



## Texas Department of Transportation

P.O. Box 29928, SAN ANTONIO, TEXAS, 78229-0928 | (210) 615-1110 | WWW.TXDOT.GOV

March 13, 2024

Mr. Kevin Smith, P.E.  
Texas Commission on Environmental Quality  
12100 Park 35 Circle, Bldg. A, Rm 179  
Austin, Texas 78753

Re: Water Pollution Abatement Plan (WPAP) Submittal  
FM 462 from 1.5 miles North of CR 331 to CR 433  
Medina County, TX  
CSJ: 0848-04-052

Dear Mr. Smith,

This letter transmits of a Water Pollution Abatement Plan (WPAP) for the above-referenced Texas Department of Transportation (TxDOT) road project. The regulated entity limits for this project are on FM 462 from 1.5 miles North of CR 331 to CR 433. If you have any questions regarding this submittal, please do not hesitate to call me at (210) 615-6486.

Sincerely,

Ricardo S. Flores, P.G.  
Geologist

WPAP submitted via TCEQ FTP site



# TCEQ Core Data Form

For detailed instructions on completing this form, please read the Core Data Form Instructions or call 512-239-5175.

## SECTION I: General Information

<b>1. Reason for Submission</b> (If other is checked please describe in space provided.)		
<input checked="" type="checkbox"/> New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)		
<input type="checkbox"/> Renewal (Core Data Form should be submitted with the renewal form)	<input type="checkbox"/> Other	
<b>2. Customer Reference Number</b> (if issued)	<a href="#">Follow this link to search for CN or RN numbers in Central Registry**</a>	<b>3. Regulated Entity Reference Number</b> (if issued)
CN 600803456		RN

## SECTION II: Customer Information

<b>4. General Customer Information</b>		<b>5. Effective Date for Customer Information Updates</b> (mm/dd/yyyy)		
<input type="checkbox"/> New Customer <input checked="" type="checkbox"/> Update to Customer Information <input type="checkbox"/> Change in Regulated Entity Ownership <input type="checkbox"/> Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)				
<i>The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).</i>				
<b>6. Customer Legal Name</b> (If an individual, print last name first: eg: Doe, John)			<i>If new Customer, enter previous Customer below:</i>	
Texas Department of Transportation				
<b>7. TX SOS/CPA Filing Number</b>	<b>8. TX State Tax ID</b> (11 digits)		<b>9. Federal Tax ID</b> (9 digits)	<b>10. DUNS Number</b> (if applicable)
<b>11. Type of Customer:</b>		<input type="checkbox"/> Corporation	<input type="checkbox"/> Individual	Partnership: <input type="checkbox"/> General <input type="checkbox"/> Limited
Government: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> Local <input checked="" type="checkbox"/> State <input type="checkbox"/> Other		<input type="checkbox"/> Sole Proprietorship	<input type="checkbox"/> Other:	
<b>12. Number of Employees</b>			<b>13. Independently Owned and Operated?</b>	
<input type="checkbox"/> 0-20 <input type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input type="checkbox"/> 251-500 <input checked="" type="checkbox"/> 501 and higher			<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>14. Customer Role</b> (Proposed or Actual) – as it relates to the Regulated Entity listed on this form. Please check one of the following				
<input checked="" type="checkbox"/> Owner <input type="checkbox"/> Operator <input type="checkbox"/> Owner & Operator <input type="checkbox"/> Other: <input type="checkbox"/> Occupational Licensee <input type="checkbox"/> Responsible Party <input type="checkbox"/> VCP/BSA Applicant				
<b>15. Mailing Address:</b>	Texas Department of Transportation, ATTN: Ricardo Flores, P.G.			
	4615 NW Loop 410			
	<b>City</b>	San Antonio	<b>State</b>	TX
		<b>ZIP</b>	78229	<b>ZIP + 4</b>
<b>16. Country Mailing Information</b> (if outside USA)			<b>17. E-Mail Address</b> (if applicable)	
			Ricardo.Flores@txdot.gov	
<b>18. Telephone Number</b>		<b>19. Extension or Code</b>		<b>20. Fax Number</b> (if applicable)



**SECTION III: Regulated Entity Information**

<b>21. General Regulated Entity Information</b> <i>(If 'New Regulated Entity' is selected, a new permit application is also required.)</i>							
<input checked="" type="checkbox"/> New Regulated Entity <input type="checkbox"/> Update to Regulated Entity Name <input type="checkbox"/> Update to Regulated Entity Information							
<i>The Regulated Entity Name submitted may be updated, in order to meet TCEQ Core Data Standards (removal of organizational endings such as Inc, LP, or LLC).</i>							
<b>22. Regulated Entity Name</b> <i>(Enter name of the site where the regulated action is taking place.)</i>							
FM 462 from 1.7 MI north of CR 331 to CR 433 TxDOT CSJ 0848-04-052							
<b>23. Street Address of the Regulated Entity:</b> <i>(No PO Boxes)</i>							
		<b>City</b>		<b>State</b>		<b>ZIP</b>	
						<b>ZIP + 4</b>	
<b>24. County</b>		Medina					

If no Street Address is provided, fields 25-28 are required.

<b>25. Description to Physical Location:</b>		FM 462 from 1.7 MI north of CR 331 to CR 433					
<b>26. Nearest City</b>				<b>State</b>		<b>Nearest ZIP Code</b>	
Hondo				TX		78861	
<i>Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).</i>							
<b>27. Latitude (N) In Decimal:</b>		29.472396°		<b>28. Longitude (W) In Decimal:</b>		-99.202676°	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds		
29	28	20.6256	-99	12	9.6336		
<b>29. Primary SIC Code</b> (4 digits)		<b>30. Secondary SIC Code</b> (4 digits)		<b>31. Primary NAICS Code</b> (5 or 6 digits)		<b>32. Secondary NAICS Code</b> (5 or 6 digits)	
<b>33. What is the Primary Business of this entity?</b> <i>(Do not repeat the SIC or NAICS description.)</i>							
Transportation							
<b>34. Mailing Address:</b>		Texas Department of Transportation, ATTN: Ricardo Flores, P.G					
		4615 NW Loop 410					
		<b>City</b>	San Antonio	<b>State</b>	TX	<b>ZIP</b>	78229
						<b>ZIP + 4</b>	
<b>35. E-Mail Address:</b>		Ricardo.Flores@txdot.gov					
<b>36. Telephone Number</b>			<b>37. Extension or Code</b>			<b>38. Fax Number</b> <i>(if applicable)</i>	
( 210 ) 615-1110						( ) -	

**39. TCEQ Programs and ID Numbers** Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.


<input type="checkbox"/> Dam Safety	<input type="checkbox"/> Districts	<input checked="" type="checkbox"/> Edwards Aquifer	<input type="checkbox"/> Emissions Inventory Air	<input type="checkbox"/> Industrial Hazardous Waste
<input type="checkbox"/> Municipal Solid Waste	<input type="checkbox"/> New Source Review Air	<input type="checkbox"/> OSSF	<input type="checkbox"/> Petroleum Storage Tank	<input type="checkbox"/> PWS
<input type="checkbox"/> Sludge	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Title V Air	<input type="checkbox"/> Tires	<input type="checkbox"/> Used Oil
<input type="checkbox"/> Voluntary Cleanup	<input type="checkbox"/> Wastewater	<input type="checkbox"/> Wastewater Agriculture	<input type="checkbox"/> Water Rights	<input type="checkbox"/> Other:

### **SECTION IV: Preparer Information**

<b>40. Name:</b>	Ricardo Flores	<b>41. Title:</b>	Professional Geoscientist
<b>42. Telephone Number</b>	<b>43. Ext./Code</b>	<b>44. Fax Number</b>	<b>45. E-Mail Address</b>
( 210 ) 615-1110		( ) -	Ricardo.flores@TxDOT.com

### **SECTION V: Authorized Signature**

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

<b>Company:</b>	TxDOT	<b>Job Title:</b>	Geologist
<b>Name (in Print):</b>	Ricardo Flores	<b>Phone:</b>	(210) 615-1110
<b>Signature:</b>		<b>Date:</b>	3/13/2024

# Texas Commission on Environmental Quality

## Edwards Aquifer Application Cover Page

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### Our Review of Your Application

**The Edwards Aquifer Program staff conducts an administrative and technical review of all applications. The turnaround time for administrative review can be up to 30 days as outlined in 30 TAC 213.4(e). Generally administrative completeness is determined during the intake meeting or within a few days of receipt. The turnaround time for technical review of an administratively complete Edwards Aquifer application is 90 days as outlined in 30 TAC 213.4(e). Please know that the review and approval time is directly impacted by the quality and completeness of the initial application that is received. In order to conduct a timely review, it is imperative that the information provided in an Edwards Aquifer application include final plans, be accurate, complete, and in compliance with [30 TAC 213](#).**

### Administrative Review

1. [Edwards Aquifer applications](#) must be deemed administratively complete before a technical review can begin. To be considered administratively complete, the application must contain completed forms and attachments, provide the requested information, and meet all the site plan requirements. The submitted application and plan sheets should be final plans. Please submit one full-size set of plan sheets with the original application, and half-size sets with the additional copies.

To ensure that all applicable documents are included in the application, the program has developed tools to guide you and web pages to provide all forms, checklists, and guidance. Please visit the below website for assistance: <http://www.tceq.texas.gov/field/eapp>.

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.
3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.
4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

An appointment should be made to resubmit the application. The application is re-examined to ensure all deficiencies are resolved. The application will only be deemed administratively complete when all administrative deficiencies are addressed.

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.
6. If the geologic assessment was completed before October 1, 2004 and the site contains “possibly sensitive” features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

### Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.
2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be

clearly marked, features identified in the geologic assessment should be flagged, roadways marked and the alignment of the Sewage Collection System and manholes should be staked at the time the application is submitted. If the site is not marked the application may be returned.

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited.**
4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

**Mid-Review Modifications**

It is important to have final site plans prior to beginning the permitting process with TCEQ to avoid delays.

Occasionally, circumstances arise where you may have significant design and/or site plan changes after your Edwards Aquifer application has been deemed administratively complete by TCEQ. This is considered a “Mid-Review Modification”. Mid-Review Modifications may require redistribution of an application that includes the proposed modifications for public comment.

If you are proposing a Mid-Review Modification, two options are available:

- If the technical review has begun your application can be denied/withdrawn, your fees will be forfeited, and the plan will have to be resubmitted.
- TCEQ can continue the technical review of the application as it was submitted, and a modification application can be submitted at a later time.

If the application is denied/withdrawn, the resubmitted application will be subject to the administrative and technical review processes and will be treated as a new application. The application will be redistributed to the affected jurisdictions.

Please contact the regional office if you have questions. If your project is located in Williamson, Travis, or Hays County, contact TCEQ’s Austin Regional Office at 512-339-2929. If your project is in Comal, Bexar, Medina, Uvalde, or Kinney County, contact TCEQ’s San Antonio Regional Office at 210-490-3096

Please fill out all required fields below and submit with your application.

<b>1. Regulated Entity Name:</b> FM 462 from 1.7 MI north of CR 331 to CR 433 TxDOT CSJ 0848-04-052					<b>2. Regulated Entity No.:</b>					
<b>3. Customer Name:</b> Texas Department of Transportation					<b>4. Customer No.:</b> 600803456					
<b>5. Project Type:</b> (Please circle/check one)		<input checked="" type="radio"/> New	Modification		Extension		Exception			
<b>6. Plan Type:</b> (Please circle/check one)		<input checked="" type="radio"/> WPAP	<input type="radio"/> CZP	<input type="radio"/> SCS	<input type="radio"/> UST	<input type="radio"/> AST	<input type="radio"/> EXP	<input type="radio"/> EXT	Technical Clarification	Optional Enhanced Measures
<b>7. Land Use:</b> (Please circle/check one)		<input type="radio"/> Residential	<input checked="" type="radio"/> Non-residential			<b>8. Site (acres):</b>		10.84		
<b>9. Application Fee:</b>		N/A		<b>10. Permanent BMP(s):</b>			Vegetated Filter Strips			
<b>11. SCS (Linear Ft.):</b>		N/A		<b>12. AST/UST (No. Tanks):</b>			N/A			
<b>13. County:</b>		Medina		<b>14. Watershed:</b>			San Antonio-Nueces River Basin			

# Application Distribution

Instructions: Use the table below to determine the number of applications required. One original and one copy of the application, plus additional copies (as needed) for each affected incorporated city, county, and groundwater conservation district are required. Linear projects or large projects, which cross into multiple jurisdictions, can require additional copies. Refer to the “Texas Groundwater Conservation Districts within the EAPP Boundaries” map found at:

[http://www.tceq.texas.gov/assets/public/compliance/field\\_ops/eapp/EAPP%20GWCD%20map.pdf](http://www.tceq.texas.gov/assets/public/compliance/field_ops/eapp/EAPP%20GWCD%20map.pdf)

For more detailed boundaries, please contact the conservation district directly.

<b>Austin Region</b>			
<b>County:</b>	<b>Hays</b>	<b>Travis</b>	<b>Williamson</b>
Original (1 req.)	—	—	—
Region (1 req.)	—	—	—
County(ies)	—	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Barton Springs/Edwards Aquifer <input type="checkbox"/> Hays Trinity <input type="checkbox"/> Plum Creek	<input type="checkbox"/> Barton Springs/Edwards Aquifer	NA
City(ies) Jurisdiction	<input type="checkbox"/> Austin <input type="checkbox"/> Buda <input type="checkbox"/> Dripping Springs <input type="checkbox"/> Kyle <input type="checkbox"/> Mountain City <input type="checkbox"/> San Marcos <input type="checkbox"/> Wimberley <input type="checkbox"/> Woodcreek	<input type="checkbox"/> Austin <input type="checkbox"/> Bee Cave <input type="checkbox"/> Pflugerville <input type="checkbox"/> Rollingwood <input type="checkbox"/> Round Rock <input type="checkbox"/> Sunset Valley <input type="checkbox"/> West Lake Hills	<input type="checkbox"/> Austin <input type="checkbox"/> Cedar Park <input type="checkbox"/> Florence <input type="checkbox"/> Georgetown <input type="checkbox"/> Jerrell <input type="checkbox"/> Leander <input type="checkbox"/> Liberty Hill <input type="checkbox"/> Pflugerville <input type="checkbox"/> Round Rock

<b>San Antonio Region</b>					
<b>County:</b>	<b>Bexar</b>	<b>Comal</b>	<b>Kinney</b>	<b>Medina</b>	<b>Uvalde</b>
Original (1 req.)	—	—	—	_1_	—
Region (1 req.)	—	—	—	_1_	—
County(ies)	—	—	—	_1_	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Trinity-Glen Rose	<input type="checkbox"/> Edwards Aquifer Authority	<input type="checkbox"/> Kinney	<input type="checkbox"/> _1_ EAA <input type="checkbox"/> _1_ Medina	<input type="checkbox"/> EAA <input type="checkbox"/> Uvalde
City(ies) Jurisdiction	<input type="checkbox"/> Castle Hills <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Helotes <input type="checkbox"/> Hill Country Village <input type="checkbox"/> Hollywood Park <input type="checkbox"/> San Antonio (SAWS) <input type="checkbox"/> Shavano Park	<input type="checkbox"/> Bulverde <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Garden Ridge <input type="checkbox"/> New Braunfels <input type="checkbox"/> Schertz	NA	<input type="checkbox"/> _1_ San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review.

*Ricardo Flores*

Print Name of Customer/Authorized Agent

*[Signature]*

*3/13/2024*

Signature of Customer/Authorized Agent

Date

**FOR TCEQ INTERNAL USE ONLY**			
Date(s) Reviewed:		Date Administratively Complete:	
Received From:		Correct Number of Copies:	
Received By:		Distribution Date:	
EAPP File Number:		Complex:	
Admin. Review(s) (No.):		No. AR Rounds:	
Delinquent Fees (Y/N):		Review Time Spent:	
Lat./Long. Verified:		SOS Customer Verification:	
Agent Authorization Complete/Notarized (Y/N):		Fee Check:	Payable to TCEQ (Y/N):
Core Data Form Complete (Y/N):			Signed (Y/N):
Core Data Form Incomplete Nos.:			Less than 90 days old (Y/N):

# Edwards Aquifer Protection Program Roadway Application

## Texas Commission on Environmental Quality

This application is intended only for projects which a major roadway is designed for construction, such as State highways, County roads, and City thoroughfares.

Designed for Regulated Activities on the Contributing Zone to the Edwards Aquifer in relation to 30 TAC §213.24, Regulated Activities on the Edwards Aquifer Recharge Zone, in relation to 30 TAC §213.5(b), Effective June 1, 1999.

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*

## Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer.

The application was prepared by:

Print Name of Customer/Agent: Ricardo Flores, P.G.

Date: 3/20/24

Signature of Customer/Agent:



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## Project Information

1. Regulated Entity (Project) Name: FM 462 from 1.7 MI north of CR 331 to CR 433 TxDOT CSJ 0848-04-052
2. County: Medina
3. Stream Basin(s): San Antonio-Nueces River Basin
4. Groundwater Conservation District (if applicable): Medina County GCD; EAA
5. Customer (Applicant):  
Contact Person: Charles Benavidez, P.E.  
Entity: Texas Department of Transportation  
Mailing Address: 4615 NW Loop 410  
City, State: San Antonio, TX Zip: 78229  
Telephone: (210) 615-1110  
Email Address: Charles.Benavidez@txdot.gov





6. Agent (Representative):

Contact Person: Ricardo Flores, P.G.  
Entity: Texas Department of Transportation  
Mailing Address: 4615 NW Loop 410  
City, State: San Antonio, TX Zip: 78229  
Telephone: (210) 615-1110  
Email Address: Ricardo.Flores@txdot.gov

7. Landowner of R.O.W. (Right of Way)

Person or entity responsible for maintenance of water quality Best Management Practices (BMPs), if not applicant.

Contact Person: \_\_\_\_\_  
Entity: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_  
City, State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
Email Address: \_\_\_\_\_

8.  **The TCEQ must be able to inspect the project site or the application will be returned.**

Sufficient survey marking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of any regulated activities and the geologic or manmade features noted in the Geologic Assessment.

Survey marking will be completed by this date: July 2024

9.  **Attachment A - Road Map.** A road map showing directions to and the location of the project site is attached. The map clearly shows the boundary of the project site.

10.  **Attachment B - USGS Quadrangle.** A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') is attached. The map(s) clearly show:

- Project site boundaries
- USGS Quadrangle Name(s)
- All drainage paths from site to surface waters

11.  **This project extends into (Check all that apply):**

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Recharge Zone (RZ) | <input type="checkbox"/> Contributing Zone within              |
| <input type="checkbox"/> Contributing Zone (CZ)        | Transition Zone (CZ/TZ)  |
| <input type="checkbox"/> Transition Zone (TZ)          | <input checked="" type="checkbox"/> Zone not regulated by EAPP |

12.  **Attachment C - Project Description.** A detailed narrative description of the proposed project is attached. The project description is consistent throughout the application and contains, at a minimum, the following details:

- Complete site area [Acres]
- Offsite upgradient stormwater areas to be captured
- Impervious area [Acres]
- Permanent BMP(s)
- Proposed site use
- Existing roadway (paved and/or unpaved)
- Structures to be demolished [Include demo phase]
- Major interim phases

13. Existing project site conditions are noted below:

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Existing paved and/or unpaved roads | <input type="checkbox"/> Existing commercial site  |
| <input type="checkbox"/> Undeveloped (Cleared)                          | <input type="checkbox"/> Existing industrial site  |
| <input type="checkbox"/> Undeveloped (Undisturbed/Not cleared)          | <input type="checkbox"/> Existing residential site |
|   | <input type="checkbox"/> Other: _____              |

14.  **Attachment D - Factors Affecting Surface Water Quality.** A detailed description of all factors that could affect surface water quality is attached.

15.  Only inert materials as defined by 30 TAC §330.3 will be used as fill material.

16. Type of pavement or road surface to be used:

- Concrete
- Asphaltic concrete pavement
- Permeable Friction Course (PFC)
- Other: \_\_\_\_\_

17. Right of Way (R.O.W.) and Pavement Area:

R.O.W. for project: 10.84 (ac.)

Length: 5900 ft.

Width: varies from 80 ft. to 80 ft.

Impervious cover (IC): 3.13 (ac.)

Total of Pavement area 3.13 (ac.) ÷ R.O.W. area 10.84 (ac.) x 100 = 28.9% IC.

- CAD program was used to determine areas.
- Number of travel lanes: proposed: 2, existing: 2
- Typical widths of lanes: 22 (ft.)
- Are intersections also being improved? (Y/N) N

## Site Plan Requirements

Items 18 - 28 must be included on the Site Plan.

18.  The Site Plan must have a minimum scale of 1" = 400'.  
Site Plan Scale: 1" = 400'
19. 100-year floodplain boundaries:
- Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled. The 100-year floodplain boundaries are based on the following specific (including date of material) source(s): Effective Zone A Floodplain source FEMA firm panel 48325C0175C effective April 3, 2012.
  - No part of the project site is located within the 100-year floodplain.
20.  A layout of the development with existing and finished contours at appropriate, but not greater than ten-foot contour intervals is shown. Sensitive features, lots, wells, buildings, roads, culverts, etc. are shown on the site plan.
21.  A figure (map) indicating all paths of drainage from the site to surface waters.
- Name all stream crossings: Does not cross a named waterway only unnamed tributaries to Hondo Creek
  - Drainage patterns and approximate slopes.
  - There will be no discharge to surface waters.
22.  Distinguish between areas of soil disturbance and areas which will not be disturbed.
23.  Show locations of major structural and nonstructural controls. These are the temporary and permanent best management practices. Include the following:
- Show design and location of any hazardous materials traps.
  - Show design at outfalls of major control structures and conveyances.
  - A description of the BMPs and measures that prevent pollutants from entering surface streams.
24. Show locations of staging areas or project specific locations (PSL). Are they:
- Onsite, within project R.O.W.
  - Offsite.
  - Not yet determined. (Requires future authorization)
25.  Show locations where soil stabilization practices are expected to occur.
26.  Show surface waters (including wetlands).
27. Temporary aboveground storage tank facilities:
- Temporary aboveground storage tank facilities will be located on this site. Show on site plan.
  - Temporary aboveground storage tank facilities will not be located on this site.
28.  Plan(s) also include:
- Sidewalks
  - Related turn lanes
  - Shared-use paths
  - Off-site improvements and staging areas

- Demolition plans                       Utility relocations  
 Other improved areas: \_\_\_\_\_

## **Permanent Best Management Practices (BMPs)**

**Description of practices and measures that will be used after construction is completed.**

29.  Permanent BMPs and measures have been designed, and will be constructed, operated, and maintained to ensure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance accepted by the executive director.
- The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.
  - A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used: \_\_\_\_\_
30.  **Attachment E - BMPs for Upgradient (Offsite) Stormwater.**
- A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.
  - No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.
  - Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.
31.  **Attachment F - BMPs for On-site Stormwater.**
- A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.
  - Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.
32.  **Attachment G - Construction Plans.** Construction plans and design calculations for the proposed permanent BMPs and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer, and are signed, sealed, and dated. Construction plans for the proposed permanent BMPs and measures are attached and include all proposed structural plans and specifications, and appropriate details.
- Major bridge cross-sections, and roadway plan and profiles
  - BMP plans and details     Design calculations
  - Erosion control     TCEQ Construction Notes
  - SW3P     EPIC, as necessary

33.  **Attachment H - Inspection, Maintenance, Repair and Retrofit Plan.** A site and BMP specific plan for the inspection, maintenance, repair, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan fulfills all the following:
- Prepared and certified by the engineer designing the permanent BMPs and measures.
  - Signed by the owner or responsible party.
  - Outlines specific procedures for documenting inspections, maintenance, repairs, and, if necessary, retrofit.
  - Contains a discussion of recordkeeping procedures.
34.  **Attachment I - Pilot-Scale Field Testing Plan.** Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.
- N/A
35.  **Attachment J - Measures for Minimizing Surface Stream Contamination.** A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows, and in-stream effects caused by the regulated activity which increase erosion or may result in water quality degradation.
- Include permanent spill measures used to contain hydrocarbons or hazardous substances by way of traps, or response contingencies.
36. The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity.
- If the applicant intends to transfer responsibility, check the box below.
- Yes
- A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days.

## ***Stormwater to be generated by the Proposed Project***

### ***Description of practices and measures that will be used during construction.***

37.  The site description, controls, maintenance, and inspection requirements for the Storm Water Pollution Prevention Plan (SWPPP or SW3P) developed under the Texas Pollutant Discharge Elimination System (TPDES) general permits for stormwater discharges have been submitted to fulfill paragraphs 30 TAC §213.24(1-5) & §213.5(b) of the technical report.
- The Temporary Stormwater Section (TCEQ-0602) is included with the application.
  - The SWPPP (SW3P) will serve as the Temporary Stormwater Section (TCEQ-0602).
38.  **Attachment K - Volume and Character of Stormwater.** A detailed description of the volume (quantity) and character (quality) of the stormwater runoff expected to occur from the proposed project is attached. The estimates of stormwater runoff quality and quantity are based on area and type of impervious cover.
- Include the pre-construction runoff coefficient.
  - Include the post-construction runoff coefficient.

### ***Administrative Information***

39.  Submit one (1) original and one (1) copy of the application, plus one electronic copy as needed, for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ is required to distribute the additional copies to these jurisdictions.
40. The fee for the plan(s) is based on:
- The total R.O.W. (as in Item 17).
  - TxDOT roadway project.

**ROADWAY APPLICATION SECTION**  
**TCEQ-20872**  
**ATTACHMENT A – ATTACHMENT K**

## **ATTACHMENT A – Road Map and USGS Map**

See attached

## **ATTACHMENT B – Official Recharge Zone Map**

See Attached

## **ATTACHMENT C – Project Description**

The San Antonio District of the Texas Department of Transportation (TxDOT) proposes to rehabilitate the existing Ranch to Market (RM) 462 roadway from 1.7 miles north of County Road (CR) 331 to CR 433 in Medina County. The project will also add five-foot-wide shoulders onto both existing travel lanes. The northern approximately 1.45 miles of the project is located with the Edwards Aquifer Recharge Zone (EARZ) and will be referred to as the “WPAP area”. Portions of the WPAP area are in the 100-yr floodplain as shown in Attachment B.

The existing roadway consists of two 11 ft travel lanes, one lane in each direction, with no shoulders.

The proposed project would rehabilitate the roadway surface and add five-foot-wide shoulders onto both existing lanes. No new right-of-way would be required and no demolitions are required.

Based on calculations made by project design engineers using OpenRoads™, the total project area is approximately 55.46 acres, the WPAP area is approximately 8.23 acres, and there are 3.13 acres of existing impervious cover in the ROW in the Recharge Zone. The proposed project would add 1.36 acres of impervious cover in the ROW in the Recharge Zone. Upon completion, there would be 4.49 acres of impervious cover in the Recharge Zone. These values and the corresponding total suspended solids removal and treatment calculations are shown on the “WPAP Calculations” sheet (in the included construction plans). The permanent BMPs will conform with guidance TCEQ RG348 (updated Jan 2017) and include vegetated filter strips.

The Geologic Assessment identified no sensitive geologic features within the project limits.

## **ATTACHMENT D – Factors Affecting Surface Water Quality**

Factors affecting water quality include contaminated stormwater from construction activities and vehicular traffic carried directly to Hondo Creek (San Antonio-Nueces River Basin). Pollutants from the construction site may include: dirt from grading, chemicals from cementing, and oils from asphalt paving and paints. Pollutants from vehicular traffic, such as oil and dirt, are expected on finished pavement.

## **ATTACHMENT E – BMPs for Upgradient (Offsite) Stormwater**

The project does not include features to provide post-construction treatment of runoff from up gradient locations.



**ATTACHMENT F – BMPs for On-site Stormwater**

Vegetated Filter Strips would be used to remove TSS from on-site stormwater. The treatment is designed to exceed TCEQ requirements. The WPAP Plan Summary and WPAP Layout Sheets tabulate and illustrate details on the permanent BMP's.

**ATTACHMENT G – Construction Plans**

See attached plans.

**ATTACHMENT H – Inspection, Maintenance, Repair, and Retrofit Plan**

See attached plan.

**ATTACHMENT I – Pilot-Scale Field Testing Plan**

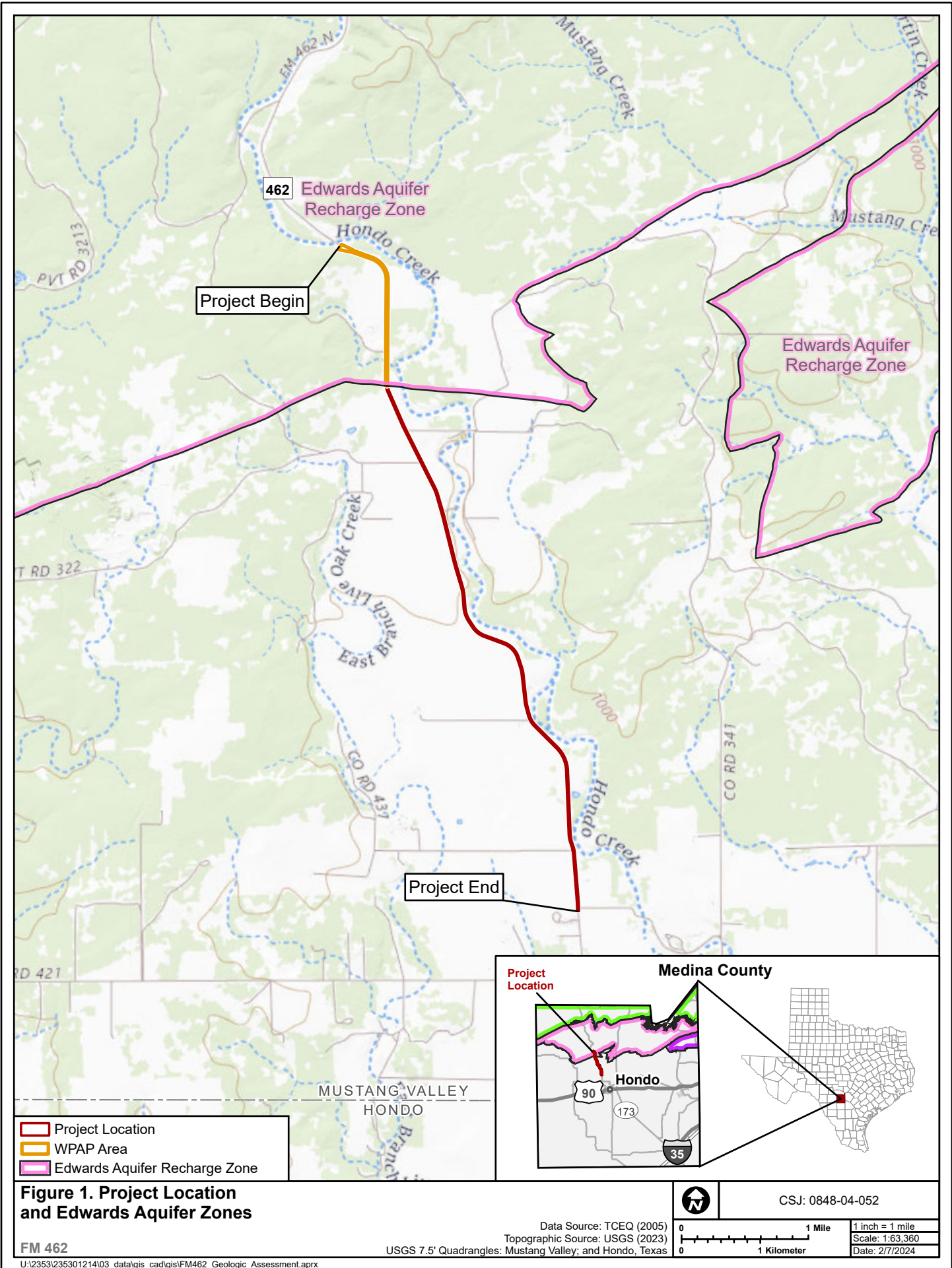
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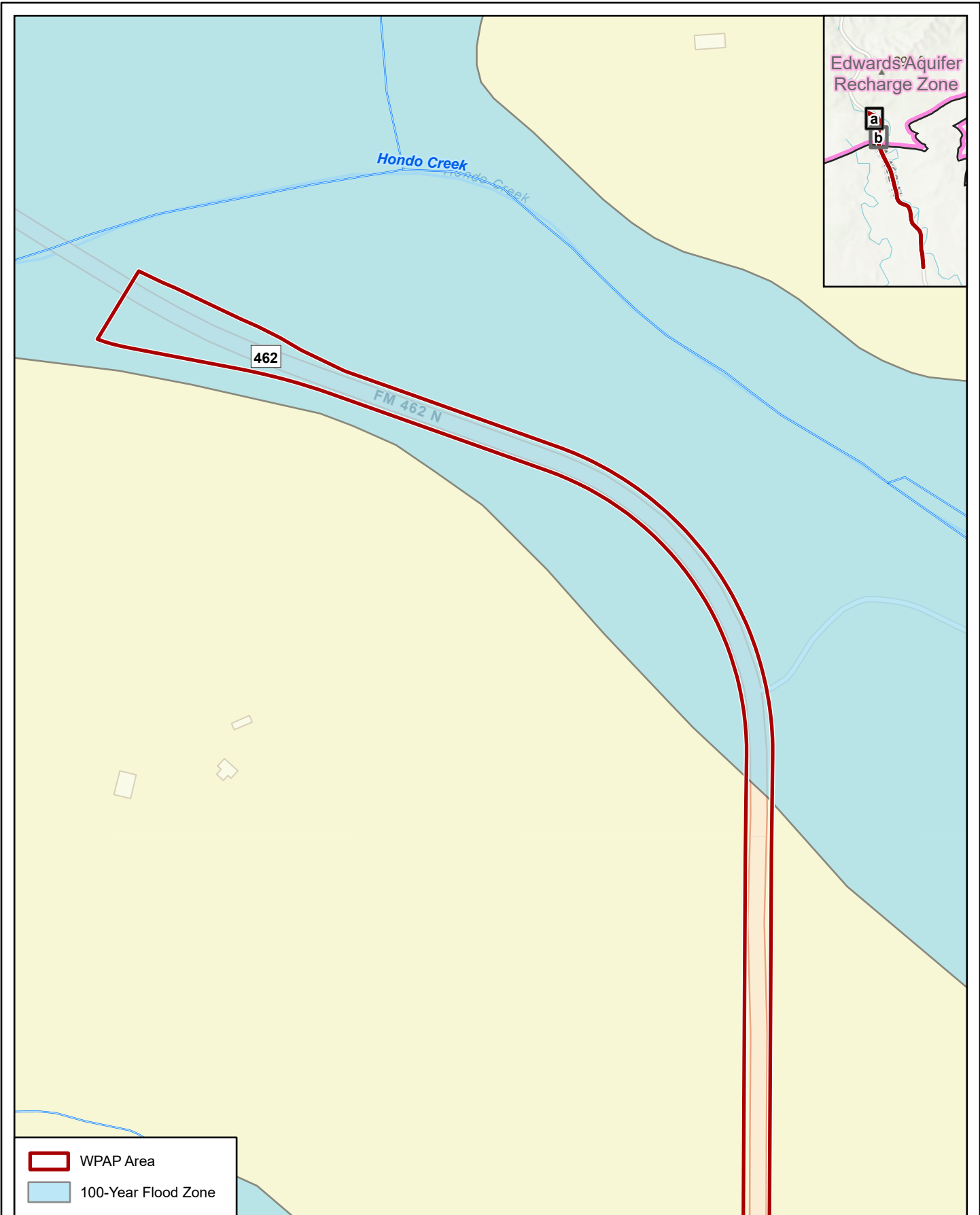
**ATTACHMENT J – Measures for Minimizing Surface Stream Contamination**



The project would include vegetated filter strips to protect Hondo Creek from pollutant runoff during and after construction is complete. See attached SW3P sheets.

**ATTACHMENT K – Volume and Character of Storm Water**


Stormwater runoff from the project area will be collected in roadside ditches and conveyed offsite, eventually to Hondo Creek. Based on calculations made by project design engineers using OpenRoads™, the total project area is approximately 55.46 acres, the WPAP area is approximately 8.23 acres, and there are 3.13 acres of existing impervious cover in the ROW in the Recharge Zone. The proposed project would add 1.36 acres of impervious cover in the ROW in the Recharge Zone. Upon completion, there would be 4.49 acres of impervious cover in the Recharge Zone. These values and the corresponding total suspended solids removal and treatment calculations are shown on the “WPAP Calculations” sheet (in the included construction plans). The permanent BMPs will conform with guidance TCEQ RG348 (updated Jan 2017) and include vegetated filter strips.





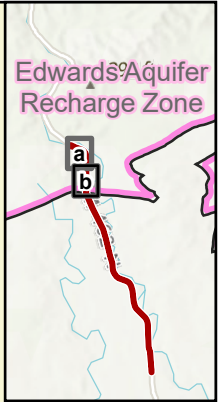
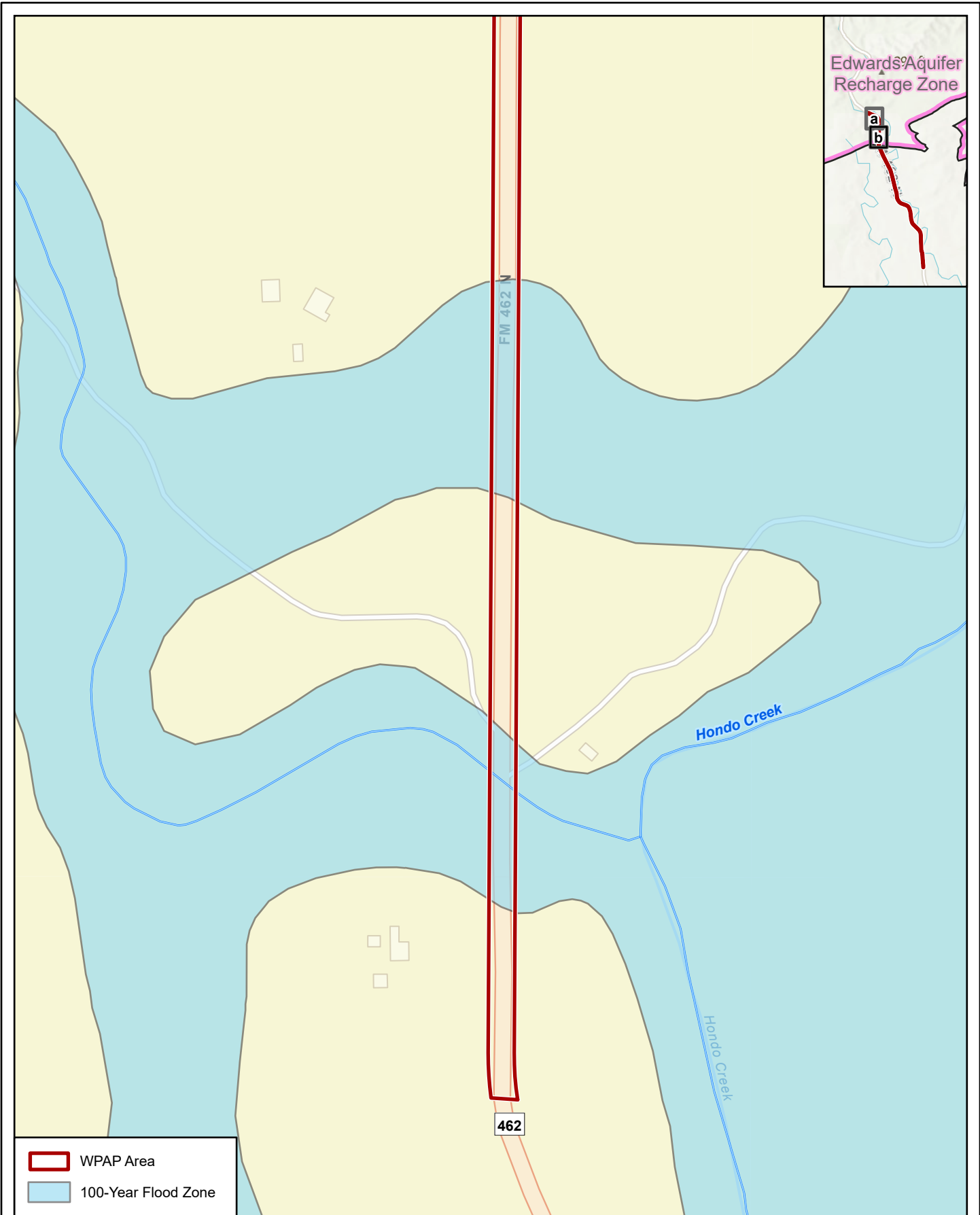
	WPAP Area
	100-Year Flood Zone



**Figure 4a. WPAP Area and FEMA 100-Year Flood Zone**

	CSJ: 0848-04-052	
	0 400 Feet	1 inch = 400 feet
0 100 Meters	Scale: 1:4,800	
Date: 2/7/2024		

FM 462

Data Source: TCEQ (2005), FEMA NHFL (2023)  
 Basemap Source: Esri (2024)




	WPAP Area
	100-Year Flood Zone

**Figure 4b. WPAP Area and FEMA 100-Year Flood Zone**

FM 462

Data Source: TCEQ (2005), FEMA NHFL (2023)  
 Basemap Source: Esri (2024)

	CSJ: 0848-04-052	
	0 400 Feet 100 Meters	1 inch = 400 feet Scale: 1:4,800 Date: 2/7/2024

## **Attachment G – Construction Plans**

# STATE OF TEXAS

## DEPARTMENT OF TRANSPORTATION

FED. RD. DIST. NO.	PROJECT NO.	SHEET NO.	
15		1	
STATE	STATE DIST.	COUNTY	
TEXAS	SAT	MEDINA	
CONT.	SECT.	JOB	HIGHWAY NO.
0848	04	052	FM 462

INDEX OF SHEETS  
SEE SHEET 2 FOR INDEX OF SHEETS

### PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

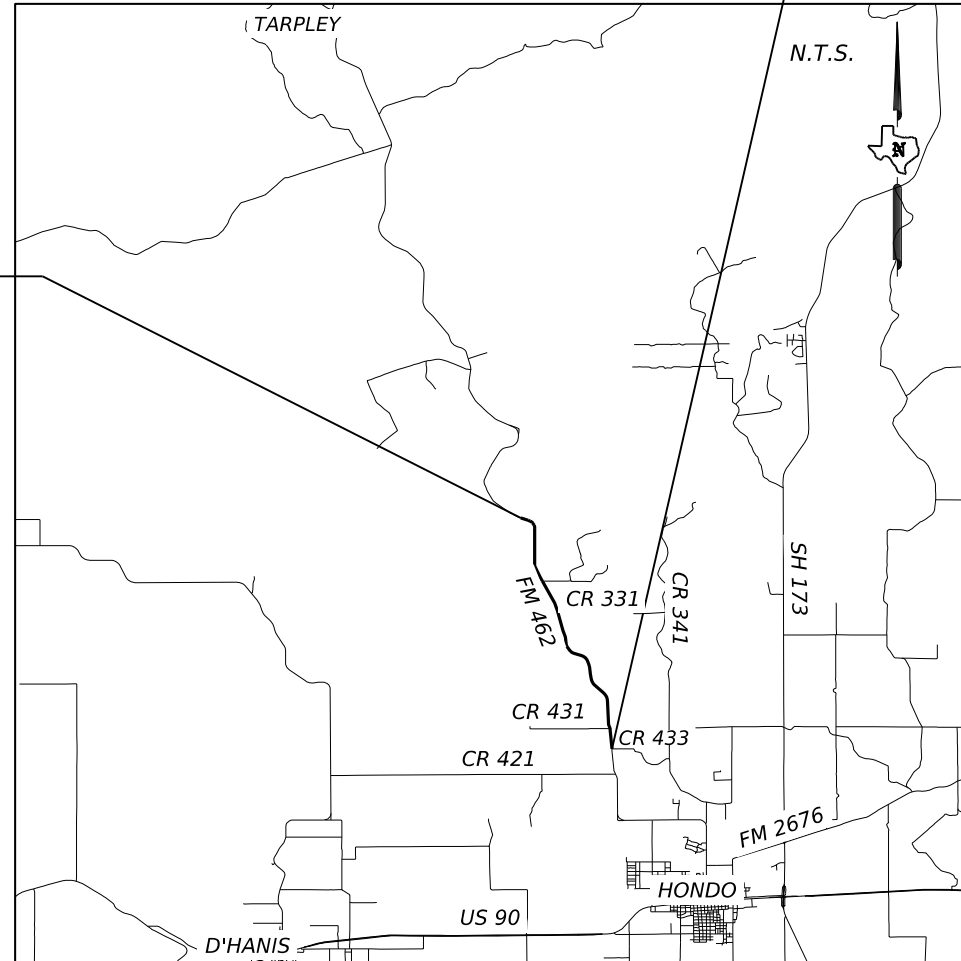
DESIGN SPEED = 30 MPH  
AREA OF DISTURBED SOIL = 38.61 AC  
A.D.T. (2024) = 700  
A.D.T. (2044) = 900

FEDERAL AID PROJECT  
PROJECT NO.  
CSJ:0848-04-052  
**MEDINA COUNTY**  
**FM 462**

LIMITS FROM: 1.5 MI NORTH OF CR 331  
TO: CR 433  
NET LENGTH OF ROADWAY = 30200 FT = 5.720 MI  
NET LENGTH OF BRIDGE = 0 FT = 0 MI  
NET LENGTH OF PROJECT = 30200 FT = 5.720 MI

PLANS PREPARED BY  
**Kimley»Horn** F-928  
10814 JOLLYVILLE ROAD, CAMPUS IV,  
SUITE 200, AUSTIN, TX 78759  
TEL: 512-418-1771  
FAX: 972-239-3820

FOR WORK CONSISTING OF REHABILITATION AND WIDENING OF EXISTING ROAD  
END PROJECT  
CSJ: 0848-04-052  
STA: 1119+00.00



BEGIN PROJECT  
CSJ: 0848-04-052  
STA: 817+00.00

FINAL PLANS

LETTING DATE: \_\_\_\_\_  
DATE CONTRACTOR BEGAN WORK: \_\_\_\_\_  
DATE WORK WAS ACCEPTED: \_\_\_\_\_  
FINAL CONTRACT COST: \$ \_\_\_\_\_  
CONTRACTOR: \_\_\_\_\_

FINAL PLANS STATEMENT:

THE CONSTRUCTION WORK WAS PERFORMED  
IN ACCORDANCE WITH THE PLANS.

P.E. \_\_\_\_\_ DATE \_\_\_\_\_

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

TEXAS DEPARTMENT OF TRANSPORTATION

RECOMMENDED FOR LETTING

DESIGN SUPPORT DIRECTOR

RECOMMENDED FOR LETTING

TRANSPORTATION ENGINEER SUPERVISOR

RECOMMENDED FOR LETTING

DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

APPROVED FOR LETTING

DISTRICT ENGINEER

EXCEPTIONS: NONE  
EQUATIONS: NONE  
R.R. CROSSINGS: NONE

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION,  
NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS  
FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS  
FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 23, 2023)

FILE LOCATION AND NAME  
T:\Engdata\Standards\Des\gn\TITLESHEET-2014Specs.dgn

LEVELS DISPLAYED	
1	

COUNTY \_\_\_\_\_ PROJ. NO. \_\_\_\_\_  
HWY. NO. \_\_\_\_\_ LETTING DATE \_\_\_\_\_  
DATE ACCEPTED \_\_\_\_\_



CK: DW: CK: DW:

SHEET	DESCRIPTION
<b>I. GENERAL</b>	
1	TITLE SHEET
2	INDEX OF SHEETS
3 - 4	PROJECT LAYOUT
5	EXISTING TYPICAL SECTIONS
6	PROPOSED TYPICAL SECTIONS
7	GENERAL NOTES
8	ESTIMATE & QUANTITY SHEET
9	SUMMARY OF TRAFFIC CONTROL QUANTITIES
10	SUMMARY OF ROADWAY QUANTITIES
11	SUMMARY OF DRIVEWAY QUANTITIES
12	SUMMARY OF EARTHWORK QUANTITIES
13	SUMMARY OF DRAINAGE QUANTITIES
14	SUMMARY OF SIGNING AND PAVEMENT MARKING QUANTITIES
15	SUMMARY OF SW3P QUANTITIES

SHEET	DESCRIPTION
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16	TRAFFIC CONTROL PLAN NARRATIVE
17	SCHEDULE OF BARRICADES & ADVANCE WARNING DEVICES
18	TRAFFIC CONTROL PLAN - TYPICAL SECTION PHASE 1A
19	TRAFFIC CONTROL PLAN - CULVERT REPLACEMENT PHASE 1A STEP 1
20	TRAFFIC CONTROL PLAN - CULVERT REPLACEMENT PHASE 1A STEP 2
21	TRAFFIC CONTROL PLAN - TYPICAL SECTION PHASE 1B
22	TRAFFIC CONTROL PLAN - CULVERT REPLACEMENT PHASE 1B STEP 1
23	TRAFFIC CONTROL PLAN - CULVERT REPLACEMENT PHASE 1B STEP 2
24 - 25	TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 2
26 - 27	TRAFFIC CONTROL PLAN - PHASE 2 STEP 1
28 - 29	TRAFFIC CONTROL PLAN - PHASE 2 STEP 2
30 - 31	TRAFFIC CONTROL PLAN - PHASE 2 STEP 3
32 - 33	TRAFFIC CONTROL PLAN - PHASE 2 STEP 4
34 - 35	TRAFFIC CONTROL PLAN - PHASE 2 STEP 5
36 - 37	TRAFFIC CONTROL PLAN - PHASE 2 STEP 6
38 - 39	TRAFFIC CONTROL PLAN - PHASE 2 STEP 7
40	TRAFFIC CONTROL PLAN - PHASE 2 STEP 8
41	TRAFFIC CONTROL PLAN - LAYOUT
42	TRAFFIC CONTROL PLAN - TYPICAL SECTIONS PHASE 3,4,5,6,7,8,9,10
43 - 44	TRAFFIC CONTROL PLAN - PHASE 3 STEP 1
45 - 46	TRAFFIC CONTROL PLAN - PHASE 3 STEP 2
47 - 48	TRAFFIC CONTROL PLAN - PHASE 4 STEP 1
49 - 50	TRAFFIC CONTROL PLAN - PHASE 4 STEP 2
51 - 52	TRAFFIC CONTROL PLAN - PHASE 5 STEP 1
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71	TRAFFIC CONTROL PLAN - PHASE 10 STEP 1
72	TRAFFIC CONTROL PLAN - PHASE 10 STEP 2
73 - 74	SHORING LAYOUTS
75	MISCELLANEOUS TCP DETAILS

SHEET	DESCRIPTION
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88	*WZ(STPM)-23
89	*TCP(2-8)-23
90	*TCP(3-1)-13
91	*TCP(3-3)-14
92	*TCP(7-1)-13
93	*TREATMENT FOR VARIOUS EDGE CONDITIONS

SHEET	DESCRIPTION
<b>III. ROADWAY DETAILS</b>	
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98	HORIZONTAL AND VERTICAL CONTROL SHEET
99 - 101	HORIZONTAL ALIGNMENT DATA
102 - 127	ROADWAY PLAN AND PROFILE
128	INTERSECTION PLAN AND PROFILE
129 - 144	DRIVEWAY PLAN AND PROFILE
145 - 146	GABION DETAILS
147	HISTORICAL MARKER TURNOUT DETAIL
148	MAILBOX TURNOUT DETAILS
149	DITCH DETAILS

SHEET	DESCRIPTION
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151	*GF(31)DAT-19
152	*GF(31)LS-19
153	*GF(31)MS-19
154	*SGT(10S)31-16
155	*SGT(11S)31-18
156	*SGT(12S)31-18
157	*SGT(15)31-20
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159 - 162	*MB(1)-21 THRU MB(4)-21

SHEET	DESCRIPTION
<b>IV. DRAINAGE DETAILS</b>	
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164 - 165	HYDRAULIC DATA
166 - 167	CULVERT LAYOUT
<b>DRAINAGE STANDARDS</b>	
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169	*ECD
170	*SCC-MD
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175	*SCP-MD
176	*SCP-4
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SHEET	DESCRIPTION
<b>V. UTILITIES</b>	
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SHEET	DESCRIPTION
<b>VI. TRAFFIC ITEMS</b>	
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208 - 215	SUMMARY OF SMALL SIGNS
216	SIGN DETAILS

SHEET	DESCRIPTION
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218	*TSR(4)-13
219	*TSR(5)-13
220 - 224	*D&OM(1)-20 THRU D&OM(5)-20
225	*PM(1)-22
226	*PM(2)-22
227	*SMD(GEN)-08
228	*SMD(SLIP-1)-08
229	*SMD(SLIP-2)-08
230	*SMD(SLIP-3)-08
231	*RS(4)-23


SHEET	DESCRIPTION
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232 - 233	STORM WATER POLLUTION PREVENTION PLAN (SW3P)
234	ENVIRONMENTAL PERMITS, ISSUES, AND COMMITMENTS (EPIC)
235 - 247	SW3P LAYOUTS
248	WATER QUALITY CALCULATIONS AND TCEQ GENERAL NOTES
249 - 251	WATER POLLUTION ABATEMENT PLAN (WPAP)

SHEET	DESCRIPTION
<b>ENVIRONMENTAL STANDARDS</b>	
252	EC(1)-16
253	EC(2)-16
254 - 256	EC(9)-16

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

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FM 462

INDEX OF SHEETS

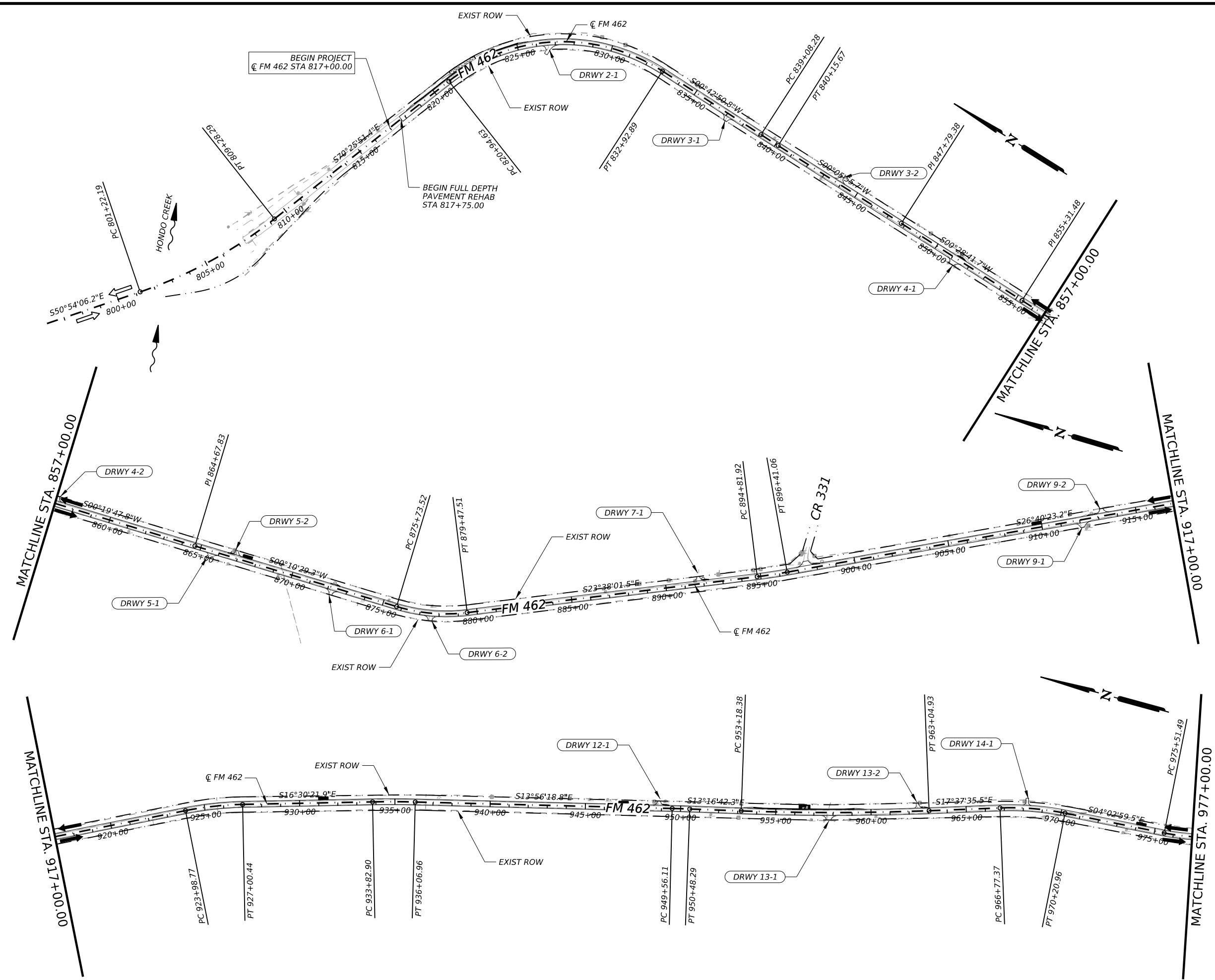
SHEET 1 OF 1

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0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	2	

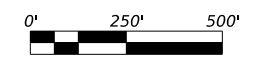
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TREY NEAL  
106194  
LICENSED PROFESSIONAL ENGINEER



