THE PLANS. THE CONTRACTOR SHALL CONTACT A UTILITY LOCATING SERVICE 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND OF ALL EXISTING UTILITIES AND DETERMINE IF THERE ARE ANY CONFLICTS WITH THE PROPOSED FACILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY WHEN CONFLICTS WITH EXISTING UTILITIES ARE DISCOVERED.

NO.	REVISION	DATE

STATE OF TEXAS — ANNA JANE ROSCOE — 142544 — LICENSED PROFESSIONAL ENGINEER

1/28/25

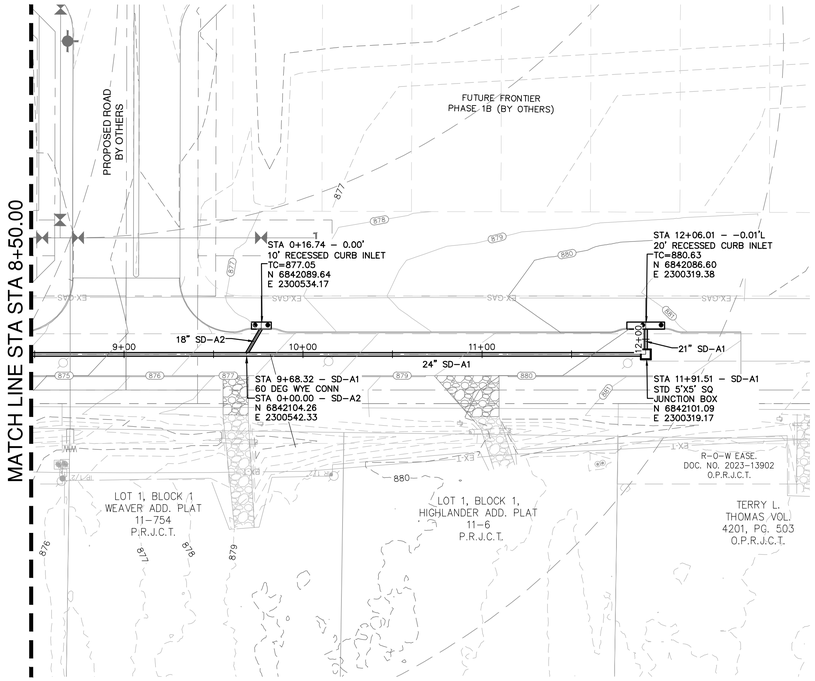
PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

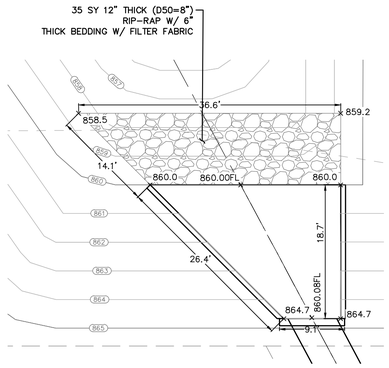
COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

STORM DRAIN PLAN & PROFILE
SD-A1

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 14

ISSUED FOR CONSTRUCTION SET





DETAIL "A"
SCALE: 1" = 10'

SCALE: 1"= 40'

0' 40' 80' 120'

LEGEND

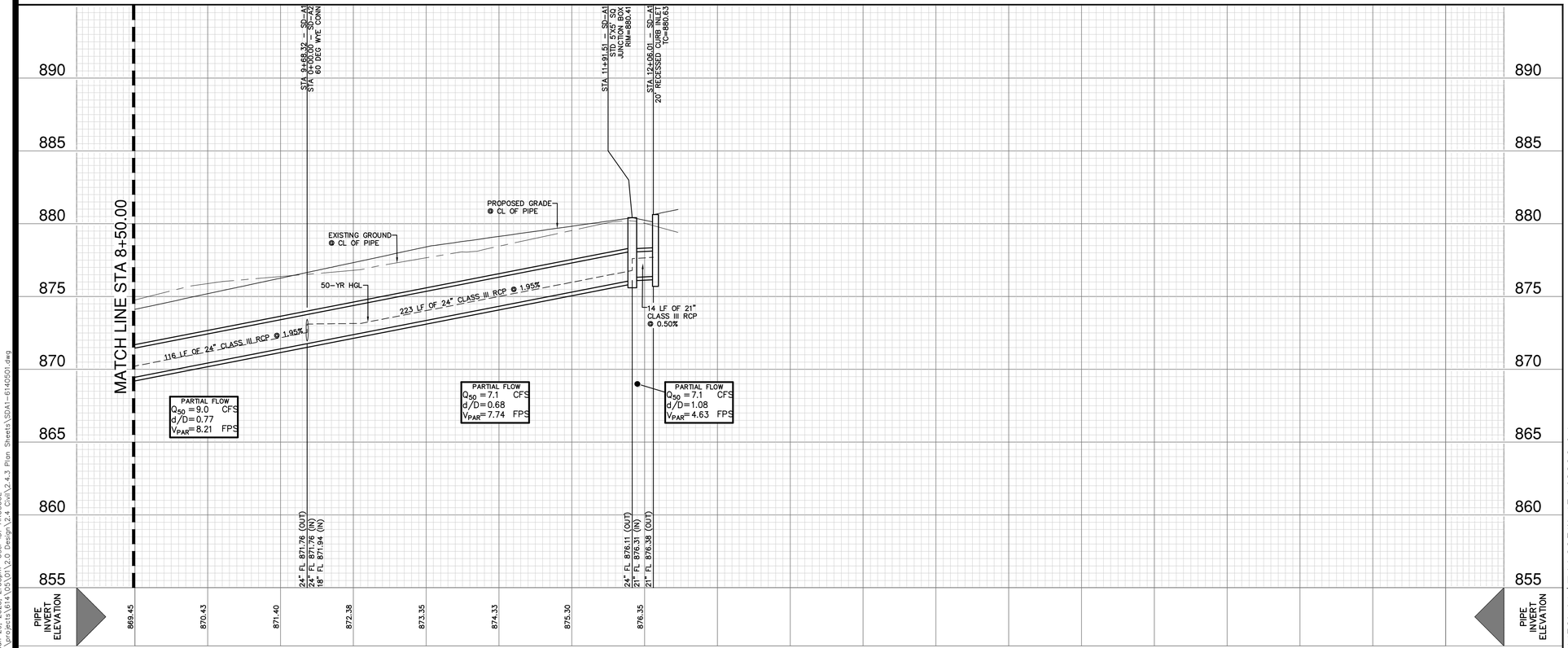
- PROPOSED WATER LINE
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED SANITARY SEWER LINE
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED STORM DRAIN
- PROPOSED CURB INLET
- PROPOSED JUNCTION BOX

NOTES:
1. NO DETENTION IS REQUIRED PER PAPE-DAWSON PRELIMINARY DRAINAGE & FLOODPLAIN STUDY DATED AUGUST 11,2022.
2. 100 & 50-YR WSEL BASED ON PAPE-DAWSON DRAINAGE & FLOODPLAIN STUDY DATED OCTOBER 18, 2024.
3. JUNCTION BOX SPACING SET BASED ON JOHNSON COUNTY CRITERIA.

*FLOWS ARE BASED ON ULTIMATE CONDITIONS

SD-A1
STA 8+50.00 TO END

HORIZ. SCALE: 1" = 40'
VERT. SCALE: 1" = 4'



TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/ GEOTECHNICAL/ SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND /OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

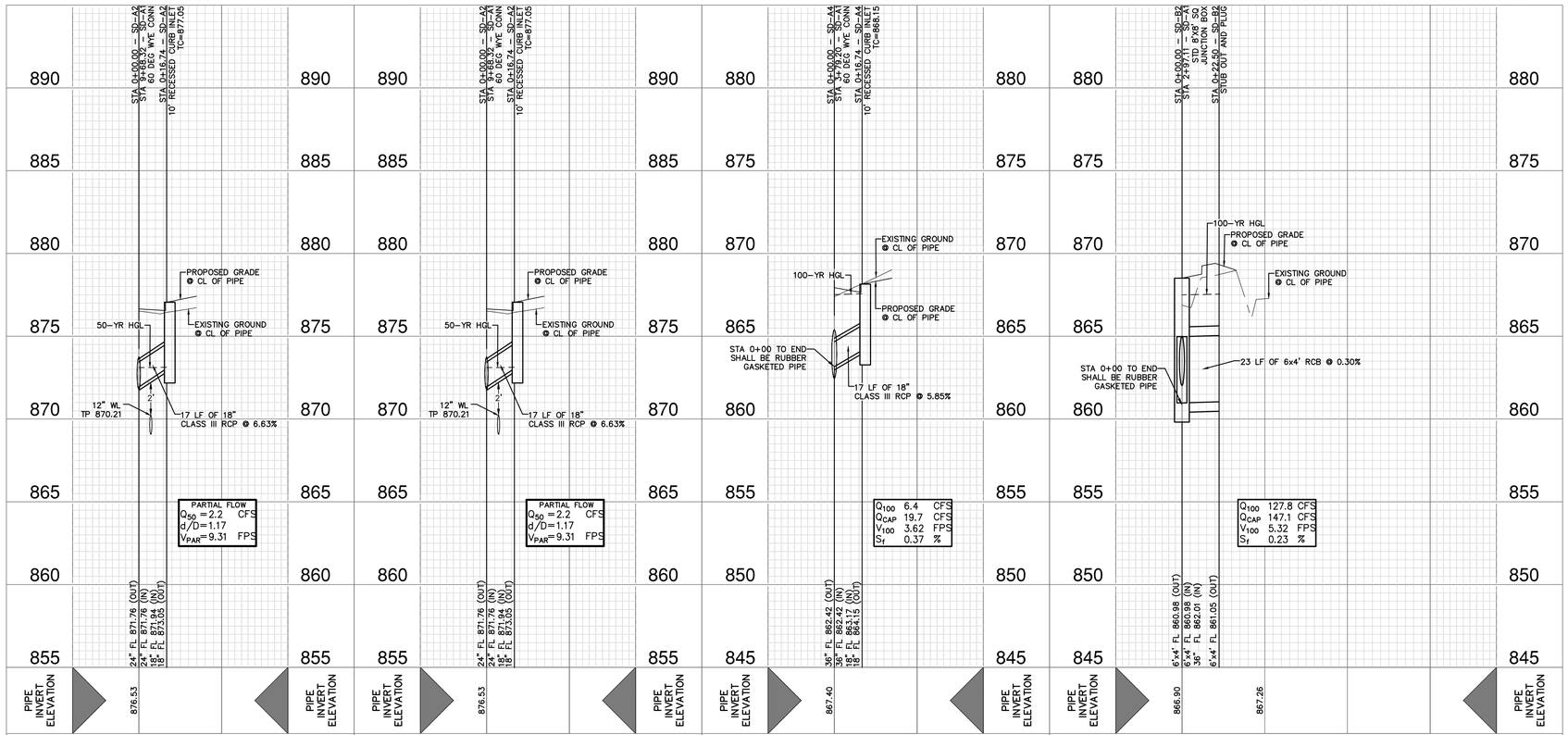
COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

STORM DRAIN PLAN & PROFILE
SD-A1

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 15

ISSUED FOR CONSTRUCTION SET

SD-A2
STA 0+00.00 TO END



SD-A3
STA 0+00.00 TO END

SD-A4
STA 8+50.00 TO END

SD-B2
STA 0+00.00 TO END

HORIZ. SCALE: 1" = 40'
VERT. SCALE: 1" = 4'

NOTES:
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2. JUNCTION BOX SPACING SET BASED ON JOHNSON COUNTY CRITERIA.

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/ GEOTECHNICAL/ SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND /OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5494
TEXAS ENGINEERING FIRM # 470 | TEXAS SURVEYING FIRM # 100288-00

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

STORM DRAIN PROFILES
SD-A2 - SD-A4 & SD-B2

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 16

Date: Jan 29, 2025, 2:38pm User ID: ARoscoe
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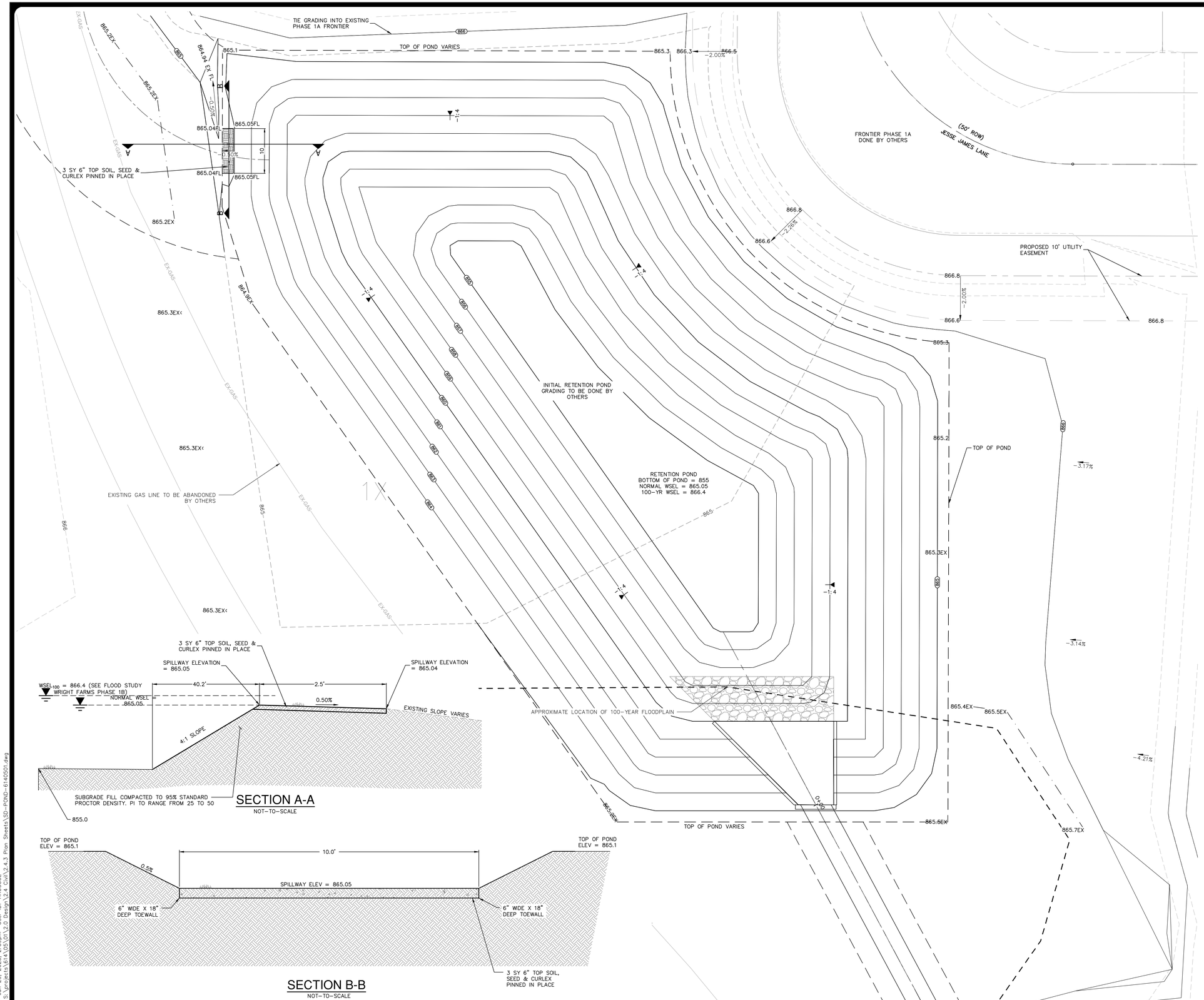
ISSUED FOR CONSTRUCTION SET



SECTION A-A
NOT-TO-SCALE

SECTION B-B
NOT-TO-SCALE

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

RETENTION POND PLAN

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN CL
SHEET 17

Date: Jan 29, 2025, 2:39pm User ID: AROSCOE
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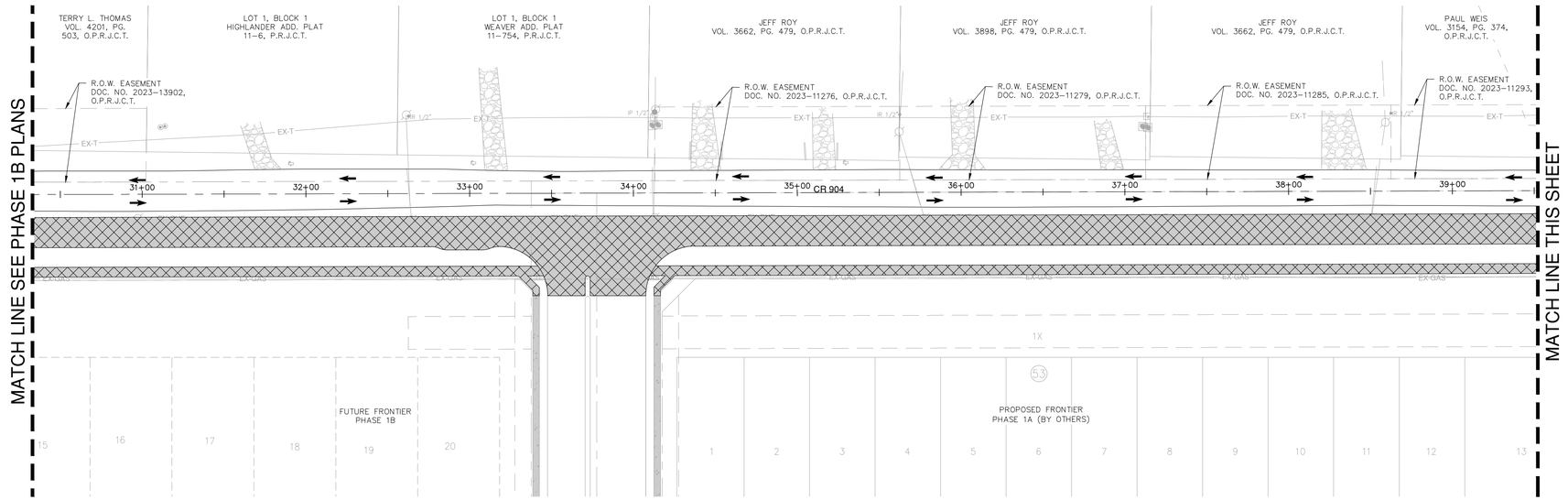
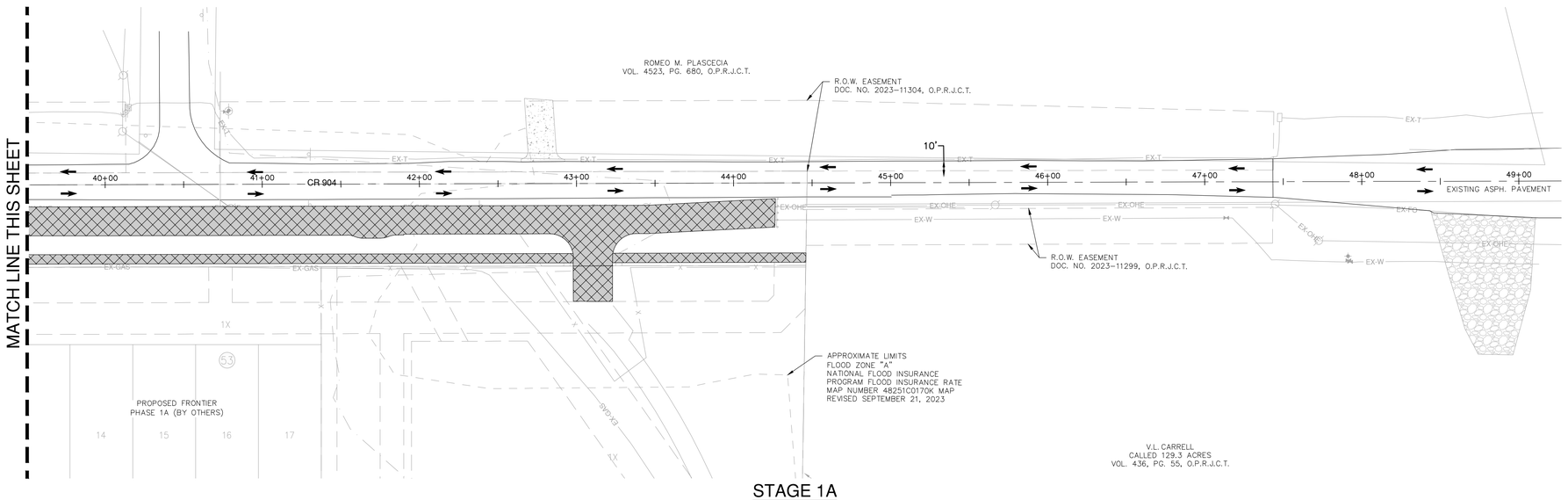


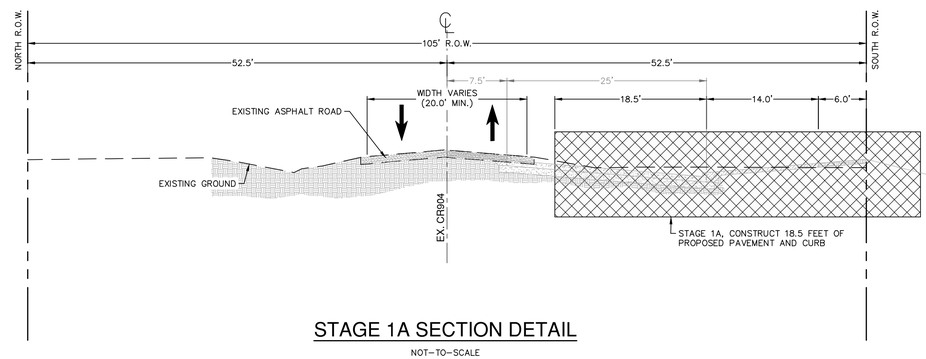
STAGE 1A

SCALE: 1" = 40'



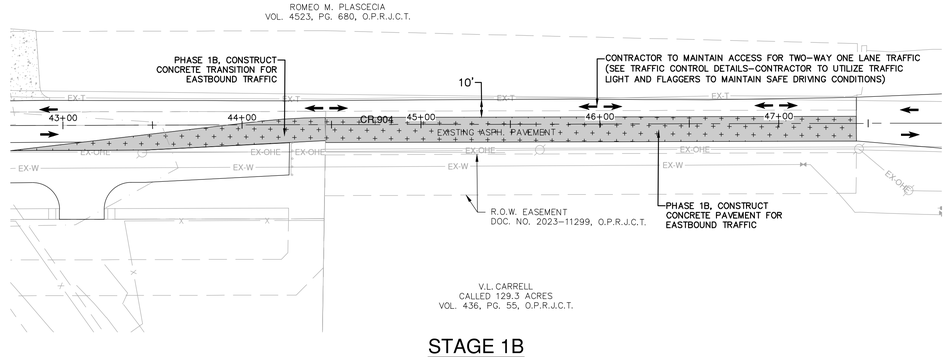
STAGE 1A

SCALE: 1" = 40'



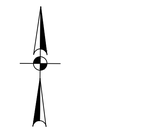
STAGE 1A SECTION DETAIL

NOT-TO-SCALE



STAGE 1B

SCALE: 1" = 40'



BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

STAGE 1A, CONSTRUCT 18.5 FEET OF PROPOSED PAVEMENT, CURB AND DRIVEWAY

STAGE 1B, CONSTRUCT ASPHALT TRANSITION FOR EASTBOUND TRAFFIC

EXISTING EDGE OF ASPHALT PAVEMENT

PROPOSED TRAVEL LANE DIRECTIONS

NOTES

1. MINIMUM OF ONE-LANE TWO-WAY TRAFFIC TO BE OPEN AT ALL TIMES WITH CHANNEL DEVICES WHERE CONNECTING TO EXISTING ASPHALT ROAD.

2. STAGE 1A TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR EASTBOUND AND WESTBOUND DIRECTIONS.

3. STAGE 1B, 2A & 2B TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR THE WESTBOUND DIRECTION AND ON PROPOSED CONCRETE FOR EASTBOUND DIRECTION.

4. STAGE 3 TRAFFIC SHALL CONTINUE ONTO PROPOSED CONCRETE ROAD FOR BOTH EASTBOUND AND WESTBOUND DIRECTION.

5. CONTRACTOR SHALL MAINTAIN HOME ACCESS THROUGHOUT DURATION OF CONSTRUCTION. CONTRACTOR TO PHASE DRIVEWAY AND ROAD CONSTRUCTION TO ACHIEVE FULL ACCESS AT ALL TIMES. CONTRACTOR SHALL USE TEMPORARY GRAVEL/FLEXBASE ROADS TO ACHIEVE ACCESS AS NECESSARY.

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM # 10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

STAGE 1A & 1B
CONSTRUCTION PHASING PLAN

PLAT NO.	N/A
JOB NO.	61405-01
DATE	1/28/2025
DESIGNER	SM
CHECKED	AR
DRAWN	SM
SHEET	18

Date: Jan 29, 2025, 2:39pm User ID: AROSCOE
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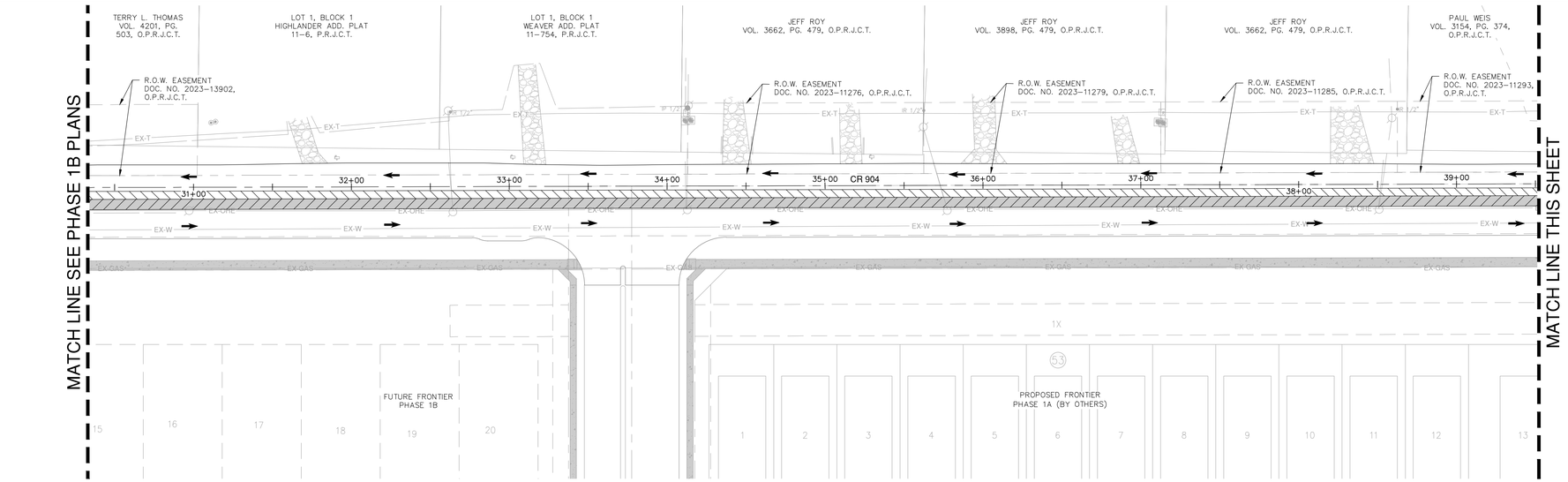
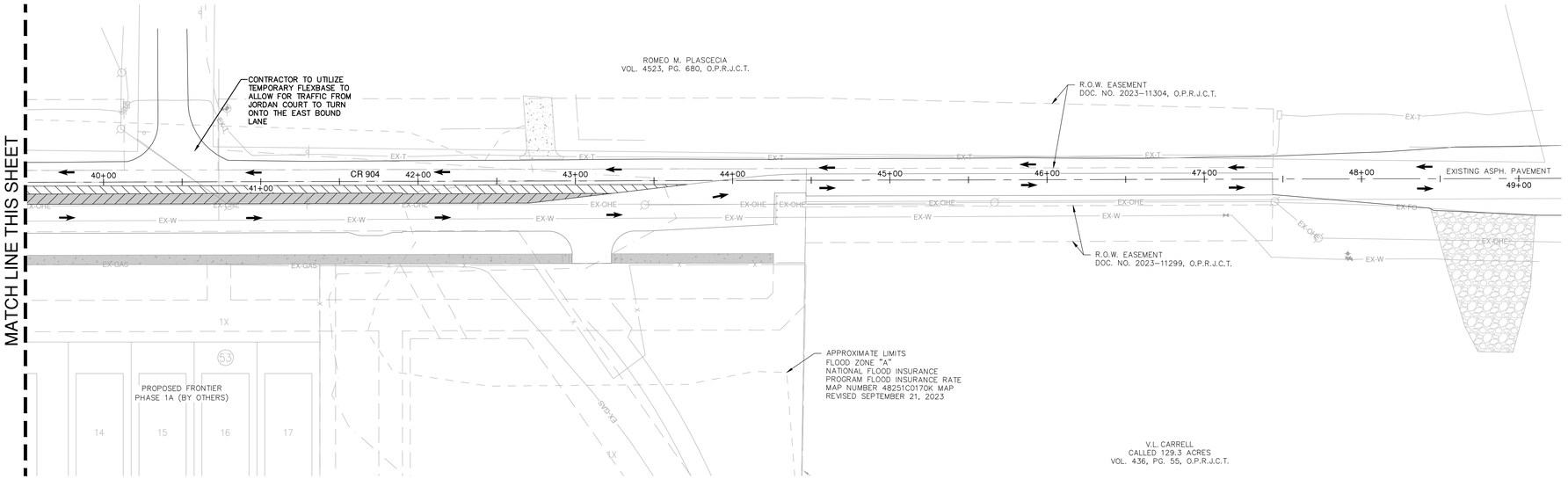
ISSUED FOR CONSTRUCTION SET



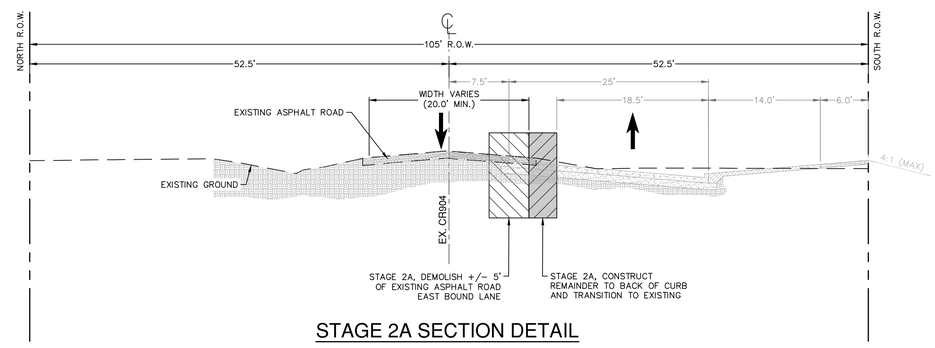
STAGE 2A

SCALE: 1" = 40'



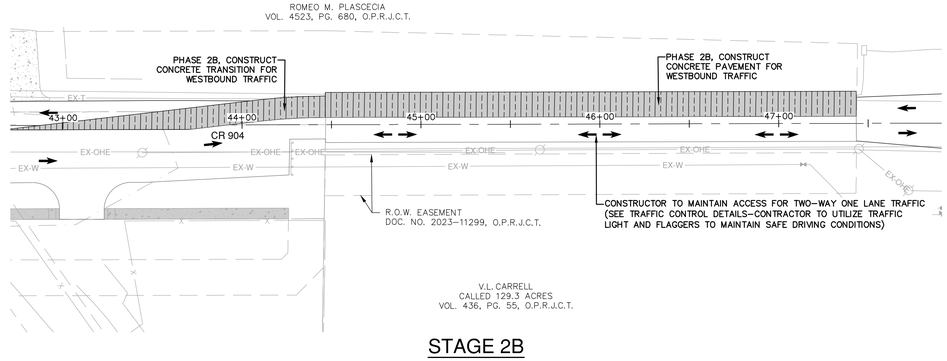
STAGE 2A

SCALE: 1" = 40'



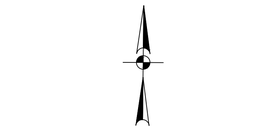
STAGE 2A SECTION DETAIL

NOT-TO-SCALE



STAGE 2B

SCALE: 1" = 40'



BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

STAGE 2A, DEMOLISH +/- 5' OF EXISTING ASPHALT ROAD EAST BOUND LANE

STAGE 2A, CONSTRUCT REMAINDER TO BACK OF CURB AND TRANSITION TO EXISTING

STAGE 2B, CONSTRUCT ASPHALT TRANSITION FOR WESTBOUND TRAFFIC

EXISTING EDGE OF ASPHALT PAVEMENT

PROPOSED TRAVEL LANE DIRECTIONS

NOTES

1. MINIMUM OF ONE-LANE TWO-WAY TRAFFIC TO BE OPEN AT ALL TIMES WITH CHANNEL DEVICES WHERE CONNECTING TO EXISTING ASPHALT ROAD.
2. STAGE 1A TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR EASTBOUND AND WESTBOUND DIRECTIONS.
3. STAGE 1B, 2A & 2B TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR THE WESTBOUND DIRECTION AND ON PROPOSED CONCRETE FOR EASTBOUND DIRECTION.
4. STAGE 3 TRAFFIC SHALL CONTINUE ONTO PROPOSED CONCRETE ROAD FOR BOTH EASTBOUND AND WESTBOUND DIRECTION.
5. CONTRACTOR SHALL MAINTAIN HOME ACCESS THROUGHOUT DURATION OF CONSTRUCTION. CONTRACTOR TO PHASE DRIVEWAY AND ROAD CONSTRUCTION TO ACHIEVE FULL ACCESS AT ALL TIMES. CONTRACTOR SHALL USE TEMPORARY GRAVEL/FLEXBASE ROADS TO ACHIEVE ACCESS AS NECESSARY.

UTILITY NOTE

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STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

STAGE 2A & PHASE 2B CONSTRUCTION PHASING PLAN

PLAT NO.	N/A
JOB NO.	61405-01
DATE	1/28/2025
DESIGNER	SM
CHECKED	AR
DRAWN	SM
SHEET	19

Date: Jan 29, 2025, 2:40pm User ID: ARDSCOE
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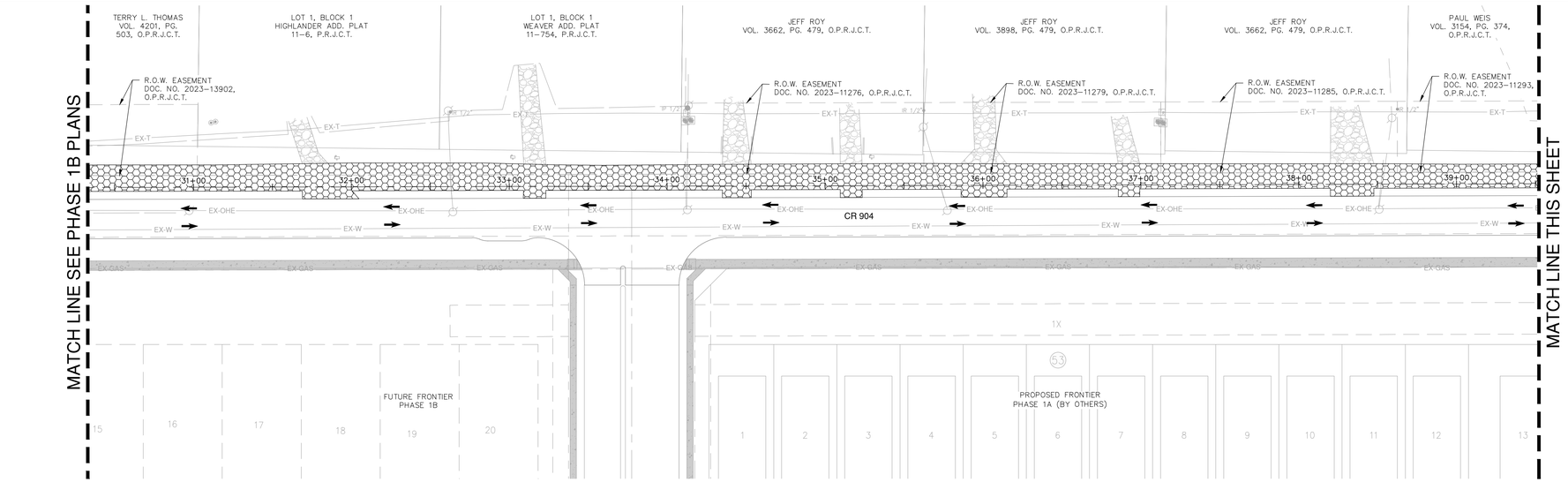
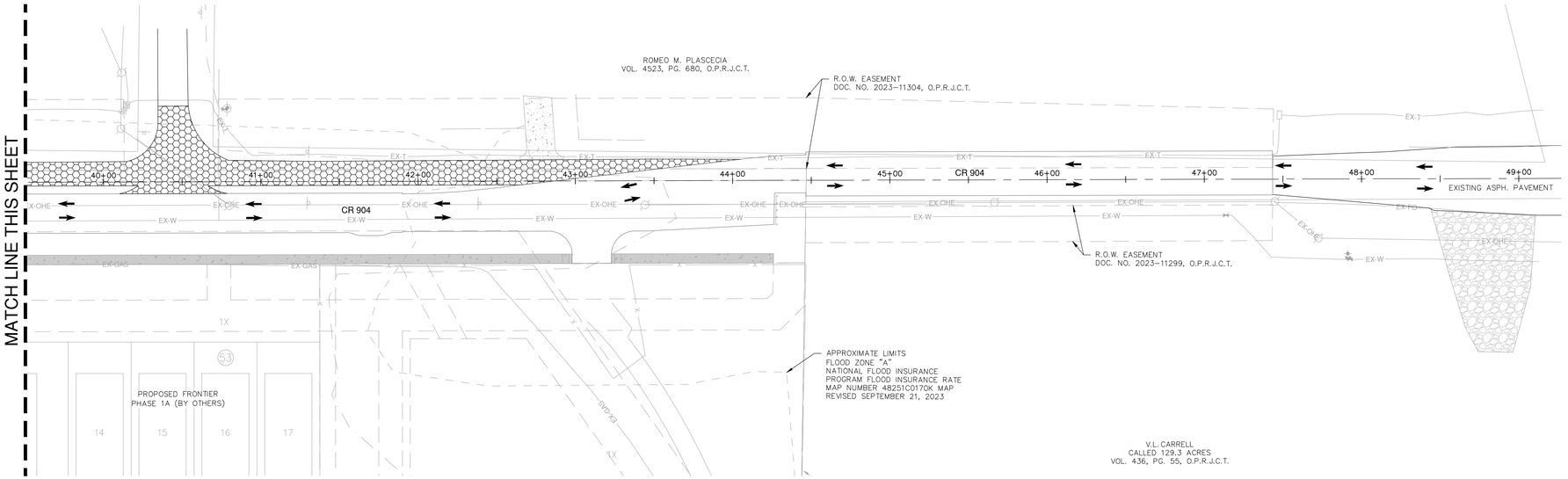
ISSUED FOR CONSTRUCTION SET



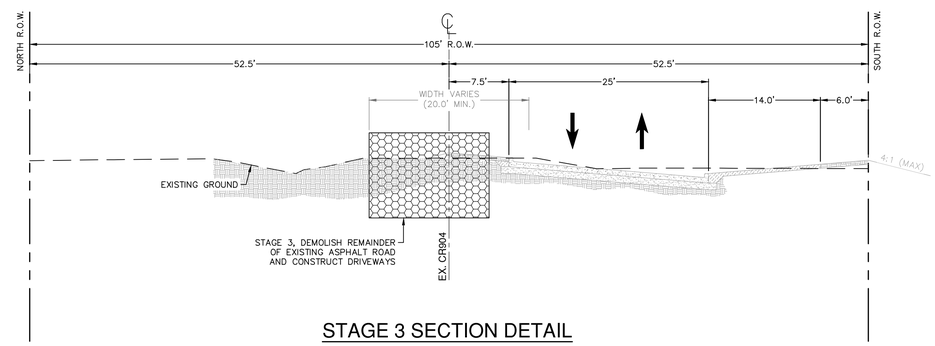
STAGE 3

SCALE: 1" = 40'



STAGE 3

SCALE: 1" = 40'



STAGE 3 SECTION DETAIL

NOT-TO-SCALE

SCALE: 1"= 40'

0' 40' 80' 120'

BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

STAGE 3, DEMOLISH REMAINDER OF EXISTING ASPHALT ROAD AND CONSTRUCT DRIVEWAYS

EXISTING EDGE OF ASPHALT PAVEMENT

PROPOSED TRAVEL LANE DIRECTIONS

NOTES

1. MINIMUM OF ONE-LANE TWO-WAY TRAFFIC TO BE OPEN AT ALL TIMES WITH CHANNEL DEVICES WHERE CONNECTING TO EXISTING ASPHALT ROAD.
2. STAGE 1A TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR EASTBOUND AND WESTBOUND DIRECTIONS.
3. STAGE 1B, 2A & 2B TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR THE WESTBOUND DIRECTION AND ON PROPOSED CONCRETE FOR EASTBOUND DIRECTION.
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UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

STAGE 3

CONSTRUCTION PHASING PLAN

PLAT NO.	N/A
JOB NO.	61405-01
DATE	1/28/2025
DESIGNER	SM
CHECKED	AR
DRAWN	SM
SHEET	20

ISSUED FOR CONSTRUCTION SET

Date: Jan 29, 2025, 2:40pm User ID: ARDSCOE
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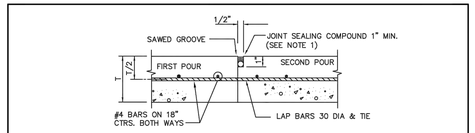
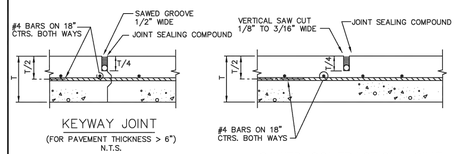


CONSTRUCTION JOINT

N.T.S.



KEYWAY JOINT

(FOR PAVEMENT THICKNESS > 6")

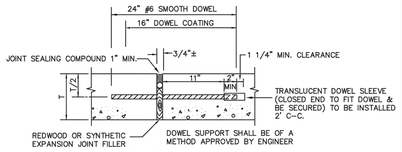
N.T.S.

SAWED CONTRACTION JOINT

N.T.S.

NOTE:

1. APPLY BACKER ROD AS APPROVED BY OWNER

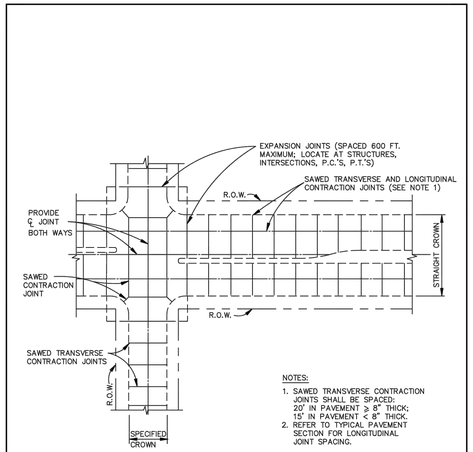


EXPANSION JOINT

(SPACED 600 FT. MAXIMUM; LOCATE AT STRUCTURES AND AT INTERSECTION P.C.'S & P.T.'S)

N.T.S.

REINFORCED CONCRETE PAVEMENT	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 303.5.4.	
JOINTS		DATE AUG '23	STANDARD DRAWING NO. 2050



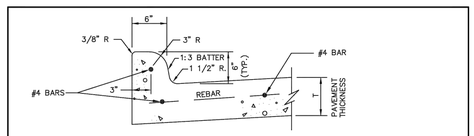
NOTES:

1. SAWED TRANSVERSE CONTRACTION JOINTS SHALL BE SPACED: 20' IN PAVEMENT ≥ 8" THICK; 15' IN PAVEMENT < 8" THICK.
2. REFER TO TYPICAL PAVEMENT SECTION FOR LONGITUDINAL JOINT SPACING.

SPACING DIAGRAM FOR TRANSVERSE JOINTS

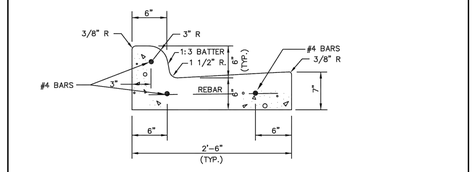
N.T.S.

REINFORCED CONCRETE PAVEMENT	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 303.5.4.	
TRANSVERSE JOINT SPACING		DATE AUG '23	STANDARD DRAWING NO. 2060



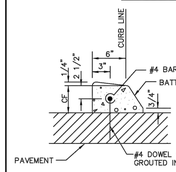
INTEGRAL CURB & GUTTER

N.T.S.



SEPARATE CURB & GUTTER

N.T.S.



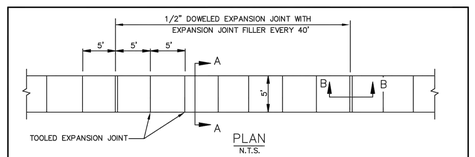
DOWELED CURB

N.T.S.

NOTES:

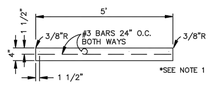
1. REINFORCEMENT SHALL BE NO. 4 BARS, UNLESS OTHERWISE SPECIFIED.
2. CONCRETE SHALL BE CLASS "C" OR "PC".
3. "G" IS 6" UNLESS OTHERWISE SPECIFIED.
4. ALL CURBS ARE CONSTRUCTED OF PORTLAND CEMENT CONCRETE UNLESS OTHERWISE SHOWN.
5. GRADE SHALL BE MEASURED AT BACK OF CURB.
6. SEE ROADWAY SECTIONS FOR SUBGRADE SUBGRADE SHALL EXTEND 1' BEYOND BACK OF CURB.

CONCRETE CURB & GUTTER	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 305.1	
INTEGRAL, SEPARATE, & DOWELED		DATE AUG '23	STANDARD DRAWING NO. 2120



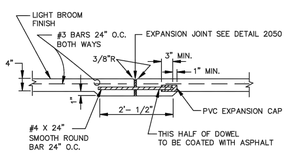
PLAN

N.T.S.



SECTION "A–A"

N.T.S.



SECTION "B–B"

N.T.S.

NOTE:

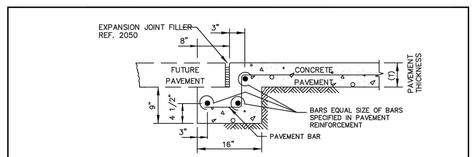
1. REFER TO STANDARD SPECIFICATION ITEM 305.2 FOR ALTERNATE REINFORCEMENT.
2. CROSS SLOPE OF SIDEWALK SHALL BE 2% MAX.
3. OTHER THAN 5'-0" SIDEWALK WIDTH MAY BE SPECIFIED BY OWNER. IF LESS THAN 5' SIDEWALK IS USED, THE TOOLED JOINT IS TO MATCH THE WIDTH OF SIDEWALK.
4. SIDEWALK SHALL BE CLASS "C" CONCRETE UNLESS OTHERWISE SPECIFIED BY OWNER.
5. ALL HONEYCOMB IN BACK OF CURB TO BE TROWEL-PLASTERED BEFORE POURING SIDEWALK.
6. LUG MAY BE FORMED BY SHAPING SUBGRADE TO APPROXIMATE DIMENSIONS SHOWN.
7. IF 5' WIDTH CANNOT BE ACHIEVED, MUST BE COMPLIANT WITH ADA AND PROWAG PASSING REQUIREMENTS.

REINFORCED CONCRETE SIDEWALKS	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 305.2	
JOINTS AND SPACING		DATE AUG '23	STANDARD DRAWING NO. 2170

GENERAL NOTES:

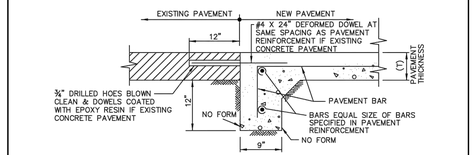
1. REINFORCED CONCRETE PAVEMENT:
   A. ALL CURBS SHALL BE PLACED INTEGRAL WITH PAVEMENT UNLESS OTHERWISE APPROVED BY THE OWNER.
   B. CURBS SHALL MEET THE SAME COMPRESSIVE STRENGTH AS SPECIFIED FOR THE PAVEMENT.
   C. BAR LAPS SHALL BE 30 DIAMETERS.
   D. REINFORCING BARS SHALL BE SUPPORTED BY CHAIRS OR OTHER DEVICES APPROVED BY THE OWNER.
2. SUBGRADE: (UNLESS OTHERWISE SPECIFIED BY OWNER)
   A. SUBGRADE UNDER ALL PAVEMENTS SHALL BE STABILIZED TO MINIMUM DEPTH OF 6" FOR 2 LANE RESIDENTIAL ROAD AND 8" FOR ALL OTHERS. IF THE P.I. IS 15 OR GREATER, LIME SHALL BE USED, IF THE P.I. IS LESS THAN 15, CEMENT SHALL USED OR AS RECOMMENDED BY A GEOTECH ENGINEER. LABORATORY TESTS MUST BE PERFORMED TO DETERMINE THE AMOUNT OF CEMENT REQUIRED TO LOWER THE P.I. TO 15 OR BELOW SATURATION P.I. (PH± 12.4) WILL BE THE LIMIT WHEN A SOIL'S P.I. CANNOT BE BROUGHT TO 15 OR LOWER.
   B. WHERE THE IN PLACE MATERIAL HAS A P.I. OF LESS THAN 15, THE SUBGRADE SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 6" AND RECOMPACTED.
   C. WHERE SULFATES ARE PRESENT, CONSULT A GEOTECHNICIAL ENGINEER FOR RECOMMEND SUBGRADE TREATMENT.
3. IF THE ROADWAY IS A DESIGNATED BIKE ROUTE OR BIKE USAGE IS ANTICIPATED, REFER TO AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AASHTO GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES (2012, 4TH EDITION) AND THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD): https://mutcd.fhwa.dot.gov/resources/state_info/texas/tx.htm

PAVEMENT SYSTEMS	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 301. 302. 303.	
GENERAL NOTES		DATE AUG '23	STANDARD DRAWING NO. 2110



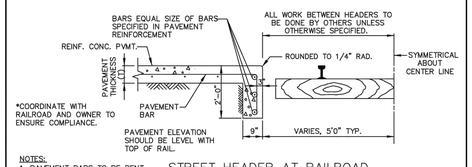
STREET HEADER FOR FUTURE PAVEMENT

N.T.S.



STREET HEADER AT EXISTING PAVEMENT

N.T.S.



NOTES:

1. PAVEMENT BARS TO BE BENT DOWN INTO HEADER.
2. HEADER AND PAVEMENT TO BE MONOLITHIC.

STREET HEADER AT RAILROAD

N.T.S.

REINFORCED CONCRETE PAVEMENT	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 303.5.4.	
STREET HEADERS		DATE AUG '23	STANDARD DRAWING NO. 2070

Date: Jan 29, 2025, 2:41pm User ID: ARDSCOE
Files: S:\projects\61405\01\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\STDT-61405001.dwg

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

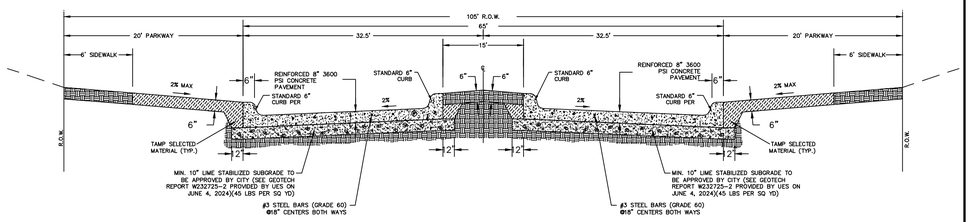
PAVING DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 21

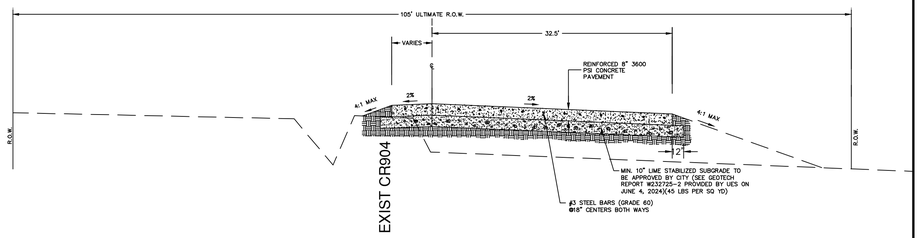
ISSUED FOR CONSTRUCTION SET

NOTE:

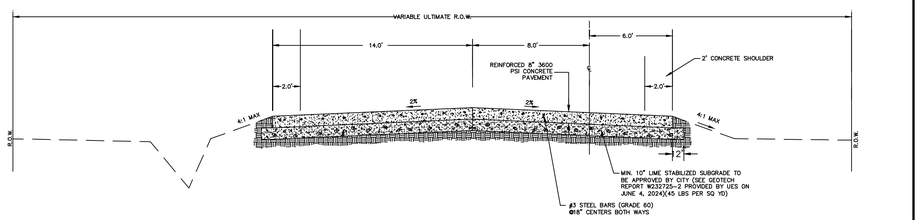
THE CLIENT CONTRACTED WITH UES TO PREPARE A FINAL GEOTECHNICAL EXPLORATION REPORT FOR WRIGHT FARMS/FRONTIER CR904. CONTRACTOR SHALL REFERENCE THIS GEOTECHNICAL REPORT NO. W232725-2, ADDENDUM W232725-B, AND ADDENDUM W232725-2-REV1 PREFORMED BY UES ON JUNE 4, 2024, OCTOBER 3, 2024, AND JANUARY 22, 2025 RESPECTIVELY.