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**FM 462**

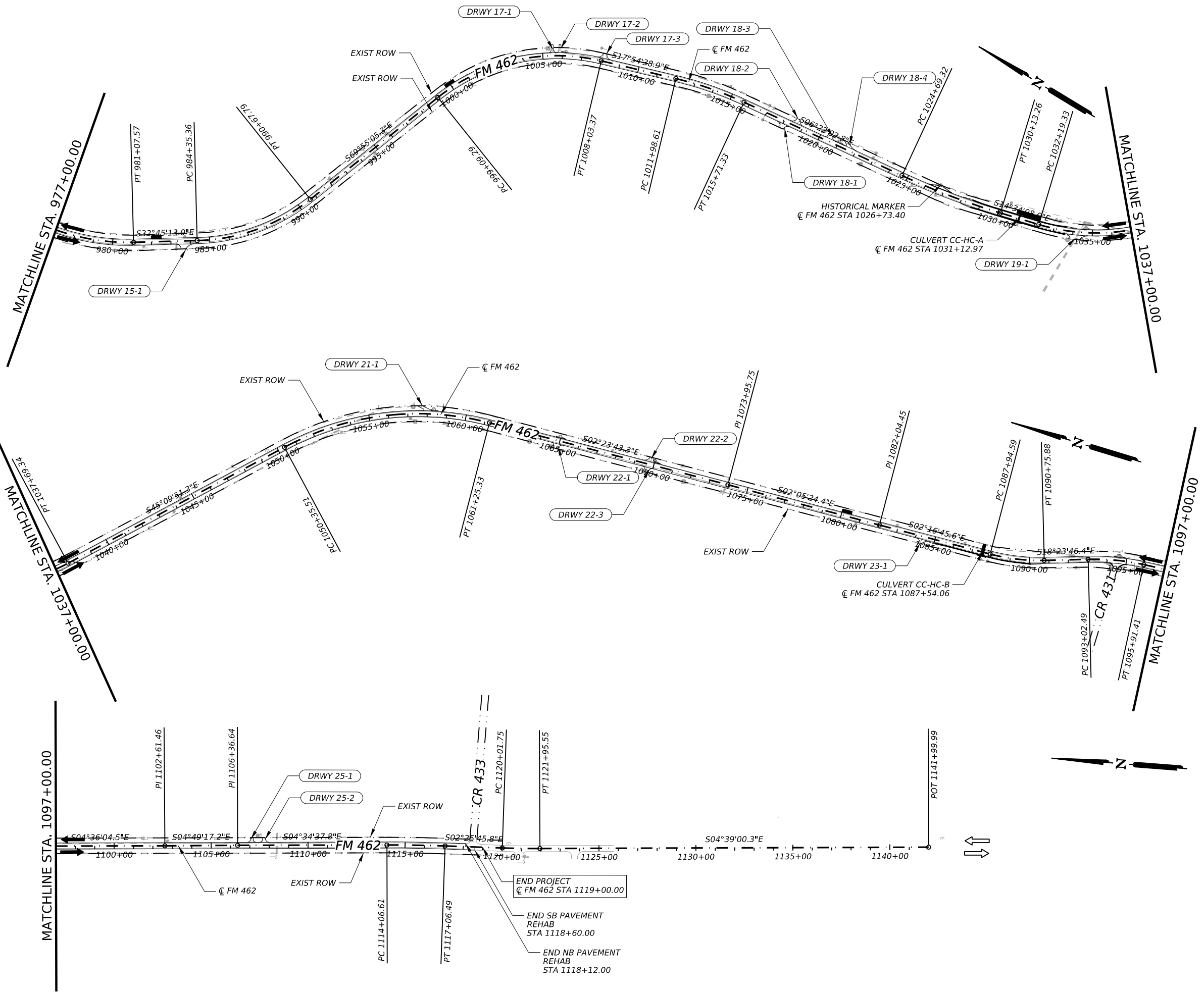
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SHEET 1 OF 2

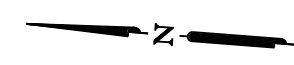
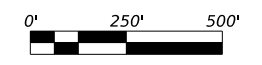
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0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	3	



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 STATE OF TEXAS  
 TROY NEAL  
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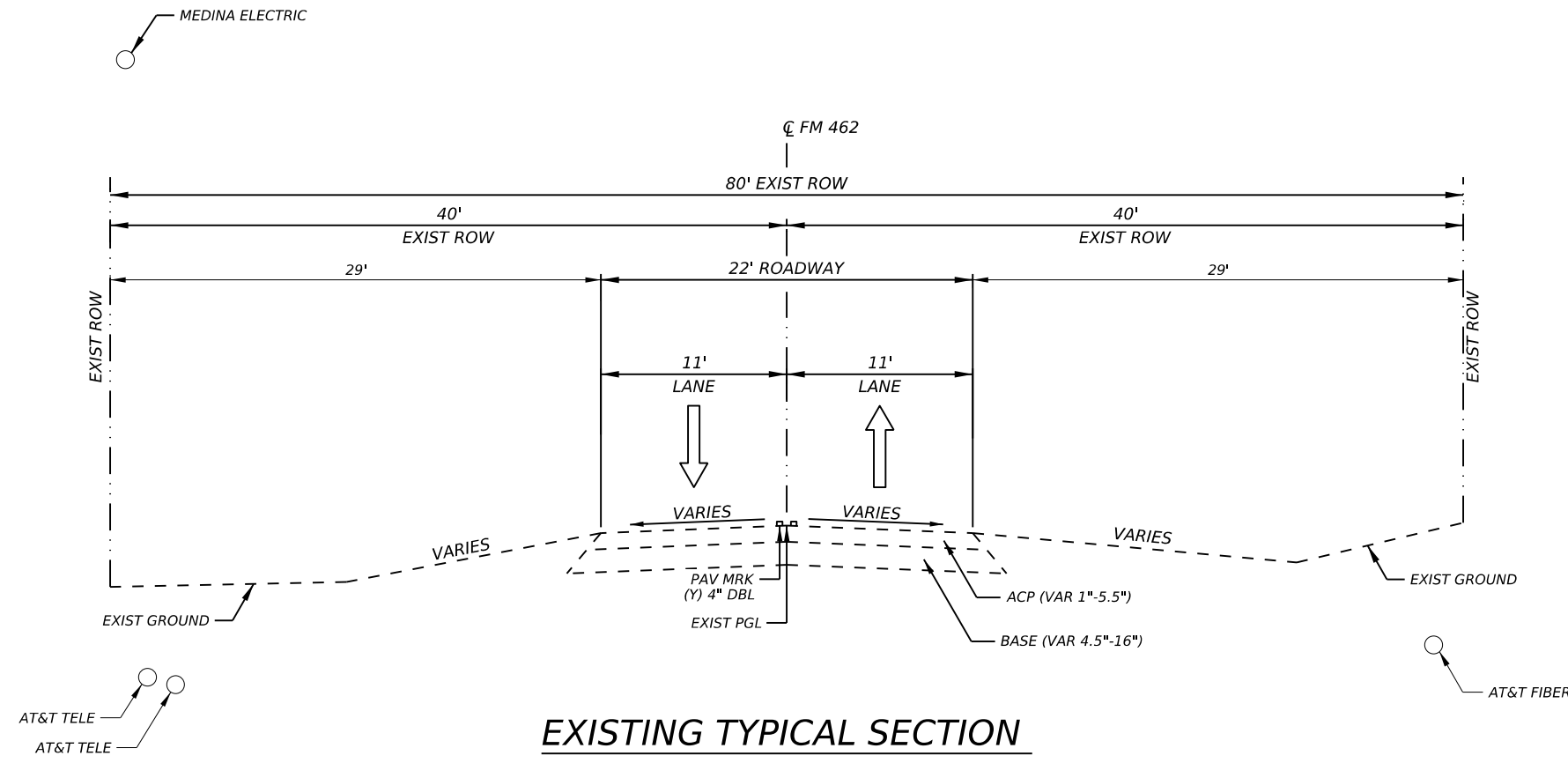
**FM 462**

**PROJECT LAYOUT**

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY		SHEET NO.
SAT	MEDINA		4

CK: DW: CK: DN:



**EXISTING TYPICAL SECTION**

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 1/31/2024  
 STATE OF TEXAS  
 TROY NEAL  
 106194  
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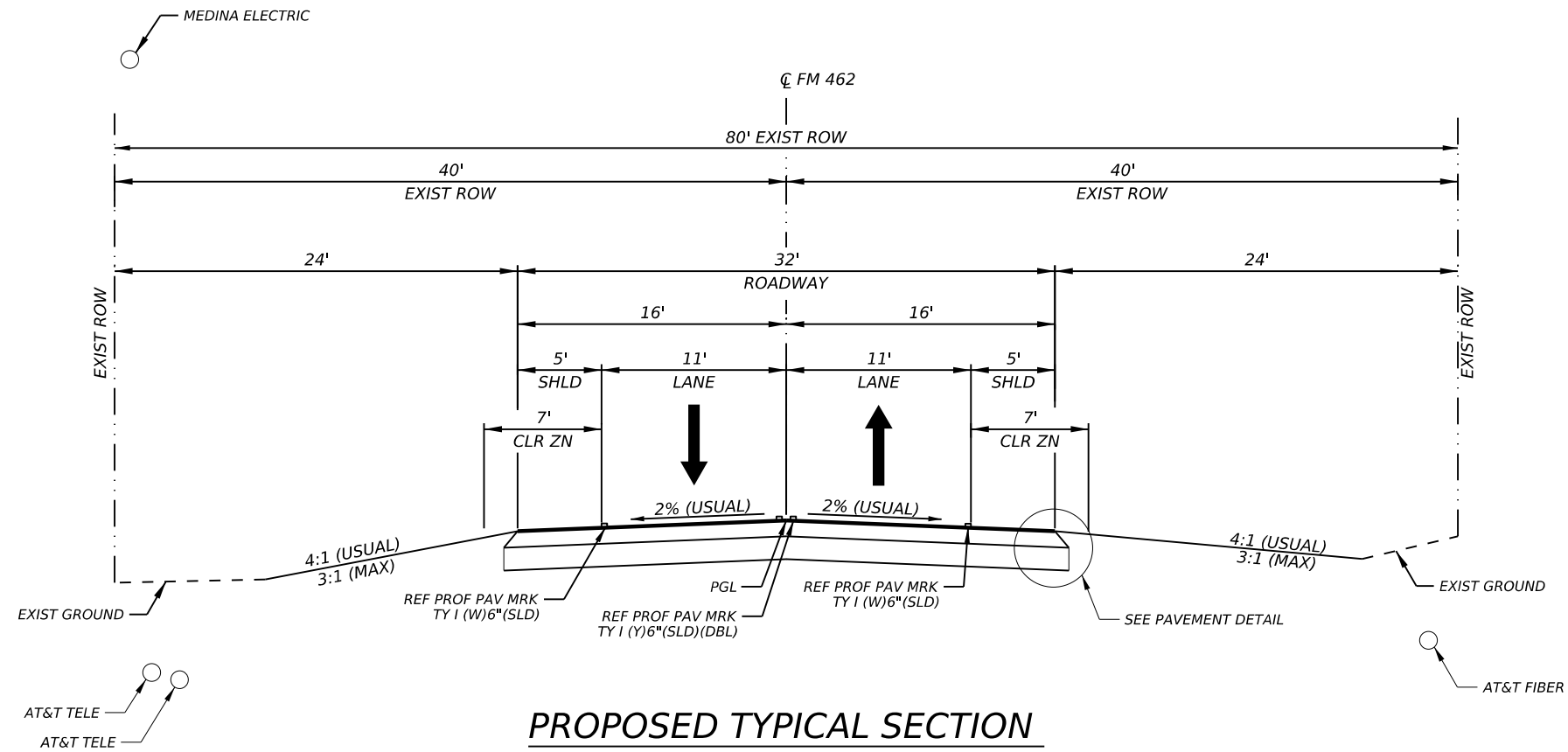
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FM 462  
 EXISTING  
 TYPICAL SECTION

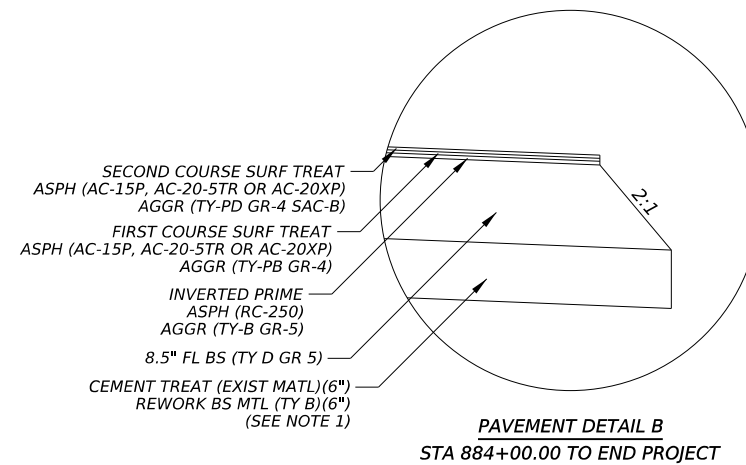
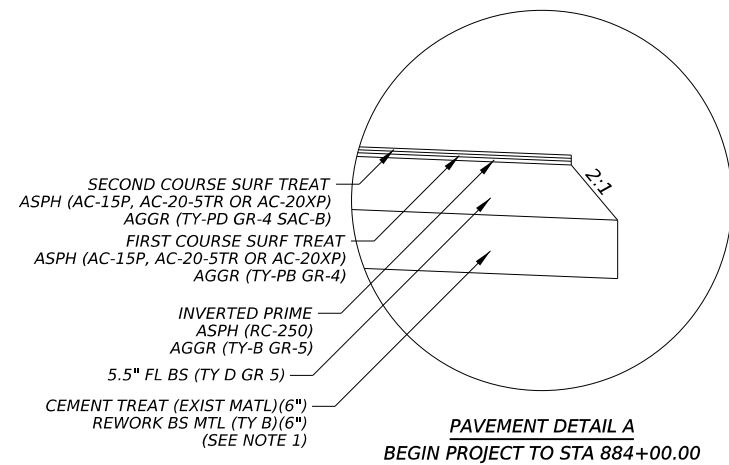
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	5	

CK: DW: CK: DN:



- NOTES:**
1. MATERIAL FOR CEMENT TREATED BASE SHALL BE COMPOSED OF REWORKING EXISTING PAVEMENT TO PROPOSED DEPTH AND WIDTH. IN LOCATIONS WHERE THERE IS NOT SUFFICIENT EXISTING MATERIAL, MIX WITH NEW MATERIAL. THIS WORK SHALL BE PAID AS ITEM 251. NEW BASE SHALL BE PAID FOR AS ITEM 247. REFER TO GENERAL NOTES BASIS OF ESTIMATES FOR RATES OF APPLICATION.



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**PROPOSED TYPICAL SECTION**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	6	

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PHASE	DESCRIPTION	0400	0402	0403	5" Depth	10" Depth	0510	0512	0512	0512	0512	0512	0512	0662	0662	0662	0662	0677	6001	6001	6185	6509
		6006 CUT & RESTORING PAV	6001 TRENCH EXCAVATION PROTECTION	6001 TEMPORARY SPL SHORING	0508 6001 CONSTR- UCTING DETOURS	0508 6001 CONSTR- UCTING DETOURS	6003 ONE-WAY TRAF CONT (PORT TRAF SIG)	6009 PORT CTB (FUR & INSTA) (LOW PROF) (TY 1)	6010 PORT CTB (FUR & INSTA) (LOW PROF) (TY 2)	6033 PORT CTB (MOVE) (LOW PROF) (TY 1)	6034 PORT CTB (MOVE) (LOW PROF) (TY 2)	6057 PORT CTB (REMOVE) (LOW PROF) (TY 1)	6058 PORT CTB (REMOVE) (LOW PROF) (TY 2)	6037 WK ZN PAV MRK NON-REMOV (Y) 6" (SLD)	6067 WK ZN PAV MRK REMOV (W) 6" (SLD)	6075 WK ZN PAV MRK REMOV (W)24" (SLD)	6111 WK ZN PAV MRK SHT TERM (TAB) TY Y-2	6001 ELIM EXT PAV MRK & MRKS (4")	6001 PORTABLE CHANGEABLE MESSAGE SIGN	6002 PORTABLE CHANGEABLE MESSAGE SIGN	6005 TMA (MOBILE OPERATION)	6001 DRIVEWAY ASSISTANCE DEVICE (DAD) SYSTEM MO
		SY	LF	SF	SY	SY	MO	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	LF	DAY	EA	DAY	MO
PHASE 1A CULVERT-HC-A	STEP 1	4	14		1351			380	40						1080	22		2460				
	STEP 2	13	19	198				380	40	380	40			2460	1700	22						
PHASE 1B CULVERT-HC-B	STEP 1	11	14		986					380	40				1200	22		2740				
	STEP 2	24	19	186						380	40	380	40	2740	1840	22						
PHASE 2 (STEP 1)	BEGIN TO 847+00				2434									6250	3025	11		6250				
	847+00 TO 862+00				1168									2700	1600	11		3300				
PHASE 2 (STEP 2)	862+00 TO 895+00				2676									7000	3350	11		6300				
	895+00 TO 900+00				493									1200	500	22		1300				
PHASE 2 (STEP 3)	900+00 TO 931+00				2415									6600	3200	11		5900				
	931+00 TO 937+00				468									800	700	11		1500				
PHASE 2 (STEP 4)	937+00 TO 967+00				2359									6400	3100	11		5700				
	967+00 TO 974+00				489									800	700	11		1500				
PHASE 2 (STEP 5)	974+00 TO 1003+00				2328									6400	3100	11		5700				
	1003+00 TO 1016+00				1042									2200	1400	11		2900				
PHASE 2 (STEP 6)	1016+00 TO 1039+00				1202									5000	2400	11		4300				
	1039+00 TO 1055+00				1248									2400	2100	11		4300				
PHASE 2 (STEP 7)	1055+00 TO 1075+00				1607									4800	2325	11		2900				
	1075+00 TO 1082+30				570									1960	830	11		1960				
PHASE 2 (STEP 8)	1092+30 TO END				173	1880								6600	3050	44		6600				
PHASE 3 (STEP 1)	BEGIN TO 847+00														6175	11		400				
	847+00 TO 864+00														3700	11		400				
PHASE 3 (STEP 2)	BEGIN TO 847+00													6250	6150							
	847+00 TO 864+00													2600	3600							
PHASE 4 (STEP 1)	864+00 TO 895+00														6950	11						
	895+00 TO 902+00														1700	22		400				
PHASE 4 (STEP 2)	862+00 TO 895+00													7000	6910							
	895+00 TO 900+00													600	1455							
PHASE 5 (STEP 1)	902+00 TO 931+00														6500	11						
	931+00 TO 939+00														1900	11		400				
PHASE 5 (STEP 2)	900+00 TO 931+00													6600	6445							
	931+00 TO 937+00													800	1500							
PHASE 6 (STEP 1)	939+00 TO 967+00														6350	11						
	967+00 TO 975+00														2600	11		1100				
PHASE 6 (STEP 2)	937+00 TO 967+00													6400	6250							
	967+00 TO 973+00													2700	1400	11						
PHASE 7 (STEP 1)	975+00 TO 1003+00														6740	11						
	1003+00 TO 1017+15														4367	11		1300				
PHASE 7 (STEP 2)	973+00 TO 1003+00													6800	6718							
	1003+00 TO 1016+00													3610	2785	11						
PHASE 8 (STEP 1)	1017+15 TO 1039+00									380	40				4915	11		110				
	1039+00 TO 1057+00														4213	11		700				
PHASE 8 (STEP 2)	1016+00 TO 1039+00													5000	4905							
	1039+00 TO 1055+00													2350	3895							
PHASE 9 (STEP 1)	1057+00 TO 1075+00														4385	11						
	1075+00 TO 1092+00														3697	11		400				
PHASE 9 (STEP 2)	1055+00 TO 1075+00													4850	4680							
	1075+00 TO 1091+00													2600	3560							
PHASE 10 (STEP 1)	1092+00 TO END														6080	44		580				
PHASE 10 (STEP 2)	1091+00 TO END														6250							
PHASE 11	BEGIN TO END													7745	6250							
TOTAL		52	66	384	23009	1880	4	760	80	1140	120	760	80	132215	173975	528	4520	71400	32	2	32	18

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FM 462

SUMMARY OF TRAFFIC  
CONTROL QUANTITIES

SHEET 1 OF 1

COUNT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY		SHEET NO.
SAT	MEDINA		9

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SHEET NO.	STATION	SEE NOTE 1																		
		0100 6002 PREPARING ROW	0104 6009 REMOVING CONC (RIPRAP)	0110 6001 EXCAVATION (ROADWAY)	0132 6005 EMBANKMENT (FINAL) (ORD COMP) (TY C)	0216 6001 PROOF ROLLING	0247 6475 FL BS (CIP)(TY D GR 1-2, OR 5) FINAL POS	0247 6475 FL BS (CIP)(TY D GR 1-2, OR 5) FINAL POS	0251 6025 REWORK BS MTL (TY B)(6") (ORD COMP)	0275 6001 CEMENT	0275 6002 CEMENT TREAT (EXIST MATL) (6")	0275 6004 CEMENT TREAT (MX EXIST MATL & NW BS) (6")	INVERTED PRIME		FIRST COURSE		SECOND COURSE			
		STA	SY	CY	CY	HR	CY	CY	SY	TON	SY	SY	*SY	*SY	*SY	*SY	*SY	*SY		
1	OF 26	BEGIN TO 823+00	6.0		157	142	1	294	12	1974	17	987	987	1867	1867	2169	2169	2169	2169	
2	OF 26	823+00 TO 835+00	12.0		755	274	1	671	82	4512	39	2256	2256	4267	4267	4267	4267	4267	4267	
3	OF 26	835+00 TO 847+00	12.0		615	350	1	671		4512	39	4512		4267	4267	4267	4267	4267	4267	
4	OF 26	847+00 TO 859+00	12.0		788	113	1	671	45	4512	39	2256	2256	4267	4267	4267	4267	4267	4267	
5	OF 26	859+00 TO 871+00	12.0		584	32	1	671	45	4512	39	2256	2256	4267	4267	4267	4267	4267	4267	
6	OF 26	871+00 TO 883+00	12.0		609	121	1	671	110	4512	39	2256	2256	4267	4267	4267	4267	4267	4267	
7	OF 26	883+00 TO 895+00	12.0		1631	8	1	1020	91	4632	40	2316	2316	4267	4267	4267	4267	4267	4267	
8	OF 26	895+00 TO 907+00	12.0		906	49	1	1053	10	4646	40	2323	2323	4267	4267	4267	4267	4267	4267	
9	OF 26	907+00 TO 919+00	12.0		1116	9	1	1053	112	4646	40	2323	2323	4267	4267	4267	4267	4267	4267	
10	OF 26	919+00 TO 931+00	12.0		924	74	1	1053		4645	40	4645		4267	4267	4267	4267	4267	4267	
11	OF 26	931+00 TO 943+00	12.0		1015	46	1	1053		4645	40	4645		4267	4267	4267	4267	4267	4267	
12	OF 26	943+00 TO 955+00	12.0		1178	27	1	1053		4645	40	4645		4267	4267	4267	4267	4267	4267	
13	OF 26	955+00 TO 967+00	12.0	63	1189	58	1	1053		4645	40	4645		4267	4267	4267	4267	4267	4267	
14	OF 26	967+00 TO 979+00	12.0		1422	49	1	1053		4645	40	4645		4267	4267	4267	4267	4267	4267	
15	OF 26	979+00 TO 991+00	12.0		1078	27	1	1053		4645	40	4645		4267	4267	4267	4267	4267	4267	
16	OF 26	991+00 TO 1003+00	12.0		1387	30	1	1053	56	4646	40	2323	2323	4267	4267	4267	4267	4267	4267	
17	OF 26	1003+00 TO 1015+00	12.0		1121	91	1	1053	84	4646	40	2323	2323	4267	4267	4267	4267	4267	4267	
18	OF 26	1015+00 TO 1027+00	12.0		1104	71	1	1053	38	4646	40	2323	2323	4267	4267	4267	4267	4267	4267	
19	OF 26	1027+00 TO 1039+00	12.0	22	823	345	1	1053		4645	40	4645		4267	4267	4267	4267	4267	4267	
20	OF 26	1039+00 TO 1051+00	12.0		1226	24	1	1053	47	4646	40	2323	2323	4267	4267	4267	4267	4267	4267	
21	OF 26	1051+00 TO 1063+00	12.0		983	187	1	1053	112	4646	40	2323	2323	4267	4267	4267	4267	4267	4267	
22	OF 26	1063+00 TO 1075+00	12.0		1298	18	1	1053	47	4646	40	2323	2323	4267	4267	4267	4267	4267	4267	
23	OF 26	1075+00 TO 1087+00	12.0		1007	55	1	1053	121	4646	40	2323	2323	4267	4267	4267	4267	4267	4267	
24	OF 26	1087+00 TO 1099+00	12.0	33	923	269	1	1053		4645	40	4645		4267	4267	4267	4267	4267	4267	
25	OF 26	1099+00 TO 1111+00	12.0		1366	3	1	1053		4645	40	4645		4267	4267	4267	4267	4267	4267	
26	OF 26	1111+00 TO END	8.0		828	2	1	646		2849	25	2849		2617	2617	2840	2840	2840	2840	
TOTAL			302.0		118	26033	2474	26	24269	1012	115634	997	82400	33234	106892	106892	107417	107417	107417	107417

\* FOR CONTRACTOR'S INFORMATION ONLY.  
SEE BASIS OF ESTIMATE FOR BID ITEM QUANTITIES.

SHEET NO.	STATION																
		0432 6002 RIPRAP (CONC) (5 IN)	0432 6045 RIPRAP (MOW STRIP) (4 IN)	0459 6001 GABIONS (GALV)	0459 6007 GABION MATTRESSES (GALV) (12 IN)	0459 6008 GABION MATTRESSES (GALV) (18 IN)	0530 6009 TURNOUTS (SURF TREAT)	0540 6001 MTL W-BEAM GD FEN (TIM POST)	0540 6033 MTL BM GD FEN (LONG SPAN SYSTEM)	0544 6001 GUARDRAIL END TREATMENT (INSTALL)	0552 6001 WIRE FENCE (TY A)	0560 6006 MAILBOX INSTALL-M (TWG-POST) TY 2	0560 6007 MAILBOX INSTALL-S (WC-POST) TY 3	0560 6011 MAILBOX INSTALL-S (TWW-POST) TY 4	0560 6013 MAILBOX INSTALL-M (TWW-POST) TY 4	0560 6015 MAILBOX INSTALL-S (TIM-POST) TY 5	
		CY	CY	CY	SY	SY	SY	LF	EA	EA	LF	EA	EA	EA	EA		
1	OF 26	BEGIN TO 823+00	59	21.2				370		1	400						
2	OF 26	823+00 TO 835+00		12.2				155		1	200						
3	OF 26	835+00 TO 847+00															
4	OF 26	847+00 TO 859+00					17								1		
5	OF 26	859+00 TO 871+00			84		9					1					
6	OF 26	871+00 TO 883+00					17					1					
7	OF 26	883+00 TO 895+00					11						1				
8	OF 26	895+00 TO 907+00					12							1			
9	OF 26	907+00 TO 919+00				84	18							1			
10	OF 26	919+00 TO 931+00															
11	OF 26	931+00 TO 943+00			84												
12	OF 26	943+00 TO 955+00		8.4	84		11	65	1					1			
13	OF 26	955+00 TO 967+00		21.1	132		11	360	1			1					
14	OF 26	967+00 TO 979+00			67												
15	OF 26	979+00 TO 991+00			84												
16	OF 26	991+00 TO 1003+00			84												
17	OF 26	1003+00 TO 1015+00					10						1				
18	OF 26	1015+00 TO 1027+00					105						1				
19	OF 26	1027+00 TO 1039+00		57.6		277	43	700	2	4	175	1					
20	OF 26	1039+00 TO 1051+00															
21	OF 26	1051+00 TO 1063+00					10					1					
22	OF 26	1063+00 TO 1075+00					26						2				
23	OF 26	1075+00 TO 1087+00		11.4	84			145	1								
24	OF 26	1087+00 TO 1099+00		16.4	9		20	205	1	1			1	1			
25	OF 26	1099+00 TO 1111+00															
26	OF 26	1111+00 TO END															
TOTAL			59	148.3	132	664	277	320	2000	3	10	775	1	4	6	4	1

**NOTES:**  
1. ADDITIONAL FLEX BASE IS FOR AREAS ESTIMATED TO NOT HAVE ENOUGH EXISTING PAVEMENT TO REWORK INTO THE PROPOSED CEMENT TREATED BASE LAYER. REFER TO TYPICAL SECTIONS FOR MORE INFORMATION.

**Kimley»Horn** F-928

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**FM 462**

**SUMMARY OF ROADWAY QUANTITIES**

SHEET 1 OF 1


CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	10

CK: DW: CK: DN:

SHEET NO.	DRIVEWAY	0105 6008	0530 6003	0530 6006
		REMOVING STAB BASE AND ASPH PAV (6")	INTERSEC- TIONS (SURF TREAT)	DRIVEWAYS (SURF TREAT)
		SY	SY	SY
1 OF 1	CR 331 & CR 431	297	253	
1 OF 16	DRIVEWAY 2-1 & 3-1			238
2 OF 16	DRIVEWAY 3-2 & 4-1	102		183
3 OF 16	DRIVEWAY 4-2 & 5-1	52		158
4 OF 16	DRIVEWAY 5-2 & 6-1	96		145
5 OF 16	DRIVEWAY 6-2 & 7-1	85		147
6 OF 16	DRIVEWAY 9-1 & 9-2	114		185
7 OF 16	DRIVEWAY 12-1 & 13-1	142		162
8 OF 16	DRIVEWAY 13-2 & 14-1	89		124
9 OF 16	DRIVEWAY 15-1 & 17-1	25		187
10 OF 16	DRIVEWAY 17-2 & 17-3	77		143
11 OF 16	DRIVEWAY 18-1 & 18-2			167
12 OF 16	DRIVEWAY 18-3 & 18-4	202		159
13 OF 16	DRIVEWAY 19-1 & 21-1	321		261
14 OF 16	DRIVEWAY 22-1 & 22-2	135		158
15 OF 16	DRIVEWAY 22-3 & 23-1	122		142
16 OF 16	DRIVEWAY 25-1 & 25-2	103		100
TOTAL		1962	253	2659

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 Texas Department of Transportation

**FM 462**  
**SUMMARY OF DRIVEWAY**  
**QUANTITIES**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY		SHEET NO.
SAT	MEDINA		11



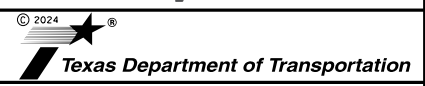


CC: DW: CC: DW:

SHEET NO.	CULVERT	0401 6001	0462 6003	0462 6006	0466 6179	0466 6180	0467 6171	0496 6004	0496 6006	0496 6007	0496 6008
		FLOWABLE BACKFILL	CONC BOX CULV (4FT X 2FT)	CONC BOX CULV (5FT X 2FT)	WINGWALL (PW-1) (HW=4 FT)	WINGWALL (PW-1) (HW=5 FT)	SET (TY 1) (S= 5 FT) (HW= 3 FT) (3:1)(C)	REMOV STR (SET)	REMOV STR (HEADWALL)	REMOV STR (PIPE)	REMOV STR (BOX CULVERT)
		CY	LF	LF	EA	EA	EA	EA	EA	LF	LF
1	OF 2	CULVERT CC-HC-A	15.0	46		1	1		2		35
2	OF 2	CULVERT CC-HC-B	20.0		92		1		2	32	
TOTAL			35.0	46	92	1	2	1	2	32	35

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**FM 462**

**SUMMARY OF DRAINAGE QUANTITIES**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY		SHEET NO.
SAT	MEDINA		13




CK: DW: CK: DW: CK: DW:

SHEET NO.	STATION	0644 6001	0644 6004	0644 6076	0658 6046	0658 6062	0666 6048	0666 6225	0666 6230	0666 6343	0666 6346	0666 6347	0672 6009	0678 6002	0678 6008
		IN SM RD SN SUP&AM TY10BWG (1)SA(P)	IN SM RD SN SUP&AM TY10BWG (1)SA(T)	REMOVE SM RD SN SUP&AM	IN STL OM ASSM (OM-2X) (WC)GND	IN STL DEL ASSM (D-SW)SZ1 (BRF)GF2(BI)	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	PAVEMENT SEALER 6"	PAVEMENT SEALER 24"	REFL PROF PAV MRK TY I (W)6"(SLD) (100 MIL)	REFL PROF PAV MRK TY I (Y)6"(BRK) (100 MIL)	REFL PROF PAV MRK TY I (Y)6"(SLD) (100 MIL)	REFL PAV MRKR TY II-A-A	PAV SURF PREP FOR MRK (6")	PAV SURF PREP FOR MRK (24")
		EA	EA	EA	EA	EA	LF	LF	LF	LF	LF	LF	EA	LF	LF
1	OF 13 BEGIN TO 835+00	10		1		24		7700		3850		3850	49	7700	
2	OF 13 835+00 TO 859+00	4		2				8599		4800	320	3479	60	8599	
3	OF 13 859+00 TO 883+00	9		2				8206		4800	410	2996	60	8206	
4	OF 13 883+00 TO 907+00	3		2			12	5900	12	4700	600	600	60	5900	12
5	OF 13 907+00 TO 931+00	2						8259		4800	370	3089	60	8259	
6	OF 13 931+00 TO 955+00	3		1		4		7024		4800	530	1694	60	7024	
7	OF 13 955+00 TO 979+00	4	1	3		16		8141		4800	390	2951	60	8141	
8	OF 13 979+00 TO 1003+00	8		5				9600		4800		4800	60	9600	
9	OF 13 1003+00 TO 1027+00	9	1	3				8648		4800	310	3538	60	8648	
10	OF 13 1027+00 TO 1051+00	8		2	3	38		9148		4800	160	4188	60	9148	
11	OF 13 1051+00 TO 1075+00	4	1	2				8141		4800	430	2911	60	8141	
12	OF 13 1075+00 TO 1099+00	5	1	4	3	18	12	8388	12	4715	370	3303	60	8388	12
13	OF 13 1099+00 TO END	2		1				5680		4400	550	730	55	5680	
TOTAL		71	4	28	6	100	24	103434	24	60865	4440	38129	764	103434	24

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**FM 462**

**SUMMARY OF SIGNING  
 AND PAVEMENT  
 MARKING QUANTITIES**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY		SHEET NO.
SAT	MEDINA		14

DATE: 1/31/2024 6:06:43 PM  
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SHEET NO.	STATION	0160 6003	0162 6008	0164 6035	0164 6051	0168 6001	0169 6001	0506 6001	0506 6002	0506 6011	0506 6020	0506 6024	0506 6038	0506 6039	
		FURNISHING AND PLACING TOPSOIL (4")	ROLL SODDING	DRILL SEEDING (PERM) (RURAL) (CLAY)	DRILL SEED (TEMP) (WARM OR COOL)	VEGETATIVE WATERING	SOIL RETENTION BLANKETS (CL 1) (TY A)	ROCK FILTER DAMS (INSTALL) (TY 1)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY I)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	
		SY	SY	SY	SY	MG	SY	LF	LF	LF	SY	SY	LF	LF	
1	OF 13	BEGIN TO 835+00	4387	528	3859	3859	128.7	3859					1692	1692	
2	OF 13	835+00 TO 859+00	8743	6471	2272	2272	171.9	2272					771	771	
3	OF 13	859+00 TO 883+00	6249	1168	5081	5081	176.8	5081					163	163	
4	OF 13	883+00 TO 907+00	5498		5498	5498	171.6	5498					632	632	
5	OF 13	907+00 TO 931+00	5351		5351	5351	167	5351					568	568	
6	OF 13	931+00 TO 955+00	5201		5201	5201	162.3	5201					559	559	
7	OF 13	955+00 TO 979+00	6101		6101	6101	190.4	6101					1501	1501	
8	OF 13	979+00 TO 1003+00	6481		6481	6481	202.3	6481					2383	2383	
9	OF 13	1003+00 TO 1027+00	5454		5454	5454	170.2	5454					907	907	
10	OF 13	1027+00 TO 1051+00	4647		4647	4647	145	4647	50	60	110		1868	1868	
11	OF 13	1051+00 TO 1075+00	5224		5224	5224	163	5224					1318	1318	
12	OF 13	1075+00 TO 1099+00	5236		5236	5236	163.4	5236	50	60	110		1308	1308	
13	OF 13	1099+00 TO END	4279		4279	4279	133.6	4279							
TOTAL			72851	8167	64684	64684	2146.2	64684	100	120	220	224	224	13670	13670

SHEET NO.	STATION	0506 6041	0506 6043	0730 6107	0734 6002	
		BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)	FULL - WIDTH MOWING	LITTER REMOVAL	
		LF	LF	CYC	CYC	
1	OF 13	BEGIN TO 835+00	200	200		
2	OF 13	835+00 TO 859+00	200	200		
3	OF 13	859+00 TO 883+00	200	200		
4	OF 13	883+00 TO 907+00	250	250		
5	OF 13	907+00 TO 931+00	275	275		
6	OF 13	931+00 TO 955+00	225	225		
7	OF 13	955+00 TO 979+00	250	250		
8	OF 13	979+00 TO 1003+00	300	300		
9	OF 13	1003+00 TO 1027+00	250	250		
10	OF 13	1027+00 TO 1051+00	175	175		
11	OF 13	1051+00 TO 1075+00	225	225		
12	OF 13	1075+00 TO 1099+00	225	225		
13	OF 13	1099+00 TO END	250	250		
TOTAL			3025	3025	4	4

**Kimley»Horn** F-928

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 Texas Department of Transportation

FM 462

**SUMMARY OF  
SW3P QUANTITIES**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY		SHEET NO.
SAT	MEDINA		15

DATE: 1/31/2024 5:07:54 PM  
FILE: c:\pwworkh1\10285615\FM462\_TCP NARR-1 - TCP NARR.dgn

### TRAFFIC CONTROL PLAN SEQUENCE OF WORK

- (1) THIS PROJECT WILL BE CONSTRUCTED IN (11) PHASES. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS AND BARRICADES AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. DAILY LANE CLOSURES WILL BE USED IN ACCORDANCE WITH STATE TCP STANDARDS. DROP OFF CONDITIONS OF GREATER THAN 2" MUST HAVE A 3:1 SLOPE AT THE END OF EACH DAY, AS WELL AS THROUGHOUT THE PROJECT WHERE ACCESS TO ADJACENT PROPERTIES IS ALLOWED TO DRIVEWAYS AND SIDE STREETS.
- (2) PREPARING ROW / REMOVAL OF EXISTING ITEMS TO BE DONE ONLY IN AREAS WHERE WORK IS OCCURRING, AS PER THE PHASES NOTED BELOW.
- (3) PLANING, SURFACE TREATMENTS AND OVERLAYS SHALL BE PERFORMED IN THE DIRECTION OF TRAFFIC. BEGIN SURFACE CONSTRUCTION ON HIGH SIDE OF ROAD TO AVOID WATER PONDING ISSUES.
- (4) THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC" AND ITEM 502, "BARRICADES, SIGNS, AND TRAFFIC HANDLING", OF THE STANDARD SPECIFICATIONS, AND TO THE GENERAL NOTES
- (5) A BRIEF DESCRIPTION OF THESE PHASES ARE AS FOLLOWS:  
PHASE 1 – CONSTRUCT CULVERTS  
PHASE 2 – CONSTRUCT TEMPORARY PAVEMENT WIDENING FROM BEGIN TO END PROJECT  
PHASE 3 – CONSTRUCT PAVEMENT FROM BEGIN PROJECT TO STA 864+00 (RIGHT SIDE); BEGIN PROJECT TO STA 862+00 (LEFT SIDE)  
PHASE 4 – CONSTRUCT PAVEMENT FROM STA 864+00 TO STA 902+00 (RIGHT SIDE); STA 862+00 TO STA 900+00.00 (LEFT SIDE)  
PHASE 5 – CONSTRUCT PAVEMENT FROM STA 902+00 TO STA 939+00 (RIGHT SIDE); STA 900+00 TO STA 937+00 (LEFT SIDE)  
PHASE 6 – CONSTRUCT PAVEMENT FROM STA 939+00 TO STA 975+00 (RIGHT SIDE); STA 937+00 TO STA 973+00 (LEFT SIDE)  
PHASE 7 – CONSTRUCT PAVEMENT FROM STA 975+00.00 TO STA 1019+00 (RIGHT SIDE); STA 973+00 TO STA 1017+00 (LEFT SIDE)  
PHASE 8 – CONSTRUCT PAVEMENT FROM STA 1019+00 TO STA 1057+00 (RIGHT SIDE); STA 1017+00 TO STA 1055+00 (LEFT SIDE)  
PHASE 9 – CONSTRUCT PAVEMENT FROM STA 1057+00 TO STA 1092+00 (RIGHT SIDE); STA 1055+00 TO STA 1090+00 (LEFT SIDE)  
PHASE 10 – CONSTRUCT PAVEMENT FROM STA 1092+00 TO END PROJECT (RIGHT SIDE); STA 1090+00 TO END PROJECT (LEFT SIDE)  
PHASE 11 – CONSTRUCT FINAL SURFACE COURSE

#### PHASE 1A

##### THE INTENT OF THIS PHASE IS TO CONSTRUCT CULVERT A.

###### STEP 1 – LEFT SIDE

- (1) INSTALL ADVANCE WARNING SIGNS, TEMPORARY PORTABLE SIGNALS, TEMPORARY PORTABLE TRAFFIC BARRIER, BARRICADES, AND WORK ZONE PAVEMENT MARKINGS AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER.
- (2) PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN THE PLANS.
- (3) REMOVE EXIST PAVEMENT AND INSTALL TRENCH EXCAVATION PROTECTION.
- (4) CONSTRUCT DOWNSTREAM END OF CULVERT AND END TREATMENT.
- (5) RESTORE PAVEMENT AND CONSTRUCT TEMPORARY PAVEMENT WIDENING AS SHOWN IN THE PLANS.
- (6) INSTALL GABION MATTRESSES PER PLANS AT CULVERT CC-HC-A.
- (7) PLACE TOPSOIL, RETENTION BLANKETS, AND TEMPORARY SEEDING ON DISTURBED AREAS.

###### STEP 2 – RIGHT SIDE

- (1) ADJUST ADVANCE WARNING SIGNS, TEMPORARY PORTABLE SIGNALS, TEMPORARY PORTABLE TRAFFIC BARRIER, BARRICADES, AND WORK ZONE PAVEMENT MARKINGS AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER.
- (2) PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN THE PLANS.
- (3) REMOVE EXIST PAVEMENT AND INSTALL TRENCH EXCAVATION PROTECTION.
- (4) CONSTRUCT UPSTREAM END OF CULVERT AND END TREATMENT.
- (5) RESTORE PAVEMENT.
- (6) PLACE TOPSOIL, RETENTION BLANKETS, AND TEMPORARY SEEDING ON DISTURBED AREAS.
- (7) INSTALL TEMPORARY PAVEMENT MARKINGS AND RETURN TRAFFIC TO TWO-LANE TWO-WAY OPERATIONS.

#### PHASE 1B

##### THE INTENT OF THIS PHASE IS TO CONSTRUCT CULVERT B.

###### STEP 1 – LEFT SIDE

- (8) INSTALL ADVANCE WARNING SIGNS, TEMPORARY PORTABLE SIGNALS, TEMPORARY PORTABLE TRAFFIC BARRIER, BARRICADES, AND WORK ZONE PAVEMENT MARKINGS AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER.
- (9) PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN THE PLANS.
- (10) REMOVE EXIST PAVEMENT AND INSTALL TRENCH EXCAVATION PROTECTION.
- (11) CONSTRUCT DOWNSTREAM END OF CULVERT AND END TREATMENT.
- (12) RESTORE PAVEMENT AND CONSTRUCT TEMPORARY PAVEMENT WIDENING AS SHOWN IN THE PLANS.
- (13) INSTALL GABION MATTRESSES PER PLANS AT CULVERT CC-HC-B.
- (14) PLACE TOPSOIL, RETENTION BLANKETS, AND TEMPORARY SEEDING ON DISTURBED AREAS.

###### STEP 2 – RIGHT SIDE

- (1) ADJUST ADVANCE WARNING SIGNS, TEMPORARY PORTABLE SIGNALS, TEMPORARY PORTABLE TRAFFIC BARRIER, BARRICADES, AND WORK ZONE PAVEMENT MARKINGS AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER.
- (2) PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN THE PLANS.
- (3) REMOVE EXIST PAVEMENT AND INSTALL TRENCH EXCAVATION PROTECTION.
- (4) CONSTRUCT UPSTREAM END OF CULVERT AND END TREATMENT.
- (5) RESTORE PAVEMENT.
- (6) PLACE TOPSOIL, RETENTION BLANKETS, AND TEMPORARY SEEDING ON DISTURBED AREAS.
- (7) INSTALL TEMPORARY PAVEMENT MARKINGS AND RETURN TRAFFIC TO TWO-LANE TWO-WAY OPERATIONS.

#### PHASE 2

##### THE INTENT OF THIS PHASE IS TO CONSTRUCT TEMPORARY PAVEMENT WIDENING.

\*NOTE: THE LENGTH OF WORK ZONE WILL BE LIMITED TO LIMITS SHOWN IN THE PLANS OR AS APPROVED BY THE ENGINEER. COMPLETE THE FOLLOWING STEPS FOR EACH WORK ZONE BEFORE MOVING TO THE NEXT LOCATION:

- (1) INSTALL ADVANCE WARNING SIGNS, TEMPORARY PORTABLE SIGNALS, BARRICADES, AND WORK ZONE PAVEMENT MARKINGS AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER.
- (2) PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN THE PLANS.
- (3) CONSTRUCT PROPOSED TEMPORARY PAVEMENT WIDENING AS SHOWN IN THE PLANS.
- (4) INSTALL TEMPORARY PAVEMENT MARKINGS AND RETURN TRAFFIC TO TWO-LANE TWO-WAY OPERATIONS.

#### PHASE 3, 4, 5, 6, 7, 8, 9, 10

##### THE INTENT OF THIS PHASE IS TO CONSTRUCT PAVEMENT REHABILITATION.

\*NOTE: THE LENGTH OF WORK ZONE WILL BE LIMITED TO LIMITS SHOWN IN THE PLANS OR AS APPROVED BY THE ENGINEER. COMPLETE THE FOLLOWING STEPS FOR EACH PHASE BEFORE MOVING TO THE NEXT PHASE:

###### STEP 1 – RIGHT SIDE

- (1) INSTALL ADVANCE WARNING SIGNS, TEMPORARY PORTABLE SIGNALS, BARRICADES, AND WORK ZONE PAVEMENT MARKINGS AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER.
- (2) PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN THE PLANS.
- (3) REMOVE AND SALVAGE EXISTING PAVEMENT MATERIAL.
- (4) PREPARE SUBGRADE TO PROPOSED WIDTH AND DEPTH.
- (5) CONSTRUCT CEMENT TREATED BASE BY MIXING AND RELAYING EXISTING PAVEMENT MATERIAL TO PROPOSED WIDTH AND DEPTH. MIX IN NEW BASE AS NEEDED. TREAT WITH CEMENT AND CURE.
- (6) CONSTRUCT FLEX BASE.
- (7) CONSTRUCT INVERT PRIME AND CURE.
- (8) CONSTRUCT FIRST COURSE SURFACE TREATMENT.


###### STEP 2 – LEFT SIDE

- (1) ADJUST ADVANCE WARNING SIGNS, TEMPORARY PORTABLE SIGNALS, BARRICADES, AND WORK ZONE PAVEMENT MARKINGS AS SHOWN ON THE PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER.
- (2) PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN THE PLANS.
- (3) REMOVE AND SALVAGE EXISTING PAVEMENT MATERIAL AND PREVIOUSLY PLACED TEMPORARY WIDENING MATERIAL.
- (4) PREPARE SUBGRADE TO PROPOSED WIDTH AND DEPTH.
- (5) CONSTRUCT CEMENT TREATED BASE BY MIXING AND RELAYING EXISTING PAVEMENT MATERIAL AND TEMPORARY WIDENING MATERIAL TO PROPOSED WIDTH AND DEPTH. TREAT WITH CEMENT AND CURE.
- (6) CONSTRUCT FLEX BASE.
- (7) CONSTRUCT INVERT PRIME AND CURE.
- (8) CONSTRUCT FIRST COURSE SURFACE TREATMENT.
- (9) INSTALL TEMPORARY PAVEMENT MARKINGS AND RETURN TRAFFIC TO TWO-LANE TWO-WAY OPERATIONS.

#### PHASE 11

##### THE INTENT OF THIS PHASE IS TO CONSTRUCT THE SURFACE COURSE AND FINALIZE CONSTRUCTION.

- (1) AS APPLICABLE, INSTALL TCP SIGNS AND BARRICADES FOR SURFACING OPERATIONS AND MOBILE OPERATIONS.
- (2) PLACE FINAL SURFACE COURSE FROM BEGIN TO END PROJECT.
- (3) INSTALL WORK ZONE TABS AT THE END OF EACH DAY AS NEEDED AND MAINTAIN FOR THE DURATION OF SURFACING OPERATIONS.
- (4) ADJUST TCP SIGNING AND MAINTAIN WORK ZONE TABS AT THE BEGINNING OF EACH WORKDAY AS WORK PROGRESSES.
- (5) INSTALL FINAL SIGNS AND PAVEMENT MARKINGS FOR ENTIRE PROJECT LIMITS.
- (6) INSTALL PERMANENT EROSION CONTROL DEVICES AS SHOWN IN PLANS.
- (7) PERFORM FINAL CLEAN-UP.
- (8) OPEN ALL LANES TO TRAFFIC AS APPROVED AND/OR DIRECTED BY THE ENGINEER.

*David Gutierrez*  
1/31/2024  


**Kimley»Horn** F-928

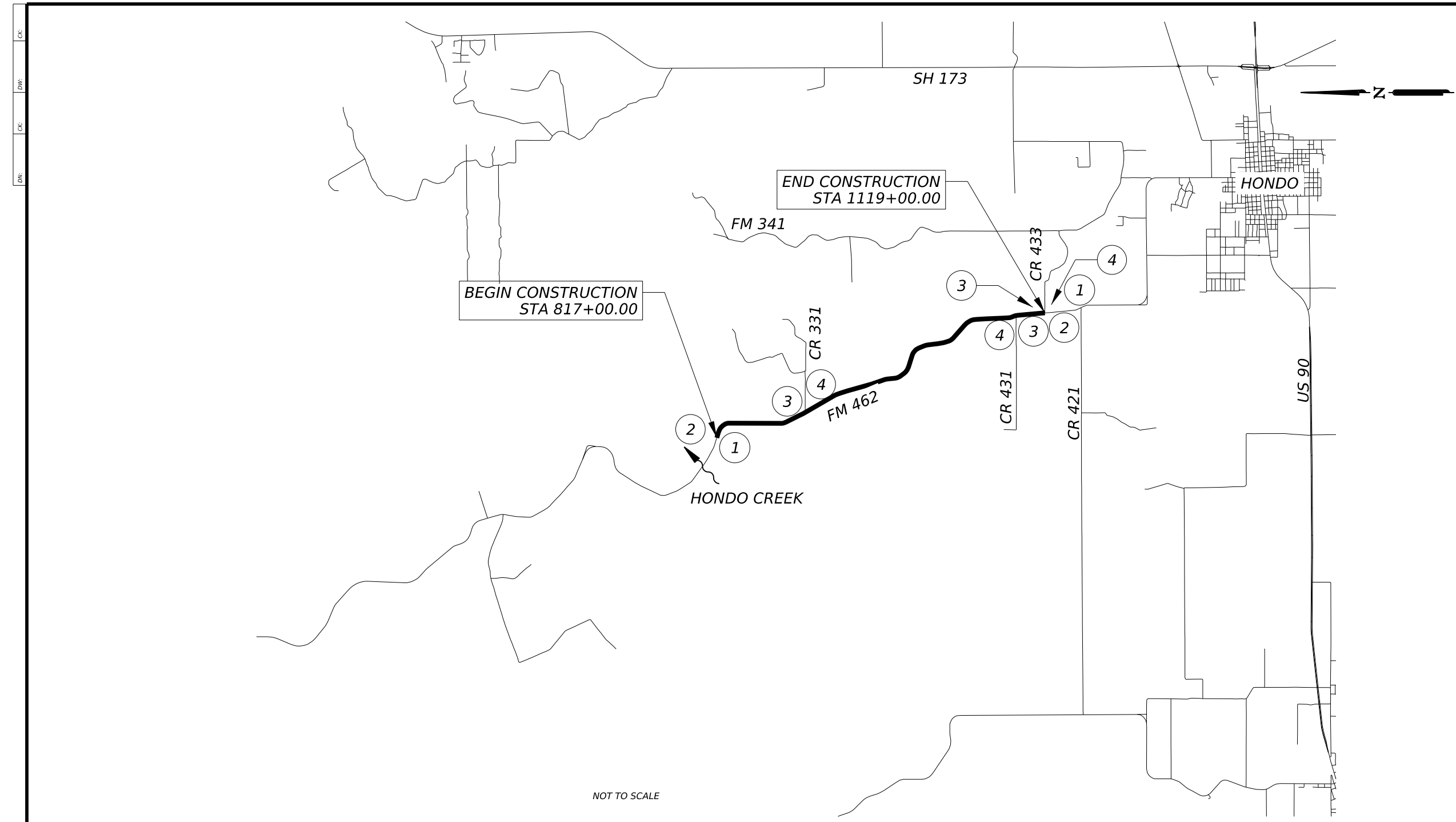
Texas Department of Transportation

FM 462

TRAFFIC CONTROL  
PLAN NARRATIVE

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	16	



- NOTES:**
1. CERTAIN SIGNS MUST BE USED IN CONJUNCTION WITH OTHER SIGNS.
  2. BARRICADES AND WARNING SIGNS ON THIS SHEET ARE MINIMAL CONSTRUCTION ZONE SIGNING. ADDITIONAL BARRICADES, WARNING SIGNS, ARROW PANELS, CONES, ETC. IN ACCORDANCE WITH BC(1) THRU BC(12) AND THE TEXAS MUTCD MAY BE REQUIRED IN AREAS OF ACTUAL CONSTRUCTION.
  3. SEE TCP SHEETS FOR ADDITIONAL SIGNING REQUIREMENTS. APPLICABLE TCP SHEETS FOR THIS PROJECT ARE: TCP(2-8), TCP(3-1), TCP(3-3), TCP(7-1).
  4. ALL ITEMS ON THIS SHEET ARE SUBSIDIARY TO ITEM 502 UNLESS STATED OTHERWISE.

David Gutierrez  
 1/31/2024  


NOT TO SCALE

SCHEDULE OF TRAFFIC CONTROL DEVICES

LOCATION	USAGE	OBSCURE WARNING SIGNS STATE LAW	STAY ALERT TALK OR TEXT LATER	BEGIN WORK ZONE	TRAFFIC FINES DOUBLE	WHEN WORKERS ARE PRESENT	BEGIN ROAD WORK NEXT X MILES	NAME ADDRESS STATE CONTRACTOR	SPEED LIMIT XX	ROAD WORK AHEAD	END ROAD WORK	END WORK ZONE	ROAD WORK NEXT XX MILES	ROAD CONSTRUCTION NEXT XX MILES	ROAD CONSTRUCTION NEXT XX MILES	CHANNELIZING DEVICES	R10-6L	CW3-3	CW13-1P	R4-1
1	APPROACHES TO PROJECT	X	X	X	X	X	X	X	X	X	X	X								
2	DEPARTURES FROM PROJECT								X		X	X								
3	SIDE STREET APPROACHES									X			X	X	X					
4	SIDE STREET DEPARTURES									X	X	X								
5	AS DIRECTED								X	X	X	X				X	X	X	X	X

SCHEDULE OF TRAFFIC CONTROL DEVICES

LOCATION	USAGE	BE PREPARED TO STOP	WORK CONVOY	X VEHICLE CONVOY	PASS WITH CARE	TY III BARRICADE	LOOSE GRAVEL	ONE LANE ROAD AHEAD	NO CENTER LINE
1	APPROACHES TO PROJECT								
2	DEPARTURES FROM PROJECT								
3	SIDE STREET APPROACHES								
4	SIDE STREET DEPARTURES								
5	AS DIRECTED	X	X	X	X	X	X	X	X

**Kimley Horn** F-928

Texas Department of Transportation

FM 462

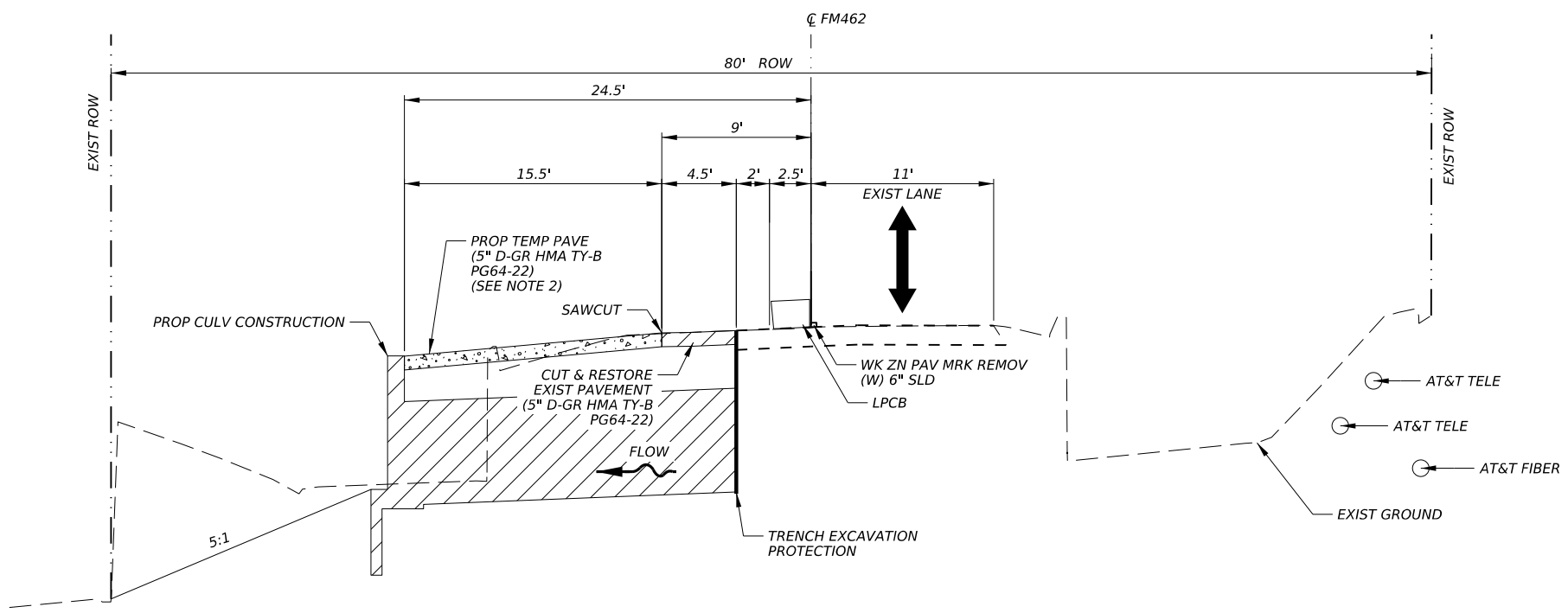
SCHEDULE OF BARRICADES & ADVANCE WARNING DEVICES

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	17	

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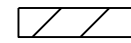



CK:  
DW:  
CK:  
DN:



**PHASE 1A - STEP 1**

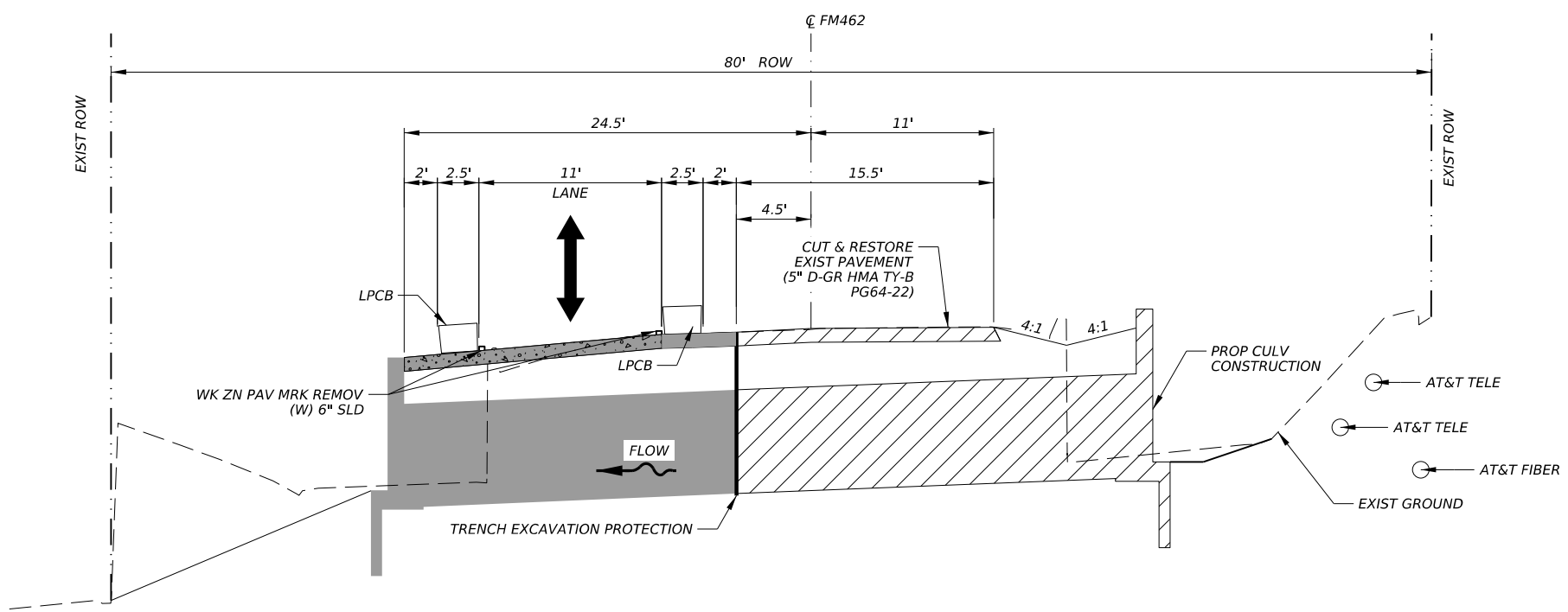
CONSTRUCT DOWNSTREAM  
CULVERT CC-HC-A  
STA 1031+12.97

**LEGEND**

-  CONSTRUCTION THIS STEP
-  CONSTRUCTION PREVIOUS STEP
-  TEMPORARY PAVEMENT THIS STEP
-  TEMPORARY PAVEMENT PREVIOUS STEP

**NOTES**

1. TYPICAL SECTIONS ARE NOT TO SCALE.
2. TEMPORARY PAVEMENT PLACEMENT SHALL BE PAID FOR AS ITEM 508. SAWCUT AND EXISTING PAVEMENT REMOVAL SHALL BE SUBSIDIARY TO ITEM 508.