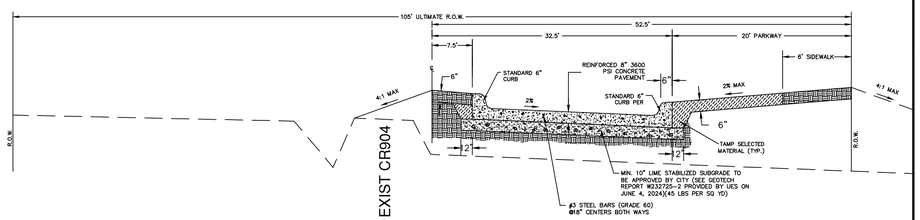
CR904 ULTIMATE PAVEMENT SECTION



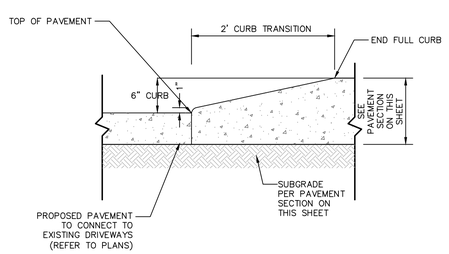
CR904 PROPOSED PAVEMENT SECTION STA 41+90.00 TO 44+46.66



CR904 PROPOSED PAVEMENT SECTION STA 44+46.22 TO 47+43.05

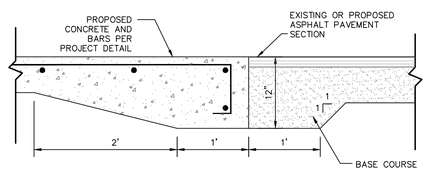


CR904 PROPOSED PAVEMENT SECTION STA 30+33.96 TO 41+90.00



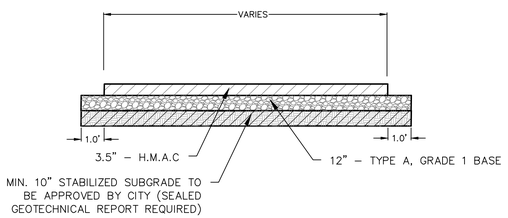
CURB TRANSITION DETAIL

NOT-TO-SCALE



CONCRETE/ASPHALT JUNCTURE DETAIL

NOT-TO-SCALE



PROPOSED ASPHALT PAVEMENT
CONNECTION TO JORDAN CT

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5404
TEXAS ENGINEERING FIRM # 470 | TEXAS SURVEYING FIRM # 100288-00

STATE OF TEXAS
ANNA JANE PISCOCE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

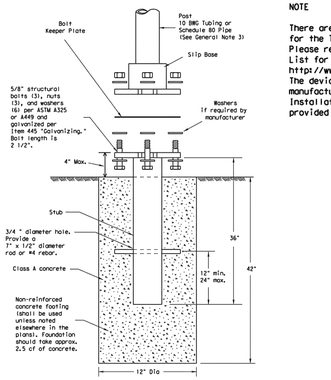
PAVING DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 22

Date: Jan 29, 2025, 2:41pm User ID: AR03CDE
File: S:\projects\614\05\01\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\STDT-614050101.dwg

ISSUED FOR CONSTRUCTION SET

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(3)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

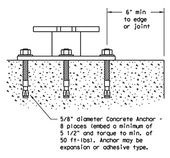
1. Slip base shall be permanently marked to indicate manufacturer, Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   20% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138".
   Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   Galvanization per ASTM A123 or ASTM A653 G210. For preworked steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
   46,000 PSI minimum yield strength
   62,000 PSI minimum tensile strength
   21% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304".
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 1 to 7.5 feet above the edge of the traveltay (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the traveltay. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(3)SB(X-XXXX)

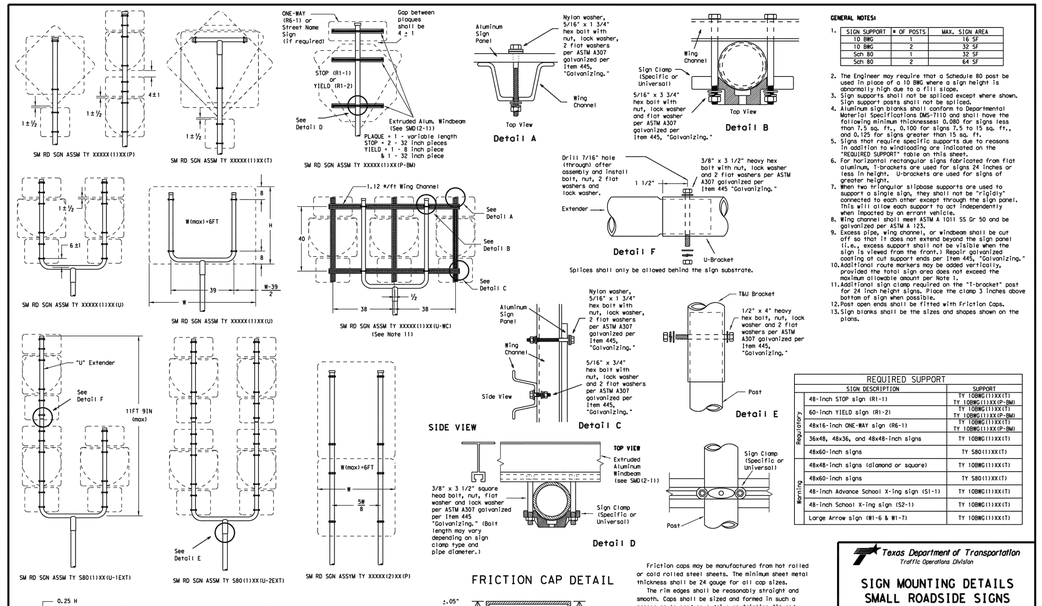
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-1)-08

©TxDOT July 2002	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

268



SM RD SGN ASSM TY XXXXX(1)XX(T)
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)
SM RD SGN ASSM TY XXXXX(1)XX(T)
SM RD SGN ASSM TY XXXXX(1)XX(U)
SM RD SGN ASSM TY XXXXX(1)XX(Q)
SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)
SM RD SGN ASSM TY S801(1)XX(U-1EXT)
SM RD SGN ASSM TY S801(1)XX(U-2EXT)
SM RD SGN ASSM TY XXXXX(2)XX(P)
SM RD SGN ASSM TY XXXXX(1)XX(T)
(+ - See Note 12)

All dimensions are in english unless detailed otherwise.

GENERAL NOTES:

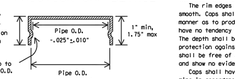
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is greater than 7.5 ft., but not greater than 15 ft.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowed for the sign size.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT	
SIGN DESCRIPTION	SUPPORT
Regulatory: 48-Inch STOP sign (R1-1)	TY 10BWG(1)XX(T) / TY 10BWG(1)XX(P-BM)
Regulatory: 60-Inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) / TY 10BWG(1)XX(P-BM)
Regulatory: 48x16-Inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) / TY 10BWG(1)XX(P-BM)
Regulatory: 36x48, 48x36, and 48x48-Inch signs	TY 10BWG(1)XX(T)
Regulatory: 48x60-Inch signs	TY S80(1)XX(T)
Regulatory: 48x48-Inch signs (diamond or square)	TY 10BWG(1)XX(T)
Regulatory: 48x60-Inch signs	TY S80(1)XX(T)
Warning: 48-Inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
Warning: 48-Inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
Warning: Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-2)-08

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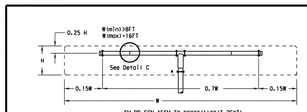
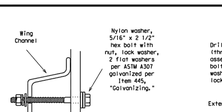
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

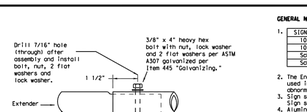
26C



SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(+ - See Note 12)



Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

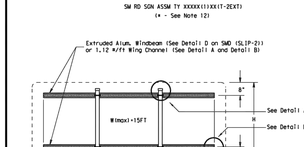
GENERAL NOTES:

1.

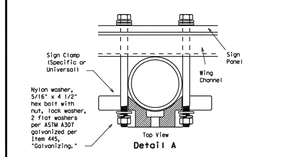
SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is greater than 7.5 sq. ft., but not greater than 15 sq. ft.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowed for the sign size.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

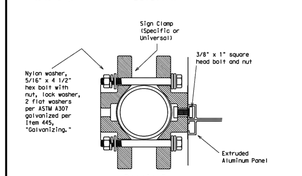
REQUIRED SUPPORT	
SIGN DESCRIPTION	SUPPORT
Regulatory: 48-Inch STOP sign (R1-1)	TY 10BWG(1)XX(T) / TY 10BWG(1)XX(P-BM)
Regulatory: 60-Inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) / TY 10BWG(1)XX(P-BM)
Regulatory: 48x16-Inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) / TY 10BWG(1)XX(P-BM)
Regulatory: 36x48, 48x36, and 48x48-Inch signs	TY 10BWG(1)XX(T)
Regulatory: 48x60-Inch signs	TY S80(1)XX(T)
Regulatory: 48x48-Inch signs (diamond or square)	TY 10BWG(1)XX(T)
Regulatory: 48x60-Inch signs	TY S80(1)XX(T)
Warning: 48-Inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
Warning: 48-Inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
Warning: Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



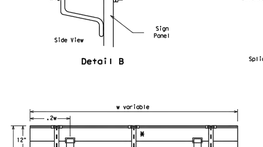
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



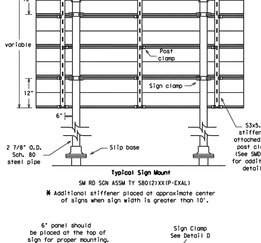
Detail A



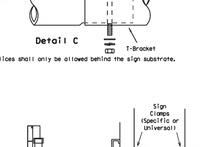
Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



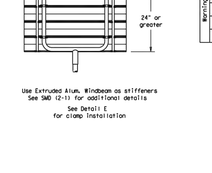
Typical Sign Mount
SM RD SGN ASSM TY S801(2)XX(P-EXAL)
N Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



Extruded Aluminum Sign
With T Bracket



Detail E
See Detail E
for clamp Installation



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-11) for additional details
See Detail E
for clamp Installation

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-3)-08

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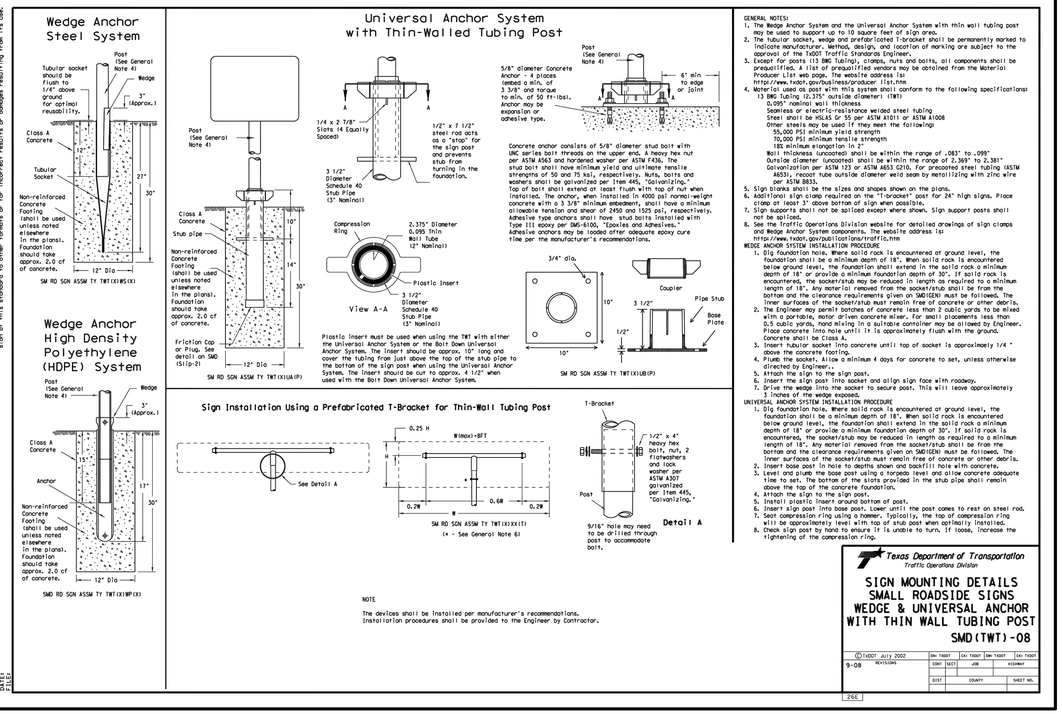
Wedge Anchor
Steel System
Post
(See General
Note 4)
Wedge
3"
(Approx.)
Tubular socket
should be
flush to
1/4" above
ground
for optimal
reusability.
Class A
Concrete
Tubular
Socket
12"
27"
30"
Non-reinforced
Concrete
Footing
(shall be used
unless noted
elsewhere
in the plans).
Foundation
should take
approx. 2.0 cf
of concrete.
12" Dia
Universal Anchor System
with Thin-Walled Tubing Post
1/4" x 2 7/8"
Slots (4 Equally
Spaced)
3 1/2"
Diameter
Schedule 40
Stub Pipe
(3" Nominal)
1/2" x 7 1/2"
steel rod acts
as a "stop" for
the sign post
and prevents
stub from
turning in the
foundation.
5/8" diameter Concrete
Anchor - 4 places
(embed a min. of
3 3/8" and torque
to min. of 50 ft-lbs).
Anchor may be
expansion or
adhesive type.
6" min
to edge
or joint
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.
Compression
Ring
2.375" Diameter
0.095 Thin
Wall Tube
(2" Nominal)
Plastic Insert
3 1/2"
Diameter
Schedule 40
Stub Pipe
(3" Nominal)
View A-A
Plastic Insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.
3/4" dia.
10"
10"
Coupler
3 1/2"
1/2"
Pipe Stub
Base
Plate
SM RD SGN ASSM TY TWT(X)(U)(P)
Wedge Anchor
High Density
Polyethylene
(HDPE) System
Anchor
Friction Cap
or Plug. See
detail on SMD
(SLIP-2)
SM RD SGN ASSM TY TWT(X)(U)(P)
Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post
See Detail A
0.25 H
W(max)=8FT
H
0.2W
0.6W
0.2W
W
T-Bracket
1/2" x 4"
heavy hex
bolt, nut, 2
flatwashers
and lock
washer per
ASTM A307
galvanized
per Item 445,
"Galvanizing."
Post
9/16" hole may need
to be drilled through
post to accommodate
bolt.
Detail A
SM RD SGN ASSM TY TWT(X)(T)
(+ - See General Note 6)
SMD RD SGN ASSM TY TWT(X)(MP)(X)

NOTE

The devices shall be installed per manufacturer's recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:
1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer_list.htm
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (2.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   18% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of .083" to .099"
   Outside diameter (uncoated) shall be within the range of 2.365" to 2.381"
   Galvanization per ASTM A123 or ASTM A653 G210. For prepainted steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: http://www.txdot.gov/publications/traffic.htm

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE
1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(SIGN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximately 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer.
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE
1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(SIGN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
WEDGE & UNIVERSAL ANCHOR
WITH THIN WALL TUBING POST
SMD(TWT)-08

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PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #100288-00

NO. REVISION | DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

STREET LIGHT, SIDEWALK & SIGNAGE DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 23

ISSUED FOR CONSTRUCTION SET

DATE:
FILE:

Date: Jan 28, 2025, 2:41pm User ID: AROSCOE
File: S:\Projects\61405\001\02 Design\04 Civil\3.4.3 Plan Sheets\SIGT-61405001.dwg

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type
- FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
- TWT = Thinwall Tubing (see SMD(TWT))
- 10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
- SBO = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

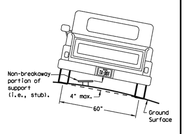
Number of Posts (1 or 2)

Anchor Type
- UA = Universal Anchor - Concreted (see SMD(FRP)) and (TWT))
- UB = Universal Anchor - Bolted down (see SMD(FRP)) and (TWT))
- WS = Wedge Anchor Steel - (see SMD(TWT))
- WP = Wedge Anchor Plastic (see SMD(TWT))
- SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
- SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation
- P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
- T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
- U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))

IF REQUIRED
- TEXT or ZEXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
- AA = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
- MC = 1.12 #/ft Bling Channel (see SMD(SLIP-1) to (SLIP-3))
- EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

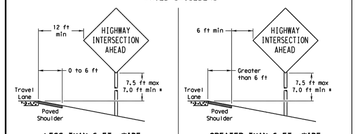
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

SIGN LOCATION

PAVED SHOULDERS



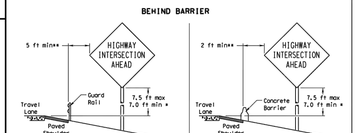
LESS THAN 6 FT. WIDE

When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.

GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

BEHIND BARRIER

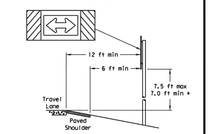


BEHIND GUARDRAIL

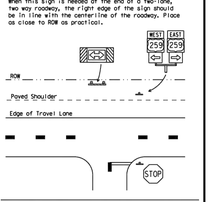
BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

T-INTERSECTION



When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



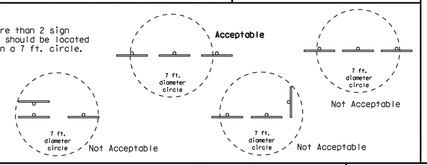
- * Signs shall be mounted using the following condition that results in the greatest sign elevation:
  - (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
  - (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

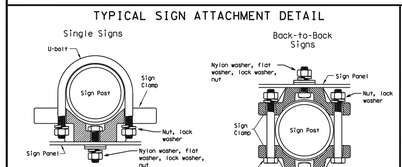
See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL



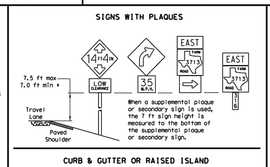
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

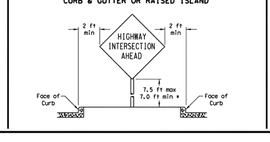
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

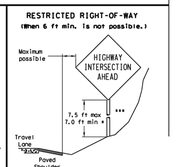


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY (When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

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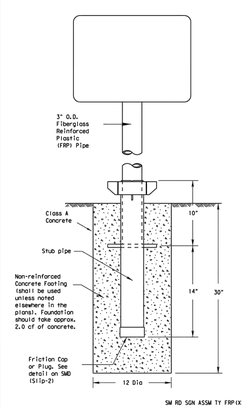
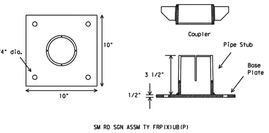
26A

Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.

BOLT-DOWN DETAILS



GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: http://www.txdot.gov/publications/traffic.htm

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are detailed by writing:
   Texas Department of Transportation
   Traffic Operations Division
   125 East 11th Street
   Austin, Texas 78701-2483

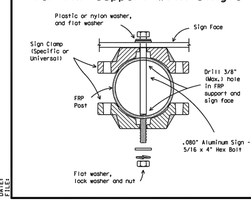
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

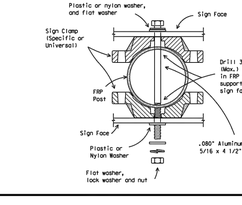
BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP with Back-to-Back Signs



Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

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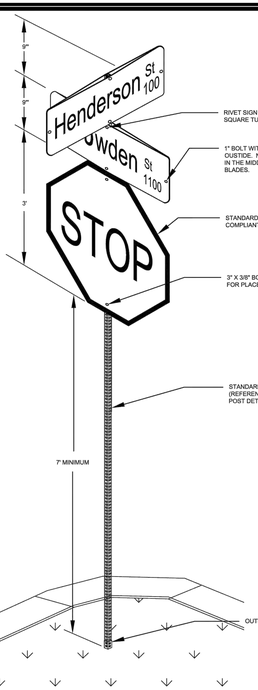
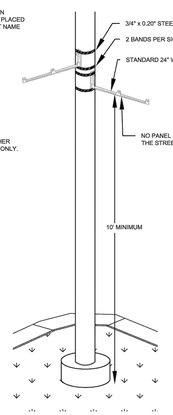
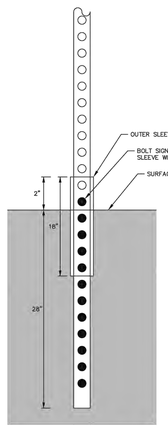


STREET NAME - POST INSTALLATION



STREET NAME - POLE INSTALLATION

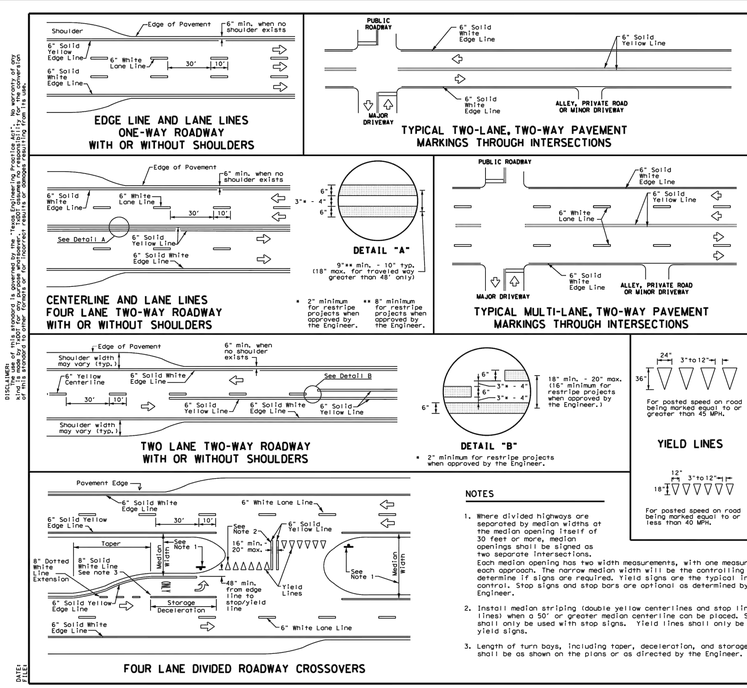


NOMINAL OUTSIDE DIMENSIONS
1 ½" x 1 ½"
1 ¾" x 1 ¾"
2" x 2"
2 ¼" x 2 ¼"
2 ½" x 2 ½"

SQUARE TUBING POST DETAIL

NOTES:

1. ALL POSTS AND ANCHORS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR HOT ROLLED CARBON SHEET STEEL, STRUCTURAL QUALITY ASTM DESIGNATION A570-79.
2. ALL POSTS AND ANCHORS SHALL CARRY MINIMUM CERTIFIABLE 60,000 PSI YIELD STRENGTH.
3. ALL POSTS AND ANCHORS SHALL BE MANUFACTURED FROM RAW STEEL, FORMED AND WELDED ON THE CORNER PRIOR TO RECEIVING A TRIPLE COAT PROTECTION OF INLINE HOT-DIPPED, GALVANIZED ZINC PER AASHTO M-120 (0.8 OZ. PER SQUARE FOOT) FOLLOWED BY A CHROMATE CONVERSION COATING AND A CROSS-LINKED POLYURETHANE ACRYLIC EXTERIOR COATING. INTERIOR SHALL RECEIVE A DOUBLE COAT OF ZINC BASED ORGANIC COATING, TESTED IN ACCORDANCE WITH ASTM B-117.
4. ALL TOP POSTS MUST BE CAPABLE OF FRACTURING AT THE POINT OF CONNECTION WITH A SINGLE ANCHOR, WHEN IMPACTED, IN SUCH A MANNER THAT THE PIECE INSIDE OF THE ANCHOR CAN BE REMOVED SO AS TO ALLOW TO RECEIVE A NEW TOP POST.
5. THE SHAPE OF ALL POSTS AND ANCHORS SHALL BE SQUARE AND STRAIGHT WITH SMOOTH TUBING WELDED IN ONE CORNER WITH A TOLERANCE THAT PERMITS TELESCOPING OF THE NEXT LARGER OR SMALL SIZE, IN ¼" INCREMENTS.
6. ALL ANCHORS SHALL BE 12 GAUGE WITH HOLES THAT ARE FULLY PERFORATED ⅝" DIAMETER ON 1" CENTERS FOR AT LEAST THE TOP 4" OF THE ANCHOR WHILE BEING TRULY ALIGNED IN THE CENTER OF THE SECTION.
7. ALL TOP POSTS SHALL BE 14 GAUGE WITH HOLES THAT ARE PRE PUNCHED ON 1" CENTERS FOR THE ENTIRE LENGTH OF THE POST AND TRULY ALIGNED IN THE CENTER OF SECTION.
8. STANDARD OUTSIDE CORNER RADII SHALL BE 5/32" PLUS OR MINUS 3/32".
9. SIGNS TO BE ATTACHED TO POST AT THE DESIRED HEIGHT WITH BOLTS.
10. SIGN BLANK FOR 2 INCH POST INSTALL: 0.08 FEDERAL SPEC. ALUM. (LP/SP INSTALL 0.125 UNDRILLED)
11. FONT: HIGHWAY GOTHIC 'C' OR 'B' (DEPENDING ON LENGTH OF NAME)
12. STREET NAME SIGN SHEETING SHALL BE WHITE 3M DIAMOND GRADE CUBED (DG3) WITH GREEN ELECTRO-CUT (EC) TRANSPARENT FILM AS AN OVERLAY OR AN APPROVED EQUAL.
13. REFER TO DETAIL D3-1G OF THE TEXAS STANDARD HIGHWAY SIGN DESIGN MANUAL FOR ADDITIONAL SPACING REQUIREMENTS.

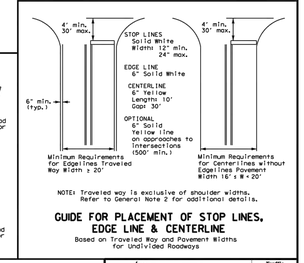


GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

Texas Department of Transportation
Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS for Undivided Roadways

PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-85 8-20 8-95 1-03 12-22 8-00 2-12	DIST	COUNTY		SHEET NO.

266

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6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.5494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

COUNTY ROAD 904 IMPROVEMENTS

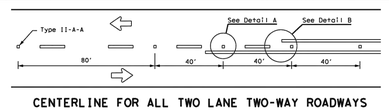
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

STREET LIGHT, SIDEWALK & SIGNAGE DETAILS

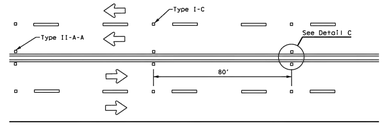
PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 24

ISSUED FOR CONSTRUCTION SET

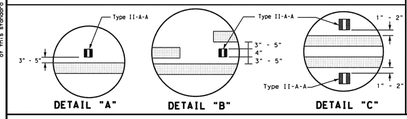
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

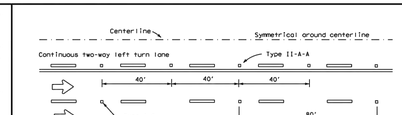


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

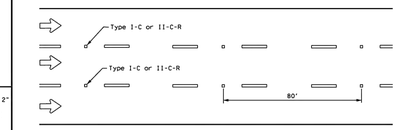


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





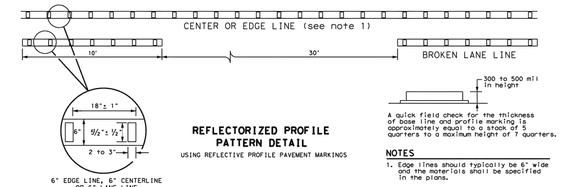
CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

See Note 3.



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

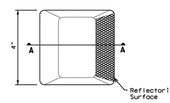
A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

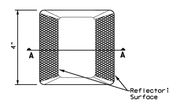
1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

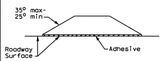
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements, the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians, and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation — Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2)-22

FILE:	pm2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT	December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS					
4-77 8-00 5-00		DIST	COUNTY		SHEET NO.
4-98 10-20 5-00					

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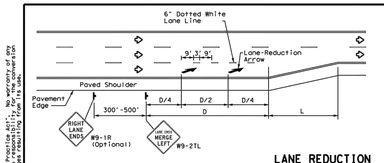
DATE: PLOTTED:



LANE REDUCTION

NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS21(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

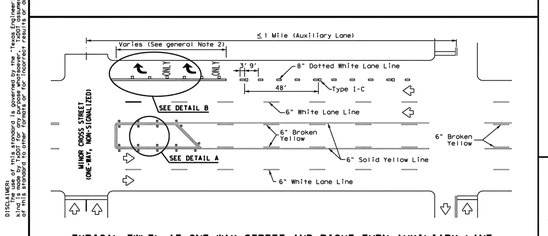
ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

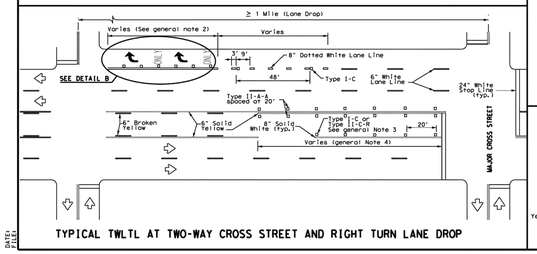
1. Lane use word and arrow markings shall be used where through lane approaching or used with an adjacent through or turning lane. Lane word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single word and arrow marking is used in a turning bay for a short turn lane, it should be located at or near the upstream end of the full-length turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

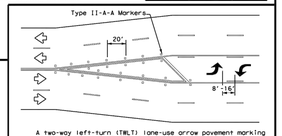
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



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

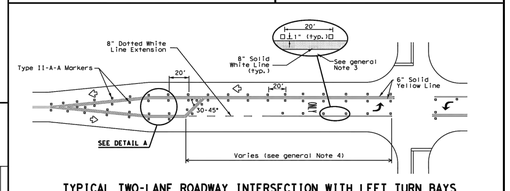


TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP

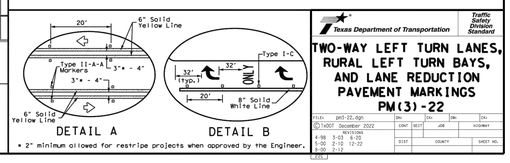


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or deglicated turn bay is not required unless stated elsewhere in the plans.

TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



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

Texas Department of Transportation — Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-22

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REVISIONS					
4-98 10-20 5-00	3-03 6-20 2-10 12-22	DIST	COUNTY		SHEET NO.
8-00 2-12					

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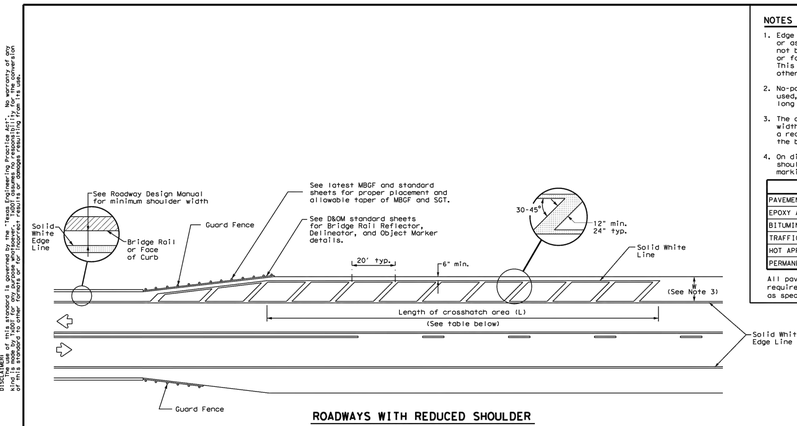

ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 4 inches from the bridge rail or face of curb or 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions.
2. No-passing zone on bridge approach is optional. If used, the no-passing zone shall be a minimum 500 feet long from the beginning of the bridge.
3. The crosshatching should be required if the shoulder width in advance of the bridge is 4 feet or wider and a reduction of at least 3 feet in shoulder width across the bridge occurs.
4. On divided highways, review both the right and left shoulder widths for the need for narrow bridge pavement markings.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

CROSSHATCH LENGTH (L)	
Posted Speed (MPH)	L (ft)
30	300 ft
35	
40	
45	
50	500 ft
55	
60	
65	
70	
75	

Texas Department of Transportation — Traffic Safety Division Standard

PAVEMENT MARKINGS FOR ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT PM(5)-22

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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

NO.	REVISION	DATE

STATE OF TEXAS — ANNA JANE ROSCOE — 142544 — LICENSED PROFESSIONAL ENGINEER — 1/28/25

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

STREET LIGHT, SIDEWALK & SIGNAGE DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 25

Date: Jan 29, 2025, 2:41pm User ID: ARoscoe
Files: S:\projects\61405\001\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\SGDT-61405001.dwg

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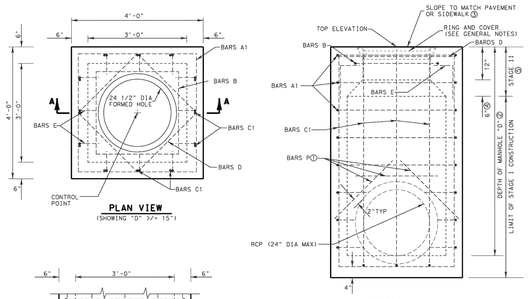
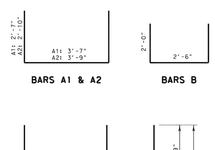


PLAN VIEW
(SHOWING "D" >/= 15")

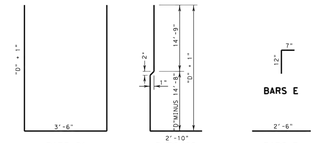
SECTION A-A
(SHOWING "D" >/= 15')

TABLE OF QUANTITIES - FREE-STANDING MANHOLE

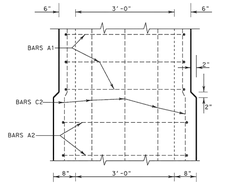
Bar	Size	Spacing	D=4'-0"			D=10'-0"			D=20'-0"			D=30'-0"		
		(in)	No	Length	Wt	No	Length	Wt	No	Length	Wt	No	Length	Wt
A1	#4	10"	8	8,750	47	22	8,750	129	36	8,750	210	36	8,750	210
A2	#5	12"	0	0,000	0	0	0,000	0	10	9,416	98	30	9,416	295
B	#4	-	2	6,500	9	2	6,500	9	2	6,500	9	2	6,500	9
C1	#4	12"	6	11,667	47	6	23,667	95	0	0,000	0	0	0,000	0
C2	#5	12"	0	0,000	0	0	0,000	0	12	22,916	287	12	32,916	412
D	#4	-	4	2,500	7	4	2,500	7	4	2,500	7	4	2,500	7
E	#4	-	12	1,583	13	12	1,583	13	12	1,583	13	12	1,583	13
Total Steel - Lbs			122			251			624			945		
Class "C" Concrete - CY			1.70			3.26			6.43			10.05		
			D=3' TO D=15' Lbs Steel = 102 + 21.38 Lb/Lf CY Conc. = 1.44 + 0.259 CY/Lf						D=15' TO D=30' Lbs Steel = 362 + 32.16 Lb/Lf CY Conc. = 4.55 + 0.362 CY/Lf					



BARS A1 & A2 — BARS B



BARS C1 ("D"<C<15') — BARS C2 ("D"=15'-30") — BARS E — BARS D



WALL THICKNESS TRANSITION DETAIL
FOR DEPTHS 15'-30"

TYPE A STORM DRAIN MANHOLE (FREE-STANDING)
MAXIMUM PIPE SIZE = 24" DIAMETER
N.T.S.

① BARS P LENGTH = PIPE O.D. + 9". PLACE 3 BARS P AS SHOWN, AT EACH PIPE OPENING, WITH 2" CLEAR COVER OVER PIPES. POSITION AS NEEDED TO PROVIDE 2" CLEAR COVER AT WALLS.
② SEE WALL THICKNESS TRANSITION DETAIL FOR DEPTHS 15'-30'.
③ LEVEL IF NOT LOCATED IN PAVEMENT OR SIDEWALK.
④ TRANSITION FROM 24 1/2" DIA FORMED HOLE TO 3' SQUARE MANHOLE.
⑤ STAGE II DEPTH = 18" IF OUTSIDE PAVEMENT; DEPTH TO TOP OF SUBGRADE IF UNDER PAVEMENT.

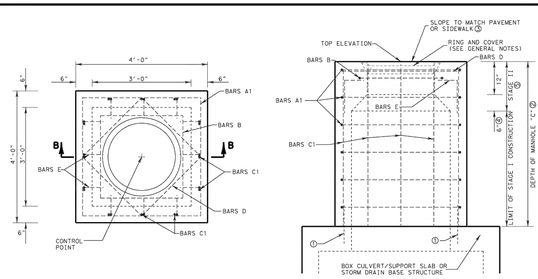
SEE SHEET 2 OF 2 FOR GENERAL NOTES

SHEET 1 OF 2 SHEETS

Texas Department of Transportation — Fort Worth District Standard

STORM DRAIN MANHOLE DETAILS
TYPE A
MH-SD (FTW)

ORIGINAL DRAWING: 05/2019	STD/SHT: FTW-MH-SD(1)	FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
DATE REVISIONS		6		
09/2019 NEW STANDARD		STATE	DIST. NO.	COUNTY
01/2022 REVISE JOINT NOMENCLATURE		TEXAS	FTW	
01/2022 REVISE NOTES AND ADD DETAILS FOR USE WITH PRECAST BASE AND RISER		CONT.	SECT.	JOB
				HIGHWAY NO.



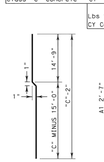
PLAN VIEW

SECTION B-B
(SHOWING "D" >/= 15")

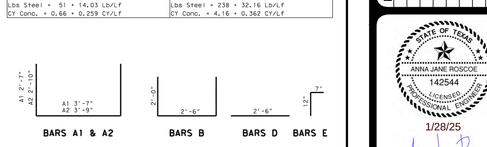
TABLE OF QUANTITIES - MANHOLE (RISER ONLY)

Bar	Size	Spacing	C=1'-6"		C=10'-0"		C=20'-0"		C=30'-0"	
		(in)	No	Length	No	Length	No	Length	No	Length
A1	#4	10"	4	8,750	23	24	8,750	140	36	8,750	210	36	8,750	210
A2	#5	12"	0	0,000	0	0	0,000	0	10	9,416	98	30	9,416	295
B	#4	-	2	6,500	9	2	6,500	9	2	6,500	9	2	6,500	9
C1	#4	12"	0	0,000	0	6	9,833	39	0	0,000	0	0	0,000	0
C2	#5	12"	0	0,000	0	0	0,000	0	12	19,833	248	12	29,833	373
D	#4	-	4	2,500	7	4	2,500	7	4	2,500	7	4	2,500	7
E	#4	-	12	1,583	13	12	1,583	13	12	1,583	13	12	1,583	13
Total Steel - Lbs			51		208		585		906					
Class "C" Concrete - CY			0.66		2.86		5.97		9.59					
			C=1'-6" TO C=15' Lbs Steel = 51 + 14.03 Lb/Lf CY Conc. = 0.66 + 0.259 CY/Lf				C=15' TO C=30' Lbs Steel = 238 + 32.16 Lb/Lf CY Conc. = 4.16 + 0.362 CY/Lf					

"C" MINUS 3"



BARS C1 ("C"<C=15') — BARS C2 ("C"15'-30")

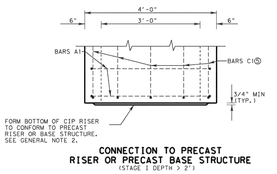


BARS A1 & A2 — BARS B — BARS D — BARS E

GENERAL NOTES:

1. DESIGNED FOR AASHTO LRFD HL 93 LOADING.
2. STAGE I MAY BE EITHER CAST-IN-PLACE OR PRECAST, IF PRECAST, A MINIMUM 2' DEPTH AT TOP OF STAGE I TO BE FABRICATED USING REBAR AS SHOWN, WITH BARS C1 AND/OR C2 TO BE INCLUDED WITH STAGE 1, SPLICING OF BARS WILL NOT BE PERMITTED.
3. STAGE II SHALL BE CAST-IN-PLACE. CONSTRUCT TOP TO CONFORM TO SLOPE OF SURFACE. STAGE II MAY BE CAST MONOLITHICALLY WITH CONCRETE PAVEMENT. IF NOT CAST MONOLITHICALLY, PLACE A SEALED 1/2" ISOLATION JOINT AROUND THE TOP OF THE MANHOLE STRUCTURE, TO THE DEPTH OF CONCRETE PAVEMENT. USE CLASS S OR B JOINT SEALANT TO SEAL THE JOINT. SEE STANDARD JS (FTW) FOR ADDITIONAL INFORMATION.
4. USE CLASS "H" CONCRETE OR CLASS "S" CONCRETE PLACE STRUCTURES; USE CLASS "H" CONCRETE WITH MINIMUM 6000 PSI DESIGN STRENGTH FOR PRECAST STRUCTURES.
5. USE GRADE 60 STEEL FOR ALL REINFORCING.
6. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO THE CENTERS OF BARS.
7. FIELD CUT AND BEND BARS AS NECESSARY TO ACCOMMODATE STORM DRAIN PIPE.
8. FABRICATE CAST IRON RING AND COVER CONFORMING TO ITEM 471. SEE MISCELLANEOUS DRAINAGE DETAILS FOR RING AND COVER DETAILS.FOR MANHOLES LOCATED IN PAVEMENT, SECURE COVER WITH 4-1/2"-13X2" BOLTS.
9. FOR CAST-IN-PLACE STRUCTURES, A CONSTRUCTION JOINT MAY BE PLACED AT EACH 5' (MIN) INCREMENT OF DEPTH.
10. FOR PIPE OR BOX CONNECTIONS TO PRECAST STRUCTURES, SEE STANDARD PBGC.
11. MAXIMUM DEPTH "D" FOR CAST-IN-PLACE FREE-STANDING MANHOLE IS 30', WITH INCREASED WALL THICKNESS AND ADDITIONAL REINFORCEMENT FOR DEPTHS GREATER THAN 15', AS DETAILED. MAXIMUM DEPTH "D" FOR MANHOLES USING PRECAST UNITS IN STAGE I, OR "C" FOR RISERS ON BASE STRUCTURES, IS 25' TO THE TOP OF THE BASE SLAB, IN ACCORDANCE WITH STANDARD MI-B&R (FTW). DETERMINE QUANTITIES FOR DEPTHS OTHER THAN THOSE SHOWN HEREON BY INTERPOLATION.
12. DO NOT COMMENCE WITH STAGE II CONSTRUCTION UNTIL PERMISSION IS GRANTED BY THE ENGINEER.
13. PLACE A TEMPORARY WOOD COVER AFTER STAGE I IS COMPLETED, TO REMAIN IN PLACE UNTIL STAGE II CONSTRUCTION BEGINS.
14. LOCATION OF MANHOLE AS SHOWN IN THE PLANS REFERS TO THE CONTROL POINT SHOWN HEREON AND DETAILED ON THE "DRAINAGE STRUCTURE CONTROL DATA" SHEET. FOR MANHOLE RISERS LOCATED ON BASE STRUCTURE, LOCATE AND POSITION BASE AS DETAILED ON THE DRAINAGE STRUCTURE CONTROL DATA SHEET, OR AS DIRECTED. FOR MANHOLES LOCATED ON BOX CULVERT LESS THAN 4' SPAN,USE WITH BASE STRUCTURE.

① REFER TO STANDARD MI-CBC (FTW) FOR DETAILS OF CONNECTION TO BOX CULVERT SUPPORT SLAB. SEE MI-B&R (FTW) FOR DETAILS OF CONNECTION TO BASE STRUCTURE.
② SEE WALL THICKNESS TRANSITION DETAIL FOR DEPTHS 15'-30'.
③ LEVEL IF NOT LOCATED IN PAVEMENT OR SIDEWALK.
④ TRANSITION FROM 24 1/2" DIA FORMED HOLE TO 3' SQUARE MANHOLE.
⑤ IF USED IN CONJUCTION WITH PRECAST RISER, MORE THAN 6" BELOW TOP OF STAGE 1, ADJUST LENGTH OF BARS C1 AS SHOWN.
⑥ STAGE II DEPTH = 18" IF OUTSIDE PAVEMENT; DEPTH TO TOP OF SUBGRADE IF UNDER PAVEMENT.



CONNECTION TO PRECAST
RISER OR PRECAST BASE STRUCTURE
(STAGE I DEPTH > 2')

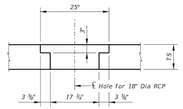
TYPE A STORM DRAIN MANHOLE (RISER ONLY)
LOCATED ON BASE STRUCTURE OR BOX CULVERT
DO NOT USE WITH BOX CULVERT SPAN LESS THAN 4'
SEE MI-CBC FOR CULVERT SPAN >/= 4'
SEE MI-B&R FOR CULVERT SPAN < 4'
N.T.S.

SHEET 2 OF 2 SHEETS

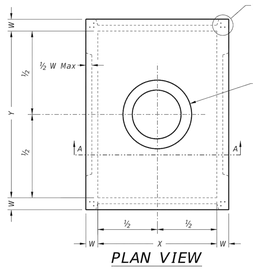
Texas Department of Transportation — Fort Worth District Standard

STORM DRAIN MANHOLE DETAILS
TYPE A
MH-SD (FTW)

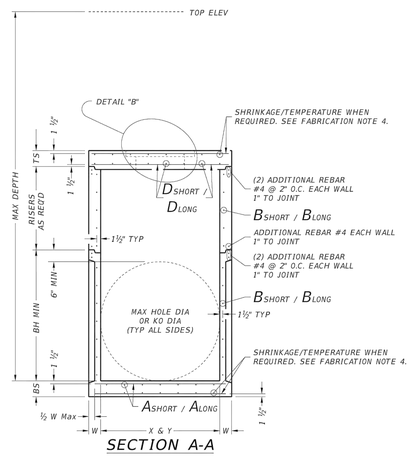
ORIGINAL DRAWING: 05/2019	STD/SHT: FTW-MH-SD(2)	FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
DATE REVISIONS		6		
09/2019 REPLACES MH-1-02 (FW)		STATE	DIST. NO.	COUNTY
01/2022 REVISE JOINT NOMENCLATURE		TEXAS	FTW	
01/2022 REVISE NOTES AND ADD DETAILS FOR USE WITH PRECAST BASE AND RISER		CONT.	SECT.	JOB
				HIGHWAY NO.



DETAIL "B"



PLAN VIEW

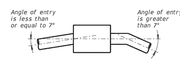


SECTION A-A

FABRICATION NOTES:
1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ½".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.
10. Provide hole in below grade slab only when PJB is installed with inlet type PDD.

INSTALLATION NOTES:
1. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to junction box.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, provided the joint depth, between ends, is maintained.
3. Do not cut pipe openings in risers without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max. 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification For placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:
1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for junction box is per Item 465 "Junction Boxes, Manholes, and Inlets" by type and size.



PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PJB wall. If necessary, use pipe elbow or curved approach alignment to stay within this limit.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

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PRECAST JUNCTION BOX

PJB

File: CD-PJB-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

	Size	Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PJB)				Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PJB)				Min Inside Diameter (Notes 3)	Max HOLE DIA (Notes 1 and 2)	Max KO DIA (Notes 1 and 2)
		Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Horizontal Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Horizontal Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness				
	X x Y	Ashort	Along	BS	Bshort	Blong	W	RWS×RWL or ID	Dshort	Dlong	TS	Ashort	Along	BS	Bshort	Blong	W	RWS×RWL or ID	Dshort	Dlong	TS	BH MIN	HOLE DIA	KO DIA
		ft.	in²/ft	in²/ft	in.	in²/ft	in²/ft	in.	ft. **	in²/ft	in²/ft	in.	in²/ft	in²/ft	in.	in²/ft	in²/ft	in.	ft. **	in²/ft	in²/ft	in.	ft.	in.	in.
Precast Junction Box (PJB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	0.37	0.37	9	0.29	0.29	6	0.24	0.24	6	N/A	0.37	0.37	9	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60
	5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.54	8	N/A	0.48	0.48	9	5.5	60/72	60/72
	6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72
	8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72
Precast Base (PB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60
	5x5	0.38	0.38	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60
	5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72
	5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72
	6x6	0.29	0.29	9	0.45	0.45	6	3x3	0.41	0.41	9	0.52	0.52	9	0.54	0.54	8	3x3	0.74	0.74	9	6.5	72	72
	6x6	0.27	0.27	9	0.45	0.45	6	4x4	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72

** Unless otherwise indicated.

FABRICATION NOTES:
1. Maximum spacing of reinforcement is 8".
2. At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.

GENERAL NOTES:
1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
2. Precast base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
3. Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-6".

HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

DESIGN DATA FOR
PRECAST BASE AND
JUNCTION BOX

PDD

File: CD-PDD-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

DATE:
FILE:

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

STORM DRAIN DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 26

ISSUED FOR CONSTRUCTION SET

Date: Jan 29, 2025, 2:41pm User ID: ARoscoe
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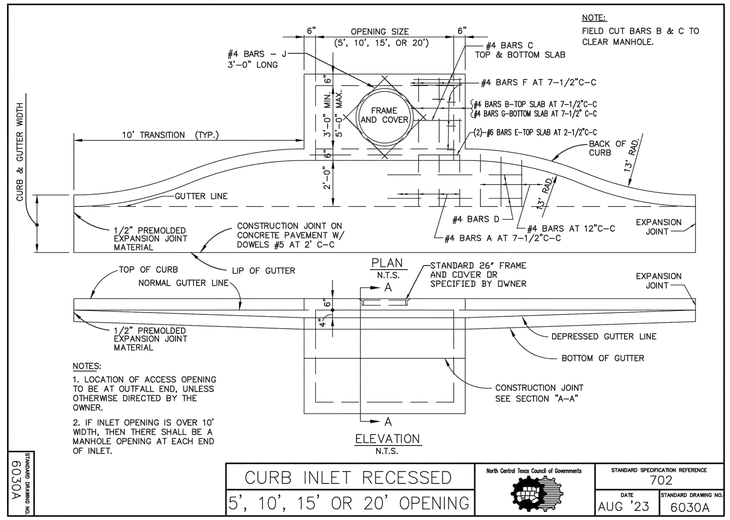


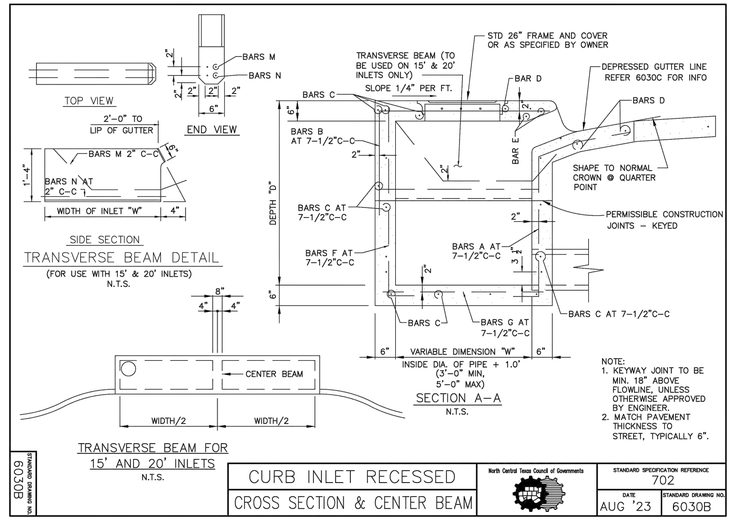


TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Maximum Wingwall Height Hw	Dimensions W	X	Y	Z	Variable Reinforcing Bars J1 Size	Bars J1 Spa	Bars J2 Size	Bars J2 Spa	Estimated Quantities (3) per ft of wing length (2–wings) Reinf (Lb/Ft)	Conc (CY/Ft)
2'–6"	2'–5"	1'–0"	9"	7"	#4	1'–0"	#4	1'–0"	33.73	0.248
3'–0"	2'–5"	1'–0"	9"	7"	#4	1'–0"	#4	1'–0"	37.07	0.261
3'–6"	2'–5"	1'–0"	9"	7"	#4	1'–0"	#4	1'–0"	37.74	0.273
4'–0"	2'–5"	1'–0"	9"	7"	#4	1'–0"	#4	1'–0"	38.41	0.285
4'–6"	3'–2"	1'–6"	1'–0"	7"	#4	1'–0"	#4	1'–0"	41.75	0.330
5'–0"	3'–2"	1'–6"	1'–0"	7"	#4	1'–0"	#4	1'–0"	45.09	0.343
5'–6"	3'–2"	1'–6"	1'–0"	7"	#4	1'–0"	#4	1'–0"	45.75	0.355
6'–0"	3'–2"	1'–6"	1'–0"	7"	#4	1'–0"	#4	1'–0"	46.42	0.367
7'–0"	3'–8"	1'–9"	1'–3"	7"	#4	1'–0"	#4	1'–0"	52.77	0.414
8'–0"	4'–2"	2'–0"	1'–6"	8"	#5	1'–0"	#4	1'–0"	60.19	0.486
9'–0"	4'–8"	2'–3"	1'–9"	8"	#4	6"	#4	6"	81.49	0.535
10'–0"	5'–2"	2'–6"	2'–0"	8"	#5	6"	#4	6"	97.25	0.584
11'–0"	5'–8"	2'–9"	2'–3"	8"	#6	6"	#5	6"	133.65	0.634
12'–0"	6'–2"	3'–0"	2'–6"	9"	#7	6"	#5	6"	162.29	0.721
13'–0"	6'–8"	3'–3"	2'–9"	11"	#7	6"	#5	6"	178.80	0.856
14'–0"	7'–2"	3'–6"	3'–0"	1'–0"	#8	6"	#5	6"	216.78	0.959
15'–0"	7'–8"	4'–0"	3'–0"	1'–1"	#9	6"	#6	6"	283.06	1.068
16'–0"	8'–2"	4'–6"	3'–0"	1'–3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2–wings)

Bar	Size	No.	Spa
DL	#5	~	1'–0"
DS	#5	~	1'–0"
E	#4	~	1'–0"
F	#4	~	1'–0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'–0"
RS	#5	3	~
RL	#5	3	~
V	#4	~	1'–0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'–6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:
(All values are in feet.)

Hw = H + T + C – 0.250'
A = (Hw – 0.333'(SL)
B = (A) [tangent (θ + 15°)]
Lw = (A) ÷ [cosine (θ + 15°)]

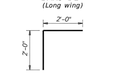
For cast–in–place culverts:
Ltw = [(N) (SL) + (N + 1) (U)] ÷ cosine θ

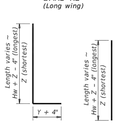
For precast culverts:
Ltw = [(N) (2U + S) + (N – 1) (0.5')] ÷ cosine θ

Total wingwall area (two wings ~ SF) = 0.5 (Hw + 0.333) (Lw + A)

Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
A = Length of short wingwalls
Lw = Length of long wingwall
Ltw = Culvert toewall length
N = Number of culvert spans
θ = Culvert skew

See applicable box culvert standard sheet for H, S, T, and U values.





(1) *Extend Bars P 3'–0" minimum into bottom slab of box culvert.*

(2) *Adjust as necessary to maintain 1 1#2" clear cover and 4" minimum between bars.*

(3) *Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by 0.5 x (A + Lw).*

(4) *Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.*

(5) *When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap." Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'–6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B–B will not be required.*

(6) *At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.*

(7) *Applicable values of skew are: 15°, 30°, and 45°.*

(8) *Typical wingwall angle for all skews.*

(9) *0" Min to 5'–0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'–0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631–CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.*

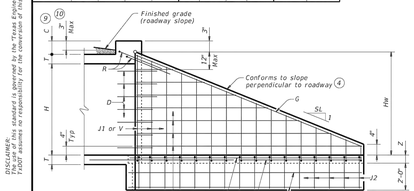
(10) *For vehicle safety, the following requirements must be met:*
- *For structures without bridge rail, construct curbs no more than 2" above finished grade.*
- *For structures with bridge rail, construct curbs flush with finished grade.*

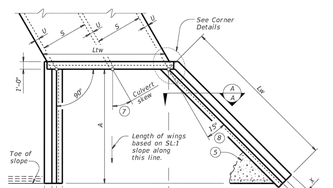
Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

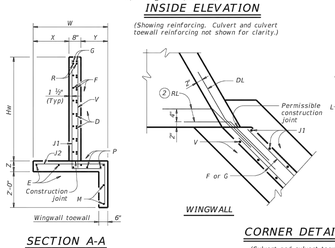
MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete, synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

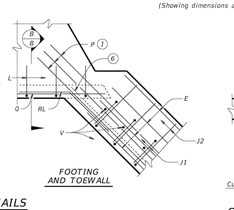
GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out–to–out of bars.

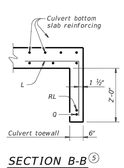








CORNER DETAILS
(Culvert and culvert toewall reinforcing not shown for clarity.)