**PHASE 1A - STEP 2**

CONSTRUCT UPSTREAM  
CULVERT CC-HC-A  
STA 1031+12.97

1/31/2024



DATE: 1/31/2024 5:09:51 PM  
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**Kimley»Horn** F-928

Texas Department of Transportation

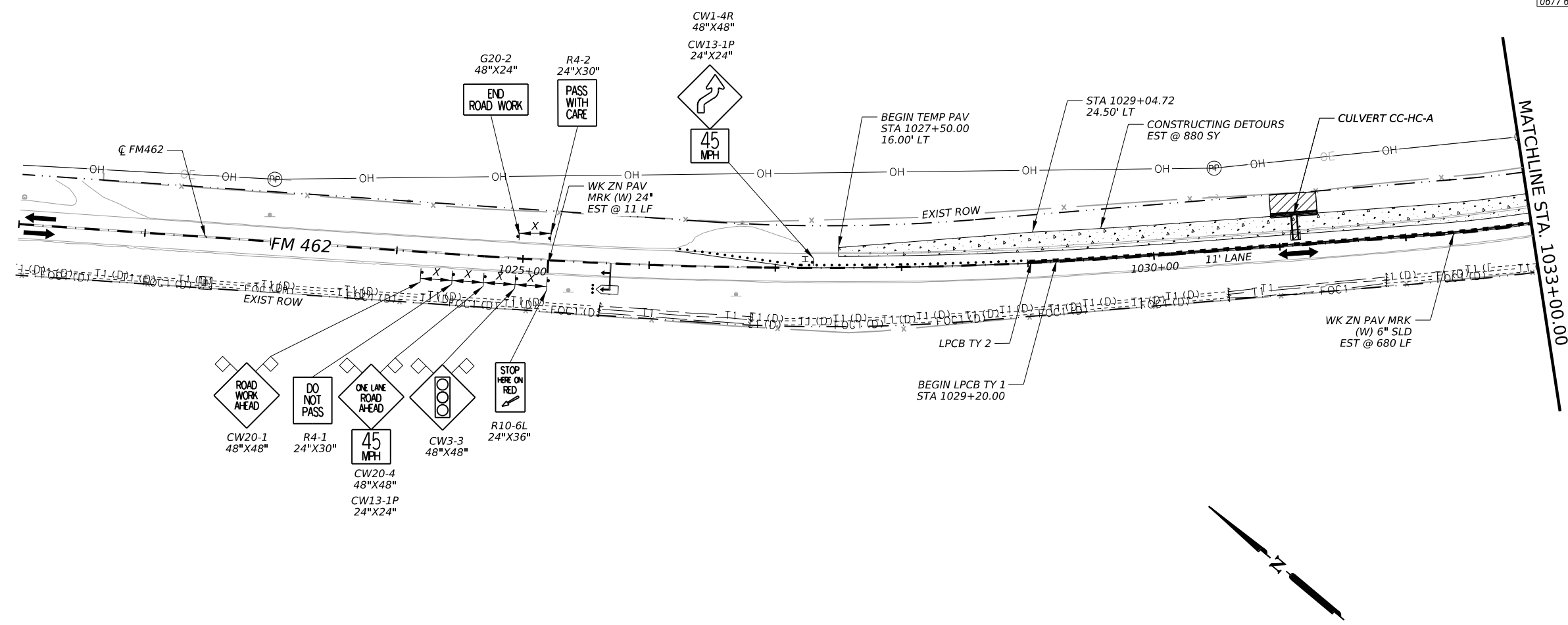
FM 462  
TRAFFIC CONTROL PLAN  
TYPICAL SECTIONS  
PHASE 1A

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	18	



ITEM	DESCRIPTION	UNIT	QTY
0400 6006	CUT & RESTORING PAV	SY	4
0402 6001	TRENCH EXCAVATION PROTECTION	LF	14
0508 6001*	CONSTRUCTING DETOURS	SY	1351
0512 6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	380
0512 6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	40
0662 6067	WK ZN PAV MRK REMOV (W)6*(SLD)	LF	1080
0662 6075	WK ZN PAV MRK REMOV (W)24*(SLD)	LF	22
0677 6001	ELIM EXT PAV MRK & MRKS (4*)	LF	2460



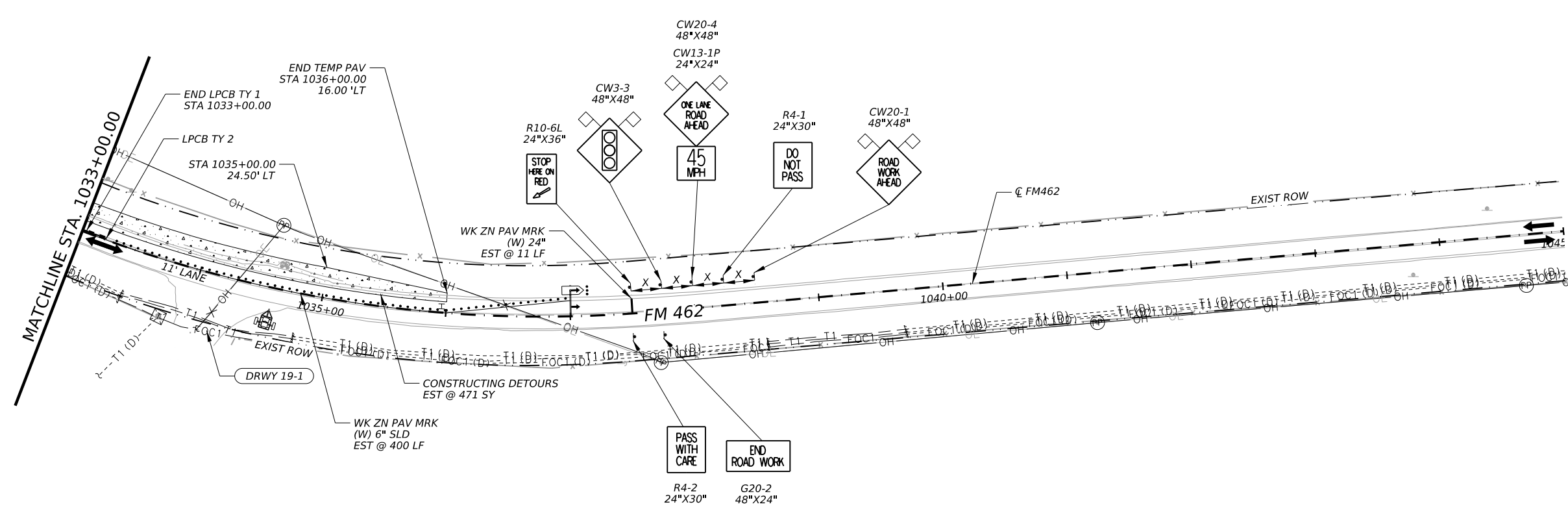
**\*5\"**

**LEGEND**

- EXIST FEATURES
- EXIST RIGHT OF WAY
- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)
- LOW PROFILE CONCETE BARRIER

**NOTES:**

- REFER TO STANDARD TCP (2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.



1/31/2024

David Gutierrez

STATE OF TEXAS  
DAVID H. GUTIERREZ  
143301  
LICENSED PROFESSIONAL ENGINEER

0' 50' 100'

**Kimley»Horn** F-928

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Texas Department of Transportation

**FM 462**

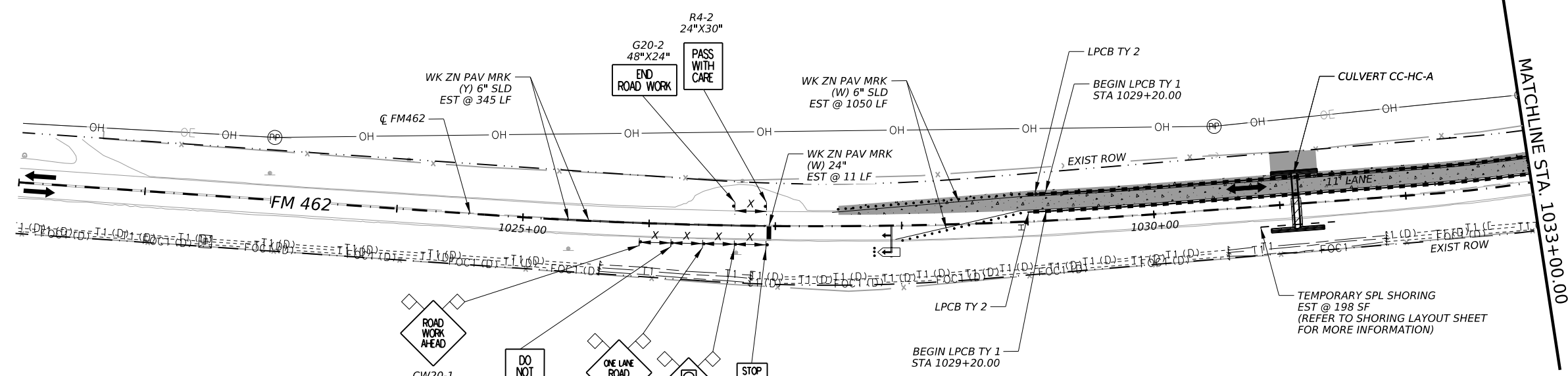
**TRAFFIC CONTROL PLAN  
CULVERT REPLACEMENT  
PHASE 1A STEP 1  
CULVERT CC-HC-A**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	19	

DATE: 1/31/2024 5:10:40 PM  
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ITEM	DESCRIPTION	UNIT	QTY
0400 6006	CUT & RESTORING PAV	SY	13
0402 6001	TRENCH EXCAVATION PROTECTION	LF	19
0403 6001	TEMPORARY SPL SHORING	SF	198
0512 6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	380
0512 6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	40
0512 6033	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	380
0512 6034	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	40
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	2460
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	1700
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	22

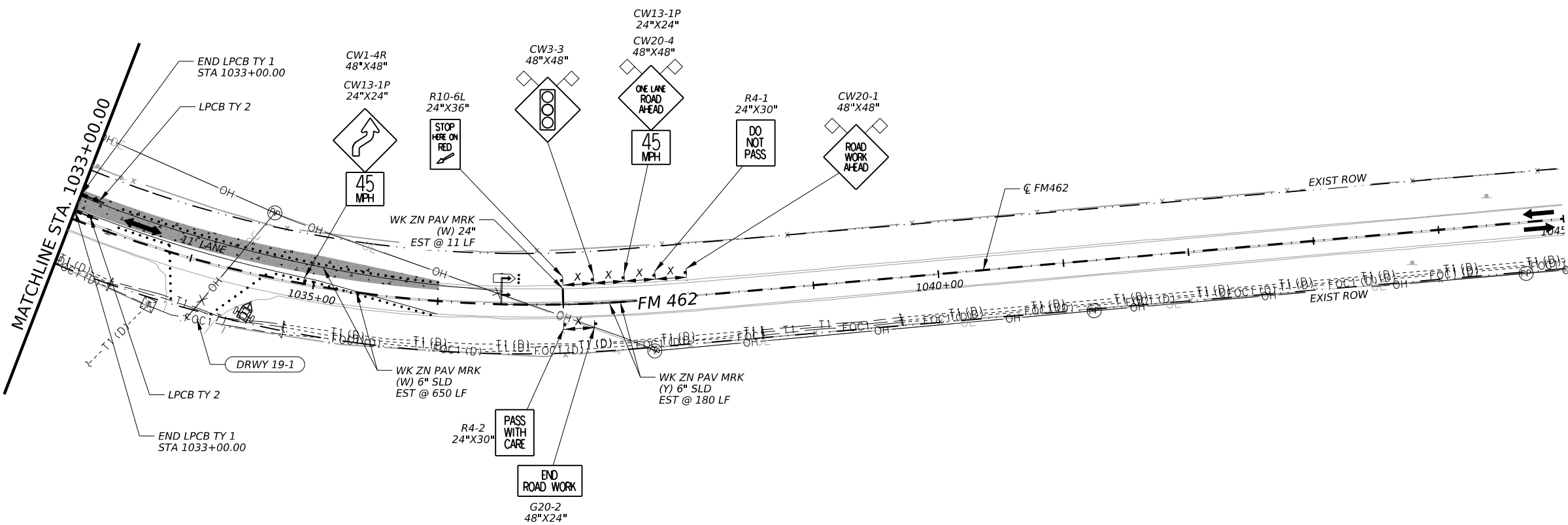


**LEGEND**

- EXIST FEATURES
- - - EXIST RIGHT OF WAY
- PROPOSED TRAFFIC FLOW ARROW
- [Hatched Box] CONSTRUCTION THIS STEP
- [Solid Grey Box] CONSTRUCTION PREVIOUS STEP
- [Dotted Box] TEMPORARY PAVEMENT THIS STEP
- [Dotted Box] TEMPORARY PAVEMENT PREVIOUS STEP
- ... CHANNELIZING DEVICES
- [Signal Icon] TEMP PORTABLE TRAFFIC SIGNAL
- [DAD Icon] DRIVEWAY ASSISTANCE DEVICE (DAD)
- LOW PROFILE CONCETE BARRIER

**NOTES:**

- REFER TO STANDARD TCP (2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.



David Gutierrez  
 STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

1/31/2024

0' 50' 100'

**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

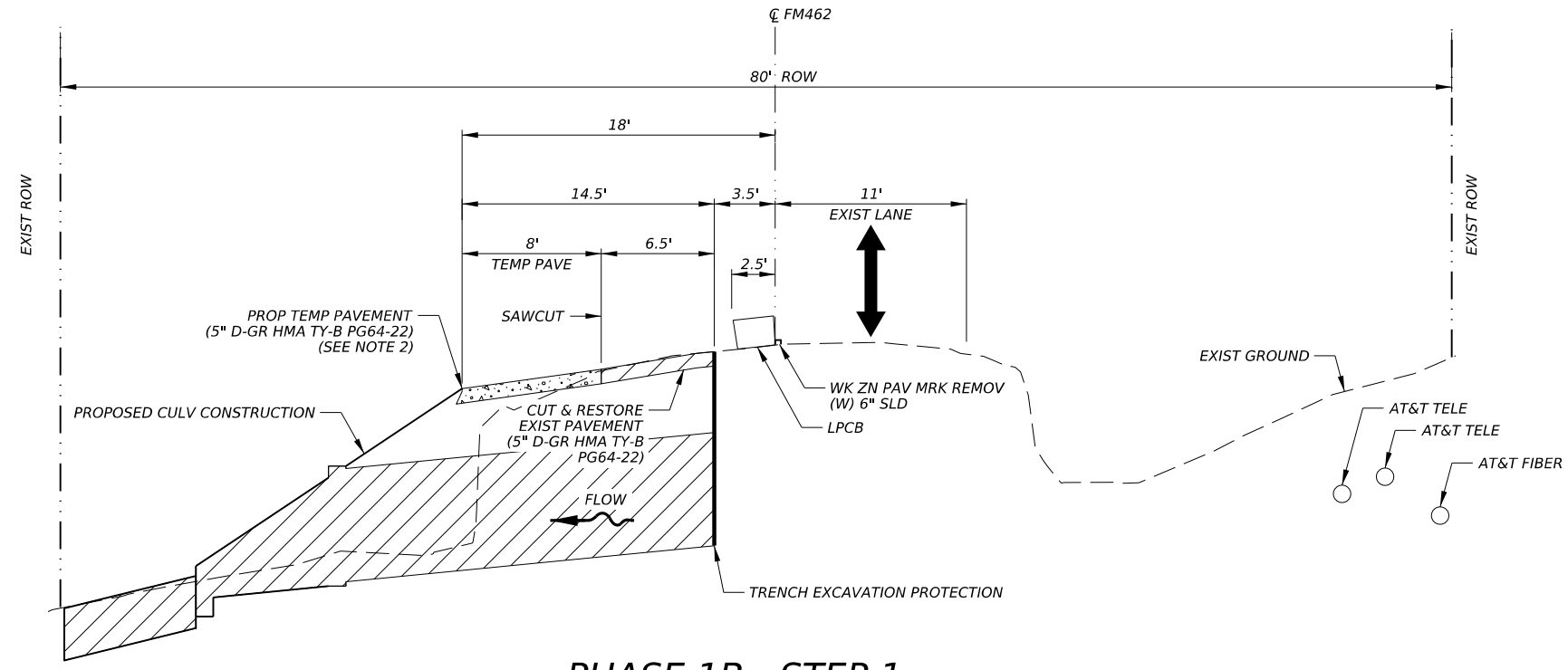
**TRAFFIC CONTROL PLAN**  
**CULVERT REPLACEMENT**  
**PHASE 1A - STEP 2**  
**CULVERT CC-HC-A**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	20	

DATE: 1/31/2024 5:11:09 PM  
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CK:  
DW:  
CK:  
DN:



**PHASE 1B - STEP 1**

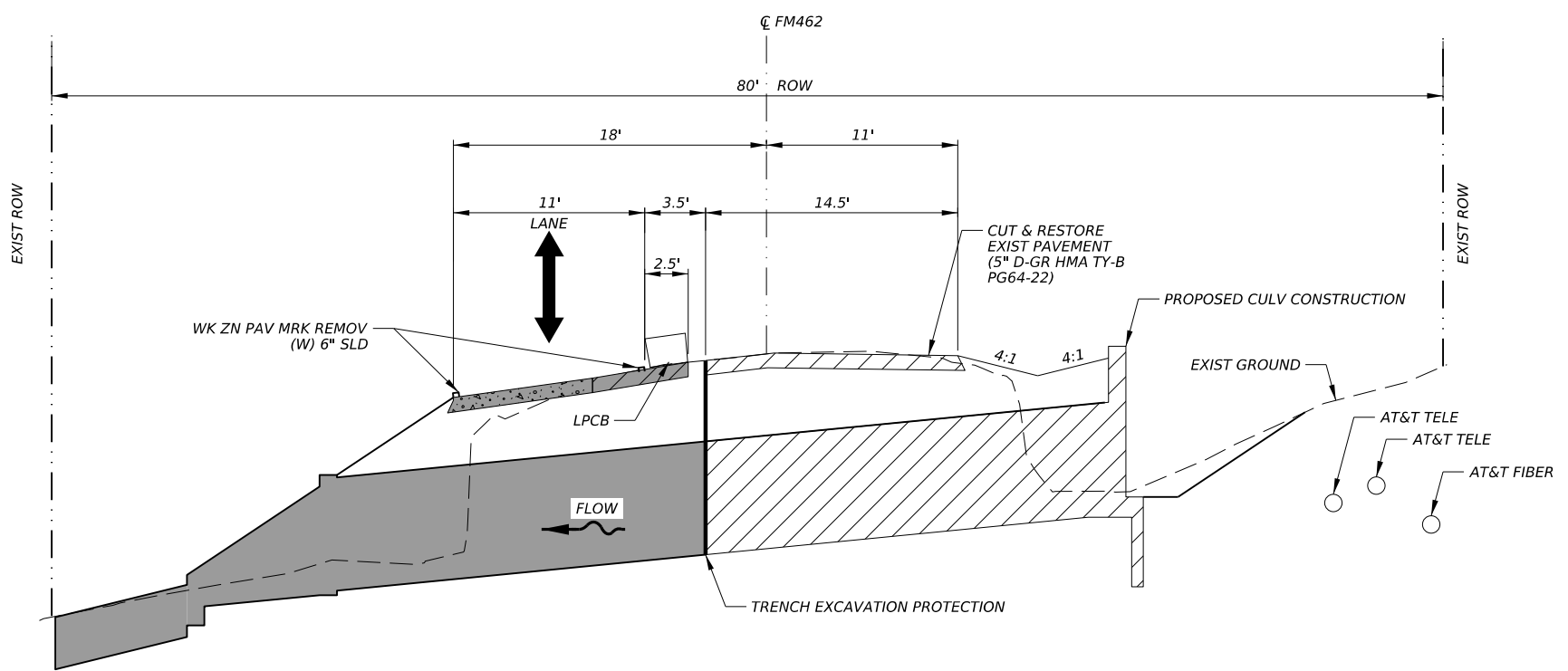
CONSTRUCT DOWNSTREAM  
CULVERT CC-HC-B  
STA 1087+54.06

**LEGEND**

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP

**NOTES**

1. TYPICAL SECTIONS ARE NOT TO SCALE.
2. TEMPORARY PAVEMENT PLACEMENT SHALL BE PAID FOR AS ITEM 508. SAWCUT AND EXISTING PAVEMENT REMOVAL SHALL BE SUBSIDIARY TO ITEM 508.



**PHASE 1B - STEP 2**

CONSTRUCT UPSTREAM  
CULVERT CC-HC-B  
STA 1087+54.06

*David Gutierrez*  
  
 1/31/2024

**Kimley»Horn** F-928

Texas Department of Transportation

FM 462

TRAFFIC CONTROL PLAN  
TYPICAL SECTIONS  
PHASE 1B

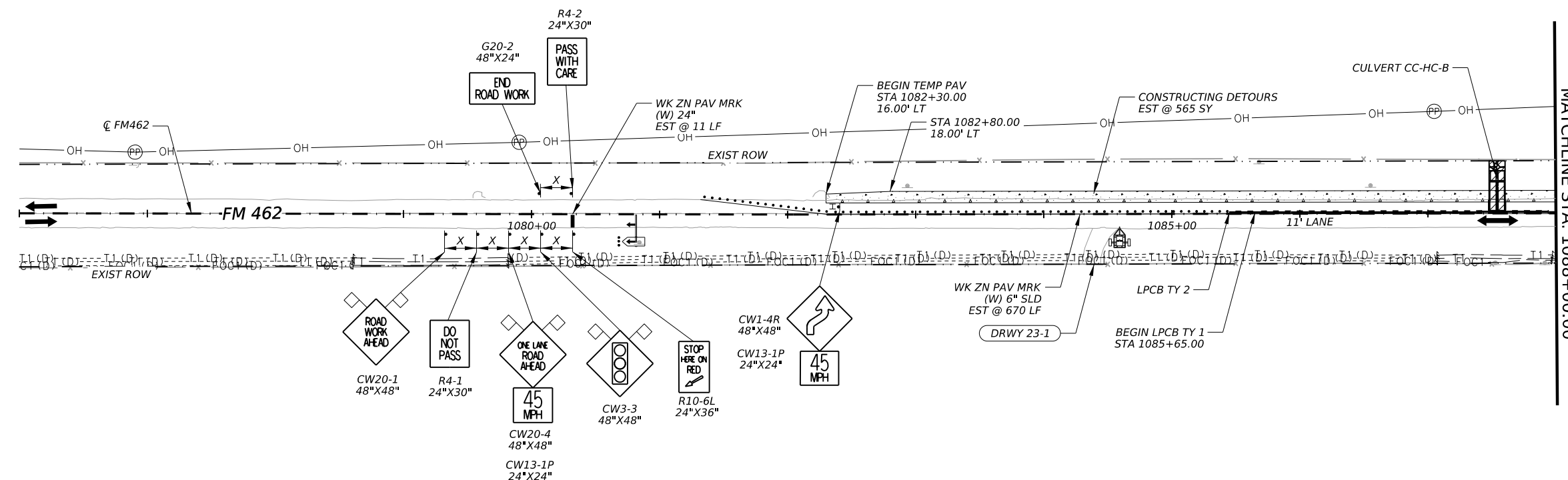
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	21

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ITEM	DESCRIPTION	UNIT	QTY
0400 6006	CUT & RESTORING PAV	SY	11
0402 6001	TRENCH EXCAVATION PROTECTION	LF	14
0508 6001*	CONSTRUCTING DETOURS	SY	986
0512 6033	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	380
0512 6034	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	40
0662 6067	WK ZN PAV MRK REMOV (W)6*(SLD)	LF	1200
0662 6075	WK ZN PAV MRK REMOV (W)24*(SLD)	LF	22
0677 6001	ELIM EXT PAV MRK & MRKS (4*)	LF	2740

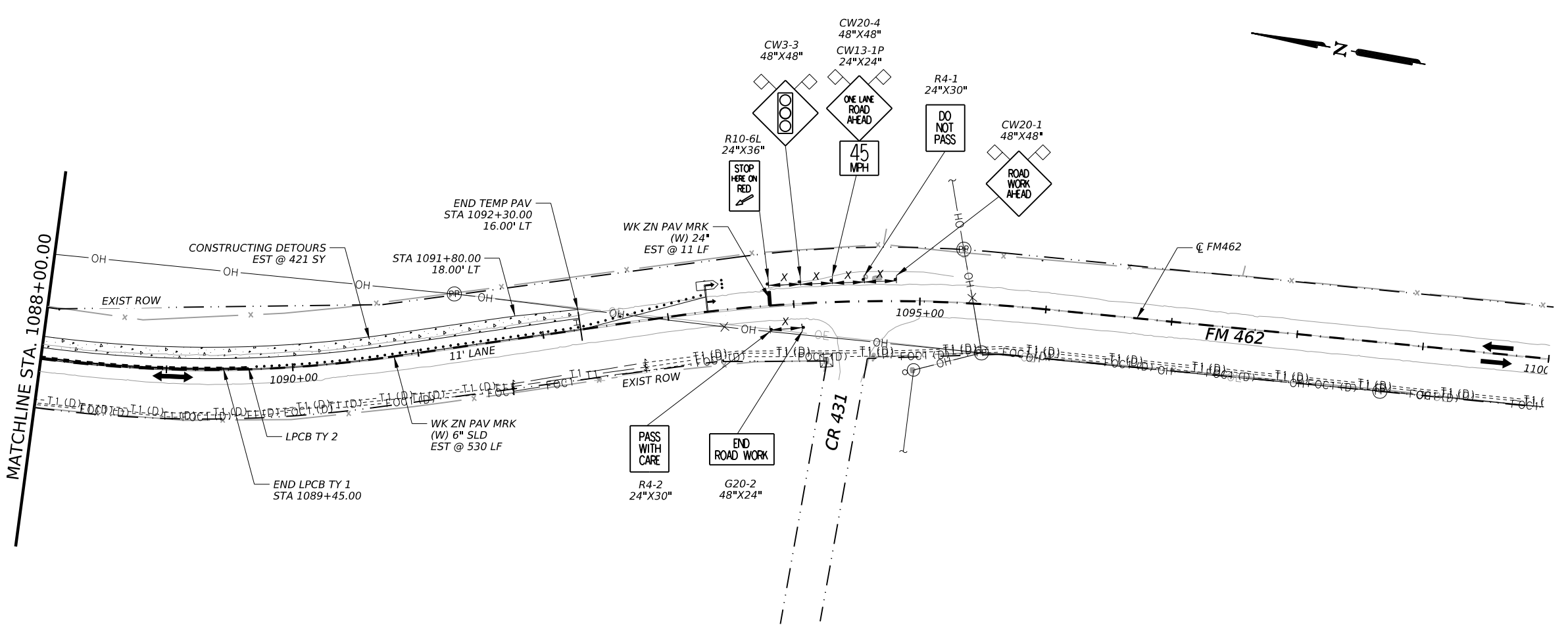


**LEGEND**

- EXIST FEATURES
- EXIST RIGHT OF WAY
- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)
- LOW PROFILE CONCETE BARRIER

**NOTES:**

- REFER TO STANDARD TCP (2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.



*David Gutierrez*

1/31/2024

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

TRAFFIC CONTROL PLAN  
CULVERT REPLACEMENT  
PHASE 1B STEP 1  
CULVERT CC-HC-B

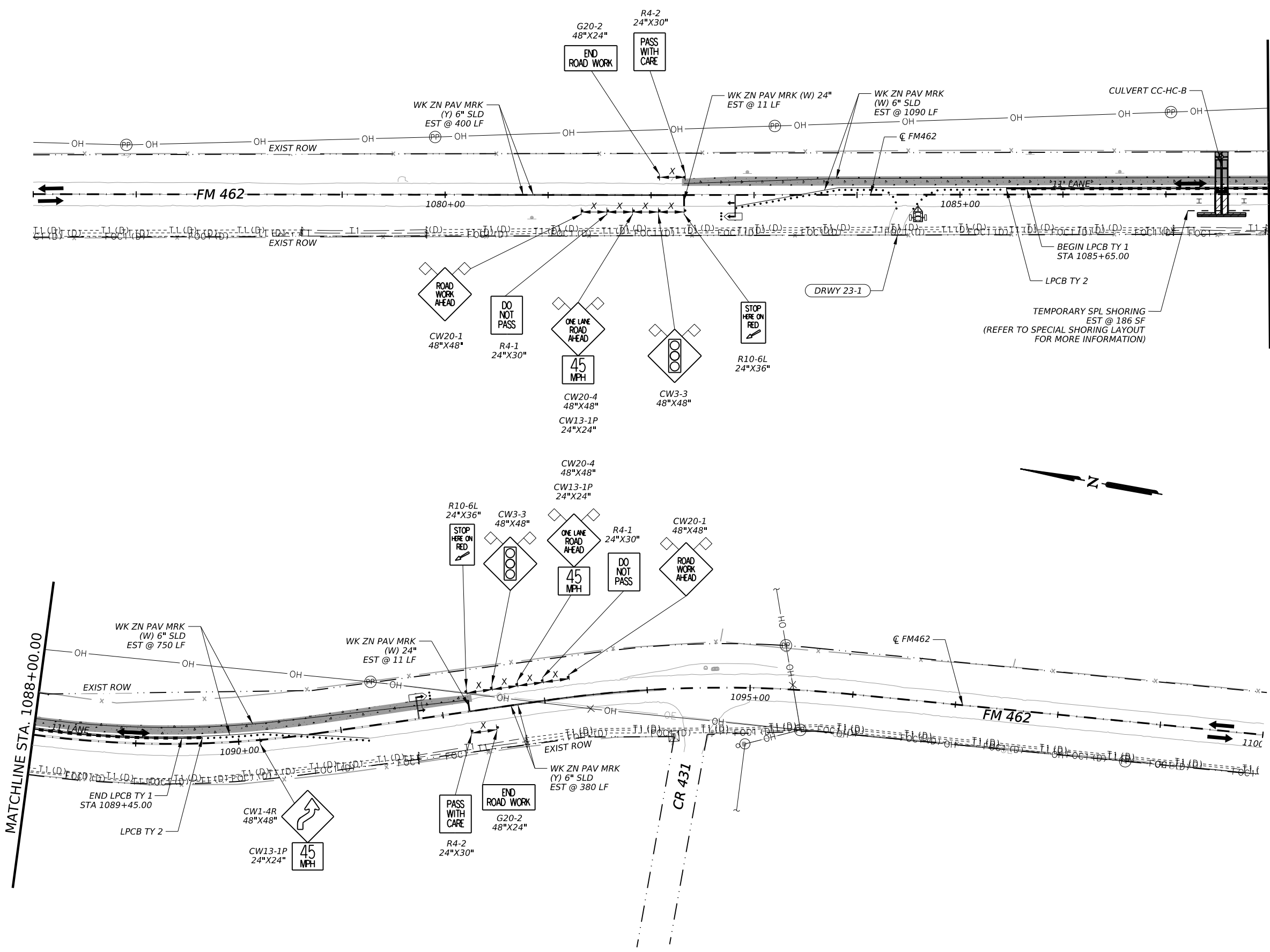
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	22	

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CK: DW: CK: DN:

ITEM	DESCRIPTION	UNIT	QTY
0400 6006	CUT & RESTORING PAV	SY	24
0402 6001	TRENCH EXCAVATION PROTECTION	LF	19
0403 6001	TEMPORARY SPL SHORING	SF	186
0512 6033	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	380
0512 6034	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	40
0512 6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	380
0512 6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	40
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	2740
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	1840
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	22



**LEGEND**

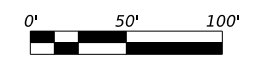
- EXIST FEATURES
- EXIST RIGHT OF WAY
- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)
- LOW PROFILE CONCETE BARRIER

**NOTES:**

1. REFER TO STANDARD TCP (2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

1/31/2024

*David Gutierrez*



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Texas Department of Transportation

**FM 462**

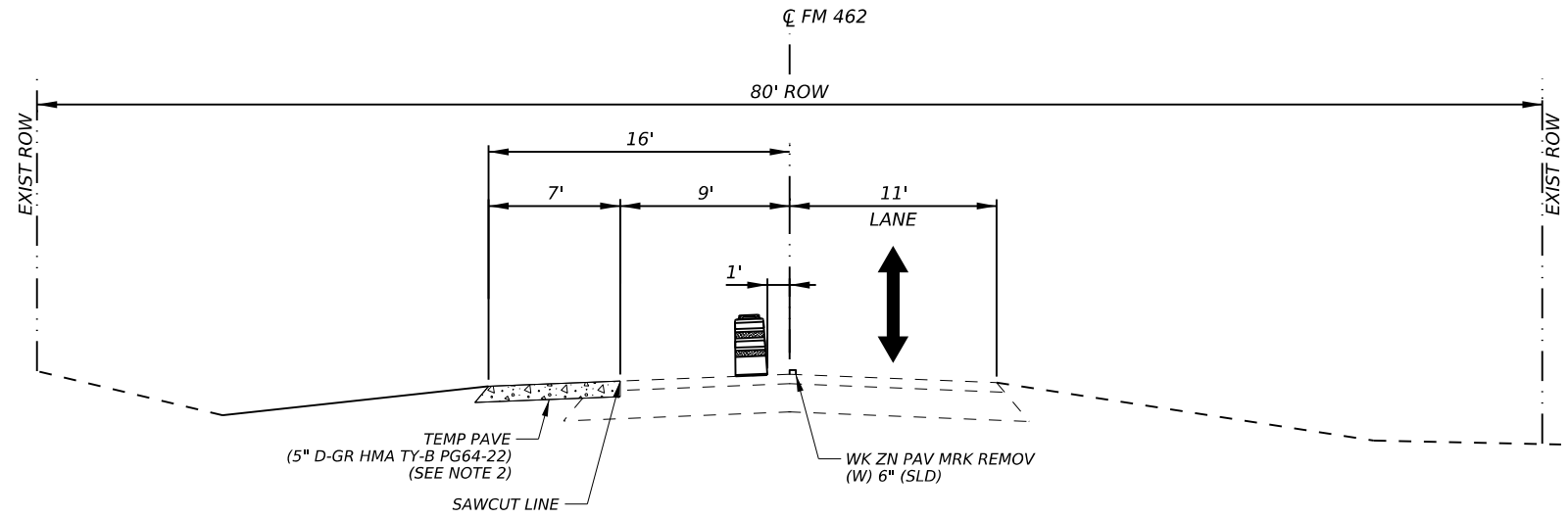
TRAFFIC CONTROL PLAN  
CULVERT REPLACEMENT  
PHASE 1B - STEP 2  
CULVERT CC-HC-B

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
SAT	COUNTY	SHEET NO.	
	MEDINA	23	

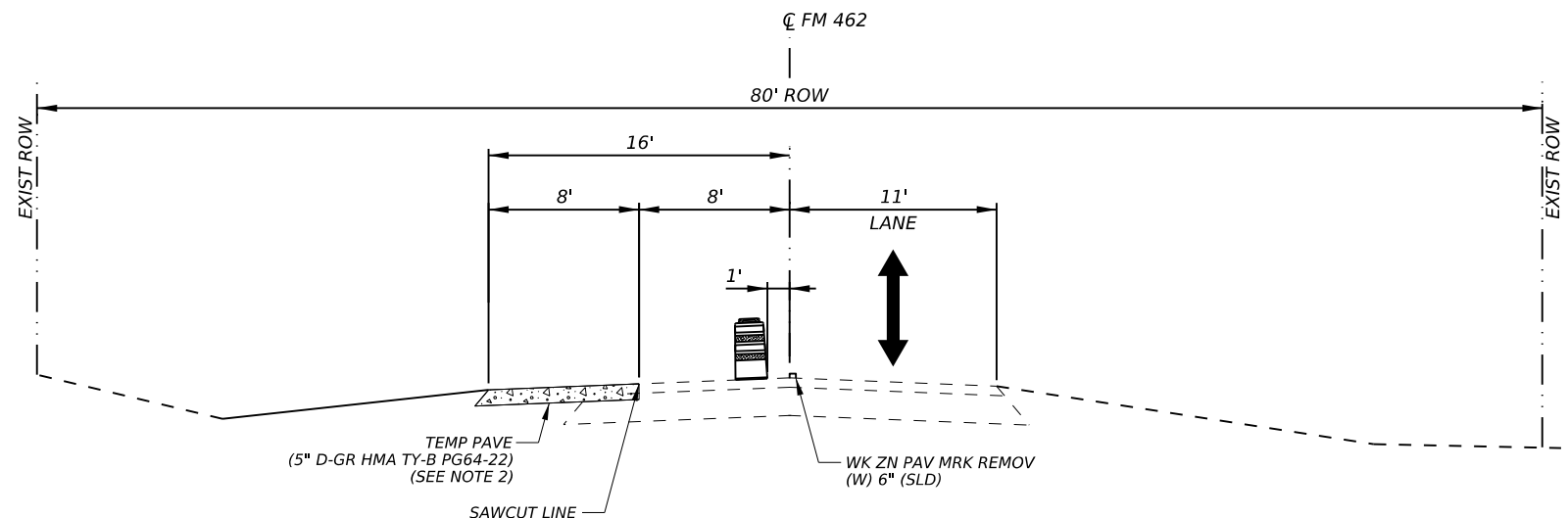
DATE: 1/31/2024 5:12:37 PM  
FILE: c:\pwworkh1\0285615\FM462\_TCP\_PH1B\_ST2.dgn

CK:  
DW:  
CK:  
DN:



**TCP TYPICAL SECTION PHASE 2**

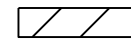


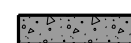
STA 817+75.00 TO STA 821+00.00  
 STA 834+00.00 TO STA 889+00.00  
 STA 894+50.00 TO STA 1094+00.00



**TCP TYPICAL SECTION PHASE 2**

STA 821+00.00 TO STA 834+00.00  
 STA 889+00.00 TO STA 894+50.00

**LEGEND**

-  CONSTRUCTION THIS STEP
-  CONSTRUCTION PREVIOUS STEP
-  TEMPORARY PAVEMENT THIS STEP
-  TEMPORARY PAVEMENT PREVIOUS STEP

**NOTES**

1. TYPICAL SECTIONS ARE NOT TO SCALE.
2. TEMPORARY PAVEMENT PLACEMENT SHALL BE PAID FOR AS ITEM 508. SAWCUT AND EXISTING PAVEMENT REMOVAL SHALL BE SUBSIDIARY TO ITEM 508.

*David Gutierrez*  
 1/31/2024  


DATE: 1/31/2024 5:13:07 PM  
 FILE: c:\pwworkh1\0285615\FM462\_TCP\_TYP\_P02.dgn

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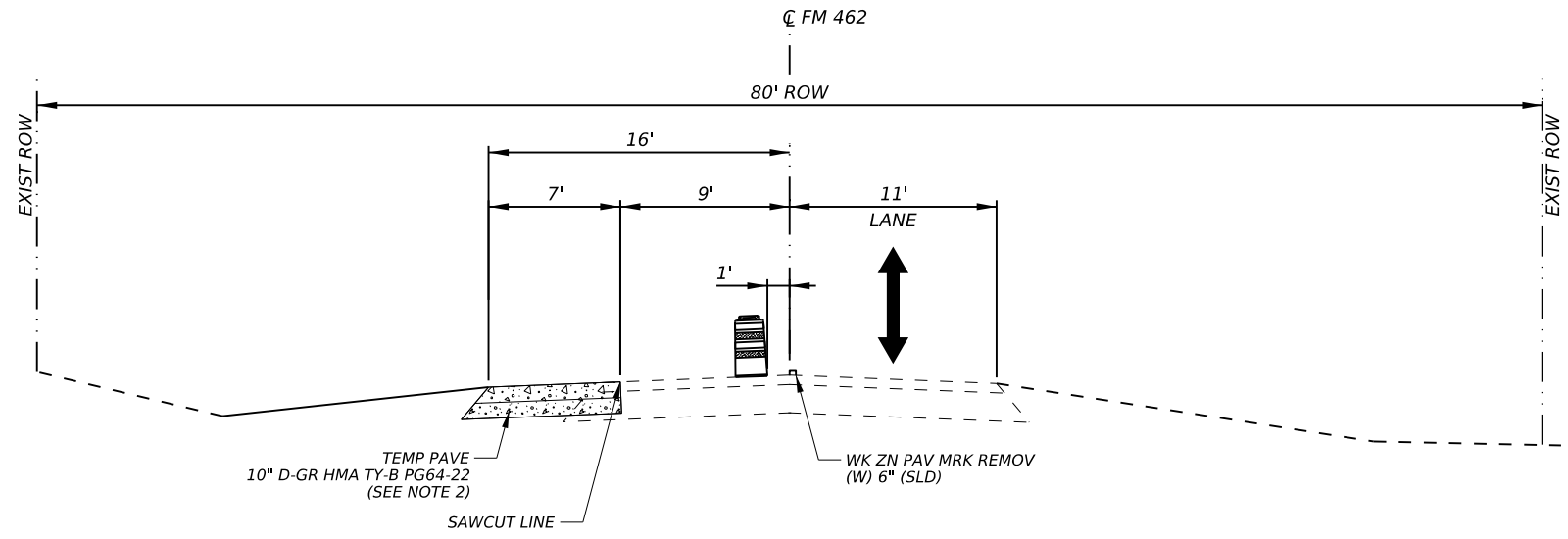
Texas Department of Transportation

FM 462  
 TRAFFIC CONTROL PLAN  
 TYPICAL SECTIONS  
 PHASE 2





SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	24	

DN: CK: DW: CK: CK:



**TCP TYPICAL SECTION PHASE 2**  
STA 1094+00.00 TO END

- LEGEND**
-  CONSTRUCTION THIS STEP
  -  CONSTRUCTION PREVIOUS STEP
  -  TEMPORARY PAVEMENT THIS STEP
  -  TEMPORARY PAVEMENT PREVIOUS STEP

- NOTES**
1. TYPICAL SECTIONS ARE NOT TO SCALE.
  2. TEMPORARY PAVEMENT PLACEMENT SHALL BE PAID FOR AS ITEM 508. SAWCUT AND EXISTING PAVEMENT REMOVAL SHALL BE SUBSIDIARY TO ITEM 508.

*David Gutierrez*  
  
 1/31/2024

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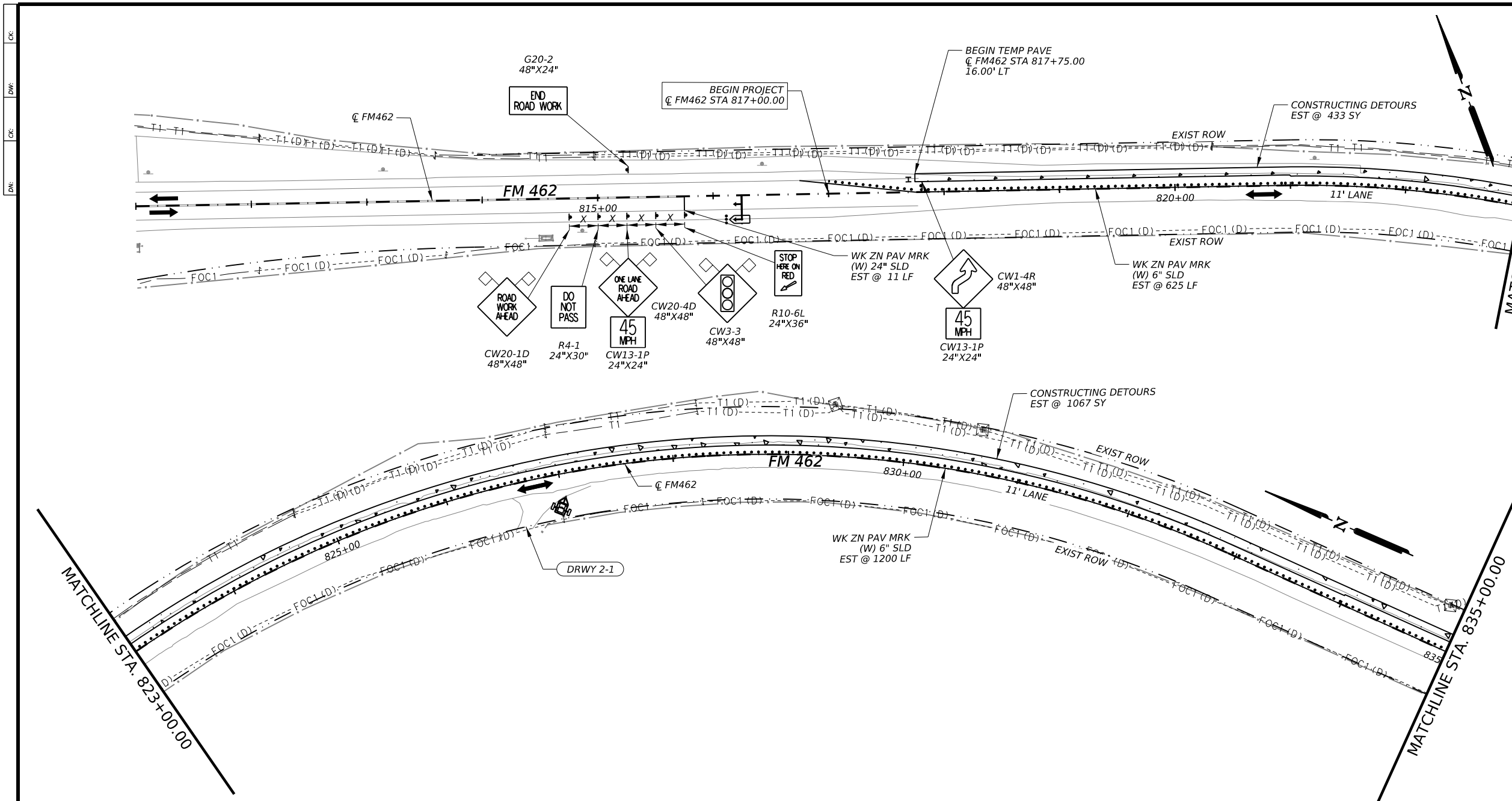
FM 462  
 TRAFFIC CONTROL PLAN  
 TYPICAL SECTIONS  
 PHASE 2

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	25	

DATE: 1/31/2024 5:13:36 PM  
 FILE: c:\pwworking\kimleyhorn\10285615\FM462\_TCP\_TYP\_ST2\_10.dgn

ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	2434
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	6250
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	3025
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4*)	LF	6250



\*5" THICKNESS  
\*\*10" THICKNESS

**LEGEND**

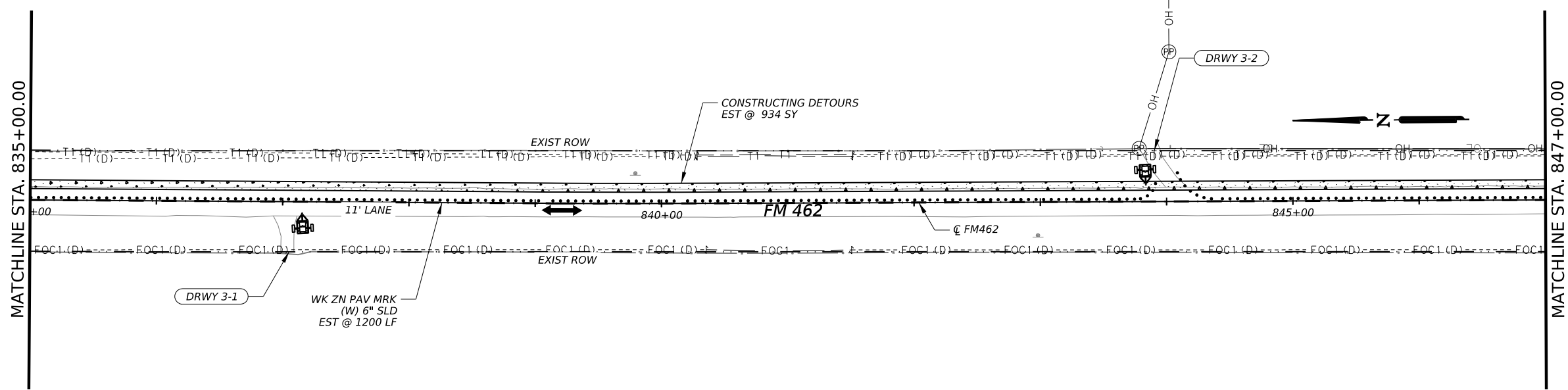
- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

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1/31/2024



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**FM 462**

**TRAFFIC CONTROL PLAN**  
**PHASE 2**  
**STEP 1**

SHEET 1 OF 2

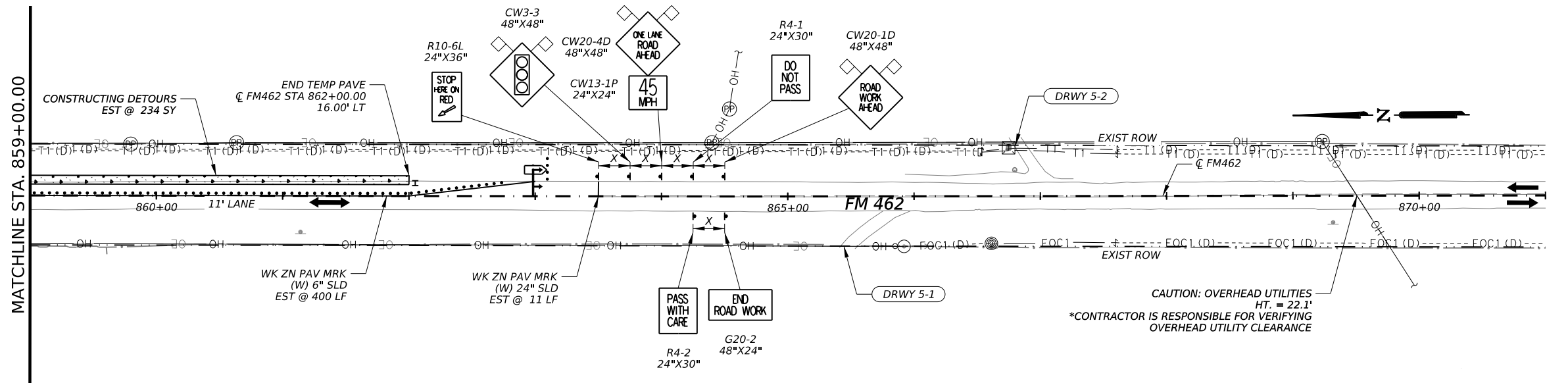
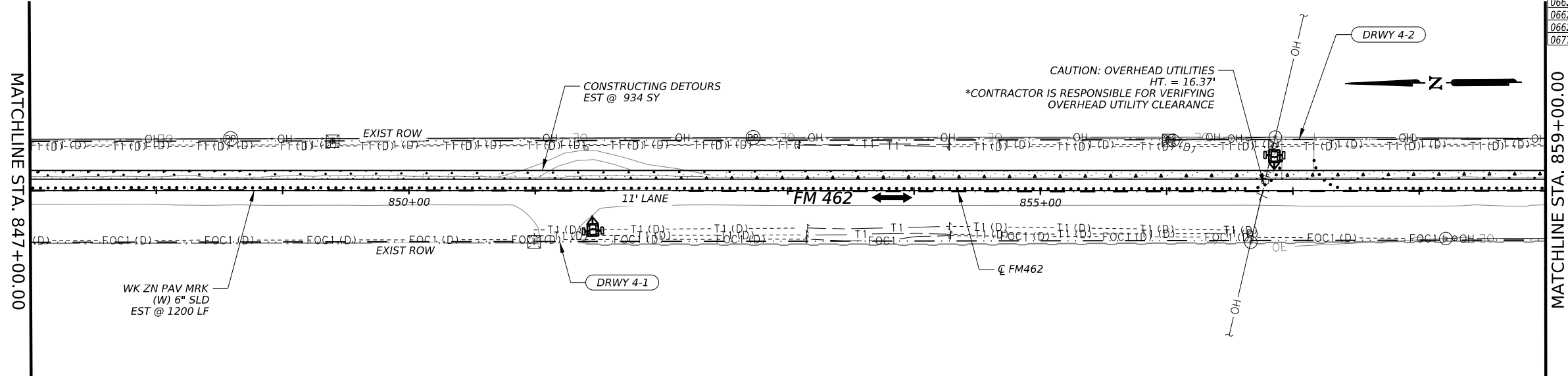
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	26	

DATE: 1/31/2024 5:14:05 PM  
FILE: c:\pwworking\10285615\FM462\_TCP\_PH2\_ST1A.dgn



CK:  
DW:  
CK:  
DN:

ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	1168
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	2700
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	1600
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	3300



\*5" THICKNESS  
\*10" THICKNESS

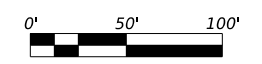
**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

*David Gutierrez*  
 1/31/2024



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Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 2**

**STEP 1**

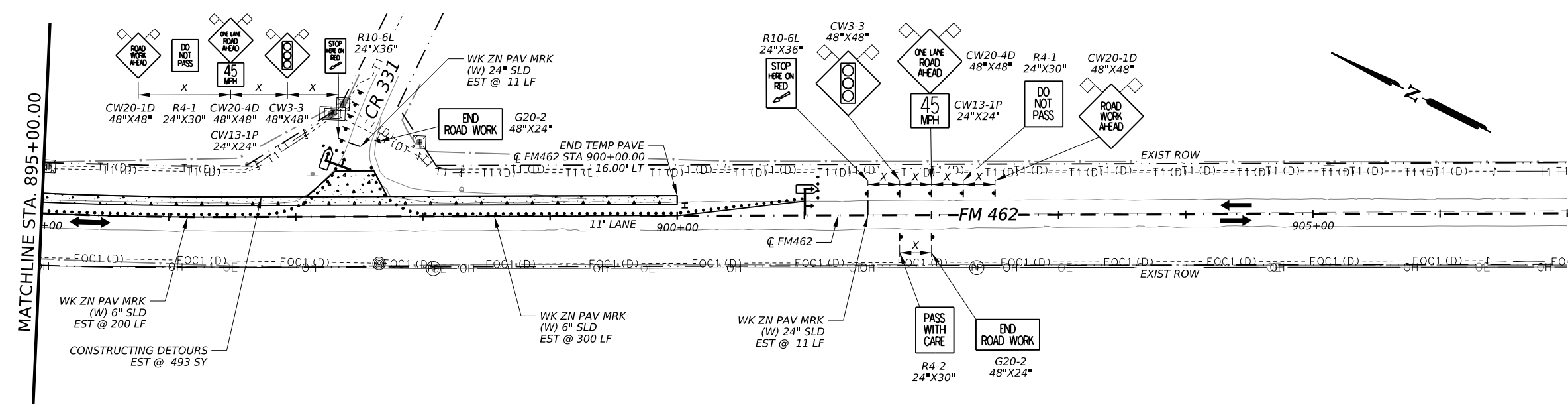
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	27

DATE: 1/31/2024 5:14:33 PM  
 FILE: c:\pwworking\10285615\FM462\_TCP\_PH2\_ST1B.dgn



ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	493
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	1200
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	500
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	22
0677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	1300



\*5" THICKNESS  
\*\*10" THICKNESS

**LEGEND**

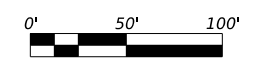
- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