Texas Department of Transportation — Bridge Division Standard

CONCRETE WINGWALLS WITH FLARED WINGS FOR SKEWED BOX CULVERTS

FW–S

FILE: CD-FWS-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

DATE
DESC

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

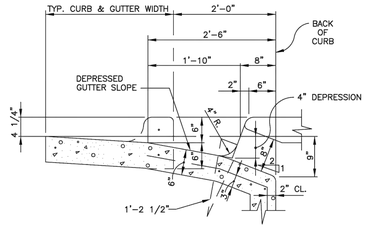
COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

STORM DRAIN DETAILS

PLAT NO. N/A
JOB NO. 61405–01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 27

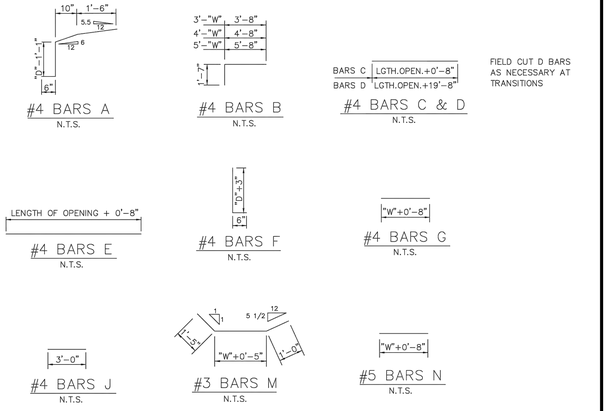
ISSUED FOR CONSTRUCTION SET



INLET THROAT
N.T.S.

GENERAL NOTES:

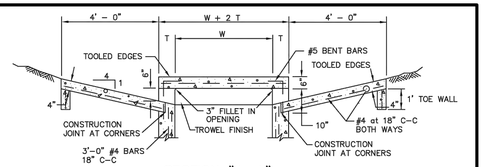
1. ALL REINFORCING STEEL SHALL BE GRADE 60. DEFORMED REINFORCING BARS AT A DIAMETER & LENGTH AS SHOWN.
2. ALL CONCRETE SHALL BE CLASS "C". ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
3. ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 2" CLEAR OF THE BARS.
4. 10'-0" OF EXISTING CURB AND GUTTER UPSTREAM AND 10'-0" OF EXISTING CURB AND GUTTER DOWNSTREAM SHALL BE REMOVED AND REPOURED INTEGRALLY WITH EACH INLET.
5. ALL BACK FILLING SHALL BE PERFORMED BY MECHANICAL TAMPING TO 95% STANDARD PROCTOR DENSITY.
6. PRECAST PRODUCTS MAY BE USED AT THE APPROVAL OF THE OWNER.
7. ALLOW 1" MIN. CLEAR SPACE BETWEEN OD OF PIPE OR BOX AND INSIDE WALL OF INLET (OD OF PIPE OR BOX SHOULD ACCOUNT FOR SKEWED CONDITIONS).
8. FIELD CUT & BEND BARS AS NECESSARY TO ACCOMODATE STORM SEWER PIPE.
9. RING & COVER SHALL BE APPROVED BY THE OWNER AND INSTALLED BT CONTRACTOR.
10. WHEN POURING INVERTS, THE BOTTOM SHALL BE SLOPED NO MORE THAN 1/4"/FT TOWARD PIPE.
11. INLET OPENING SHALL BE 6" MIN OR 8" MAX.
12. 10 FT. MAX DEPTH.



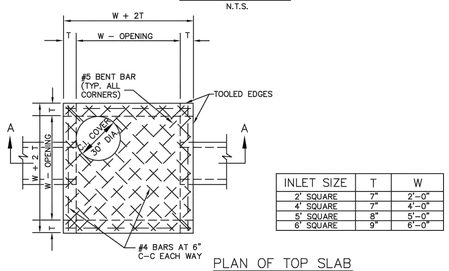
CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702	
INLET THROAT		DATE AUG '23	STANDARD DRAWING NO. 6030C

CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702	
GENERAL NOTES		DATE AUG '23	STANDARD DRAWING NO. 6030D

CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702	
REBAR		DATE AUG '23	STANDARD DRAWING NO. 6030E



SECTION "A-A"
N.T.S.



INLET SIZE	T	W
2' SQUARE	7"	2'-0"
4' SQUARE	7"	4'-0"
5' SQUARE	8"	5'-0"
6' SQUARE	9"	6'-0"

PLAN OF TOP SLAB
N.T.S.

NOTES:

1. MATERIAL AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF NCTCOG STANDARD SPECIFICATIONS FOR STANDARD CONCRETE MANHOLES. MINIMUM CLASS "C" CONCRETE.
2. LAYERS OF REINFORCING STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACES SHALL HAVE A COVER OF 2" CLEAR OF BARS, UNLESS OTHERWISE NOTED.
3. FOR DETAILS OF REINFORCING OF LOWER PORTION OF INLET SEE APPROPRIATE SQUARE MANHOLE DETAILS.
4. DEPTH OF DROP INLET FROM FINISHED GRADE TO FLOW LINE OF INLET IS VARIABLE. APPROXIMATE DEPTH WILL BE SHOWN ON PLANS AT LOCATION OF INLET.
5. ALL STANDARD DROP INLETS SHALL HAVE ONE OPENING ON EACH SIDE UNLESS OTHERWISE SHOWN ON PLANS.
6. TOP SLAB MAY BE REINFORCED SAME AS 4' SQUARE MANHOLE.
7. PRECAST PRODUCTS MAY BE USED AT THE APPROVAL OF THE OWNER.
8. ALLOW 1" MIN CLEAR SPACE BETWEEN OD OF PIPE OR BOX AND INSIDE WALL OF INLET (OD OF PIPE OR BOX SHOULD ACCOUNT FOR SKEWED CONDITIONS).
9. DEPTHS OF GREATER THAN 10' NEED TO BE STRUCTURALLY ENGINEERED.

DROP INLET	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702	
2', 4', 5', OR 6' SQUARE		DATE AUG '23	STANDARD DRAWING NO. 6040

BILL OF REINFORCING STEEL

DEPTH "D"	ALL WIDTHS AND LENGTHS	OPENING LENGTH "L" = 5ft							OPENING LENGTH "L" = 10ft								OPENING LENGTH "L" = 15 ft								OPENING LENGTH "L" = 20 ft							
		Widths "W" 3ft	4ft	5ft					Widths "W" 3ft	4ft	5ft						Widths "W" 3ft	4ft	5ft						Widths "W" 3ft	4ft	5ft					
		BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS	BARS
		C	D	E	J	F	F	A	B	G	F	F	A	B	G	F	F	A	B	G	M	N	F	F	A	B	G	M	N	F	F	A	B	G	M	N
3'-6"	17	3	2	4	20	24	28	10	10	20	28	32	36	18	18	28	36	40	44	26	26	36	2	2	44	48	52	34	34	44	2	2
3'-9"	18	"	"	"	"	"	"	"	"	20	"	"	"	"	"	28	"	"	"	"	"	36	"	"	"	"	"	"	"	44	"	"
4'-0"	19	"	"	"	"	"	"	"	"	24	"	"	"	"	"	32	"	"	"	"	"	40	"	"	"	"	"	"	"	48	"	"
4'-3"	19	"	"	"	"	"	"	"	"	24	"	"	"	"	"	32	"	"	"	"	"	40	"	"	"	"	"	"	"	48	"	"
4'-6"	21	"	"	"	"	"	"	"	"	26	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	"	"	50	"	"
4'-9"	21	"	"	"	"	"	"	"	"	26	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	"	"	50	"	"
5'-0"	21	"	"	"	"	"	"	"	"	26	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	"	"	50	"	"
5'-3"	23	"	"	"	"	"	"	"	"	28	"	"	"	"	"	36	"	"	"	"	"	44	"	"	"	"	"	"	"	52	"	"
5'-6"	23	"	"	"	"	"	"	"	"	28	"	"	"	"	"	36	"	"	"	"	"	44	"	"	"	"	"	"	"	52	"	"
5'-9"	25	"	"	"	"	"	"	"	"	30	"	"	"	"	"	38	"	"	"	"	"	46	"	"	"	"	"	"	"	54	"	"
6'-0"	25	"	"	"	"	"	"	"	"	30	"	"	"	"	"	38	"	"	"	"	"	46	"	"	"	"	"	"	"	54	"	"
6'-3"	26	"	"	"	"	"	"	"	"	30	"	"	"	"	"	38	"	"	"	"	"	46	"	"	"	"	"	"	"	54	"	"
6'-6"	27	"	"	"	"	"	"	"	"	32	"	"	"	"	"	40	"	"	"	"	"	48	"	"	"	"	"	"	"	56	"	"
6'-9"	27	"	"	"	"	"	"	"	"	32	"	"	"	"	"	40	"	"	"	"	"	48	"	"	"	"	"	"	"	56	"	"
7'-0"	29	"	"	"	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	50	"	"	"	"	"	"	"	58	"	"
7'-3"	29	"	"	"	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	50	"	"	"	"	"	"	"	58	"	"
7'-6"	30	"	"	"	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	50	"	"	"	"	"	"	"	58	"	"
7'-9"	31	"	"	"	"	"	"	"	"	36	"	"	"	"	"	44	"	"	"	"	"	52	"	"	"	"	"	"	"	60	"	"
8'-0"	31	"	"	"	"	"	"	"	"	36	"	"	"	"	"	44	"	"	"	"	"	52	"	"	"	"	"	"	"	60	"	"
8'-3"	32	"	"	"	"	"	"	"	"	36	"	"	"	"	"	44	"	"	"	"	"	52	"	"	"	"	"	"	"	60	"	"
8'-6"	33	"	"	"	"	"	"	"	"	38	"	"	"	"	"	46	"	"	"	"	"	54	"	"	"	"	"	"	"	62	"	"
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9'-0"	35	"	"	"	"	"	"	"	"	40	"	"	"	"	"	48	"	"	"	"	"	56	"	"	"	"	"	"	"	64	"	"
9'-3"	36	"	"	"	"	"	"	"	"	40	"	"	"	"	"	48	"	"	"	"	"	56	"	"	"	"	"	"	"	64	"	"
9'-6"	37	"	"	"	"	"	"	"	"	42	"	"	"	"	"	50	"	"	"	"	"	58	"	"	"	"	"	"	"	66	"	"
10'-0"	38	"	"	"	"	"	"	"	"	42	"	"	"	"	"	50	"	"	"	"	"	58	"	"	"	"	"	"	"	66	"	"

NOTE:
- FOR CONVENIENCE, DEPTHS OF INLETS SHOWN IN ABOVE TABLES ARE IN INCREMENTS OF 3 INCHES BUT ANY DEPTHS OTHER THAN THOSE SHOWN ABOVE MAY BE USED WHEREVER DEEMED NECESSARY. QUANTITIES FOR OTHER DEPTHS FALLING WITHIN THE LIMITS OF THE TABLE MAY BE FOUND BY INTERPOLATION.
- DEPTHS GREATER THAN 10' NEED TO BE STRUCTURALLY ENGINEERED.

CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702	
BILL OF REINFORCING STEEL		DATE AUG '23	STANDARD DRAWING NO. 6030F

SUMMARY OF QUANTITIES FOR CURB INLETS

DEPTH "D"	5'-0" OPENING						10'-0" OPENING						15'-0" OPENING						20'-0" OPENING					
	WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"		WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"		WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"		WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"	
	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.
3'-6"	2.87	324	3.23	357	3.59	390	4.41	496	4.95	540	5.50	584	5.94	684	6.67	742	7.40	799	7.48	858	8.40	926	9.31	995
3'-9"	2.96	333	3.32	367	3.69	401	4.54	512	5.09	556	5.64	601	6.12	706	6.86	764	7.60	822	7.70	886	8.63	955	9.55	1024
4'-0"	3.04	353	3.42	390	3.79	428	4.66	537	5.23	585	5.79	633	6.29	737	7.04	799	7.79	861	7.92	923	8.86	996	9.79	1068
4'-3"	3.12	358	3.51	396	3.89	434	4.79	545	5.37	594	5.94	643	6.47	748	7.23	811	7.99	873	8.14	937	9.09	1010	10.03	1083
4'-6"	3.21	376	3.60	417	4.00	457	4.92	573	5.51	624	6.09	675	6.64	786	7.41	850	8.18	915	8.36	984	9.32	1059	10.27	1134
4'-9"	3.29	382	3.69	423	4.10	464	5.05	581	5.65	633	6.24	684	6.82	796	7.60	862	8.37	927	8.59	997	9.55	1073	10.51	1149
5'-0"	3.37	387	3.79	429	4.20	471	5.18	589	5.79	641	6.38	693	7.00	807	7.78	873	8.57	939	8.81	1011	9.78	1087	10.75	1164
5'-3"	3.46	406	3.88	450	4.30	493	5.31	617	5.92	671	6.53	725	7.17	845	7.97	912	8.76	980	9.03	1057	10.02	1136	10.99	1215
5'-6"	3.54	411	3.97	456	4.40	500	5.44	625	6.06	680	6.68	735	7.35	855	8.15	924	8.96	992	9.25	1071	10.25	1150	11.23	1229
5'-9"	3.62	429	4.06	476	4.50	523	5.57	653	6.20	710	6.83	767	7.52	893	8.34	963	9.15	1034	9.48	1118	10.48	1199	11.48	1280
6'-0"	3.71	435	4.16	482	4.61	530	5.70	661	6.34	719	6.98	776	7.70	903	8.53	975	9.35	1046	9.70	1131	10.71	1213	11.72	1295
6'-3"	3.79	444	4.25	492	4.71	540	5.83	676	6.48	735	7.12	793	7.88	925	8.71	997	9.54	1069	9.92	1159	10.94	1242	11.96	1324
6'-6"	3.87	459	4.34	509	4.81	559	5.96	697	6.62	757	7.27	818	8.05	952	8.90	1026	9.74	1100	10.14	1191	11.17	1276	12.20	1361
6'-9"	3.96	464	4.43	515	4.91	566	6.09	705	6.76	766	7.42	827	8.23	962	9.08	1037	9.93	1112	10.36	1205	11.40	1290	12.44	1376
7'-0"	4.04	482	4.53	536	5.01	589	6.22	733	6.90	796	7.57	859	8.40	1000	9.27	1077	10.12	1154	10.59	1252	11.64	1339	12.68	1427
7'-3"	4.12	488	4.62	542	5.12	595	6.35	741	7.04	805	7.72	869	8.58	1010	9.45	1088	10.32	1166	10.81	1265	11.87	1353	12.92	1442
7'-6"	4.21	497	4.71	552	5.22	606	6.48	756	7.17	821	7.87	885	8.76	1032	9.64	1110	10.51	1189	11.03	1293	12.10	1382	13.16	1471
7'-9"	4.29	512	4.80	568	5.32	625	6.61	777	7.31	843	8.01	910	8.93	1059	9.82	1139	10.71	1219	11.25	1326	12.33	1417	13.40	1508
8'-0"	4.37	517	4.90	574	5.42	632	6.74	785	7.45	852	8.16	919	9.11	1069	10.01	1150	10.90	1231	11.48	1339	12.56	1431	13.64	1522
8'-3"	4.46	526	4.99	584	5.52	642	6.87	800	7.59	868	8.31	936	9.28	1091	10.19	1173	11.10	1254	11.70	1367	12.79	1459	13.88	1551
8'-6"	4.54	541	5.08	601	5.63	661	7.00	820	7.73	891	8.46	961	9.46	1118	10.38	1201	11.29	1285	11.92	1399	13.02	1494	14.12	1588
8'-9"	4.62	550	5.17	611	5.73	672	7.13	836	7.87	907	8.61	978	9.64	1139	10.56	1224	11.49	1308	12.14	1427	13.26	1522	14.36	1617
9'-0"	4.71	565	5.27	628	5.83	691	7.26	856	8.01	929	8.75	1002	9.81	1166	10.75	1252	11.68	1339	12.36	1460	13.49	1557	14.60	1654
9'-3"	4.79	574	5.36	638	5.93	701	7.39	872	8.15	945	8.90	1019	9.99	1187	10.93	1275	11.87	1362	12.59	1487	13.72	1585	14.85	1683
9'-6"	4.87	588	5.45	654	6.03	720	7.52	892	8.29	968	9.05	1044	10.16	1214	11.12	1303	12.07	1393	12.81	1520	13.95	1620	15.09	1720
10'-0"	5.04	603	5.64	670	6.24	738	7.78	916	8.56	993	9.35	1070	10.51	1246	11.49	1337	12.46	1428	13.25	1561	14.41	1662	15.57	1764

NOTE:
- FOR CONVENIENCE, DEPTHS OF INLETS SHOWN IN ABOVE TABLES ARE IN INCREMENTS OF 3 INCHES BUT ANY DEPTHS OTHER THAN THOSE SHOWN ABOVE MAY BE USED WHEREVER DEEMED NECESSARY. QUANTITIES FOR OTHER DEPTHS FALLING WITHIN THE LIMITS OF THE TABLE MAY BE FOUND BY INTERPOLATION.
- DEPTHS GREATER THAN 10' NEED TO BE STRUCTURALLY ENGINEERED.

CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702	
SUMMARY OF QUANTITIES		DATE AUG '23	STANDARD DRAWING NO. 6030G

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.5404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

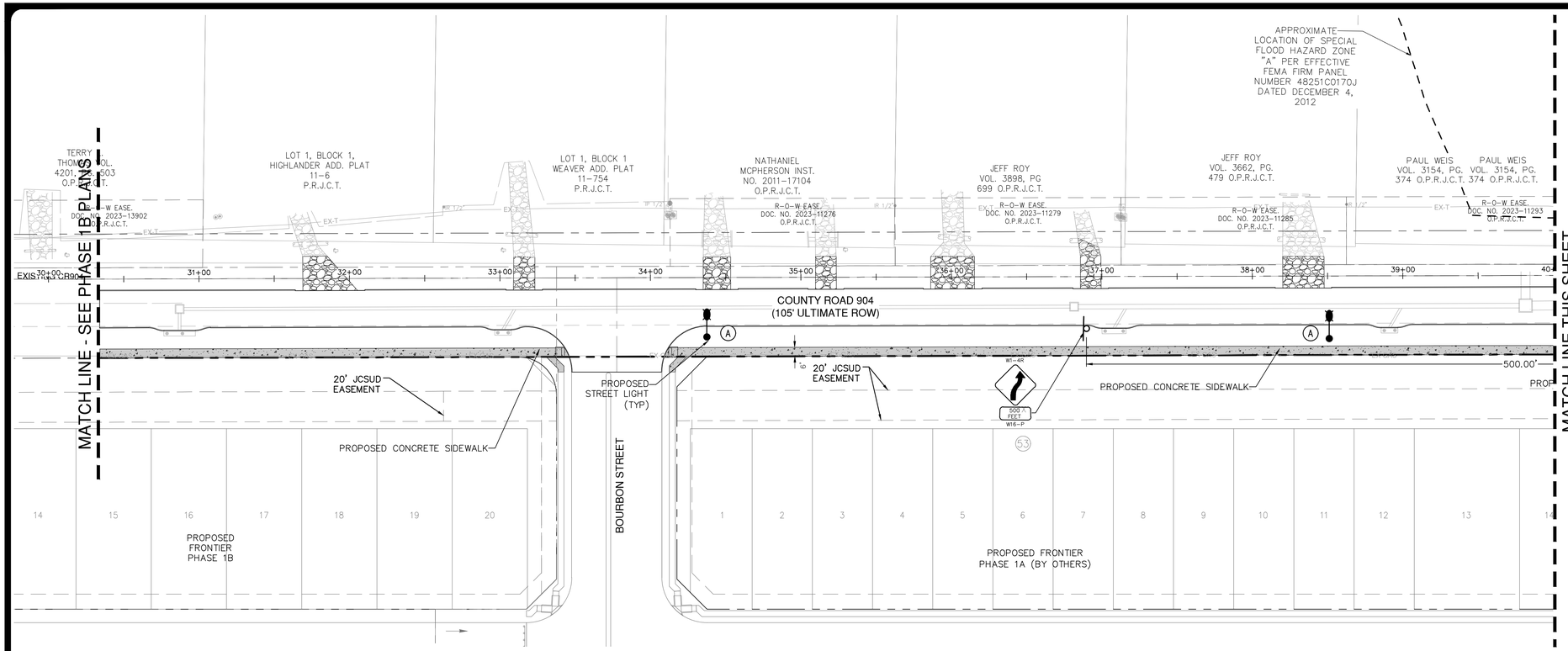
COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

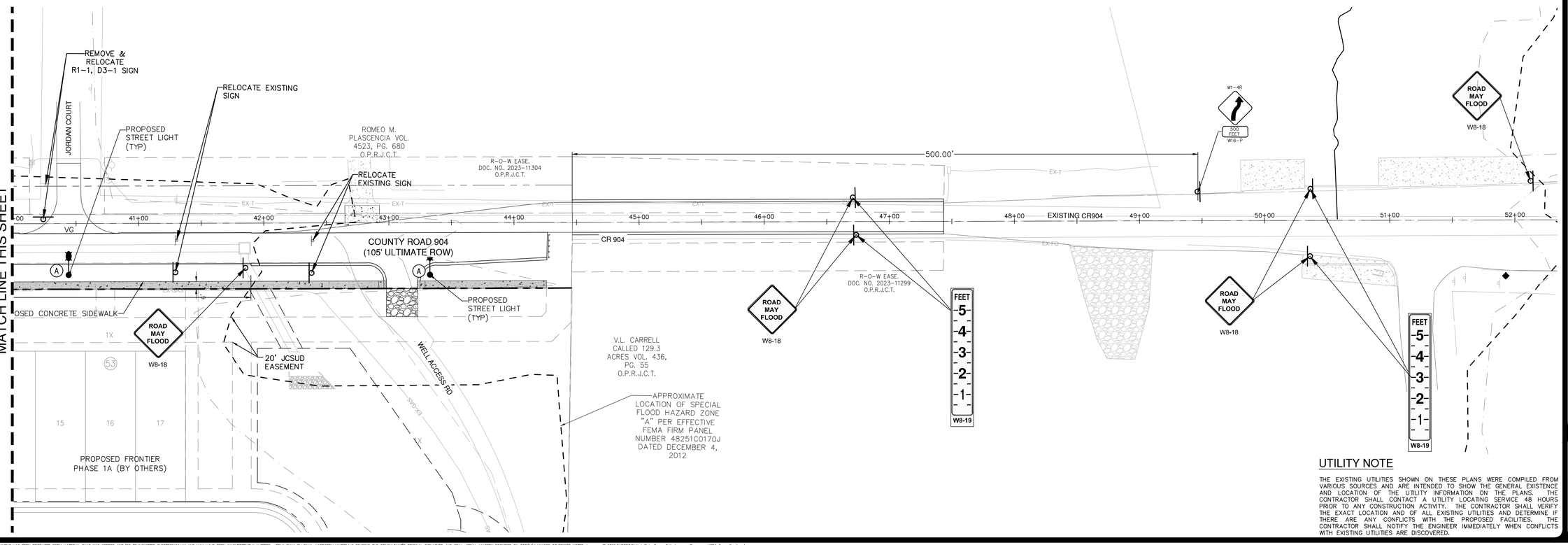
STORM DRAIN DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 28

Date: Jan 29, 2025, 2:41pm User ID: ARoscoe
Files: S:\Projects\061405\001\20 Design\24 Civil\2.4.3 Plan Sheets\SDDT-6140501.dwg

ISSUED FOR CONSTRUCTION SET





SCALE: 1" = 40'

0' 40' 80' 120'

BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- PROPOSED CONCRETE SIDEWALK
- STREET SIGN
- PROPOSED STREET LIGHT
- GRAVEL PAVEMENT

NOTE:

1. STREET LIGHTS SHALL BE MINIMUM 7000 LUMENS PER CITY CODE.
2. STREET LIGHTS SHALL HAVE A MAXIMUM SPACING OF 600' AS APPROVED BY THE CITY ON 09/24/24.
3. STREET LIGHTS SHALL BE ATTACHED TO UCS OHE POLES.
4. CONTRACTOR TO COORDINATE WITH NTTA AND ENGINEER ON EXACT LOACTION OF FLOOD GUAGE SIGNS PRIOR TO INSTALLATION.

UTILITY NOTE

THE EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED FROM VARIOUS SOURCES AND ARE INTENDED TO SHOW THE GENERAL EXISTENCE AND LOCATION OF THE UTILITY INFORMATION ON THE PLANS. THE CONTRACTOR SHALL CONTACT A UTILITY LOCATING SERVICE 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND OF ALL EXISTING UTILITIES AND DETERMINE IF THERE ARE ANY CONFLICTS WITH THE PROPOSED FACILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY WHEN CONFLICTS WITH EXISTING UTILITIES ARE DISCOVERED.

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

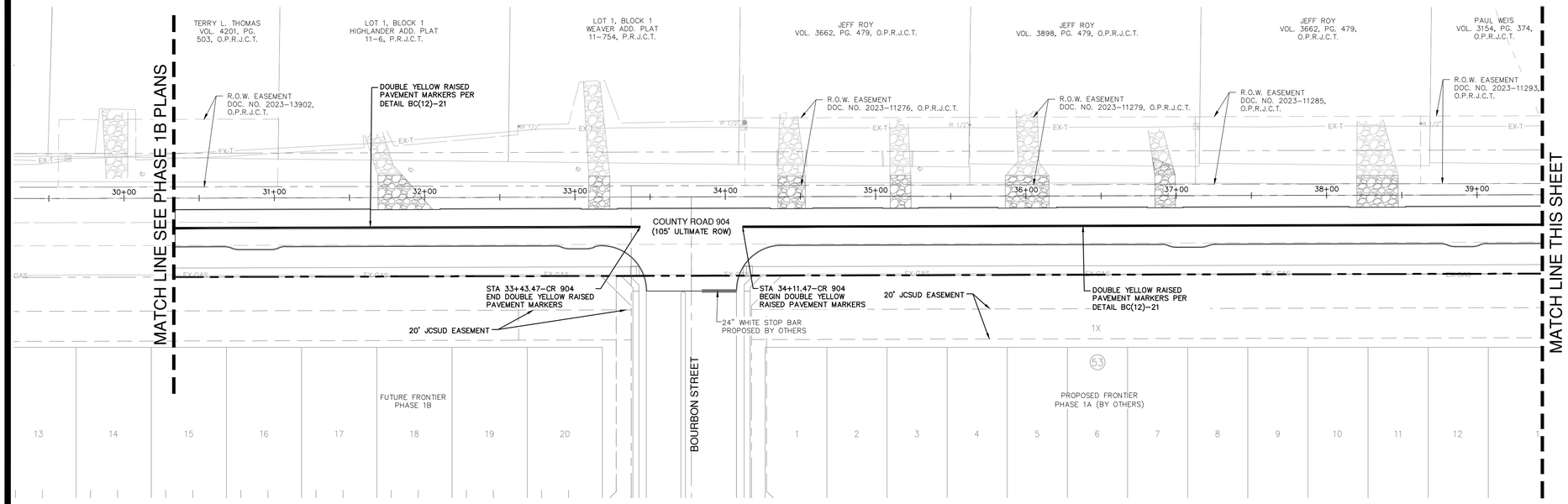
COUNTY ROAD 904 IMPROVEMENTS

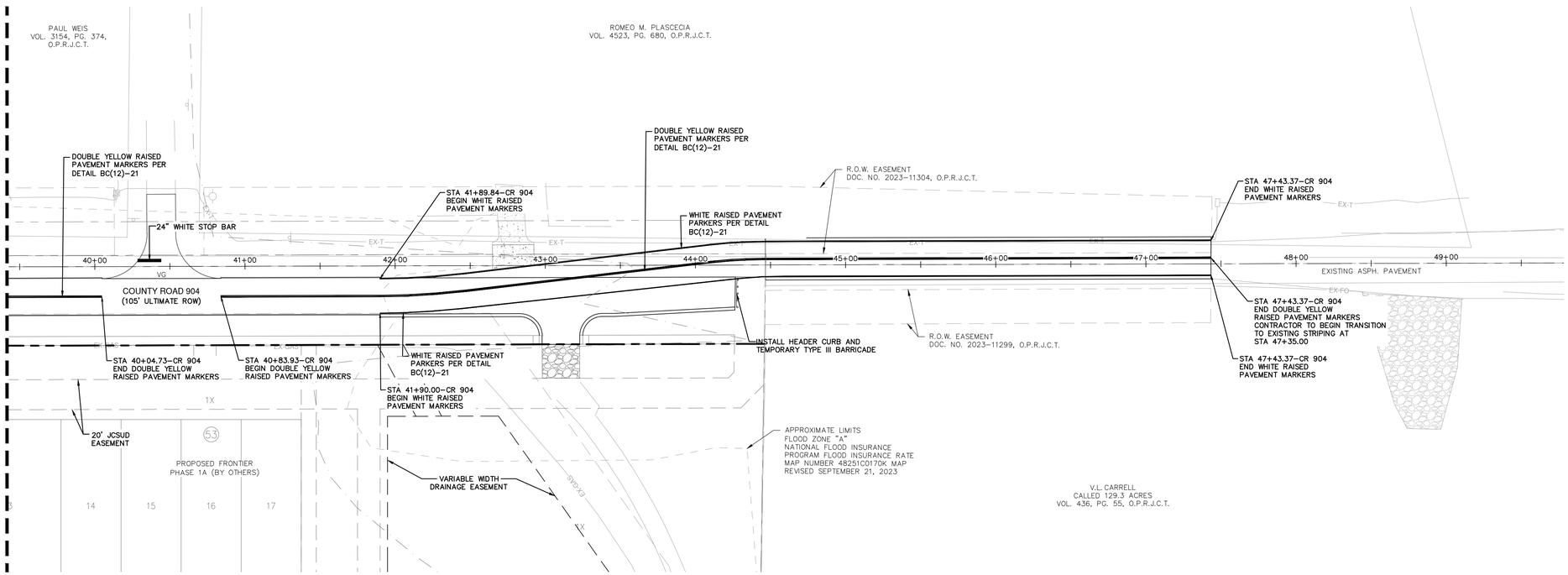
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

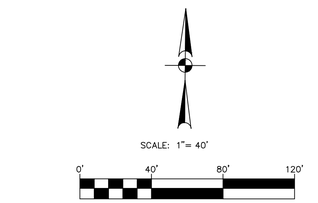
STREET LIGHT, SIDEWALK & SIGNAGE PLAN

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 29

ISSUED FOR CONSTRUCTION SET







BENCHMARKS

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

NO. REVISION | DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.5404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS
PAVEMENT MARKING LAYOUT

UTILITY NOTE

THE EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED FROM VARIOUS SOURCES AND ARE INTENDED TO SHOW THE GENERAL EXISTENCE AND LOCATION OF THE UTILITY INFORMATION ON THE PLANS. THE CONTRACTOR SHALL CONTACT A UTILITY LOCATING SERVICE 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND OF ALL EXISTING UTILITIES AND DETERMINE IF THERE ARE ANY CONFLICTS WITH THE PROPOSED FACILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY WHEN CONFLICTS WITH EXISTING UTILITIES ARE DISCOVERED.

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 30

ISSUED FOR CONSTRUCTION SET

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

Texas Department of Transportation — Traffic Safety Division Standard

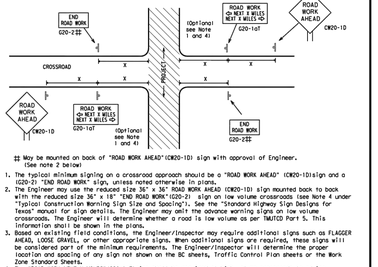
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	November 2002	CONT:	SECT:	JOB:	HIGHWAY
REVISIONS		DIST:	COUNTY:		SHEET NO.
4-03	7-13				
9-07	8-14				
5-10	5-21				

BC-1

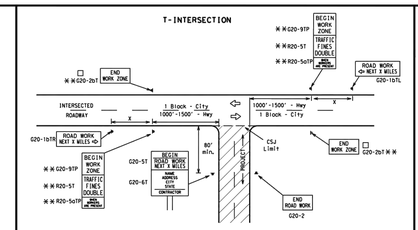
TYPICAL LOCATION OF CROSSROAD SIGNS



May be mounted on back of "ROAD WORK AHEAD"(CW20-10) sign with approval of Engineer. (See note 2 below)

1. The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-10)sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
2. The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-10) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK"(G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume as per TMUTCD Part 5. This information shall be shown in the plans.
3. Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
4. The "ROAD WORK NEXT X MILES"(G20-1a)sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[4,5,6]

SIZE: Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4], CW21, CW22, CW23, CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING: Posted Speed	Sign △ Spacing "X"
MPH	Feet (Approx.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
*	* 3

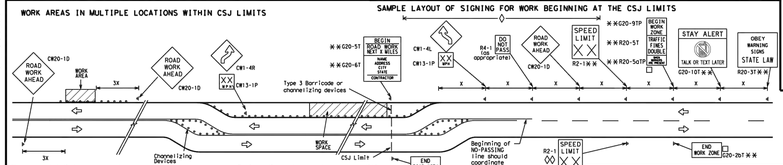
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

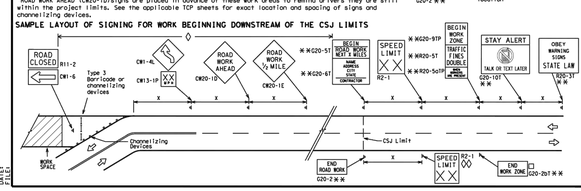
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-10)signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-10)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" (CW20-10)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 Table or the TMUTCD for sign spacing requirements.

SHEET 2 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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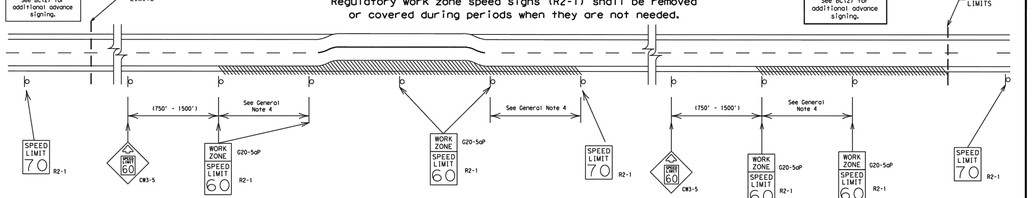
BC-2

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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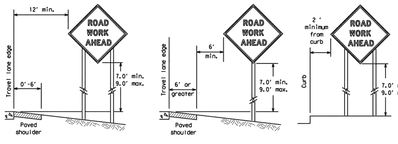
BC-3

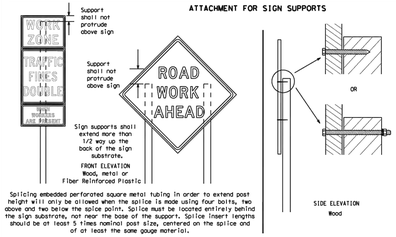
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

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

ATTACHMENT FOR SIGN SUPPORTS

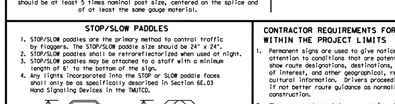


Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the splice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should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

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.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flagmen. The STOP/SLOW paddle size should be 24" x 24".
2. STOP/SLOW paddles shall be retroreflectorized when used at night.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP/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_0 OR C_0 SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

1. The types of sign supports, sign mounting heights,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 supports, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_0 or Type C_0, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

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

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned or 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, waterproof, and either fabric or heavy kraft paper. The covering shall not reduce the nighttime reflectorization of the sign face material. Reflective sheeting shall not deteriorate chemically or physically at night, without damaging the sign sheeting. Burlap shall NOT be used to cover signs.
5. Duct tape or other adhesive material shall NOT be affixed to a sign face.
6. Signs and anchor studs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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BC-4

Date: Jan 29, 2025, 7:43pm User ID: ARDSCOE
Files: S:\projects\61405\001\2d Design\2d Civil\2.4.3 Plan Sheets\TCP(DT-6)14050l.dwg

ISSUED FOR CONSTRUCTION SET

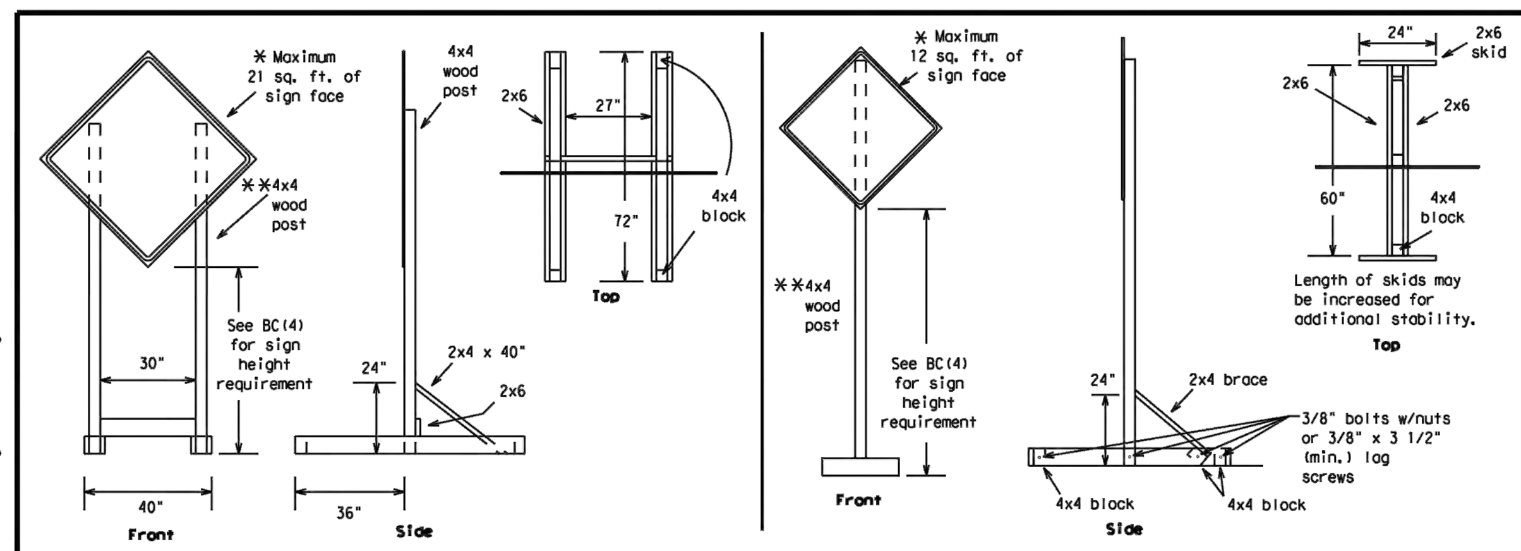
NO. REVISION — DATE

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

STATE OF TEXAS — ANNA JANE ROSCOE — 142544 — LICENSED PROFESSIONAL ENGINEER — 1/28/25

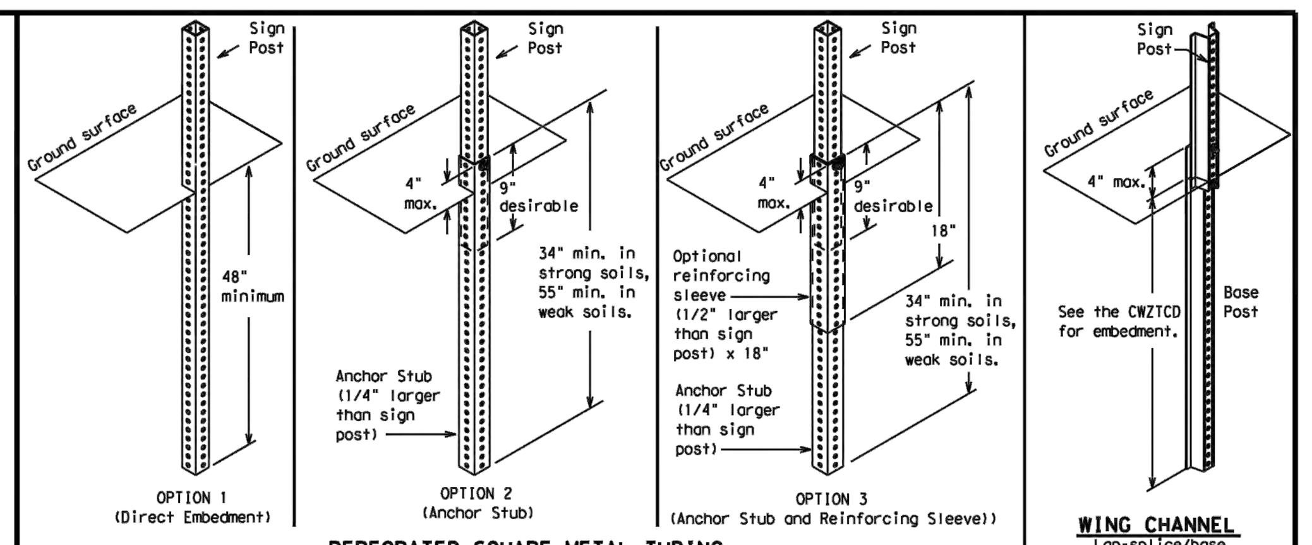
COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS
TRAFFIC CONTROL DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 31



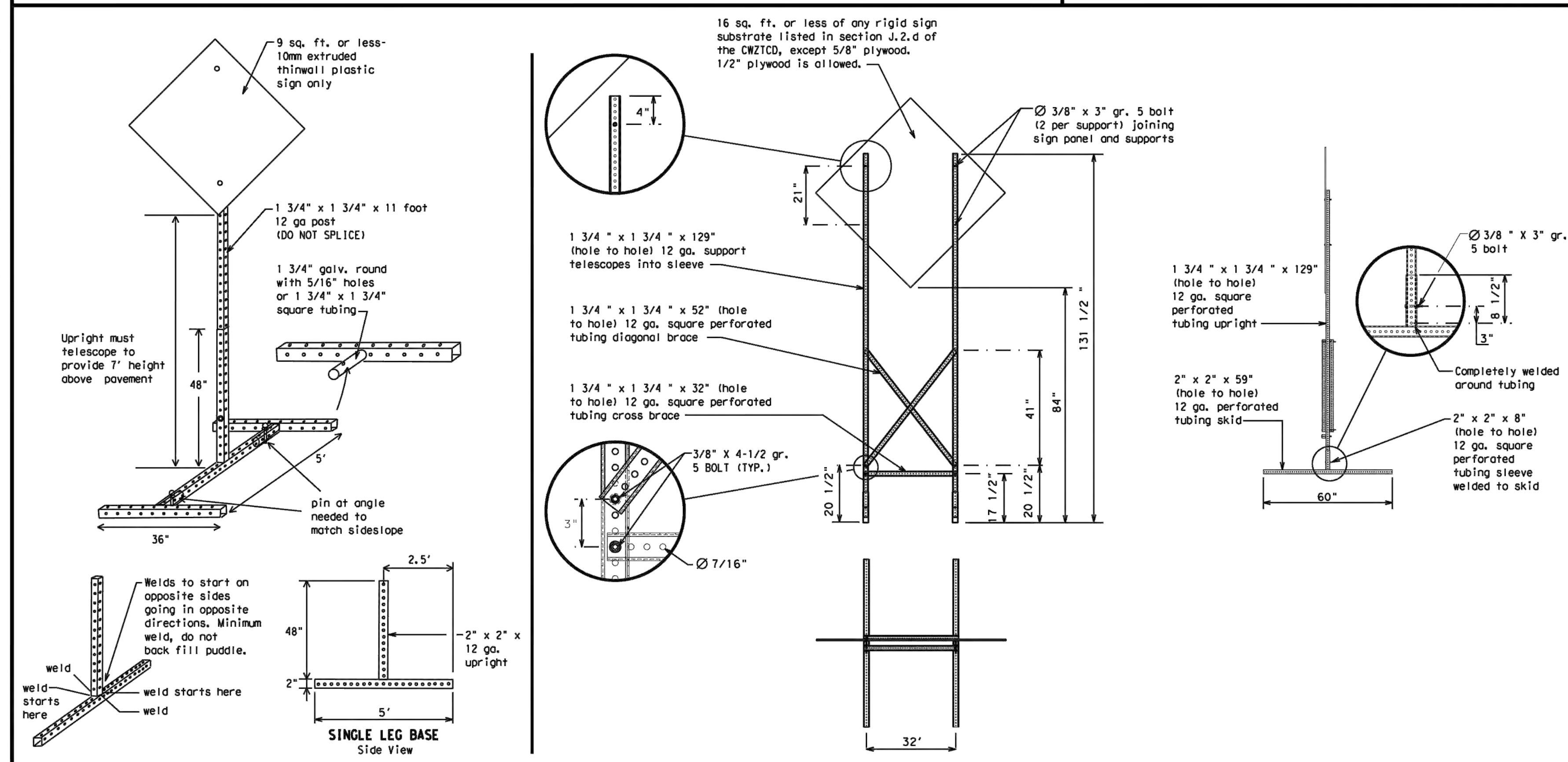
SKID MOUNTED WOOD SIGN SUPPORTS

* 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

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

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

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

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

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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DATE:
FILE:

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List		Other Condition List	
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *
XXXXXXXX BLVD CLOSED			

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List		Location List	Warning List	** Advance Notice List
MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX- XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM- XX AM
STAY IN LANE *				

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

SHEET 6 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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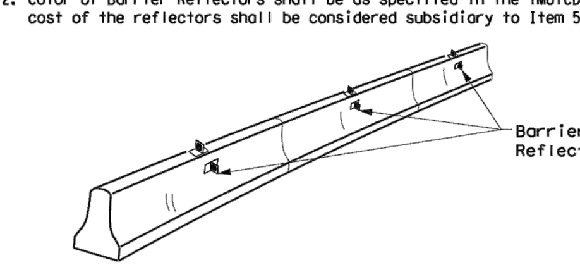
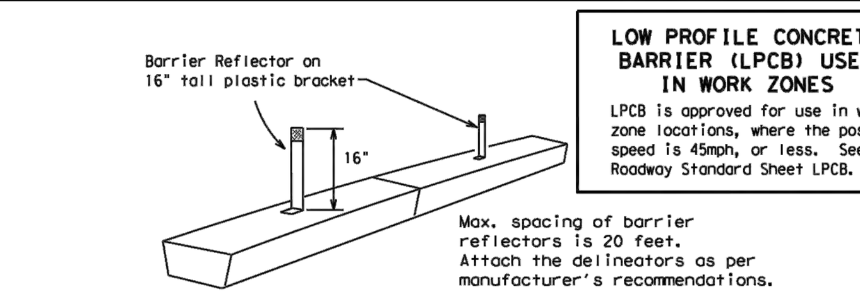
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

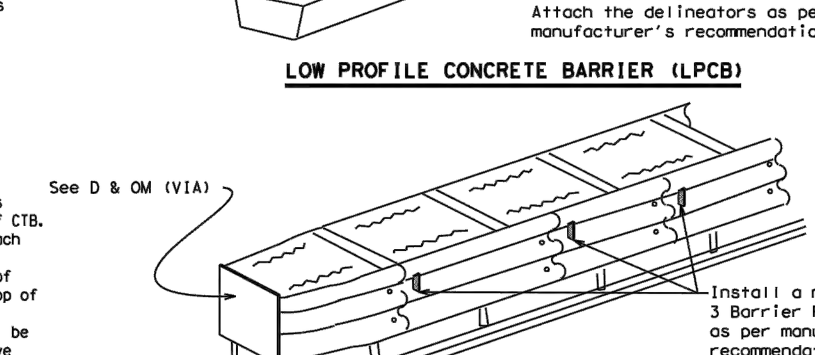


LOW PROFILE CONCRETE BARRIER (LPCB)

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.

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

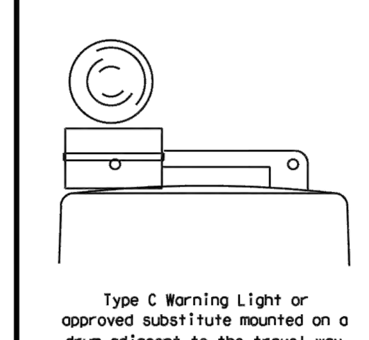


DELINEATION OF END TREATMENTS

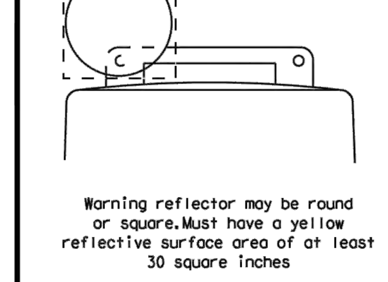
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

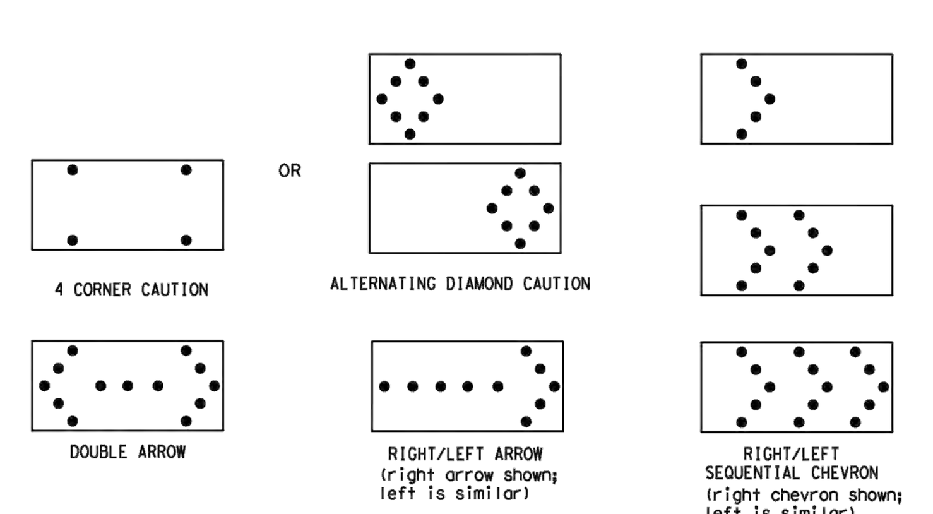
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

SHEET 7 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

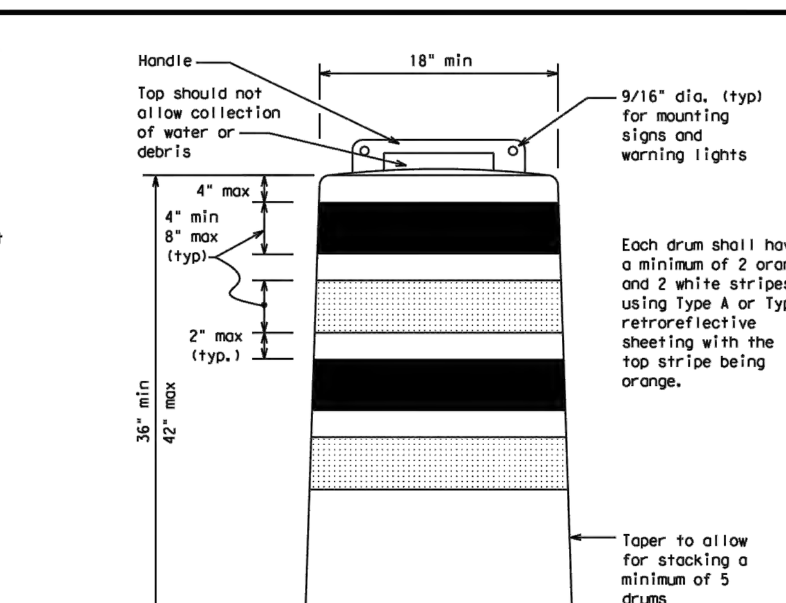
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

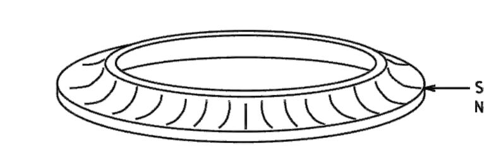
RETROREFLECTIVE SHEETING

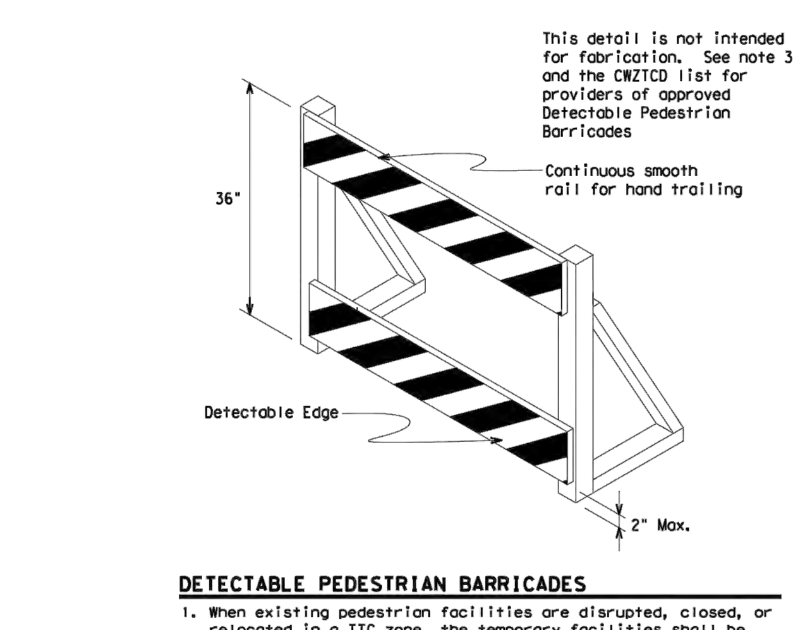
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

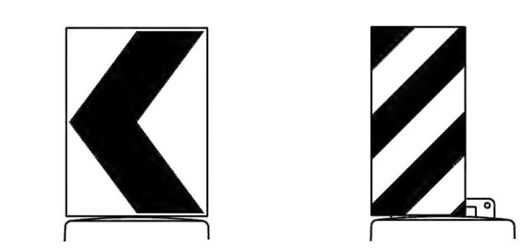






DETECTABLE PEDESTRIAN BARRICADES

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



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

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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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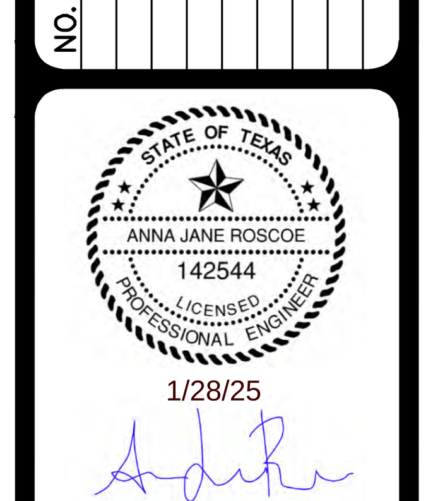
NO.	REVISION	DATE



PAPE-DAWSON ENGINEERS

6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

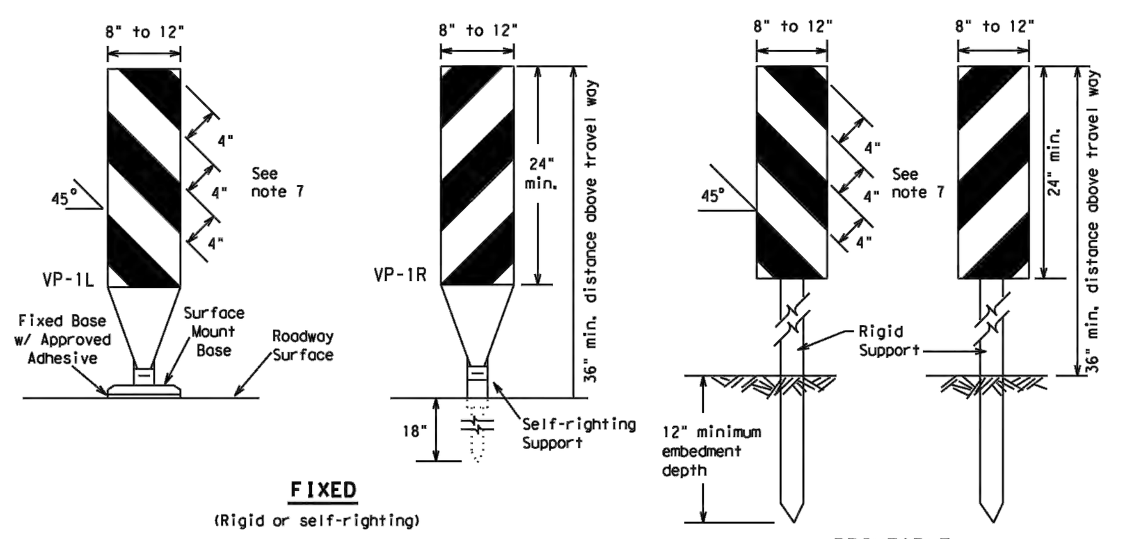
COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

TRAFFIC CONTROL DETAILS

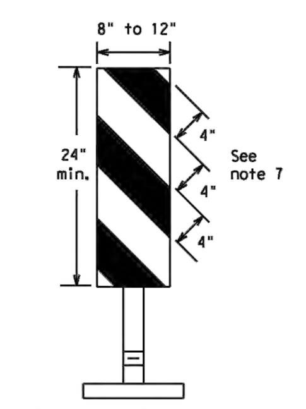
PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 32

ISSUED FOR CONSTRUCTION SET



FIXED
(Rigid or self-righting)

DRIVEABLE

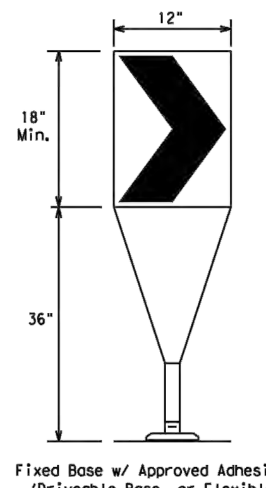


(Rigid or self-righting)

PORTABLE

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

VERTICAL PANELS (VPs)



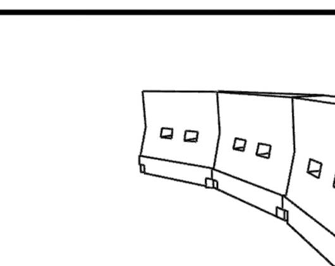
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

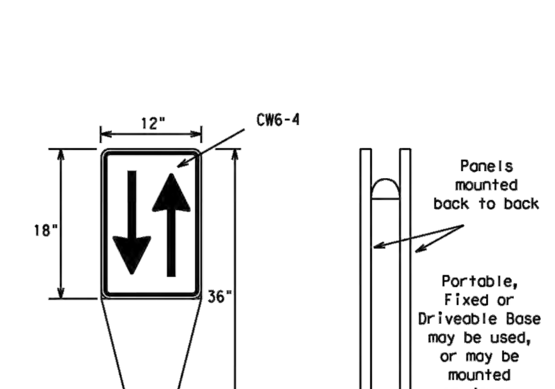
If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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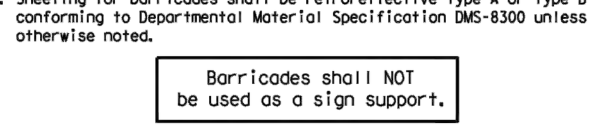
DATE:
FILE:

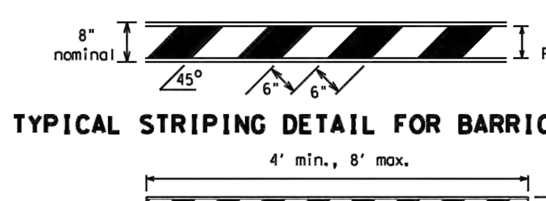
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.