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**FM 462**

**TRAFFIC CONTROL PLAN**  
**PHASE 2**  
**STEP 2**

SHEET 2 OF 2

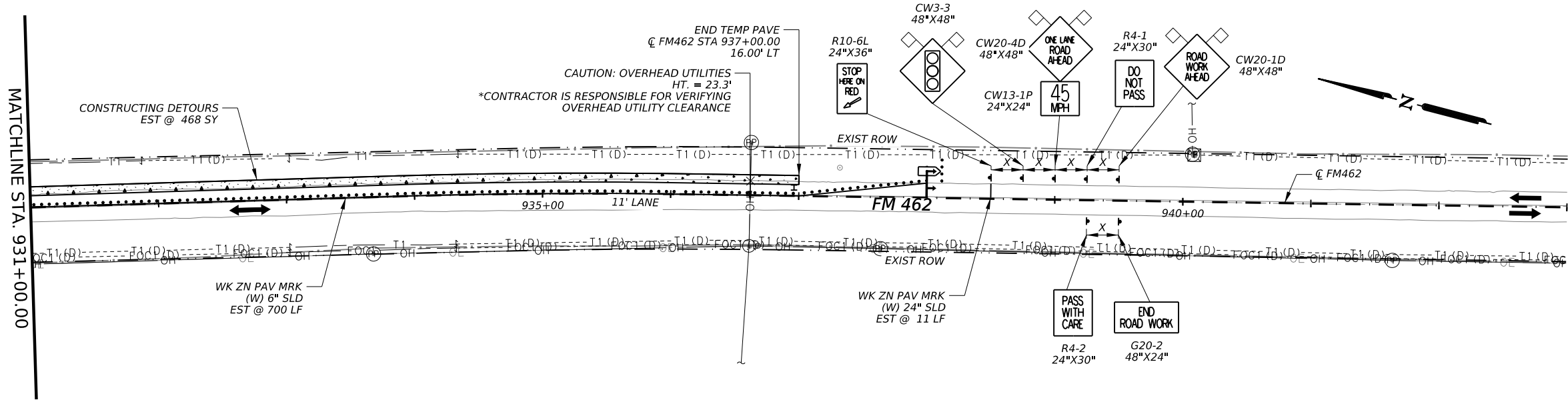
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	29	

DATE: 1/31/2024 5:15:28 PM  
FILE: c:\pwworkh\1\0285615\FM462 TCP PH2\_ST2B.dgn





ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	468
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	800
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	700
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	1500



- \*5" THICKNESS  
 \*\*10" THICKNESS
- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

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1/31/2024



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FM 462

TRAFFIC CONTROL PLAN  
 PHASE 2  
 STEP 3

SHEET 2 OF 2

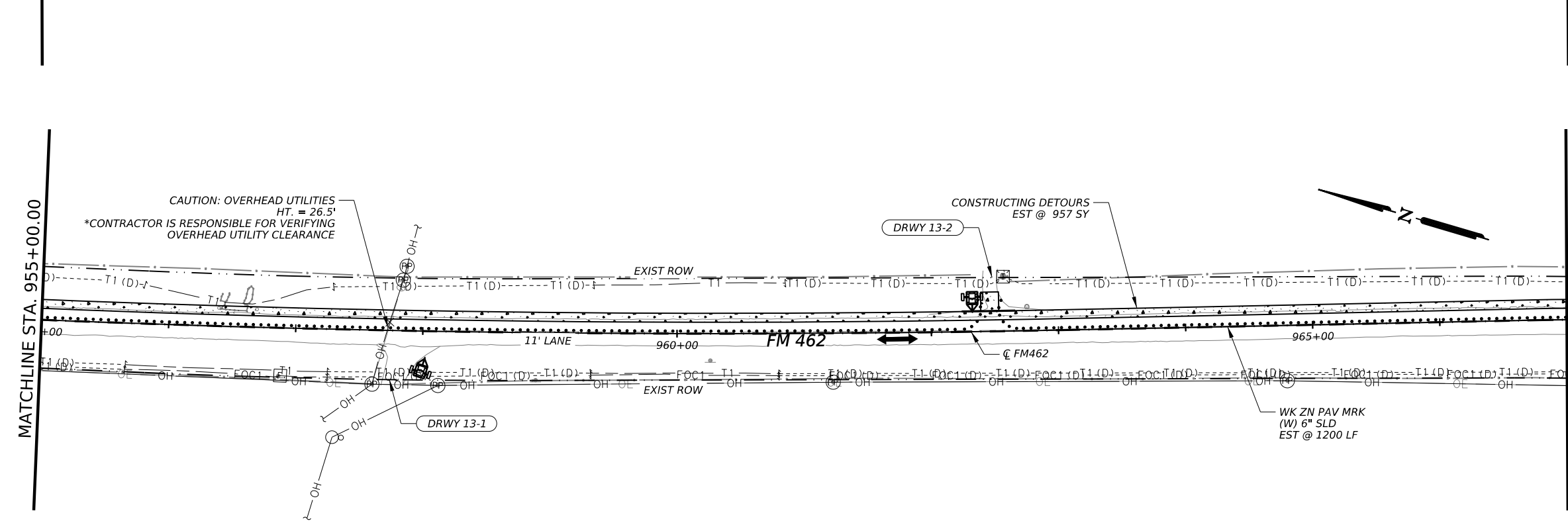
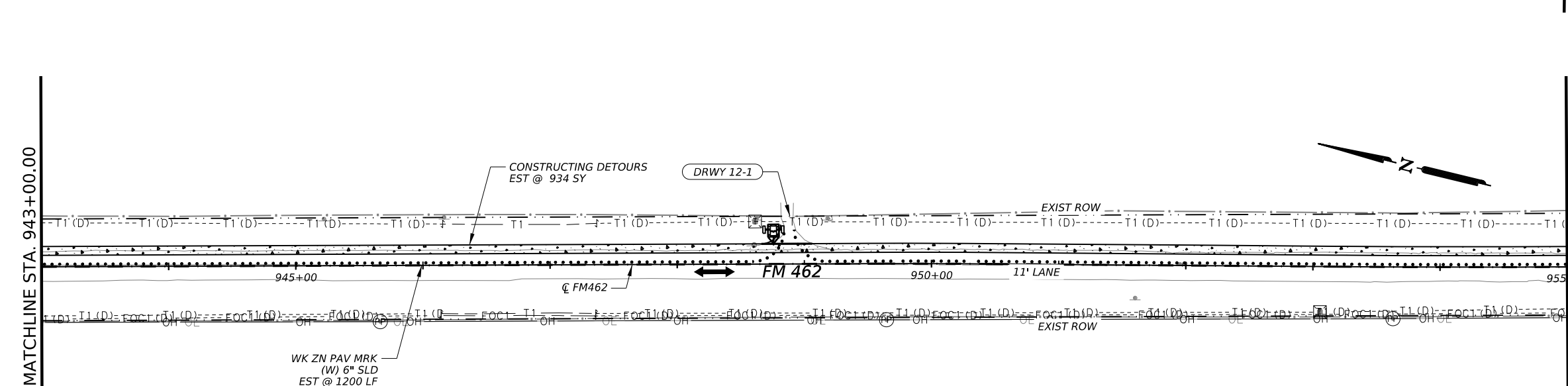
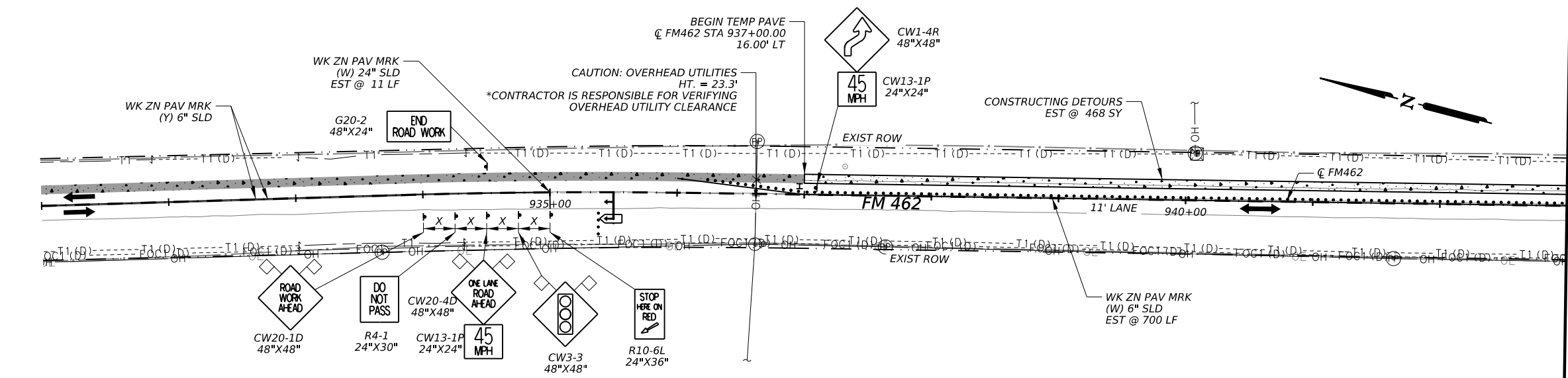
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	31

DATE: 1/31/2024 5:16:21 PM  
 FILE: c:\pwwork1\0285615\FM462 TCP PH2\_ST3B.dgn

CK: DW: CK: DW:

CK:  
DW:  
CK:  
DN:

ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	2359
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	6400
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	3100
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4*)	LF	5700



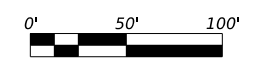
**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

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 1/31/2024



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**FM 462**

**TRAFFIC CONTROL PLAN**  
**PHASE 2**  
**STEP 4**

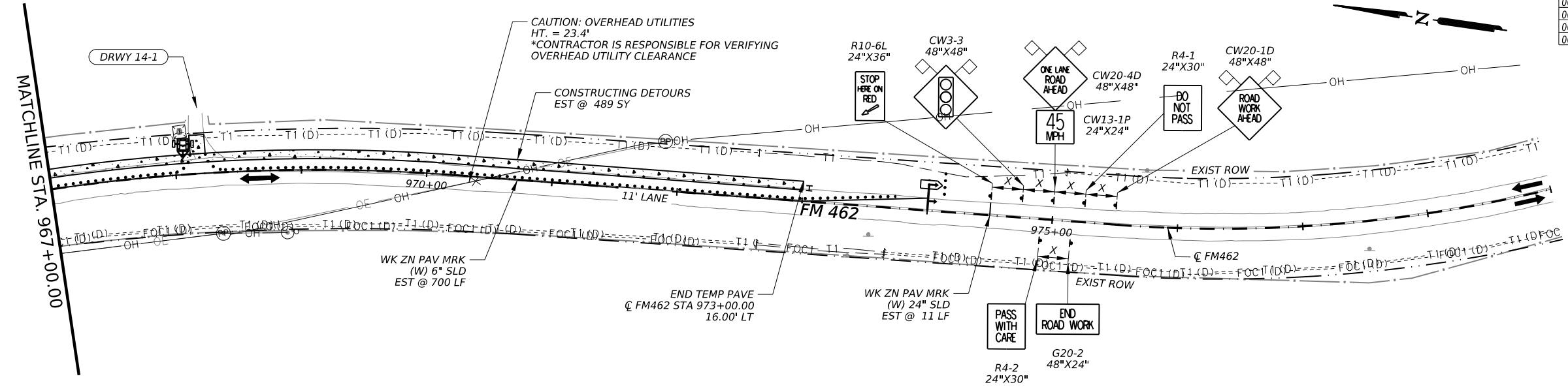
SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	32	

DATE: 1/31/2024 5:16:48 PM  
 FILE: c:\pwworking\kimley-horn.com\project\285615\FM462 TCP PH2\_ST4A.dgn

CK:  
DW:  
CK:  
DN:

ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	489
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	800
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	700
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	1500



\*5" THICKNESS  
\*\*10" THICKNESS

**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

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1/31/2024



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**FM 462**

**TRAFFIC CONTROL PLAN**  
**PHASE 2**  
**STEP 4**

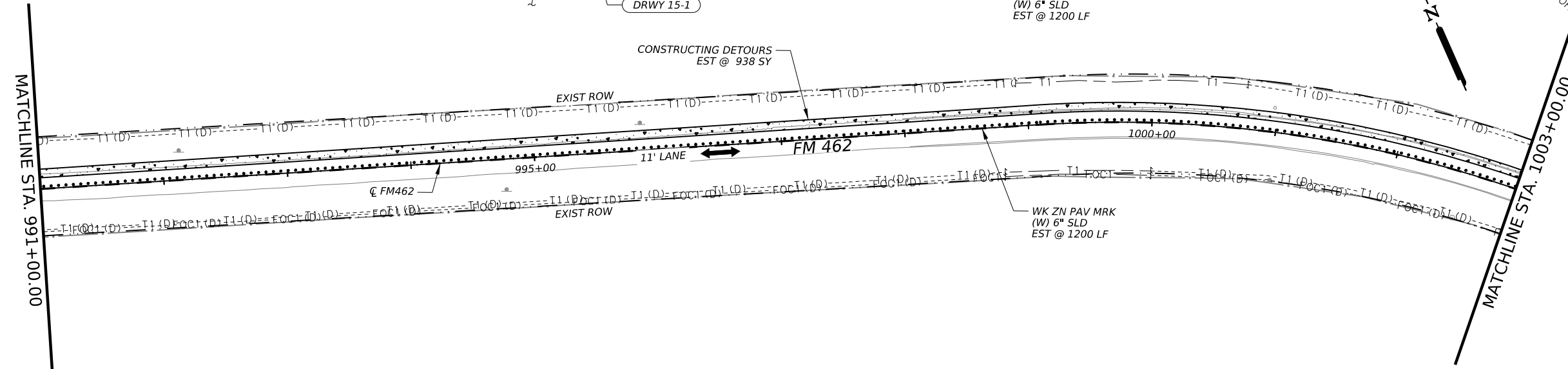
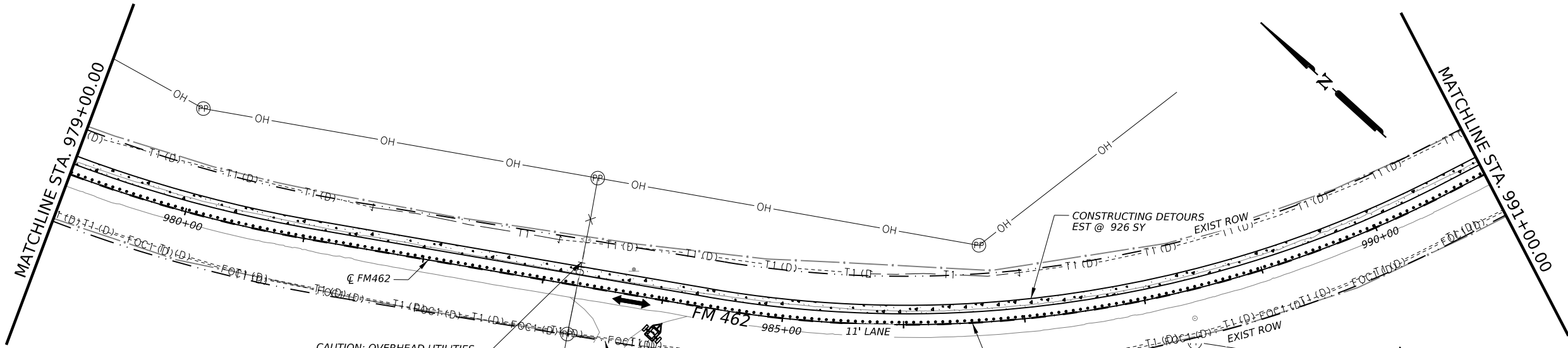
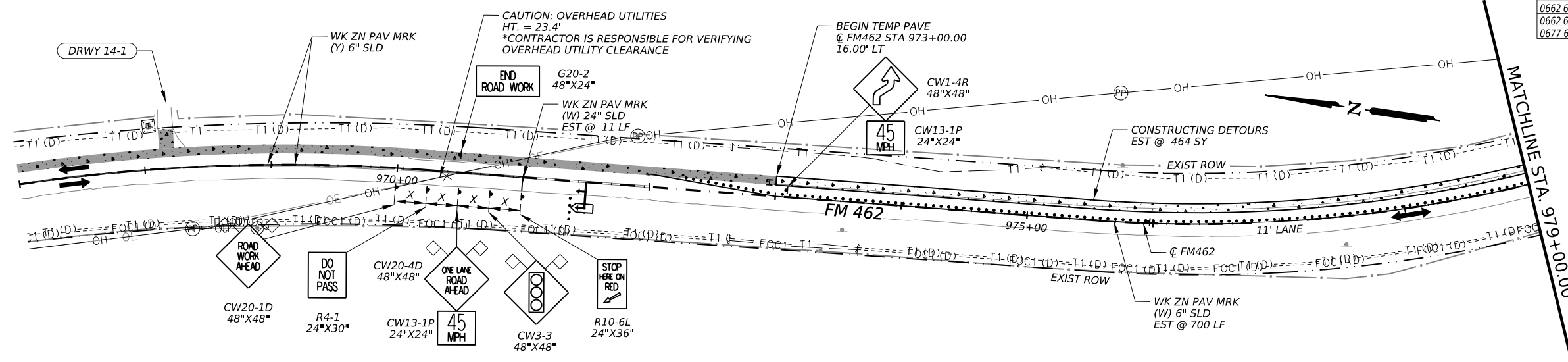
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	33

DATE: 1/31/2024 5:17:13 PM  
FILE: c:\pwworkh\1\0285615\FM462\_TCP\_PH2\_ST4B.dgn



ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	2328
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6*(SLD)	LF	6400
0662 6067	WK ZN PAV MRK REMOV (W)6*(SLD)	LF	3100
0662 6075	WK ZN PAV MRK REMOV (W)2*(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4*)	LF	5700



**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

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*David Gutierrez*

0' 50' 100'

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**FM 462**

**TRAFFIC CONTROL PLAN**  
**PHASE 2**  
**STEP 5**

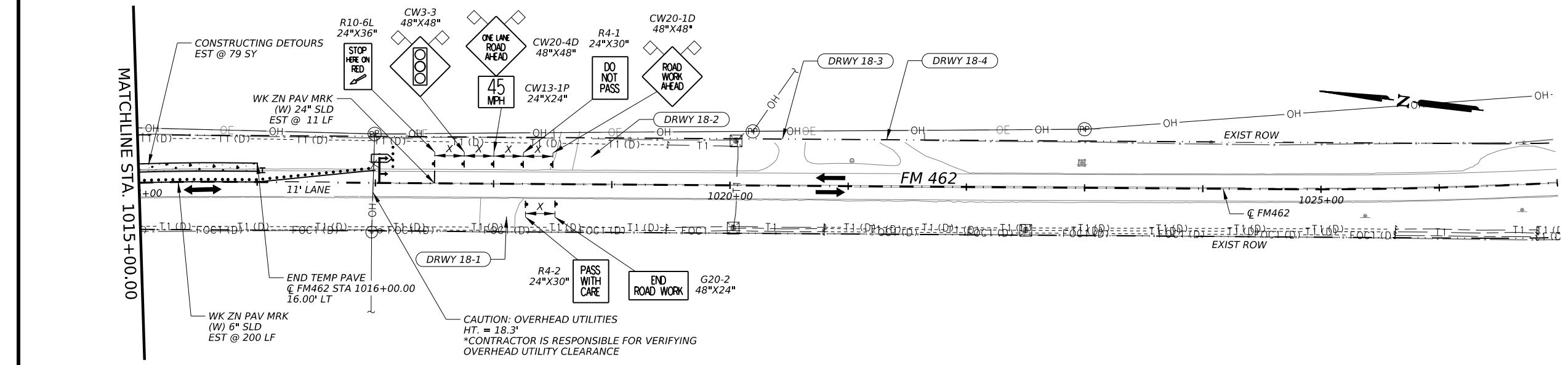
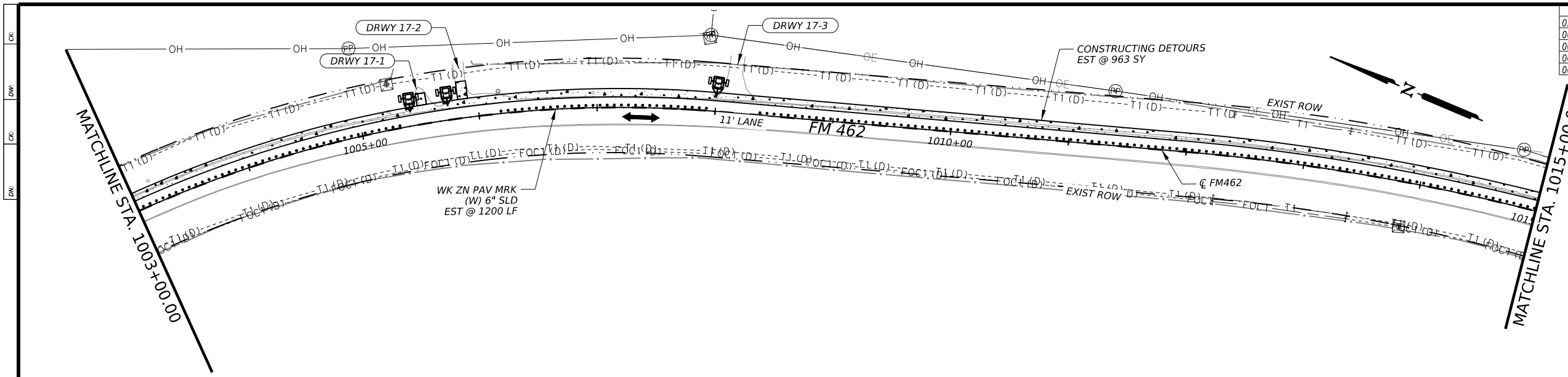
SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	34	

DATE: 1/31/2024 5:17:38 PM  
FILE: c:\pwworking\10285615\FM462 TCP PH2 ST5A.dgn

CK: DW: CK: DN:

ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	1042
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6*(SLD)	LF	2200
0662 6067	WK ZN PAV MRK REMOV (W)6*(SLD)	LF	1400
0662 6075	WK ZN PAV MRK REMOV (W)2*(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4*)	LF	2900



- \*5" THICKNESS  
\*\*10" THICKNESS
- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

1/31/2024

*David Gutierrez*



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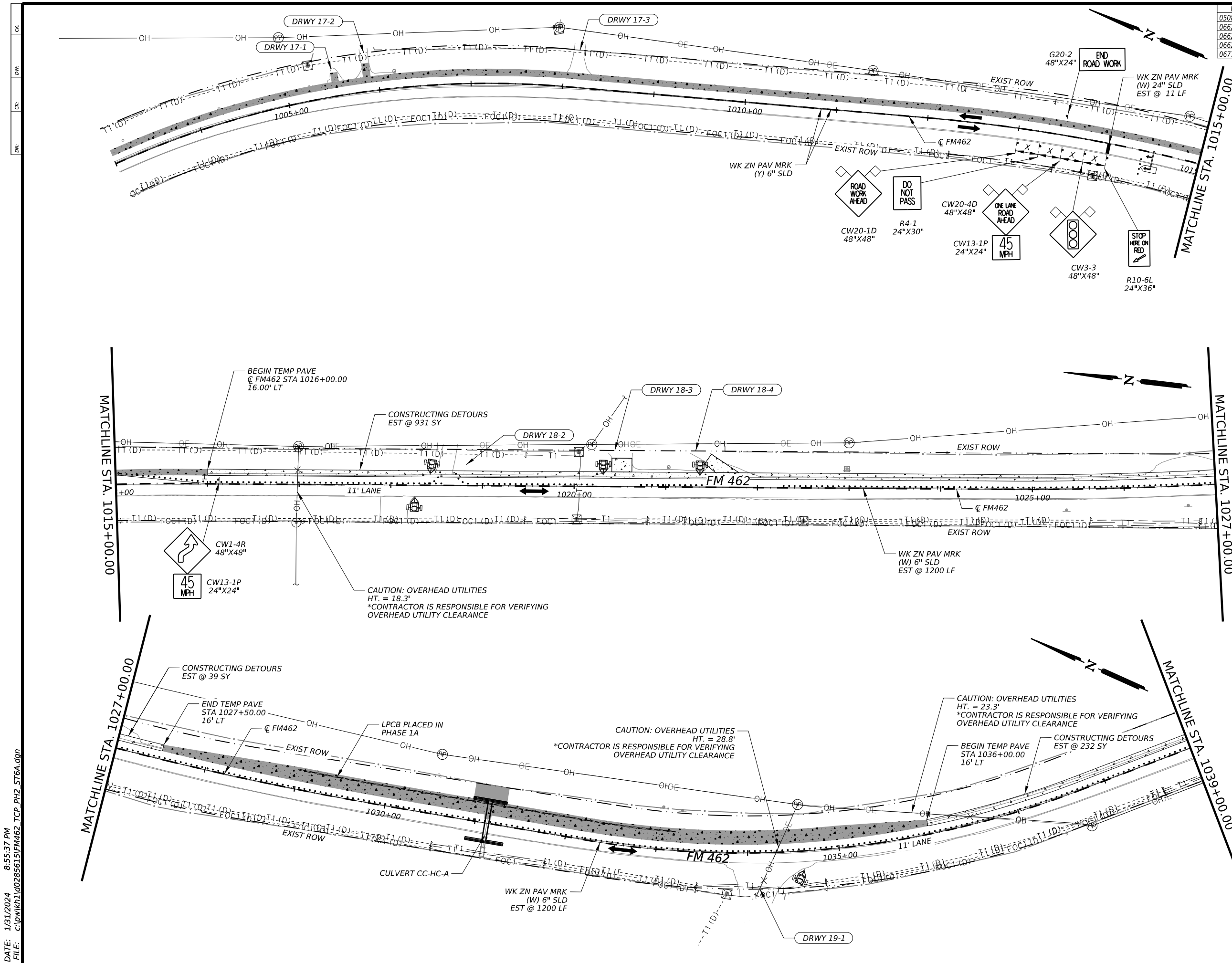
**FM 462**

**TRAFFIC CONTROL PLAN**  
**PHASE 2**  
**STEP 5**

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	35	

DATE: 1/31/2024 5:18:05 PM  
FILE: c:\pwworking\10285615\FM462\_TCP\_PH2\_ST5B.dgn



ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	1202
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6\"(SLD)	LF	5000
0662 6067	WK ZN PAV MRK REMOV (W)6\"(SLD)	LF	2400
0662 6075	WK ZN PAV MRK REMOV (W)2\"(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4\"	LF	4300

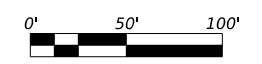
**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

1/31/2024



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**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 2**

**STEP 6**

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	36	

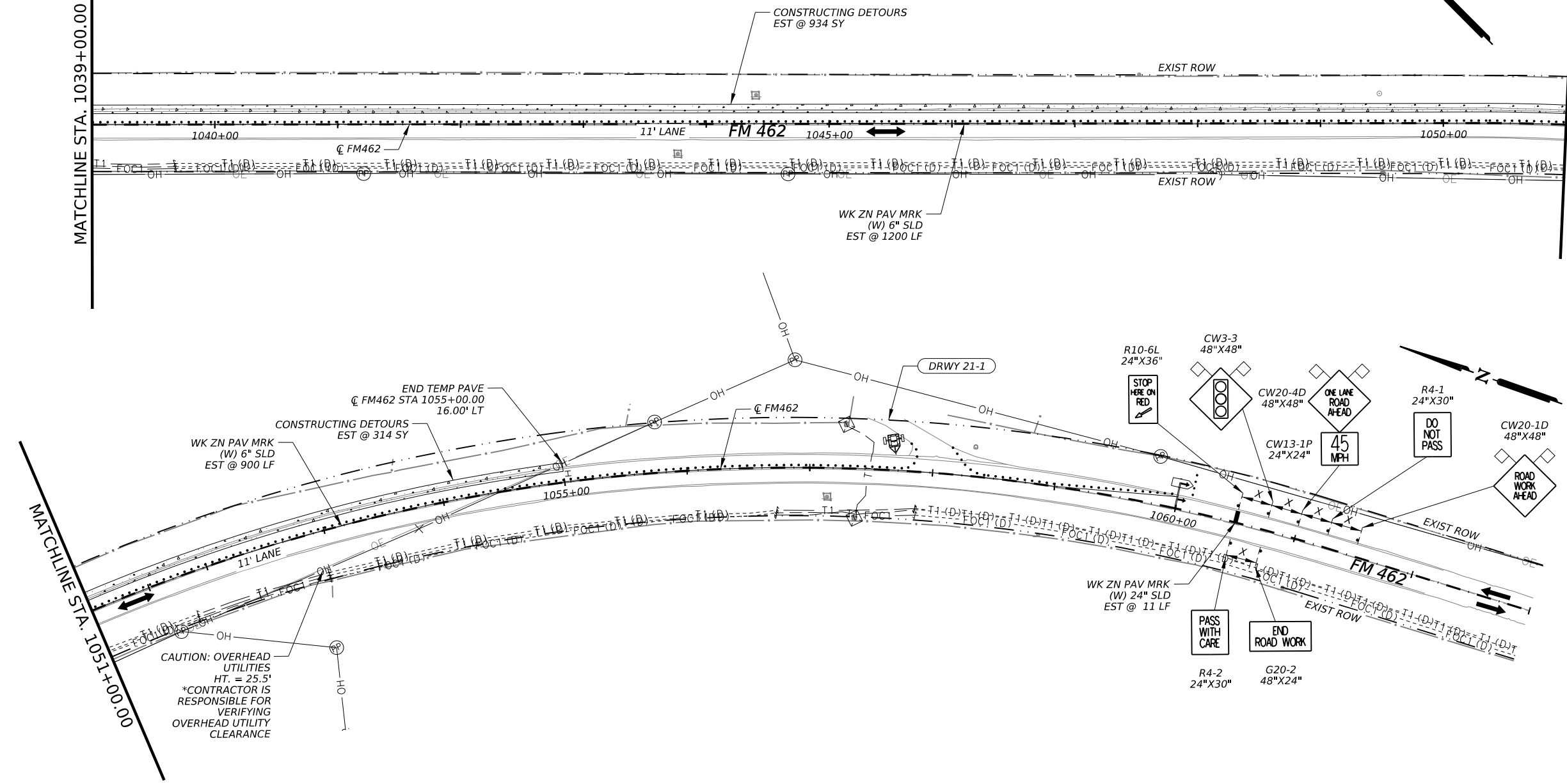
DATE: 1/31/2024 8:55:37 PM  
 FILE: c:\pwworking\kimleyhorn\project\10285615\FM462 TCP PH2\_STEP6.dgn



ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	1248
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6*(SLD)	LF	2400
0662 6067	WK ZN PAV MRK REMOV (W)6*(SLD)	LF	2100
0662 6075	WK ZN PAV MRK REMOV (W)24*(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4*)	LF	4300

MATCHLINE STA. 1039+00.00

MATCHLINE STA. 1051+00.00



**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

*David Gutierrez*  
 1/31/2024



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**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 2**

**STEP 6**

SHEET 2 OF 2

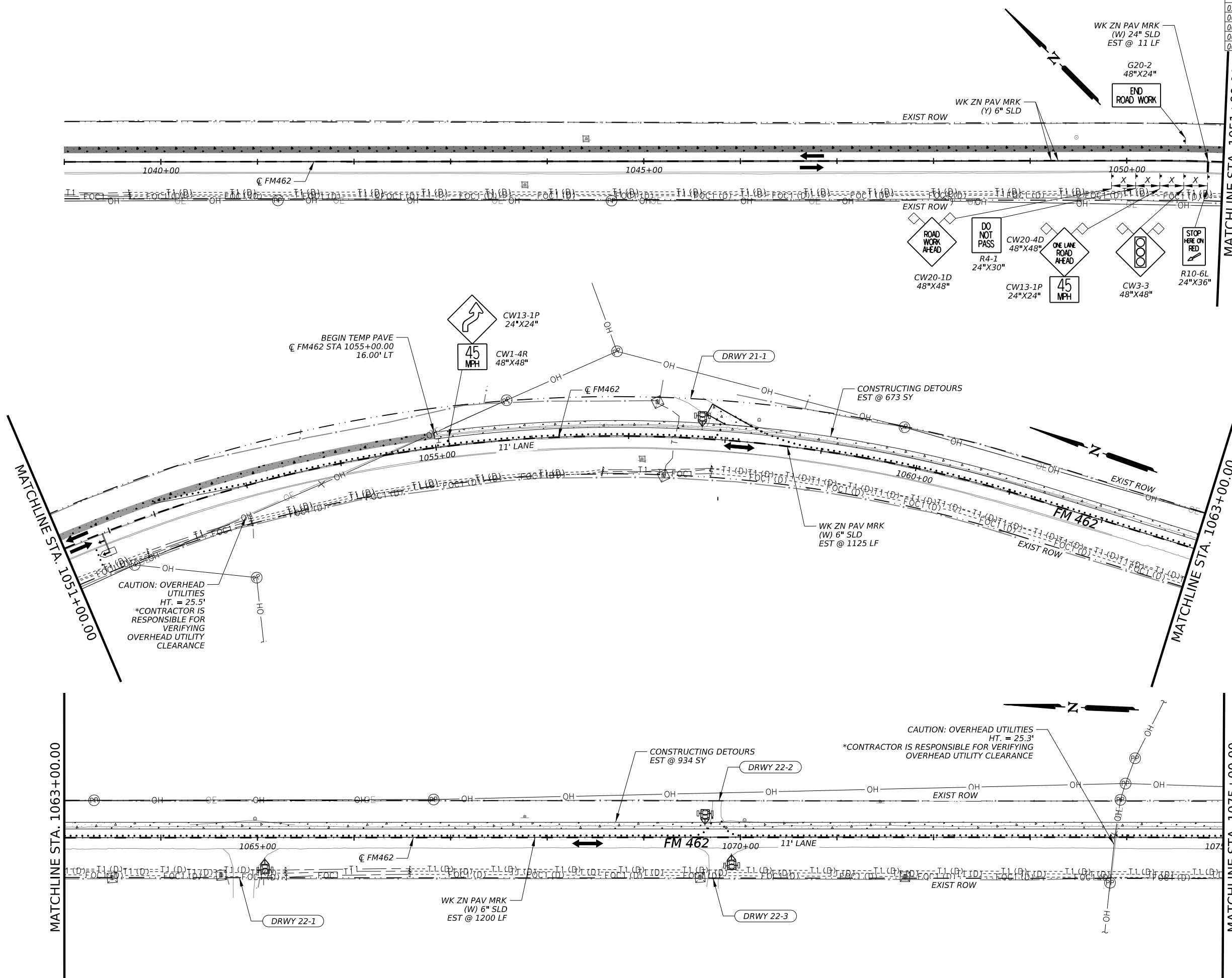
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	37	

DATE: 1/31/2024 5:19:02 PM  
 FILE: c:\pwwork1\0285615\FM462\_TCP\_PH2\_ST6B.dgn



CK:  
DW:  
CK:  
DN:

ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	1607
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6*(SLD)	LF	4800
0662 6067	WK ZN PAV MRK REMOV (W)6*(SLD)	LF	2325
0662 6075	WK ZN PAV MRK REMOV (W)2*(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4*)	LF	2900



**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

1/31/2024

*David Gutierrez*



**Kimley Horn** F-928

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**FM 462**

**TRAFFIC CONTROL PLAN**  
**PHASE 2**  
**STEP 7**

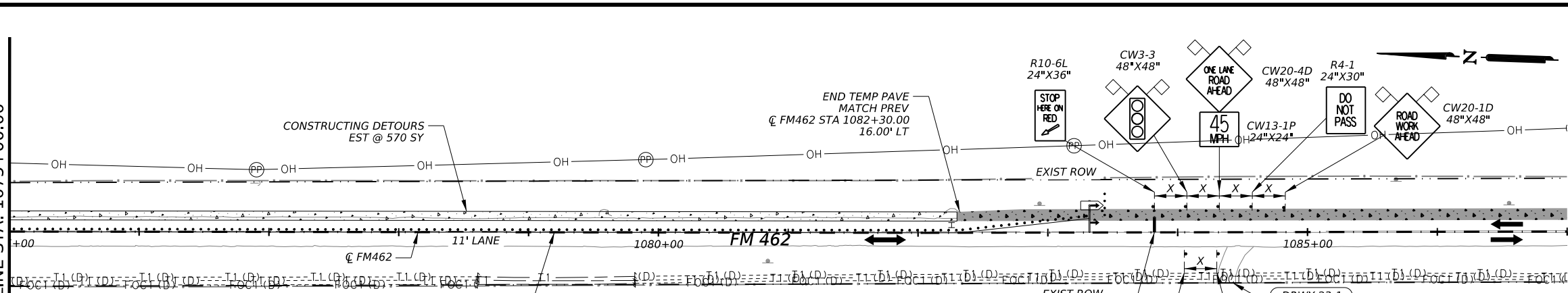
SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	38	

DATE: 1/31/2024 6:58:03 PM  
FILE: c:\pwworking\10285615\FM462 TCP PH2 ST7\_01.dgn

CK: DW: CK: DN:

MATCHLINE STA. 1075+00.00



ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	570
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	1960
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	830
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	1960

CONSTRUCTING DETOURS  
EST @ 570 SY

END TEMP PAVE  
MATCH PREV  
@ FM462 STA 1082+30.00  
16.00' LT

WK ZN PAV MRK  
(W) 6" SLD  
EST @ 830 LF

EXIST ROW  
WK ZN PAV MRK  
(W) 24" SLD  
EST @ 11 LF

\*5" THICKNESS  
\*\*10" THICKNESS

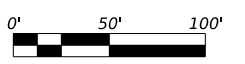
**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

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 1/31/2024



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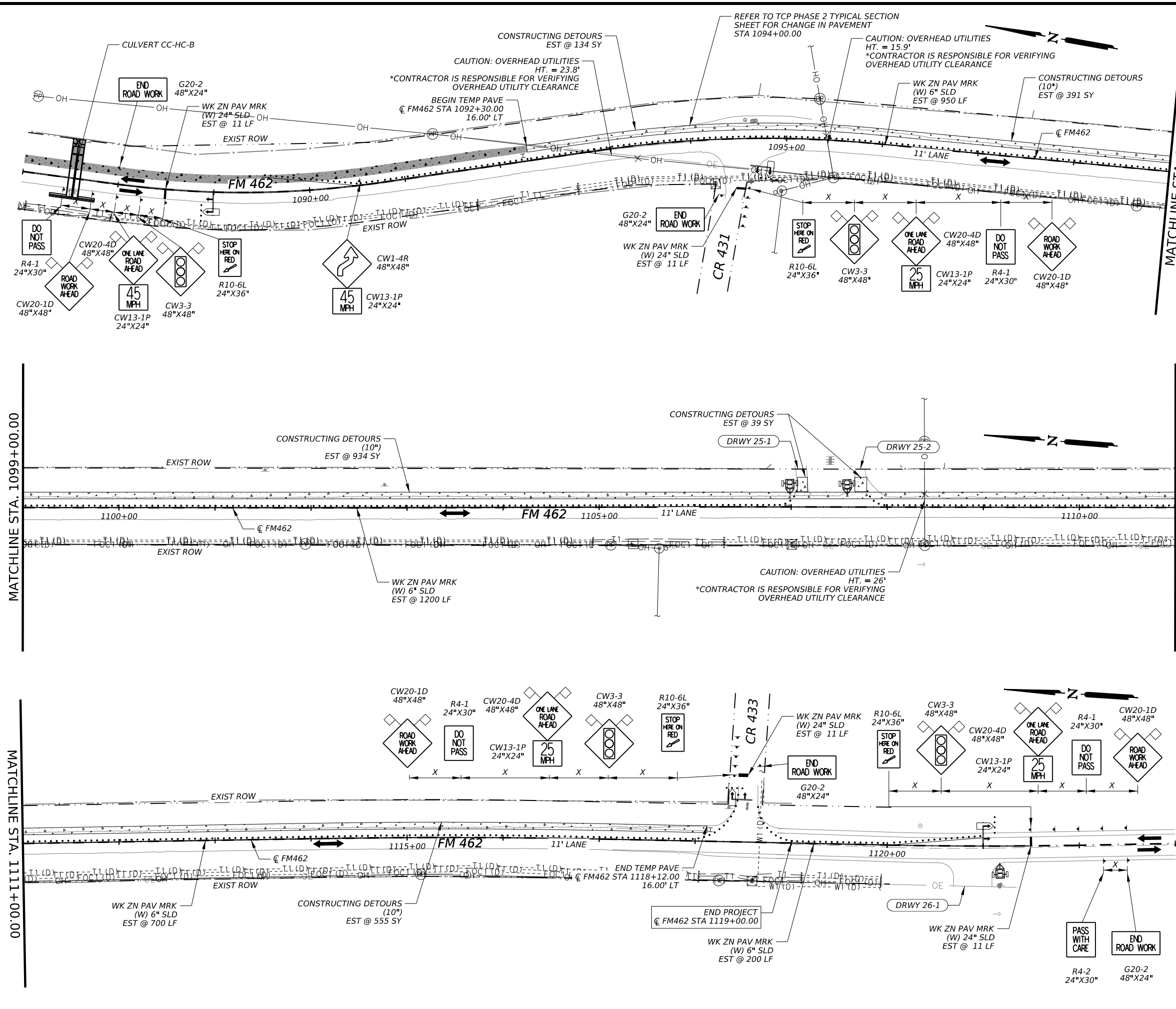
**TRAFFIC CONTROL PLAN  
 PHASE 2  
 STEP 7**

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	39

DATE: 1/31/2024 5:19:57 PM  
 FILE: c:\pwworkh\1\0285615\FM462\_TCP\_PH2\_ST7\_02.dgn

CK: DW: CK: DN:



ITEM	DESCRIPTION	UNIT	QTY
0508 6001*	CONSTRUCTING DETOURS	SY	173
0508 6001**	CONSTRUCTING DETOURS	SY	1880
0662 6037	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	6600
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	3050
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	44
0677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	6600

**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- ▨ CONSTRUCTION THIS STEP
- ▩ CONSTRUCTION PREVIOUS STEP
- ▧ TEMPORARY PAVEMENT THIS STEP
- ▦ TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- Ⓜ TEMP PORTABLE TRAFFIC SIGNAL
- Ⓜ DRIVEWAY ASSISTANCE DEVICE (DAD)

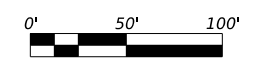
**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.

1/31/2024

David Gutierrez

STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER



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Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 2**

**STEP 8**

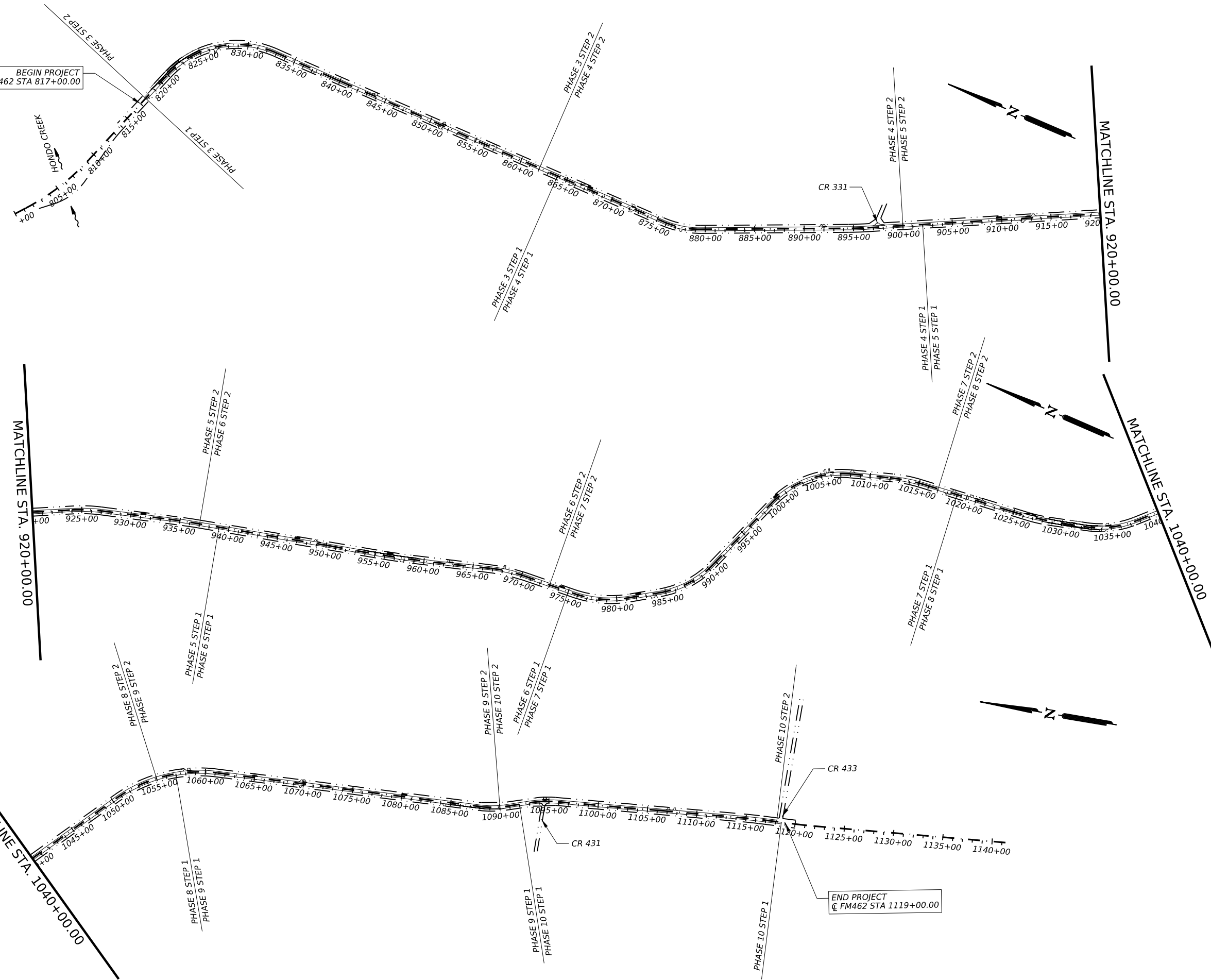
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	40	

DATE: 1/31/2024 5:20:25 PM  
 FILE: c:\p\mkh\1\0285615\FM462 TCP PH2 ST8A.dgn

CK: DW: CK: DN:

BEGIN PROJECT  
FM462 STA 817+00.00



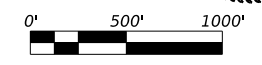
**NOTES:**

- LAYOUT FOR CONTRACTOR'S INFORMATION ONLY. REFER TO THE TCP LAYOUT SHEETS FOR MORE INFORMATION.

*David Gutierrez*



1/31/2024



DATE: 1/31/2024 5:20:51 PM  
 FILE: c:\p\kh\1\0285615\FM462\_TCP\_LAYOUT.dgn

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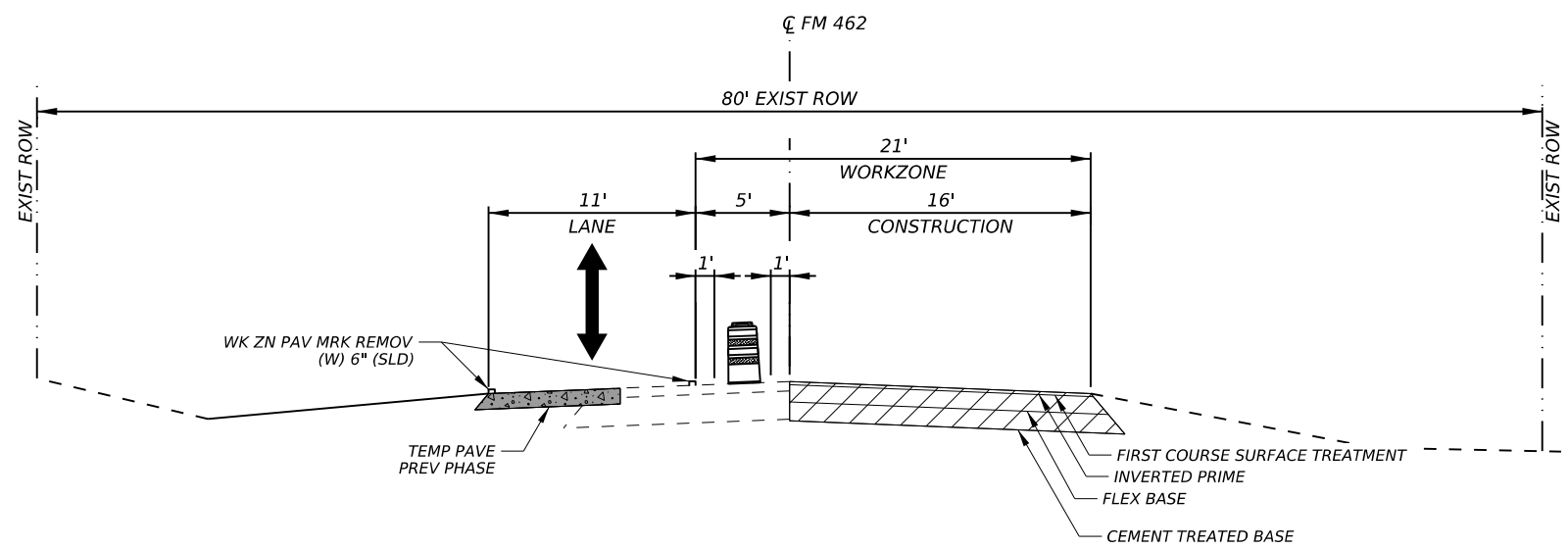
FM 462

TRAFFIC CONTROL PLAN  
 PHASING LAYOUT  
 PHASE 3 THRU 10

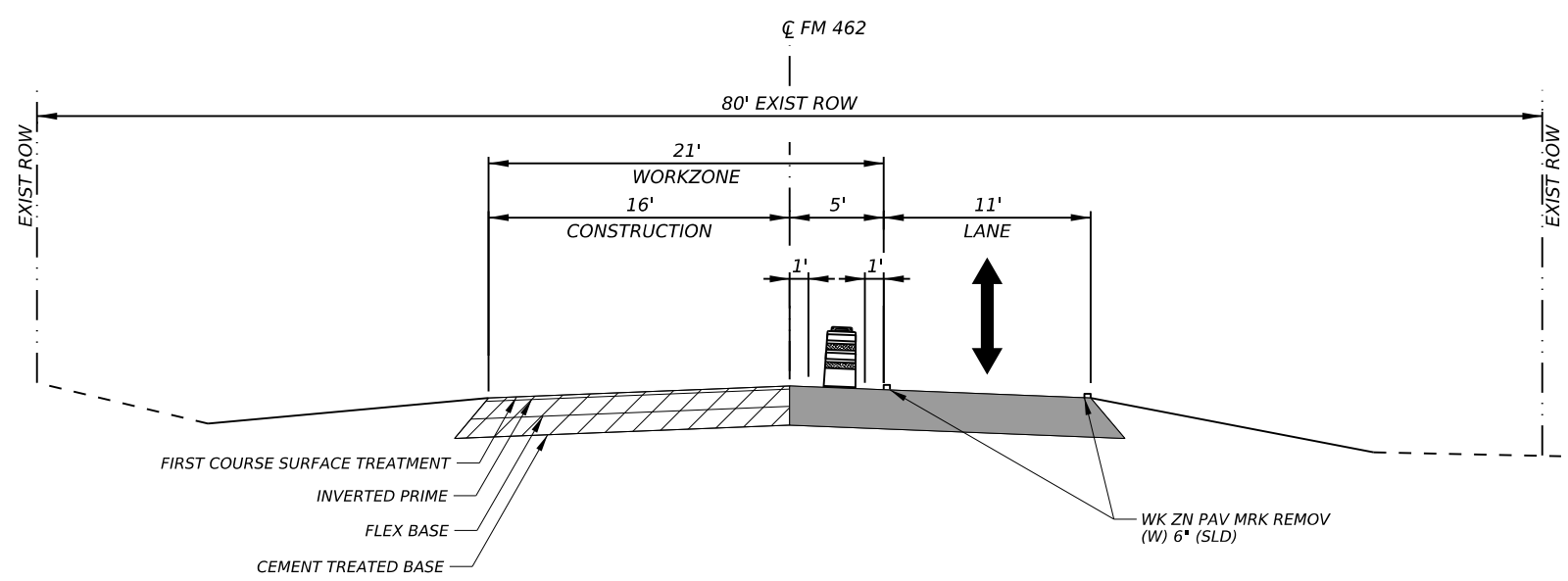
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	41

DW: \_\_\_\_\_  
 CK: \_\_\_\_\_  
 CK: \_\_\_\_\_  
 DW: \_\_\_\_\_  
 CK: \_\_\_\_\_



**TCP TYPICAL SECTION PHASE 3,4,5,6,7,8,9,10 - STEP 1**  
 STA 817+75.00 TO STA 1118+60.00



**TCP TYPICAL SECTION PHASE 3,4,5,6,7,8,9,10 - STEP 2**  
 STA 817+75.00 TO STA 1118+12.00

**LEGEND**

- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP

- NOTES**
1. TYPICAL SECTIONS ARE NOT TO SCALE.
  2. REFER TO PROPOSED TYPICAL SECTIONS FOR PAVEMENT DETAILS.