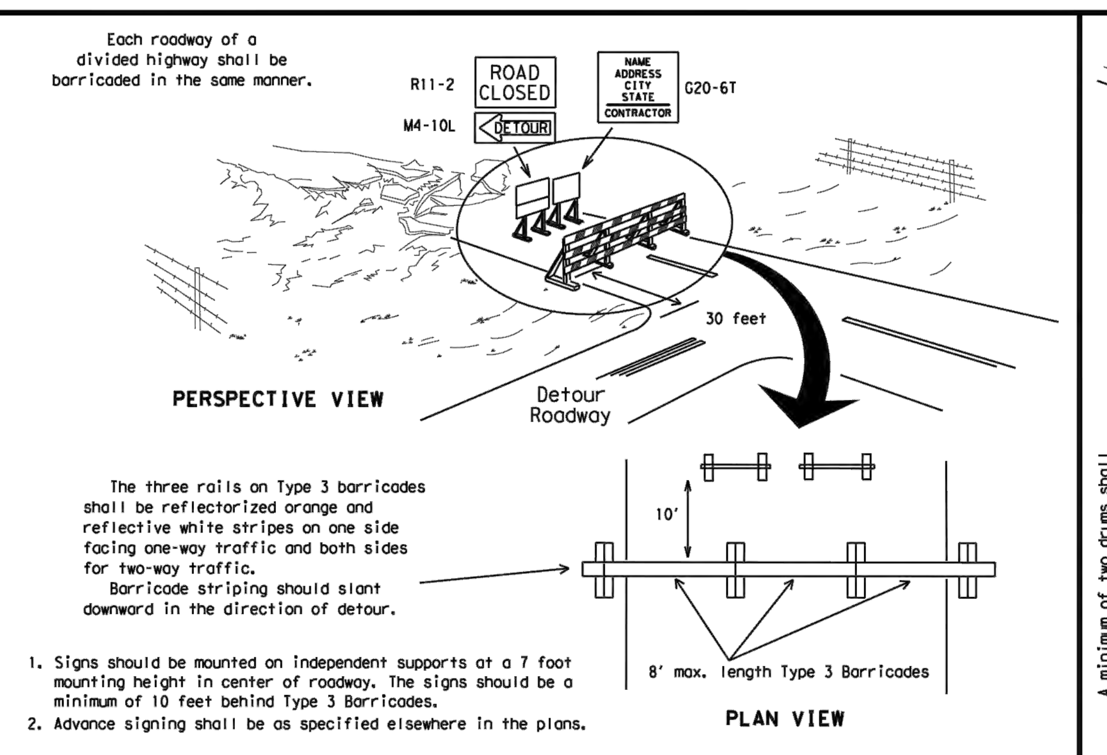


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



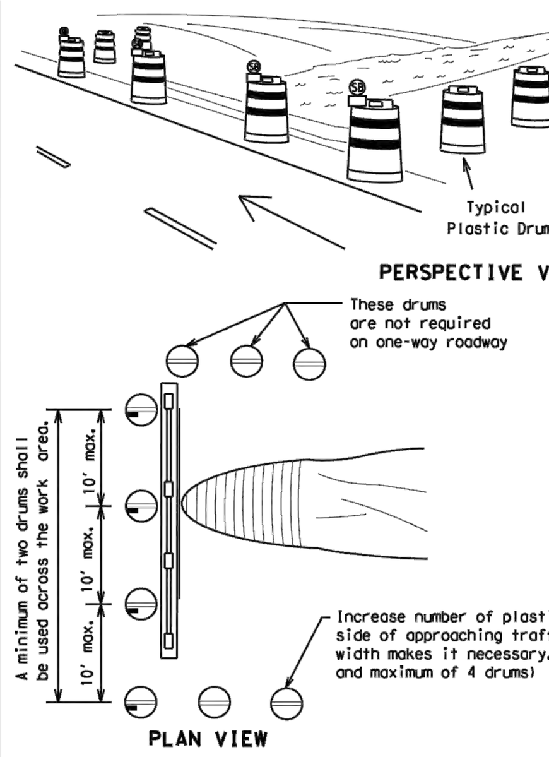
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES


Each roadway of a divided highway shall be barricaded in the same manner.
R11-2
ROAD CLOSED
M4-10L
DETOUR
NAME ADDRESS CITY STATE CONTRACTOR
G20-6T
30 feet
PERSPECTIVE VIEW
Detour Roadway
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.
10'
8' max. length Type 3 Barricades
PLAN VIEW

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

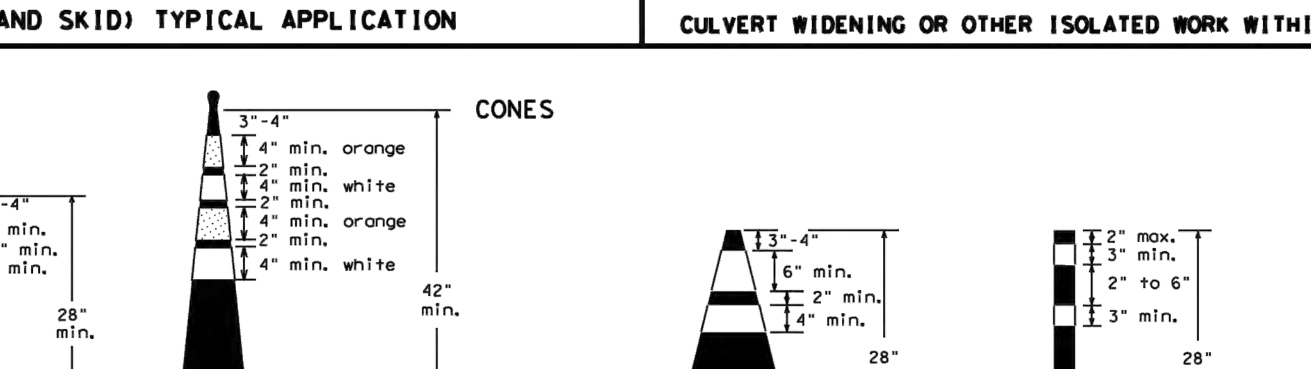
TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION


Typical Plastic Drum
PERSPECTIVE VIEW
These drums are not required on one-way roadway
A minimum of two drums shall be used across the work area.
10' max.
10' max.
10' max.
Increase number of plastic drums on the side of approaching traffic if the crown width makes it necessary. (minimum of 2 and maximum of 4 drums)
PLAN VIEW

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

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones

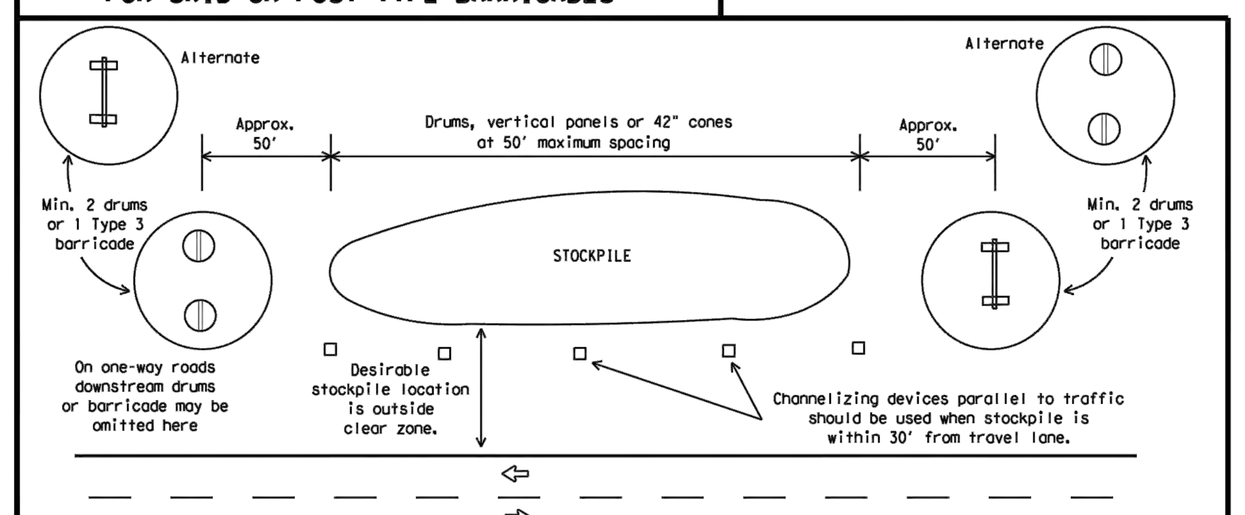
One-Piece cones

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.

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


Alternate
Alternate
Approx. 50'
Drums, vertical panels or 42" cones at 50' maximum spacing
Approx. 50'
Min. 2 drums or 1 Type 3 barricade
Min. 2 drums or 1 Type 3 barricade
STOCKPILE
On one-way roads downstream drums or barricade may be omitted here
Desirable stockpile location is outside clear zone.
Channelizing devices parallel to traffic should be used when stockpile is within 30' from travel lane.

TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

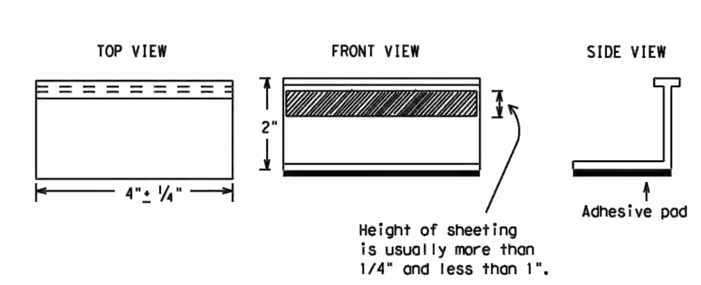
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

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BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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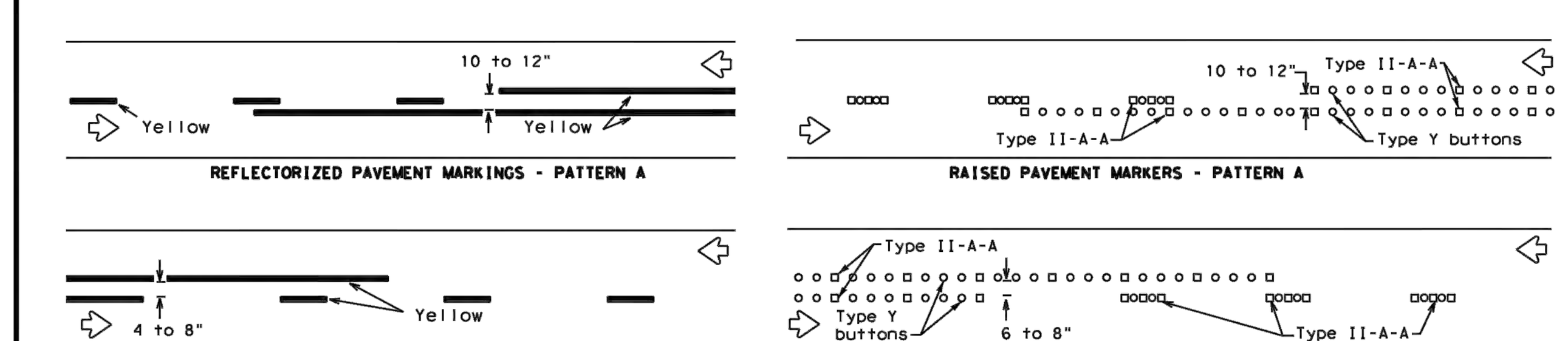
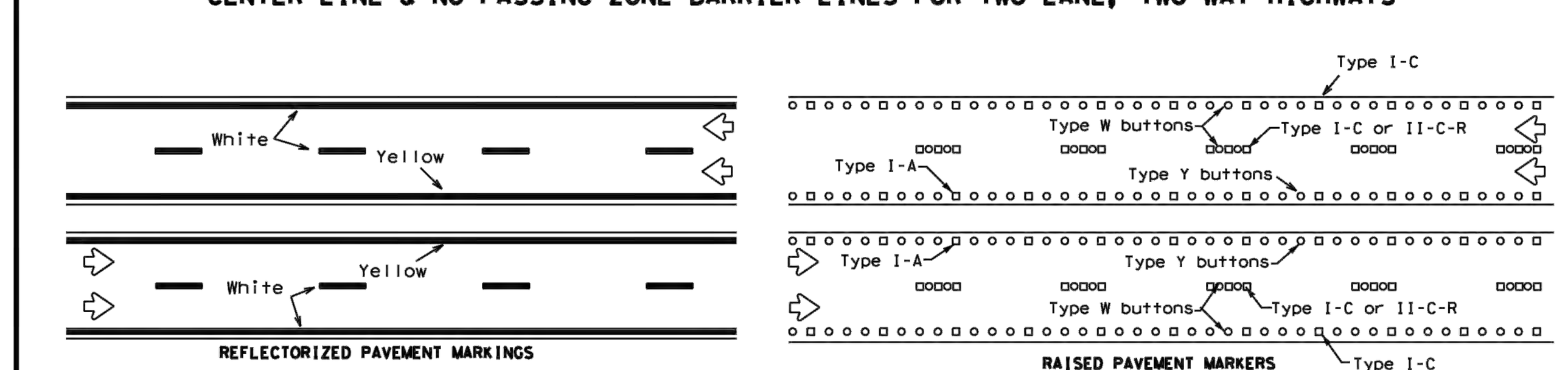
PAVEMENT MARKING PATTERNS



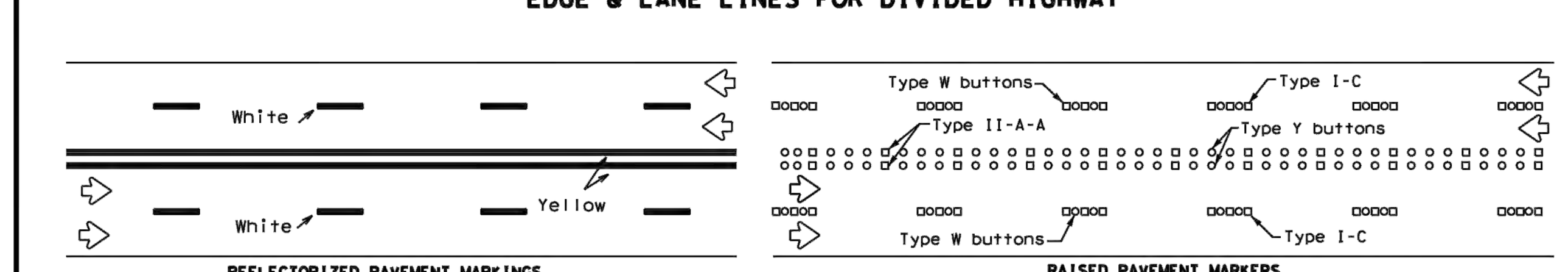
Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

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



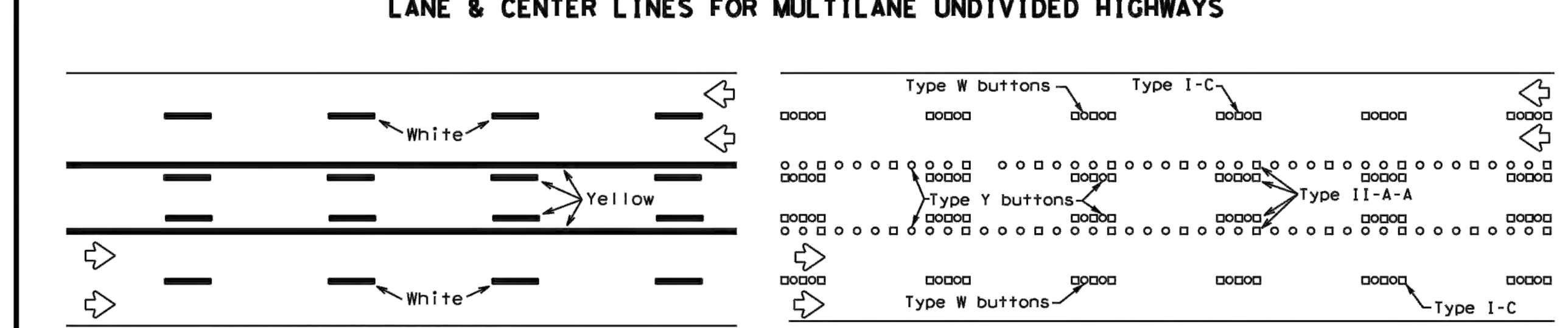
Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectorized pavement markings.

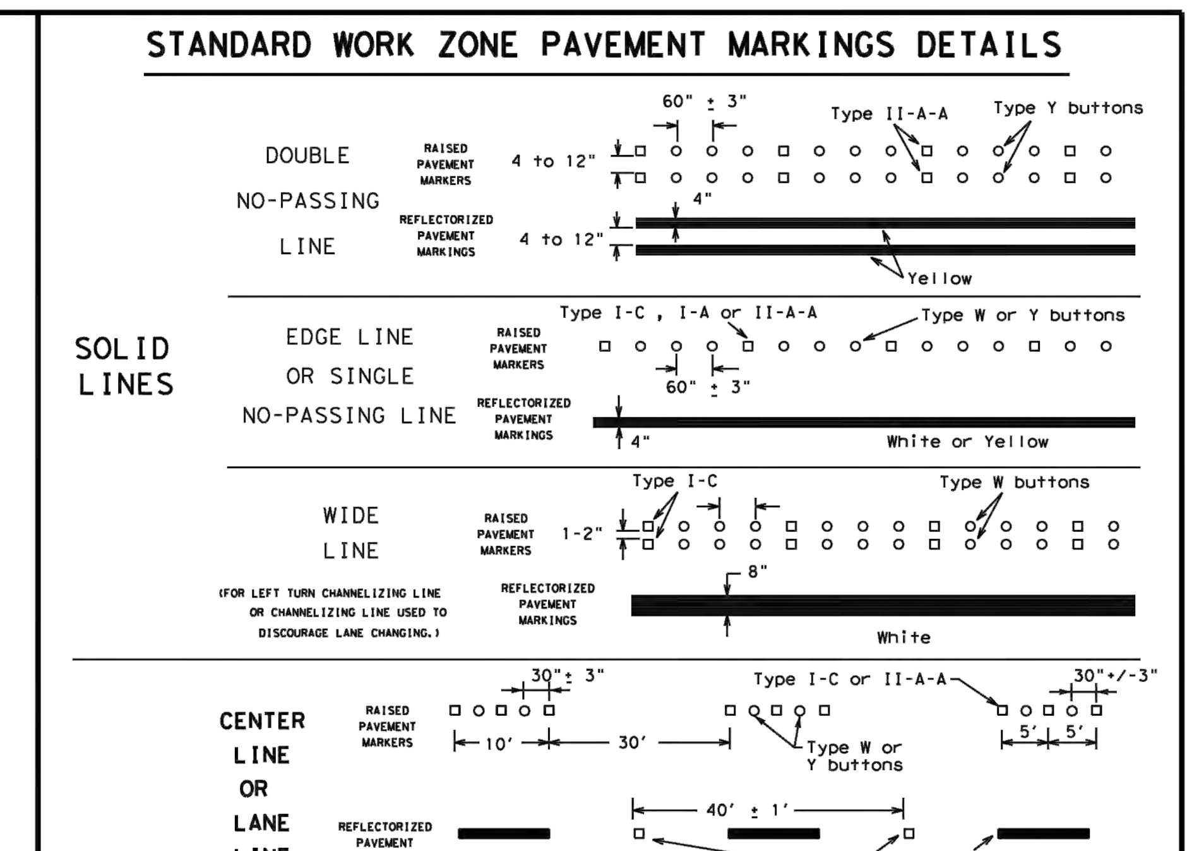
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS

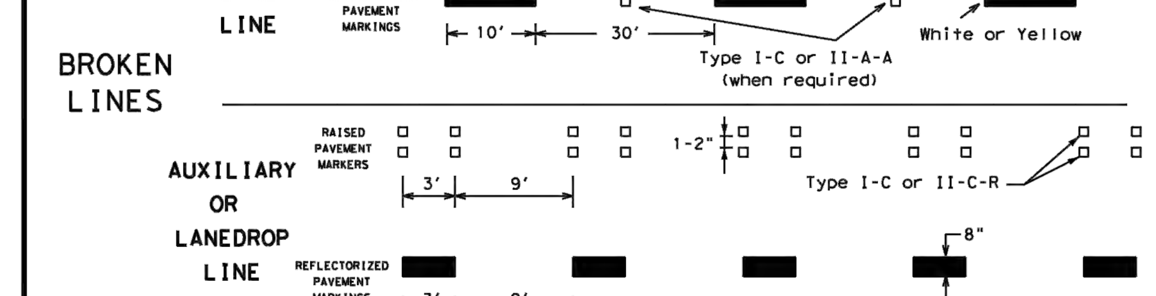


Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

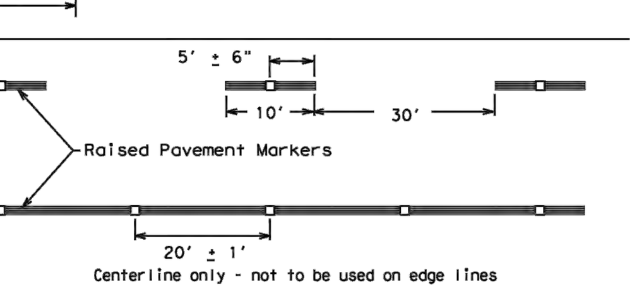
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS


DOUBLE NO-PASSING LINE
RAISED PAVEMENT MARKERS
REFLECTORIZED PAVEMENT MARKINGS
4 to 12"
60" ± 3"
Type II-A-A
Type Y buttons
4"
Yellow
SOLID LINES
EDGE LINE OR SINGLE NO-PASSING LINE
Type I-C , I-A or II-A-A
Type W or Y buttons
White or Yellow
WIDE LINE
(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)
1-2"
Type I-C
Type W buttons
8"
White



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



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

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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NO.	REVISION	DATE

1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

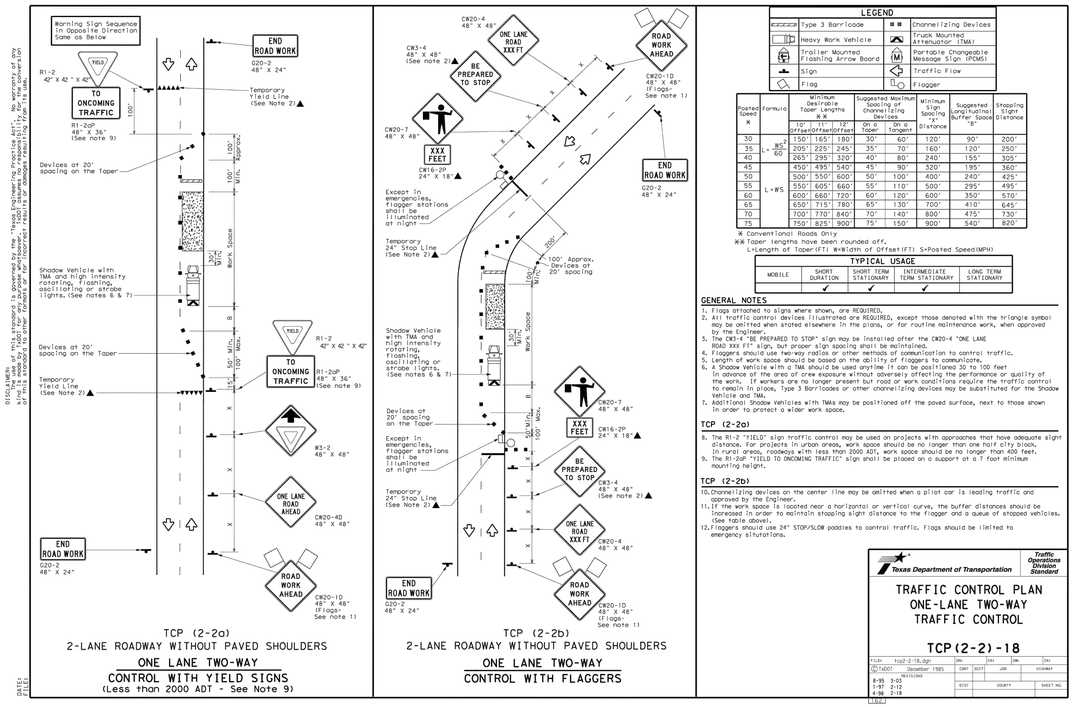
COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

TRAFFIC CONTROL DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 33

Date: Jan 29, 2025, 2:43pm User ID: AROSCOE
File: S:\projects\614\05\01\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\TCPDT-6140501.dwg

ISSUED FOR CONSTRUCTION SET



NO. REVISION DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8404
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE, JOHNSON COUNTY, TEXAS

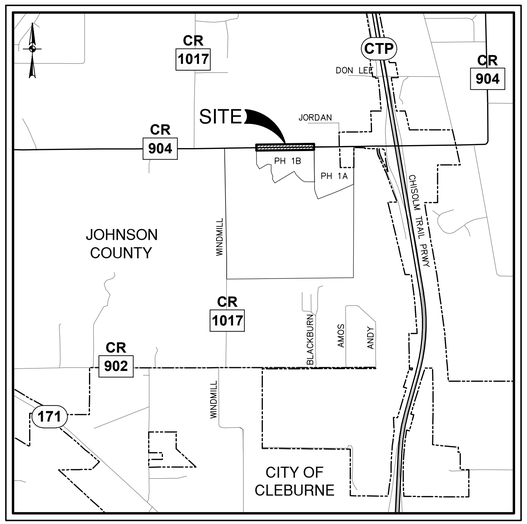
TRAFFIC CONTROL DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 34

ISSUED FOR CONSTRUCTION SET

FRONTIER

COUNTY ROAD 904 IMPROVEMENTS (PHASE 1B)
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS
CIVIL CONSTRUCTION PLANS



LOCATION MAP
NOT-TO-SCALE

SHEET INDEX

OWNED/DEVELOPED BY:

LENNAR HOMES OF TEXAS, INC.
1231 GREENWAY DR, SUITE 800
IRVING, TX 75038

JANUARY 2025

Know what's below. Call before you dig.

ALL GRADING OPERATIONS SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT NO. W232725-2 BY UES ON JUNE 4, 2024.

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

STATE OF TEXAS
DUSTIN E. WENTZ
118894
LICENSED PROFESSIONAL ENGINEER
1/28/25

CONTACT: AJ ROSCOE, P.E.
AROSCOE@PAPE-DAWSON.COM

PD JOB NO. 61405-03 FRONTIER COUNTY ROAD 904 IMPROVEMENTS (PHASE 1B)

ISSUED FOR CONSTRUCTION SET

GENERAL NOTES

1. STANDARDS AND SPECIFICATIONS: ALL MATERIALS, CONSTRUCTION METHODS, WORKMANSHIP, EQUIPMENT, SERVICES AND TESTING FOR ALL PUBLIC IMPROVEMENTS SHALL BE IN ACCORDANCE WITH THE GOVERNING AUTHORITIES' ORDINANCES, REGULATIONS, REQUIREMENTS, STATUTES, SPECIFICATIONS AND DETAILS. LATEST PRINTING AND AMENDMENTS THERETO THE GOVERNING AUTHORITIES' PUBLIC WORKS AND WATER DEPARTMENT REQUIREMENTS, PLUMBING CODES, AND FIRE DEPARTMENT REGULATIONS SHALL TAKE PRECEDENT FOR ALL PRIVATE IMPROVEMENTS WHERE APPLICABLE. ALL OTHER PRIVATE CONSTRUCTION NOT REGULATED BY THE GOVERNING AUTHORITY SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS, LATEST PRINTING AND AMENDMENTS THERETO, EXCEPT AS MODIFIED BY THE PROJECT CONTRACT DOCUMENTS.
2. EXAMINATION OF PLANS: PRIOR TO COMMENCING ANY CONSTRUCTION, THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS. FAILURE ON THE PART OF THE CONTRACTOR TO FAMILIARIZE HIMSELF WITH ALL STANDARDS AND SPECIFICATIONS PERTAINING TO THE WORK SHALL IN NO WAY RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PERFORMING THE WORK IN ACCORDANCE WITH ALL SUCH APPLICABLE STANDARDS AND SPECIFICATIONS.
3. EXAMINATION OF SITE: THE CONTRACTOR SHALL BE RESPONSIBLE FOR INVESTIGATING AND SATISFYING HIMSELF AS TO THE CONDITIONS AFFECTING THE WORK, INCLUDING BUT NOT RESTRICTED TO THE BEARING UPON TRANSPORTATION, DISPOSAL, HANDLING AND STORAGE OF MATERIALS, AVAILABILITY OF LABOR, WATER, ELECTRIC POWER, ROADS AND UNCERTAINTIES OF WEATHER OR SIMILAR PHYSICAL CONDITIONS AT THE SITE, CONDITIONS OF THE GROUND, AND THE EQUIPMENT AND FACILITIES NEEDED PRELIMINARY TO AND DURING THE PERFORMANCE OF THE WORK. FAILURE BY THE CONTRACTOR TO ACQUAINT HIMSELF WITH THE AVAILABLE INFORMATION WILL NOT RELIEVE HIM OF RESPONSIBILITY FOR ESTIMATING THE DIFFICULTY OR COST OF SUCCESSFULLY PERFORMING THE WORK.
4. SUBSURFACE INVESTIGATION: SUBSURFACE EXPLORATION TO ASCERTAIN THE NATURE OF SOILS HAS BEEN PERFORMED BY THE GEOTECHNICAL ENGINEER OF RECORD ON THE PROJECT. THE SUBSURFACE INFORMATION WILL BE MADE AVAILABLE FOR THE CONTRACTORS USE. THE ENGINEER DISCLAIMS ANY RESPONSIBILITY FOR THE ACCURACY, TRUE LOCATION, AND EXTENT OF THE SOILS INFORMATION PREPARED BY OTHERS.
5. TOPOGRAPHY SURVEY: TOPOGRAPHIC SURVEY INFORMATION SHOWN ON THE PLANS IS PROVIDED FOR INFORMATIONAL PURPOSES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE INFORMATION SHOWN IS CORRECT AND SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY ERRORS, DISCREPANCIES, OR OMISSIONS TO THE SURVEY INFORMATION PROVIDED.
6. COMPLIANCE WITH LAWS: THE CONTRACTOR SHALL FULLY COMPLY WITH ALL LOCAL, STATE, AND FEDERAL LAWS. INCLUDING ALL CODES, ORDINANCES, AND REGULATIONS APPLICABLE TO THIS CONTRACT AND THE WORK TO BE DONE THEREUNDER WHICH EXIST OR MAY BE ENACTED LATER BY GOVERNMENTAL BODIES HAVING JURISDICTION OR AUTHORITY FOR SUCH ENACTMENT. ALL WORK REQUIRED UNDER THIS CONTRACT SHALL COMPLY WITH ALL REQUIREMENTS OF LAW, REGULATION, PERMIT OR LICENSE. IF THE CONTRACTOR FINDS THAT THERE IS A VARIANCE, HE SHALL IMMEDIATELY REPORT THIS TO THE OWNER FOR RESOLUTION.
7. PUBLIC CONVENIENCE AND SAFETY: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. MATERIALS STORED ON THE WORK SITE SHALL BE PLACED AND THE WORK SHALL AT ALL TIMES BE SO CONDUCTED AS TO CAUSE NO GREATER OBSTRUCTION TO THE TRAVELING PUBLIC THAN IS CONSIDERED ACCEPTABLE BY THE GOVERNING AUTHORITIES AND THE DEVELOPER AND NOT TO PREVENT FREE UNINTERRUPTED ACCESS TO ALL FIRE HYDRANTS, WATER VALVES, GAS VALVES, MANHOLES AND FIRE ALARM OR POLICE CALL BOXES IN THE VICINITY.
8. STORM WATER POLLUTION PREVENTION PLAN (SWPPP): THE CONTRACTOR SHALL COMPLY WITH THE CONDITIONS OF THE SWPPP WHILE CONDUCTING HIS ACTIVITIES ON THE PROJECT.
9. PERMITS AND LICENSES: THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND LICENSES NECESSARY FOR THE EXECUTION OF THE WORK AND SHALL FULLY COMPLY WITH ALL THEIR TERMS AND CONDITIONS. WHENEVER THE WORK UNDER THIS CONTRACT REQUIRES OBTAINING PERMITS FROM GOVERNING AUTHORITIES, THE CONTRACTOR SHALL FURNISH DUPLICATE COPIES OF SUCH PERMITS TO THE DEVELOPER BEFORE THE WORK COVERED THEREBY IS STARTED. NO WORK WILL BE ALLOWED TO PROCEED BEFORE SUCH PERMITS HAVE BEEN OBTAINED. COSTS ASSOCIATED WITH PERMITS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
10. APPROVED PLANS: THE CONTRACTOR SHALL HAVE AT LEAST ONE SET OF APPROVED PLANS ON-SITE AT ALL TIMES.
11. BONDS: PERFORMANCE, PAYMENT, AND MAINTENANCE BONDS MAY BE REQUIRED FROM THE CONTRACTOR FOR "PUBLIC" IMPROVEMENTS. IF REQUIRED, THE CONTRACTOR SHALL PROVIDE THE BONDS IN THE FORM AND IN THE AMOUNTS AS REQUIRED BY THE GOVERNING AUTHORITIES. COSTS ASSOCIATED WITH PROVIDING THE BONDS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
12. INSPECTION AND TESTING: THE GOVERNING AUTHORITIES AND/OR THE DEVELOPER WILL PROVIDE INSPECTION AND TESTING OF THE PROPOSED CONSTRUCTION AT THEIR EXPENSE. THE CONTRACTOR SHALL PROVIDE SUFFICIENT NOTICE WELL IN ADVANCE OF PENDING CONSTRUCTION ACTIVITIES TO THE GOVERNING AUTHORITIES AND/OR OWNER FOR SCHEDULING OF INSPECTION/TESTING SERVICES. IN THE EVENT THE RESULTS OF THE INITIAL TESTING DO NOT COMPLY WITH THE PLANS AND SPECIFICATIONS, SUBSEQUENT TESTS NECESSARY TO DETERMINE THE ACCEPTABILITY OF MATERIALS OR CONSTRUCTION SHALL BE AT THE CONTRACTOR'S EXPENSE.
13. SHOP DRAWINGS: THE CONTRACTOR SHALL PREPARE, REVIEW, AND SUBMIT ALL SHOP DRAWINGS, PRODUCT DATA AND SAMPLES REQUIRED BY THE GOVERNING AUTHORITIES AND THE PROJECT CONTRACT DOCUMENTS.
14. SURVEYING: ALL SURVEYING REQUIRED FOR CONSTRUCTION STAKING WILL BE PROVIDED BY THE DEVELOPER ONE TIME ONLY. ALL RESTAKING SHALL BE AT THE CONTRACTOR'S EXPENSE.
15. PROTECTION OF PROPERTY CORNERS AND BENCHMARKS: THE CONTRACTOR SHALL PROTECT ALL PROPERTY CORNERS, MARKERS, AND BENCHMARKS. WHEN ANY SUCH MARKERS OR MONUMENTS ARE IN DANGER OF BEING DISTURBED, THEY SHALL BE PROPERLY REFERENCED AND IF DISTURBED SHALL BE RESET BY A REGISTERED PROFESSIONAL LAND SURVEYOR AT THE EXPENSE OF THE CONTRACTOR.
16. EXISTING STRUCTURES: THE PLANS SHOW THE LOCATION OF ALL KNOWN SURFACE AND SUBSURFACE STRUCTURES. HOWEVER, THE DEVELOPER AND ENGINEER ASSUME NO RESPONSIBILITY FOR THE FAILURE TO SHOW ANY OR ALL OF THESE STRUCTURES ON THE PLANS OR TO SHOW THEM IN THEIR EXACT LOCATION. SUCH FAILURE SHALL NOT BE CONSIDERED SUFFICIENT BASIS FOR CLAIMS FOR ADDITIONAL COMPENSATION FOR EXTRA WORK OR FOR INCREASING THE PAY QUANTITIES IN ANY MANNER WHATSOEVER, UNLESS THE OBSTRUCTION ENCOUNTERED IS SUCH AS TO REQUIRE CHANGES IN THE LINES OR GRADES OR REQUIRE THE CONSTRUCTION OF SPECIAL WORK FOR WHICH PROVISIONS ARE NOT MADE IN THE PLANS.
17. PROTECTION OF EXISTING UTILITIES: AS REQUIRED BY "THE TEXAS UNDERGROUND FACILITY DAMAGE PREVENTION AND SAFETY ACT", TEXAS ONE CALL SYSTEM MUST BE CONTACTED (800-245-4545) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION OPERATIONS BEING PERFORMED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT TEXAS ONE CALL SYSTEM. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE PLANS ARE BASED ON THE BEST RECORDS AND/OR FIELD INFORMATION AVAILABLE AND ARE NOT GUARANTEED BY THE DEVELOPER OR ENGINEER TO BE ACCURATE AS TO THE LOCATION AND DEPTH. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY LOCATIONS OF ADJACENT AND/OR CONFLICTING UTILITIES SUFFICIENTLY IN ADVANCE OF HIS ACTIVITIES IN ORDER THAT HE MAY NEGOTIATE SUCH LOCAL ADJUSTMENTS AS NECESSARY IN THE CONSTRUCTION PROCESS TO PROVIDE ADEQUATE CLEARANCES. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS IN ORDER TO PROTECT ALL EXISTING UTILITIES, SERVICES, AND STRUCTURES ENCOUNTERED WHETHER OR NOT THEY ARE ON THE PLANS. ANY DAMAGE TO UTILITIES RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED AT HIS EXPENSE. TO AVOID UNNECESSARY INTERFERENCES OR DELAYS, THE CONTRACTOR SHALL COORDINATE ALL UTILITY REMOVALS, REPLACEMENTS, AND CONSTRUCTION WITH THE APPROPRIATE GOVERNING AUTHORITIES. THE DEVELOPER WILL NOT BE LIABLE FOR DAMAGES DUE TO DELAY BECAUSE OF THE ABOVE.
18. DAMAGE TO EXISTING FACILITIES: ALL EXISTING UTILITIES, PAVEMENT, SIDEWALKS, WALLS, FENCES, ETC. DAMAGED DURING CONSTRUCTION ACTIVITIES SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE TO A CONDITION EQUAL TO OR BETTER THAN THE CONDITIONS PRIOR TO STARTING THE WORK.
19. FIRE AND LIFE SAFETY SYSTEMS: THE CONTRACTOR SHALL NOT REMOVE, DISABLE, OR DISRUPT EXISTING FIRE OR LIFE SAFETY SYSTEMS WITHOUT RECEIVING PRIOR WRITTEN PERMISSION FROM THE GOVERNING AUTHORITY.
20. TRENCH SAFETY: THE CONTRACTOR IS RESPONSIBLE FOR HAVING A TRENCH SAFETY PLAN PREPARED IN ACCORDANCE WITH OSHA REQUIREMENTS BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS FOR THE IMPLEMENTATION OF TRENCH SAFETY CONTROL MEASURES THAT WILL BE IN EFFECT DURING THE CONSTRUCTION OF THE PROJECT. THE COSTS FOR PREPARATION OF THE TRENCH SAFETY PLAN SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
21. TRAFFIC CONTROL: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DEVELOP AND SUBMIT FOR APPROVAL BY THE GOVERNING AUTHORITIES A TRAFFIC CONTROL PLAN PREPARED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS OUTLINING TRAFFIC MANAGEMENT PROCEDURES TO BE PROVIDED DURING CONSTRUCTION. THE COSTS ASSOCIATED WITH THE PREPARATION AND IMPLEMENTATION OF THE TRAFFIC CONTROL PLAN SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
22. ACCESS TO ADJACENT PROPERTIES: ACCESS TO ADJACENT PROPERTIES SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE DIRECTED BY THE GOVERNING AUTHORITIES AND/OR OWNER.
23. ACCESS ROUTES, STAGING AREAS AND STORAGE AREAS: ALL PRIVATE HAUL ROADS AND ACCESS ROUTES AND THE LOCATION OF ALL STAGING AREAS AND STORAGE AREAS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND REPAIRING ROADS AND OTHER FACILITIES USED DURING CONSTRUCTION. UPON COMPLETION OF THE PROJECT, ALL HAUL ROADS, ACCESS ROADS, STAGING AREAS AND STORAGE AREAS SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN THE CONDITIONS PRIOR TO STARTING THE WORK.
24. PARKING OF CONSTRUCTION EQUIPMENT: AT NIGHT AND DURING ALL PERIODS OF TIME WHEN EQUIPMENT IS NOT BEING ACTIVELY USED FOR CONSTRUCTION WORK. THE CONTRACTOR SHALL PARK THE EQUIPMENT AT LOCATIONS WHICH ARE APPROVED BY THE OWNER. DURING THE CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL COMPLY WITH THE PRESENT ZONING REQUIREMENTS OF THE GOVERNING AUTHORITIES IN THE USE OF VACANT PROPERTY FOR STORAGE PURPOSES. THE CONTRACTOR SHALL ALSO PROVIDE ADEQUATE BARRICADES, MARKERS, AND LIGHTS TO PROTECT THE OWNER, THE GOVERNING AUTHORITIES, THE PUBLIC, AND THE WORK. ALL BARRICADES, LIGHTS, AND MARKERS MUST MEET THE REQUIREMENTS OF THE GOVERNING AUTHORITIES' REGULATIONS.
25. WATER FOR CONSTRUCTION: THE CONTRACTOR SHALL MAKE THE NECESSARY ARRANGEMENTS FOR PURCHASING WATER FROM THE GOVERNING AUTHORITY FOR HIS USE ON THE PROJECT SITE. COST ASSOCIATED WITH THIS SERVICE SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
26. TEMPORARY ELECTRIC AND COMMUNICATIONS FOR CONSTRUCTION: THE CONTRACTOR SHALL MAKE THE NECESSARY ARRANGEMENTS FOR THE INSTALLATION AND PURCHASING OF TEMPORARY ELECTRIC AND COMMUNICATIONS SERVICES FROM THE GOVERNING AUTHORITIES FOR HIS USE ON THE PROJECT SITE. COSTS ASSOCIATED WITH THIS SERVICE SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
27. FENCES: ALL FENCES ENCOUNTERED AND REMOVED DURING CONSTRUCTION, EXCEPT THOSE DESIGNATED TO BE REMOVED OR RELOCATED, SHALL BE RESTORED TO THE ORIGINAL OR BETTER THAN CONDITION UPON COMPLETION OF THE PROJECT. WHERE WIRE FENCING, EITHER WIRE MESH OR BARBED WIRE, IS NOT TO BE CROSSED, THE CONTRACTOR SHALL SET CROSS-BRACED POSTS ON EITHER SIDE OF THE CROSSING. TEMPORARY FENCING SHALL BE ERECTED IN PLACE OF THE FENCING REMOVED WHENEVER THE WORK IS NOT IN PROGRESS AND WHEN THE SITE IS VACATED OVERNIGHT AND/OR AT ALL TIMES TO PREVENT PERSONS AND/OR LIVESTOCK FROM ENTERING THE CONSTRUCTION AREA. THE COST OF FENCE REMOVAL, TEMPORARY CLOSURES, AND REPLACEMENT SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
28. COORDINATION WITH OTHERS: IN THE EVENT THAT OTHER CONTRACTORS ARE DOING WORK IN THE SAME AREA SIMULTANEOUSLY WITH THE PROJECT, THE CONTRACTOR SHALL COORDINATE HIS PROPOSED CONSTRUCTION WITH THAT OF THE OTHER CONTRACTORS.
29. CONDITION OF THE SITE DURING CONSTRUCTION: THE CONTRACTOR SHALL KEEP THE SITE OF THE WORK AND ADJACENT PREMISES AS FREE FROM MATERIAL, DEBRIS, AND RUBBISH AS IS PRACTICAL. THE CONTRACTOR SHALL REMOVE MATERIAL DEBRIS AND RUBBISH FROM ANY PORTION OF THE SITE IF, IN THE OPINION OF THE DEVELOPER, SUCH MATERIAL, DEBRIS, AND RUBBISH CONSTITUTES A NUISANCE OR IS OBJECTIONABLE.
30. EXISTING ROADWAYS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE CLEANLINESS OF EXISTING PAVED ROADS. COSTS ASSOCIATED WITH MAINTAINING THE CLEANLINESS OF EXISTING ROADS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
31. DUST CONTROL: THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO CONTROL DUST ON THE PROJECT SITE BY THE SPRINKLING OF WATER OR ANY OTHER METHODS APPROVED BY THE GOVERNING AUTHORITIES. COSTS ASSOCIATED WITH DUST CONTROL SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
32. CLEAN UP FOR FINAL ACCEPTANCE: THE CONTRACTOR SHALL MAKE A FINAL CLEAN UP OF ALL PARTS OF THE WORK BEFORE ACCEPTANCE BY THE OWNER. THIS CLEAN UP SHALL INCLUDE REMOVAL OF ALL OBJECTIONABLE MATERIALS AND, IN GENERAL, PREPARING THE SITE OF THE WORK IN AN ORDERLY MANNER OF APPEARANCE.
33. REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK: ALL WORK, WHICH HAS BEEN REJECTED OR CONDEMNED, SHALL BE REPAIRED, OR IF IT CANNOT BE REPAIRED SATISFACTORILY, SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. DEFECTIVE MATERIALS SHALL BE IMMEDIATELY REMOVED FROM THE WORK SITE. WORK DONE NOT IN CONFORMITY WITH THE GRADES SHOWN ON THE DRAWINGS OR AS WRITTEN AUTHORITY AND PRIOR AGREEMENT IN WRITING AS TO PRICES, SHALL BE AT THE CONTRACTOR'S RISK, AND WILL BE CONSIDERED UNAUTHORIZED, AND AT THE OPTION OF THE OWNER MAY NOT BE MEASURED AND PAID FOR AND MAY BE ORDERED REMOVED AT THE CONTRACTOR'S EXPENSE. UPON FAILURE OF THE CONTRACTOR TO REPAIR SATISFACTORILY OR TO REMOVE AND REPLACE THE DIRECTED, REJECTED, UNAUTHORIZED, OR CONDEMNED WORK OR MATERIALS IMMEDIATELY AFTER RECEIVING NOTICE FROM THE OWNER, THE OWNER WILL, AFTER GIVING WRITTEN NOTICE TO THE CONTRACTOR, HAVE THE AUTHORITY TO CAUSE UNAUTHORIZED WORK TO BE REMEDIED OR REMOVED AND REPLACED OR TO CAUSE UNAUTHORIZED WORK TO BE REMOVED AND TO DEDUCT THE COST THEREOF ANY MONIES DUE OR TO BECOME DUE TO THE CONTRACTOR.
34. DISPOSITION AND DISPOSAL OF EXCESS AND UNSUITABLE MATERIALS: ALL MATERIALS TO BE REMOVED FROM THE SITE INCLUDED BUT NOT LIMITED TO EXCESS MATERIAL AND UNSUITABLE MATERIALS SUCH AS CONCRETE, ASPHALT, LARGE ROCKS, REFUSE, AND OTHER DEBRIS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OUTSIDE THE LIMITS OF THE PROJECT. CONTRACTOR SHALL ALSO COMPLY WITH ALL APPLICABLE LAWS GOVERNING SPILLAGE OF DEBRIS WHILE TRANSPORTING TO A DISPOSAL SITE. COSTS ASSOCIATED WITH THE DISPOSAL OF EXCESS AND UNSUITABLE MATERIALS SHALL BE INCLUDED IN THE CONTRACT AMOUNT.
35. RECORD DRAWINGS: THE CONTRACTOR SHALL MAINTAIN AN ACCURATE RECORD OF THE INSTALLATION OF ALL MATERIALS AND SYSTEM COVERED BY THE PROJECT CONTRACT DOCUMENTS. THE COMPLETE SET OF "RECORD DRAWINGS" MUST BE DELIVERED TO THE OWNER AND/OR ENGINEER BEFORE REQUESTING FINAL PAYMENT.

GRADING NOTES

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH PROVISIONS OUTLINED IN F.H.A. DATA SHEET 79G AND/OR THE SPECIFICATIONS PREPARED BY THE SOILS ENGINEER.

36. *ALL CLAY SOIL USED AS FILL SHOULD BE COMPACTED TO AT LEAST 95% AND NOT EXCEEDING 105 PERCENT OF STANDARD PROCTOR DENSITY AS DETERMINED BY A.S.T.M. D-698. THE COMPACTED MOISTURE CONTENT OF THE CLAYS DURING PLACEMENT SHOULD BE AT LEAST OPTIMUM AND NOT EXCEEDING FIVE (5) PERCENTAGE POINTS ABOVE OPTIMUM.
37. *LIMESTONE OR OTHER ROCK-LIKE MATERIALS USED AS FILL SHOULD BE COMPACTED TO AT LEAST 95 PERCENT AND NOT EXCEEDING 105 PERCENT OF STANDARD PROCTOR DENSITY AS DETERMINED BY A.S.T.M. D-698/ THE COMPACTED MOISTURE CONTENT DURING PLACEMENT SHOULD BE WITHIN PLUS OR MINUS THREE (3) PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT. NO ROCK LARGER THAN SIX INCHES IN ITS GREATEST DIMENSION SHALL BE USED IN FILL WHEN THE FILL IS PLACED UNDER PADS, STREETS OR ANY OTHER AREAS THAT WILL HAVE ANY TYPE OF STRUCTURES.
38. COMPACTION SHOULD BE ACCOMPLISHED BY PLACING THE FILL IN SIX INCH THICK LOOSE LIFTS AND COMPACTING EACH LIFT TO AT LEAST THE SPECIFIED MINIMUM DRY DENSITY. PARTICLE SIZES USED IN FILL SHALL BE LESS THAN SIX (6) INCHES DIAMETER.
39. GRADING CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OFF-SITE OF ALL EXCAVATED AND CLEARED MATERIAL, WHICH SOILS LAB DECLARES UNSUITABLE FOR USE ON-SITE.
40. CONTRACTOR TO SLOPE THE ADJACENT GROUND AWAY FROM BUILDING PAD TO ACHIEVE POSITIVE SURFACE DRAINAGE.
41. INITIAL SITE GRADING SHALL BE COMPLETED TO A TOLERANCE OF PLUS OR MINUS ONE TENTH OF ONE FOOT IN STREETS AND PLUS OR MINUS THREE TENTHS OF ONE FOOT FOR THE BUILDING PADS. FINAL BUILDING PAD GRADING, TO BE DONE UPON COMPLETION OF PAVING AND UTILITY FACILITIES, SHALL BE PROVIDED TO A TOLERANCE OF PLUS OR MINUS TWO TENTHS OF ONE FOOT AT ALL FOUR CORNERS AND CENTER OF BUILDING PAD, IN ALL SWALES, AND LOT CORNERS.
42. CONTRACTOR SHALL REPLACE ANY EROSION CONTROL MATERIALS AT THE END OF EACH WORK DAY IF SAID MATERIALS WERE REMOVED DURING THE DAY FOR EASE OF CONSTRUCTION OR ACCESS.
43. IF ROCK IS ENCOUNTERED IN THE STREET SUBGRADE, THE ROCK SHALL BE EXCAVATED TO A DEPTH OF SIX INCHES, REMOVED FROM THE STREET, AND NON-ROCK MATERIAL SHALL BE REPLACED FOR THE STREET SUBGRADE. ROCK IN THE STREET PARKWAYS SHALL BE REMOVED AND REPLACED WITH SIX INCHES OF TOP SOIL. THIS SHALL BE ACCOMPLISHED BY THE EXCAVATION CONTRACTOR, SUBSIDIARY TO THIS CONTRACT.
44. NO PART OF ANY RETAINING WALL SHALL BE WITHIN CITY RIGHT-OF-WAY, OR CITY PROPERTY (I.E. PARK) INCLUDING FOOTING.

* APPLIES TO ALL AREAS OUTSIDE OF PUBLIC R.O.W. ONLY. REFER TO PAVING GENERAL CONSTRUCTION NOTES FOR DENSITY/MOISTURE REQUIREMENTS IN R.O.W.

PAVING NOTES

1. UTILITY DATA IS PROVIDED FOR INFORMATION ONLY. ALTHOUGH THIS DATA IS SHOWN AS ACCURATELY AS POSSIBLE, THE CONTRACTOR IS CAUTIONED THAT THE OWNER AND THE ENGINEER NEITHER ASSUMES NOR IMPLIES ANY RESPONSIBILITY FOR THE ACCURACY OF THIS DATA.
2. CONTRACTOR WILL BE RESPONSIBLE FOR FIELD VERIFYING THE LOCATION AND ELEVATION OF EXISTING UTILITIES PRIOR TO HIS OPERATIONS.
3. SEE UTILITY PLANS FOR LOCATION OF WATER LINES, SANITARY SEWER LINES, STORM DRAINS, AND UTILITY CROSSING.
4. ALL MATERIAL AND CONSTRUCTION SHALL CONFORM TO APPLICABLE CITY STANDARD SPECIFICATIONS AND CONSTRUCTION DETAILS.
5. ALL FILL SHALL BE COMPACTED AS SPECIFIED IN THE GEOTECHNICAL REPORT. DENSITY TEST RESULTS WILL BE REQUIRED AT THE PRE-CONSTRUCTION MEETING FOR ALL FILL AREAS IN EXCESS OF 2.0' UNDERNEATH PROPOSED PAVING.
6. STREET CURB RADII AT STREET INTERSECTIONS SHALL BE 20' (MEASURED FROM BACK OF CURB) UNLESS OTHERWISE NOTED. ALL PAVING DIMENSIONS ARE TO BACK OF CURB, UNLESS OTHERWISE NOTED.
7. TYPICAL PAVEMENT SECTION IS TO TRANSITION FROM CROWN SECTION TO TRANSVERSE SECTION WITHIN A DISTANCE OF 50' OF WHERE A VALLEY GUTTER CROSSES A STREET INTERSECTION.
8. SEE PAVEMENT CONSTRUCTION DETAILS SHEET FOR PAVEMENT SECTIONS AND CONSTRUCTION DETAILS.
9. BLUE REFLECTOR TO BE INSTALLED 1.0' OFFSET FROM CENTERLINE OF STREET ON FIRE HYDRANT SIDE, FOR PURPOSES OF QUICK HYDRANT LOCATION AT NIGHT.

STORM DRAIN NOTES

1. WATER AND SANITARY SEWER LINES ARE SHOWN FOR REFERENCE ONLY. REFER TO WATER AND SANITARY SEWER PLANS FOR EXACT LOCATION.
2. ALL STORM DRAIN LINES TO BE R.C.P. CLASS III UNLESS OTHERWISE NOTED.
3. ALL CURVED STORM DRAIN IS TO BE CONSTRUCTED WITH RADIUS PIPE OR IS TO BE DEFLECTED AT JOINTS (PER MANUFACTURER'S SPECIFICATIONS) AND GROUTED AS NECESSARY. IT SHALL BE THE CONTRACTOR'S OPTION AS TO WHICH METHOD TO USE (NO SEPARATE PAY).
4. ALL AREA DISTURBED BY CHANNEL EXCAVATION SHALL BE RE-VEGETATED AS SET FORTH IN THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) WHICH WAS PREPARED SPECIFICALLY FOR THIS PROJECT, OR OTHERWISE PROTECTED AGAINST EROSION BY THE USE OF RIP-RAP, GABIONS, OR GEOTEXTILES.

EROSION & SEDIMENT CONTROL NOTES

1. CONTRACTOR SHALL COMPLY WITH ALL STATE AND LOCAL ORDINANCES THAT APPLY.
2. LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY THE GOVERNING AUTHORITIES AND ALL PERIMETER EROSION CONTROL DEVICES HAVE BEEN INSTALLED.
3. THIS EROSION CONTROL PLAN IS A SUPPLEMENT TO THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) PREPARED BY OTHERS. REFER TO THE SWPPP FOR ADDITIONAL REQUIREMENTS.
4. THE GENERAL CONTRACTOR, AS THE TCEQ DEFINES "OPERATOR," SHALL PERFORM ALL REQUIRED INSPECTIONS OF STORM WATER CONTROLS AND PRACTICES AT FREQUENCIES OUTLINED IN THE TPDES GENERAL PERMIT AND SHALL FILL OUT APPROPRIATE INSPECTION FORMS (AS PROVIDED IN THE SWPPP) UNLESS OTHERWISE DIRECTED BY THE OWNER.
5. THE GENERAL CONTRACTOR (AND ALL SUBCONTRACTORS INVOLVED WITH ANY CONSTRUCTION ACTIVITIES RELATED TO EARTHWORK, EROSION CONTROL, ETC. OR WHICH UTILIZE POSSIBLE POLLUTANTS AS DEFINED IN THE TPDES GENERAL PERMIT) SHALL REVIEW AND ADHERE TO THE SWPPP FOR THE PROJECT, AS WELL AS ALL THE TCEQ REQUIREMENTS SET FORTH IN THE TPDES GENERAL PERMIT.
6. ADDITIONAL EROSION CONTROL DEVICES AND/OR ADJUSTMENT OF LOCATIONS FOR EROSION CONTROL MAY BE IMPLEMENTED BY THE CONTRACTOR AT HIS DISCRETION AND/OR IN THE OPINION OF THE CITY INSPECTOR, AT NO ADDITIONAL EXPENSE TO THE OWNER. THE ADDITION OR DELETION OF ANY EROSION CONTROL MEASURE MAY REQUIRE THAT THE SWPPP BE MODIFIED IN ACCORDANCE WITH THE TCEQ'S TPDES GENERAL PERMIT GUIDELINES.
   a. EXCAVATION CONTRACTOR TO BE RESPONSIBLE FOR INSTALLATION OF SILT BARRIERS, CHECK DAMS, AND CONSTRUCTION ENTRANCE/EXIT.
   b. UTILITY CONTRACTOR (WATER, SEWER & STORM DRAIN) TO BE RESPONSIBLE FOR INSTALLATION OF STAGE 1 AND STAGE 2 INLET PROTECTION.
   c. OWNER TO BE RESPONSIBLE FOR SEEDING AND FINAL REMOVAL OF EROSION CONTROLS.
7. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL EROSION CONTROL DEVICES ALREADY IN PLACE. CONTRACTOR SHALL REMOVE AND REPLACE EROSION CONTROL AS NEEDED FOR CONSTRUCTION OR ACCESS. ALL EROSION CONTROL MUST BE IN PLACE AT THE END OF EACH DAY.
8. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO USE WHATEVER MEANS ARE NECESSARY TO CONTROL AND LIMIT SILT AND SEDIMENT LEAVING THE SITE. SPECIFICALLY, THE CONTRACTOR SHALL PROTECT ALL PUBLIC STREETS, ALLEYS, STREAMS, STORM DRAIN SYSTEMS, INLETS, AND ADJACENT PROPERTY FROM EROSION DEPOSITS. THE CONTRACTOR SHALL ASSUME LIABILITY FOR DAMAGE TO ADJACENT PROPERTIES AND/OR PUBLIC RIGHT OF WAY RESULTING FROM FAILURE TO FULLY IMPLEMENT AND EXECUTE ALL EROSION CONTROL PROCEDURES SHOWN AND NOTED IN THESE PLANS AND THE SWPPP.
9. ALL EROSION CONTROL DEVICES TO BE INSPECTED, CLEANED, AND/OR REPLACED AFTER EACH STORM.
10. USE OF ON-SITE FUEL STORAGE TANKS IS DISCOURAGED. HOWEVER, IF USED, THE PREVENTION OF HAZARDS TO THE GROUND WATER IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR UTILIZING SAID STORAGE. SEE N.C.T.C.O.G. CONSTRUCTION BMP MANUAL SECTION 4 – HAZARDOUS WASTE MANAGEMENT.
11. A CENTRALIZED PIT/WASH BASIN SHALL BE CONSTRUCTED ON-SITE FOR THE PURPOSE OF CONCRETE TRUCK WASHING. SEE N.C.T.C.O.G. CONSTRUCTION BMP MANUAL SECTION 4 – CONCRETE WASTE MANAGEMENT.
12. CONTRACTORS SHALL PARK, STORE EQUIPMENT AND MATERIALS AND SERVICE VEHICLES AT THE "PARKING AND STORAGE AREA". THE LOCATION OF SAID AREA IS TO BE APPROVED BY THE OWNER OR HIS REPRESENTATIVE.
13. CONSTRUCTION ENTRANCES ARE TO BE INSTALLED AT ALL POINTS WHERE EQUIPMENT ENTERS OR LEAVES THE SITE. THE LOCATION OF SAME IS TO BE APPROVED BY THE OWNER OR HIS REPRESENTATIVE.
14. EROSION CONTROLS TO REMAIN IN PLACE AND TO BE MAINTAINED UNTIL DISTURBED AREAS ARE STABILIZED.
15. EROSION CONTROL MEASURES MAY ONLY BE PLACED IN FRONT OF INLET OR IN CHANNELS, DRAINAGEWAYS OR BORROW DITCHES AT RISK OF CONTRACTOR. CONTRACTOR SHALL REMAIN LIABLE FOR ANY DAMAGE CAUSED BY MEASURES, INCLUDING FLOOD DAMAGE WHICH MAY OCCUR DUE TO BLOCKED DRAINAGE AT THE CONCLUSION OF ANY PROJECT. ALL CHANNELS, DRAINAGEWAYS AND BORROW DITCHES IN THE WORK ZONE SHALL BE DREDGED OF ANY SEDIMENT GENERATED BY THE PROJECT AS A RESULT OF EROSION CONTROL MEASURES.
16. ALL WASH WATER SHALL BE DISPOSED OF IN A MANNER THAT PREVENTS CONTACT BETWEEN WASH WATER POLLUTANTS AND STORM RUNOFF DISCHARGED FROM THIS SITE.
17. DISTURBED AREAS ON THE SITE WHERE CONSTRUCTION ACTIVITY HAS CEASED FOR AT LEAST 14 DAYS SHALL BE TEMPORARILY PLANTED AND/OR SEEDED AND WATERED.
18. DISTURBED AREAS ON THE SITE WHERE CONSTRUCTION ACTIVITY HAS PERMANENTLY CEASED AND AREAS WHERE FINAL GRADE HAS BEEN ACHIEVED SHALL BE PERMANENTLY PLANTED AND/OR SEEDED WITHIN 14 DAYS.
19. PLANTING AND/OR SEEDING OF VEGETATED AREAS TO ACCOMPLISH STABILIZATION SHALL BE PERFORMED IN ACCORDANCE WITH THE LANDSCAPING PLAN. AREAS BEYOND THE LIMITS OF THE LANDSCAPING PLAN (OR WHEN A LANDSCAPING PLAN DOES NOT EXIST) SHALL BE HYDROMULCHED WITH HIGHWAY MIX AND WATERED WITH TEMPORARY ABOVE GROUND IRRIGATION UNTIL THE VEGETATION IS ESTABLISHED.
20. THE CONTRACTOR SHALL REMOVE ALL ACCUMULATED SILT IN ANY STORM SEWER INLETS AND PIPES, AND ALONG SILT FENCES, WITHIN 48 HOURS AFTER INSPECTIONS OF DEVICES REVEALS THE PRESENCE OF EXCESS SILTATION.
21. SILT FENCES SHALL BE PLACED AROUND STOCKPILES USED ON THE SITE.
22. THE CONTRACTOR SHALL MODIFY THIS PLAN TO SHOW LOCATIONS OF TEMPORARY WASHDOWN AREA, PORTABLE TOILETS, EQUIPMENT MAINTENANCE/REPAIR AREAS, STOCKPILE AREAS, FUEL STORAGE AREAS, ETC. AND POLLUTANT CONTROLS FOR EACH.

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

GENERAL CONSTRUCTION NOTES

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 2

Date: April 21, 2023, 2:12 PM – User ID: AROSCOE
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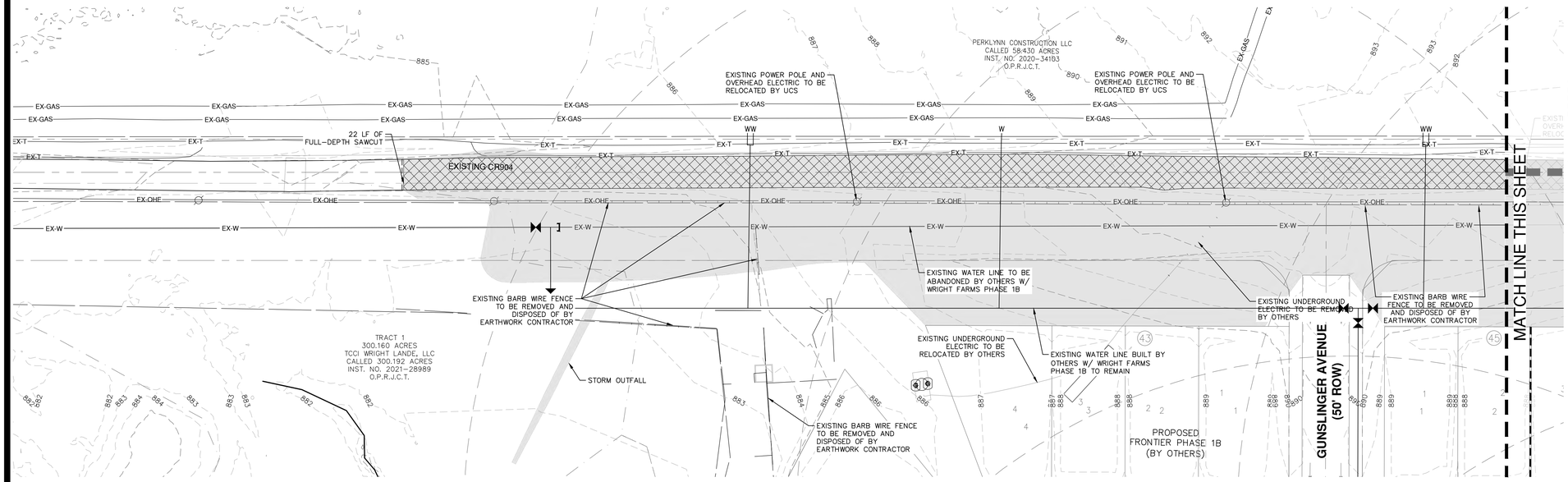

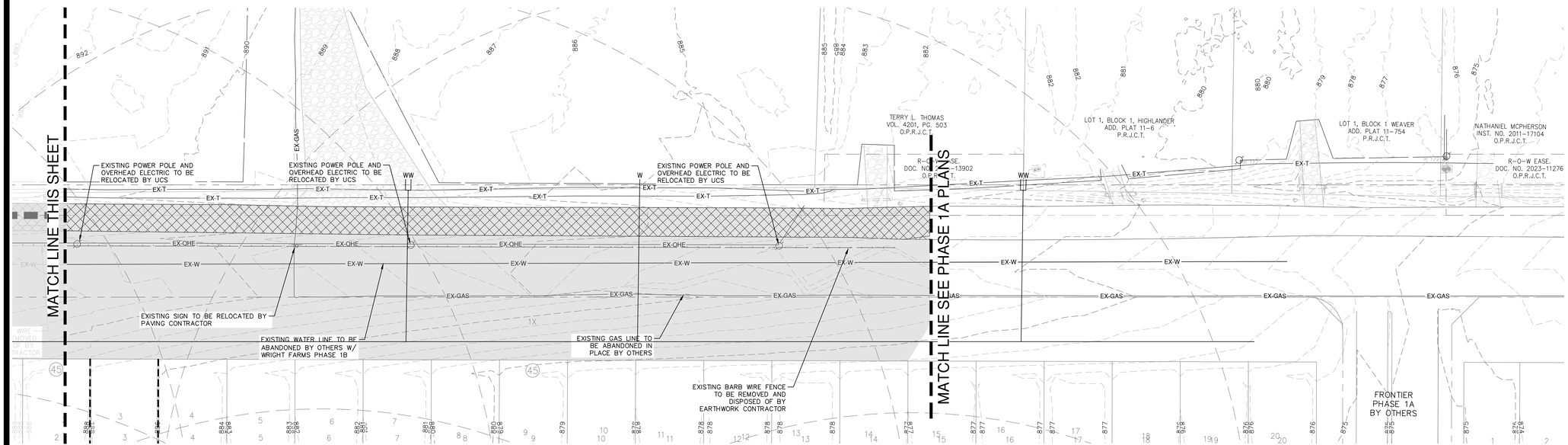

SCALE: 1" = 40'

0' 40' 80' 120'

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HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- 700 — EXISTING CONTOUR
- AREA OF DISTURBANCE
- DEMOLITION OF EXISTING CR 904
- REMOVE EXISTING FENCE OR UTILITIES

UTILITY NOTE

THE EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED FROM VARIOUS SOURCES AND ARE INTENDED TO SHOW THE GENERAL EXISTENCE AND LOCATION OF THE UTILITY INFORMATION ON THE PLANS. THE CONTRACTOR SHALL CONTACT A UTILITY LOCATING SERVICE 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND OF ALL EXISTING UTILITIES AND DETERMINE IF THERE ARE ANY CONFLICTS WITH THE PROPOSED FACILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY WHEN CONFLICTS WITH EXISTING UTILITIES ARE DISCOVERED.

NO.	REVISION	DATE

STATE OF TEXAS
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COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

DEMOLITION PLAN

PLAT NO.	N/A
JOB NO.	61405-03
DATE	1/28/2025
DESIGNER	CL
CHECKED	AR
DRAWN	SM
SHEET	3

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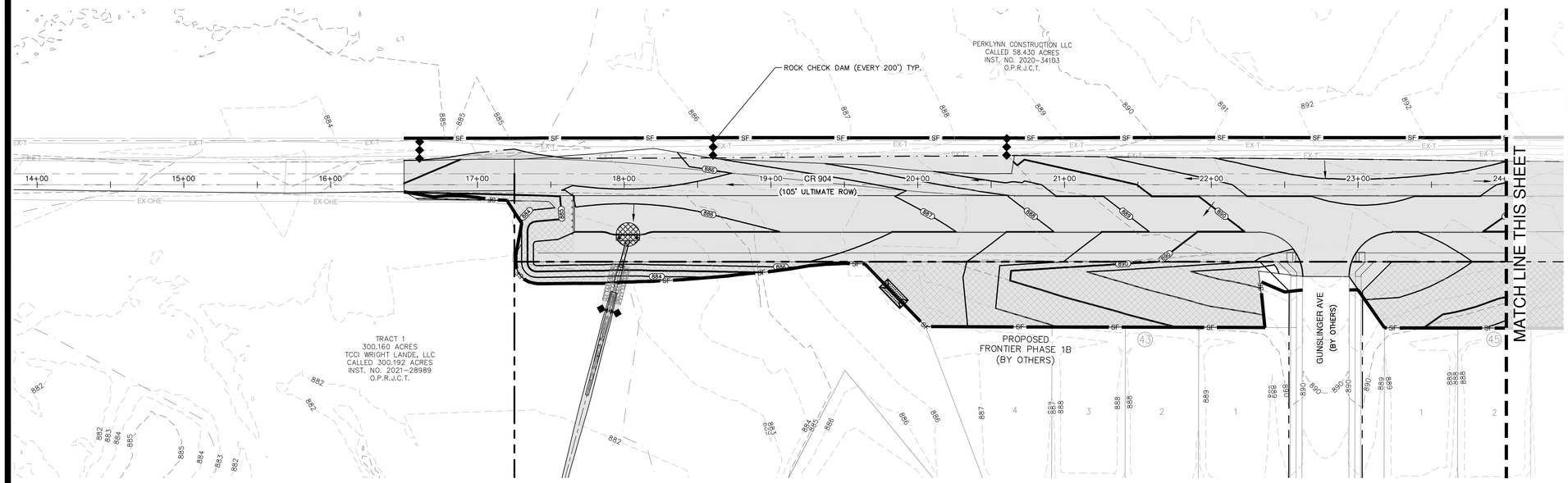

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0' 40' 80' 120'

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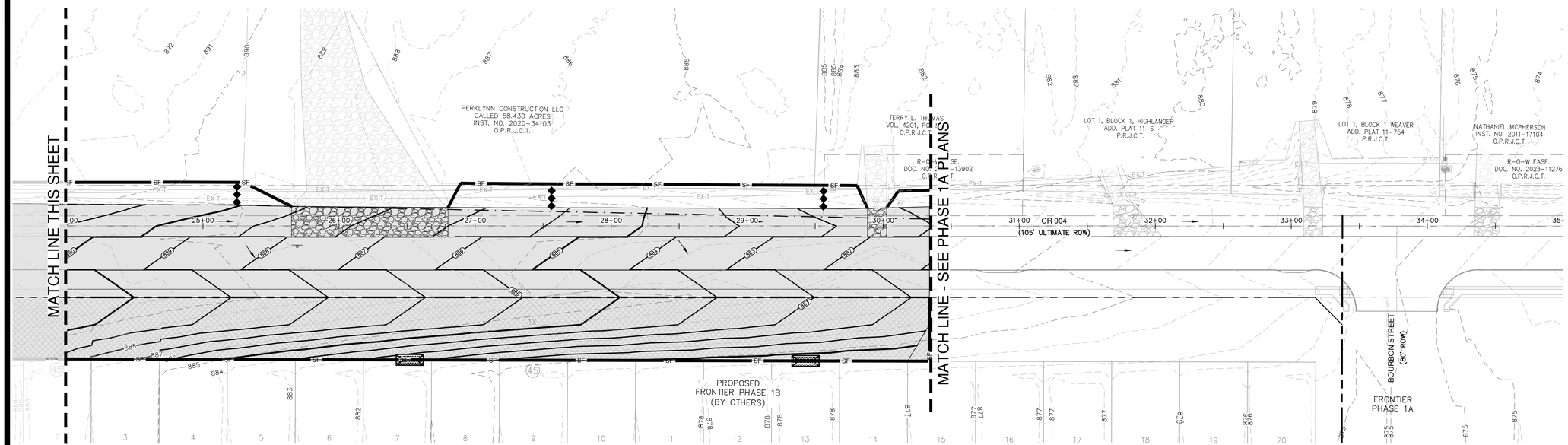
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- FLOW ARROW
- SILT FENCE
- LIMITS OF DISTURBANCE
- INLET PROTECTION
- CONSTRUCTION ENTRANCE
- ROCK CHECK DAM
- STONE OVERFLOW STRUCTURE
- SLOPE STABILIZATION BLANKET
- GRAVEL PAVEMENT



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COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

EROSION CONTROL PLAN

PLAT NO. N/A
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DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 4

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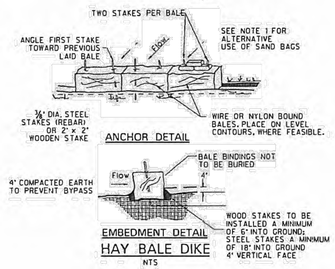
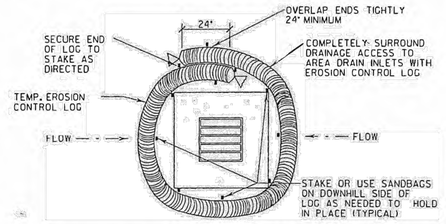
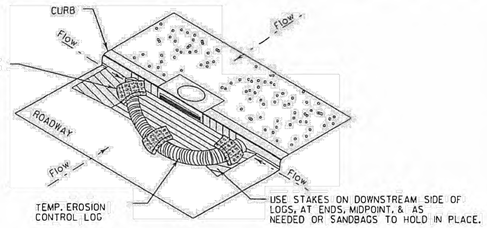


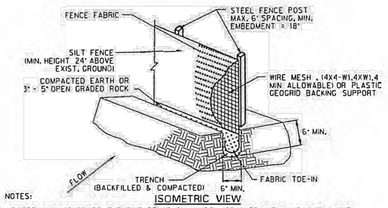


EROSION CONTROL LOG AT DROP INLET



EROSION CONTROL LOG AT CURB INLET

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'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.

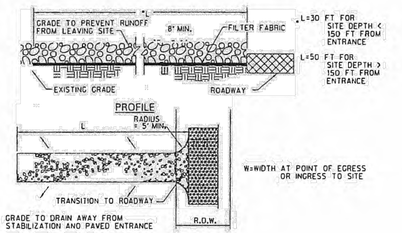


ISOMETRIC VIEW

GENERAL NOTES:

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED WITH A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 18".
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE, AS NECESSARY, TO PREVENT FLOW UNDER FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO BACKING SUPPORT, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. FABRIC SHALL OVERLAP AT ABUTTING ENDS A MINIMUM OF 3 FEET AND SHALL BE JOINED SUCH THAT NO BYPASS OR LEAKAGE OCCURS.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

SILT FENCE DETAILS
NTS

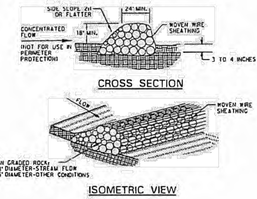


PLAN VIEW

GENERAL NOTES

1. THE ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
2. STONE SHALL BE 3 TO 5 INCH DIAMETER CRUSHED ROCK OR ACCEPTABLE CRUSHED PORTLAND CEMENT CONCRETE

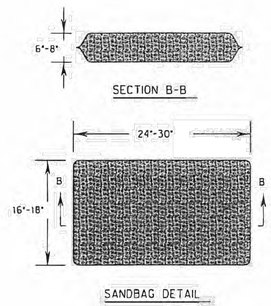
STABILIZED CONSTRUCTION ENTRANCE
NTS



GENERAL NOTES:

1. WOVEN WIRE SHEATHING SHALL HAVE MAXIMUM OPENING OF 6" SQUARE AND A MINIMUM WIRE SIZE OF 20 GAUGE AND SHALL BE SECURED WITH SHOAT RINGS.
2. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN AND SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION PROPERLY.
3. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD OF THE HEIGHT OF THE BERM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.
4. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

ROCK BERM DETAILS
NTS



CITY OF CLEBURNE

EROSION CONTROL DETAILS

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

EROSION CONTROL DETAILS (1)

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 5

Date: April 21, 2023, 2:15 PM - User ID: AROSCOE
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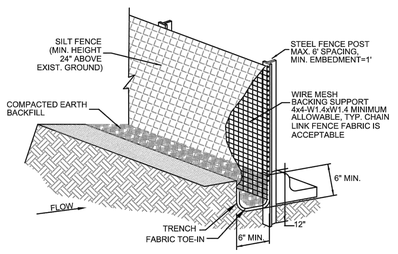
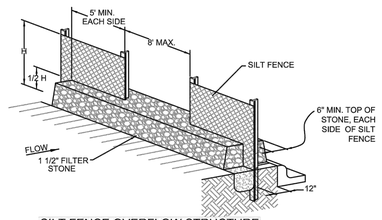


ISOMETRIC PLAN VIEW

N.T.S.



SILT FENCE OVERFLOW STRUCTURE

N.T.S.

FIGURE 3.28 STANDARD CONSTRUCTION DETAIL - FOR SILT FENCE (1 OF 2)

SILT FENCE GENERAL NOTES:

1. DESIGN SHALL SHOW ON THE DRAWINGS THE LOCATIONS WHERE OVERFLOW STRUCTURES SHALL BE INSTALLED. OVERFLOW STRUCTURES ARE REQUIRED AT ALL LOW POINTS AND AT A SPACING OF APPROXIMATELY 300 FEET WHERE NO LOW POINT IS APPARENT.

2. DESIGNER SHALL SHOW ON THE DRAWINGS THE LOCATIONS WHERE SILT FENCE IS TO BE TURNED UPSLOPE AT THE ENDS. UPSLOPE LENGTHS SHALL BE A MINIMUM OF 10 FEET.

3. POST WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF ONE FOOT.

4. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.

5. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.

6. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH SUPPORT POST OR TO WIRE BACKING, WHICH IN TURN IS ATTACHED TO THE FENCE POST. THERE SHALL BE A 3 FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.

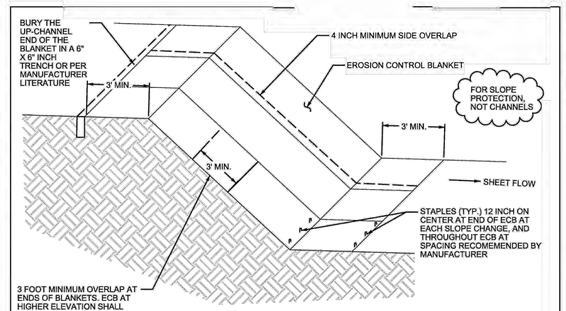
7. INSPECTION SHALL BE AS SPECIFIED IN THE SWPPP. REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

8. SILT FENCE SHALL BE REMOVED WHEN FINAL STABILIZATION IS ACHIEVED OR ANOTHER EROSION OR SEDIMENT CONTROL DEVICE IS EMPLOYED.

9. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF HALF THE HEIGHT OF THE FENCE. THE SILT SHALL BE DISPOSED OF AT AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

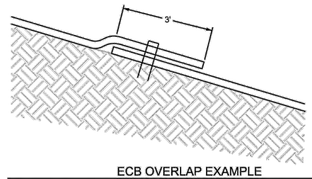
10. SEE NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.5

FIGURE 3.28 NOTES FOR SILT FENCE (2 OF 2)



ECB ISOMETRIC PLAN VIEW

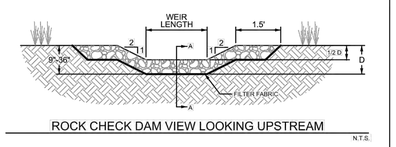
N.T.S.



ECB OVERLAP EXAMPLE

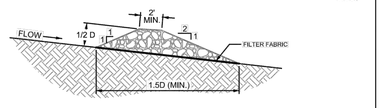
N.T.S.

FIGURE 2.7 STANDARD CONSTRUCTION DETAIL - TEMPORARY EROSION CONTROL BLANKETS (1 OF 2)



ROCK CHECK DAM VIEW LOOKING UPSTREAM

N.T.S.



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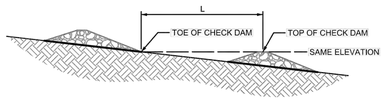

SPACE BETWEEN ROCK CHECK DAMS

N.T.S.

NOTES:
ACTUAL DIMENSIONS OF THE CHECK DAMS SHALL BE DESIGNED BASED ON FLOW CONDITIONS IN THE DRAINAGE SWALE OR DITCH. PROVIDE CALCULATIONS THAT DOCUMENT THE FOLLOWING PARAMETERS USED TO DESIGN THE CHECK DAM.

-HEIGHT OF CHECK DAMS (D) BASED ON SWALE OR DITCH DIMENSIONS AND FLOW CONDITIONS

-SPACING OF CHECK DAMS BASED ON GRADE OF THE SWALE OR DITCH. TOP OF DOWNSTREAM DAM SHALL BE AT THE SAME ELEVATION AS TOE OF UPSTREAM DAM

FIGURE 2.1 STANDARD CONSTRUCTION DETAIL - ROCK CHECK DAMS (1 OF 2)

ROCK CHECK DAM GENERAL NOTES:

1. SEE NCTCOG STANDARD SPECIFICATIONS (2017), SECTION 202.9 CHECK DAM (ROCK).

2. STONE SHALL BE WELL GRADED WITH SIZE RANGE FROM 1 1/2 TO 3 1/2 INCHES IN DIAMETER DEPENDING ON EXPECTED FLOWS.

3. THE CHECK DAM SHALL BE INSPECTED AS SPECIFIED IN THE SWPPP AND SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD OF THE HEIGHT OF THE CHECK DAM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF PROPERLY.

5. WHEN THE SITE HAS ACHIEVED FINAL STABILIZATION OR ANOTHER EROSION OR SEDIMENT CONTROL DEVICE IS EMPLOYED, THE CHECK DAM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

FIGURE 2.1 NOTES ON ROCK CHECK DAM (2 OF 2)

EROSION CONTROL BLANKETS GENERAL NOTES:

1. SEE NCTCOG STANDARD SPECIFICATIONS (2017) SECTION 202.15.

2. PRIOR TO THE INSTALLATION OF ANY EROSION CONTROL BLANKETS, ALL ROCKS, DIRT CLODS, STUMPS, ROOTS, TRASH AND ANY OTHER OBSTRUCTIONS THAT WOULD PREVENT THE BLANKET FROM LYING IN DIRECT CONTACT WITH THE SOIL SHALL BE REMOVED. ANCHOR TRENCHING SHALL BE LOCATED ALONG THE ENTIRE PERIMETER OF THE INSTALLATION AREA, EXCEPT FOR SMALL AREAS WITH LESS THAN 2% SLOPE.

3. INSTALLATION AND ANCHORING SHALL CONFORM TO THE RECOMMENDATIONS SHOWN WITHIN THE MANUFACTURER'S PUBLISHED LITERATURE FOR THE APPROVED EROSION CONTROL BLANKET. PARTICULAR ATTENTION MUST BE PAID TO JOINTS AND OVERLAPPING MATERIAL.

4. IN ABSENCE OF MANUFACTURE'S LITERATURE, A MINIMUM 11-GUAGE WIRE STAPLES, 6-INCHES IN LENGTH AND 1-INCH WIDTH WILL BE USED.

5. AFTER APPROPRIATE INSTALLATION, THE BLANKETS SHOULD BE CHECKED FOR UNIFORM CONTACT WITH THE SOIL, SECURITY OF THE LAP JOINTS, AND FLUSHNESS OF THE STAPLES WITH THE GROUND.

6. INSPECTION SHALL BE AS SPECIFIED IN THE SWPPP.

FIGURE 2.7 NOTES ON TEMPORARY EROSION CONTROL BLANKETS (2 OF 2)

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EROSION CONTROL DETAILS (2)

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Date: April 21, 2023, 2:15 PM - User ID: AROSCOE
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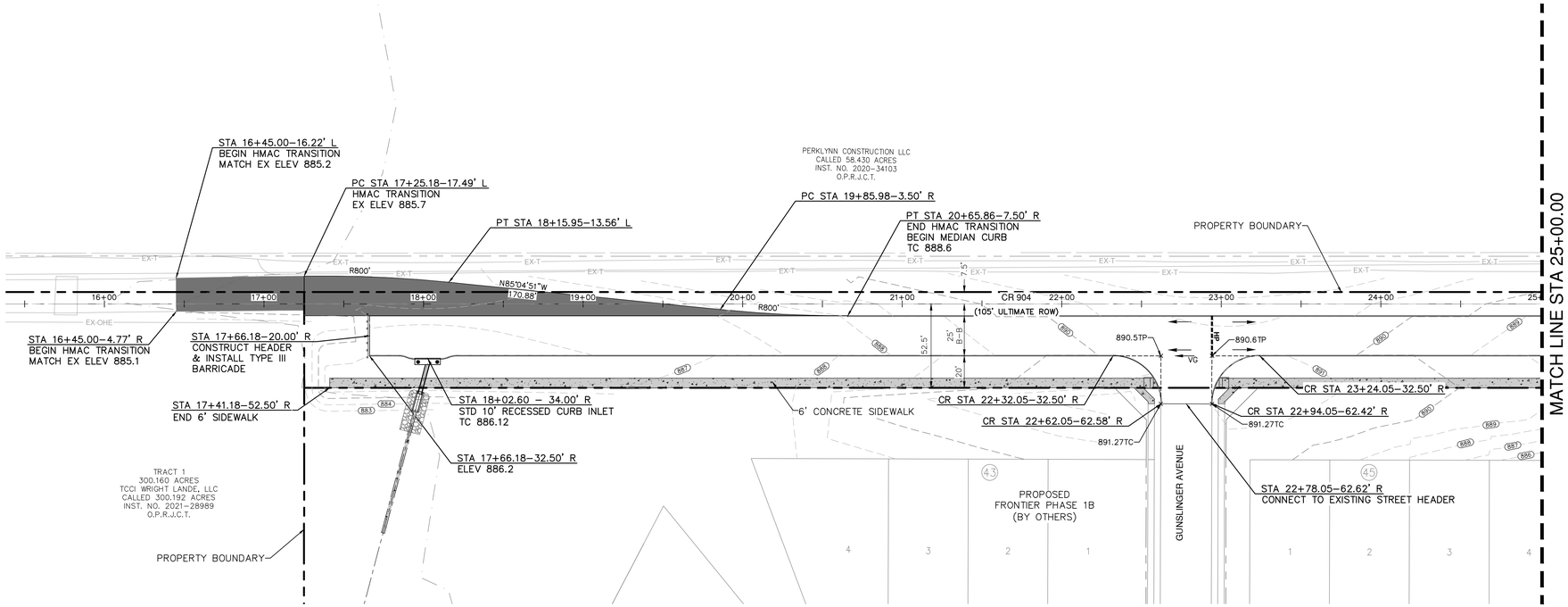
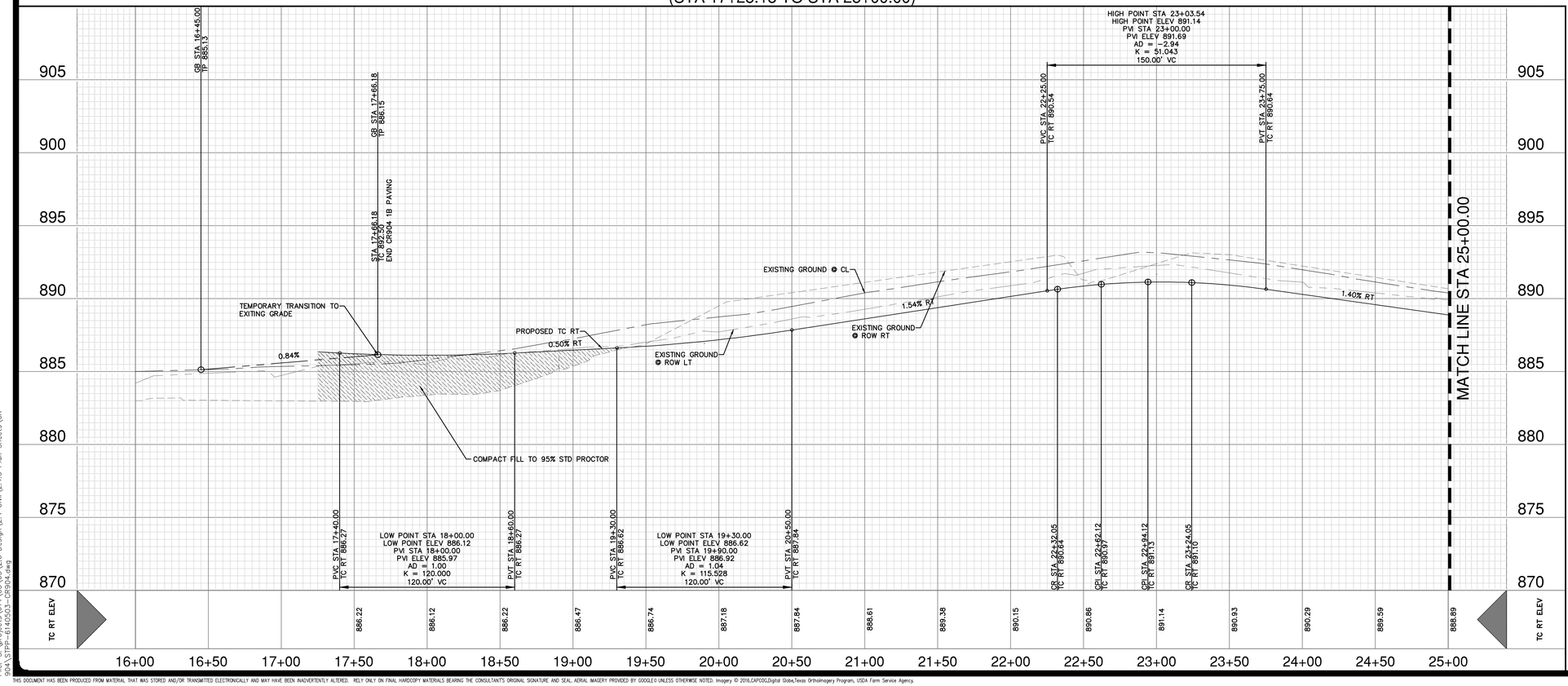
ISSUED FOR CONSTRUCTION SET



DESIGN SPEED 40 MPH
COUNTY ROAD 904
(STA 17+25.18 TO STA 25+00.00)

HORIZ. SCALE: 1" = 40'
VERT. SCALE: 1" = 4'



NOTES

1. ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE AND WILL BE CONFIRMED BY CONTRACTOR PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL PROTECT ALL EXISTING TREES, FENCES, RETAINING WALLS AND STRUCTURES UNLESS OTHERWISE NOTED.
3. ALL CURB RADII SHALL BE 30' TO BACK OF CURB UNLESS OTHERWISE NOTED.
4. SIDEWALK/TRAILS IN COMMON AREAS SHALL BE BUILT AT TIME OF PUBLIC IMPROVEMENTS.
5. CONCRETE PAVEMENT SHALL BE MACHINE PLACED EITHER BY MECHANICAL VIBRATORY SCREED OR SLIP FORM PAVER UNLESS OTHERWISE APPROVED BY CITY.
6. AT LEAST SIX (6) INCHES OF FLEXIBLE BASE MATERIAL TO BE INSTALLED FOR THE GRAVEL PRIVATE DRIVEWAYS. PRIOR TO PLACEMENT OF THE FLEXIBLE BASE MATERIAL, THE EXPOSED SUBGRADE SHOULD BE SCARIFIED TO A DEPTH OF AT LEAST 6 INCHES AND COMPACTED TO AT LEAST 95 PERCENT OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D 698) AND WITHIN THE RANGE OF 0 TO 4 PERCENTAGE POINTS ABOVE THE MATERIAL'S OPTIMUM MOISTURE CONTENT. (UES REPORT NO. W232725–2–REV1, 01/22/25)

UTILITY NOTE

THE EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED FROM VARIOUS SOURCES AND ARE INTENDED TO SHOW THE GENERAL EXISTENCE AND LOCATION OF THE UTILITY INFORMATION ON THE PLANS. THE CONTRACTOR SHALL CONTACT A UTILITY LOCATING SERVICE 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND OF ALL EXISTING UTILITIES AND DETERMINE IF THERE ARE ANY CONFLICTS WITH THE PROPOSED FACILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY WHEN CONFLICTS WITH EXISTING UTILITIES ARE DISCOVERED.

SCALE: 1"= 40'

0' 40' 80' 120'

	CP#1	CP#2	CP#3	CP#4	CP#5
	HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
	N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
	E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
	ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- PROPOSED CONCRETE SIDEWALK BY DEVELOPER (THIS CONTRACT)
- PROPOSED ASPHALT PAVEMENT (THIS CONTRACT)
- VG — VALLEY GUTTER
- GRAVEL PAVEMENT

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

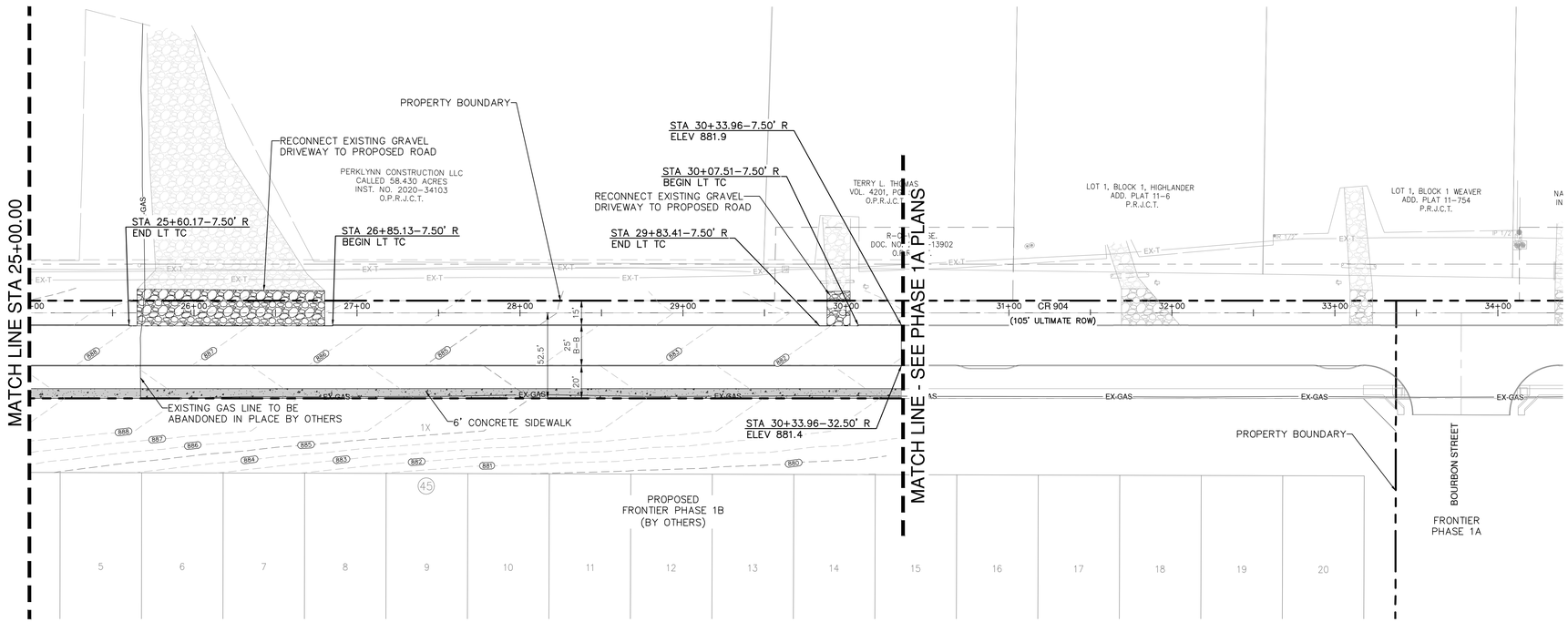
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

PAVING PLAN & PROFILE - COUNTY ROAD 904 (1)

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 7

Date: April 21, 2023, 2:16 PM – User ID: AROSCOE
File: S:\projects\614\05\03\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\CR 904 STPP - 61405-03-SHEET.dwg

ISSUED FOR CONSTRUCTION SET



DESIGN SPEED 40 MPH
COUNTY ROAD 904
(STA 25+00.00 TO END)

SCALE: 1"= 40'

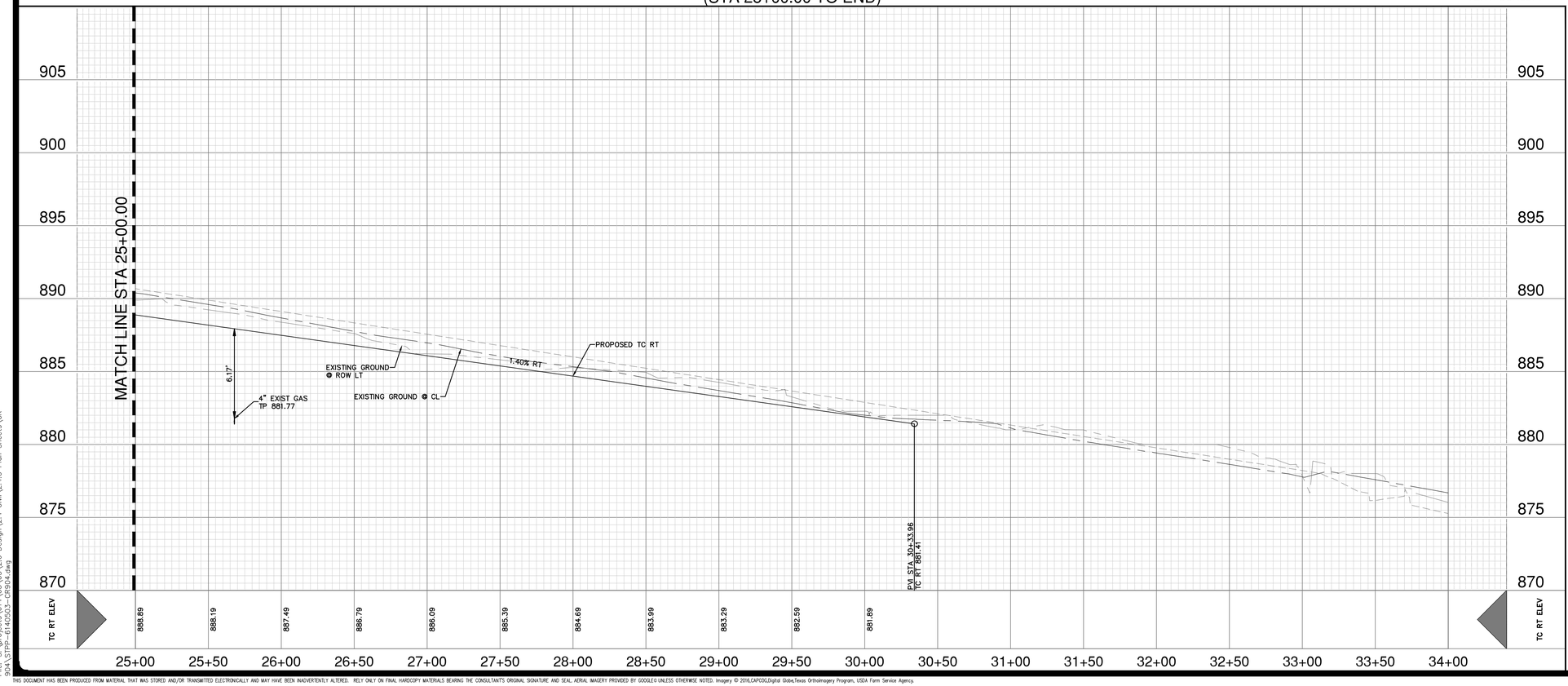
0' 40' 80' 120'

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- PROPOSED CONCRETE SIDEWALK BY DEVELOPER (THIS CONTRACT)
- VG — VALLEY GUTTER
- GRAVEL PAVEMENT

HORIZ. SCALE: 1" = 40'
VERT. SCALE: 1" = 4'



NOTES

1. ALL EXISTING UTILITY LOCATIONS ARE APPROXIMATE AND WILL BE CONFIRMED BY CONTRACTOR PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL PROTECT ALL EXISTING TREES, FENCES, RETAINING WALLS AND STRUCTURES UNLESS OTHERWISE NOTED.
3. ALL CURB RADII SHALL BE 30' TO BACK OF CURB UNLESS OTHERWISE NOTED.
4. SIDEWALK/TRAILS IN COMMON AREAS SHALL BE BUILT AT TIME OF PUBLIC IMPROVEMENTS.
5. CONCRETE PAVEMENT SHALL BE MACHINE PLACED EITHER BY MECHANICAL VIBRATORY SCREED OR SLIP FORM PAVER UNLESS OTHERWISE APPROVED BY CITY.
6. CONTRACTOR TO TURNDOWN CURB AND CONNECT TO EXISTING DRIVEWAY LOCATIONS (SEE DETAIL ON SHEET 19)
7. AT LEAST SIX (6) INCHES OF FLEXIBLE BASE MATERIAL TO BE INSTALLED FOR THE GRAVEL PRIVATE DRIVEWAYS. PRIOR TO PLACEMENT OF THE FLEXIBLE BASE MATERIAL, THE EXPOSED SUBGRADE SHOULD BE SCARIFIED TO A DEPTH OF AT LEAST 6 INCHES AND COMPACTED TO AT LEAST 95 PERCENT OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D 698) AND WITHIN THE RANGE OF 0 TO 4 PERCENTAGE POINTS ABOVE THE MATERIAL'S OPTIMUM MOISTURE CONTENT. (UES REPORT NO. W232725-2-REV1, 01/22/25)

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

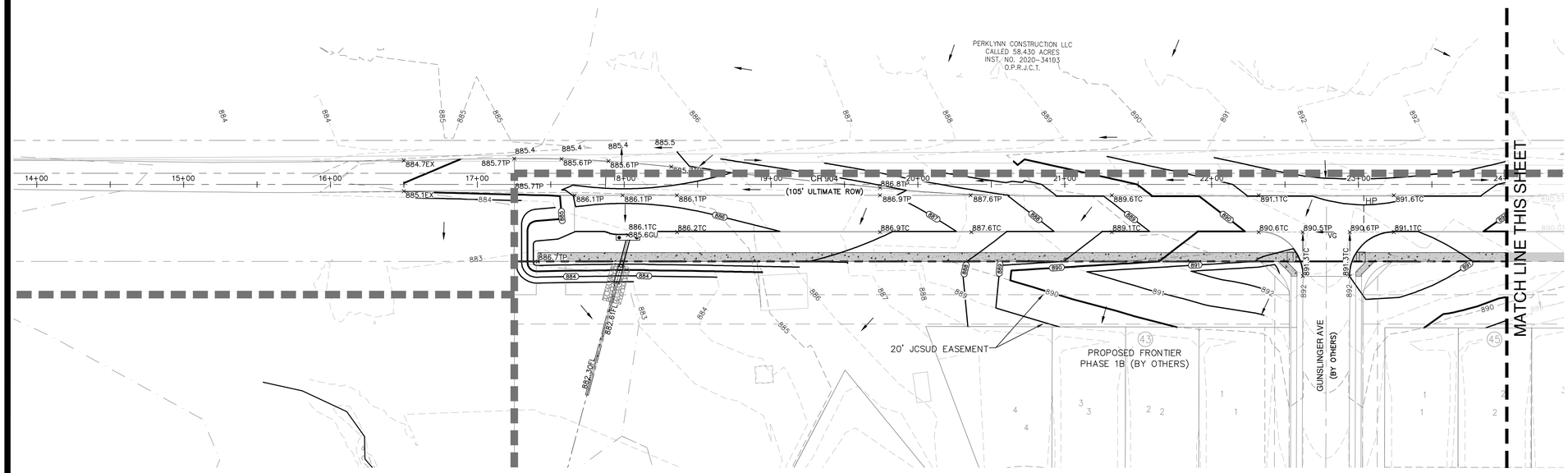
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

PAVING PLAN & PROFILE - COUNTY ROAD 904 (2)

PLAT NO.	N/A
JOB NO.	61405-03
DATE	1/28/2025
DESIGNER	CL
CHECKED	AR
DRAWN	SM
SHEET	8

Date: April 21, 2023, 2:16 PM - User ID: AROSCOE
File: S:\projects\614\05\03\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\CR 904 STP- 61405-03-2023-SHEET.dwg

ISSUED FOR CONSTRUCTION SET



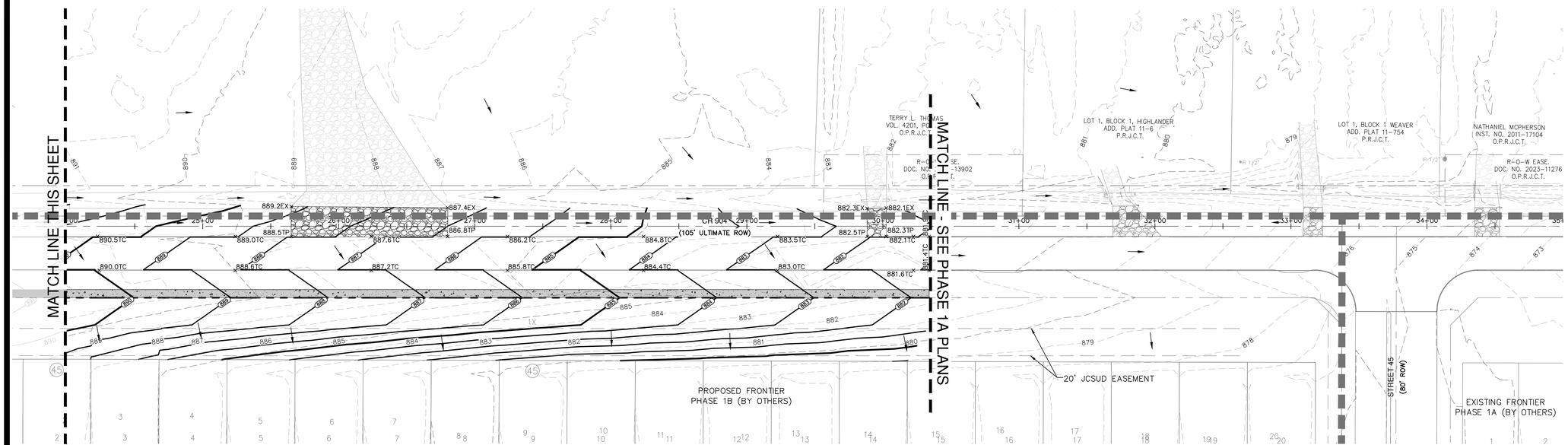
SCALE: 1"= 40'

0' 40' 80' 120'

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED RETAINING WALL
- VALLEY GUTTER
- FLOW ARROW
- FG FINISHED GRADE
- TC TOP OF CURB
- TP TOP OF PAVEMENT
- GRAVEL PAVEMENT



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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE #210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

GRADING PLAN

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 9

ISSUED FOR CONSTRUCTION SET

Date: April 21, 2023, 2:17 PM - User ID: AROSCOE
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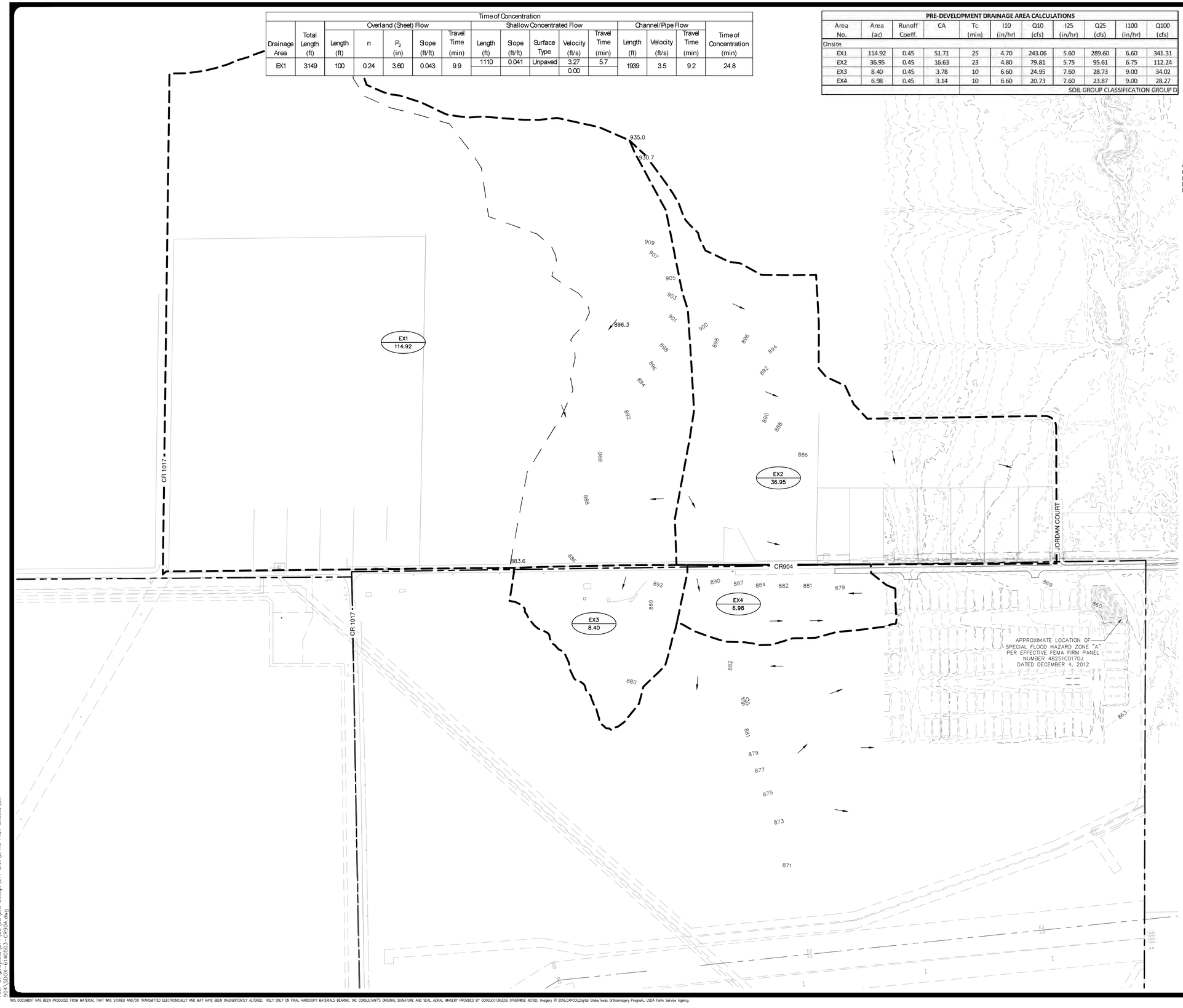
Time of Concentration																
		Overland (Sheet) Flow					Shallow Concentrated Flow					Channel/Pipe Flow			
Drainage Area	Total Length (ft)	Length (ft)	n	P_2 (in)	Slope (ft/ft)	Travel Time (min)	Length (ft)	Slope (ft/ft)	Surface Type	Velocity (ft/s)	Travel Time (min)	Length (ft)	Velocity (ft/s)	Travel Time (min)	Time of Concentration (min)
EX1	3149	100	0.24	3.60	0.043	9.9	1110	0.041	Unpaved	3.27	5.7	1939	3.5	9.2	24.8
										0.00					

PRE-DEVELOPMENT DRAINAGE AREA CALCULATIONS

Area No.	Area (ac)	Runoff Coeff.	CA	Tc (min)	I10 (in/hr)	Q10 (cfs)	I25 (in/hr)	Q25 (cfs)	I100 (in/hr)	Q100 (cfs)
Onsite										
EX1	114.92	0.45	51.71	25	4.70	243.06	5.60	289.60	6.60	341.31
EX2	36.95	0.45	16.63	23	4.80	79.81	5.75	95.61	6.75	112.24
EX3	8.40	0.45	3.78	10	6.60	24.95	7.60	28.73	9.00	34.02
EX4	6.98	0.45	3.14	10	6.60	20.73	7.60	23.87	9.00	28.27
				SOIL GROUP CLASSIFICATION GROUP D						



SCALE: 1"= 200'

0' 200' 400' 600'

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- DRAINAGE DIVIDE
- A-1 / 1.00 — DRAINAGE AREA / ACRES
- 1 — DESIGN POINT
- FLOW ARROW
- 600 — PROPOSED CONTOUR
- 600 — EXISTING CONTOUR
- EXISTING STORM DRAIN

NOTES:

1. REFERENCE DRAINAGE REPORT FOR WRIGHT FARMS DATED OCTOVER 18, 2024 FOR DETAILED TIME OF CONCENTRATION CALCULATIONS
2. DRAINAGE AREA FOR EX1 BASED ON TOPO FROM FINAL DRAINAGE REPORT.