1/31/2024

DATE: 1/31/2024 5:21:21 PM  
 FILE: c:\pwworkh1\0285615\FM462\_TCP\_TYP\_P03.dgn

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**FM 462**

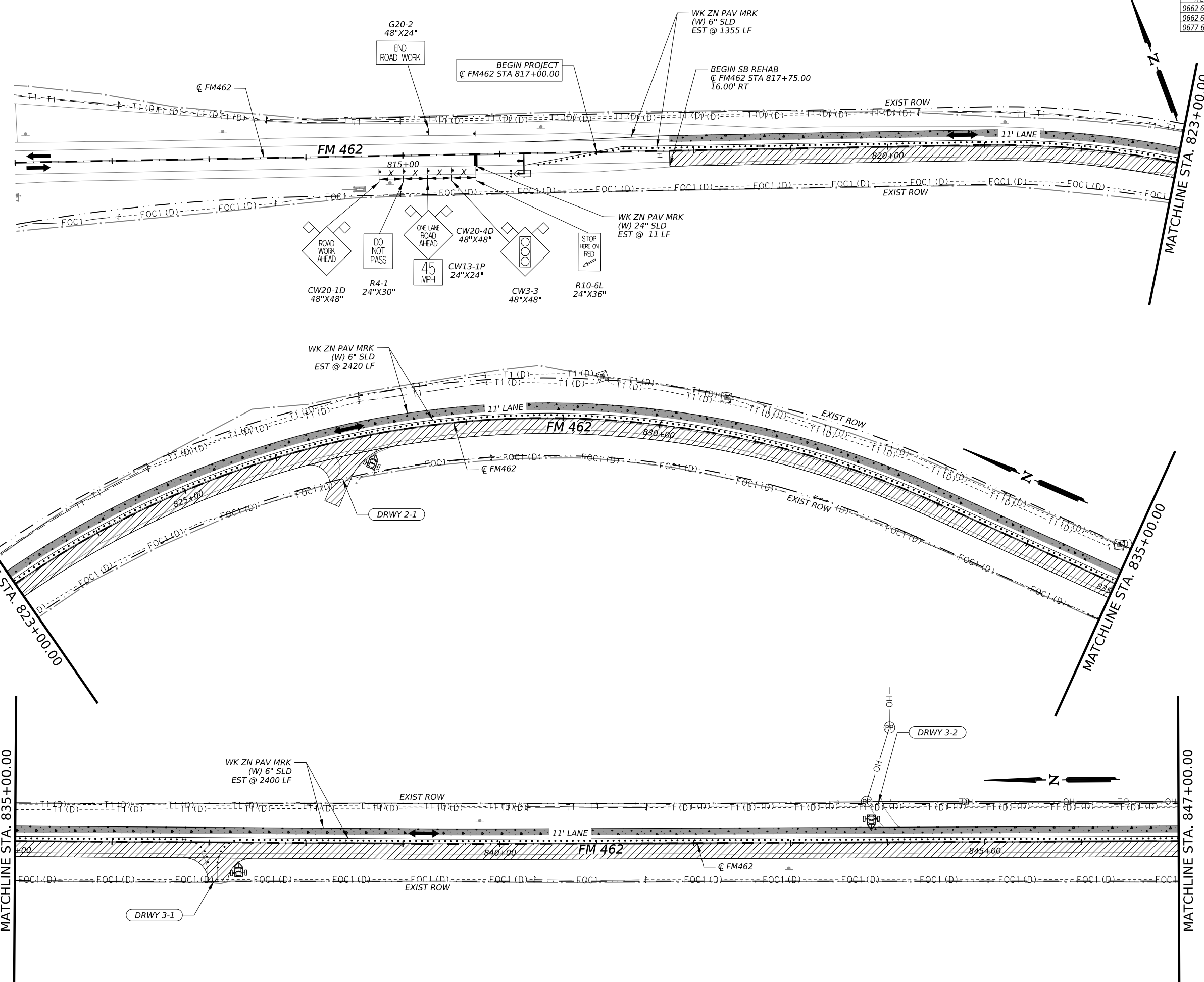
**TRAFFIC CONTROL PLAN**  
**TYPICAL SECTIONS**  
**PHASE 3,4,5,6,7,8,9,10**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	42	




ITEM	DESCRIPTION	UNIT	QTY
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	6175
0662.6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11
0677.6001	ELIM EXT PAV MRK & MRKS (4")	LF	400



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER  
 STATE OF TEXAS

1/31/2024

0' 50' 100'

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**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 3**

**STEP 1**

SHEET 1 OF 2

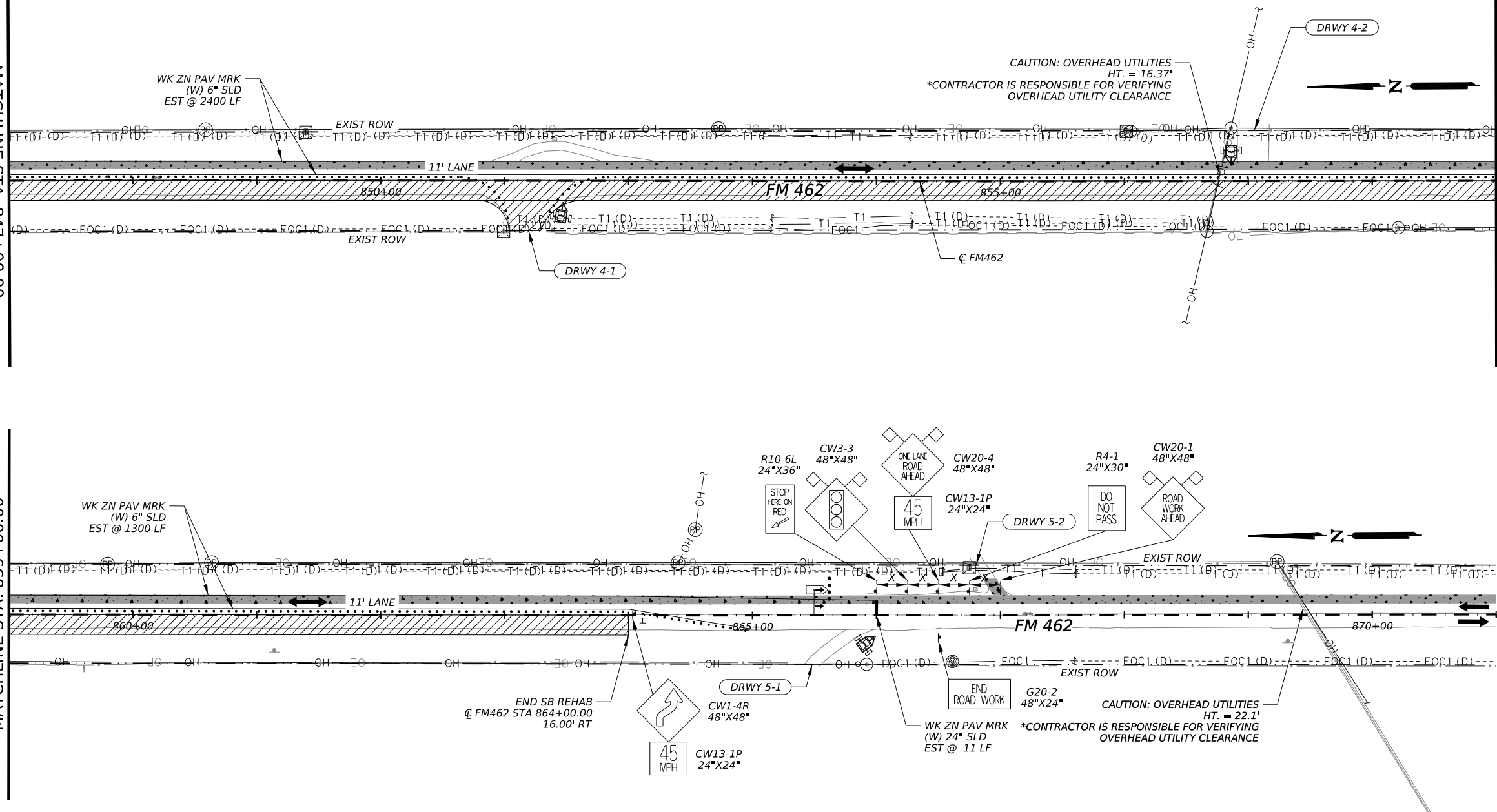
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	43	

DATE: 1/31/2024 5:21:52 PM  
 FILE: c:\pwwork1\0285615\FM462 TCP PH3 ST1A.dgn

CK: DW: CK: DN:

MATCHLINE STA. 847+00.00

MATCHLINE STA. 859+00.00

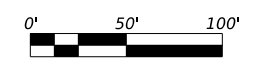


ITEM	DESCRIPTION	UNIT	QTY
0662 6067	WK ZN PAV MRK REMOV (W)6" SLD	LF	3700
0662 6075	WK ZN PAV MRK REMOV (W)24" SLD	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	400

- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

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 1/31/2024



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**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 3**

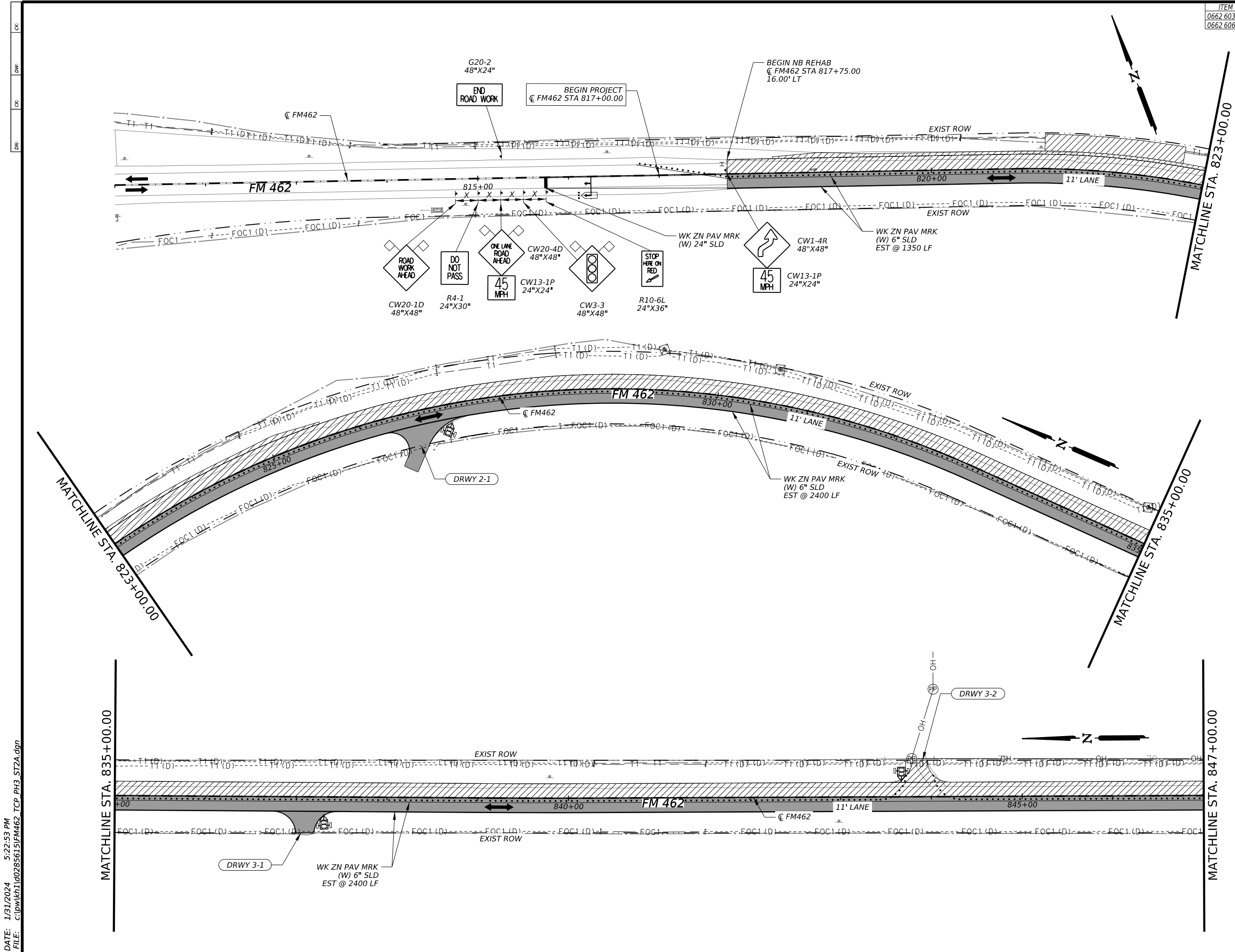
**STEP 1**

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	44

DATE: 1/31/2024 5:22:26 PM  
 FILE: c:\pwworkh\1\0285615\FM462\_TCP\_PH3\_ST1B.dgn

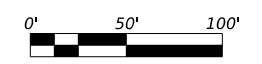
ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	6250
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	6150



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
1. REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  2. CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

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**FM 462**

**TRAFFIC CONTROL PLAN**  
**PHASE 3**  
**STEP 2**

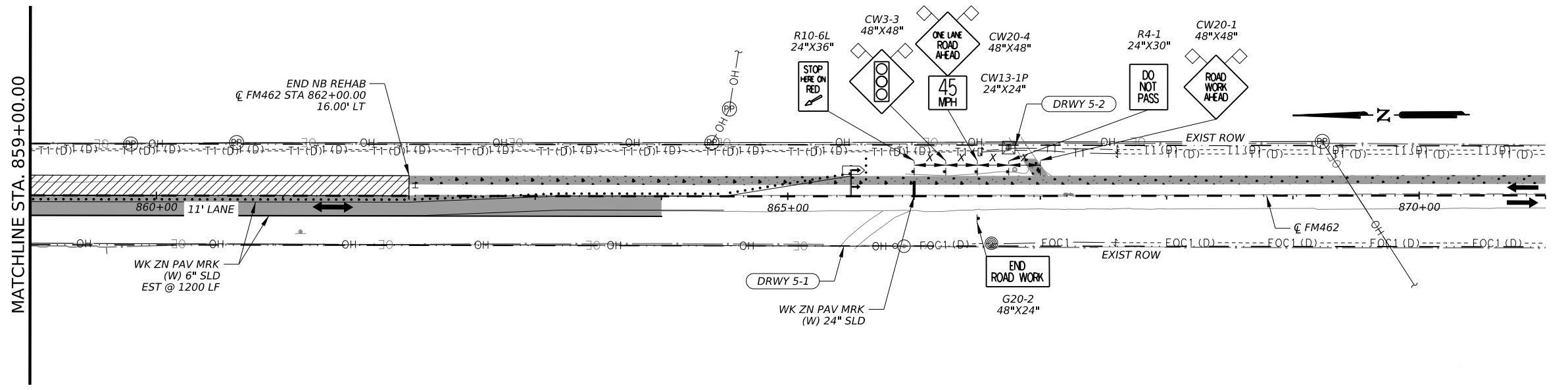
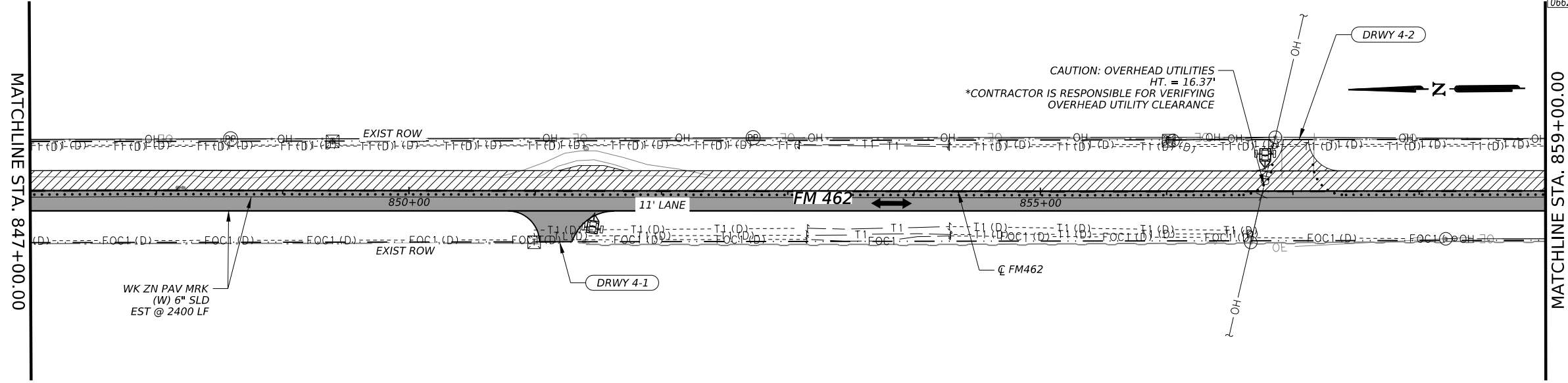
SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	45	

DATE: 1/31/2024 5:22:53 PM  
 FILE: c:\pwworkh\1\0285615\FM462 TCP PH3\_ST2A.dgn



ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	2600
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	3600



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

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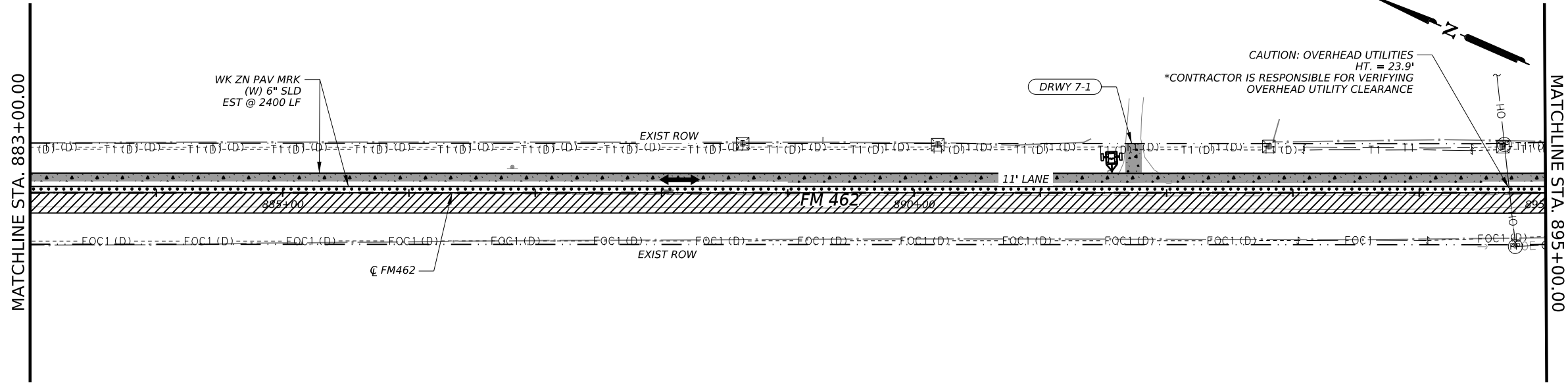
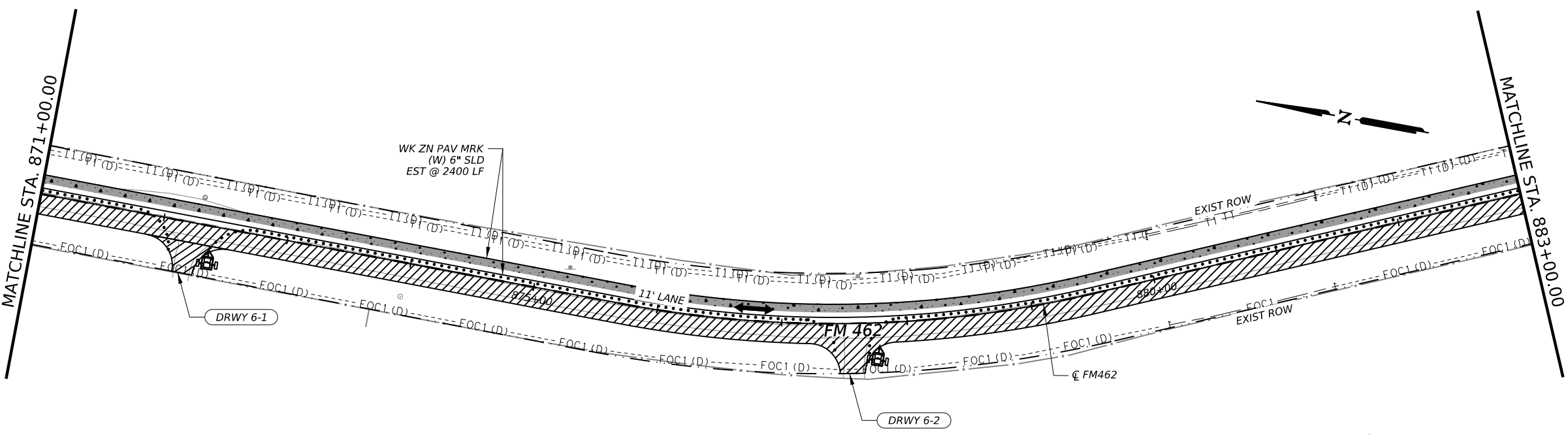
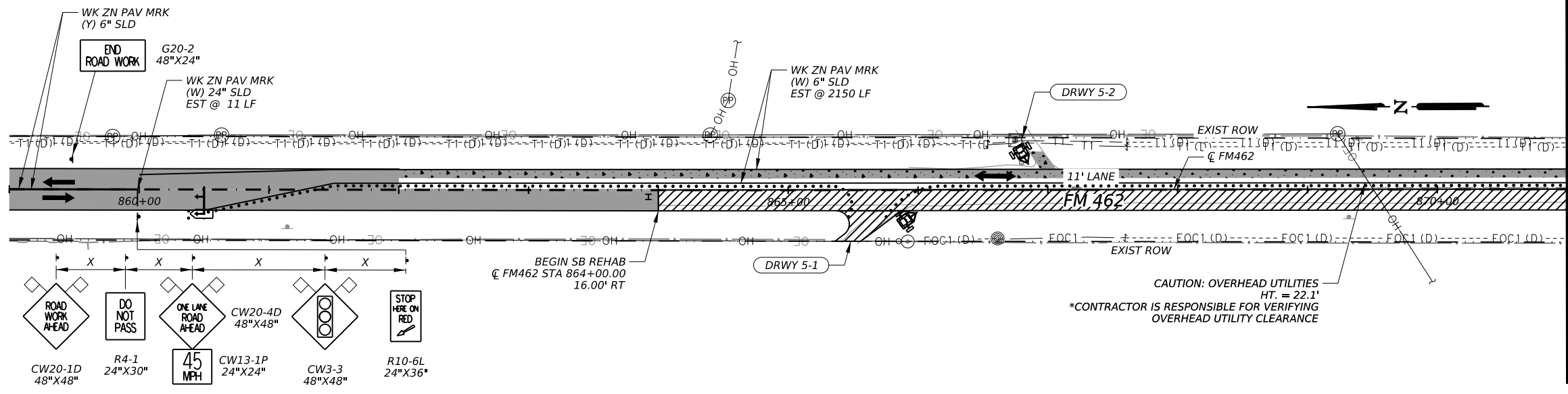


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 FM 462  
 TRAFFIC CONTROL PLAN  
 PHASE 3  
 STEP 2  
 SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	46

DATE: 1/31/2024 5:23:20 PM  
 FILE: c:\pwworkh\1\0285615\FM462\_TCP\_PH3\_ST2B.dgn

ITEM	DESCRIPTION	UNIT	QTY
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	6950
0662.6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)
- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

David Gutierrez  
 1/31/2024  
  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER



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**FM 462**

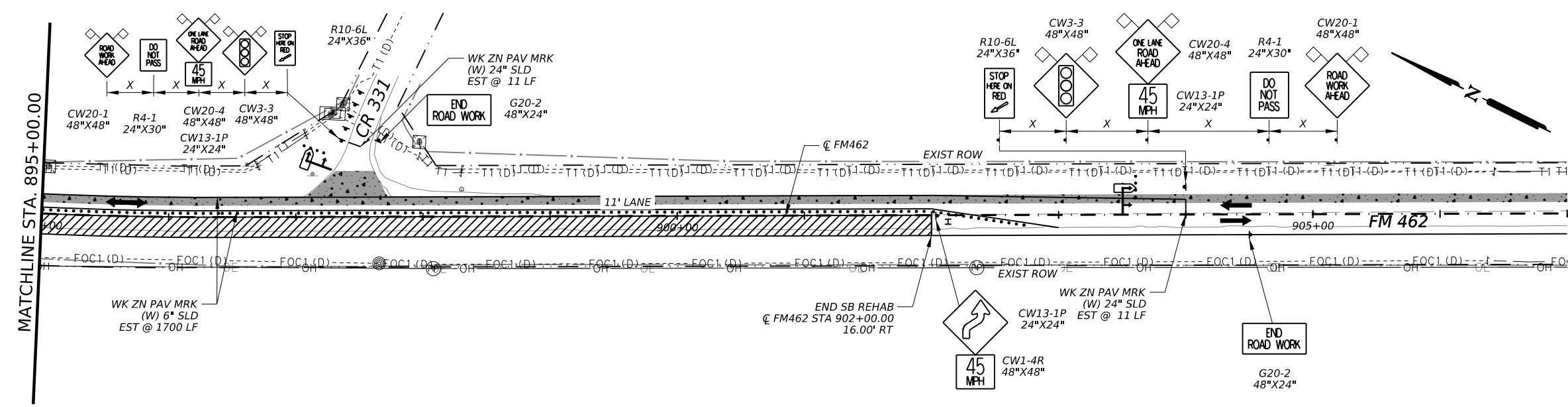
**TRAFFIC CONTROL PLAN**  
 PHASE 4  
 STEP 1

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	47	



DATE: 1/31/2024 5:23:45 PM  
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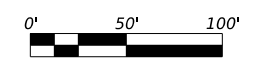
ITEM	DESCRIPTION	UNIT	QTY
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	1700
0662.6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	22
0677.6001	ELIM EXT PAV MRK & MRKS (4")	LF	400




- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
1. REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  2. CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

  
 1/31/2024  




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**FM 462**  
**TRAFFIC CONTROL PLAN**  
**PHASE 4**  
**STEP 1**

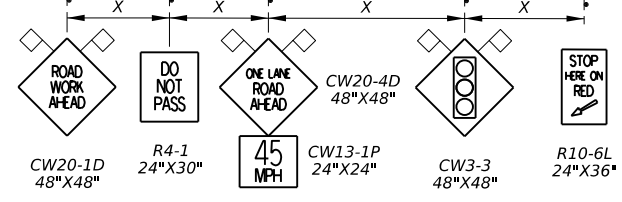
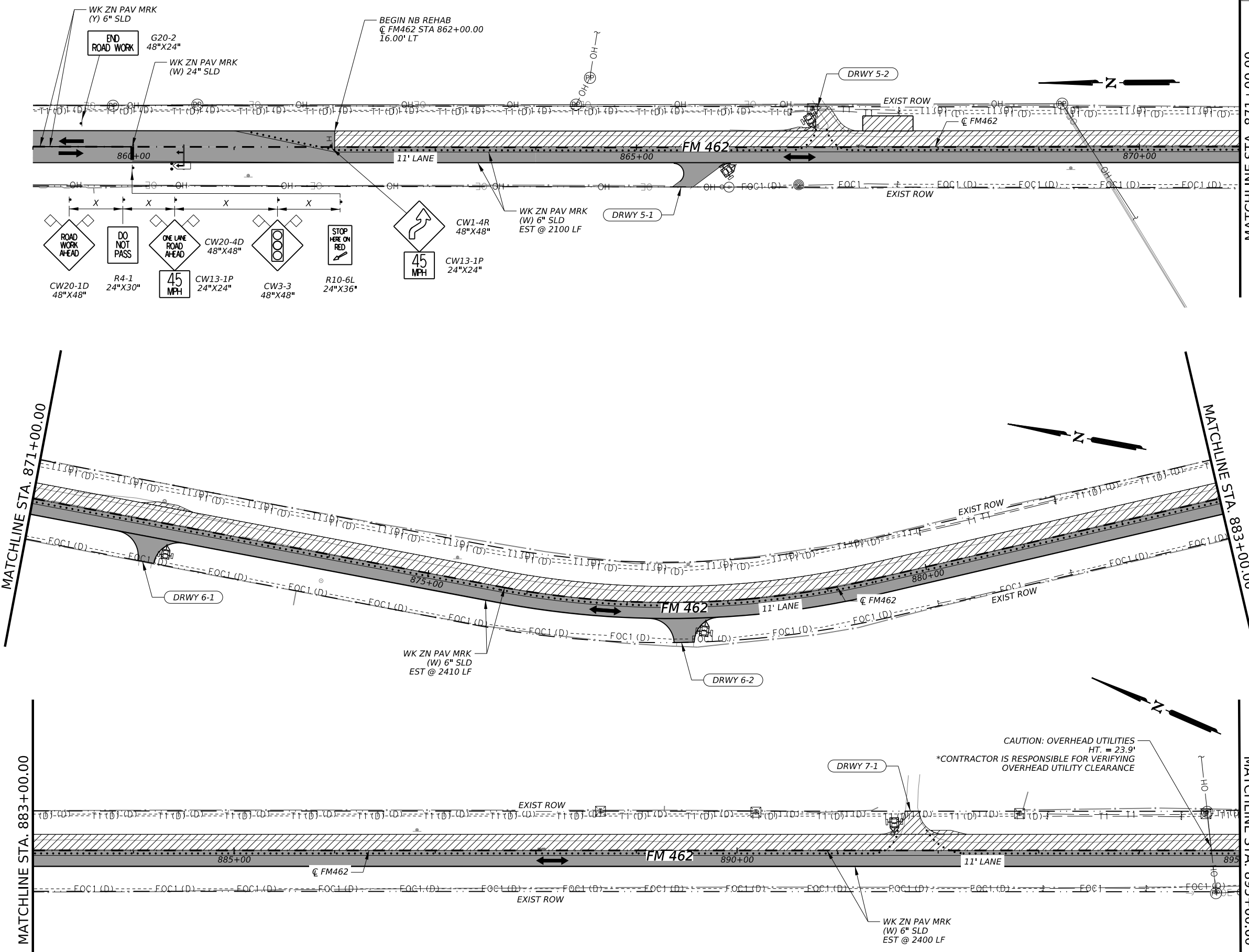
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	48

DATE: 1/31/2024 5:24:10 PM  
 FILE: c:\pwworking\10285615\FM462\_TCP\_PH4\_ST1B.dgn

CK:  
DW:  
CK:  
DN:

ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (Y)6" SLD	LF	7000
0662.6067	WK ZN PAV MRK REMOV (W)6" SLD	LF	6910



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - ▨ CONSTRUCTION THIS STEP
  - ▩ CONSTRUCTION PREVIOUS STEP
  - ▧ TEMPORARY PAVEMENT THIS STEP
  - ▦ TEMPORARY PAVEMENT PREVIOUS STEP
  - ⋯ CHANNELIZING DEVICES
  - Ⓜ TEMP PORTABLE TRAFFIC SIGNAL
  - Ⓜ DRIVEWAY ASSISTANCE DEVICE (DAD)
- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

David Gutierrez  
 1/31/2024  
  
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 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER



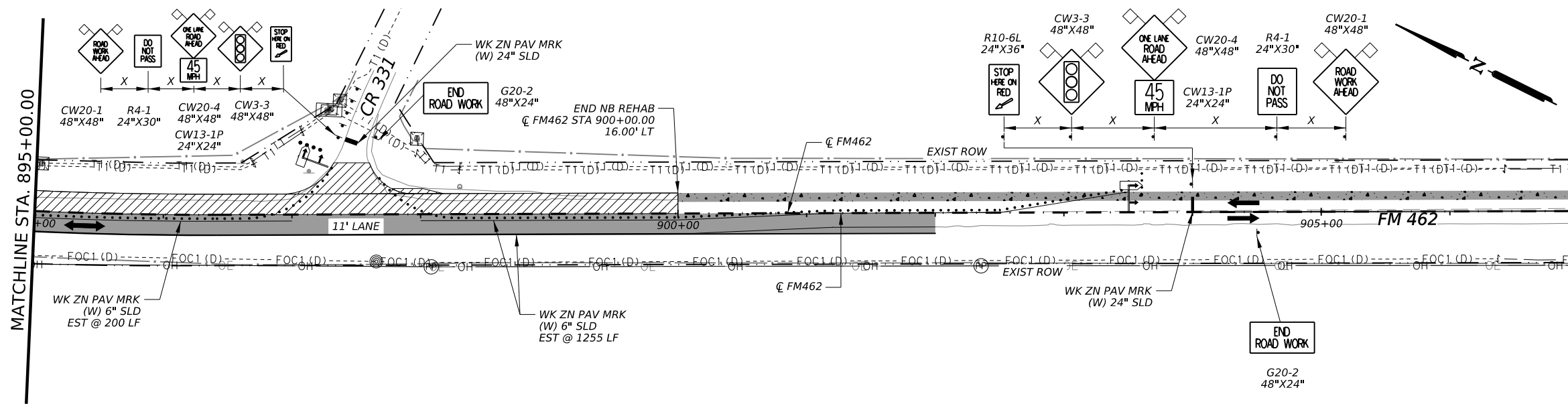
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**FM 462**  
**TRAFFIC CONTROL PLAN**  
**PHASE 4**  
**STEP 2**

SHEET 1 OF 2









CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	49	

DATE: 1/31/2024 5:24:36 PM  
 FILE: c:\pwworking\10285615\FM462\_TCP\_PH4\_ST2A.dgn

ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	600
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	1455



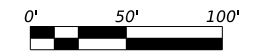
**LEGEND**

-  PROPOSED TRAFFIC FLOW ARROW
-  CONSTRUCTION THIS STEP
-  CONSTRUCTION PREVIOUS STEP
-  TEMPORARY PAVEMENT THIS STEP
-  TEMPORARY PAVEMENT PREVIOUS STEP
-  CHANNELIZING DEVICES
-  TEMP PORTABLE TRAFFIC SIGNAL
-  DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

1. REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
2. CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

  
 1/31/2024  

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**FM 462**  
**TRAFFIC CONTROL PLAN**  
**PHASE 4**  
**STEP 2**

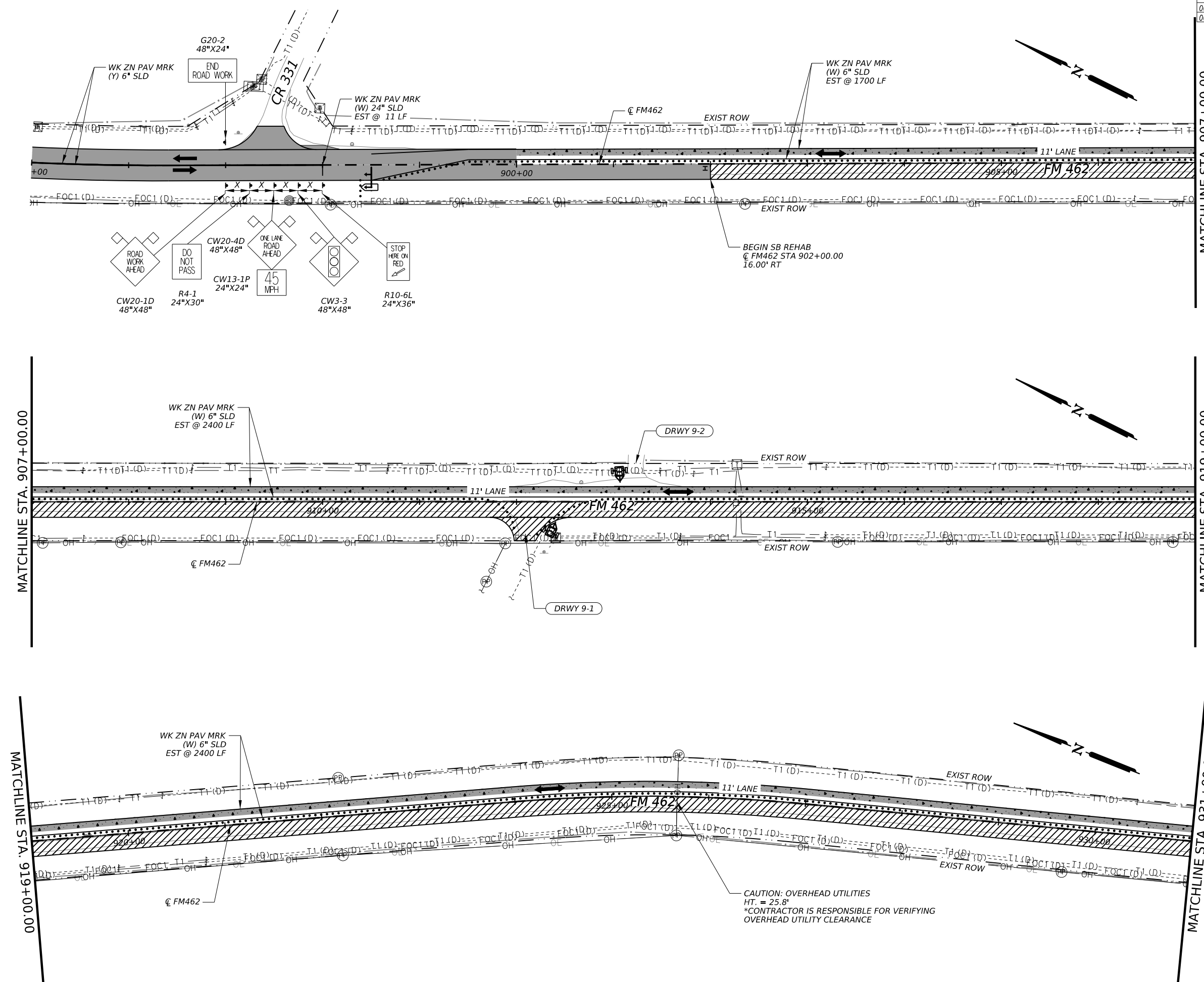
SHEET 2 OF 2			
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	50

DATE: 1/31/2024 5:25:04 PM  
 FILE: c:\pwworking\1\0285615\FM462\_TCP\_PH4\_ST2B.dgn



CK:  
DW:  
CK:  
DN:

ITEM	DESCRIPTION	UNIT	QTY
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	6500
0662.6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)
- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

David Gutierrez  
 1/31/2024  
  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER



**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 5**

**STEP 1**

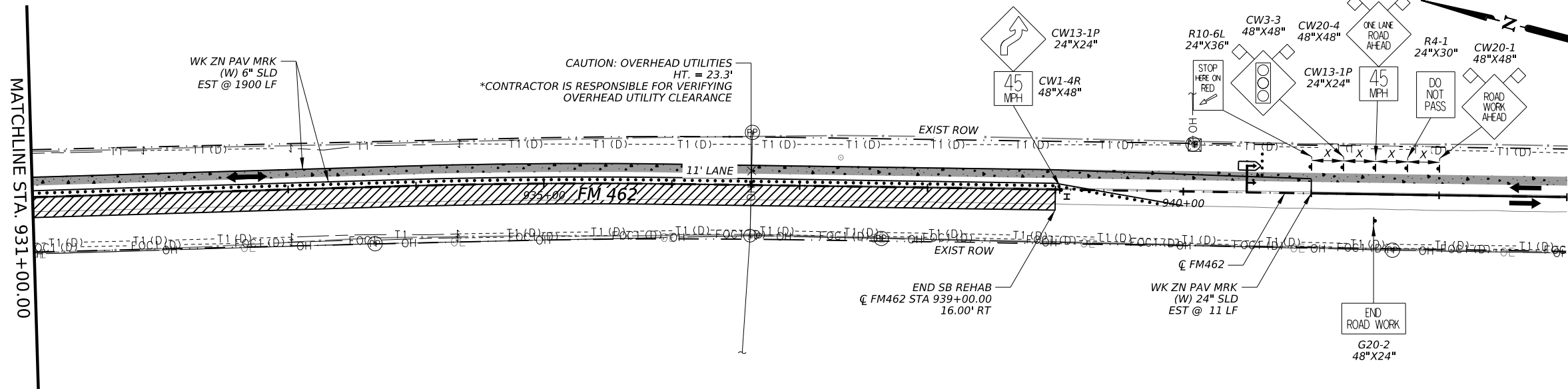
SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	51	

DATE: 1/31/2024 5:25:31 PM  
 FILE: c:\pwworkh1\0285615\FM462 TCP PH5\_ST1A.dgn



CAUTION: OVERHEAD UTILITIES  
 HT. = 25.8'  
 \*CONTRACTOR IS RESPONSIBLE FOR VERIFYING  
 OVERHEAD UTILITY CLEARANCE

ITEM	DESCRIPTION	UNIT	QTY
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	1900
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	400



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
1. REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  2. CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

  
 1/31/2024  




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Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 5**

**STEP 1**

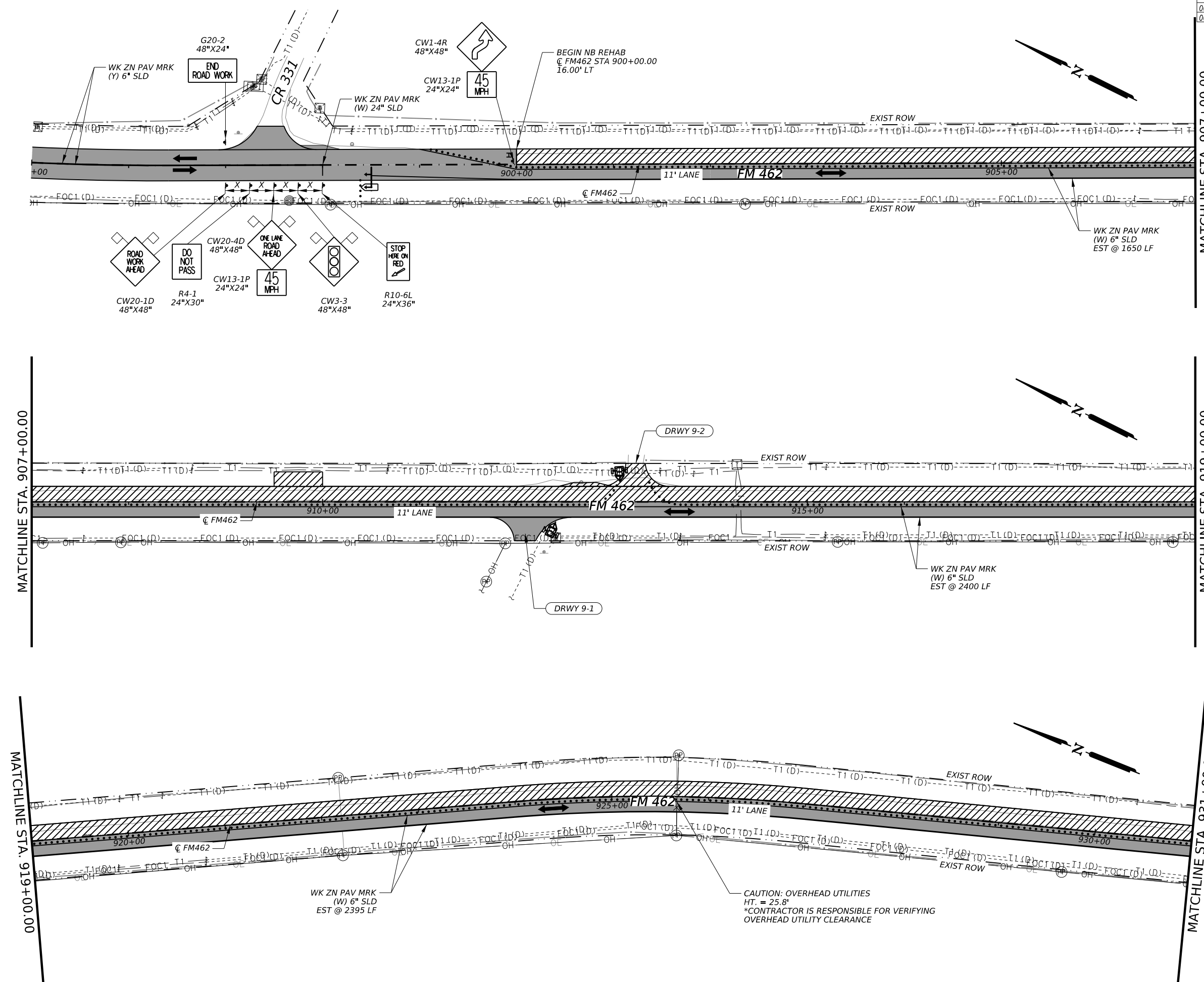
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	52

DATE: 1/31/2024 5:25:58 PM  
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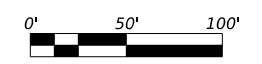
CK:  
DW:  
CK:  
DN:

ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	6600
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	6445



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)
- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

*David Gutierrez*  
 1/31/2024  
  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER



**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 5**

**STEP 2**

SHEET 1 OF 2

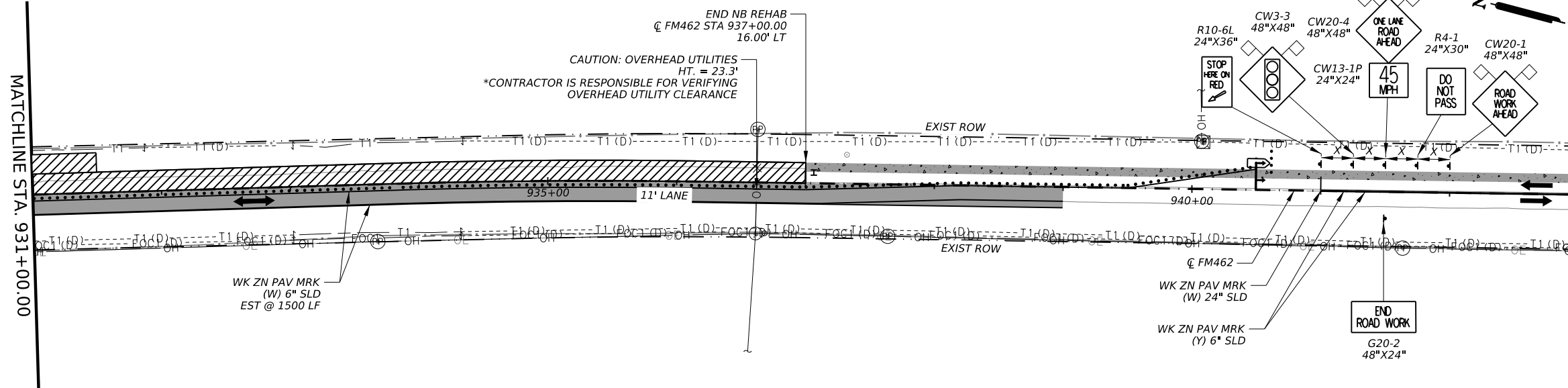
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0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	53

DATE: 1/31/2024 5:26:28 PM  
 FILE: c:\pwworking\10285615\FM462 TCP PH5\_ST2A.dgn

CAUTION: OVERHEAD UTILITIES  
 HT. = 25.8'  
 \*CONTRACTOR IS RESPONSIBLE FOR VERIFYING  
 OVERHEAD UTILITY CLEARANCE



ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	800
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	1500



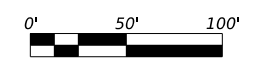
**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

1. REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
2. CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

  
 1/31/2024  

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Texas Department of Transportation

FM 462  
 TRAFFIC CONTROL PLAN  
 PHASE 5  
 STEP 2

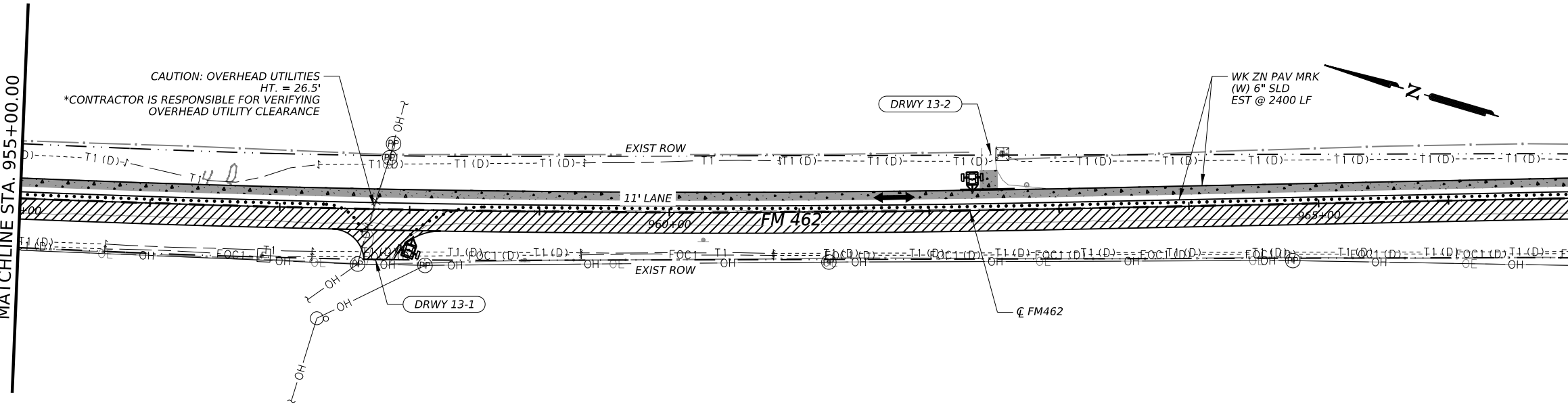
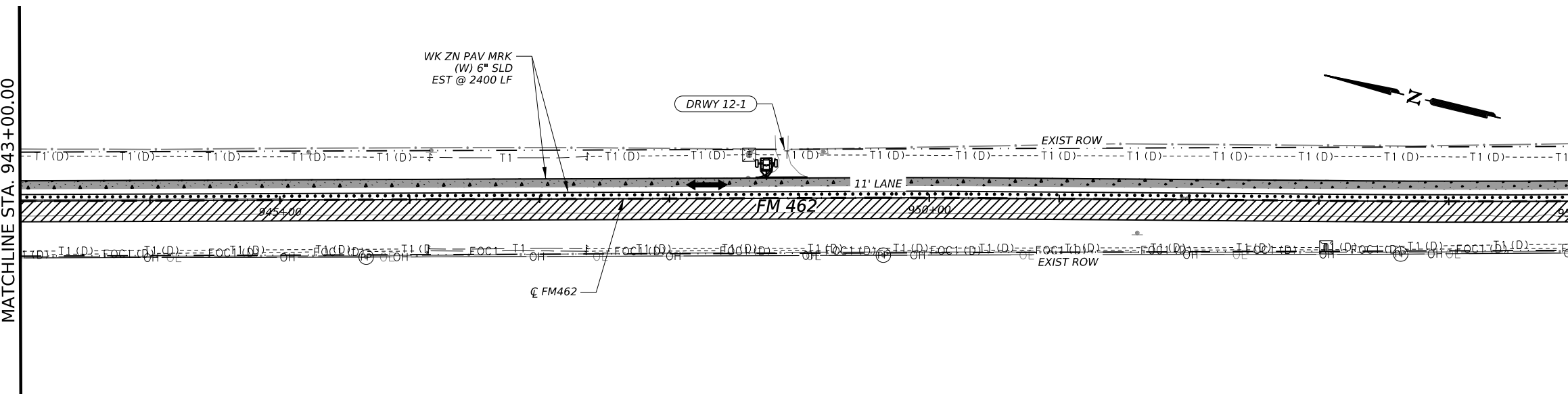
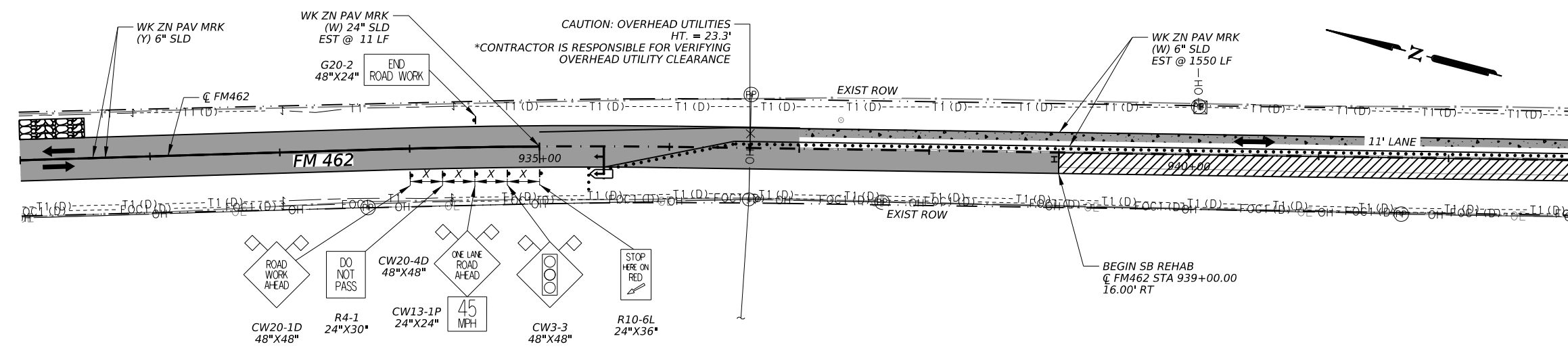
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	54

DATE: 1/31/2024 5:26:54 PM  
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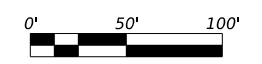
ITEM	DESCRIPTION	UNIT	QTY
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	6350
0662.6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
1. REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  2. CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

David Gutierrez  
 1/31/2024  
  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER



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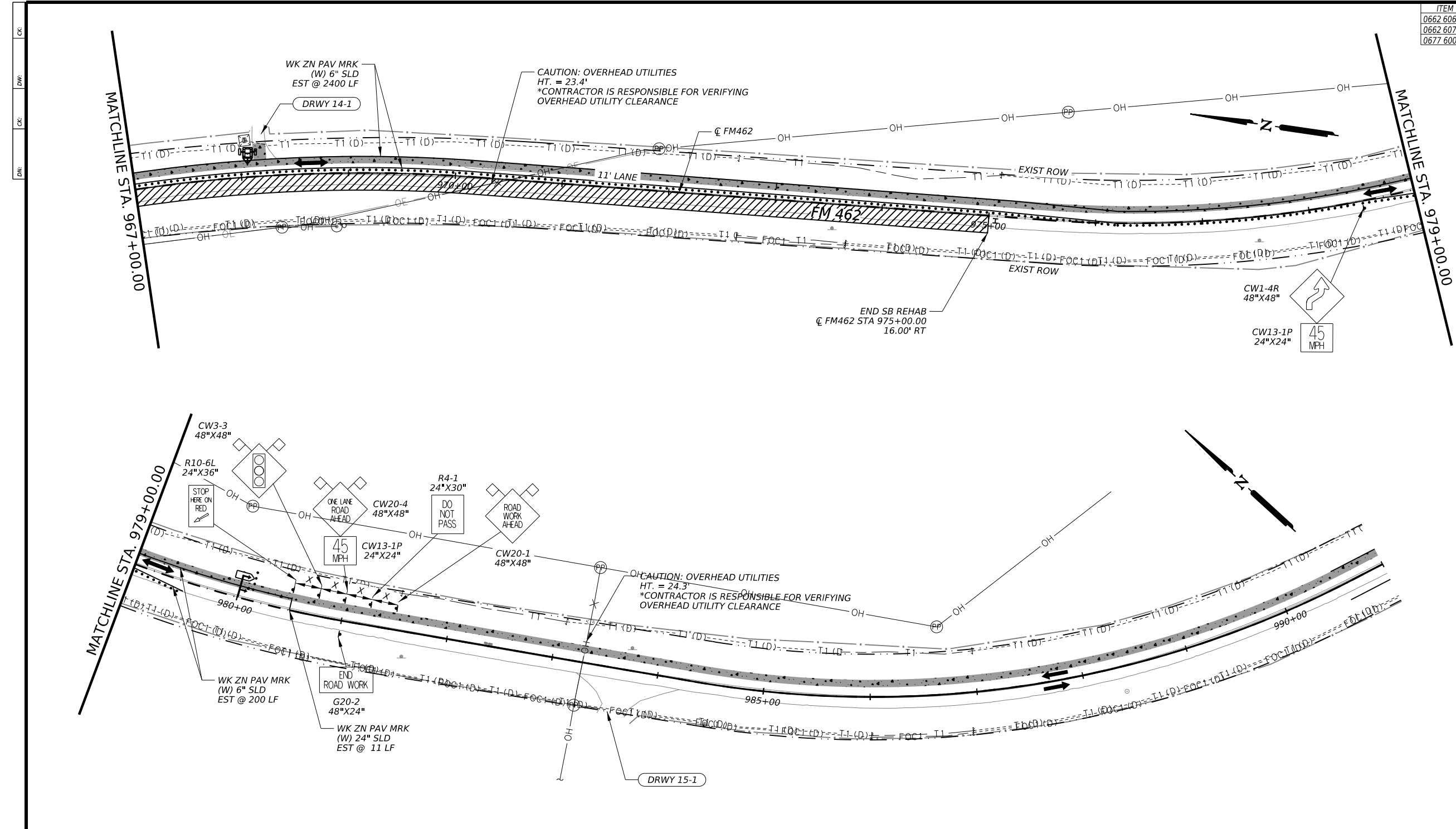
**FM 462**  
**TRAFFIC CONTROL PLAN**  
**PHASE 6**  
**STEP 1**

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	55	


DATE: 1/31/2024 5:27:21 PM  
 FILE: c:\pwworking\kimleyhorn\project\151\FM462 TCP PH6 ST1A.dgn

ITEM	DESCRIPTION	UNIT	QTY
0662 6067	WK ZN PAV MRK REMOV (W)6" (SLD)	LF	2600
0662 6075	WK ZN PAV MRK REMOV (W)24" (SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	1100




- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER  
 STATE OF TEXAS

1/31/2024



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**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 6**

**STEP 1**

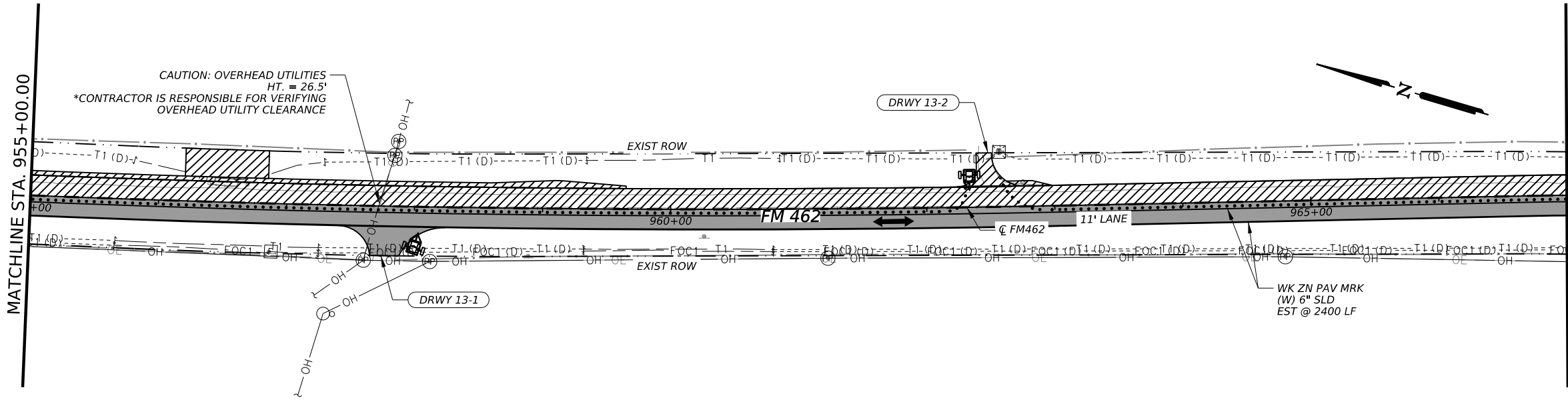
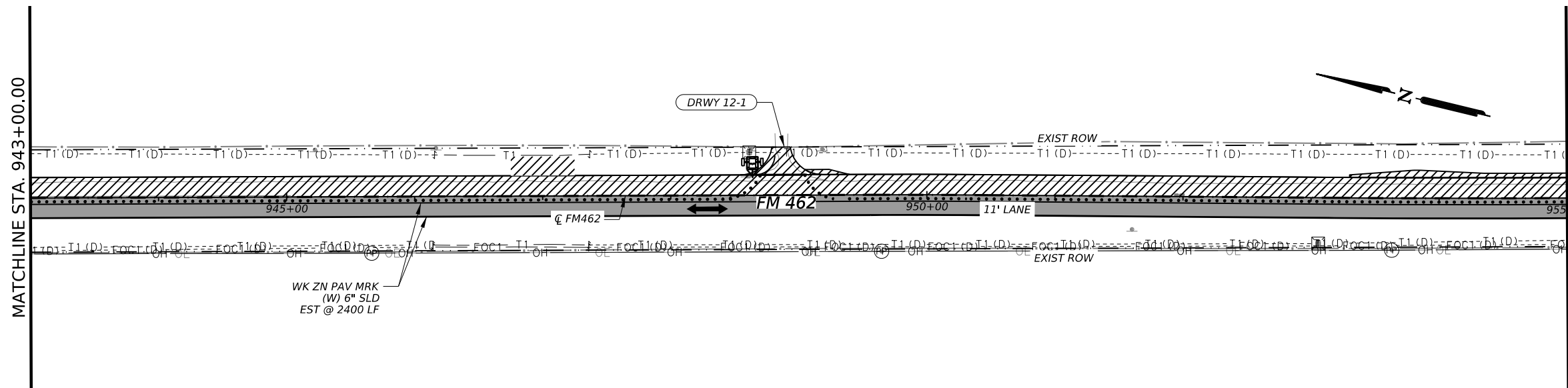
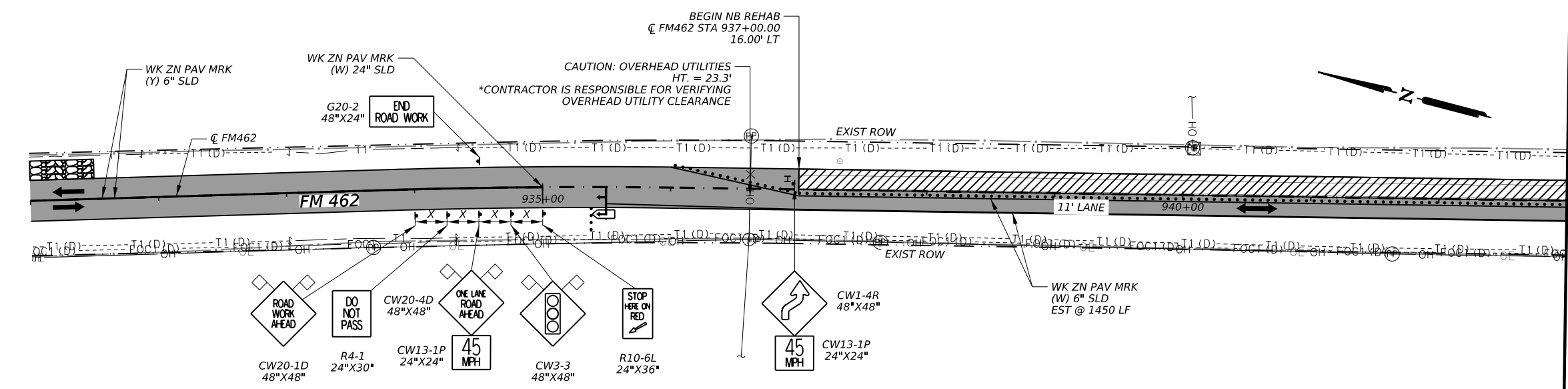
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	56

DATE: 1/31/2024 5:27:50 PM  
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CK:  
DW:  
CK:  
DN:

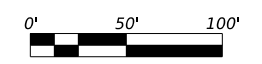
ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	6400
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	6250



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

*David Gutierrez*  
 1/31/2024



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**FM 462**  
**TRAFFIC CONTROL PLAN**  
**PHASE 6**  
**STEP 2**

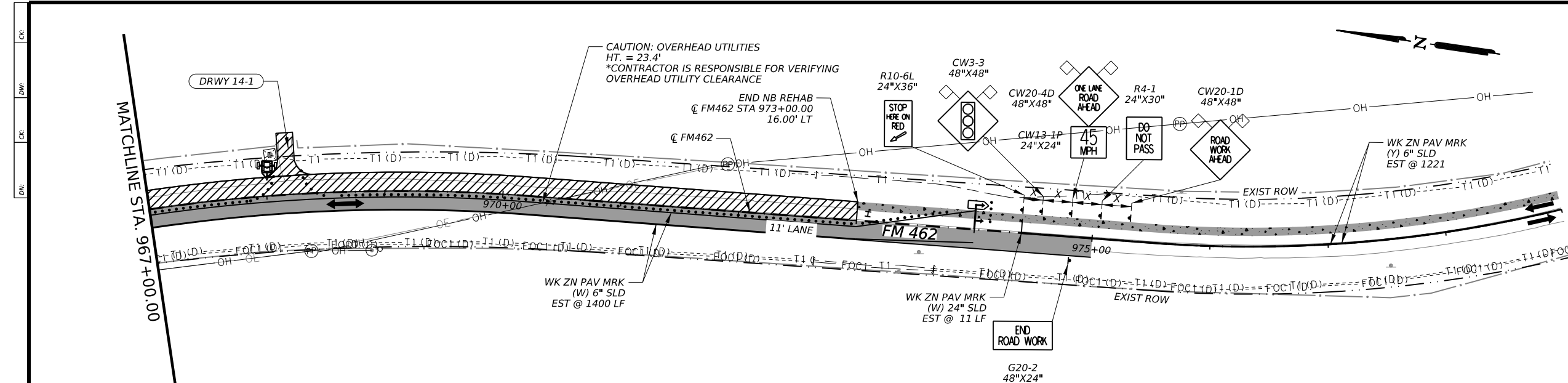
SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	57	