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

EXISTING DRAINAGE AREA MAP

PLAT NO.	N/A
JOB NO.	61405-03
DATE	1/28/2025
DESIGNER	CL
CHECKED	AR
DRAWN	SM
SHEET	10

Date: April 21, 2023, 2:18 PM - User ID: AROSCOE
File: S:\Projects\614\05\03\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\CR 904_SDOR_61405-03804.dwg

ISSUED FOR CONSTRUCTION SET

POST-DEVELOPMENT DRAINAGE AREA CALCULATIONS

Design Point	Area No.	Area (ac)	Runoff Coeff.	CA	Tc (min)	I10 (in/hr)	Q10 (cfs)	I25 (in/hr)	Q25 (cfs)	I100 (in/hr)	Q100 (cfs)	Receiving
	Onsite											
1	A1	0.90	0.90	0.81	10	6.60	5.35	7.60	6.16	9.00	7.29	
	A2	0.26	0.90	0.23	10	6.60	1.54	7.60	1.78	9.00	2.11	
2	D1	0.94	0.90	0.85	10	6.60	5.58	7.60	6.43	9.00	7.61	
3	OS1	114.92	0.45	51.71	25	4.70	243.06	5.60	289.60	6.60	341.31	
	Design Point 1	0.90	0.90	0.81	10	6.60	5.35	7.60	6.16	9.00	7.29	
	Design Point 2	0.94	0.90	0.85	10	6.60	5.58	7.60	6.43	9.00	7.61	
	Design Point 3	114.92	0.45	51.71	25	4.70	243.06	5.60	289.60	6.60	341.31	
	TOTAL	116.76					253.99		302.18		356.22	
SOIL GROUP CLASSIFICATION GROUP D												

OS1
114.92

A1
0.90

A2
0.26

D1
0.94

CR904

PROPOSED FRONTIER
PHASE 1B (BY OTHERS)

EXISTING FRONTIER
PHASE 1A (BY OTHERS)

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- DRAINAGE DIVIDE
- A-1 / 1.00 — DRAINAGE AREA / ACRES
- 1 — DESIGN POINT
- FLOW ARROW
- 6:00 — PROPOSED CONTOUR
- 600 — EXISTING CONTOUR
- PROPOSED STORM DRAIN

NOTES:

1. SEE SHEET 10 FOR FLOW PATH USED FOR TIME OF CONCENTRATION CALCULATIONS

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER

1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

PROPOSED DRAINAGE AREA MAP

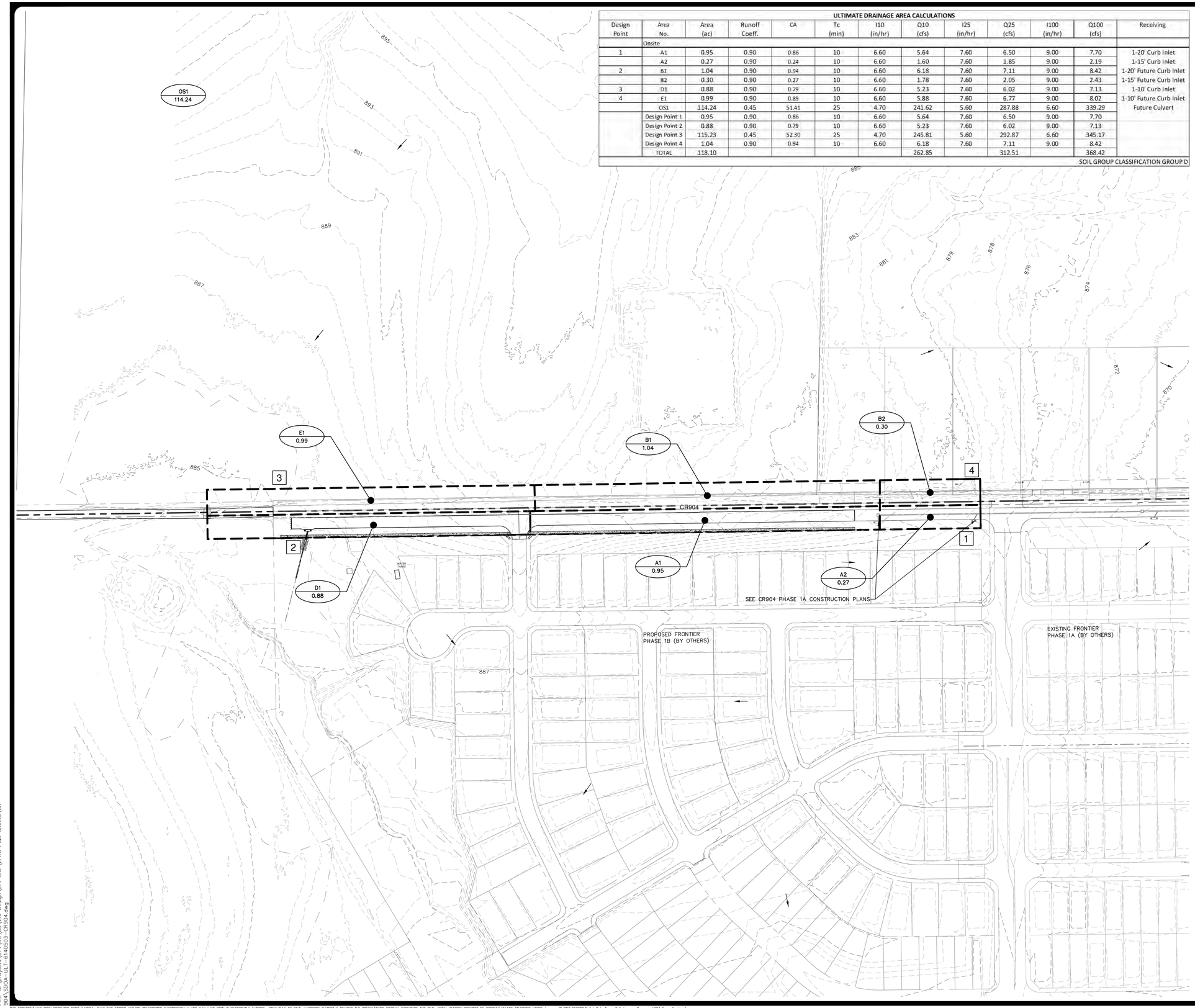
PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 11

ISSUED FOR CONSTRUCTION SET

ULTIMATE DRAINAGE AREA CALCULATIONS

Design Point	Area No.	Area (ac)	Runoff Coeff.	CA	Tc (min)	I10 (in/hr)	Q10 (cfs)	I25 (in/hr)	Q25 (cfs)	I100 (in/hr)	Q100 (cfs)	Receiving
	Onsite											
1	A1	0.95	0.90	0.86	10	6.60	5.64	7.60	6.50	9.00	7.70	1-20' Curb Inlet
	A2	0.27	0.90	0.24	10	6.60	1.60	7.60	1.85	9.00	2.19	1-15' Curb Inlet
2	B1	1.04	0.90	0.94	10	6.60	6.18	7.60	7.11	9.00	8.42	1-20' Future Curb Inlet
	B2	0.30	0.90	0.27	10	6.60	1.78	7.60	2.05	9.00	2.43	1-15' Future Curb Inlet
3	D1	0.88	0.90	0.79	10	6.60	5.23	7.60	6.02	9.00	7.13	1-10' Curb Inlet
4	E1	0.99	0.90	0.89	10	6.60	5.88	7.60	6.77	9.00	8.02	1-10' Future Curb Inlet
	OS1	114.24	0.45	51.41	25	4.70	241.62	5.60	287.88	6.60	339.29	Future Culvert
	Design Point 1	0.95	0.90	0.86	10	6.60	5.64	7.60	6.50	9.00	7.70	
	Design Point 2	0.88	0.90	0.79	10	6.60	5.23	7.60	6.02	9.00	7.13	
	Design Point 3	115.23	0.45	52.30	25	4.70	245.81	5.60	292.87	6.60	345.17	
	Design Point 4	1.04	0.90	0.94	10	6.60	6.18	7.60	7.11	9.00	8.42	
	TOTAL	118.10					262.85		312.51		368.42	

SOIL GROUP CLASSIFICATION GROUP D



SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- DRAINAGE DIVIDE
- A-1 / 1.00 — DRAINAGE AREA / ACRES
- 1 — DESIGN POINT
- FLOW ARROW
- 6:00 — PROPOSED CONTOUR
- 600 — EXISTING CONTOUR
- PROPOSED STORM DRAIN

NOTES:

SEE SHEET 10 FOR TIME OF CONCENTRATION FLOW PATH

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

ULTIMATE DRAINAGE AREA MAP

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 12

ISSUED FOR CONSTRUCTION SET

STORM DRAIN HYDRAULIC CALCULATIONS TABLE

FROM Sta	TO Sta	Pipe Length (ft)	Drainage Area: Incremental No.	Drainage Area: Incremental Area	Drainage Area: Total Area	Runoff "c"	Incr. cA	Total cA	Time of Concentration: Inlet (min)	Time of Concentration: Travel (min)	Time of Concentration: Total (min)	100-year Intensity (in/hr)	Q100 Runoff (cfs)	Inlet Bypass (cfs)	Q Pipe (cfs)	Qcap Pipe (cfs)	No. of Barrels	Pipe Size (in)	Box Culvert: Width (ft)	Box Culvert: Height (ft)	Depth (ft)	Manning n	Sf (ft/ft)	HGL: US Elev	HGL: DS Elev	Head Loss Calculations: V1 (in) (ft/s)	V2 (out) (ft/s)	$V1^2/2G$ (ft)	$V2^2/2G$ (ft)	Kj	$KjV1^2/2G$ (ft)	Hk (ft)	Design HGL Elev	Invert Elev. FROM (ft)	Invert Elev. TO (ft)	Crown Elev. FROM (ft)	Crown Elev. TO (ft)	Prop. Grade Elev (ft)	Froude Number	Comments
1	2	3	4	5	6	7	8	9	10	11	12	14	16	17	18		19a	19b	19c	19d	19e	20	21	22	23	24	25	26	27	28	29	30	31	32	33	33a	33b	34	34a	
* After V1(in) & V2(out) implies the velocities calculated for partial flov																																								
Storm Drain Line SD-D1																																								
2+12.61	1+78.54	34.07	D1	0.94	0.94	0.90	0.85	0.85	10.00	0.00	10.00	9.00	7.6		7.6	16.0	1	24			2.00	0.013	0.0011	884.38	884.34	*	5.47	*	0.00	0.46	1.25	0.00	0.58	884.96	882.85	882.68	884.85	884.68	887.60		Inlet at Beginning of Main Line

CAPACITY OF CURB OPENING INLETS IN SUMPS

Design Point	Inlet Inlet No.	Station	Drainage Area: Area No	Drainage Area: Area (ac.)	Drainage Area: Runoff Coeff "C"	Drainage Area: Time of Concen. (min.)	Long Slope "So" (ft./ft.)	Cross Slope of Pavement "Sx" (ft./ft.)	Cross Slope of Gutter "S'x" (ft./ft.)	5 Year: Intensity (in./hr)	5 Year: Runoff Flow (c.f.s.)	5 Year: Carry Over Flow (c.f.s.)	5 Year: Gutter Flow "Q" (c.f.s.)	100 Year: Intensity (in./hr.)	100 Year: Runoff (c.f.s.)	100 Year: Carry Over (c.f.s.)	100 Year: Gutter Flow "Q" (c.f.s.)	5 Yr: Depth of Flow "Yo" (ft.)	5 Yr: Spread of Flow "Sp" (ft)	Manning Coefficient for Pavement "n"	Design Storm (25 yr or 100 yr)	Depth of Depression "a" (ft.)	Depth of Flow at Opening "y" (ft.)	50% Clogging applied: Capacity of Inlet / foot of Length "Q/L" (c.f.s./ft.)	50% Clogging applied: Length of Inlet Opening "L" (ft.)	50% Clogging applied: Capacity of Inlet "Q" (c.f.s.)	50% Clogging applied: Carry Over Into Over Flow (c.f.s.)	50% Clogging applied: Percent 100 Year Flow Captured by Inlet	Comments
	1						2	3					4				4	5	6			7	8	9	10	11	12	13	14
1	D1A		D1	0.88	0.90	10.0	0.0050	0.02	0.18	5.71	4.5		4.5	9.00	7.1		7.1	0.22	11.1	0.013	100	0.33	0.65	0.79	15	11.8	0.0	100.0%	

NO. | REVISION | DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

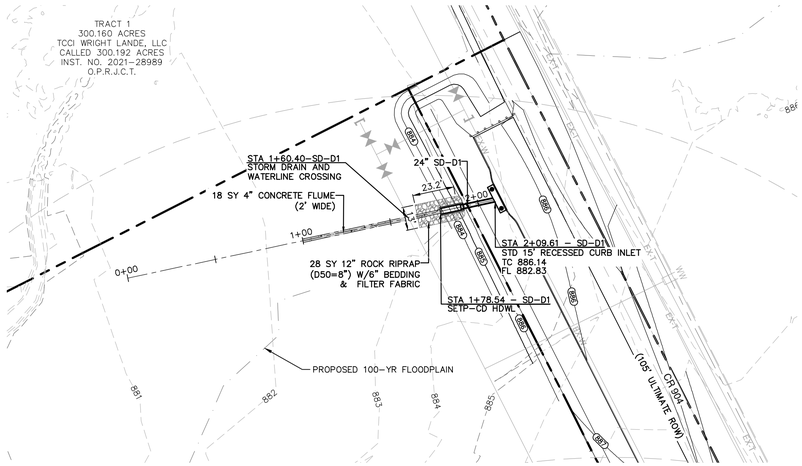
COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

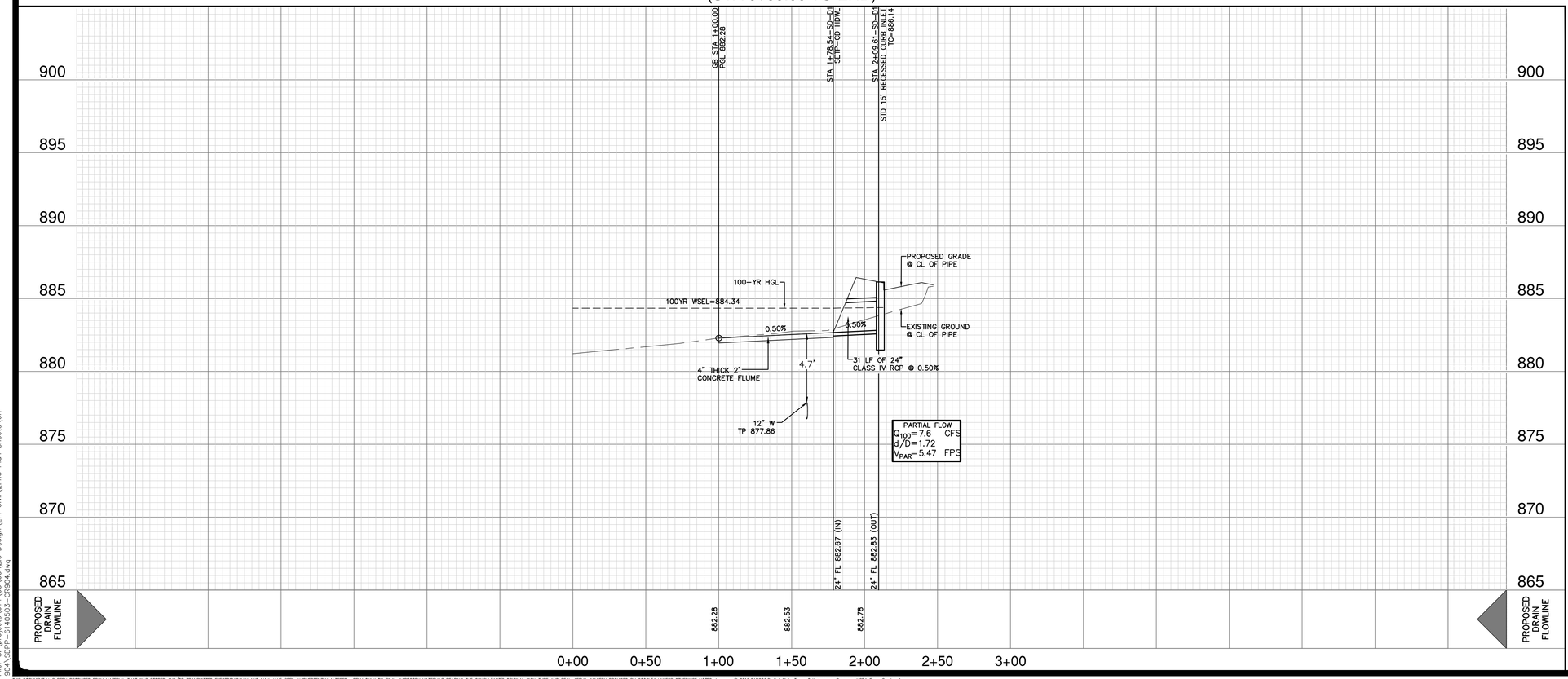
DRAINAGE & HYDRAULIC CALCULATIONS

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER CL
CHECKED AR DRAWN SM
SHEET 13

ISSUED FOR CONSTRUCTION SET



SD-D1
(STA 0+00.00 TO END)



Gregory Method Riprap Sizing	SD-D1
Vel (fps) =	5.5
g (ft/s2) =	32.2
γs (pcf) =	160
γw (pcf) =	62.4
C =	1.8
D_{50} (in) =	6.6
D_{50} Used =	8
Riprap Thickness (in) =	12
Bedding Thickness (in) =	6
Total Thickness (in) =	18

RIPRAP GRADATION 12" THICKNESS OF RIPRAP	
SIEVE SIZE SQUARE MESH	PERCENT PASSING
15 INCH	100
12 INCH	70 – 100
8 INCH	45 – 75
6 INCH	30 – 55
3 INCH	10 – 30
1-1/2 INCH	0 – 10

BEDDING GRADATIONS 6" THICKNESS OF BEDDING	
SIEVE SIZE SQUARE MESH	PERCENT PASSING
3 INCH	100
1-1/2 INCH	55 – 100
3/4 INCH	25 – 60
3/8 INCH	5 – 30
NO. 4	0 – 10

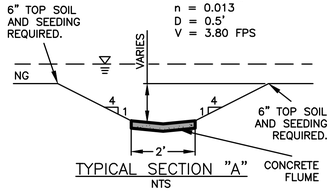
CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

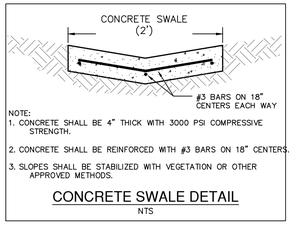
- PROPOSED WATER LINE
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT ASSEMBLY
- PROPOSED SANITARY SEWER LINE
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED STORM DRAIN
- PROPOSED CURB INLET
- PROPOSED JUNCTION BOX

HORIZ. SCALE: 1" = 40'
VERT. SCALE: 1" = 4'

14' EARTHEN TRAPEZOIDAL CHANNEL
SECTION "A"
Q100 = 7.6 CFS
S = 0.50 %
n = 0.013
D = 0.5'
V = 3.80 FPS



TYPICAL SECTION "A"
NTS



NOTE:
1. CONCRETE SHALL BE 4" THICK WITH 3000 PSI COMPRESSIVE STRENGTH.
2. CONCRETE SHALL BE REINFORCED WITH #3 BARS ON 18" CENTERS.
3. SLOPES SHALL BE STABILIZED WITH VEGETATION OR OTHER APPROVED METHODS.

CONCRETE SWALE DETAIL
NTS

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/ GEOTECHNICAL/ SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND /OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

STORM DRAIN PLAN & PROFILE - SD-A2

PLAT NO.	N/A
JOB NO.	61405-03
DATE	1/28/2025
DESIGNER	CL
CHECKED	AR
DRAWN	SM
SHEET	14

Date: April 21, 2023, 2:21 PM - User ID: AROSCOE
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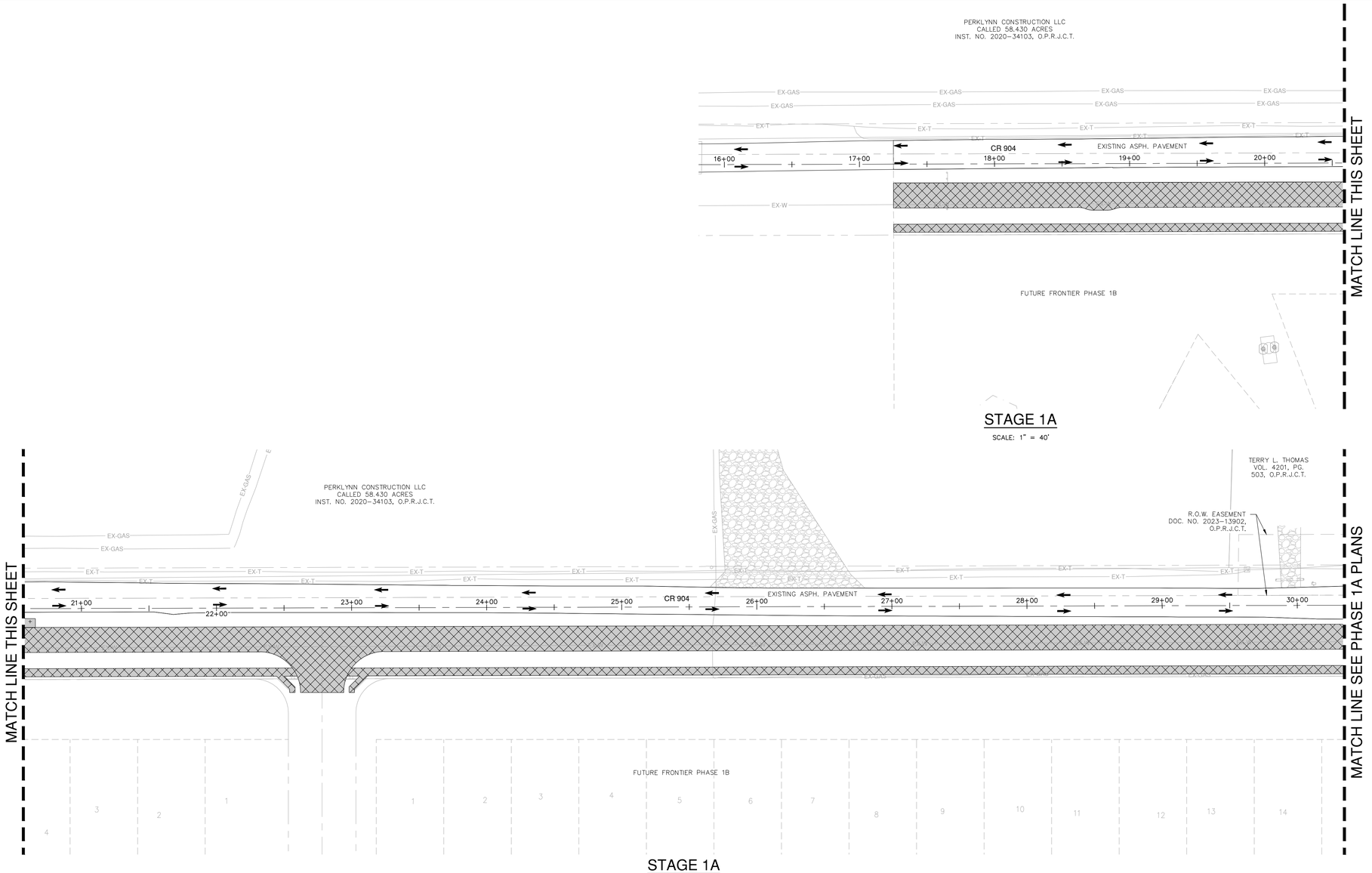
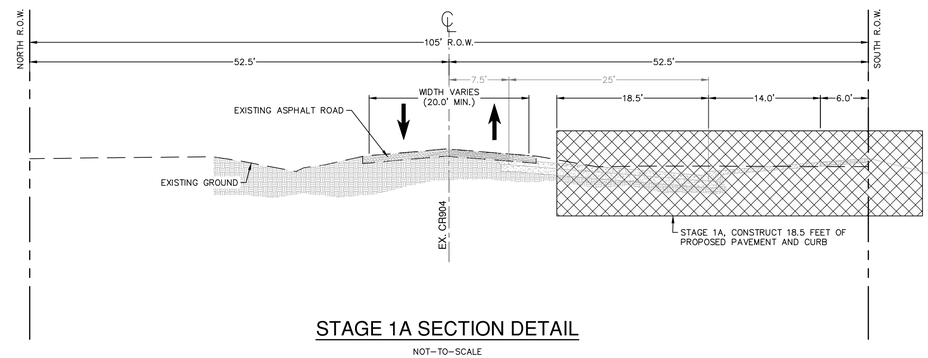
ISSUED FOR CONSTRUCTION SET



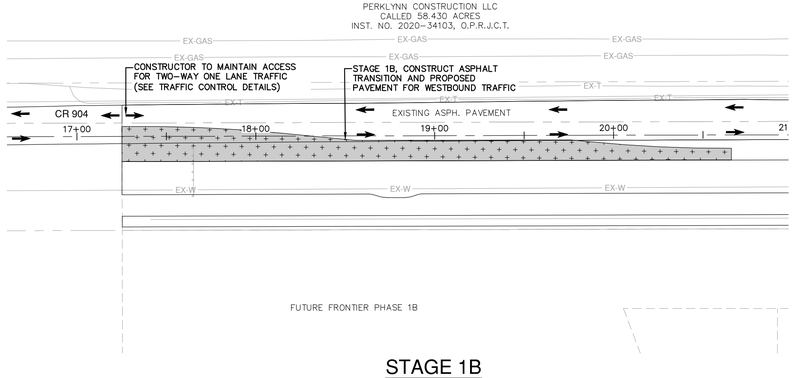
STAGE 1A

SCALE: 1" = 40'



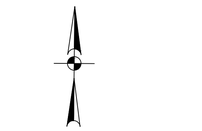
STAGE 1A SECTION DETAIL

NOT-TO-SCALE



STAGE 1B

SCALE: 1" = 40'



CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- STAGE 1A, CONSTRUCT 18.5 FEET OF PROPOSED PAVEMENT, CURB AND DRIVEWAY
- STAGE 1B, CONSTRUCT ASPHALT TRANSITION AND PROPOSED PAVEMENT FOR WESTBOUND TRAFFIC
- EXISTING EDGE OF ASPHALT PAVEMENT
- PROPOSED TRAVEL LANE DIRECTIONS

NOTES

1. MINIMUM OF ONE-LANE TWO-WAY TRAFFIC TO BE OPEN AT ALL TIMES WITH CHANNEL DEVICES WHERE CONNECTING TO EXISTING ASPHALT ROAD.
2. STAGE 1A TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR EASTBOUND AND WESTBOUND DIRECTIONS.
3. STAGE 1B, 2A & 2B TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR THE EASTBOUND DIRECTION AND ON PROPOSED CONCRETE FOR EASTBOUND DIRECTION.
4. STAGE 3 TRAFFIC SHALL CONTINUE ONTO PROPOSED CONCRETE ROAD FOR BOTH EASTBOUND AND WESTBOUND DIRECTION.
5. CONTRACTOR SHALL MAINTAIN HOME ACCESS THROUGHOUT DURATION OF CONSTRUCTION. CONTRACTOR TO PHASE DRIVEWAY AND ROAD CONSTRUCTION TO ACHIEVE FULL ACCESS AT ALL TIMES. CONTRACTOR SHALL USE TEMPORARY GRAVEL/FLEXBASE ROADS TO ACHIEVE ACCESS AS NECESSARY.

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

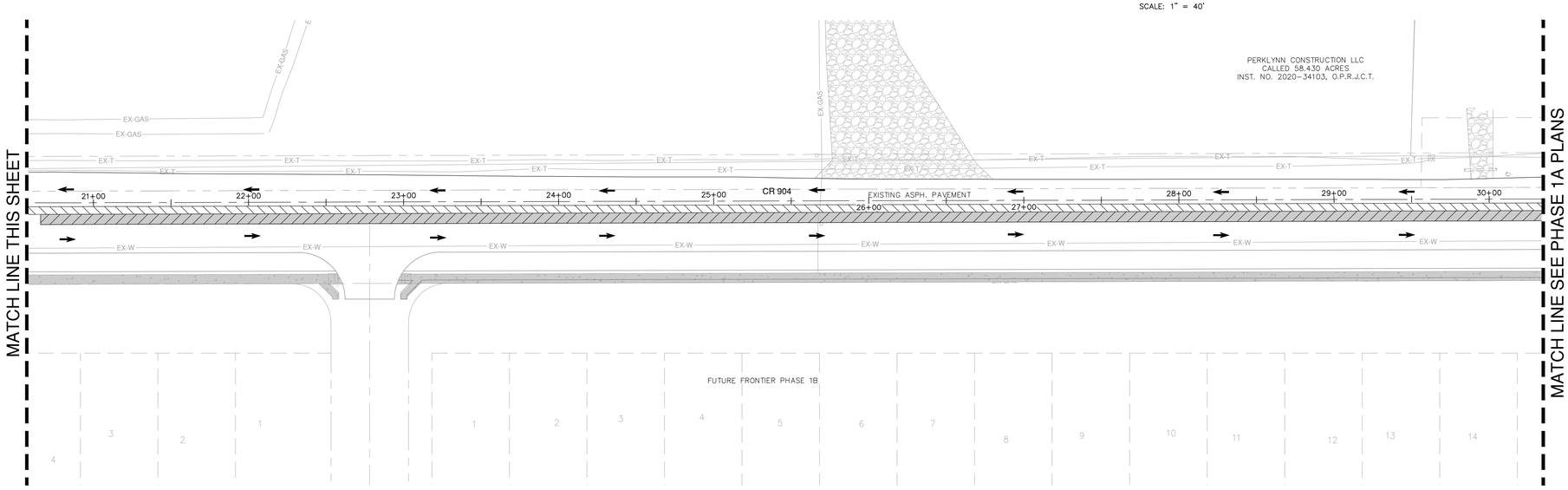
COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

STAGE 1A & STAGE 1B
CONSTRUCTION PHASING PLAN

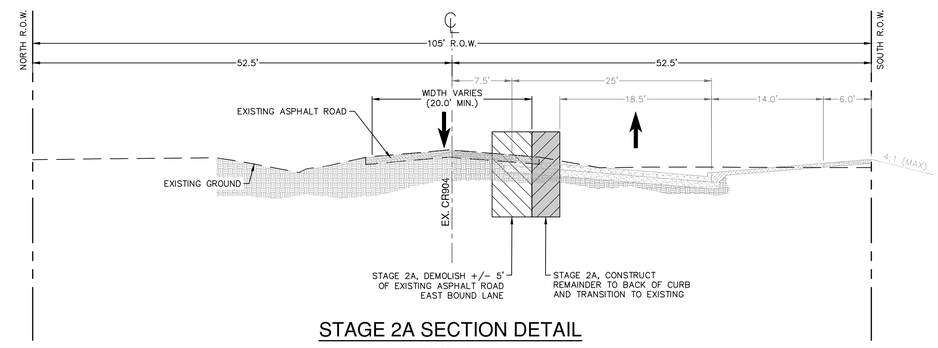
PLAT NO.	N/A
JOB NO.	61405-03
DATE	1/28/2025
DESIGNER	SM
CHECKED	AR
DRAWN	SM
SHEET	15

ISSUED FOR CONSTRUCTION SET



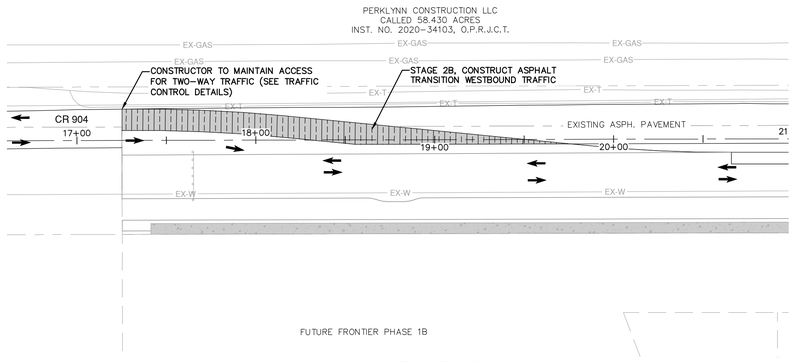
STAGE 2A

SCALE: 1" = 40'



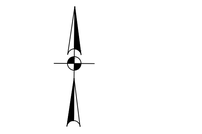
STAGE 2A SECTION DETAIL

NOT-TO-SCALE



STAGE 2B

SCALE: 1" = 40'



CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

STAGE 2A, DEMOLISH +/- 5' OF EXISTING ASPHALT ROAD EAST BOUND LANE

STAGE 2A, CONSTRUCT REMAINDER TO BACK OF CURB AND TRANSITION TO EXISTING

STAGE 2B, CONSTRUCT ASPHALT TRANSITION FOR WESTBOUND TRAFFIC

EXISTING EDGE OF ASPHALT PAVEMENT

PROPOSED TRAVEL LANE DIRECTIONS

NOTES

1. MINIMUM OF ONE-LANE TWO-WAY TRAFFIC TO BE OPEN AT ALL TIMES WITH CHANNEL DEVICES WHERE CONNECTING TO EXISTING ASPHALT ROAD.
2. STAGE 1A TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR EASTBOUND AND WESTBOUND DIRECTIONS.
3. STAGE 1B, 2A & 2B TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR THE EASTBOUND DIRECTION AND ON PROPOSED CONCRETE FOR EASTBOUND DIRECTION.
4. STAGE 3 TRAFFIC SHALL CONTINUE ONTO PROPOSED CONCRETE ROAD FOR BOTH EASTBOUND AND WESTBOUND DIRECTION.
5. CONTRACTOR SHALL MAINTAIN HOME ACCESS THROUGHOUT DURATION OF CONSTRUCTION. CONTRACTOR TO PHASE DRIVEWAY AND ROAD CONSTRUCTION TO ACHIEVE FULL ACCESS AT ALL TIMES. CONTRACTOR SHALL USE TEMPORARY GRAVEL/FLEXBASE RAODS TO ACHIEVE ACCESS AS NECESSARY.

UTILITY NOTE

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NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

STAGE 2A & STAGE 2B
CONSTRUCTION PHASING PLAN

PLAT NO.	N/A
JOB NO.	61405-03
DATE	1/28/2025
DESIGNER	SM
CHECKED	AR
DRAWN	SM
SHEET	16

ISSUED FOR CONSTRUCTION SET

Date: April 21, 2023, 2:23 PM - User ID: AROSCOE
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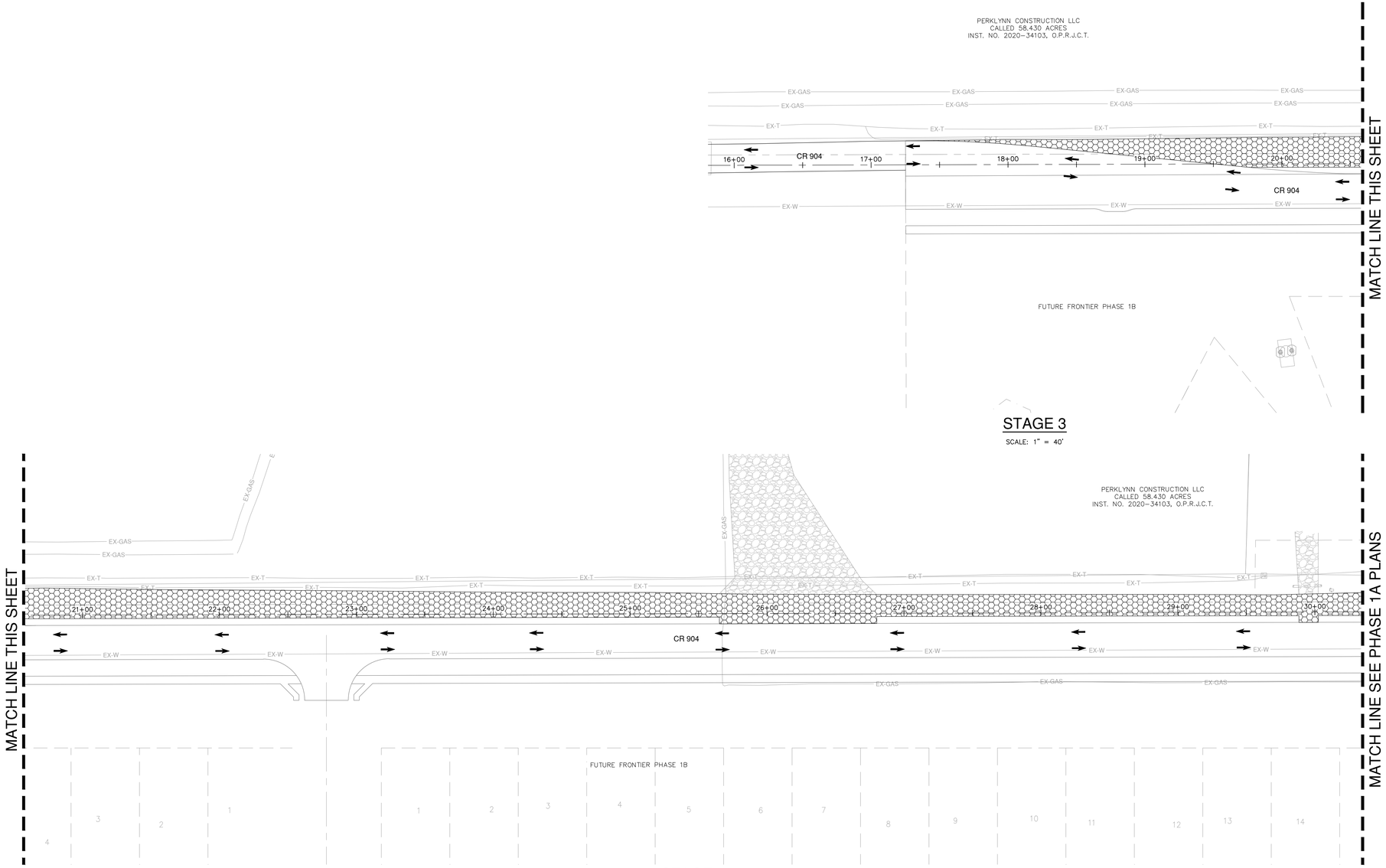
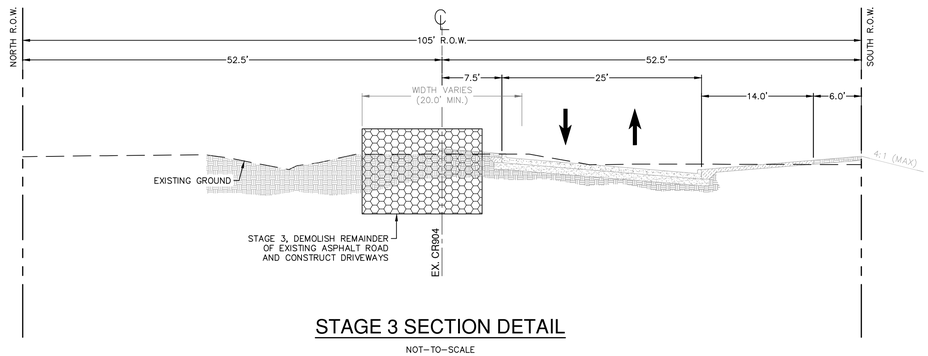


STAGE 3

SCALE: 1" = 40'

STAGE 3

SCALE: 1" = 40'



STAGE 3 SECTION DETAIL

NOT-TO-SCALE

SCALE: 1"= 40'

0' 40' 80' 120'

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

STAGE 3, DEMOLISH REMAINDER OF EXISTING ASPHALT ROAD AND CONSTRUCT DRIVEWAYS

EXISTING EDGE OF ASPHALT PAVEMENT

PROPOSED TRAVEL LANE DIRECTIONS

NOTES

1. MINIMUM OF ONE-LANE TWO-WAY TRAFFIC TO BE OPEN AT ALL TIMES WITH CHANNEL DEVICES WHERE CONNECTING TO EXISTING ASPHALT ROAD.
2. STAGE 1A TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR EASTBOUND AND WESTBOUND DIRECTIONS.
3. STAGE 1B, 2A & 2B TRAFFIC SHALL CONTINUE ON EXISTING ASPHALT ROAD FOR THE EASTBOUND DIRECTION AND ON PROPOSED CONCRETE FOR EASTBOUND DIRECTION.
4. STAGE 3 TRAFFIC SHALL CONTINUE ONTO PROPOSED CONCRETE ROAD FOR BOTH EASTBOUND AND WESTBOUND DIRECTION.
5. CONTRACTOR SHALL MAINTAIN HOME ACCESS THROUGHOUT DURATION OF CONSTRUCTION. CONTRACTOR TO PHASE DRIVEWAY AND ROAD CONSTRUCTION TO ACHIEVE FULL ACCESS AT ALL TIMES. CONTRACTOR SHALL USE TEMPORARY GRAVEL/FLEXBASE RAODS TO ACHIEVE ACCESS AS NECESSARY.

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1/28/25

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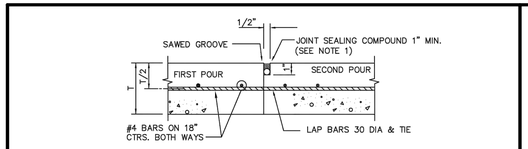
COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

STAGE 3
CONSTRUCTION PHASING PLAN

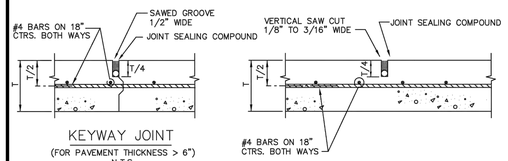
PLAT NO.	N/A
JOB NO.	61405-03
DATE	1/28/2025
DESIGNER	SM
CHECKED	AR
DRAWN	SM
SHEET	17

ISSUED FOR CONSTRUCTION SET



CONSTRUCTION JOINT

N.T.S.



KEYWAY JOINT

(FOR PAVEMENT THICKNESS > 6")

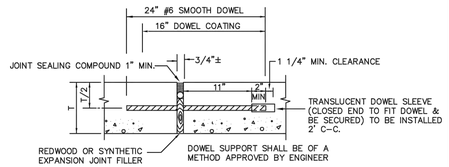
N.T.S.

SAWED CONTRACTION JOINT

N.T.S.

NOTE:

1. APPLY BACKER ROD AS APPROVED BY OWNER

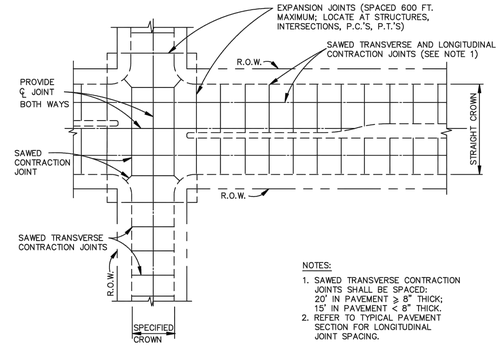


EXPANSION JOINT

(SPACED 600 FT. MAXIMUM; LOCATE AT STRUCTURES AND AT INTERSECTION P.C.'S & P.T.'S)

N.T.S.

REINFORCED CONCRETE PAVEMENT	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 303.5.4.	
JOINTS		DATE AUG '23	STANDARD DRAWING NO. 2050



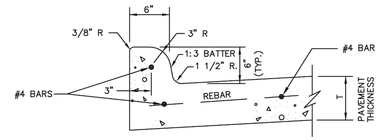
NOTES:

1. SAWED TRANSVERSE CONTRACTION JOINTS SHALL BE SPACED: 20' IN PAVEMENT ≥ 8" THICK; 15' IN PAVEMENT < 8" THICK.
2. REFER TO TYPICAL PAVEMENT SECTION FOR LONGITUDINAL JOINT SPACING.

SPACING DIAGRAM FOR TRANSVERSE JOINTS

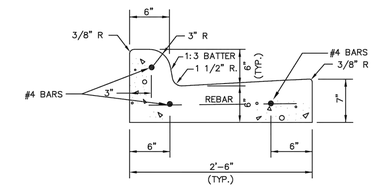
N.T.S.

REINFORCED CONCRETE PAVEMENT	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 303.5.4.	
TRANSVERSE JOINT SPACING		DATE AUG '23	STANDARD DRAWING NO. 2060



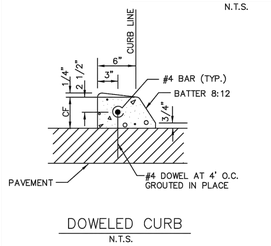
INTEGRAL CURB & GUTTER

N.T.S.



SEPARATE CURB & GUTTER

N.T.S.



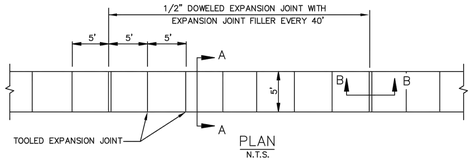
DOWELED CURB

N.T.S.

NOTES:

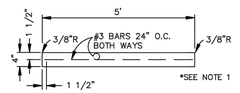
1. REINFORCEMENT SHALL BE NO. 4 BARS, UNLESS OTHERWISE SPECIFIED.
2. CONCRETE SHALL BE CLASS "C" OR "PC".
3. "CF" IS 6" UNLESS OTHERWISE SPECIFIED.
4. ALL CURBS ARE CONSTRUCTED OF PORTLAND CEMENT CONCRETE UNLESS OTHERWISE SHOWN.
5. GRADE SHALL BE MEASURED AT BACK OF CURB.
6. SEE ROADWAY SECTIONS FOR SUBGRADE SUBGRADE SHALL EXTEND 1' BEYOND BACK OF CURB.

CONCRETE CURB & GUTTER	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 305.1	
INTEGRAL, SEPARATE, & DOWELED		DATE AUG '23	STANDARD DRAWING NO. 2120



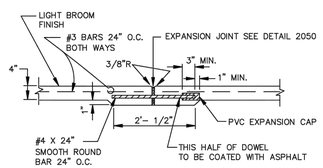
PLAN

N.T.S.



SECTION "A–A"

N.T.S.



SECTION "B–B"

N.T.S.

NOTE:

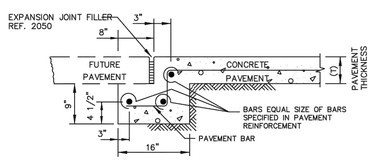
1. REFER TO STANDARD SPECIFICATION ITEM 305.2 FOR ALTERNATE REINFORCEMENT.
2. CROSS SLOPE OF SIDEWALK SHALL BE 2% MAX.
3. OTHER THAN 5'-0" SIDEWALK WIDTH MAY BE SPECIFIED BY OWNER. IF LESS THAN 5' SIDEWALK IS USED, THE TOOLED JOINT IS TO MATCH THE WIDTH OF SIDEWALK.
4. SIDEWALK SHALL BE CLASS "C" CONCRETE UNLESS OTHERWISE SPECIFIED BY OWNER.
5. ALL HONEYCOMB IN BACK OF CURB TO BE TROWEL-PLASTERED BEFORE POURING SIDEWALK.
6. LUG MAY BE FORMED BY SHAPING SUBGRADE TO APPROXIMATE DIMENSIONS SHOWN.
7. IF 5' WIDTH CANNOT BE ACHIEVED, MUST BE COMPLIANT WITH ADA AND PROWAG PASSING REQUIREMENTS.

REINFORCED CONCRETE SIDEWALKS	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 305.2	
JOINTS AND SPACING		DATE AUG '23	STANDARD DRAWING NO. 2170

GENERAL NOTES:

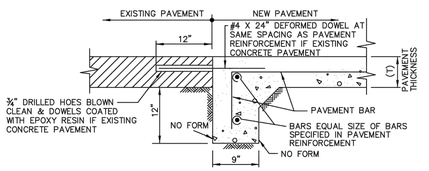
1. REINFORCED CONCRETE PAVEMENT:
   - A. ALL CURBS SHALL BE PLACED INTEGRAL WITH PAVEMENT UNLESS OTHERWISE APPROVED BY THE OWNER.
   - B. CURBS SHALL MEET THE SAME COMPRESSIVE STRENGTH AS SPECIFIED FOR THE PAVEMENT.
   - C. BAR LAPS SHALL BE 30 DIAMETERS.
   - D. REINFORCING BARS SHALL BE SUPPORTED BY CHAIRS OR OTHER DEVICES APPROVED BY THE OWNER.
2. SUBGRADE: (UNLESS OTHERWISE SPECIFIED BY OWNER)
   - A. SUBGRADE UNDER ALL PAVEMENTS SHALL BE STABILIZED TO MINIMUM DEPTH OF 6" FOR 2 LANE RESIDENTIAL ROAD AND 8" FOR ALL OTHERS. IF THE P.I. IS 15 OR GREATER, LIME SHALL BE USED, IF THE P.I. IS LESS THAN 15, CEMENT SHALL USED OR AS RECOMMENDED BY A GEOTECH ENGINEER. LABORATORY TESTS MUST BE PERFORMED TO DETERMINE THE AMOUNT OF CEMENT REQUIRED TO LOWER THE P.I. TO 15 OR BELOW SATURATION P.I. (PH≥ 12.4) WILL BE THE LIMIT WHEN A SOIL'S P.I. CANNOT BE BROUGHT TO 15 OR LOWER.
   - B. WHERE THE IN PLACE MATERIAL HAS A P.I. OF LESS THAN 15, THE SUBGRADE SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 6" AND RECOMPACTED.
   - C. WHERE SULFATES ARE PRESENT, CONSULT A GEOTECHNICIAL ENGINEER FOR RECOMMEND SUBGRADE TREATMENT.
3. IF THE ROADWAY IS A DESIGNATED BIKE ROUTE OR BIKE USAGE IS ANTICIPATED, REFER TO AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AASHTO GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES (2012, 4TH EDITION) AND THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD): https://mutcd.fhwa.dot.gov/resources/state_info/texas/tx.htm

PAVEMENT SYSTEMS	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 301. 302. 303.	
GENERAL NOTES		DATE AUG '23	STANDARD DRAWING NO. 2110



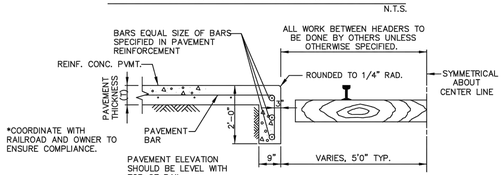
STREET HEADER FOR FUTURE PAVEMENT

N.T.S.