DATE: 1/31/2024 5:28:15 PM  
 FILE: c:\pwworking\kimleyhorn\project\15\fm462\_tcp\_ph6\_step2.dgn





ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	2700
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	1400
0662.6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11



**LEGEND**


- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

  
 1/31/2024  




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 Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 6**

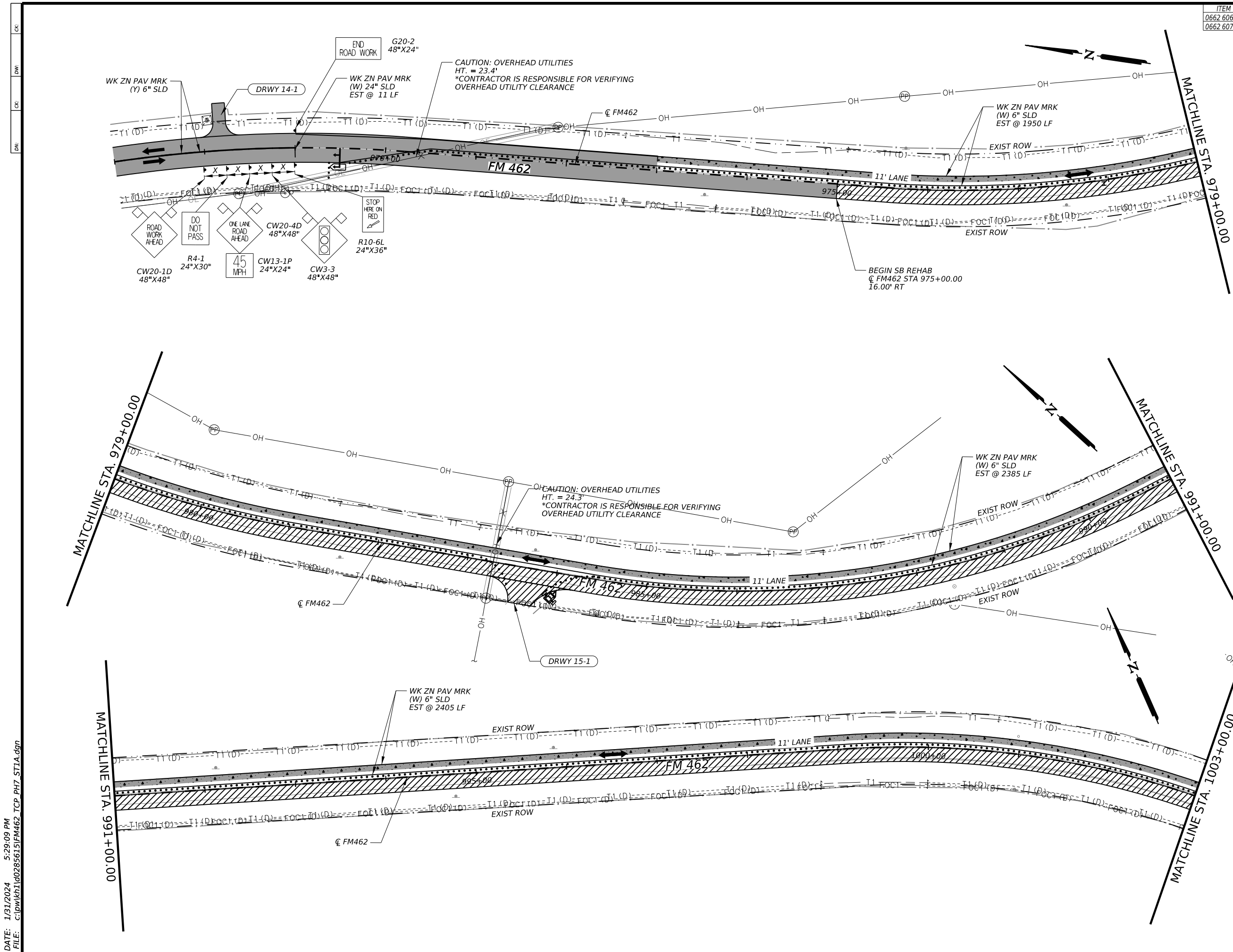
**STEP 2**

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	58

DATE: 1/31/2024 5:28:39 PM  
FILE: c:\pwworkh\1\0285615\FM462\_TCP\_PH6\_ST2B.dgn

ITEM	DESCRIPTION	UNIT	QTY
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	6740
0662.6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11



**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

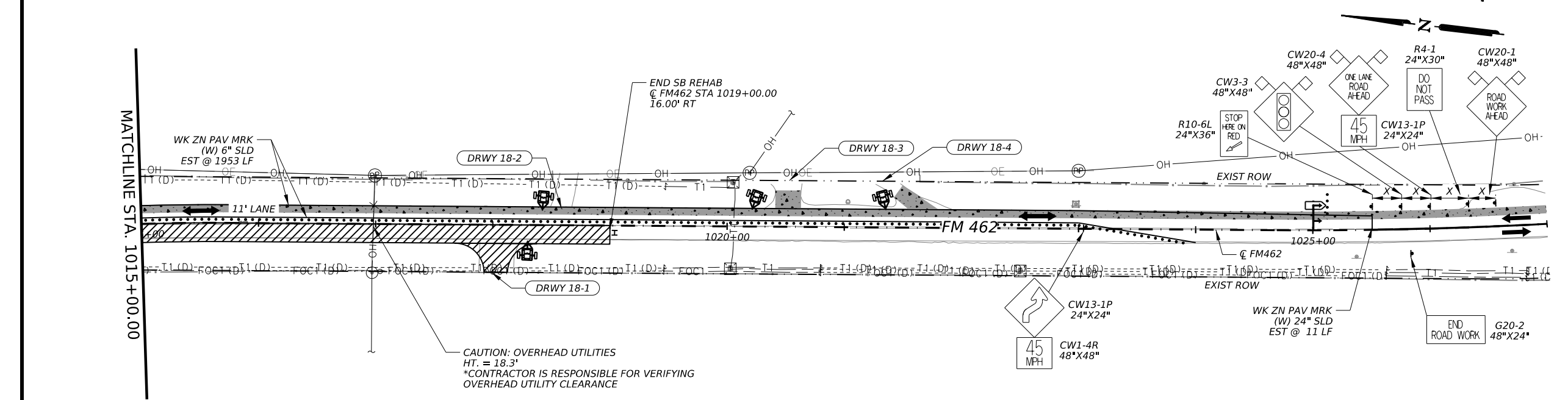
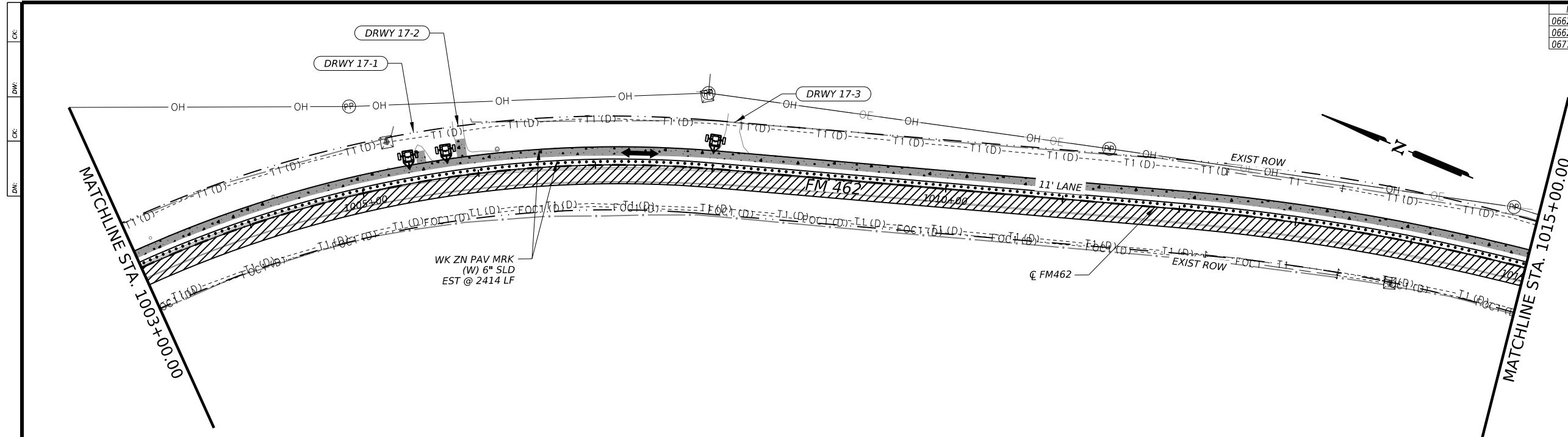
David Gutierrez  
 1/31/2024  
  
 0' 50' 100'

**Kimley»Horn** F-928  
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 Texas Department of Transportation  
**FM 462**  
**TRAFFIC CONTROL PLAN**  
**PHASE 7**  
**STEP 1**  
 SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	59	

DATE: 1/31/2024 5:29:09 PM  
 FILE: c:\pwworking\10285615\FM462 TCP PH7\_ST1A.dgn

ITEM	DESCRIPTION	UNIT	QTY
0662 6067	WK ZN PAV MRK REMOV (W)6"SLD	LF	4367
0662 6075	WK ZN PAV MRK REMOV (W)24"SLD	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	1300

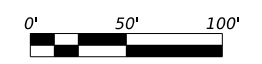


- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

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*David Gutierrez*



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Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 7**

**STEP 1**

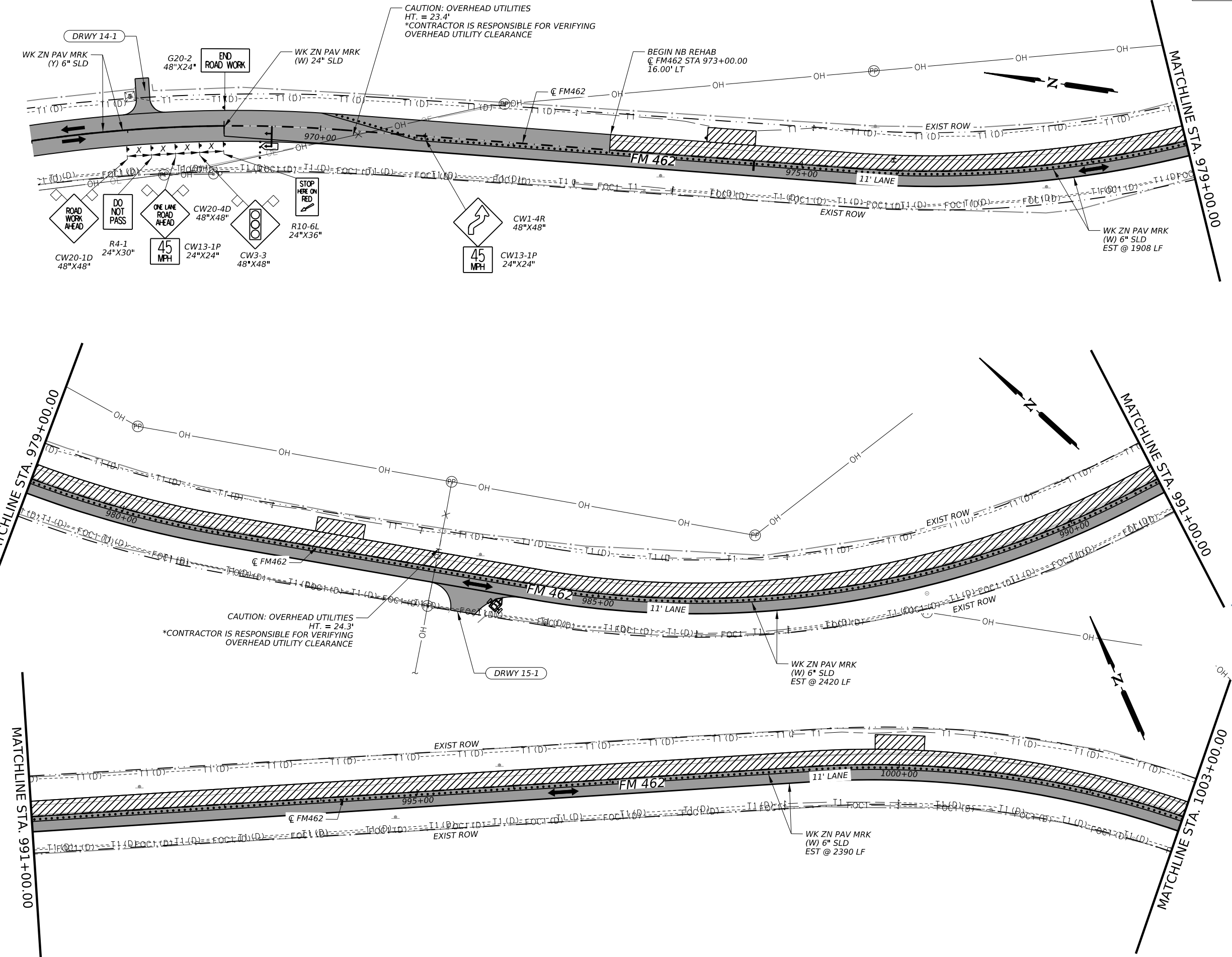
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	60

DATE: 1/31/2024 5:29:37 PM  
 FILE: c:\pwworkh\1\0285615\FM462\_TCP\_PH7\_ST1B.dgn



ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	6800
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	6718



**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

1/31/2024

0' 50' 100'

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**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 7**

**STEP 2**

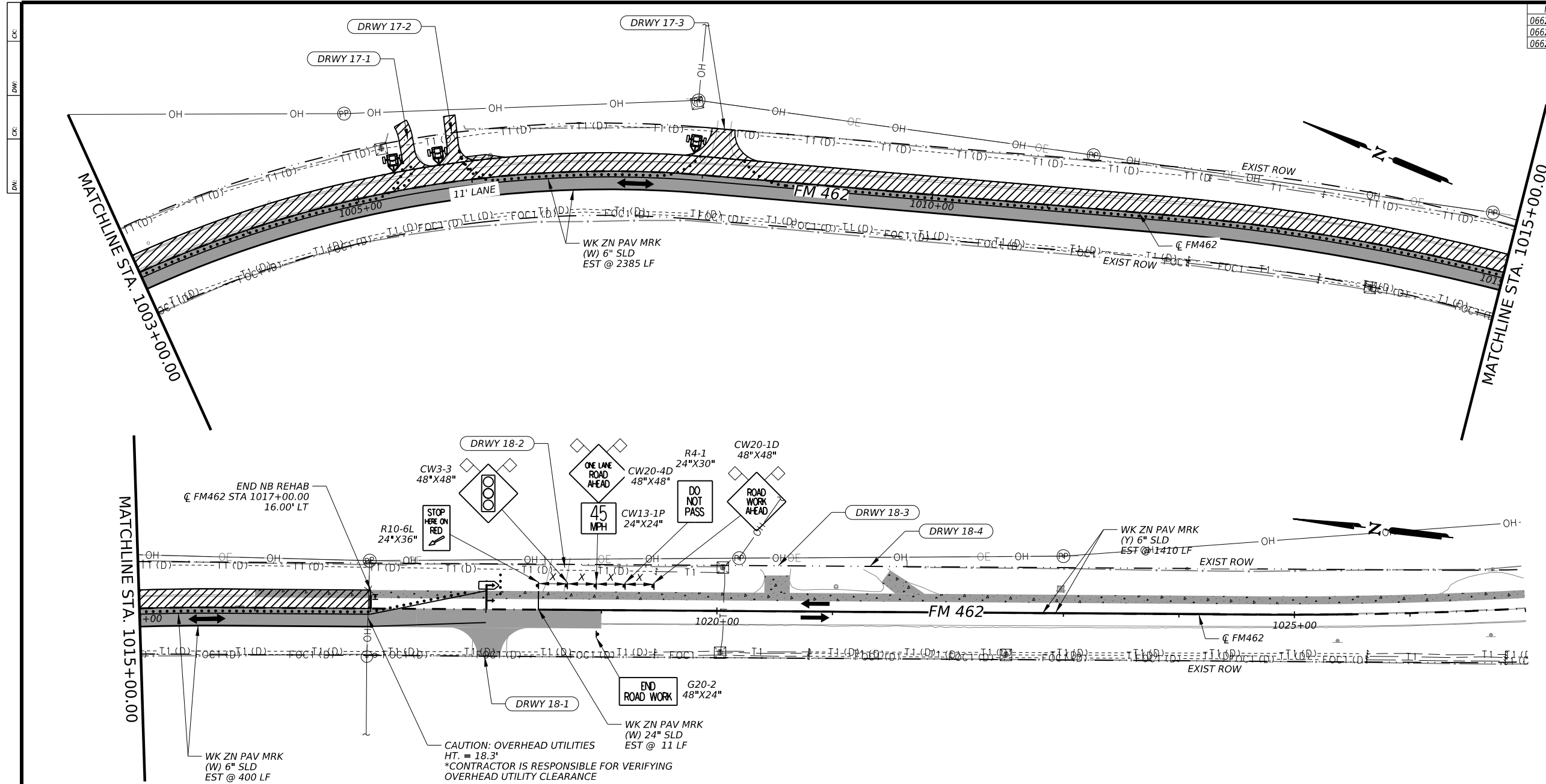
SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	61	

DATE: 1/31/2024 5:30:06 PM  
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CK: \_\_\_\_\_  
 DW: \_\_\_\_\_  
 CC: \_\_\_\_\_  
 DN: \_\_\_\_\_

ITEM	DESCRIPTION	UNIT	QTY
0662 6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	3610
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	2785
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11



**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

1/31/2024

*David Gutierrez*



**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 7**

**STEP 2**

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
SAT	COUNTY	SHEET NO.	
	MEDINA	62	

DATE: 1/31/2024 5:30:31 PM  
 FILE: c:\pwworkh\1\0285615\FM462 TCP PH7\_ST2B.dgn

ITEM	DESCRIPTION	UNIT	QTY
0512.6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	380
0512.6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	40
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	4915
0662.6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11
0677.6001	ELIM EXT PAV MRK & MRKS (4*)	LF	110

**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

1/31/2024



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**FM 462**

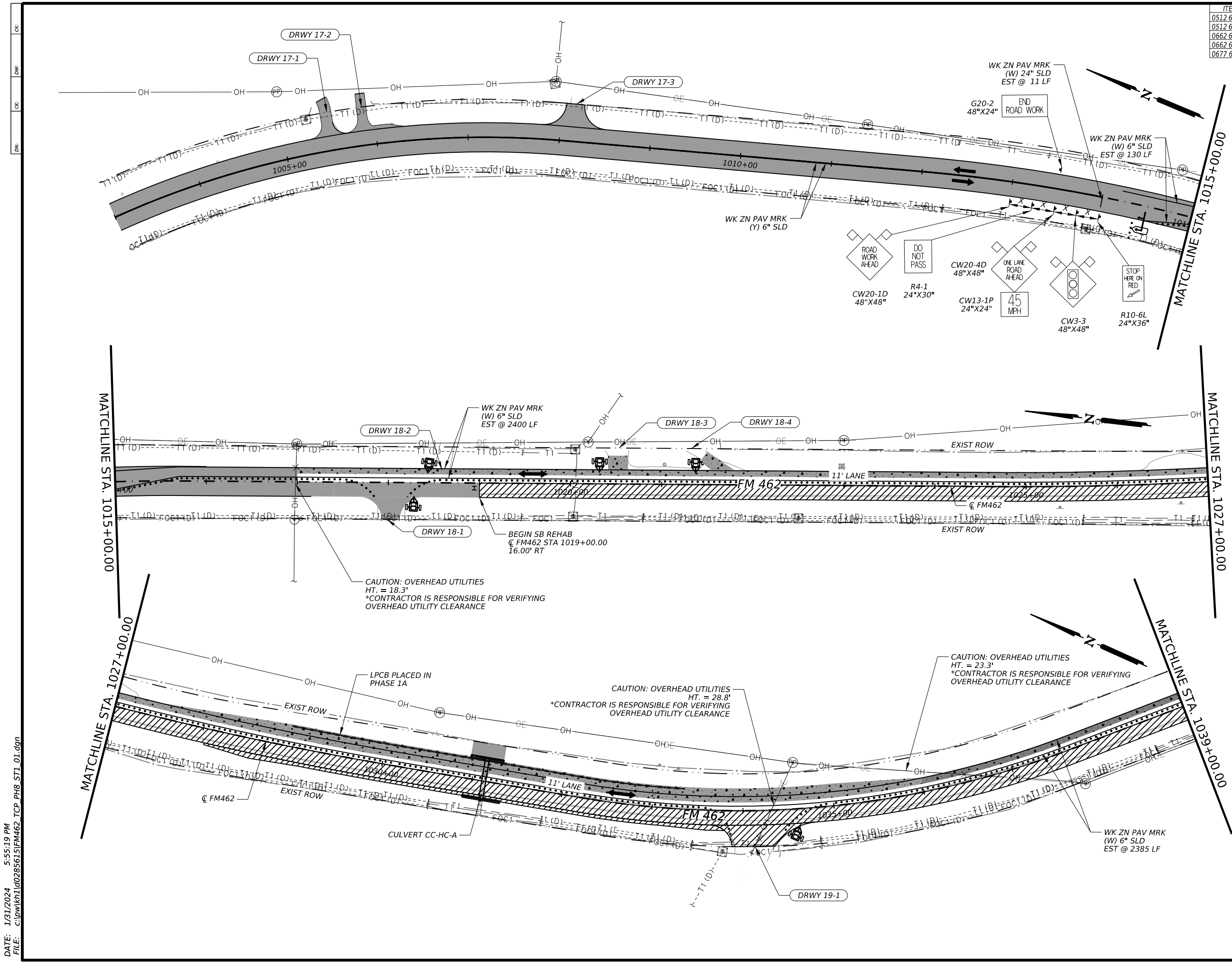
**TRAFFIC CONTROL PLAN**

**PHASE 8**

**STEP 1**

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	63	



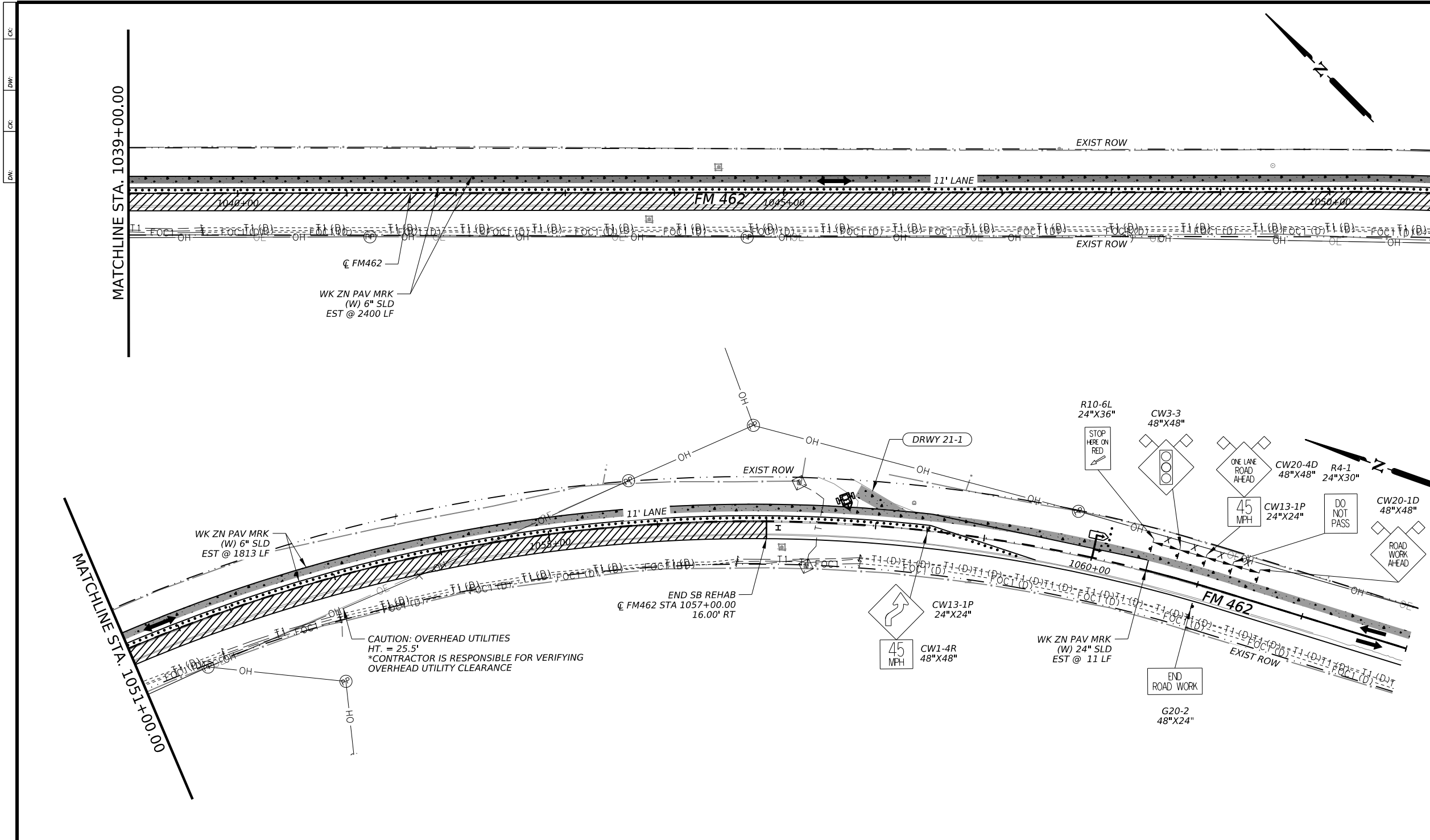
DATE: 1/31/2024 5:55:19 PM  
 FILE: c:\pwworking\kimleyhorn\project\10285615\FM462 TCP PH8 ST1\_01.dgn



ITEM	DESCRIPTION	UNIT	QTY
0662 6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	4213
0662 6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4")	LF	700

MATCHLINE STA. 1039+00.00

MATCHLINE STA. 1051+00.00



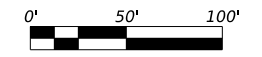
**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

1. REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
2. CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

1/31/2024



**Kimley»Horn** F-928

Texas Department of Transportation

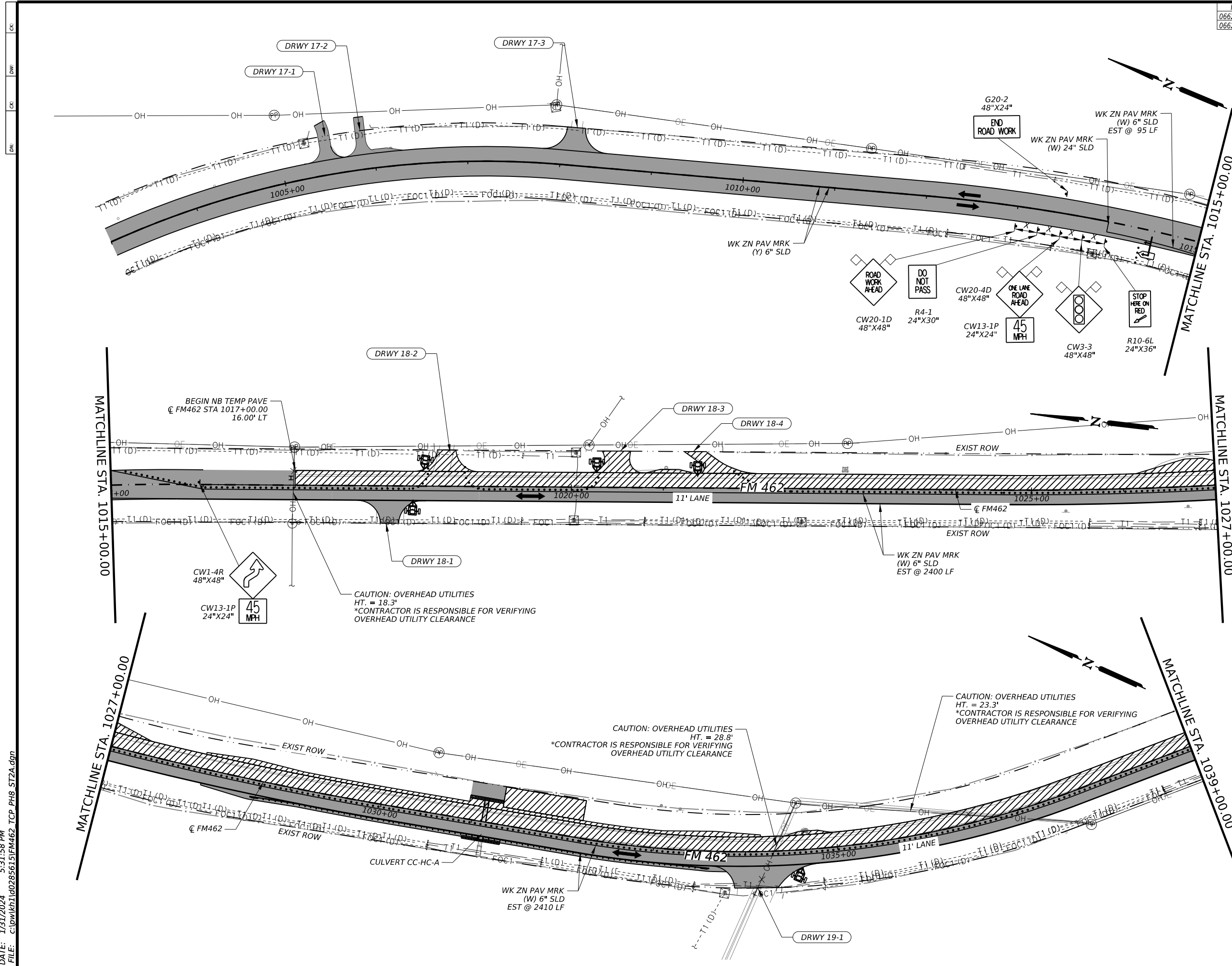
**FM 462**  
**TRAFFIC CONTROL PLAN**  
**PHASE 8**  
**STEP 1**

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	64

DATE: 1/31/2024 5:55:49 PM  
FILE: c:\pwworking\10285615\FM462 TCP PH8 ST1\_02.dgn

ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (Y)6"SLD	LF	5000
0662.6067	WK ZN PAV MRK REMOV (W)6"SLD	LF	4905



**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

David Gutierrez  
 1/31/2024  
  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER



**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 8**

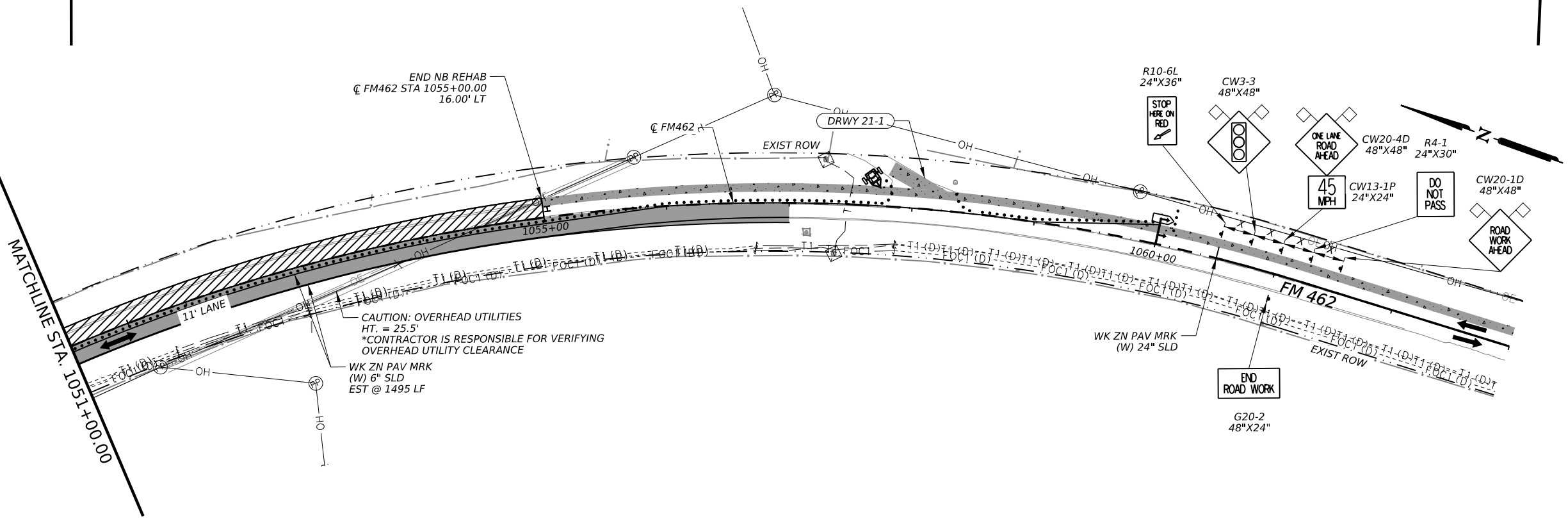
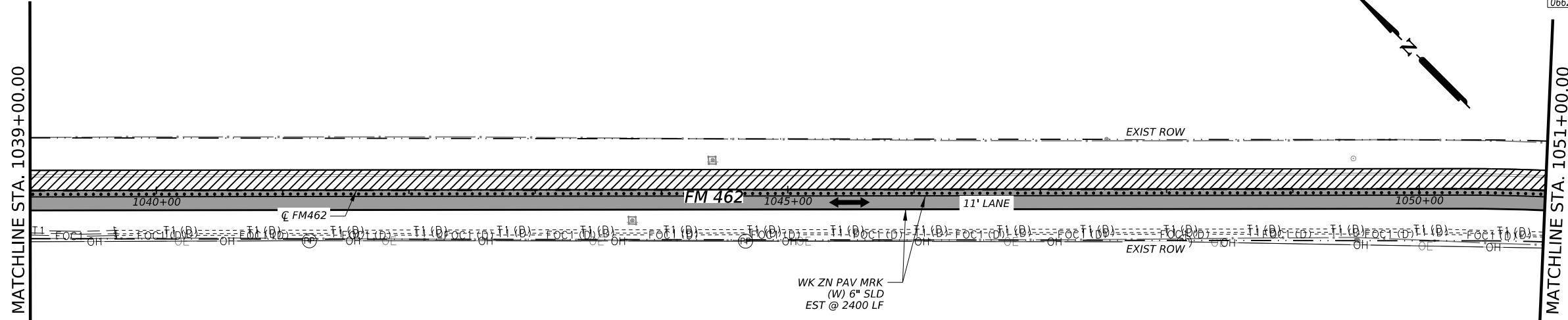
**STEP 2**

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	65	

DATE: 1/31/2024 5:31:58 PM  
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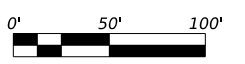
ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	2350
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	3895



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

1/31/2024



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Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 8**

**STEP 2**

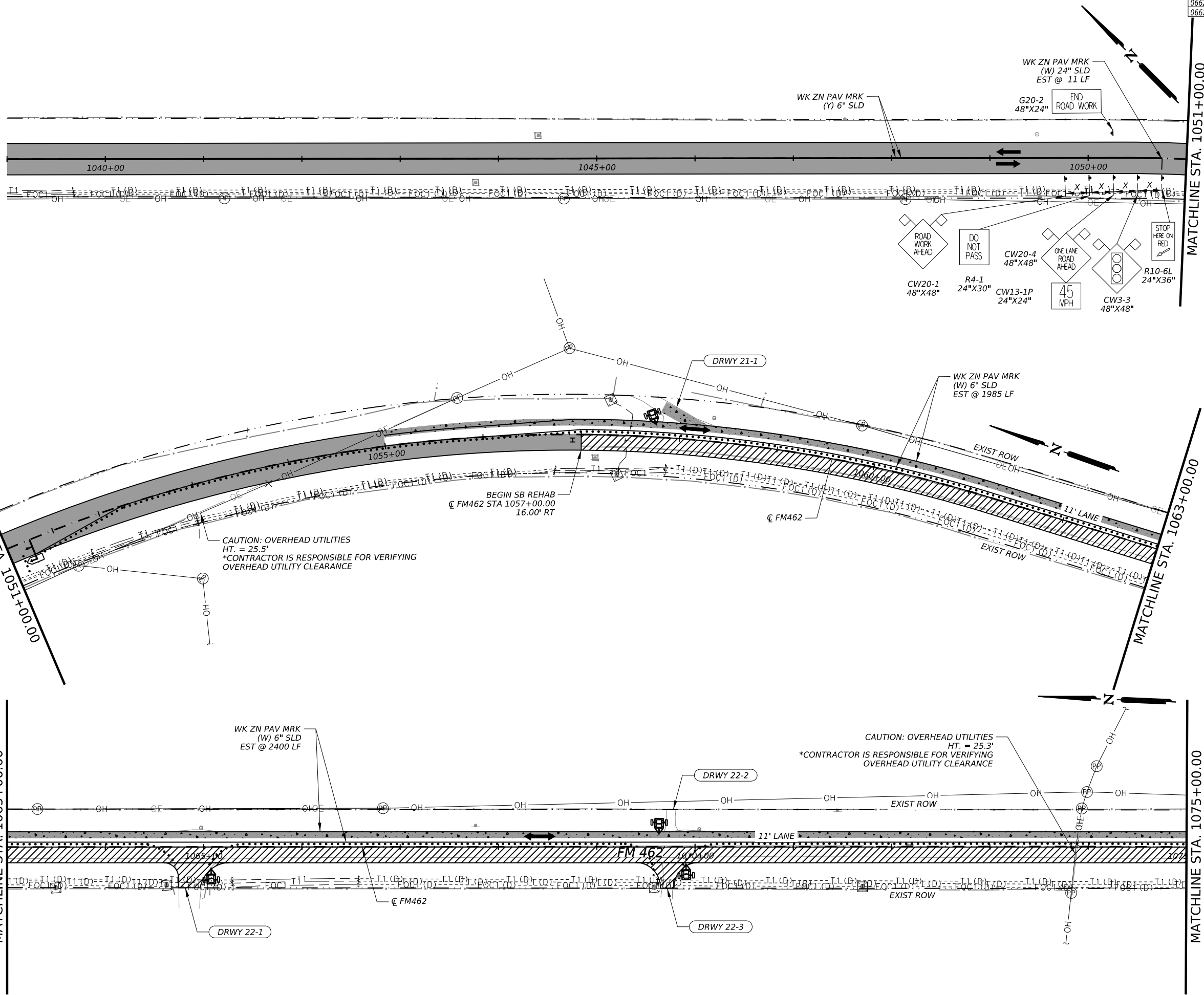
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	66

DATE: 1/31/2024 5:32:29 PM  
FILE: c:\p\mkh\1\0285615\FM462\_TCP\_PH8\_ST2B.dgn



ITEM	DESCRIPTION	UNIT	QTY
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	4385
0662.6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	11



**LEGEND**

- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  - CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

1/31/2024



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Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 9**

**STEP 1**

SHEET 1 OF 2

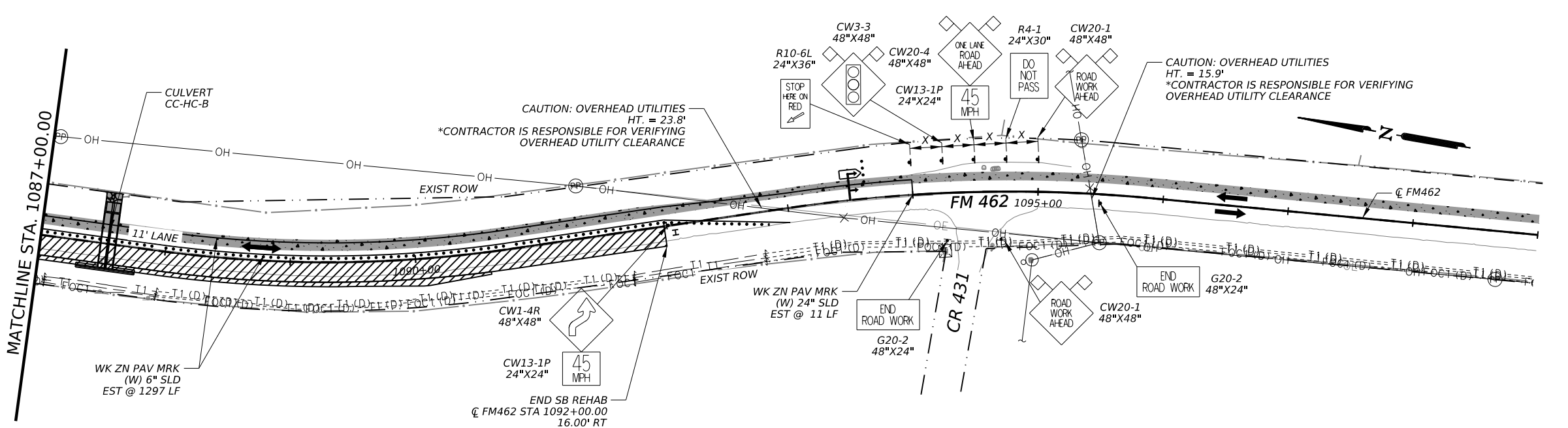
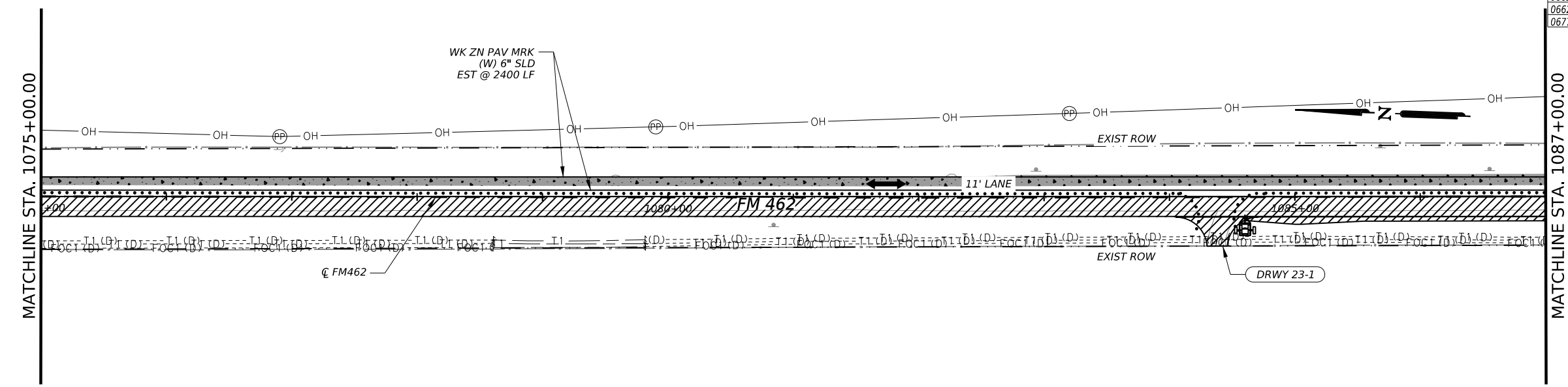
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	67

DATE: 1/31/2024 5:32:57 PM  
 FILE: c:\pwworking\10285615\FM462 TCP PH9 ST1\_01.dgn

CK: \_\_\_\_\_  
 DW: \_\_\_\_\_  
 CK: \_\_\_\_\_  
 DN: \_\_\_\_\_

CK: DW: CK: DW: CK: DW:

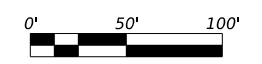
ITEM	DESCRIPTION	UNIT	QTY
0662 6067	WK ZN PAV MRK REMOV (W)6" SLD	LF	3697
0662 6075	WK ZN PAV MRK REMOV (W)24" SLD	LF	11
0677 6001	ELIM EXT PAV MRK & MRKS (4*)	LF	400



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
1. REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  2. CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

David Gutierrez  
 1/31/2024



**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 9**

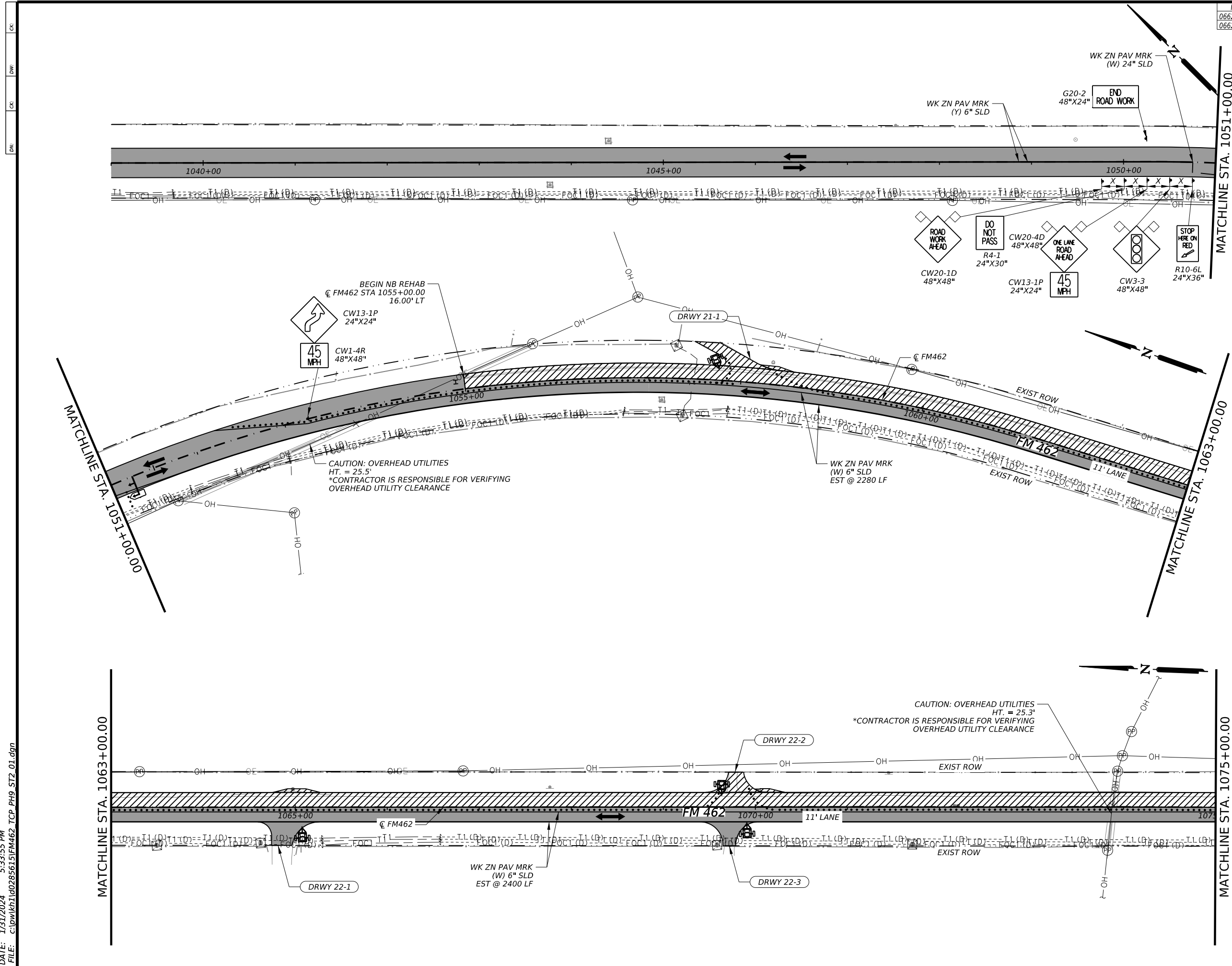
**STEP 1**

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	68

DATE: 1/31/2024 5:33:25 PM  
 FILE: c:\pwworking\10285615\FM462 TCP PH9 ST1\_02.dgn

ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	4850
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	4680

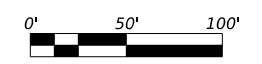


- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
1. REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  2. CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

1/31/2024

*David Gutierrez*



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**FM 462**

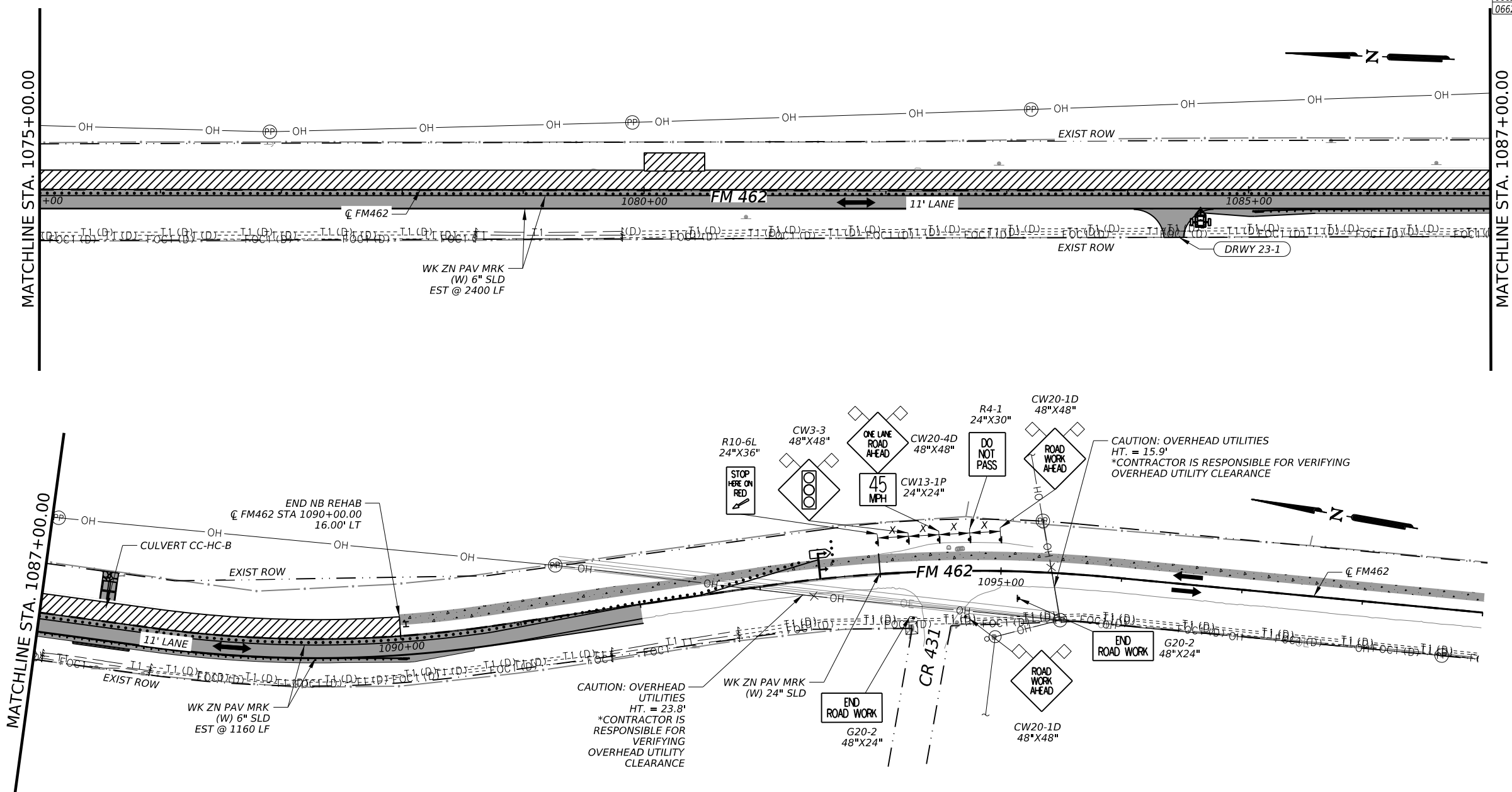
**TRAFFIC CONTROL PLAN**  
**PHASE 9**  
**STEP 2**

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	69	


DATE: 1/31/2024 5:33:55 PM  
FILE: c:\pwworking\10285615\FM462 TCP PH9 ST2 01.dgn

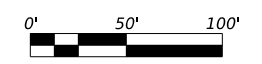
ITEM	DESCRIPTION	UNIT	QTY
0662.6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	2600
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	3560



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - CONSTRUCTION THIS STEP
  - CONSTRUCTION PREVIOUS STEP
  - TEMPORARY PAVEMENT THIS STEP
  - TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - TEMP PORTABLE TRAFFIC SIGNAL
  - DRIVEWAY ASSISTANCE DEVICE (DAD)

- NOTES:**
1. REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  2. CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

  
 1/31/2024  




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**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 9**

**STEP 2**

SHEET 2 OF 2

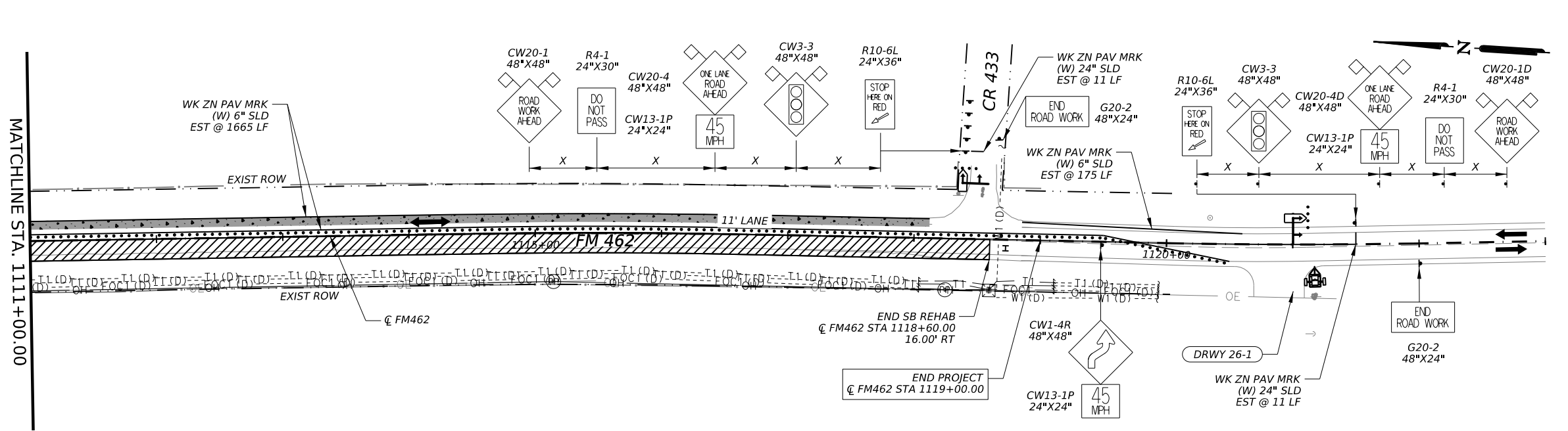
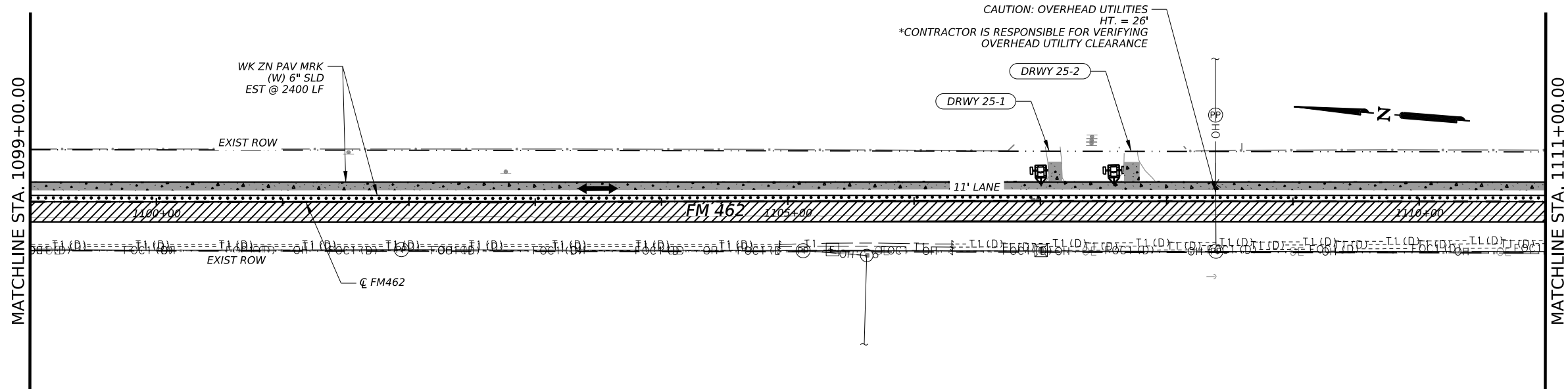
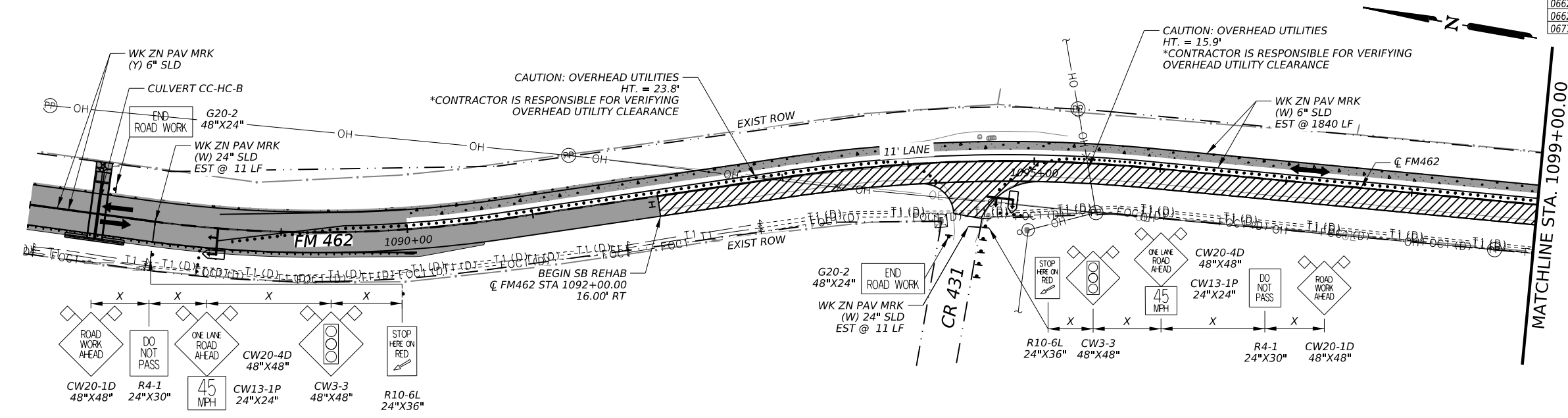
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0848	04	052	FM 462
SAT	COUNTY	SHEET NO.	
	MEDINA	70	

DATE: 1/31/2024 5:34:23 PM  
 FILE: c:\pwworking\kimley-horn.com\project\10285615\FM462 TCP PH9 ST2 02.dgn



CK: DW: CK: DN:

ITEM	DESCRIPTION	UNIT	QTY
0662.6067	WK ZN PAV MRK REMOV (W)6"(SLD)	LF	6080
0662.6075	WK ZN PAV MRK REMOV (W)24"(SLD)	LF	44
0677.6001	ELIM EXT PAV MRK & MRKS (4")	LF	580



**LEGEND**

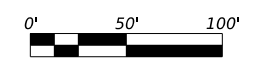
- PROPOSED TRAFFIC FLOW ARROW
- CONSTRUCTION THIS STEP
- CONSTRUCTION PREVIOUS STEP
- TEMPORARY PAVEMENT THIS STEP
- TEMPORARY PAVEMENT PREVIOUS STEP
- CHANNELIZING DEVICES
- TEMP PORTABLE TRAFFIC SIGNAL
- DRIVEWAY ASSISTANCE DEVICE (DAD)

**NOTES:**

- REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
- CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

1/31/2024

*David Gutierrez*



**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

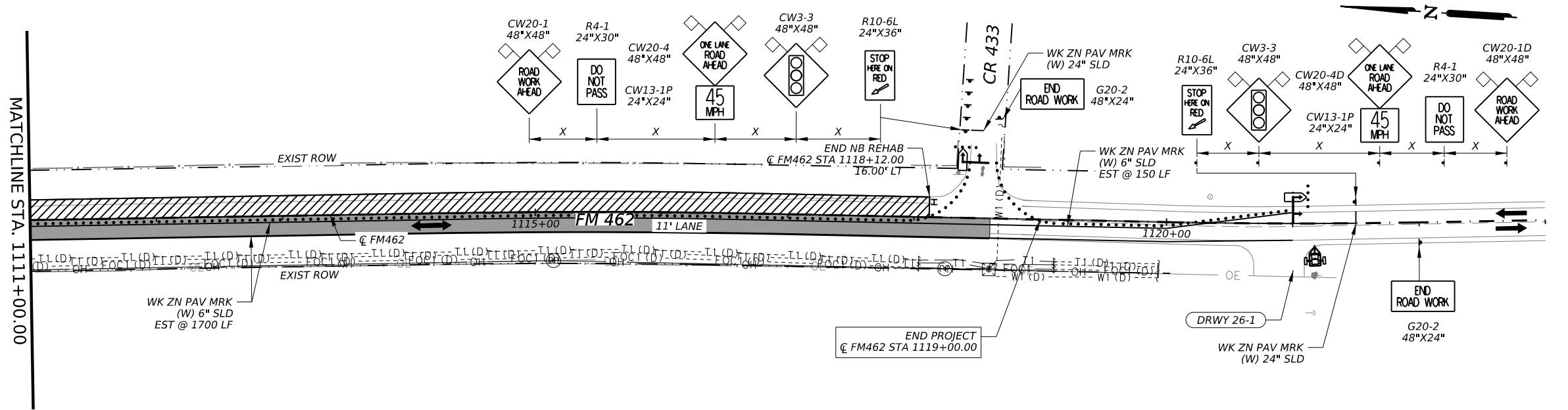
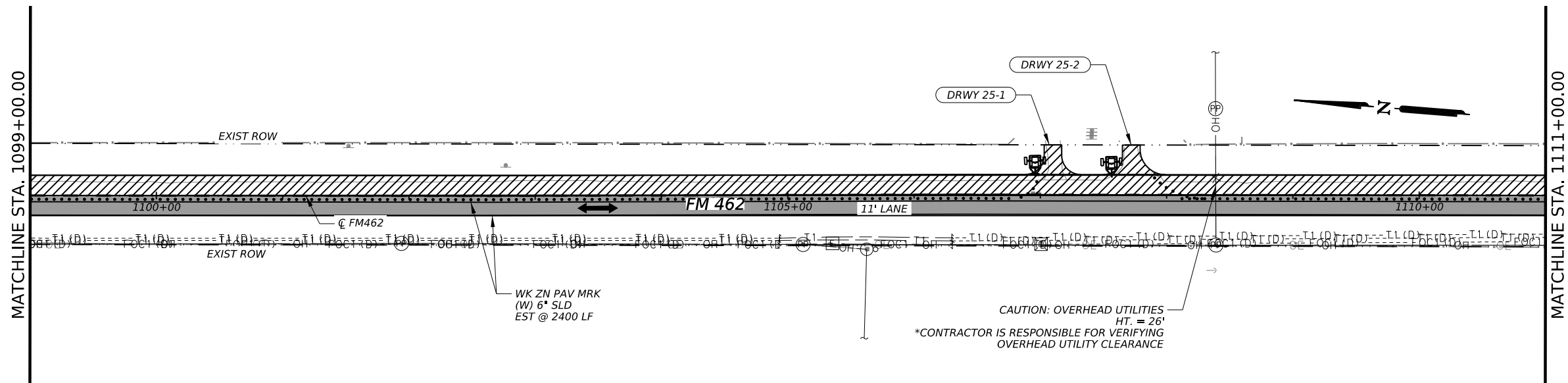
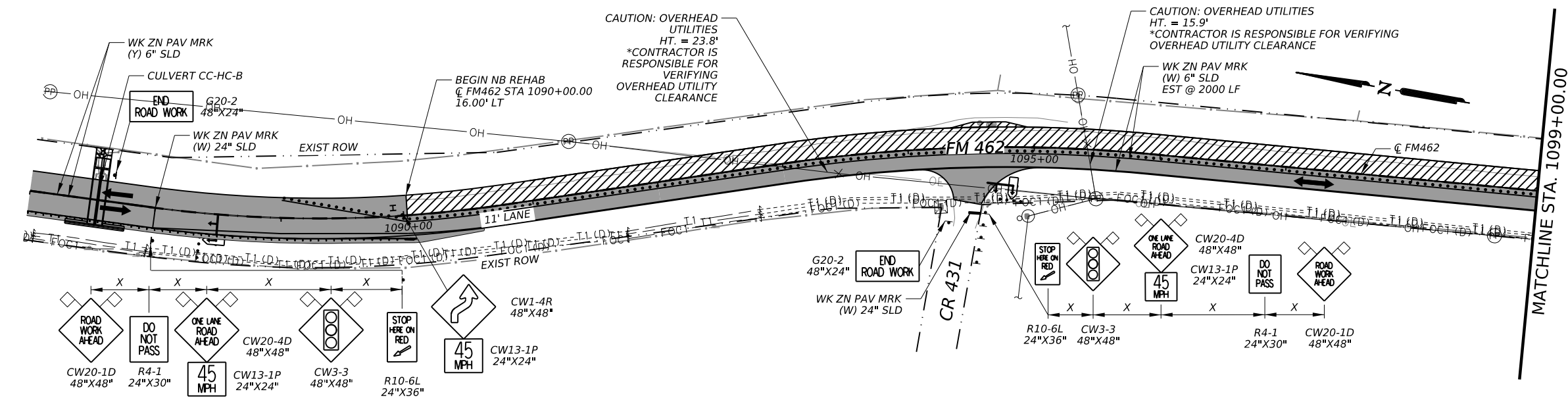
**PHASE 10**

**STEP 1**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY		SHEET NO.
SAT	MEDINA		71

DATE: 1/31/2024 5:34:52 PM  
 FILE: c:\pwworkh1\0285615\FM462 TCP PH10 ST1A.dgn



- LEGEND**
- PROPOSED TRAFFIC FLOW ARROW
  - ▨ CONSTRUCTION THIS STEP
  - ▩ CONSTRUCTION PREVIOUS STEP
  - ▧ TEMPORARY PAVEMENT THIS STEP
  - ▦ TEMPORARY PAVEMENT PREVIOUS STEP
  - CHANNELIZING DEVICES
  - ⊕ TEMP PORTABLE TRAFFIC SIGNAL
  - ⊕ DRIVEWAY ASSISTANCE DEVICE (DAD)
- NOTES:**
1. REFER TO STANDARD TCP(2-8) FOR INFORMATION NOT SHOWN ON THIS SHEET.
  2. CONTRACTOR TO PROVIDE SMOOTH TRANSITION AT LONGITUDINAL AND TRAVERSE PHASED JOINTS. NOT PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO PERTINENT ITEMS.

David Gutierrez  
 1/31/2024  
  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER



**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**TRAFFIC CONTROL PLAN**

**PHASE 10**

**STEP 2**

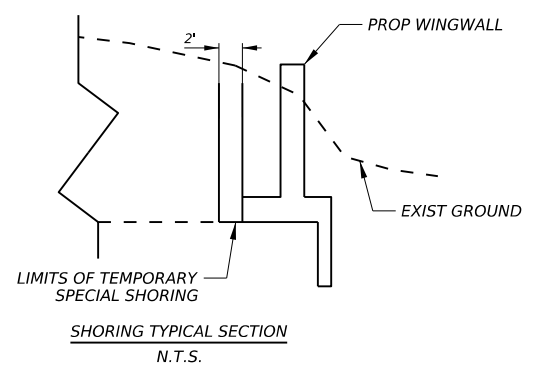
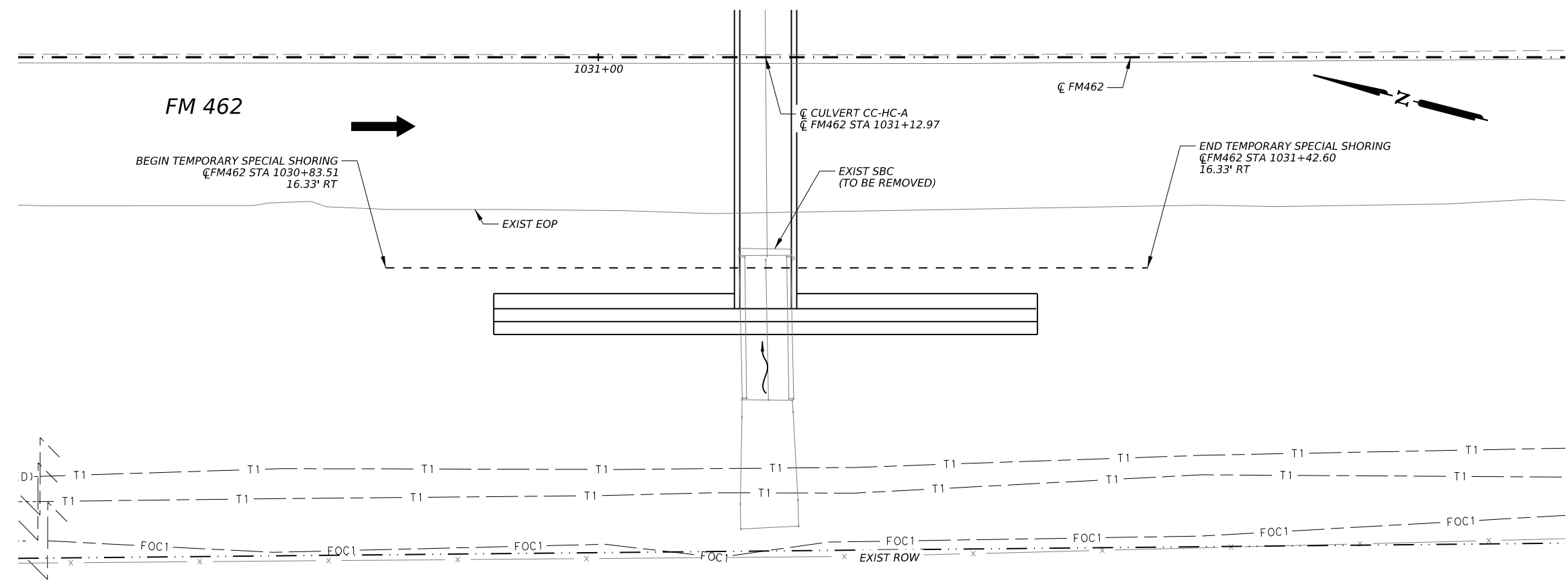
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	72	

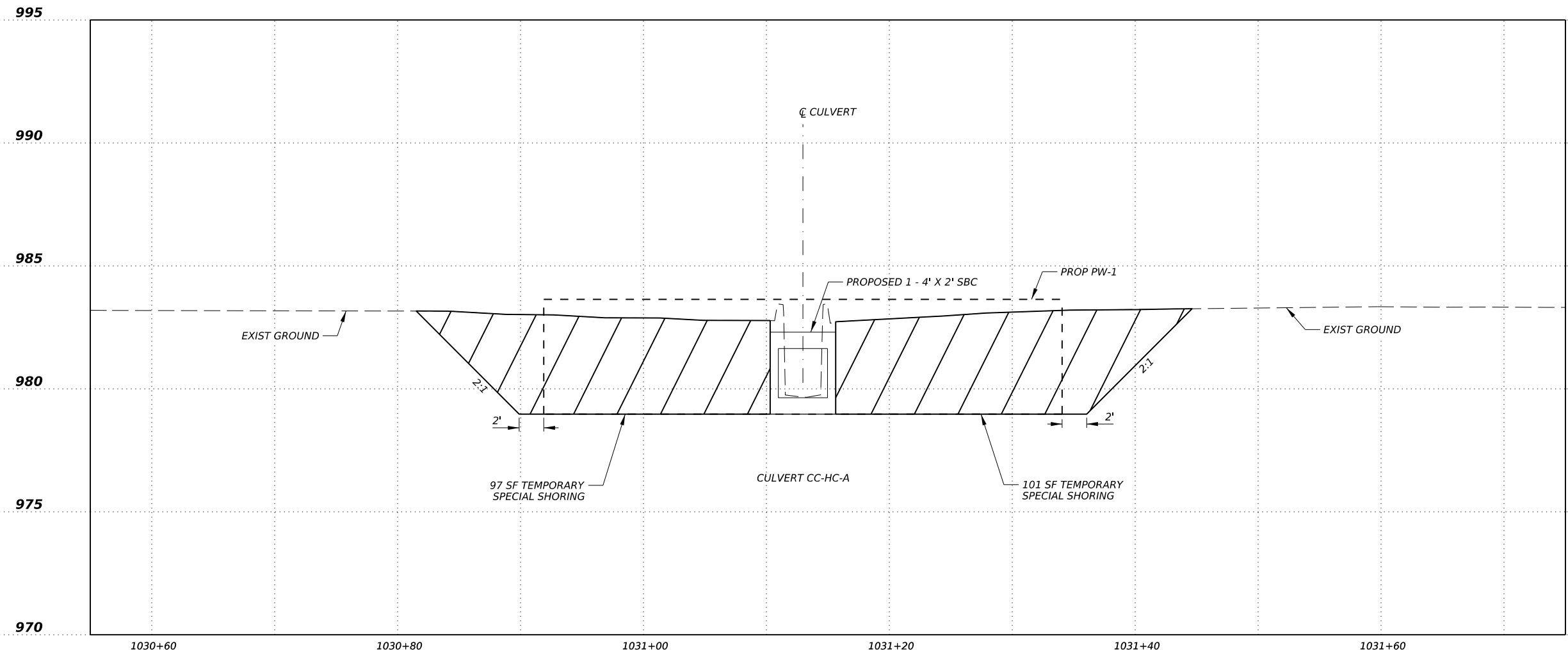
DATE: 1/31/2024 5:35:25 PM  
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CK: DW: CK: DN:



NOTES:  
1. REFER TO TCP PHASE 1A FOR QUANTITIES.



1/31/2024

DAVID H. GUTIERREZ  
143301  
LICENSED PROFESSIONAL ENGINEER

0' 5' 10' HORIZ  
0' 2.5' 5' VERT

**Kimley»Horn** F-928

Texas Department of Transportation

FM 462

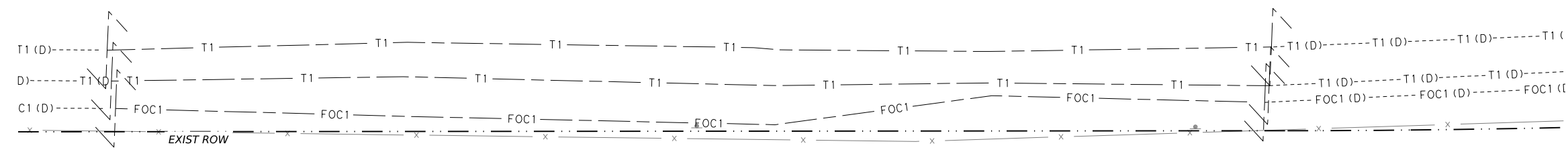
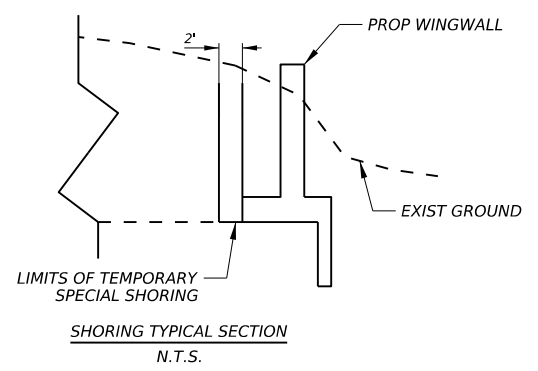
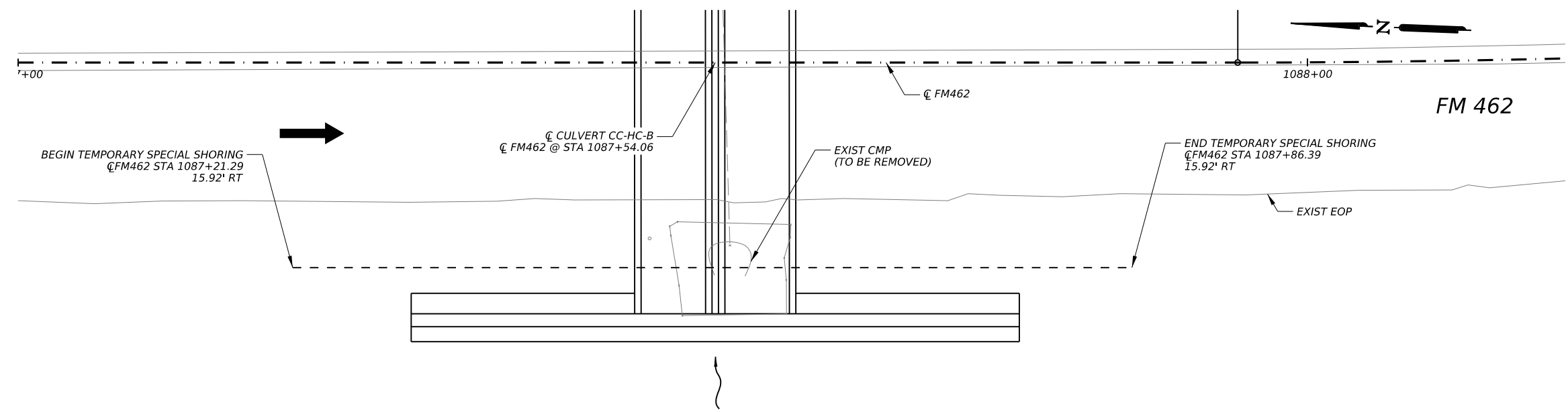
SHORING LAYOUT  
CULVERT CC-HC-A

SHEET 1 OF 2

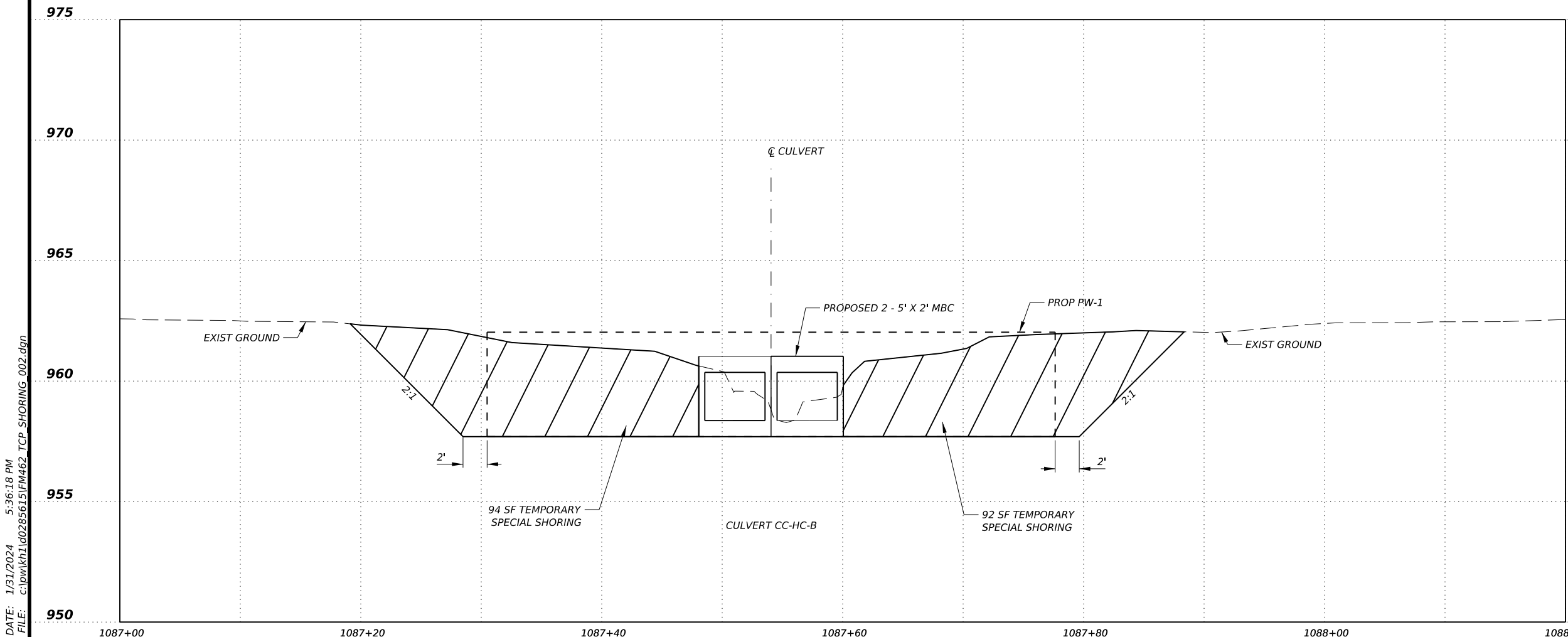
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	73

DATE: 1/31/2024 5:35:54 PM  
FILE: c:\pwworking\kimley-horn\project\10285615\FM462\_TCP\_SHORING\_001.dgn

CK: DW: CK: DN:



**NOTES:**  
 1. REFER TO TCP PHASE 1B FOR QUANTITIES.



1/31/2024

0' 5' 10' HORIZ  
 0' 2.5' 5' VERT

**Kimley»Horn** F-928

Texas Department of Transportation

FM 462

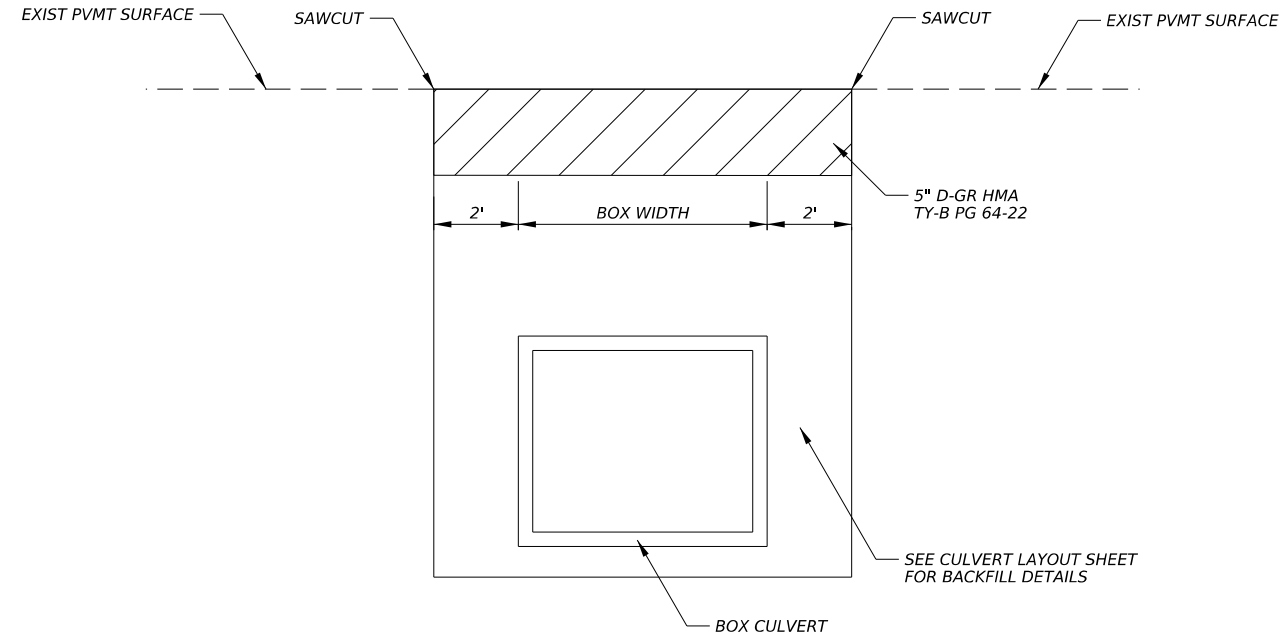
SHORING LAYOUT  
 CULVERT CC-HC-B

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	74

DATE: 1/31/2024 5:36:18 PM  
 FILE: c:\pwworking\10285615\FM462\_TCP\_SHORING\_002.dgn

DN: DW: CK: CK:



**CUT & RESTORE DETAIL**

**NOTES**

1. SAWCUT OF EXISTING PAVEMENT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 400.
2. HMA TY-B MATERIAL SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 400.
3. CONTRACTOR SHALL OBTAIN ENGINEER'S APPROVAL FOR CUTS WIDER THAN AS INDICATED IN THIS DETAIL.
4. HMA TY-B TO BE PLACED IN COMPACTED LIFTS IN ACCORDANCE WITH SPECIAL SPECIFICATION 3076

  
  
 1/31/2024

DATE: 1/31/2024 5:37:36 PM  
 FILE: c:\pwworkh1\0285615\FM462\_TCP\_MISCDET.dgn

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FM 462

MISCELLANEOUS  
 TCP DETAILS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	75	

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DATE: 1/31/2024 5:38:00 PM  
 FILE: c:\pw\khi\d0285615\bc-21.dgn

**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).

<p><b>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT</b>  <a href="http://www.txdot.gov">http://www.txdot.gov</a></p>
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

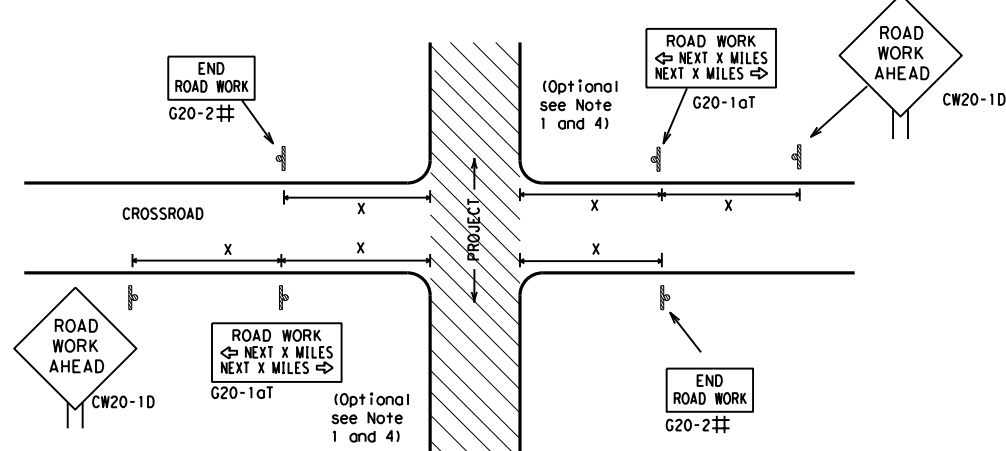


**BARRICADE AND CONSTRUCTION  
 GENERAL NOTES  
 AND REQUIREMENTS**  
  
**BC (1) - 21**

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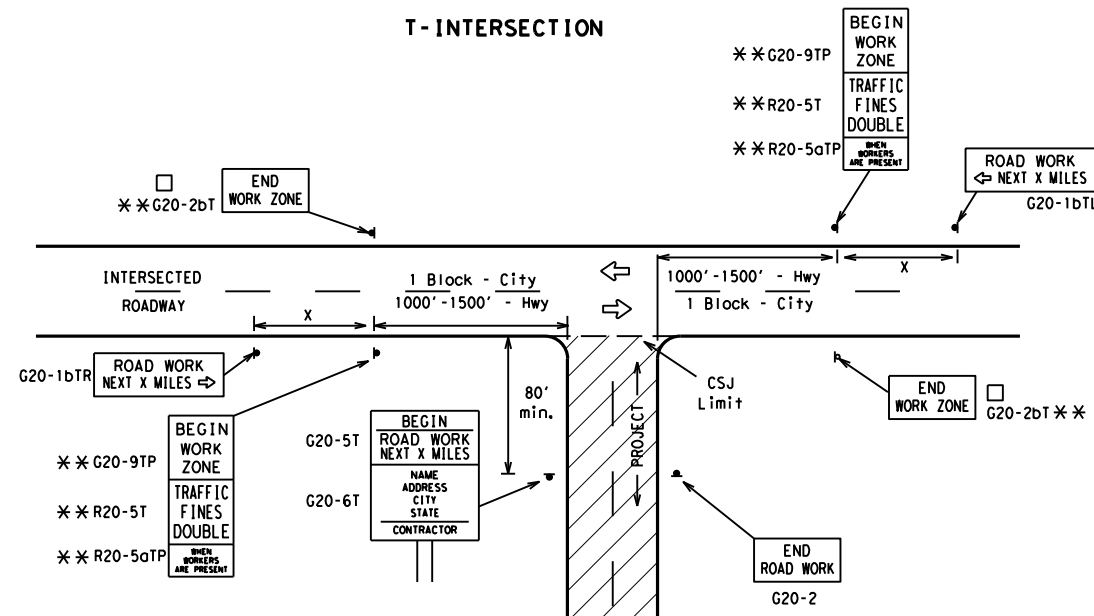
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**TYPICAL LOCATION OF CROSSROAD SIGNS**



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

**T-INTERSECTION**



**CSJ LIMITS AT T-INTERSECTION**

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

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

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

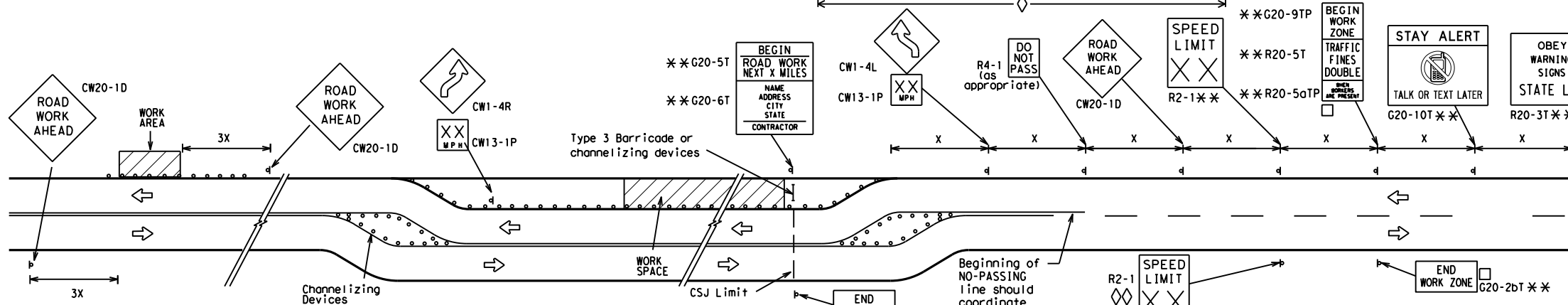
\* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

**GENERAL NOTES**

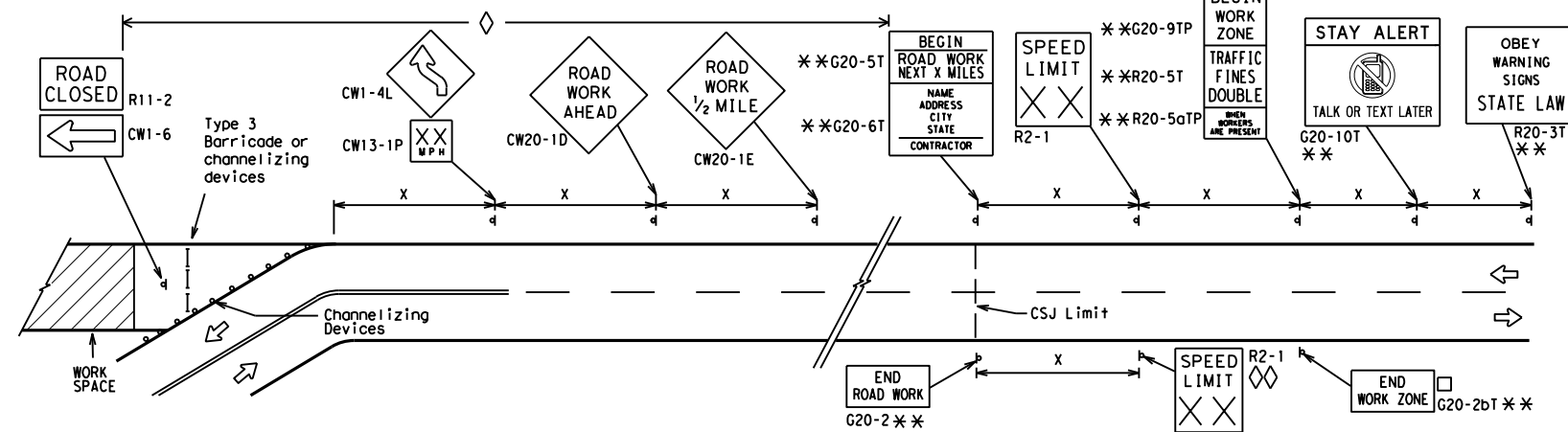
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

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

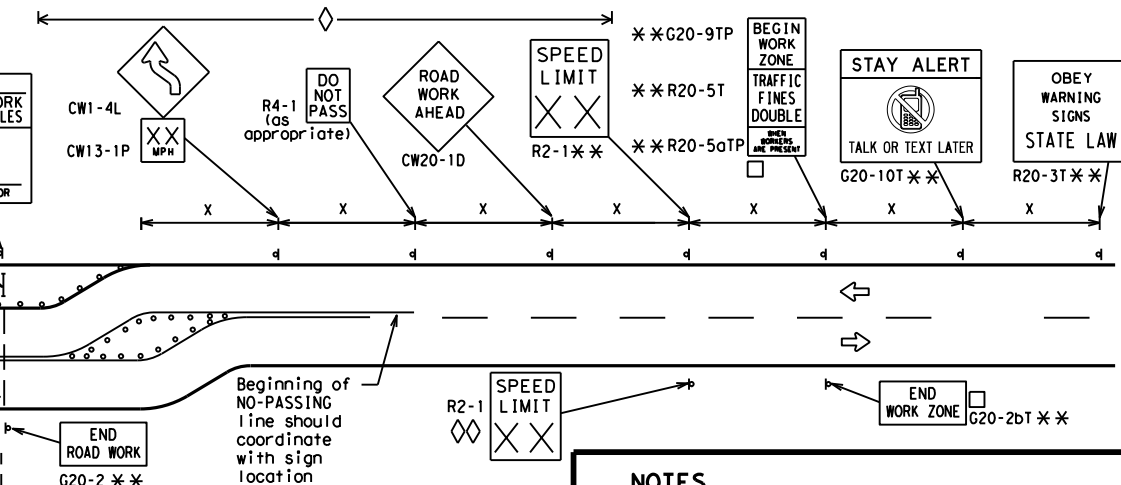


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



**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 chart or the TMUTCD for sign spacing requirements.

SHEET 2 OF 12



**BARRICADE AND CONSTRUCTION PROJECT LIMIT**

**BC(2)-21**

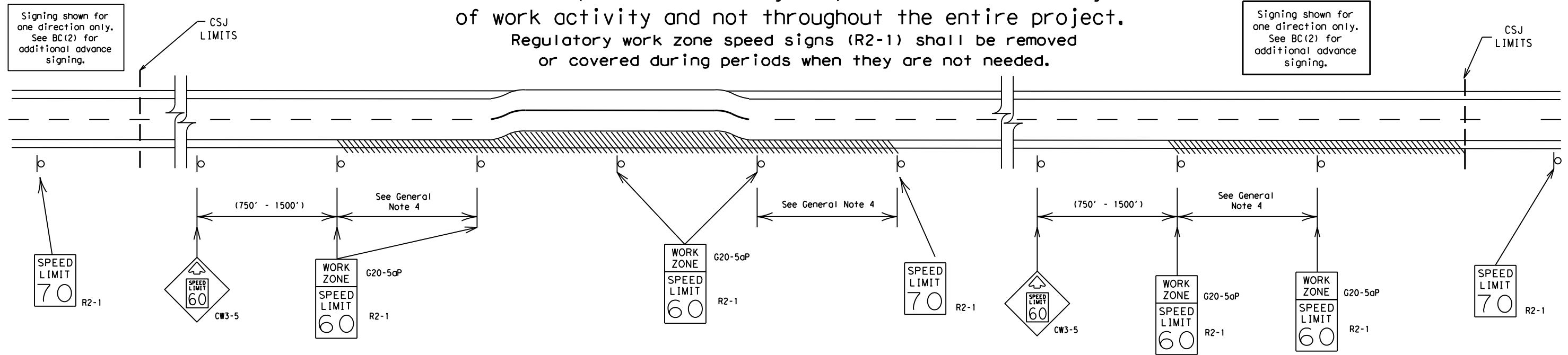
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# TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



## GUIDANCE FOR USE:

### LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

### SHORT TERM WORK ZONE SPEED LIMITS

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

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

## GENERAL NOTES

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

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SHEET 3 OF 12



## BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

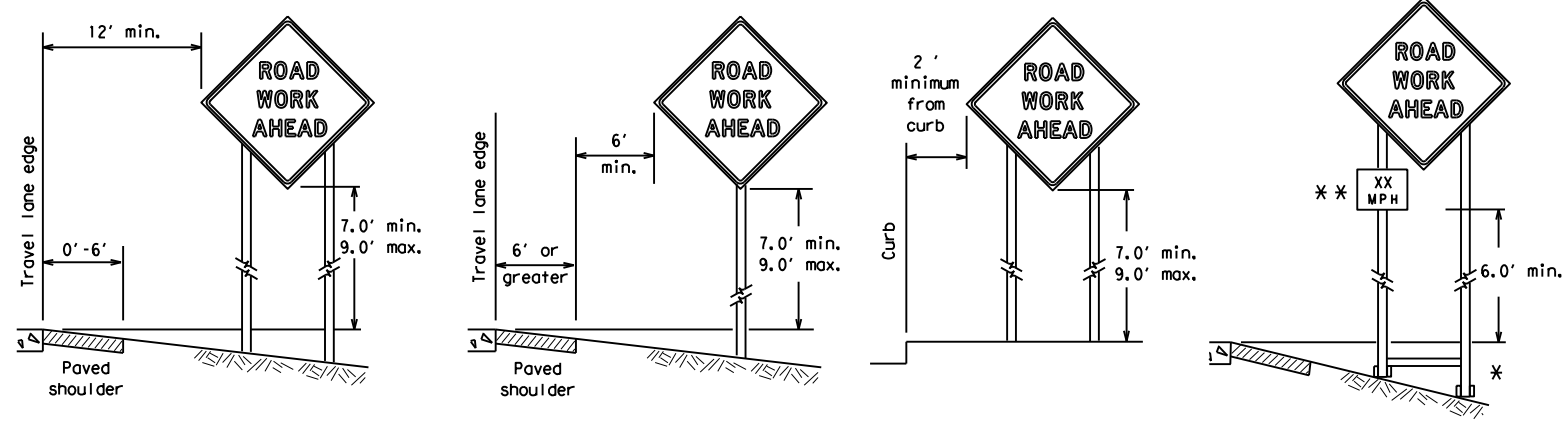
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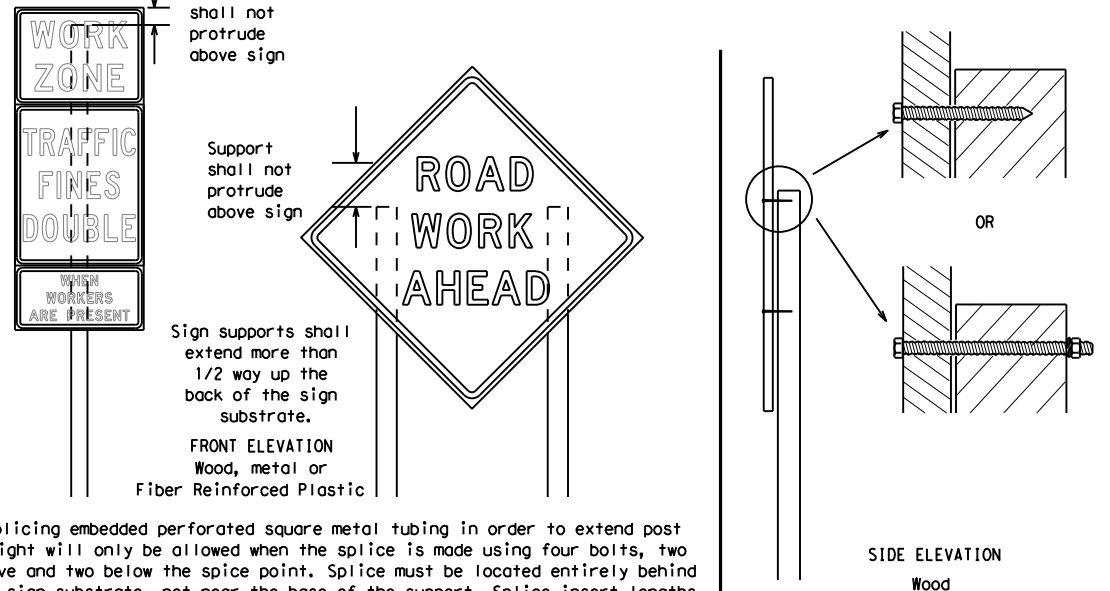
**TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS**



\* 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 support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

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

**GENERAL NOTES FOR WORK ZONE SIGNS**

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

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

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

**SIGN MOUNTING HEIGHT**

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

**SIZE OF SIGNS**

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

**SIGN SUBSTRATES**

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

**REFLECTIVE SHEETING**

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

**SIGN LETTERS**

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

**REMOVING OR COVERING**

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

**SIGN SUPPORT WEIGHTS**

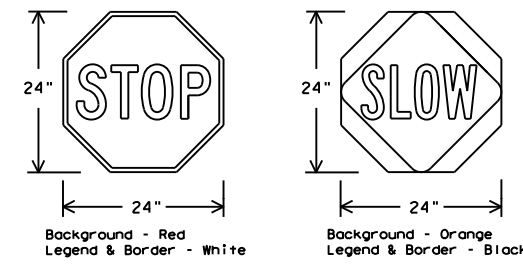
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not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

**FLAGS ON SIGNS**

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

**STOP/SLOW PADDLES**

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



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

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

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



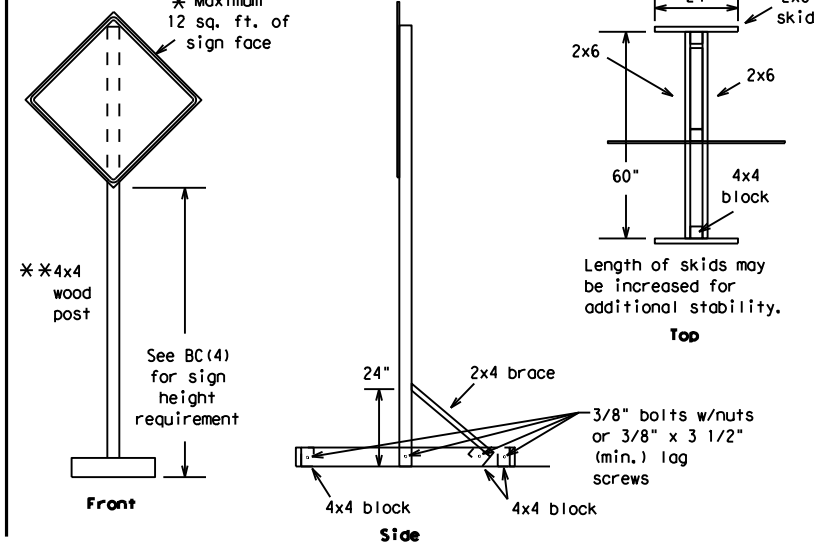
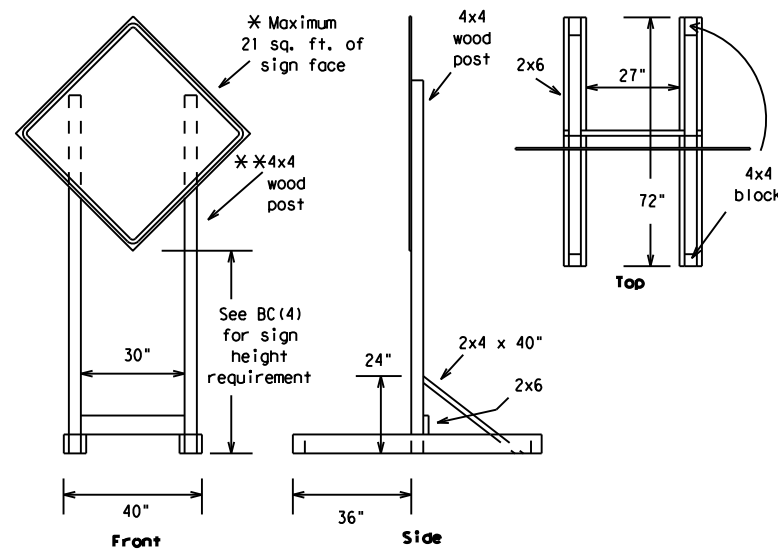
**BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES**

**BC (4) - 21**

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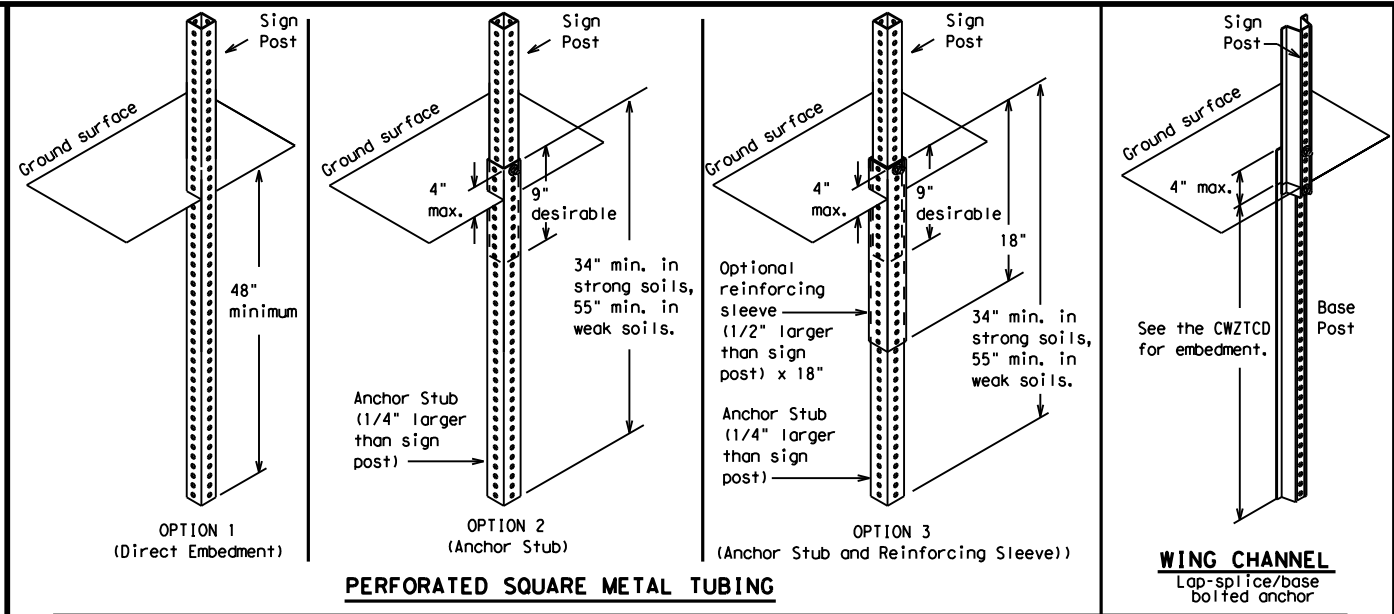
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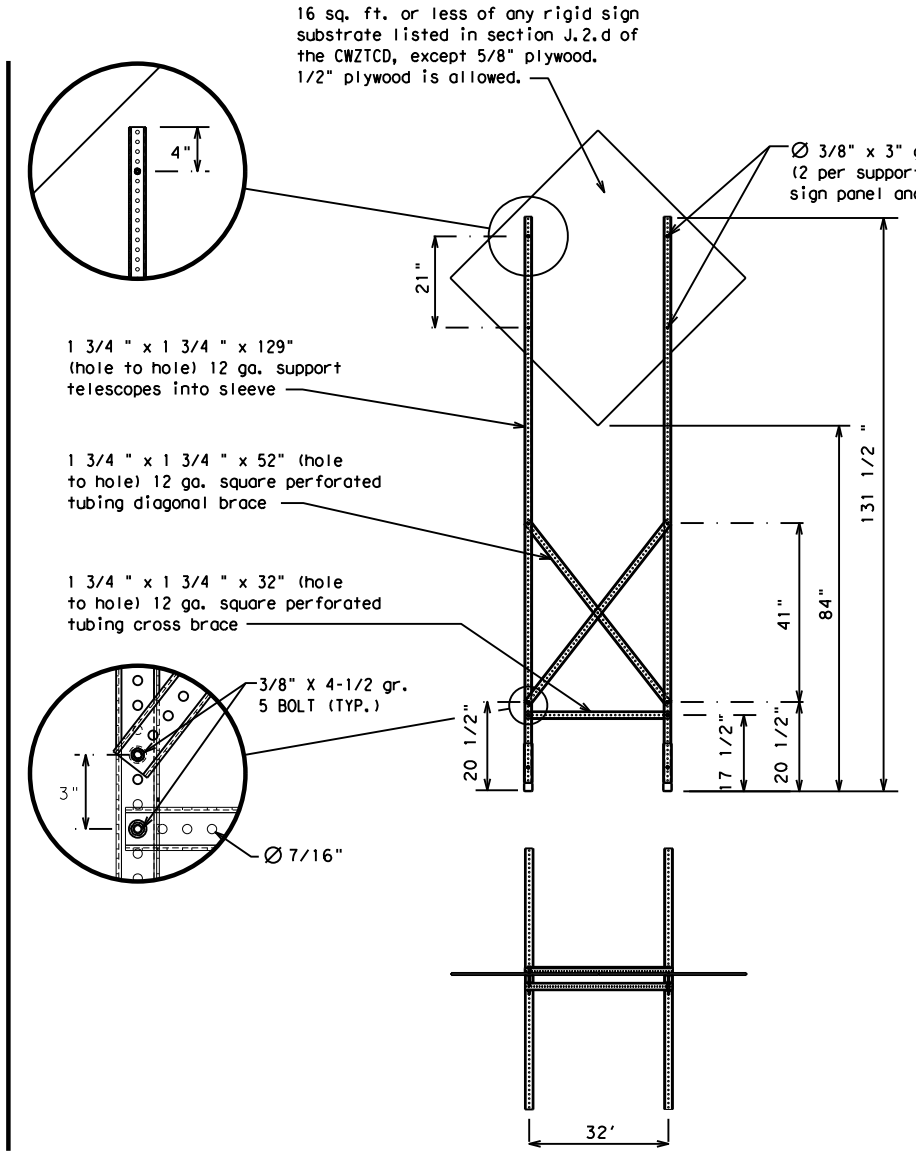
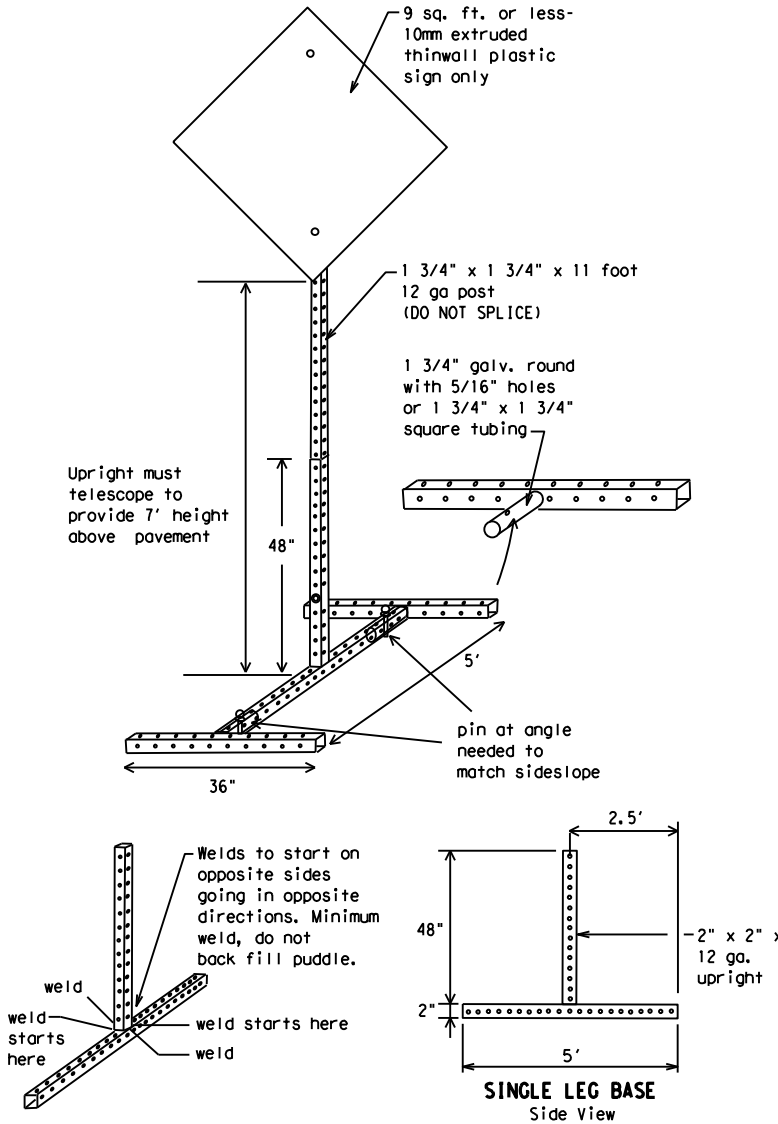
### SKID MOUNTED WOOD SIGN SUPPORTS

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



### GROUND MOUNTED SIGN SUPPORTS

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



### SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

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

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

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

SHEET 5 OF 12



## BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	SAT	MEDINA	80	

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

# RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

## PORTABLE CHANGEABLE MESSAGE SIGNS

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

## Phase 1: Condition Lists

### Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

### Other Condition List

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI
ROADWORK XXX FT
FLAGGER XXXX FT
RIGHT LN NARROWS XXXX FT
MERGING TRAFFIC XXXX FT
LOOSE GRAVEL XXXX FT
DETOUR X MILE
ROADWORK PAST SH XXXX
BUMP XXXX FT
TRAFFIC SIGNAL XXXX FT
ROAD REPAIRS XXXX FT
LANE NARROWS XXXX FT
TWO-WAY TRAFFIC XX MILE
CONST TRAFFIC XXX FT
UNEVEN LANES XXXX FT
ROUGH ROAD XXXX FT
ROADWORK NEXT FRI-SUN
US XXX EXIT X MILES
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
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE *
FORM X LINES RIGHT
USE XXXXX RD EXIT
USE EXIT I-XX NORTH
USE I-XX E TO I-XX N
WATCH FOR TRUCKS
EXPECT DELAYS
END SHOULDER USE
WATCH FOR WORKERS

### Location List

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

### Warning List

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

### \*\* Advance Notice List

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

\*\* See Application Guidelines Note 6.