STREET HEADER AT EXISTING PAVEMENT

N.T.S.



NOTES:

1. PAVEMENT BARS TO BE BENT DOWN INTO HEADER.
2. HEADER AND PAVEMENT TO BE MONOLITHIC.

STREET HEADER AT RAILROAD

N.T.S.

REINFORCED CONCRETE PAVEMENT	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 303.5.4.	
STREET HEADERS		DATE AUG '23	STANDARD DRAWING NO. 2070

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

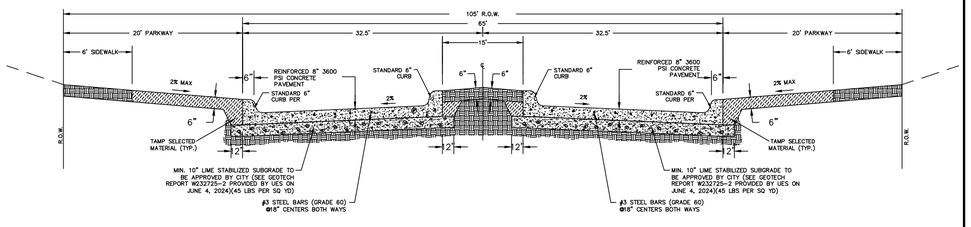
PAVING DETAILS (1)

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 18

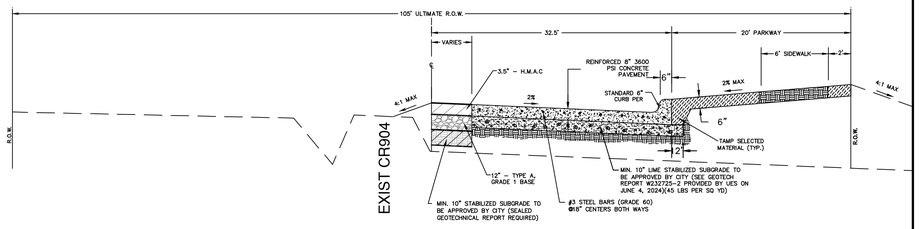
Date: April 21, 2023, 2:24 PM – User ID: AROSCOE
Files: S:\projects\61405\03\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\CR 904_SHT01_61405-03-904.dwg

ISSUED FOR CONSTRUCTION SET

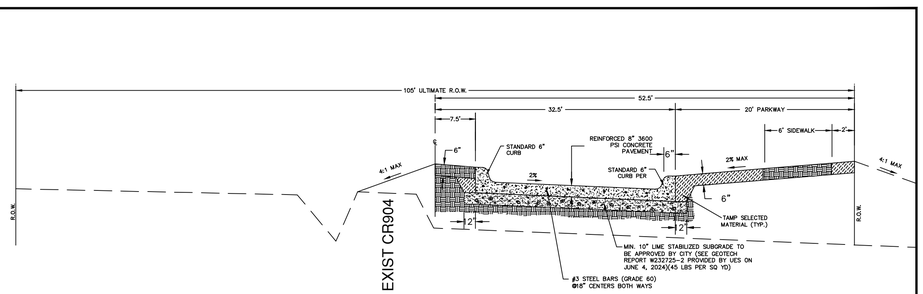
NOTE:
THE CLIENT CONTRACTED WITH UES TO PREPARE A FINAL GEOTECHNICAL EXPLORATION REPORT FOR WRIGHT FARMS/FRONTIER CR904. CONTRACTOR SHALL REFERENCE THIS GEOTECHNICAL REPORT NO. W232725-2, ADDENDUM W232725-B, AND ADDENDUM W232725-2-REV1 PREFORMED BY UES ON JUNE 4, 2024, OCTOBER 3, 2024, AND JANUARY 22, 2025 RESPECTIVELY.



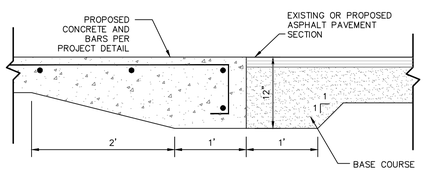
CR904 ULTIMATE PAVEMENT SECTION



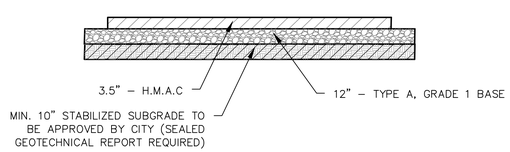
CR904 PROPOSED PAVEMENT SECTION
STA 17+66.18 TO 20+65.86



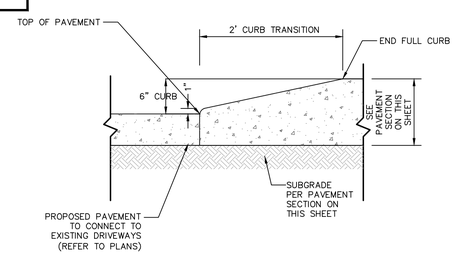
CR904 PROPOSED PAVEMENT SECTION
STA 20+65.86 TO 30+33.96



CONCRETE/ASPHALT JUNCTURE DETAIL
NOT-TO-SCALE



TEMPORARY ASPHALT TRANSITION
STA 16+45.00 TO 20+65.86



CURB TRANSITION DETAIL
NOT-TO-SCALE

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

PAVING DETAILS (2)

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 19

ISSUED FOR CONSTRUCTION SET

Date: April 21, 2023, 2:24 PM - User ID: AROSCOE
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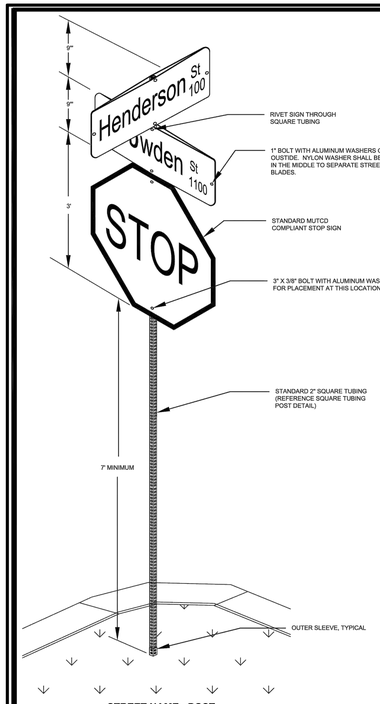
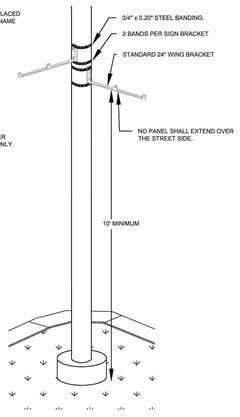
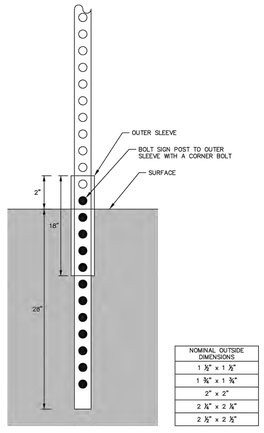


STREET NAME - POST INSTALLATION



STREET NAME - POLE INSTALLATION



NOMINAL OUTSIDE DIMENSIONS
1 ½" x 1 ½"
1 ¾" x 1 ¾"
2" x 2"
2 ½" x 2 ½"
2 ½" x 2 ½"

SQUARE TUBING POST DETAIL

NOTES:

1. ALL POSTS AND ANCHROS SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR HOT ROLLED CARBON SHEET STEEL, STRUCTURAL QUALITY ASTM DESIGNATION A570-79.
2. ALL POSTS AND ANCHORS SHALL CARRY MINIMUM CERTIFIABLE 60,000 PSI YIELD STRENGTH.
3. ALL POSTS AND ANCHORS SHALL BE MANUFACTURED FROM RAW STEEL, FORMED AND WELDED ON THE CORNER PRIOR TO RECEIVING A TRIPLE COAT PROTECTION OF INLINE HOT-DIPPED, GALVANIZED ZINC PER AASHTO M-120 (0.8 OZ. PER SQUARE FOOT) FOLLOWED BY A CHROMATE CONVERSION COATING AND A CROSS-LINKED POLYURETHANE ACRYLIC EXTERIOR COATING. THE INTERIOR SHALL RECEIVE A DOUBLE COAT OF ZINC BASED ORGANIC COATING, TESTED IN ACCORDANCE WITH ASTM B-117.
4. ALL TOP POSTS MUST BE CAPABLE OF FRACTURING AT THE POINT OF CONNECTION WITH A SINGLE ANCHOR, WHEN IMPACTED, IN SUCH A MANNER THAT THE PIECE INSIDE OF THE ANCHOR CAN BE REMOVED SO AS TO ALLOW TO RECEIVE A NEW TOP POST.
5. THE SHAPE OF ALL POSTS AND ANCHORS SHALL BE SQUARE AND STRAIGHT WITH SMOOTH TUBING WELDED IN ONE CORNER WITH A TOLERANCE THAT PERMITS TELESCOPING OF THE NEXT LARGER OR SMALL SIZE, IN ¼" INCREMENTS.
6. ALL ANCHORS SHALL BE 12 GAUGE WITH HOLES THAT ARE FULLY PERFORATED ⅜" DIAMETER ON 1" CENTERS FOR AT LEAST THE TOP 4' OF THE ANCHOR WHILE BEING TRULY ALIGNED IN THE CENTER OF THE SECTION.
7. ALL TOP POSTS SHALL BE 14 GAUGE WITH HOLES THAT ARE PRE PUNCHED ON 1" CENTERS FOR THE ENTIRE LENGTH OF THE POST AND TRULY ALIGNED IN THE CENTER OF SECTION.
8. STANDARD OUTSIDE CORNER RADII SHALL BE 5/32" PLUS OR MINUS 1/32".
9. SIGNS TO BE ATTACHED TO POST AT THE DESIRED HEIGHT WITH BOLTS.
10. SIGN BLANK FOR 2 INCH POST INSTALL: 0.08 FEDERAL SPEC. ALUM. (LP/SP INSTALL 0.125 UNDRILLED)
11. FONT: HIGHWAY GOTHIC 'C' OR 'B' (DEPENDING ON LENGTH OF NAME)
12. STREET NAME SIGN SHEETING SHALL BE WHITE 3M DIAMOND GRADE CUBED (DG3) WITH GREEN ELECTRO-CUT (EC) TRANSPARENT FILM AS AN OVERLAY OR AN APPROVED EQUAL.
13. REFER TO DETAIL 03-1G OF THE TEXAS STANDARD HIGHWAY SIGN DESIGN MANUAL FOR ADDITIONAL SPACING REQUIREMENTS.

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

SIGNAGE DETAILS

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 20

Date: April 21, 2023, 2:24 PM - User ID: AROSCOE
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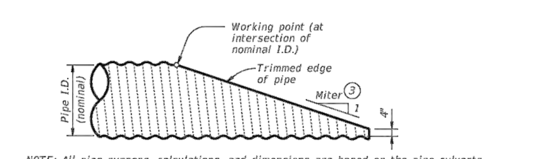
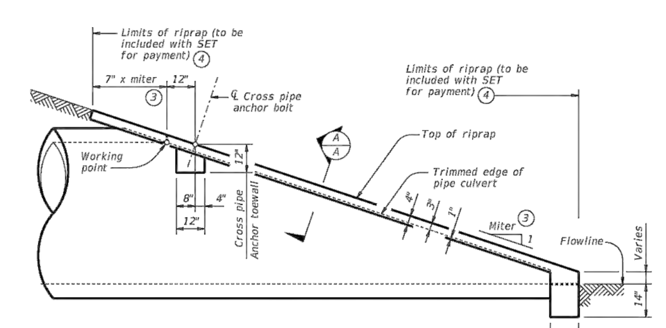
ISSUED FOR CONSTRUCTION SET



NOTE: All pipe runners, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

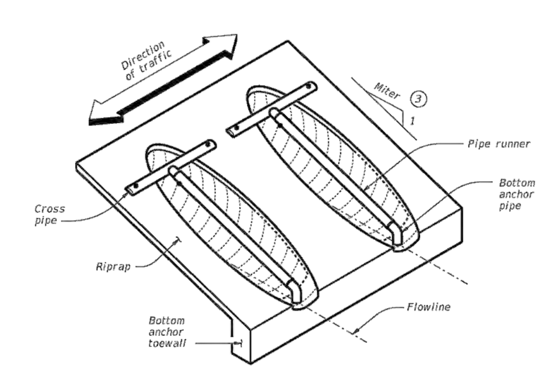
SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details of reinforced concrete pipe (RCP) culvert are similar.)



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details of corrugated metal pipe (CMP) culvert are similar. Pipe runners not shown for clarity)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing installation with no skew.)

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:

CROSS PIPE LENGTHS AND PIPE RUNNER LENGTHS ① ②

Nominal Culvert I.D.	Pipe Culvert Spa ~ G	Cross Pipe Length	Pipe Runner Length: 3:1 Side Slope 0° Skew	3:1 15° Skew	3:1 30° Skew	3:1 45° Skew	4:1 Side Slope 0° Skew	4:1 15° Skew	4:1 30° Skew	4:1 45° Skew	6:1 Side Slope 0° Skew	6:1 15° Skew	6:1 30° Skew	6:1 45° Skew
24"	1' - 7"	3' - 5"	N/A	N/A	N/A	5' - 10"	N/A	N/A	N/A	8' - 1"	N/A	N/A	N/A	12' - 9"
27"	1' - 8"	3' - 8"	N/A	N/A	5' - 5"	6' - 11"	N/A	N/A	7' - 7"	9' - 7"	N/A	N/A	11' - 11"	14' - 11"
30"	1' - 10"	3' - 11"	N/A	N/A	6' - 4"	8' - 0"	N/A	N/A	8' - 9"	11' - 0"	N/A	N/A	13' - 8"	17' - 0"
33"	1' - 11"	4' - 2"	6' - 2"	6' - 5"	7' - 3"	9' - 1"	8' - 6"	8' - 10"	10' - 0"	12' - 5"	13' - 3"	13' - 9"	15' - 5"	19' - 2"
36"	2' - 1"	4' - 5"	6' - 11"	7' - 3"	8' - 2"	10' - 2"	9' - 6"	9' - 11"	11' - 2"	13' - 10"	14' - 9"	15' - 3"	17' - 2"	21' - 3"
42"	2' - 4"	4' - 11"	8' - 6"	8' - 10"	9' - 11"	12' - 4"	11' - 7"	12' - 0"	13' - 6"	16' - 8"	17' - 9"	18' - 5"	20' - 8"	25' - 7"
48"	2' - 7"	5' - 5"	10' - 1"	10' - 5"	11' - 9"	N/A	13' - 7"	14' - 2"	15' - 10"	N/A	20' - 9"	21' - 6"	24' - 2"	N/A
54"	3' - 0"	5' - 11"	11' - 8"	12' - 1"	N/A	N/A	15' - 8"	16' - 3"	N/A	N/A	23' - 10"	24' - 8"	N/A	N/A
60"	3' - 3"	6' - 5"	13' - 3"	N/A	N/A	N/A	17' - 9"	N/A	N/A	N/A	26' - 10"	N/A	N/A	N/A

TYPICAL PIPE CULVERT MITERS ③

Side Slope	0° Skew	15° Skew	30° Skew	45° Skew
3:1	3:1	3.106:1	3.464:1	4.243:1
4:1	4:1	4.141:1	4.619:1	5.657:1
6:1	6:1	6.212:1	6.928:1	8.485:1

CONDITIONS WHERE PIPE RUNNERS ARE NOT REQUIRED ②

Nominal Culvert I.D.	Single Pipe Culvert	Multiple Pipe Culverts
12" thru 21"	Skews thru 45°	Skews thru 45°
24"	Skews thru 45°	Skews thru 30°
27"	Skews thru 30°	Skews thru 15°
30"	Skews thru 15°	Skews thru 15°
33"	Skews thru 15°	Always required
36"	Normal (no skew)	Always required
42" thru 60"	Always required	Always required

STANDARD PIPE SIZES AND MAX PIPE RUNNER LENGTHS ①

Pipe Size	Pipe O.D.	Pipe I.D.	Max Pipe Runner Length
2" STD	2.375"	2.067"	N/A
3" STD	3.500"	3.068"	10' - 0"
4" STD	4.500"	4.026"	19' - 8"
5" STD	5.563"	5.047"	34' - 2"

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) ⑤

Nominal Culvert I.D.	3:1 Side Slope 0° Skew	3:1 15° Skew	3:1 30° Skew	3:1 45° Skew	4:1 Side Slope 0° Skew	4:1 15° Skew	4:1 30° Skew	4:1 45° Skew	6:1 Side Slope 0° Skew	6:1 15° Skew	6:1 30° Skew	6:1 45° Skew
12"	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.8
15"	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9
18"	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0
21"	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9	0.9	0.9	1.0	1.2
24"	0.6	0.7	0.7	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.1	1.3
27"	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.1	1.1	1.1	1.2	1.4
30"	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.2	1.2	1.2	1.3	1.6
33"	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.3	1.3	1.4	1.5	1.7
36"	0.9	0.9	0.9	1.1	1.1	1.1	1.2	1.4	1.4	1.5	1.6	1.8
42"	1.0	1.0	1.1	1.3	1.2	1.3	1.3	1.6	1.6	1.7	1.8	2.1
48"	1.1	1.1	1.2	N/A	1.4	1.4	1.5	N/A	1.9	1.9	2.1	N/A
54"	1.3	1.3	N/A	N/A	1.6	1.6	N/A	N/A	2.1	2.1	N/A	N/A
60"	1.4	N/A	N/A	N/A	1.7	N/A	N/A	N/A	2.3	N/A	N/A	N/A

① Provide pipe runner of the size shown in the tables. Provide cross pipe of the same size as the pipe runner. Provide cross pipe stub out and bottom anchor pipe of the next smaller size pipe as shown in the Standard Pipe Sizes and Max Pipe Runner Lengths table.

② This standard allows for the placement of only one pipe runner across each culvert pipe opening. In order to limit the clear opening to be traversed by an errant vehicle, the following conditions must be met:

For 60" culvert pipes, the skew must not exceed 0°.
For 54" culvert pipes, the skew must not exceed 15°.
For 48" culvert pipes, the skew must not exceed 30°.
For all culvert pipe sizes 42" and less, the skew must not exceed 45°.

If the above conditions cannot be met, the designer should consider using a safety end treatment with flared wings. For further information, refer to the TxDOT Roadway Design Manual.

③ Miter = slope of mitered end of pipe culvert.

④ Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap."

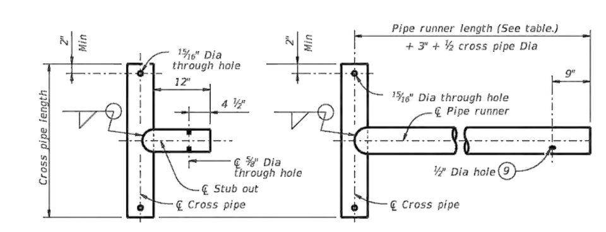
⑤ Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

SHEET 1 OF 2

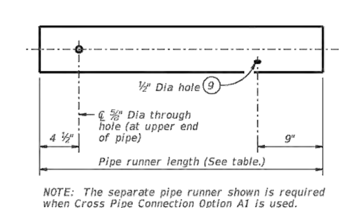
Texas Department of Transportation | Bridge Division Standard

SAFETY END TREATMENT
FOR 12" DIA TO 60" DIA
PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE
SETP-CD

FILE: CD-SETP-CD-20.dgn | DN: GAF | CK: CAT | DW: JRP | CK: GAF
©TxDOT February 2020 | CONT | SECT | JOB | HIGHWAY
REVISIONS | DIST | COUNTY | SHEET NO.

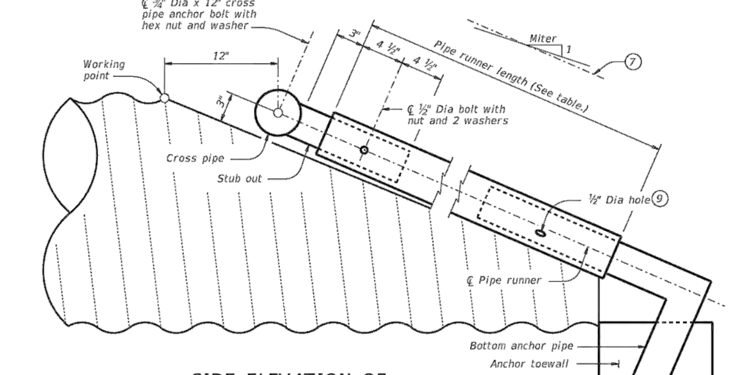


CROSS PIPE AND CONNECTIONS DETAILS



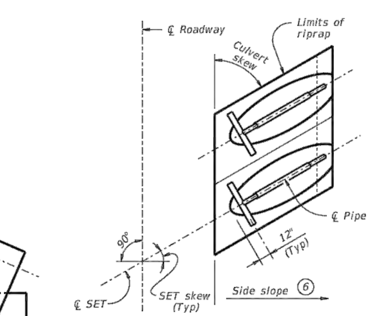
NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS

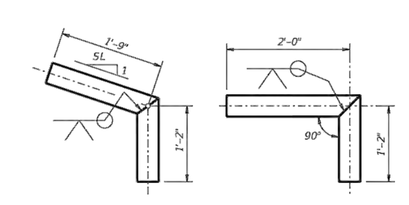


SIDE ELEVATION OF SAFETY END TREATMENT INSTALLATION

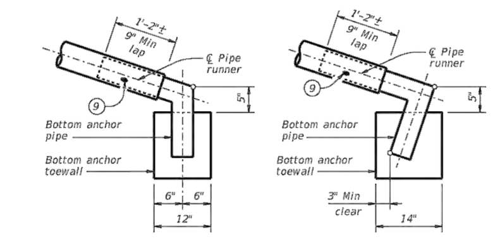
(Showing pipe runner with Cross Pipe Connection Option A1 and Anchor Pipe Option B2 on corrugated metal pipe (CMP) culvert. Reinforced concrete pipe culvert (RCP) details are similar. Riprap not shown for clarity)



PLAN OF SKEWED INSTALLATION

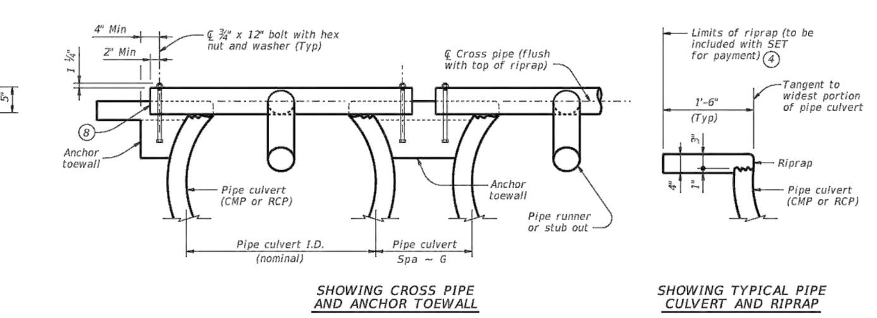


BOTTOM ANCHOR PIPE DETAILS ⑩



BOTTOM ANCHOR TOEWALL DETAILS

(Culvert and riprap not shown for clarity.)



SECTION A-A

④ Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap."

⑥ Recommended values of side slope are 3:1, 4:1, and 6:1. All quantities, calculations, and dimensions shown herein are based on these recommended values. Slope of 3:1 or flatter is required for vehicle safety.

⑦ Note that actual slope of pipe runner may vary slightly from side slope of riprap and trimmed culvert pipe edge.

⑧ Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.

⑨ After installation, inspect the ½" hole to ensure that the lap of the pipe runner with the bottom anchor pipe is adequate.

⑩ At fabricator's option, a heat bend to a smooth 5" radius or a manufactured elbow (of the same material as the runner) may be substituted for the mitered and welded joint in the bottom anchor pipe.

MATERIAL NOTES:
Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
Provide pipe runners, cross pipes, and anchor pipes conforming to the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.
Provide ASTM A307 bolts and nuts.
Galvanize all steel components, except concrete reinforcing, after fabrication.
Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:
Pipe runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.
Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.
Payment for riprap and toewall is included in the price bid for each safety end treatment.
Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap."

SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

SAFETY END TREATMENT
FOR 12" DIA TO 60" DIA
PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE
SETP-CD

FILE: CD-SETP-CD-20.dgn | DN: GAF | CK: CAT | DW: JRP | CK: GAF
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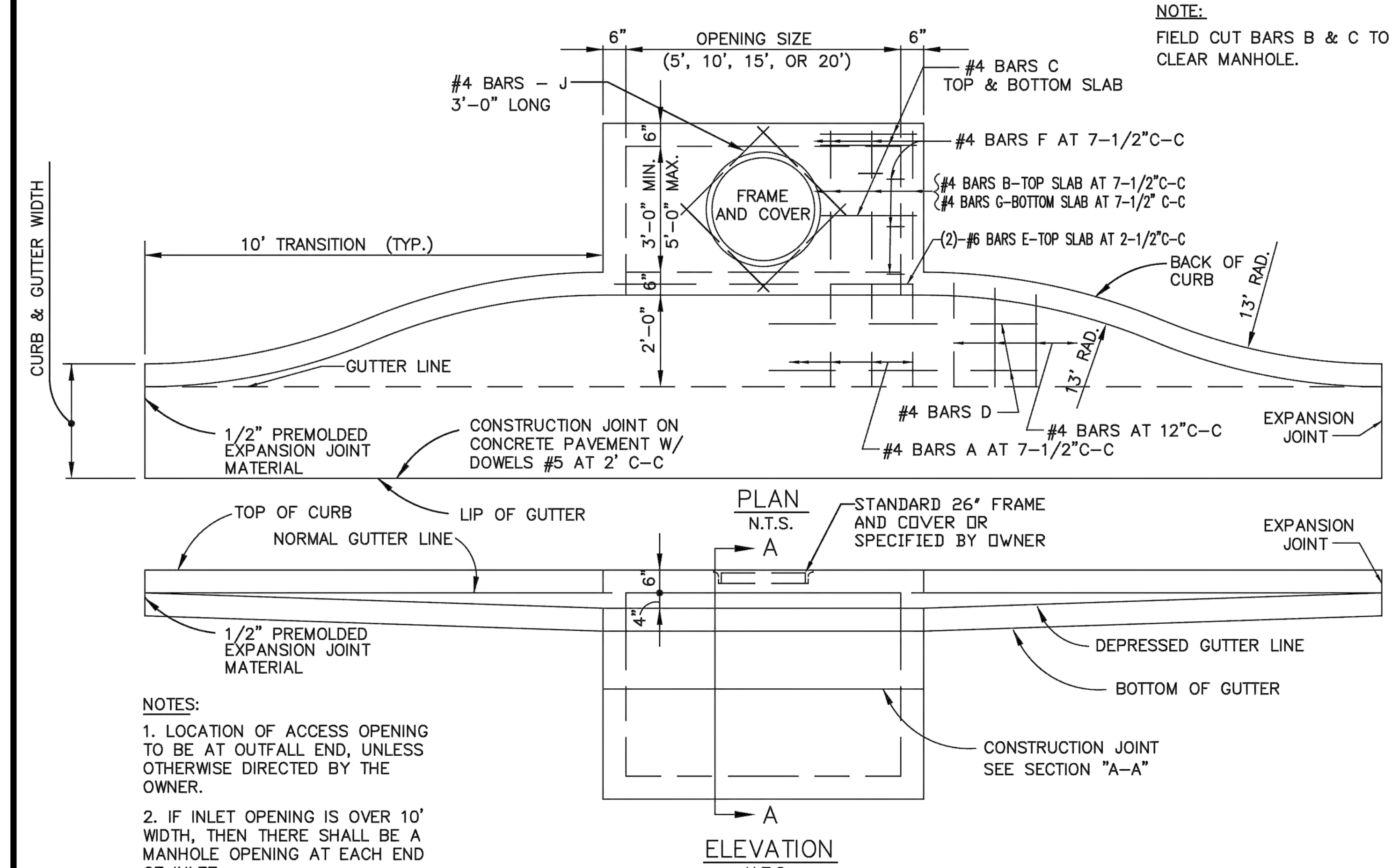
REVISIONS | DIST | COUNTY | SHEET NO.

NOTE:
FIELD CUT BARS B & C TO CLEAR MANHOLE.



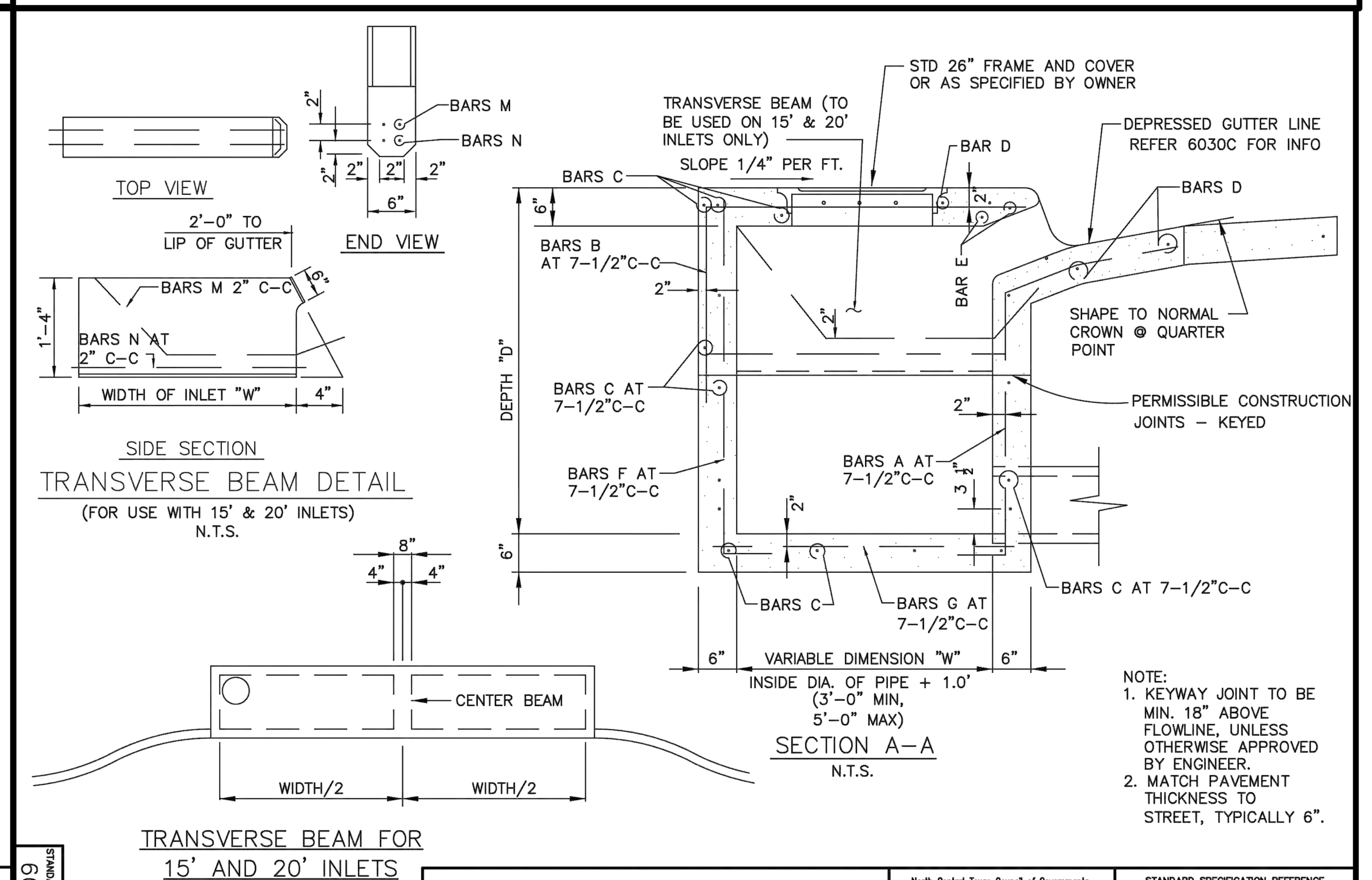
NOTES:

1. LOCATION OF ACCESS OPENING TO BE AT OUTFALL END, UNLESS OTHERWISE DIRECTED BY THE OWNER.

2. IF INLET OPENING IS OVER 10' WIDTH, THEN THERE SHALL BE A MANHOLE OPENING AT EACH END OF INLET.

STANDARD DRAWING NO. 6030A

CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702	
5', 10', 15' OR 20' OPENING		DATE AUG '23	STANDARD DRAWING NO. 6030A



NOTE:
1. KEYWAY JOINT TO BE MIN. 18" ABOVE FLOWLINE, UNLESS OTHERWISE APPROVED BY ENGINEER.
2. MATCH PAVEMENT THICKNESS TO STREET, TYPICALLY 6".

STANDARD DRAWING NO. 6030B

CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702	
CROSS SECTION & CENTER BEAM		DATE AUG '23	STANDARD DRAWING NO. 6030B

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

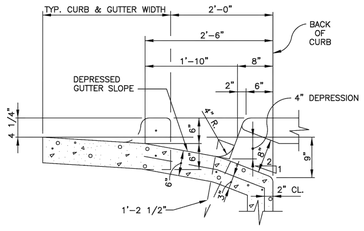
PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS
STORM DRAIN DETAILS (1)

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 21

Date: April 21, 2023, 2:24 PM – User ID: AROSCOE
File: S:\projects\614\05\03\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\CR 904\SDDT-614503-CR904.dwg

ISSUED FOR CONSTRUCTION SET



INLET THROAT
N.T.S.

CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702
INLET THROAT		DATE AUG '23 · STANDARD DRAWING NO. 6030C

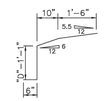
STANDARD DRAWING NO. 6030C

GENERAL NOTES:

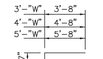
1. ALL REINFORCING STEEL SHALL BE GRADE 60. DEFORMED REINFORCING BARS AT A DIAMETER & LENGTH AS SHOWN.
2. ALL CONCRETE SHALL BE CLASS "C". ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
3. ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 2" CLEAR OF THE BARS.
4. 10'-0" OF EXISTING CURB AND GUTTER UPSTREAM AND 10'-0" OF EXISTING CURB AND GUTTER DOWNSTREAM SHALL BE REMOVED AND REPOURED INTEGRALLY WITH EACH INLET.
5. ALL BACK FILLING SHALL BE PERFORMED BY MECHANICAL TAMPING TO 95% STANDARD PROCTOR DENSITY.
6. PRECAST PRODUCTS MAY BE USED AT THE APPROVAL OF THE OWNER.
7. ALLOW 1" MIN. CLEAR SPACE BETWEEN OD OF PIPE OR BOX AND INSIDE WALL OF INLET (OD OF PIPE OR BOX SHOULD ACCOUNT FOR SKEWED CONDITIONS).
8. FIELD CUT & BEND BARS AS NECESSARY TO ACCOMODATE STORM SEWER PIPE.
9. RING & COVER SHALL BE APPROVED BY THE OWNER AND INSTALLED BT CONTRACTOR.
10. WHEN POURING INVERTS, THE BOTTOM SHALL BE SLOPED NO MORE THAN 1/4"/FT TOWARD PIPE.
11. INLET OPENING SHALL BE 6" MIN OR 8" MAX.
12. 10 FT. MAX DEPTH.

CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702
GENERAL NOTES		DATE AUG '23 · STANDARD DRAWING NO. 6030D

STANDARD DRAWING NO. 6030D



#4 BARS A
N.T.S.

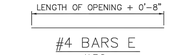


#4 BARS B
N.T.S.

BARS C | LGTH.OPEN.+0'-8"
BARS D | LGTH.OPEN.+19'-8"

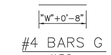
#4 BARS C & D
N.T.S.

FIELD CUT D BARS AS NECESSARY AT TRANSITIONS

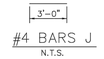


#4 BARS E
N.T.S.

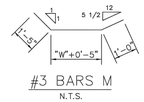
#4 BARS F
N.T.S.



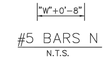
#4 BARS G
N.T.S.



#4 BARS J
N.T.S.



#3 BARS M
N.T.S.



#5 BARS N
N.T.S.

CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702
REBAR		DATE AUG '23 · STANDARD DRAWING NO. 6030E

STANDARD DRAWING NO. 6030E

BILL OF REINFORCING STEEL

DEPTH "D"	ALL AND	WIDTHS LENGTHS	OPENING LENGTH "L" = 5ft						OPENING LENGTH "L" = 10ft						OPENING LENGTH "L" = 15 ft								OPENING LENGTH "L" = 20 ft					
			Widths "W" 3ft	4ft	5ft				Widths "W" 3ft	4ft	5ft				Widths "W" 3ft	4ft	5ft						Widths "W" 3ft	4ft	5ft			
	BARS C	BARS D	BARS E	BARS F	BARS G	BARS A	BARS B	BARS J	BARS E	BARS F	BARS G	BARS A	BARS B	BARS J	BARS E	BARS F	BARS G	BARS A	BARS B	BARS H	BARS K	BARS L	BARS E	BARS F	BARS G	BARS A	BARS B	BARS J
	C	D	E	J	F	F	F	A	B	G	F	F	F	A	B	G	F	F	F	A	B	G	M	N	F	F	F	A	B	G	M	N
3'-6"	17	3	2	4	20	24	28	10	10	20	28	32	36	18	18	28	36	40	44	26	26	36	2	2	44	48	52	34	34	44	2	2
3'-9"	18	"	"	"	"	"	"	"	"	20	"	"	"	"	"	28	"	"	"	"	"	36	"	"	"	"	"	"	"	44	"	"
4'-0"	19	"	"	"	"	"	"	"	"	24	"	"	"	"	"	32	"	"	"	"	"	40	"	"	"	"	"	"	"	48	"	"
4'-3"	19	"	"	"	"	"	"	"	"	24	"	"	"	"	"	32	"	"	"	"	"	40	"	"	"	"	"	"	"	48	"	"
4'-6"	21	"	"	"	"	"	"	"	"	26	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	"	"	50	"	"
4'-9"	21	"	"	"	"	"	"	"	"	26	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	"	"	50	"	"
5'-0"	21	"	"	"	"	"	"	"	"	26	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	"	"	50	"	"
5'-3"	23	"	"	"	"	"	"	"	"	28	"	"	"	"	"	36	"	"	"	"	"	44	"	"	"	"	"	"	"	52	"	"
5'-6"	23	"	"	"	"	"	"	"	"	28	"	"	"	"	"	36	"	"	"	"	"	44	"	"	"	"	"	"	"	52	"	"
5'-9"	25	"	"	"	"	"	"	"	"	30	"	"	"	"	"	38	"	"	"	"	"	46	"	"	"	"	"	"	"	54	"	"
6'-0"	25	"	"	"	"	"	"	"	"	30	"	"	"	"	"	38	"	"	"	"	"	46	"	"	"	"	"	"	"	54	"	"
6'-3"	26	"	"	"	"	"	"	"	"	30	"	"	"	"	"	38	"	"	"	"	"	46	"	"	"	"	"	"	"	54	"	"
6'-6"	27	"	"	"	"	"	"	"	"	32	"	"	"	"	"	40	"	"	"	"	"	48	"	"	"	"	"	"	"	56	"	"
6'-9"	27	"	"	"	"	"	"	"	"	32	"	"	"	"	"	40	"	"	"	"	"	48	"	"	"	"	"	"	"	56	"	"
7'-0"	29	"	"	"	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	50	"	"	"	"	"	"	"	58	"	"
7'-3"	29	"	"	"	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	50	"	"	"	"	"	"	"	58	"	"
7'-6"	30	"	"	"	"	"	"	"	"	34	"	"	"	"	"	42	"	"	"	"	"	50	"	"	"	"	"	"	"	58	"	"
7'-9"	31	"	"	"	"	"	"	"	"	36	"	"	"	"	"	44	"	"	"	"	"	52	"	"	"	"	"	"	"	60	"	"
8'-0"	31	"	"	"	"	"	"	"	"	36	"	"	"	"	"	44	"	"	"	"	"	52	"	"	"	"	"	"	"	60	"	"
8'-3"	32	"	"	"	"	"	"	"	"	36	"	"	"	"	"	44	"	"	"	"	"	52	"	"	"	"	"	"	"	60	"	"
8'-6"	33	"	"	"	"	"	"	"	"	38	"	"	"	"	"	46	"	"	"	"	"	54	"	"	"	"	"	"	"	62	"	"
8'-9"	34	"	"	"	"	"	"	"	"	38	"	"	"	"	"	46	"	"	"	"	"	54	"	"	"	"	"	"	"	62	"	"
9'-0"	35	"	"	"	"	"	"	"	"	40	"	"	"	"	"	48	"	"	"	"	"	56	"	"	"	"	"	"	"	64	"	"
9'-3"	36	"	"	"	"	"	"	"	"	40	"	"	"	"	"	48	"	"	"	"	"	56	"	"	"	"	"	"	"	64	"	"
9'-6"	37	"	"	"	"	"	"	"	"	42	"	"	"	"	"	50	"	"	"	"	"	58	"	"	"	"	"	"	"	66	"	"
10'-0"	38	"	"	"	"	"	"	"	"	42	"	"	"	"	"	50	"	"	"	"	"	58	"	"	"	"	"	"	"	66	"	"

NOTE:
- FOR CONVENIENCE, DEPTHS OF INLETS SHOWN IN ABOVE TABLES ARE IN INCREMENTS OF 3 INCHES BUT ANY DEPTHS OTHER THAN THOSE SHOWN ABOVE MAY BE USED WHEREVER DEEMED NECESSARY. QUANTITIES FOR OTHER DEPTHS FALLING WITHIN THE LIMITS OF THE TABLE MAY BE FOUND BY INTERPOLATION.
- DEPTHS GREATER THAN 10' NEED TO BE STRUCTURALLY ENGINEERED.

CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702
BILL OF REINFORCING STEEL		DATE AUG '23 · STANDARD DRAWING NO. 6030F

STANDARD DRAWING NO. 6030F

SUMMARY OF QUANTITIES FOR CURB INLETS

DEPTH "D"	5'-0" OPENING						10'-0" OPENING						15'-0" OPENING						20'-0" OPENING					
	WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"		WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"		WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"		WIDTH 3'-0"		WIDTH 4'-0"		WIDTH 5'-0"	
	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.	CONC C.Y.	STEEL LBS.
3'-6"	2.87	324	3.23	357	3.59	390	4.41	496	4.95	540	5.50	584	5.94	684	6.67	742	7.40	799	7.48	858	8.40	926	9.31	995
3'-9"	2.96	333	3.32	367	3.69	401	4.54	512	5.09	556	5.64	601	6.12	706	6.86	764	7.60	822	7.70	886	8.63	955	9.55	1024
4'-0"	3.04	353	3.42	390	3.79	428	4.66	537	5.23	585	5.79	633	6.29	737	7.04	799	7.79	861	7.92	923	8.86	996	9.79	1068
4'-3"	3.12	358	3.51	396	3.89	434	4.79	545	5.37	594	5.94	643	6.47	748	7.23	811	7.99	873	8.14	937	9.09	1010	10.03	1083
4'-6"	3.21	376	3.60	417	4.00	457	4.92	573	5.51	624	6.09	675	6.64	786	7.41	850	8.18	915	8.36	984	9.32	1059	10.27	1134
4'-9"	3.29	382	3.69	423	4.10	464	5.05	581	5.65	633	6.24	684	6.82	796	7.60	862	8.37	927	8.59	997	9.55	1073	10.51	1149
5'-0"	3.37	387	3.79	429	4.20	471	5.18	589	5.79	641	6.38	693	7.00	807	7.78	873	8.57	939	8.81	1011	9.78	1087	10.75	1164
5'-3"	3.46	406	3.88	450	4.30	493	5.31	617	5.92	671	6.53	725	7.17	845	7.97	912	8.76	980	9.03	1057	10.02	1136	10.99	1215
5'-6"	3.54	411	3.97	456	4.40	500	5.44	625	6.06	680	6.68	735	7.35	855	8.15	924	8.96	992	9.25	1071	10.25	1150	11.23	1229
5'-9"	3.62	429	4.06	476	4.50	523	5.57	653	6.20	710	6.83	767	7.52	893	8.34	963	9.15	1034	9.48	1118	10.48	1199	11.48	1280
6'-0"	3.71	435	4.16	482	4.61	530	5.70	661	6.34	719	6.98	776	7.70	903	8.53	975	9.35	1046	9.70	1131	10.71	1213	11.72	1295
6'-3"	3.79	444	4.25	492	4.71	540	5.83	676	6.48	735	7.12	793	7.88	925	8.71	997	9.54	1069	9.92	1159	10.94	1242	11.96	1324
6'-6"	3.87	459	4.34	509	4.81	559	5.96	697	6.62	757	7.27	818	8.05	952	8.90	1026	9.74	1100	10.14	1191	11.17	1276	12.20	1361
6'-9"	3.96	464	4.43	515	4.91	566	6.09	705	6.76	766	7.42	827	8.23	962	9.08	1037	9.93	1112	10.36	1205	11.40	1290	12.44	1376
7'-0"	4.04	482	4.53	536	5.01	589	6.22	733	6.90	796	7.57	859	8.40	1000	9.27	1077	10.12	1154	10.59	1252	11.64	1339	12.68	1427
7'-3"	4.12	488	4.62	542	5.12	595	6.35	741	7.04	805	7.72	869	8.58	1010	9.45	1088	10.32	1166	10.81	1265	11.87	1353	12.92	1442
7'-6"	4.21	497	4.71	552	5.22	606	6.48	756	7.17	821	7.87	885	8.76	1032	9.64	1110	10.51	1189	11.03	1293	12.10	1382	13.16	1471
7'-9"	4.29	512	4.80	568	5.32	625	6.61	777	7.31	843	8.01	910	8.93	1059	9.82	1139	10.71	1219	11.25	1326	12.33	1417	13.40	1508
8'-0"	4.37	517	4.90	574	5.42	632	6.74	785	7.45	852	8.16	919	9.11	1069	10.01	1150	10.90	1231	11.48	1339	12.56	1431	13.64	1522
8'-3"	4.46	526	4.99	584	5.52	642	6.87	800	7.59	868	8.31	936	9.28	1091	10.19	1173	11.10	1254	11.70	1367	12.79	1459	13.88	1551
8'-6"	4.54	541	5.08	601	5.63	661	7.00	820	7.73	891	8.46	961	9.46	1118	10.38	1201	11.29	1285	11.92	1399	13.02	1494	14.12	1588
8'-9"	4.62	550	5.17	611	5.73	672	7.13	836	7.87	907	8.61	978	9.64	1139	10.56	1224	11.49	1308	12.14	1427	13.26	1522	14.36	1617
9'-0"	4.71	565	5.27	628	5.83	691	7.26	856	8.01	929	8.75	1002	9.81	1166	10.75	1252	11.68	1339	12.36	1460	13.49	1557	14.60	1654
9'-3"	4.79	574	5.36	638	5.93	701	7.39	872	8.15	945	8.90	1019	9.99	1187	10.93	1275	11.87	1362	12.59	1487	13.72	1585	14.85	1683
9'-6"	4.87	588	5.45	654	6.03	720	7.52	892	8.29	968	9.05	1044	10.16	1214	11.12	1303	12.07	1393	12.81	1520	13.95	1620	15.09	1720
10'-0"	5.04	603	5.64	670	6.24	738	7.78	916	8.56	993	9.35	1070	10.51	1246	11.49	1337	12.46	1428	13.25	1561	14.41	1662	15.57	1764

NOTE:
- FOR CONVENIENCE, DEPTHS OF INLETS SHOWN IN ABOVE TABLES ARE IN INCREMENTS OF 3 INCHES BUT ANY DEPTHS OTHER THAN THOSE SHOWN ABOVE MAY BE USED WHEREVER DEEMED NECESSARY. QUANTITIES FOR OTHER DEPTHS FALLING WITHIN THE LIMITS OF THE TABLE MAY BE FOUND BY INTERPOLATION.
- DEPTHS GREATER THAN 10' NEED TO BE STRUCTURALLY ENGINEERED.

CURB INLET RECESSED	North Central Texas Council of Governments	STANDARD SPECIFICATION REFERENCE 702
SUMMARY OF QUANTITIES		DATE AUG '23 · STANDARD DRAWING NO. 6030G

STANDARD DRAWING NO. 6030G

NO.	REVISION	DATE

STATE OF TEXAS · ANNA JANE ROSCOE · 142544 · LICENSED PROFESSIONAL ENGINEER

1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE #210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS
STORM DRAIN DETAILS (2)

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 22

Date: April 21, 2023, 2:24 PM - User ID: AROSCOE
File: S:\projects\614\05\03\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\CR 904_6030F_61405-03-6030F.dwg

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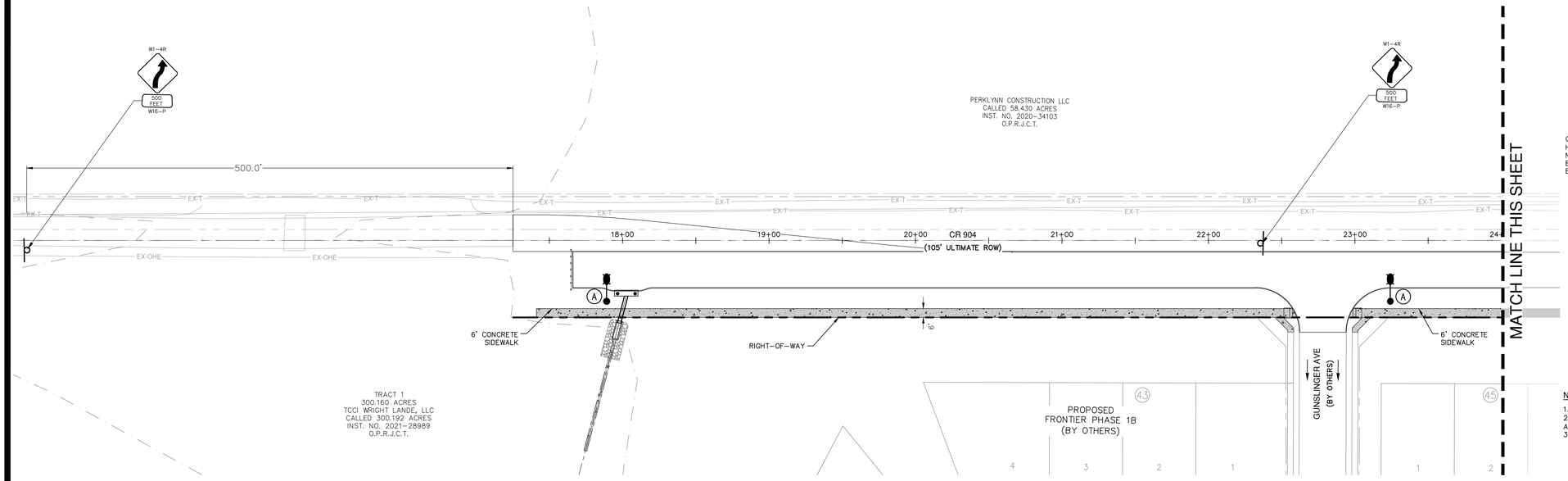


SCALE: 1"= 40'

0' 40' 80' 120'

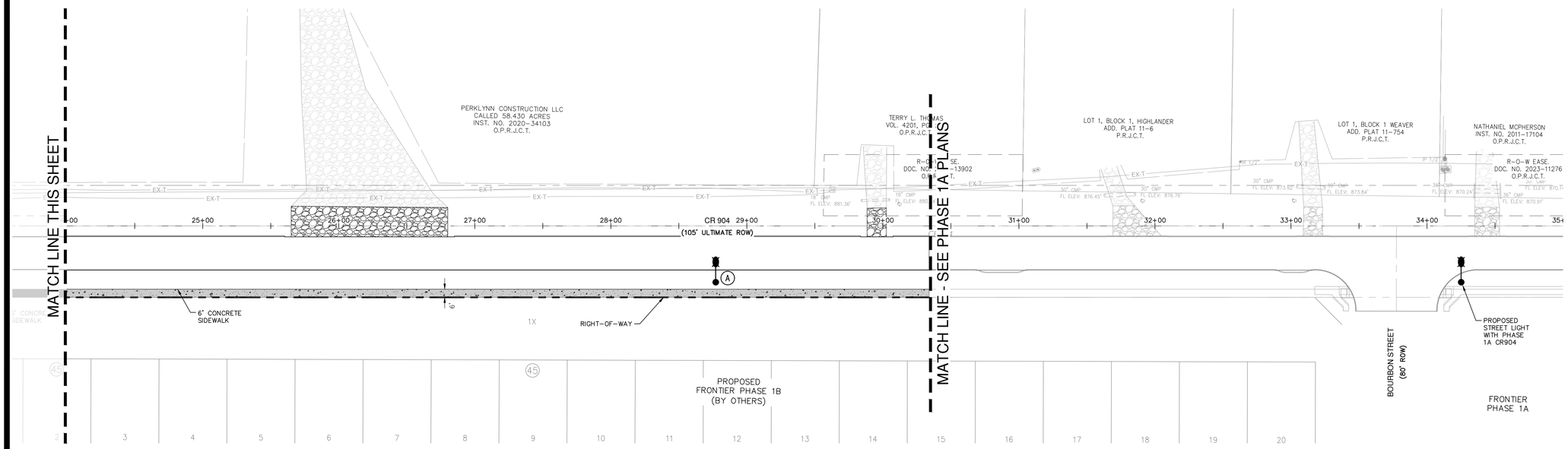
CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
E: 2298097.190	E: 2298117.060	E: 2301451.505	E: 2301645.519	E: 2298098.802
ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

LEGEND

- PROPOSED CONCRETE SIDEWALK
- STREET SIGN
- PROPOSED STREET LIGHT
- GRAVEL PAVEMENT

NOTE:

1. STREET LIGHTS SHALL BE MINIMUM 7000 LUMENS PER CITY CODE.
2. STREET LIGHTS SHALL HAVE A MAXIMUM SPACING OF 600' AS APPROVED BY THE CITY ON 09/24/24.
3. STREET LIGHTS SHALL BE ATTACHED TO UCS OHE POLES.



UTILITY NOTE

THE EXISTING UTILITIES SHOWN ON THESE PLANS WERE COMPILED FROM VARIOUS SOURCES AND ARE INTENDED TO SHOW THE GENERAL EXISTENCE AND LOCATION OF THE UTILITY INFORMATION ON THE PLANS. THE CONTRACTOR SHALL CONTACT A UTILITY LOCATING SERVICE 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND OF ALL EXISTING UTILITIES AND DETERMINE IF THERE ARE ANY CONFLICTS WITH THE PROPOSED FACILITIES. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY WHEN CONFLICTS WITH EXISTING UTILITIES ARE DISCOVERED.

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

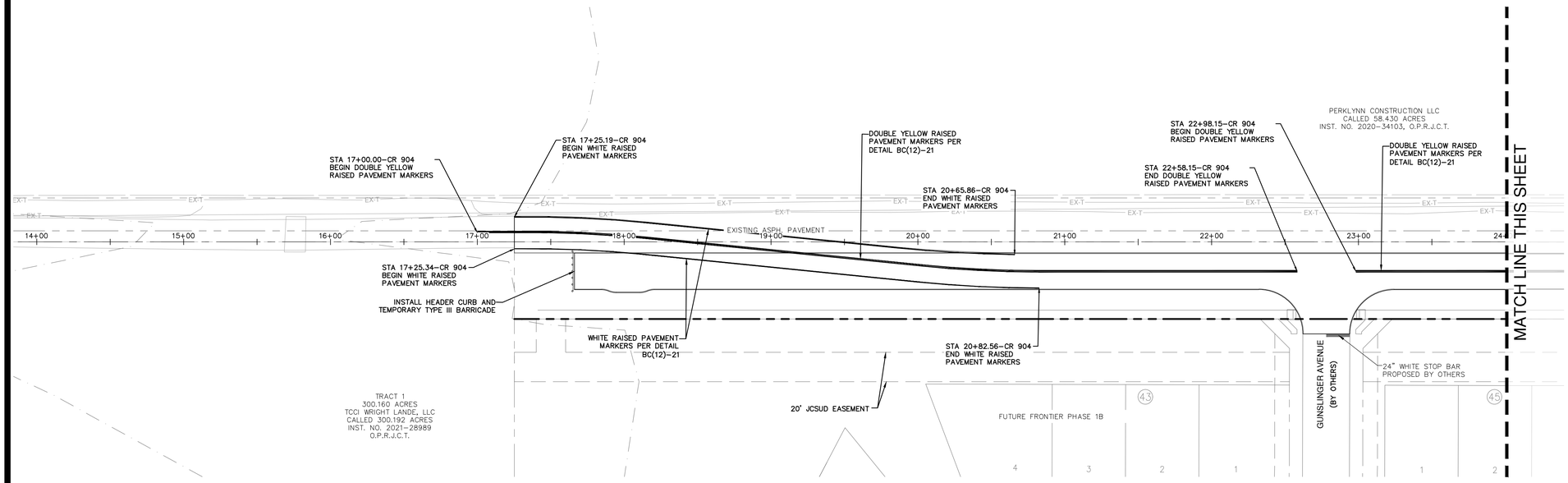
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

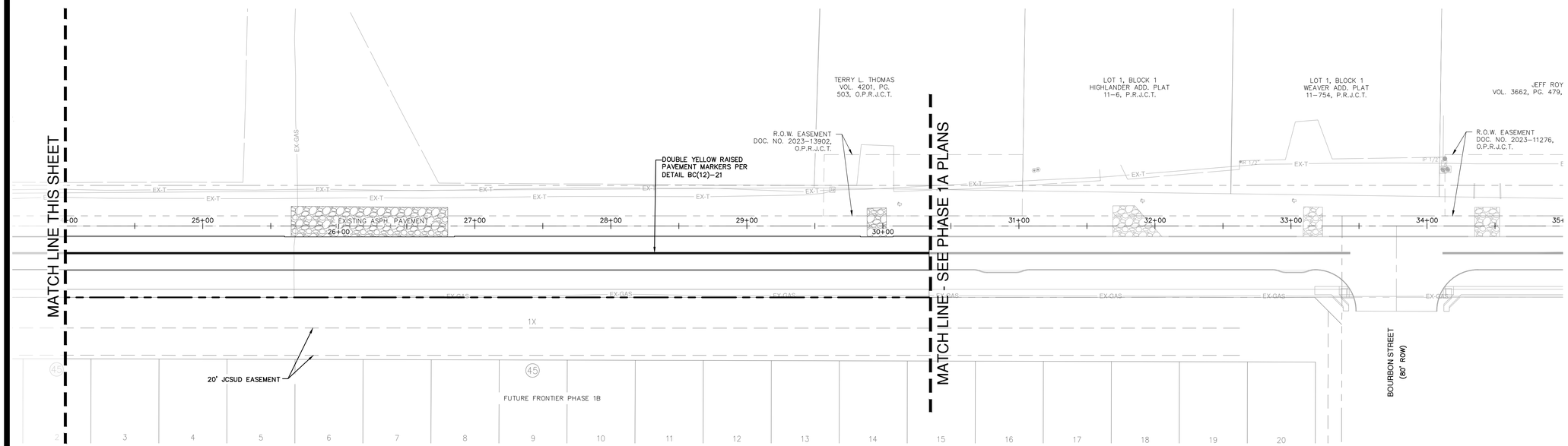
STREET LIGHT & SIDEWALK PLAN

PLAT NO.	N/A
JOB NO.	61405-03
DATE	1/28/2025
DESIGNER	SM
CHECKED	AR
DRAWN	SM
SHEET	23

Date: April 21, 2023, 2:25 PM - User ID: AROSCOE
File: S:\Projects\614.05\03\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\CR 904_SHEET_61405-03-04.dwg

ISSUED FOR CONSTRUCTION SET





SCALE: 1" = 40'

0' 40' 80' 120'

CP#1	CP#2	CP#3	CP#4	CP#5
HUB 1/2" IR	HUB 60D NAIL	HUB 1/2" IR	HUB 1/2" IR	HUB 1/2" IR
N: 6838620.362	N: 6838595.465	N: 6842154.006	N: 6841086.582	N: 6842063.285
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ELEV: 876.109	ELEV: 876.579	ELEV: 861.768	ELEV: 861.768	ELEV: 861.768

NO.	REVISION	DATE

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED
PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS
PAVEMENT MARKING PLAN

PLAT NO. N/A
JOB NO. 61405-03
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 24

Date: April 21, 2023, 2:26 PM – User ID: AROSCOE
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ISSUED FOR CONSTRUCTION SET

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

Texas Department of Transportation — Traffic Safety Division Standard

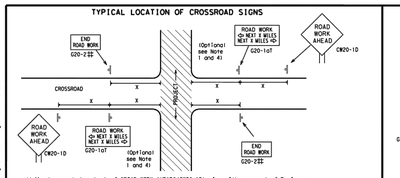
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
4-03 7-13	DIST	COUNTY		SHEET NO.
5-10 5-21				

DATE:
FILE:

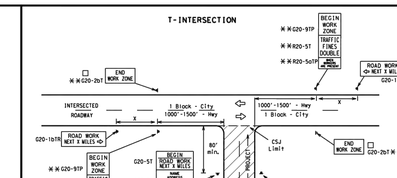
TYPICAL LOCATION OF CROSSROAD SIGNS



Way be mounted on back of "ROAD WORK AHEAD"(CW20-1D) sign with approval of Engineer. (See note 2 below)

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING[1,5,6]

SIZE: Sign Number or Series	Conventional Road	Expressway/ Freeway
CW20[4], CW21, CW22, CW23, CW25	48" x 48"	48" x 48"
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"

SPACING: Posted Speed	Sign △ Spacing "X"
MPH	Feet (Appr.)
30	120
35	160
40	240
45	320
50	400
55	500[2]
60	600[2]
65	700[2]
70	800[2]
75	900[2]
80	1000[2]
*	* [3]

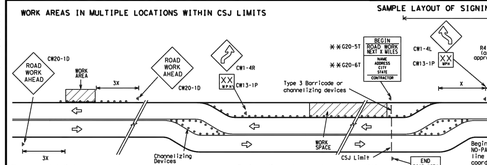
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

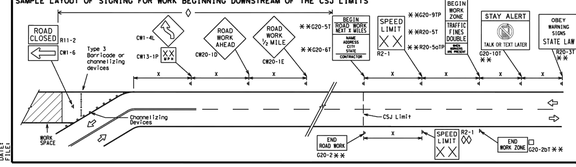
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may be used on low volume crossroads at the discretion of the Engineer as per TMUTCD Part 5. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

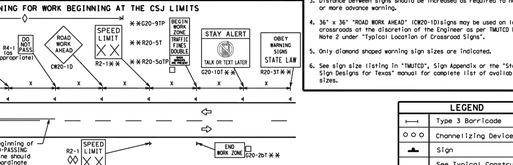


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT 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 Table or the TMUTCD for sign spacing requirements.

SHEET 2 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

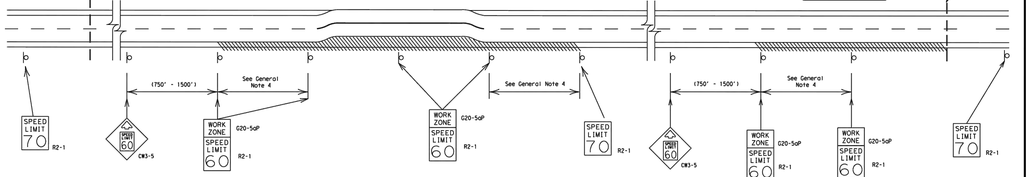
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21				

DATE:
FILE:

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:
a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver
As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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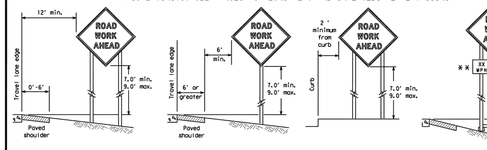
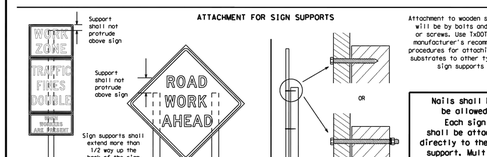
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

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

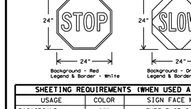
ATTACHMENT FOR SIGN SUPPORTS



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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

1. The types of sign supports, sign mounting heights,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 supports, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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Date: April 21, 2023, 2:26 PM - User ID: AROSCOE
File: S:\projects\914\05\03\C2.0 Design\C2-4 Civil\C2-4.3 Plan Sheets\CR 914_05_03 BC(1-4)-21.dwg

NO.	REVISION	DATE

STATE OF TEXAS — ANNA JANE ROSCOE — 142544 — REGISTERED PROFESSIONAL ENGINEER — 1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

TRAFFIC CONTROL DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 25

ISSUED FOR CONSTRUCTION SET

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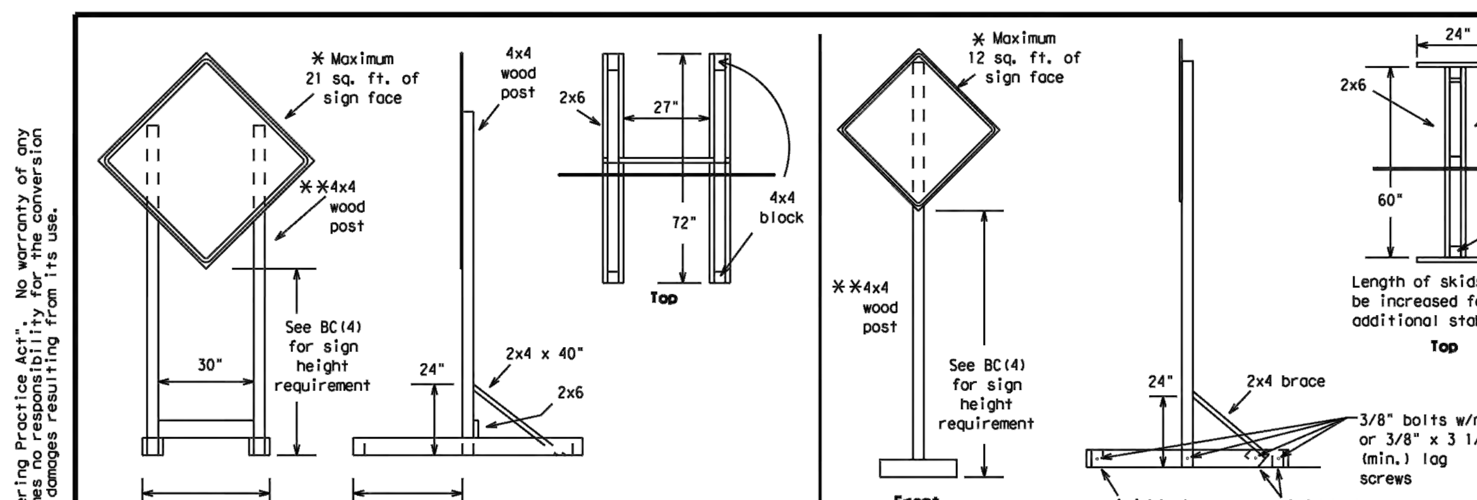
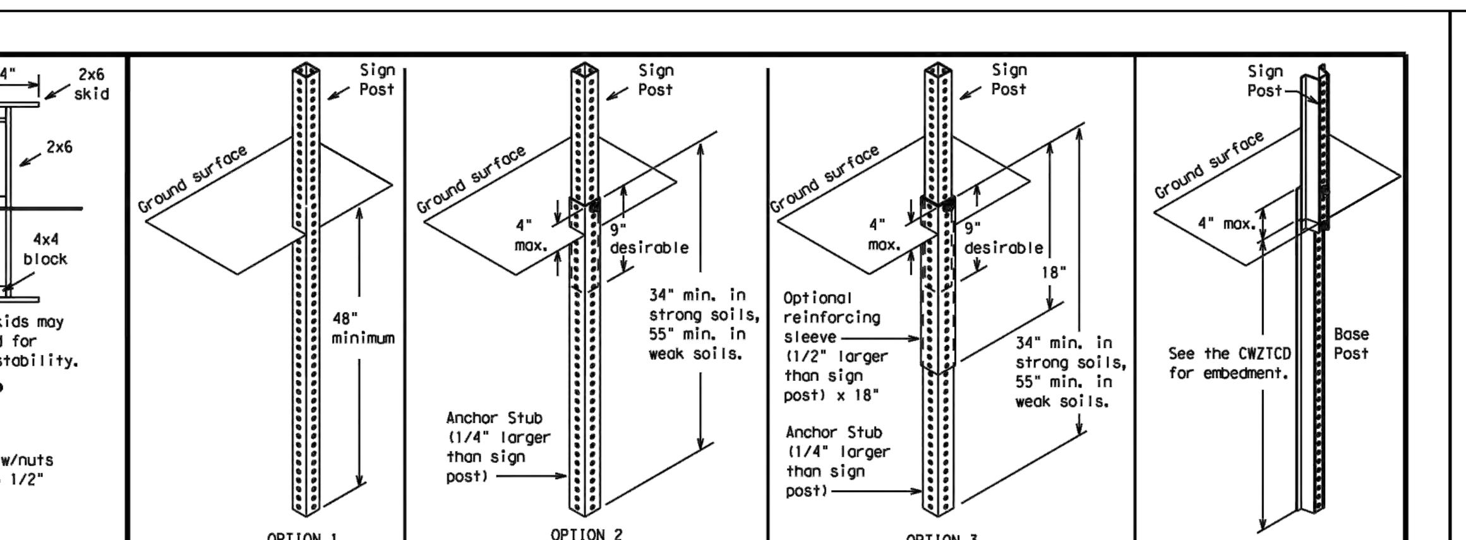


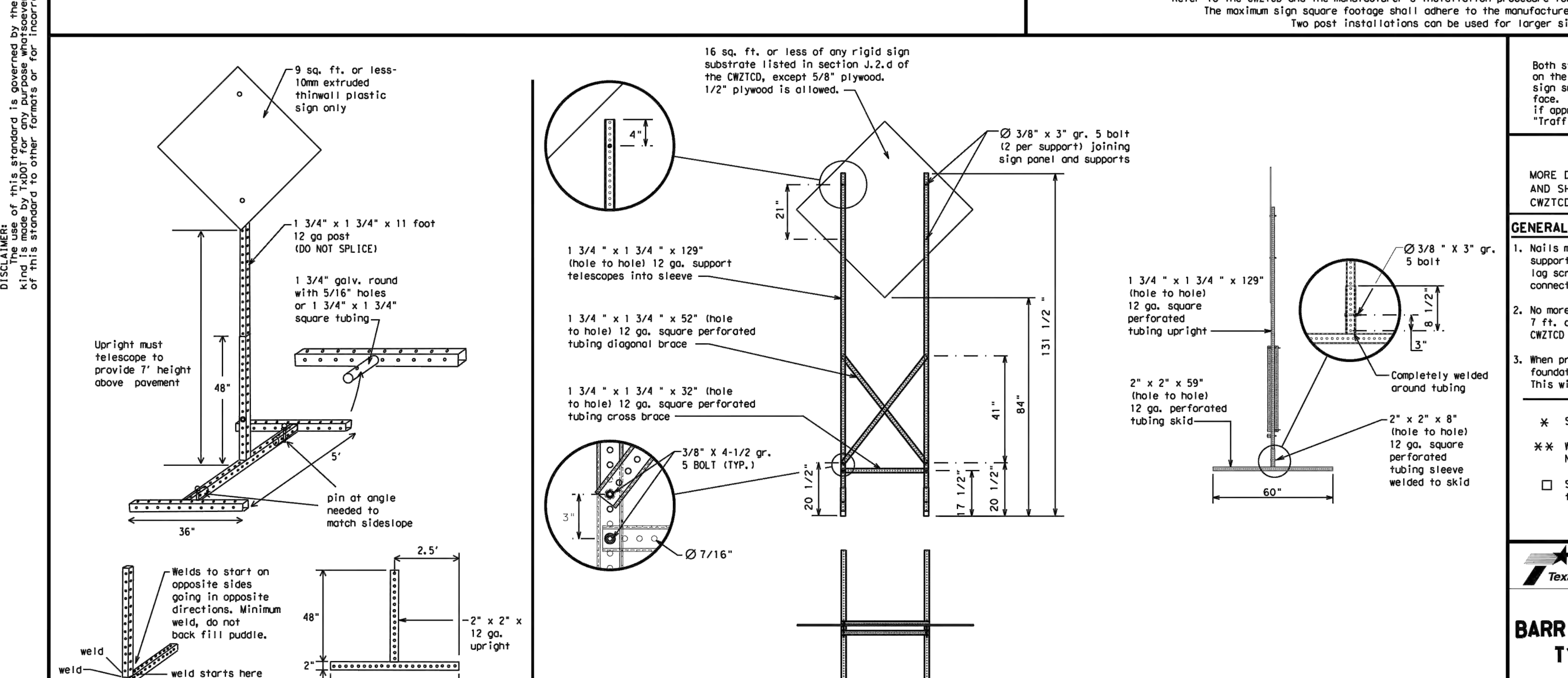
SKID MOUNTED WOOD SIGN SUPPORTS

* 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

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

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

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

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

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List	Warning List	** Advance Notice List
AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX- XX X PM-X AM
NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
	DRIVE SAFELY	XX AM TO XX PM
	DRIVE WITH CARE	NEXT TUE AUG XX
		TONIGHT XX PM- XX AM

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

SHEET 6 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

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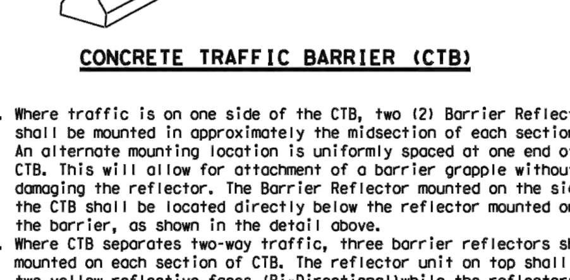
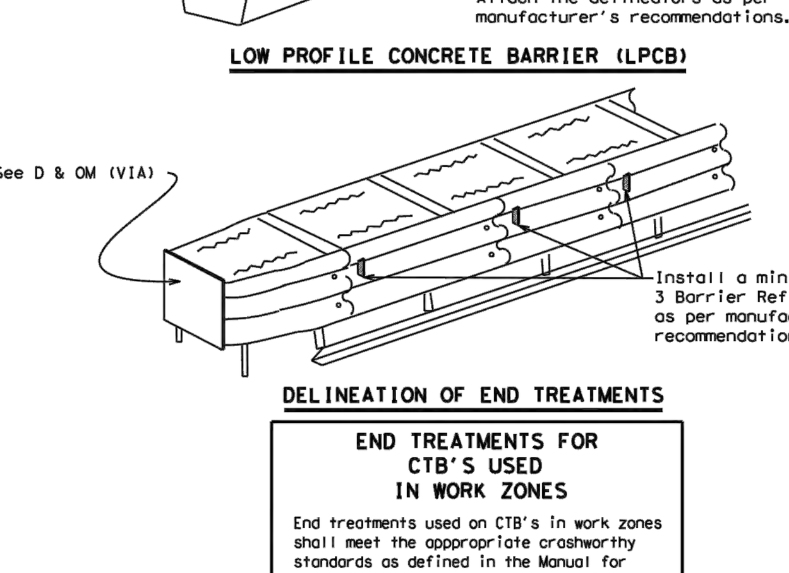
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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



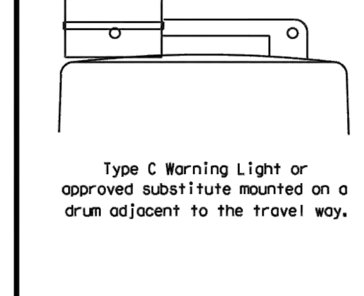
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

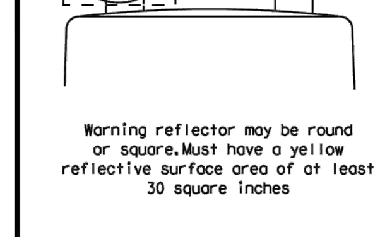
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

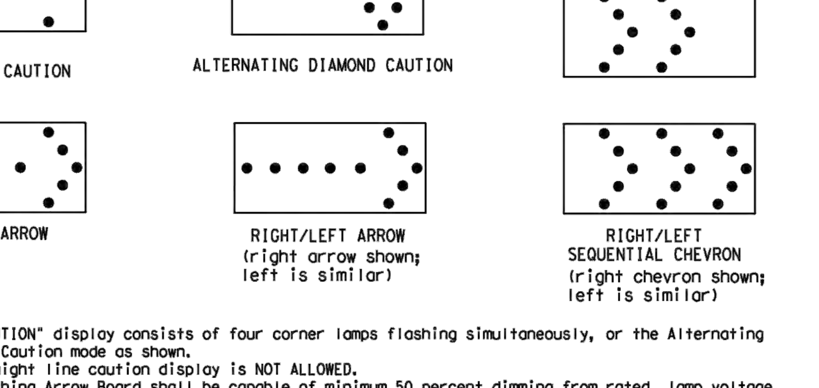
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

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Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

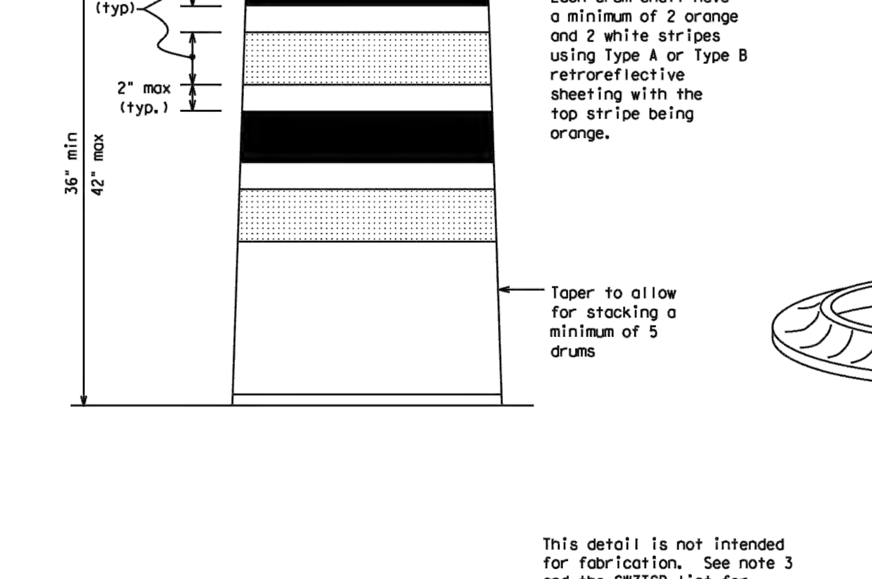
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

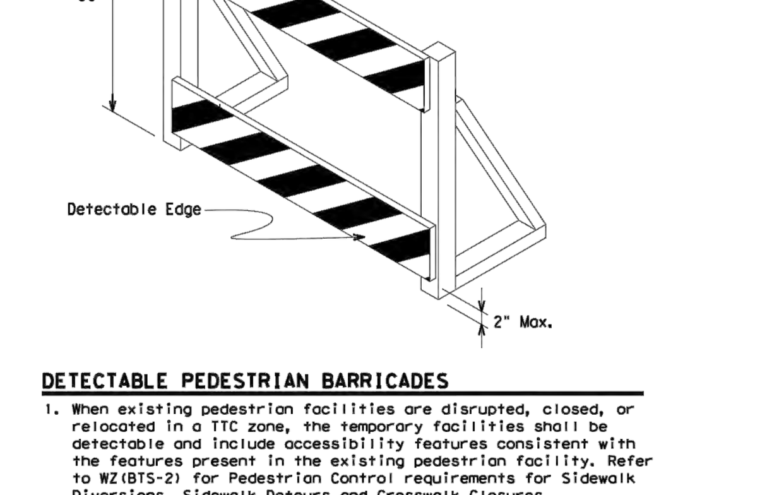
RETROREFLECTIVE SHEETING

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

BALLAST

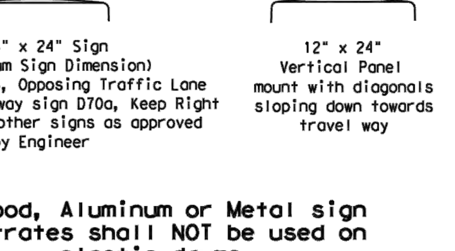
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other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





DETECTABLE PEDESTRIAN BARRICADES

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



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

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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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NO.	REVISION	DATE

STATE OF TEXAS — ANNA JANE ROSCOE — 142544 — LICENSED PROFESSIONAL ENGINEER

1/28/25

PAPE-DAWSON ENGINEERS

6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

COUNTY ROAD 904 IMPROVEMENTS

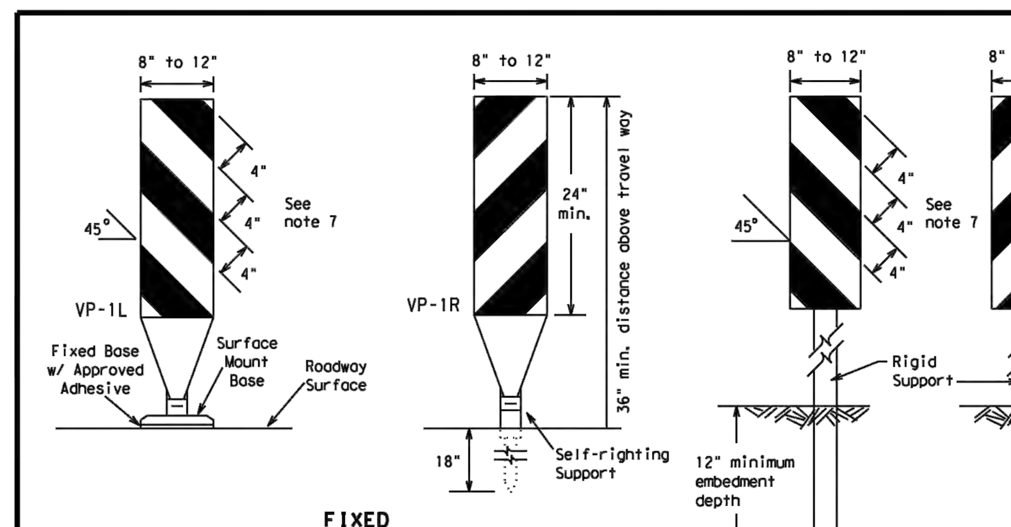
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

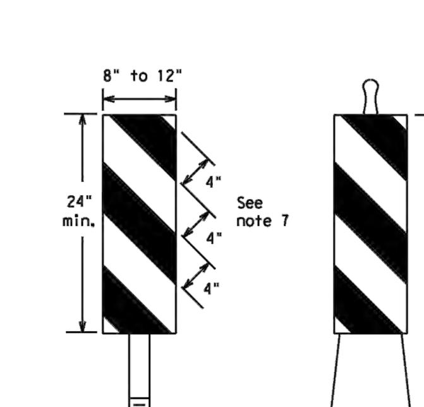
TRAFFIC CONTROL DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 26

ISSUED FOR CONSTRUCTION SET

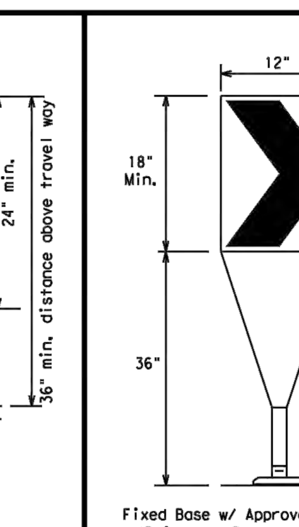
VERTICAL PANELS (VPs)





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

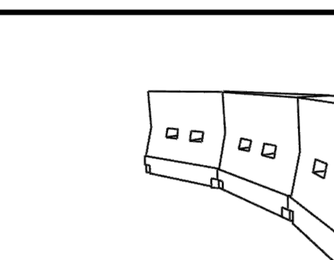
CHEVRONS



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

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

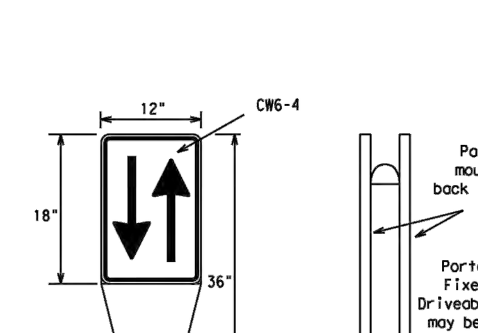
HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. The OTLD shall be orange with a black nonreflective 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.

SHEET 9 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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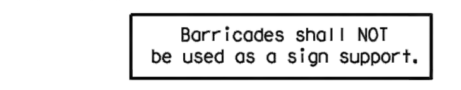
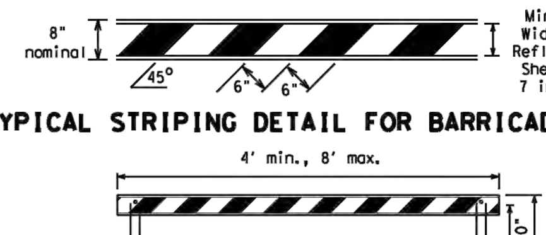
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.

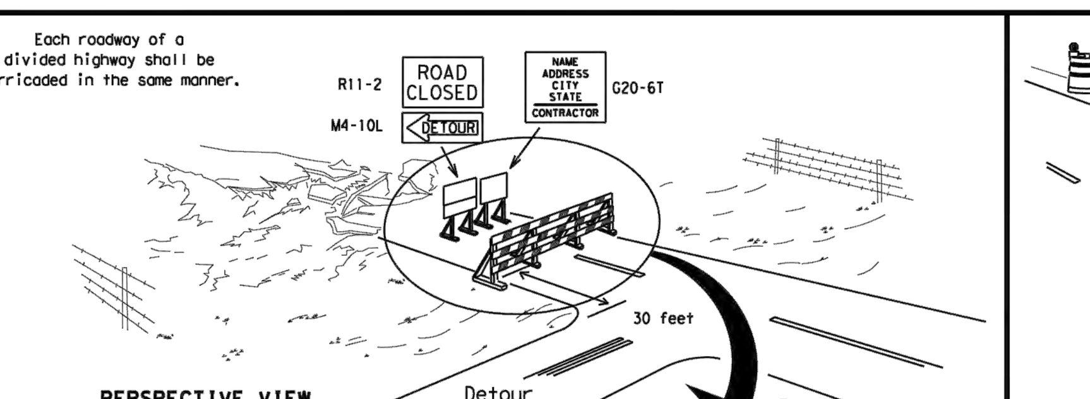


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL

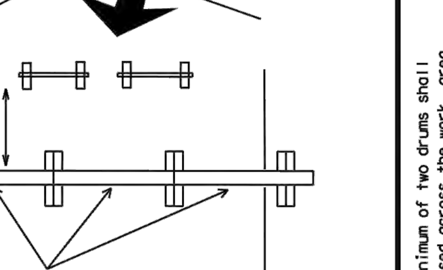


Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

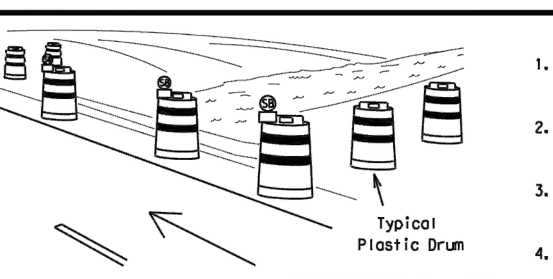


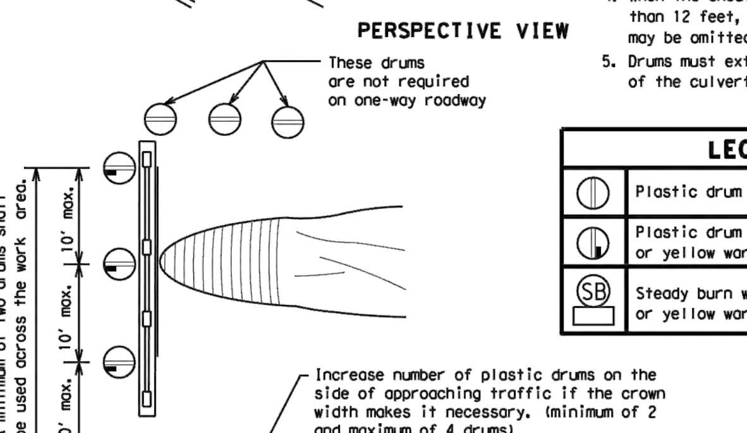
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



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

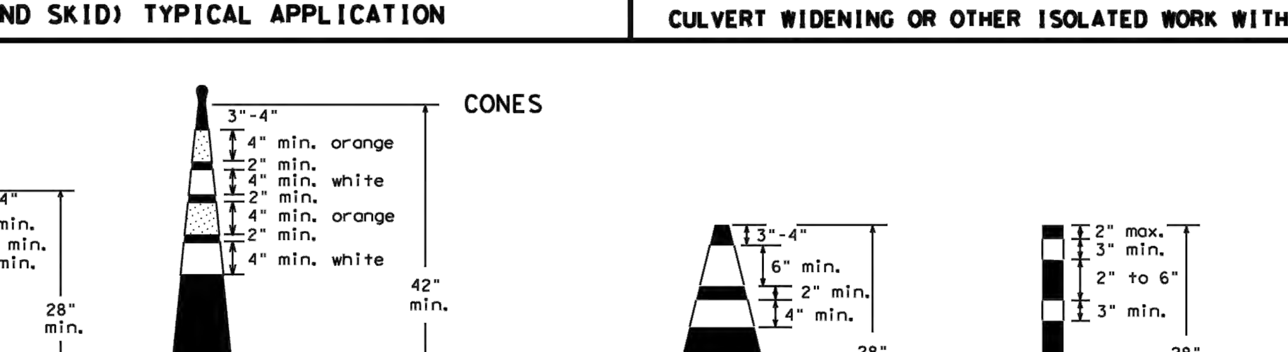




1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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

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

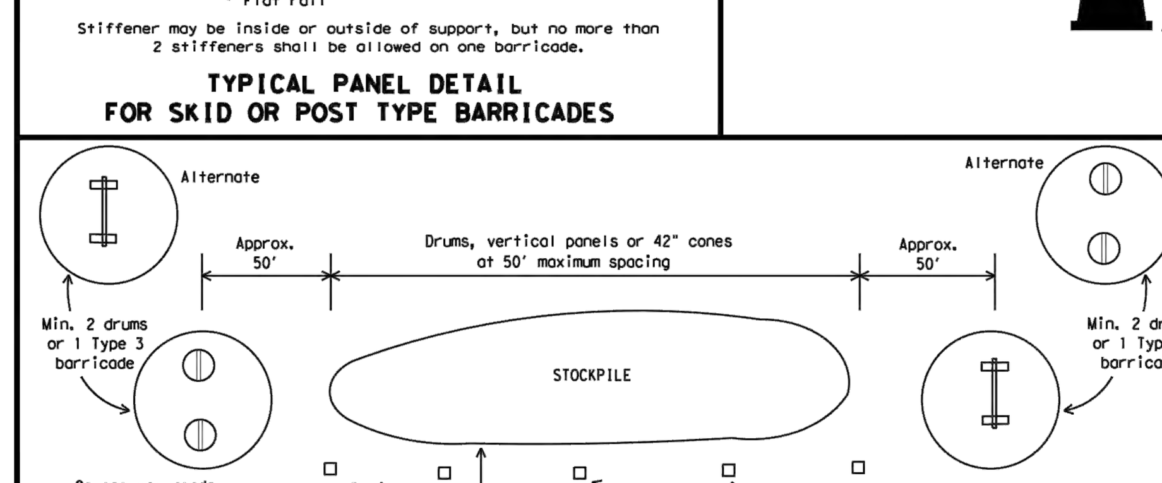
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



28" Cones shall have a minimum weight of 9 1/2 lbs.

42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

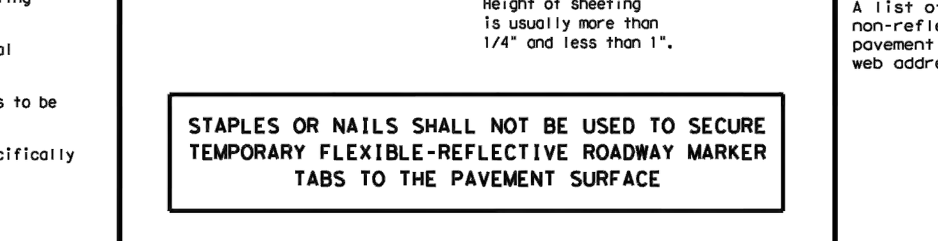
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

SHEET 11 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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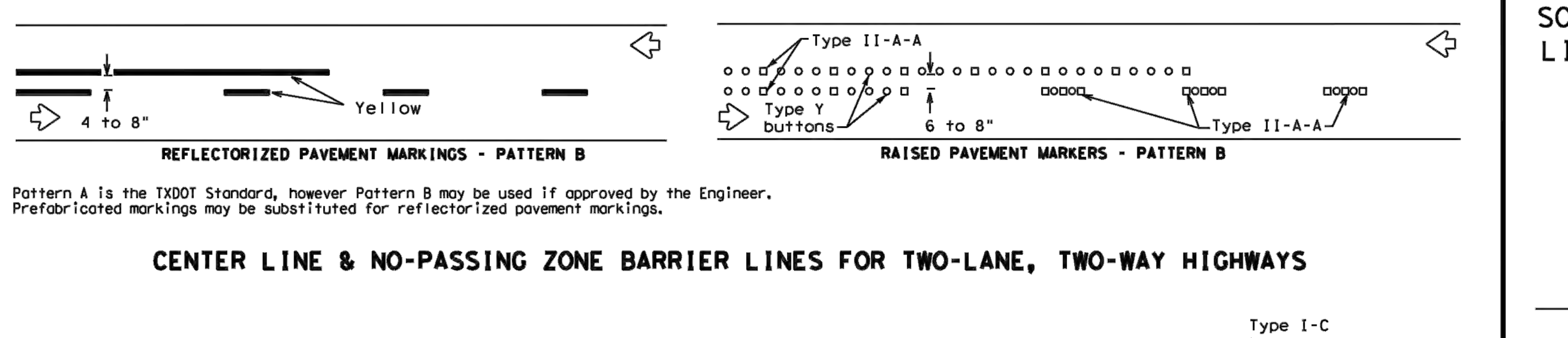
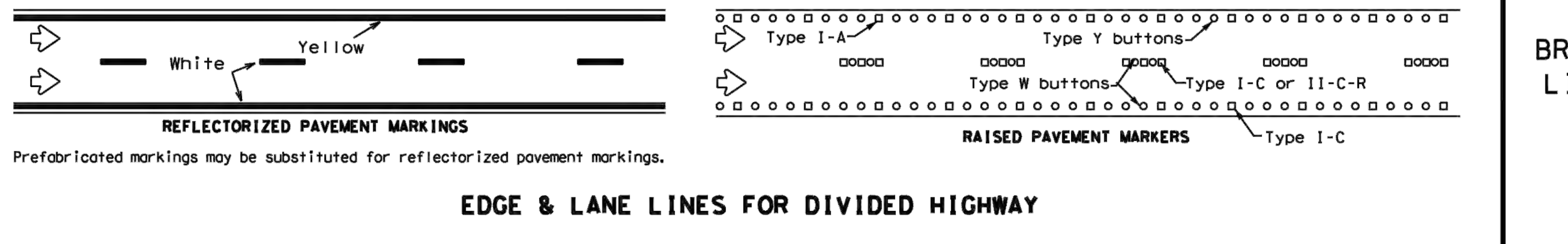
PAVEMENT MARKING PATTERNS



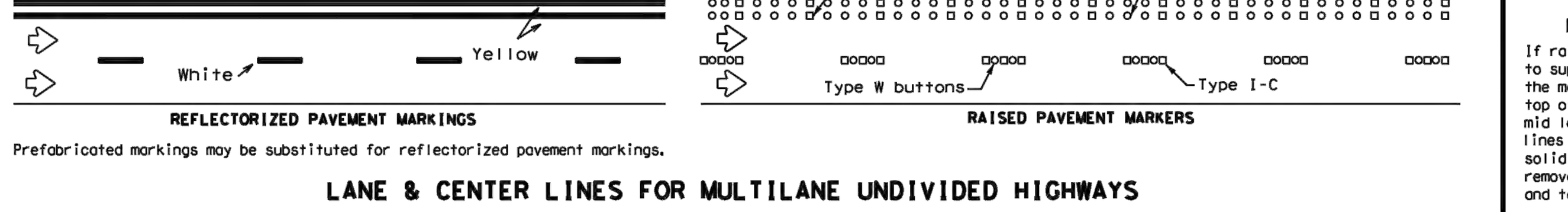
Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer.
Prefabricated markings may be substituted for reflectorized pavement markings.

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



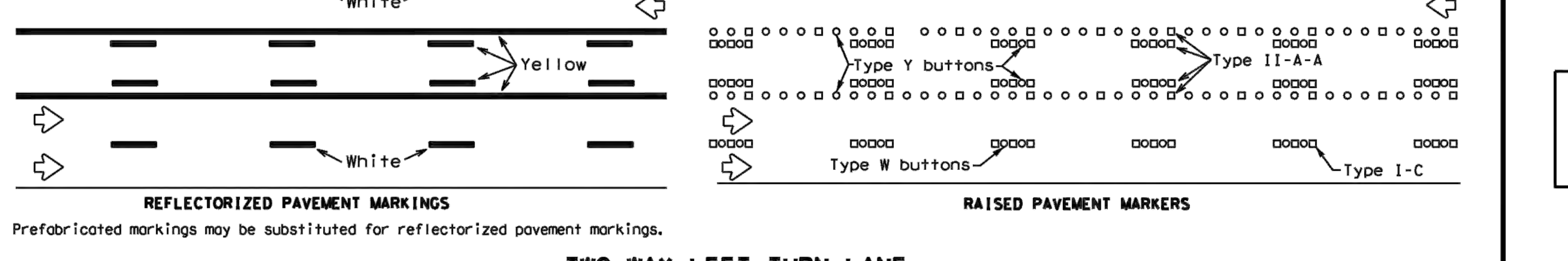
Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectorized pavement markings.

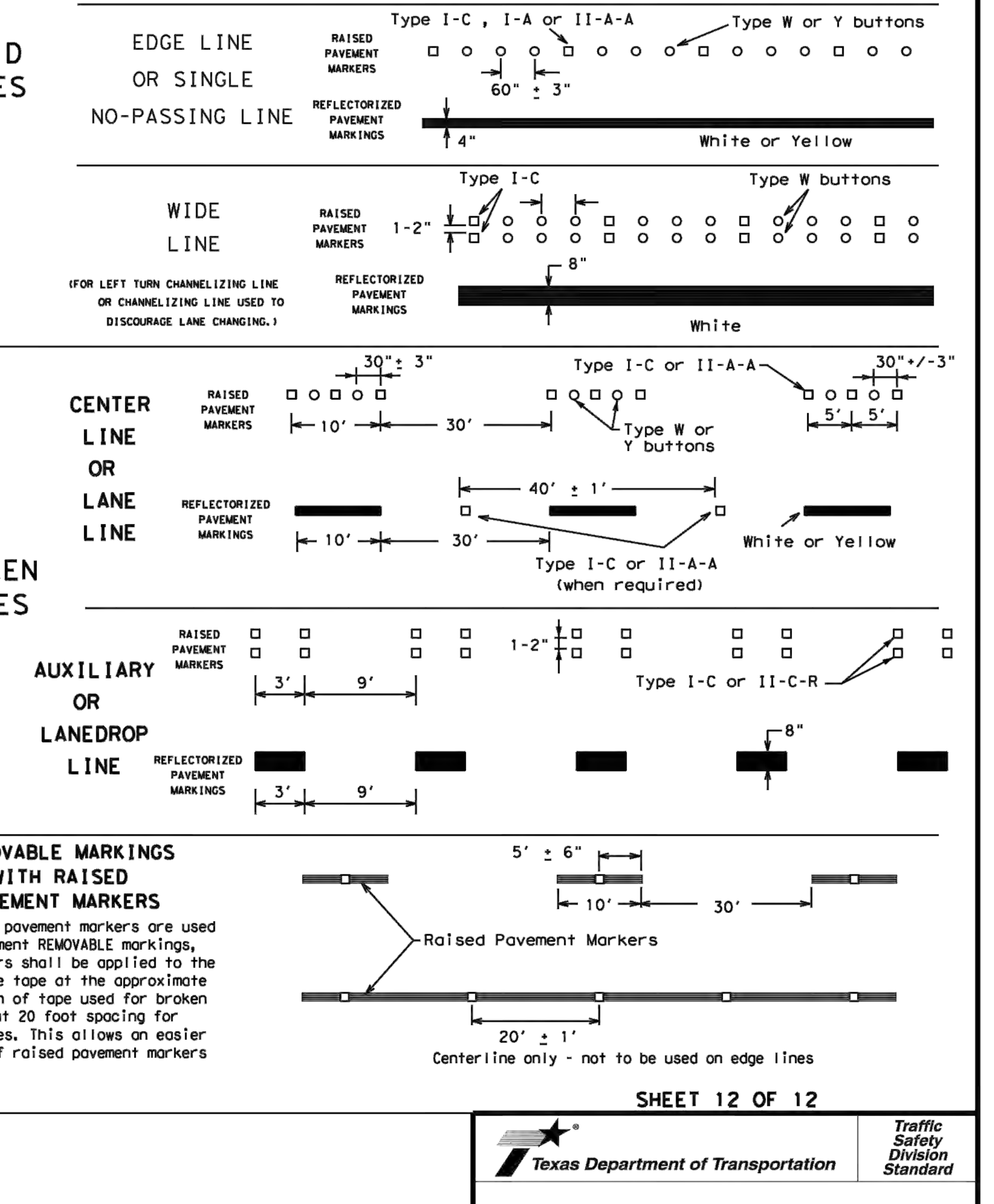
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.

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."

SHEET 12 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

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DATE:
FILE:

NO.	REVISION	DATE

STATE OF TEXAS — ANNA JANE ROSCOE — 142544 — LICENSED PROFESSIONAL ENGINEER
1/28/25

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY, STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

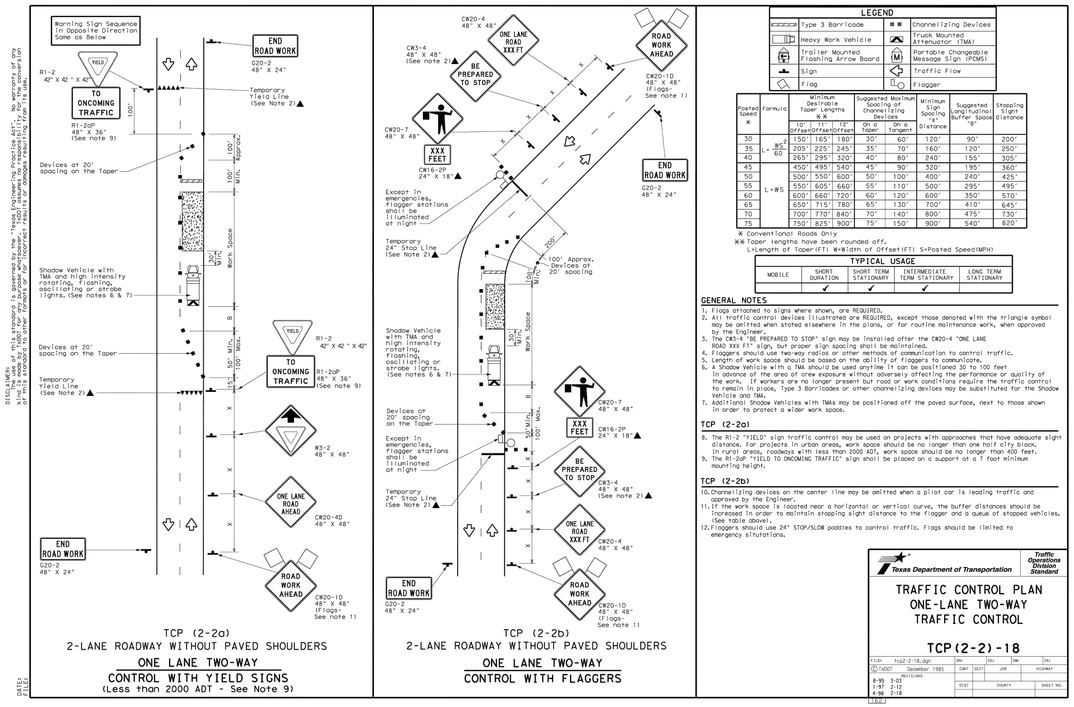
COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS

TRAFFIC CONTROL DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 27

Date: April 21, 2023, 2:26 PM - User ID: AROSCOE
File: S:\projects\614\05\03\2.0 Design\2.4 Civil\2.4.3 Plan Sheets\CR 904\TCPDT-6140503-CR904.dwg

ISSUED FOR CONSTRUCTION SET



Posted Speed *	Formula	Minimum Desirable Taper Lengths * * 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	L= WS²/60	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

* 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
		✓	✓	

TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)

TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

DISCLAIMER
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the Texas Department of Transportation for any purpose whatsoever. The Texas Department of Transportation assumes no responsibility for the accuracy or any consequences from the use of the information contained in this standard. In no event will the Texas Department of Transportation be liable for damages resulting from its use. This standard is subject to change or cancellation at any time without notice. The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the Texas Department of Transportation for any purpose whatsoever. The Texas Department of Transportation assumes no responsibility for the accuracy or consequences from the use of the information contained in this standard. In no event will the Texas Department of Transportation be liable for damages resulting from its use. This standard is subject to change or cancellation at any time without notice.

DATED 2/1/21

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

8. The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
9. The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE:	tcp2-2-18.dgn	DN:	CK:	DW:	CK:
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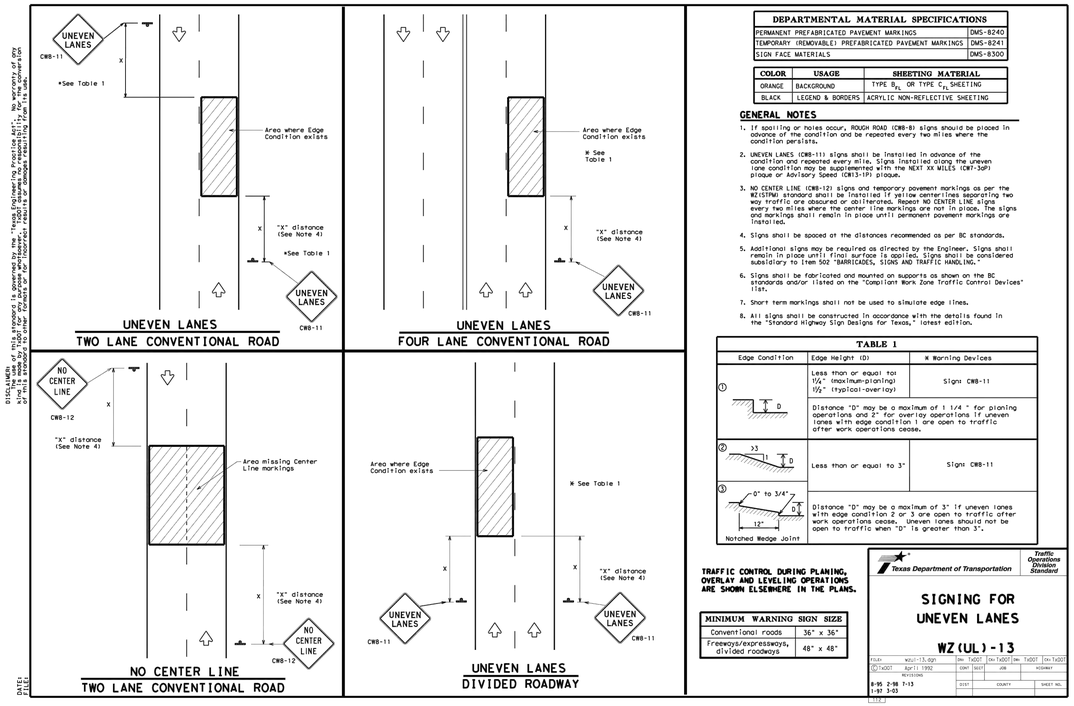
4-98 2-18					



DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1		
Edge Condition	Edge Height (D)	* Warning Devices
①	Less than or equal to 1¼" (maximum-planing) 1½" (typical-overlay)	Signs CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
②	Less than or equal to 3"	Signs CW8-11
③	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

Notched Wedge Joint

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation — Traffic Operations Division Standard

SIGNING FOR
UNEVEN LANES

WZ(UL)-13

FILE:	wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS					
8-95 2-98 7-13		DIST	COUNTY		SHEET NO.
1-97 3-03					

DATED 2/1/21

Date: April 21, 2023, 2:26 PM - User ID: AROSCOE
File: S:\projects\014\05\03\2.0 Design\2-4 Civil\2-4.3 Plan Sheets\CR 904_TCP(2-2)-18_14050303_CB004.dwg

NO. REVISION | DATE

PAPE-DAWSON ENGINEERS
6105 TENNYSON PKWY. STE 210 | PLANO, TX 75024 | 214.420.8494
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

STATE OF TEXAS
ANNA JANE ROSCOE
142544
LICENSED PROFESSIONAL ENGINEER
1/28/25

COUNTY ROAD 904 IMPROVEMENTS
CITY OF CLEBURNE ETJ, JOHNSON COUNTY, TEXAS
TRAFFIC CONTROL DETAILS

PLAT NO. N/A
JOB NO. 61405-01
DATE 1/28/2025
DESIGNER SM
CHECKED AR DRAWN SM
SHEET 28

ISSUED FOR CONSTRUCTION SET