## APPLICATION GUIDELINES

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

## WORDING ALTERNATIVES

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

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

## FULL MATRIX PCMS SIGNS

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

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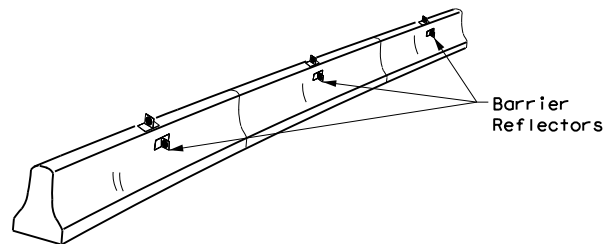
WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Canal	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLR
High-Occupancy Vehicle	HOV	Tuesday	TUES
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

<h3>BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)</h3>			
<h2>BC (6) - 21</h2>			
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT November 2002	CONT: 0848	SECT: 04	JOB: 052
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9-07 8-14	DIST: 7-13	COUNTY: 5-21	SHEET NO. 81
SAT		MEDINA	

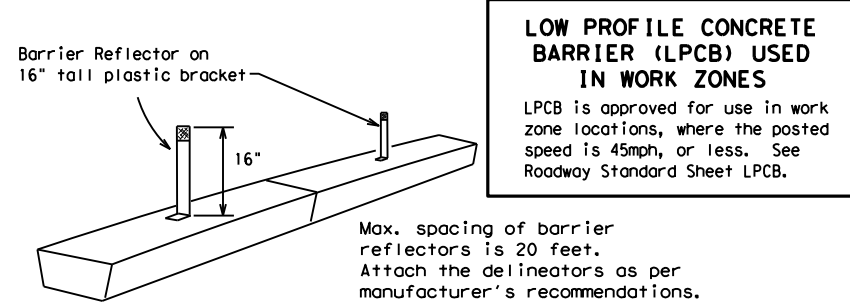
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



**CONCRETE TRAFFIC BARRIER (CTB)**

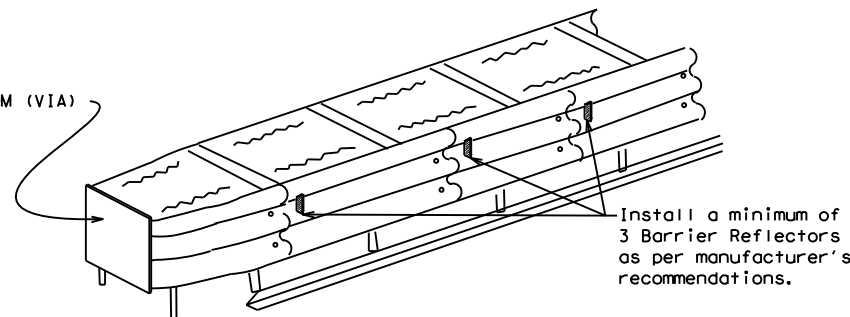
- Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector.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



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

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

**LOW PROFILE CONCRETE BARRIER (LPCB)**



**DELINEATION OF END TREATMENTS**

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

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

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

**WARNING LIGHTS**

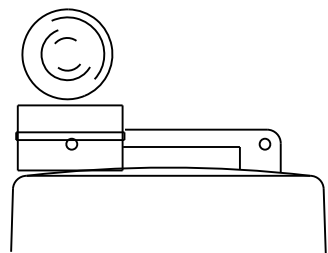
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

**WARNING LIGHTS MOUNTED ON PLASTIC DRUMS**

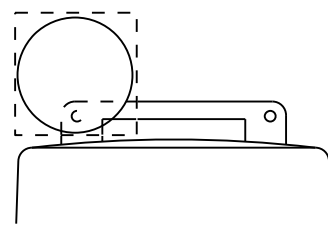
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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



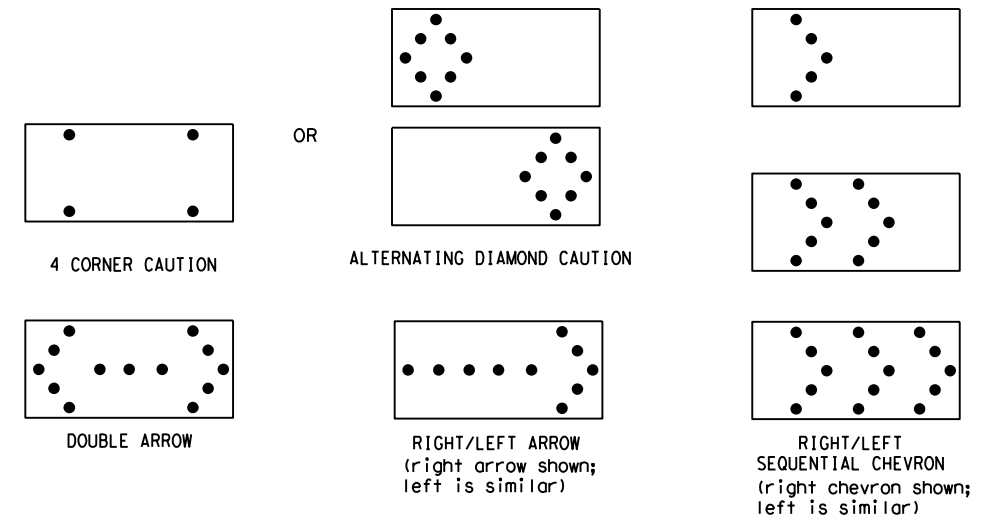
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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

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



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

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

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

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

**FLASHING ARROW BOARDS**

SHEET 7 OF 12

**TRUCK-MOUNTED ATTENUATORS**

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



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

**BC (7) -21**

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
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**GENERAL NOTES**

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

**GENERAL DESIGN REQUIREMENTS**

Pre-qualified plastic drums shall meet the following requirements:

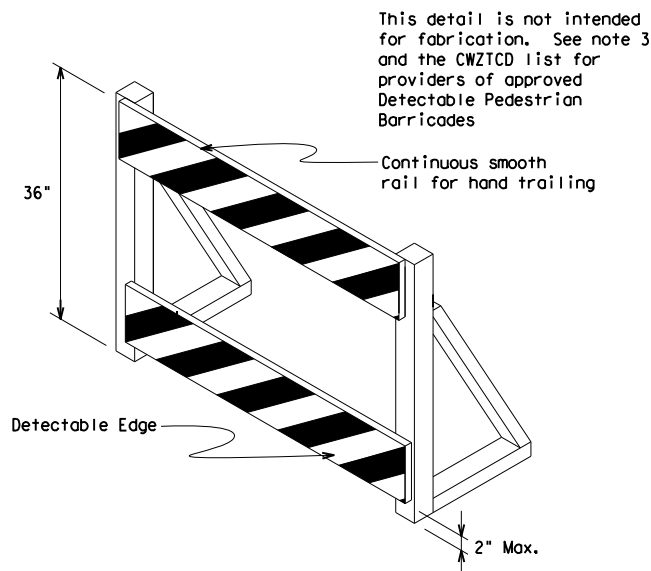
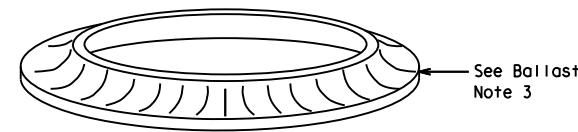
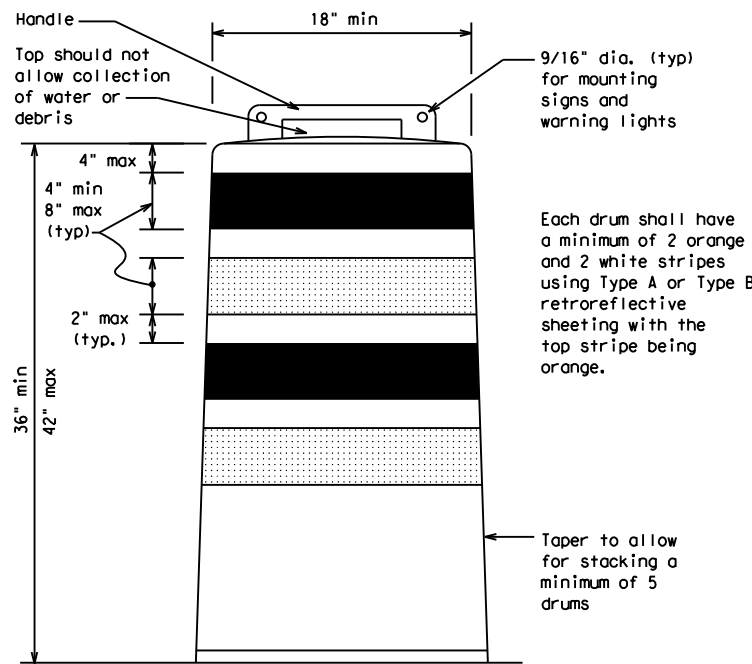
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

**RETROREFLECTIVE SHEETING**

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

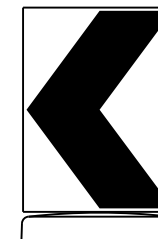
**BALLAST**

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

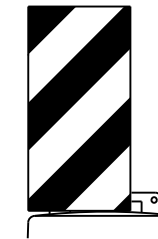


**DETECTABLE PEDESTRIAN BARRICADES**

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



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



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

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

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

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

SHEET 8 OF 12



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

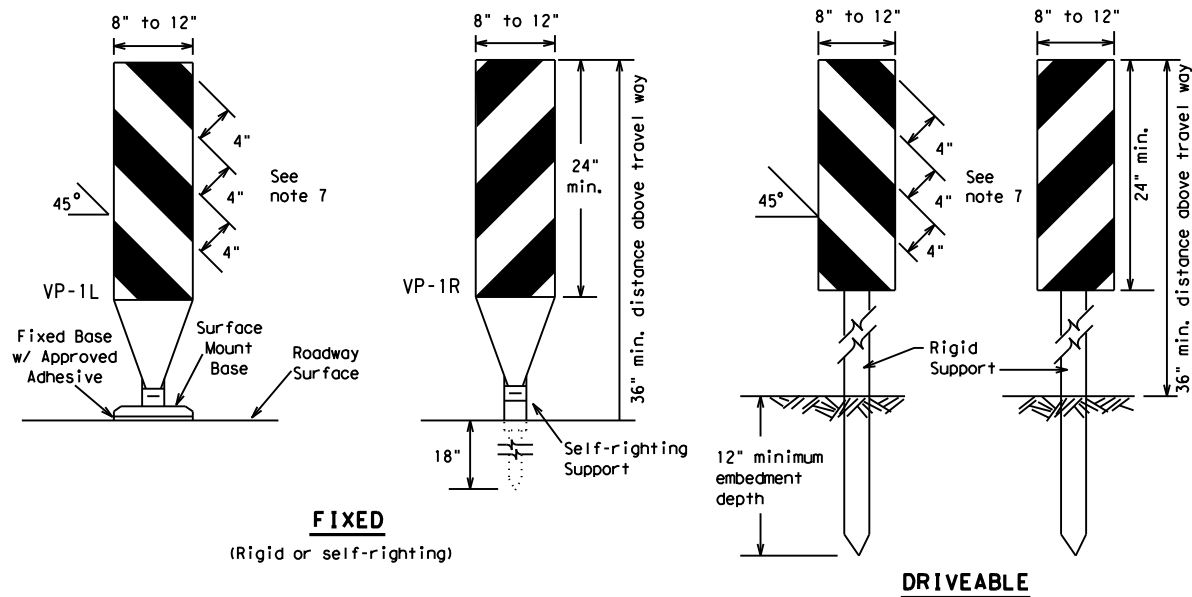
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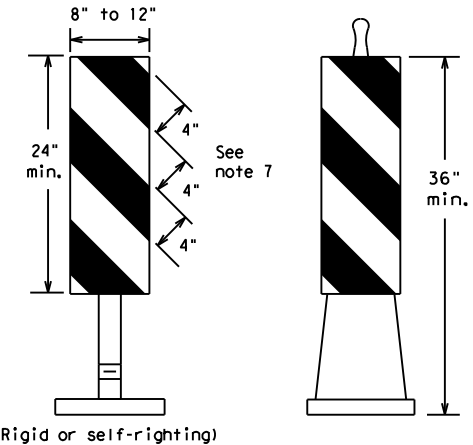
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**FIXED**  
(Rigid or self-righting)

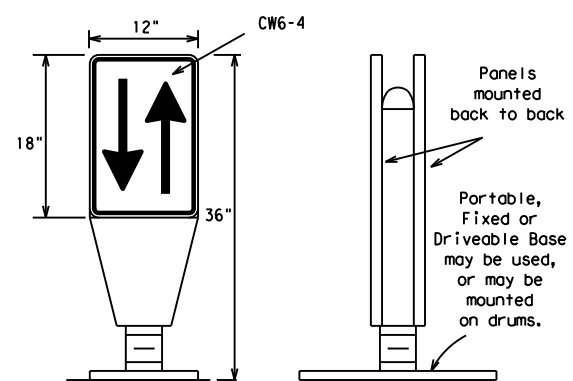
**DRIVEABLE**



**PORTABLE**

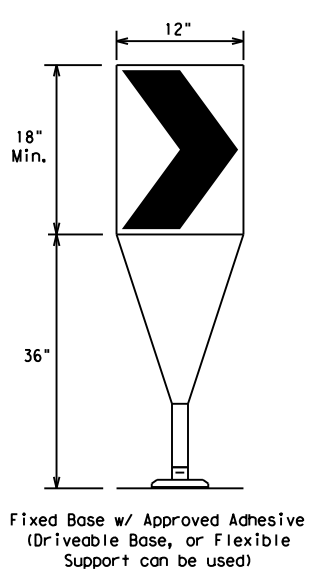
**VERTICAL PANELS (VPs)**

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



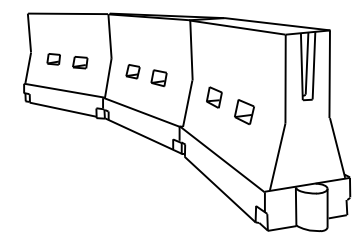
**OPPOSING TRAFFIC LANE DIVIDERS (OTLD)**

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



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

**CHEVRONS**



**LONGITUDINAL CHANNELIZING DEVICES (LCD)**

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

**WATER BALLASTED SYSTEMS USED AS BARRIERS**

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

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

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

**GENERAL NOTES**

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

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

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

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

SHEET 9 OF 12



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (9) - 21**

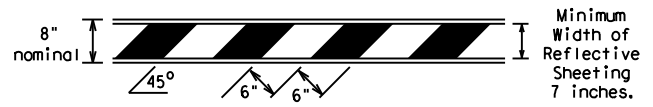
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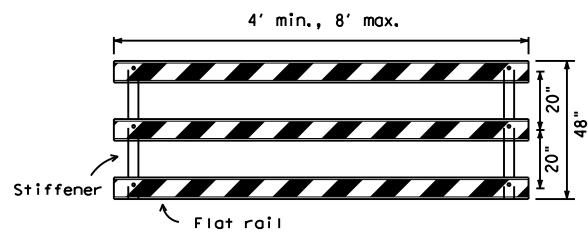
**TYPE 3 BARRICADES**

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

Barricades shall NOT be used as a sign support.

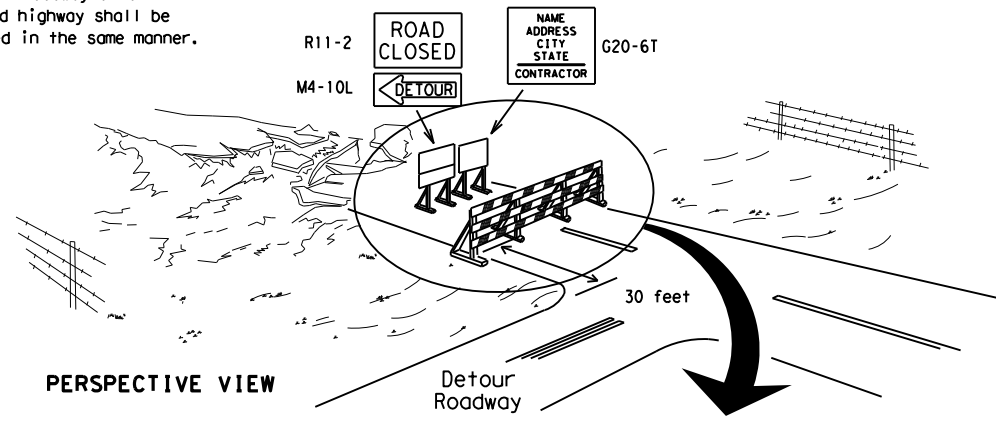


**TYPICAL STRIPING DETAIL FOR BARRICADE RAIL**



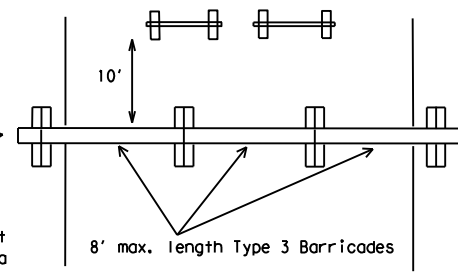
**TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES**

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



PERSPECTIVE VIEW

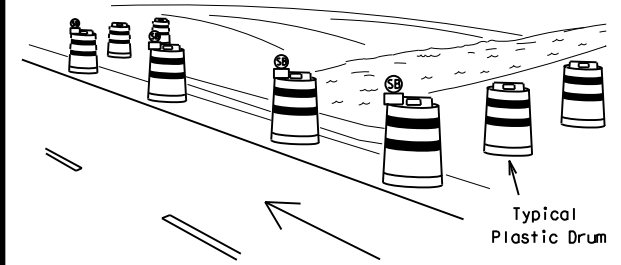
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



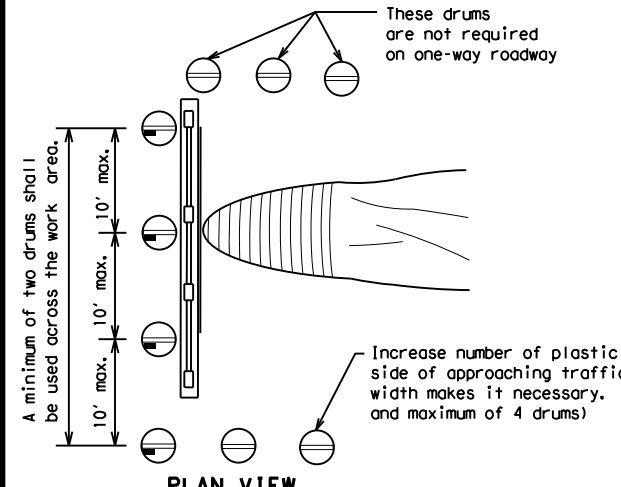
PLAN VIEW

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

**TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION**



PERSPECTIVE VIEW

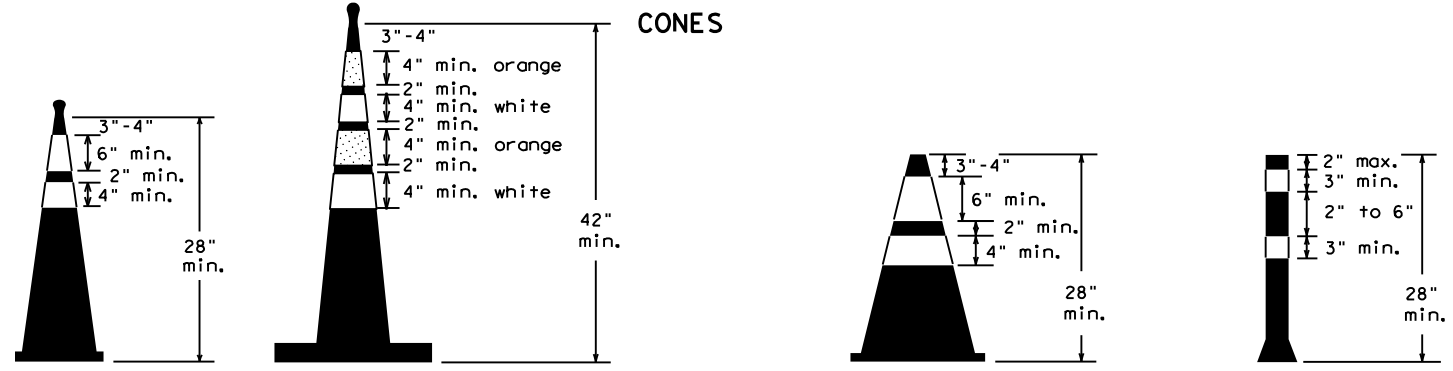


PLAN VIEW

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

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

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



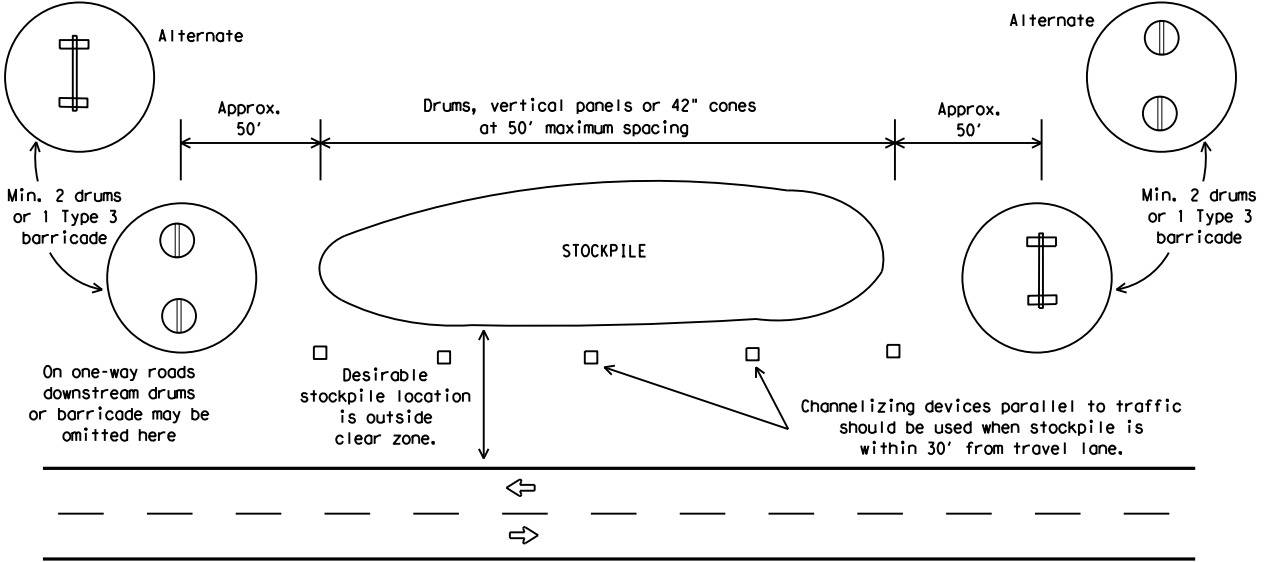
Two-Piece cones

One-Piece cones

Tubular Marker

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

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**



**BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES**

**BC (10) - 21**

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## WORK ZONE PAVEMENT MARKINGS

### GENERAL

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

### RAISED PAVEMENT MARKERS

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

### PREFABRICATED PAVEMENT MARKINGS

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

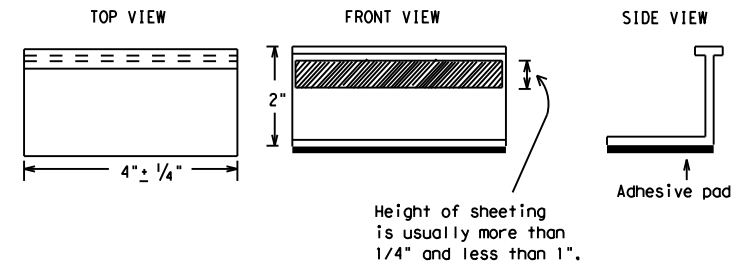
### MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

### REMOVAL OF PAVEMENT MARKINGS

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

## Temporary Flexible-Reflective Roadway Marker Tabs



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

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

### RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

SHEET 11 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

**BC(11)-21**

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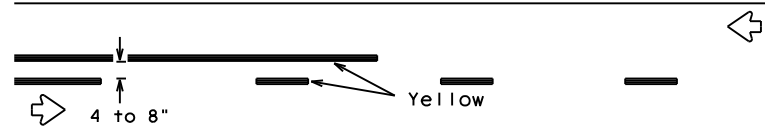
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## PAVEMENT MARKING PATTERNS

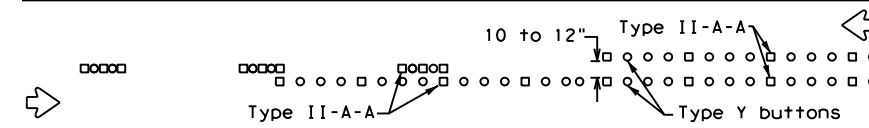


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

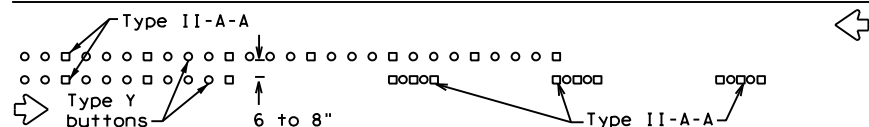


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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

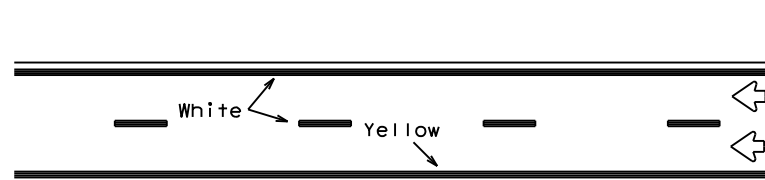


RAISED PAVEMENT MARKERS - PATTERN A



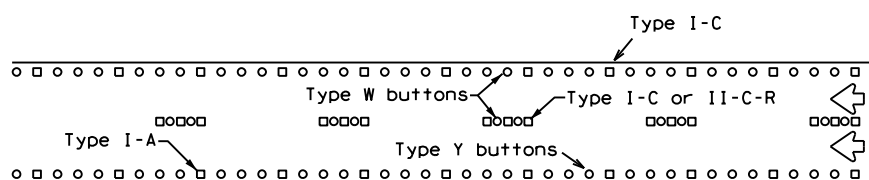
RAISED PAVEMENT MARKERS - PATTERN B

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



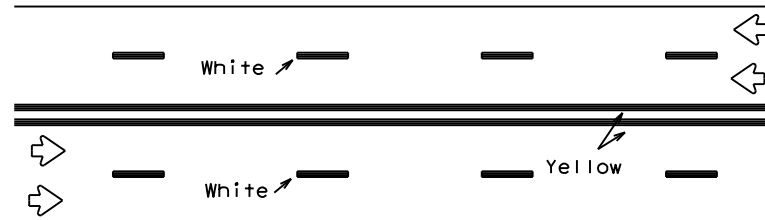
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



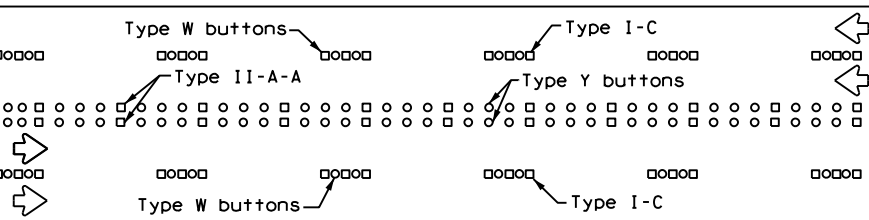
RAISED PAVEMENT MARKERS

## EDGE & LANE LINES FOR DIVIDED HIGHWAY



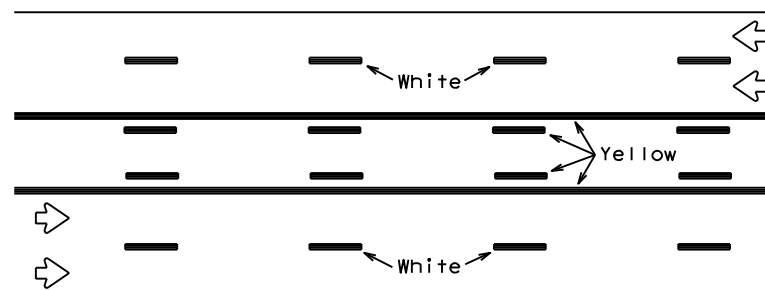
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



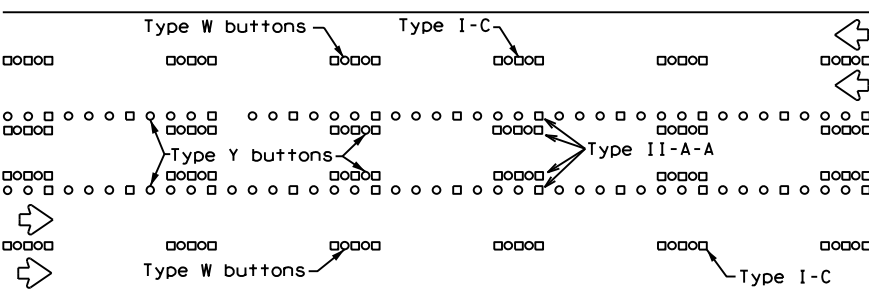
RAISED PAVEMENT MARKERS

## LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

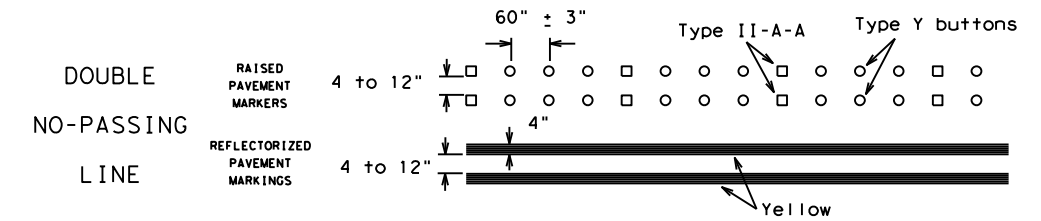
Prefabricated markings may be substituted for reflectORIZED pavement markings.



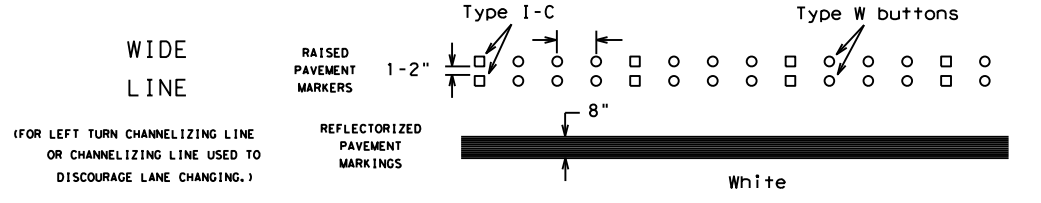
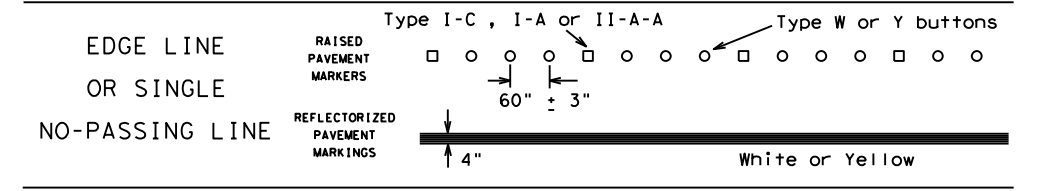
RAISED PAVEMENT MARKERS

## TWO-WAY LEFT TURN LANE

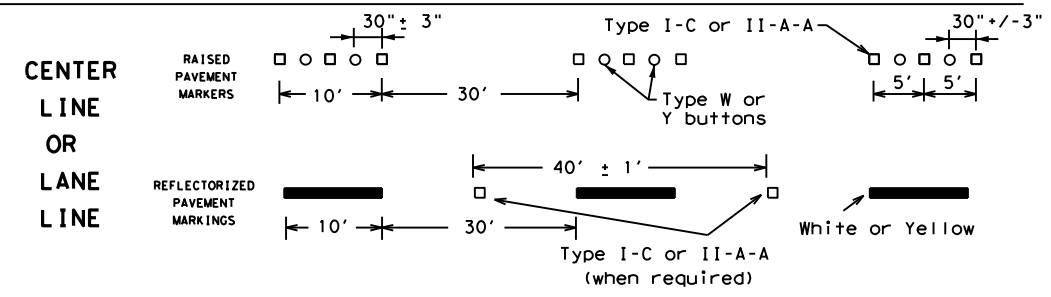
## STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



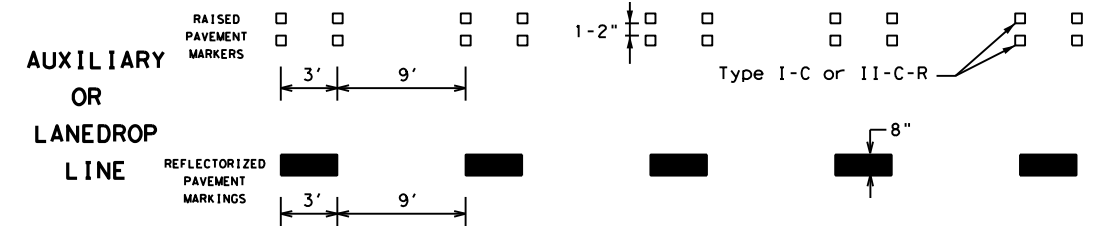
### SOLID LINES



(FOR LEFT TURN CHANNELIZING LINE OR CHANNELIZING LINE USED TO DISCOURAGE LANE CHANGING.)

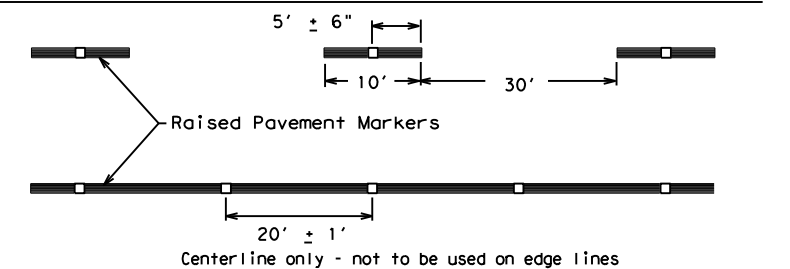


### BROKEN LINES



### REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



## BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	SAT	MEDINA	87	
11-02 8-14				

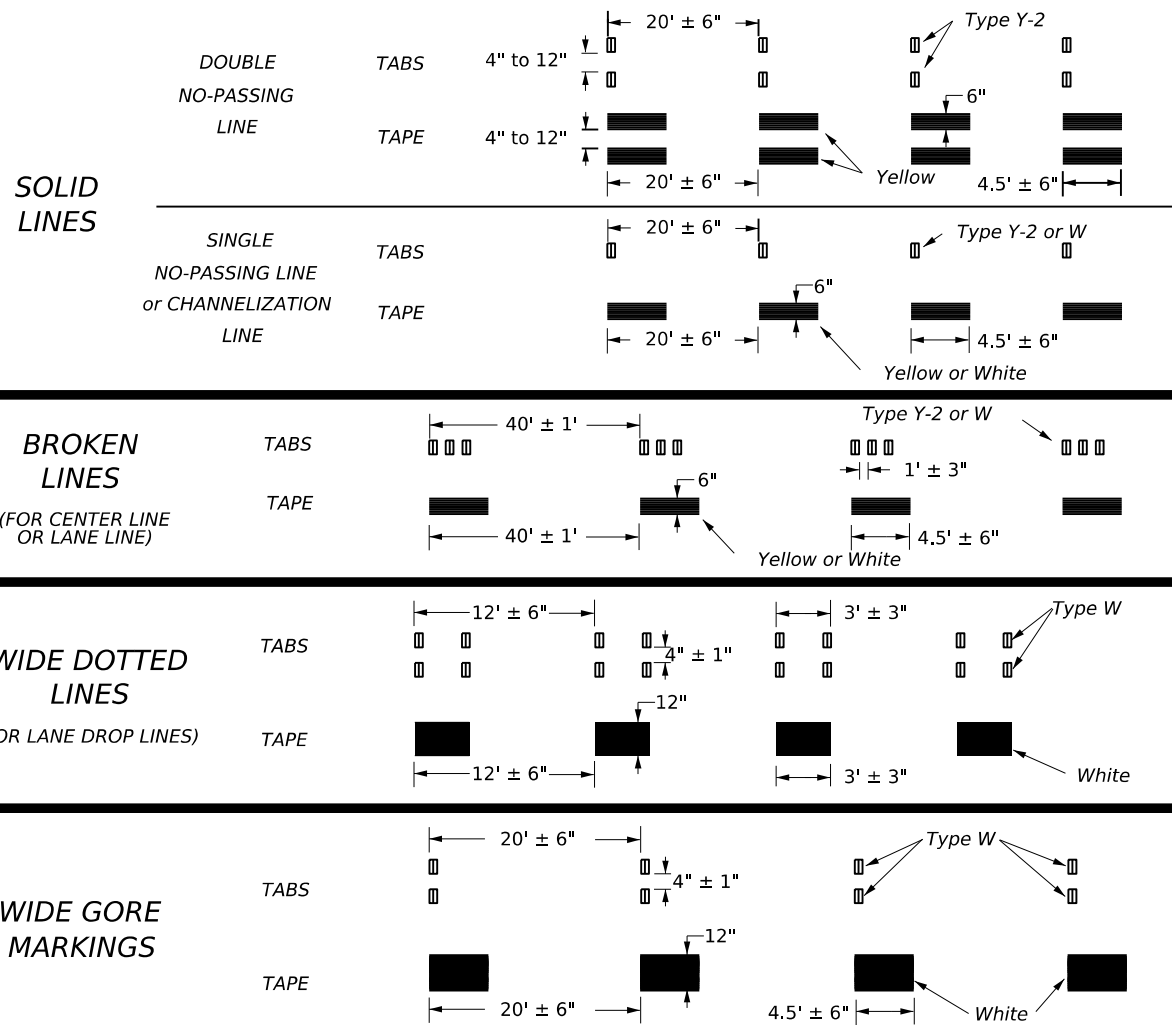
Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

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FILE: c:\pwworking\1\0285615\bc-21.dgn

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## WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



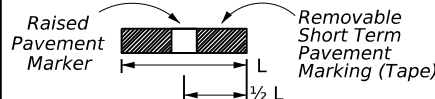
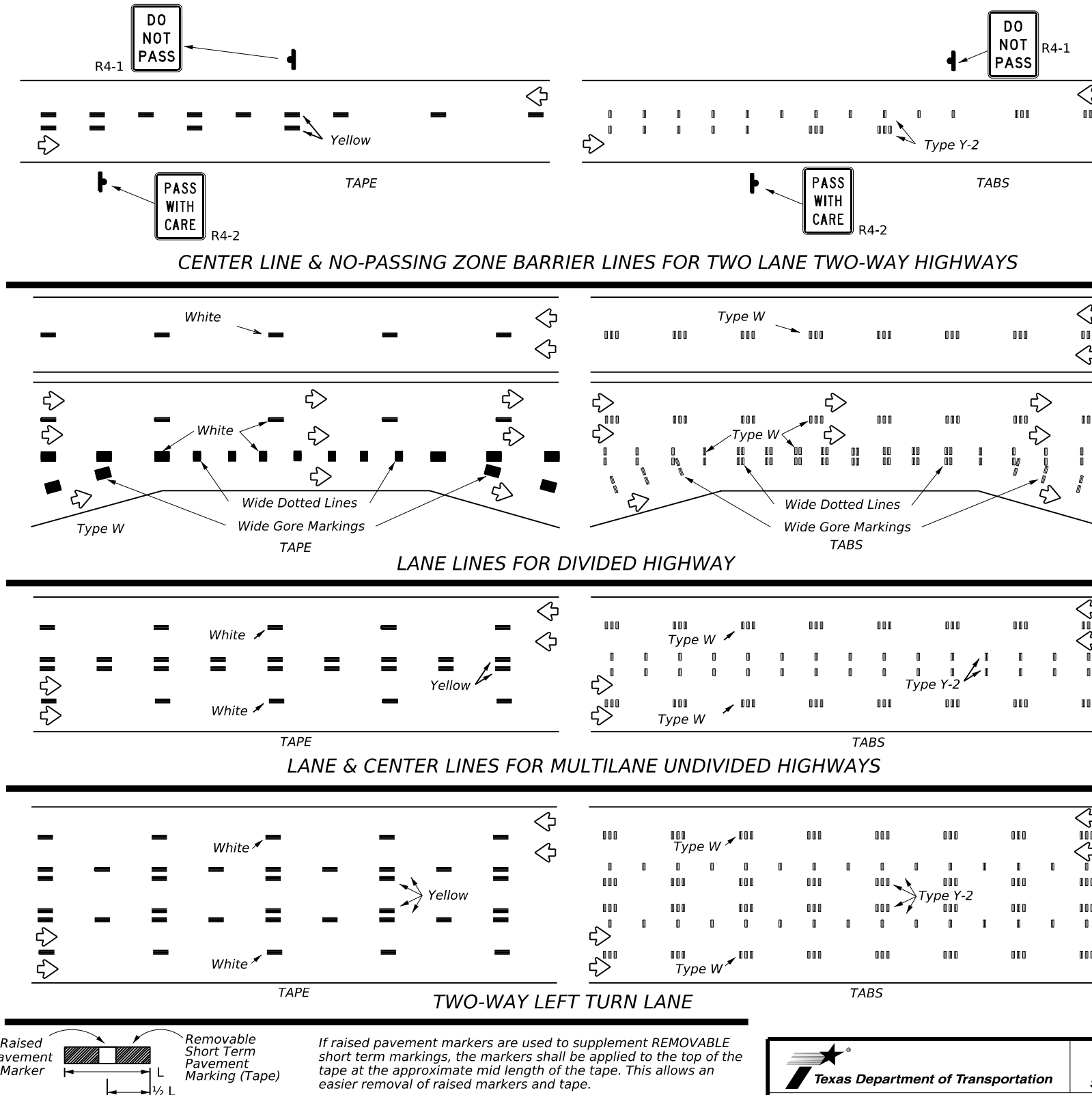
### NOTES:

- Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible reflective roadway marker tabs unless otherwise specified elsewhere in plans.
- Short term pavement markings shall NOT be used to simulate edge lines.
- Dimensions indicated on this sheet are typical and approximate. Variations in size and height may occur between markers or devices made by manufacturers, by as much as 1/4 inch, unless otherwise noted.
- Temporary flexible-reflective roadway marker tabs will require normal maintenance replacement when used on roadways with an ADT per lane of up to 7500 vehicles with no more than 10% truck mix. When roadways exceed these values, additional maintenance replacement of devices should be planned.
- No segment of roadway open to traffic shall remain without permanent pavement markings for a period greater than 14 calendar days. The Contractor will be responsible for maintaining short term pavement markings until permanent pavement markings are in place. When the Contractor is responsible for placement of permanent pavement markings, no segment of roadway shall remain without permanent pavement markings for a period greater than 14 calendar days unless weather conditions prohibit placement. Permanent pavement markings shall be placed as soon as weather permits.
- For two lane, two-way roadways, DO NOT PASS signs shall be erected to mark the beginning of sections where passing is prohibited and PASS WITH CARE signs shall be erected to mark the beginning of sections where passing is permitted. Signs shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and may be used to indicate the limits of no-passing zones for up to 14 calendar days. Permanent pavement markings should then be placed.
- For low volume two lane, two-way roadways of 4000 ADT or less, no-passing lines may be omitted when approved by the Engineer. DO NOT PASS and PASS WITH CARE signs shall be erected (see note 6).
- For exit gores where a lane is being dropped place wide gore markings or retroreflective channelizing devices to guide motorist through the exit. If channelizing devices are to be used it should be noted elsewhere in the plans. One piece cones are not allowed for this purpose.

### TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

- Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may be found on BC(11).
- Tabs shall meet requirements of Departmental Material Specification DMS-8242.
- When dry, tabs shall be visible for a minimum distance of 200 feet during normal daylight hours and when illuminated by automobile low-beam head light at night, unless sight distance is restricted by roadway geometrics.
- No two consecutive tabs nor four tabs per 1000 feet of line shall be missing or fail to meet the visual performance requirements of Note 3.

## WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



If raised pavement markers are used to supplement REMOVABLE short term markings, the markers shall be applied to the top of the tape at the approximate mid length of the tape. This allows an easier removal of raised markers and tape.

### PREFABRICATED PAVEMENT MARKINGS

- Temporary Removable Prefabricated Pavement Markings shall meet the requirements of DMS-8241.
- Non-removable Prefabricated Pavement Markings shall meet the requirements of either DMS-8240 "Permanent Prefabricated Pavement Markings" or DMS-8243 "Temporary Construction-Grade Prefabricated Pavement Markings."

### RAISED PAVEMENT MARKERS

- All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and DMS-4200.

### DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS) & MATERIAL PRODUCER LISTS (MPL)

- DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

[http://www.txdot.gov/business/contractors\\_consultants/material\\_specifications/default.htm](http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm)

Texas Department of Transportation

Traffic Safety Division Standard

## WORK ZONE SHORT TERM PAVEMENT MARKINGS

### WZ(STPM)-23

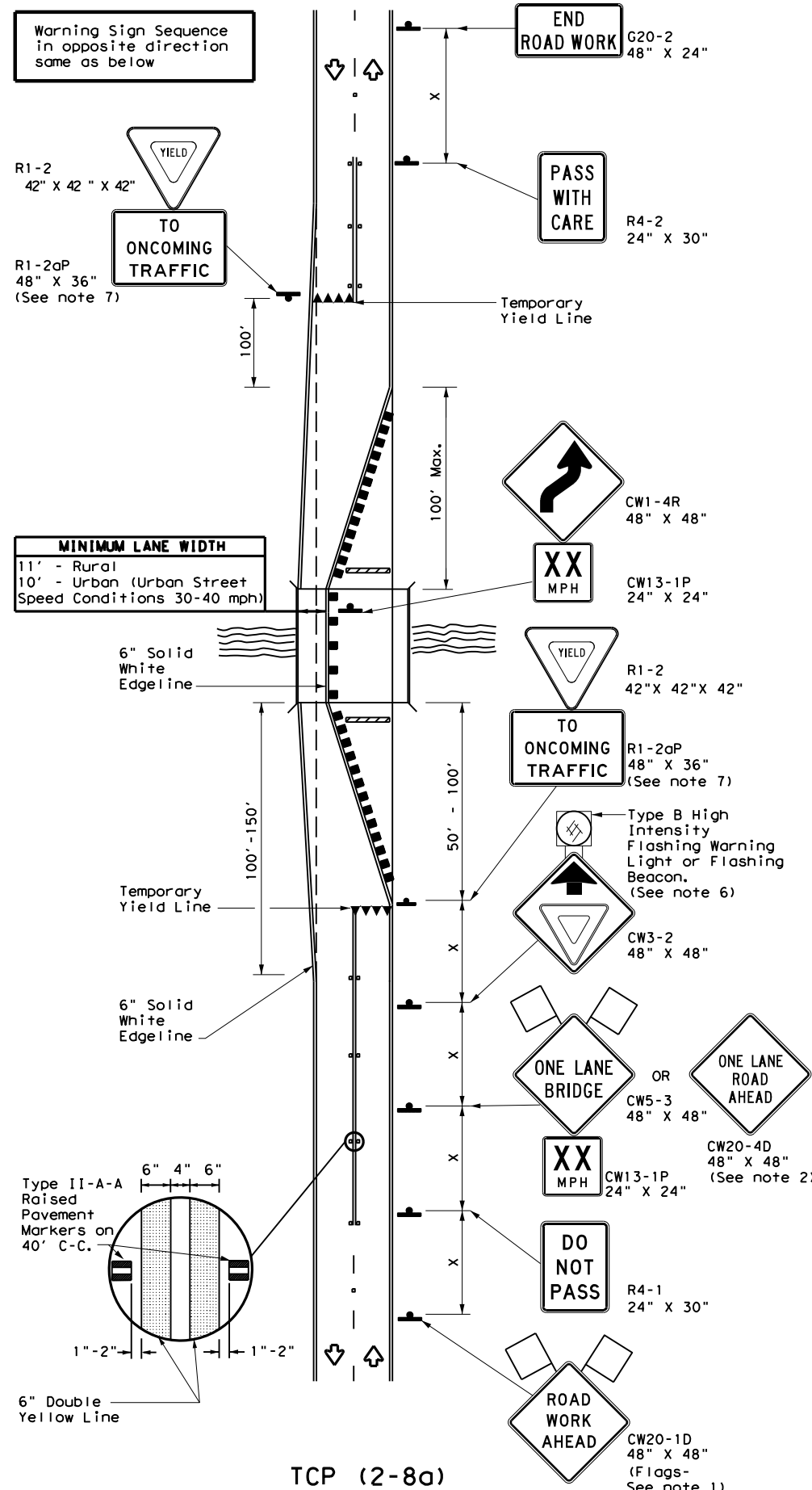
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© TxDOT February 2023	CONT 0848	SECT 04	JOB 052	HIGHWAY FM 462
REVISIONS	4-92 7-13	1-97 2-23	DIST	COUNTY
3-03	SAT	MEDINA	SHEET NO. 88	

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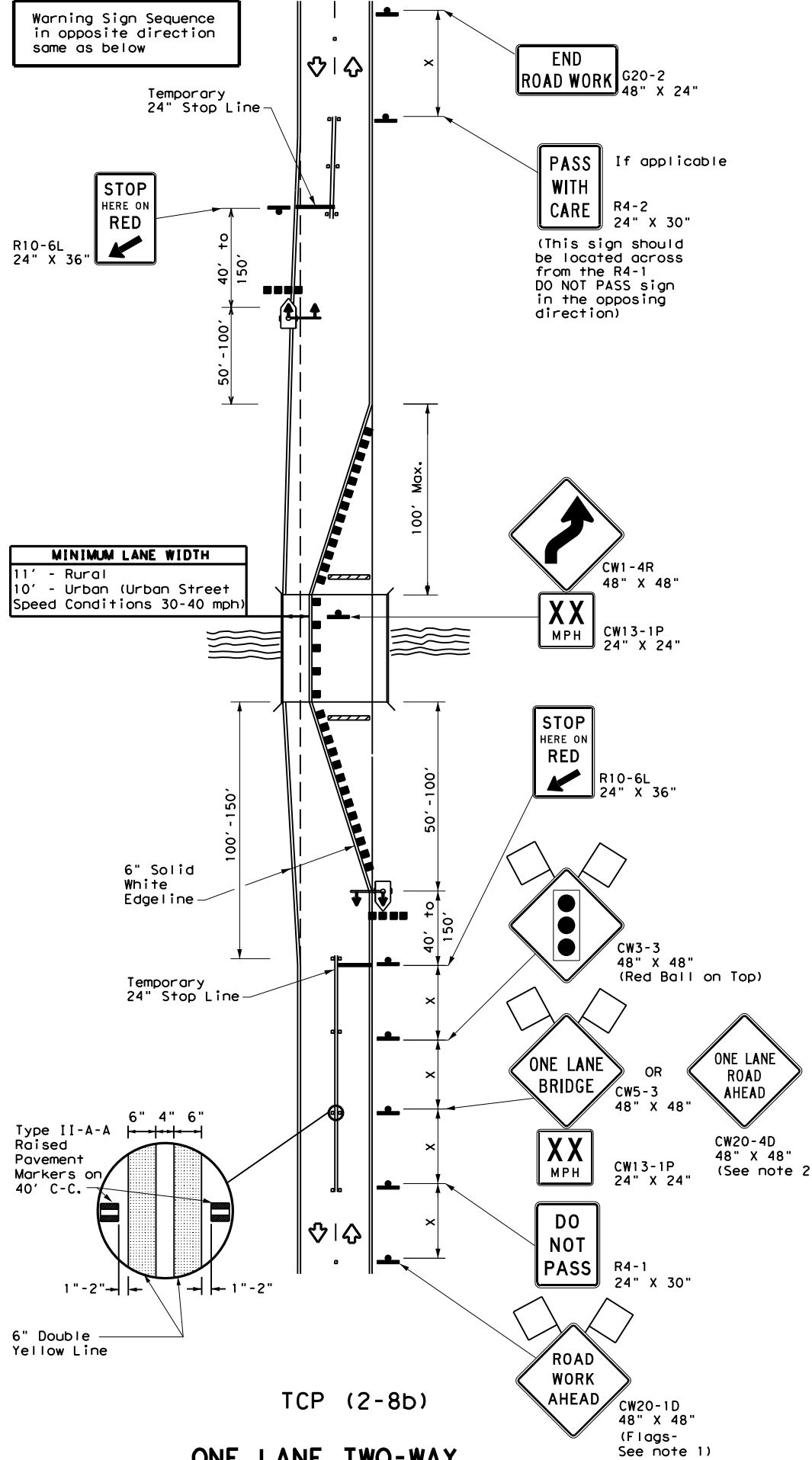
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TCP (2-8a)

**ONE LANE TWO-WAY TRAFFIC CONTROL WITH YIELD SIGNS**  
 (Less Than 2000 ADT-See Note 5)



TCP (2-8b)

**ONE LANE TWO-WAY TRAFFIC CONTROL WITH TRAFFIC SIGNAL**

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Sign		Traffic Flow
	Flag		Flagger
	Raised Pavement Markers Ty II-AA		Temporary or Portable Traffic Signal

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "x" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	L = WS <sup>2</sup> / 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
			✓	✓

**GENERAL NOTES**

- Flags attached to signs where shown are REQUIRED.
- When this TCP is used at a location which does not involve a bridge, a 48" x 48" CW20-4D "ONE LANE ROAD AHEAD" signs should be used in lieu of the CW5-3 "ONE LANE BRIDGE" signs. The CW13-1P Advisory Speed Plaque is required with either warning sign.
- Raised pavement markers shall be placed 40 feet c-c on centerline between DO NOT PASS signs and stop or yield lines.
- For intermediate term situations, when it is not feasible to remove and restore pavement markings, the channelization must be made dominant by using a very close spacing. This is especially important in locations of conflicting information, such as where traffic is directed over a double yellow centerline. In such locations a maximum channelizing device spacing of 20 feet is recommended. The 20 foot channelizing device spacing recommendation is intended for the area of conflicting information and not the entire work zone.

**TCP (2-8a)**

- Traffic control by CW3-2 "YIELD AHEAD" symbol signs for one lane two-way traffic control operations should be limited to work spaces less than 400 feet long and roadways with less than 2000 ADT. Otherwise, portable traffic signals should be used.
- If power is available, a flashing beacon should be attached to the CW3-2 "YIELD AHEAD" symbol sign for emphasis.
- The R1-2 "YIELD" and R1-2aP "TO ONCOMING TRAFFIC" signs and other regulatory signs shall be installed at 7 foot minimum mounting height.

**TCP (2-8b)**

- A list of approved Portable Traffic Signals can be found in the "Compliant Work Zone Traffic Control Devices" list.
- Portable traffic signals should be located to provide adequate stopping sight distance for approaching motorist (See table above).

Traffic Safety Division Standard

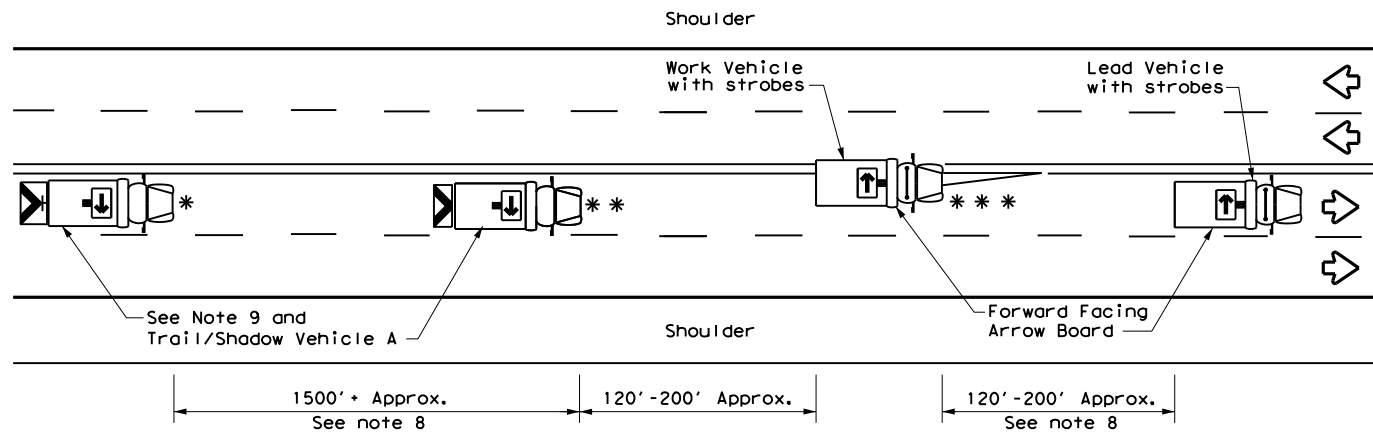
**TRAFFIC CONTROL PLAN  
 LONG TERM ONE-LANE  
 TWO-WAY CONTROL**

**TCP (2-8) - 23**

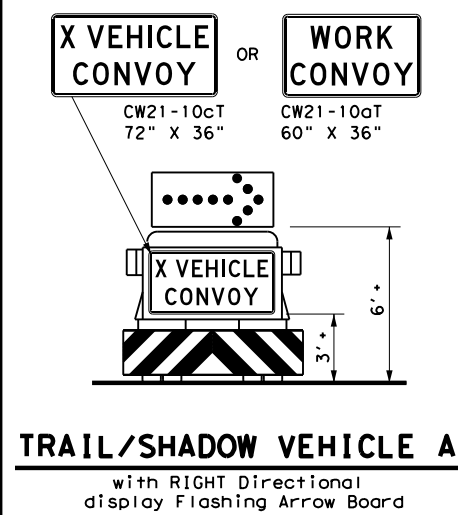
FILE: tcp2-8-23.dgn	DN:	CK:	DW:	CK:
© TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
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12-85 4-98 2-18	DIST	COUNTY	SHEET NO.	
8-95 3-03 4-23	SAT	MEDINA		89
1-97 2-12				

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TCP (3-1a)  
**UNDIVIDED MULTILANE ROADWAY**



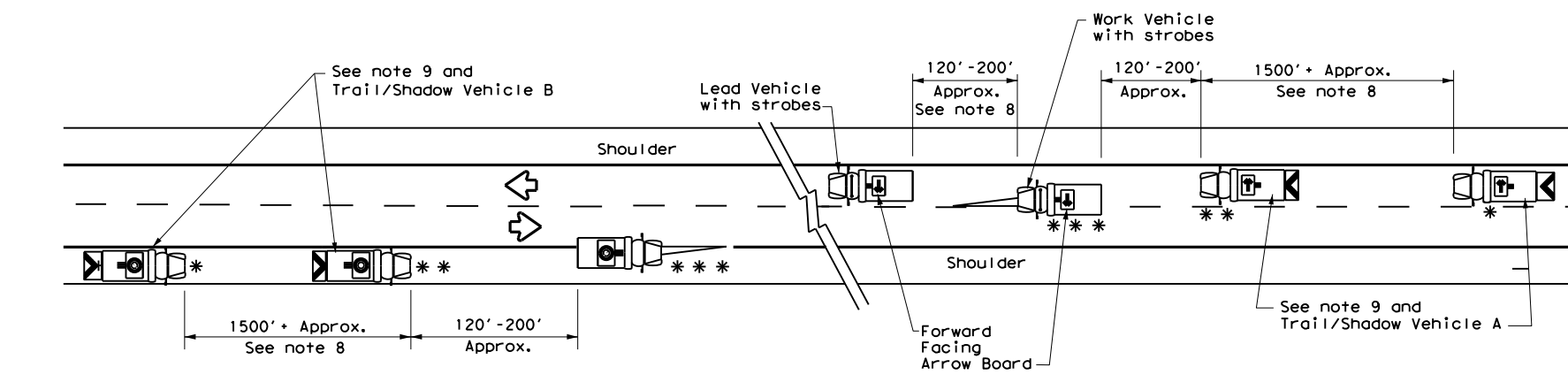
**TRAIL/SHADOW VEHICLE A**  
 with RIGHT Directional display Flashing Arrow Board

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

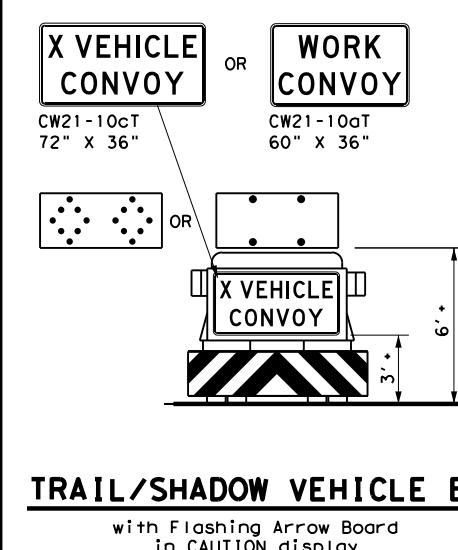
TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
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**GENERAL NOTES**

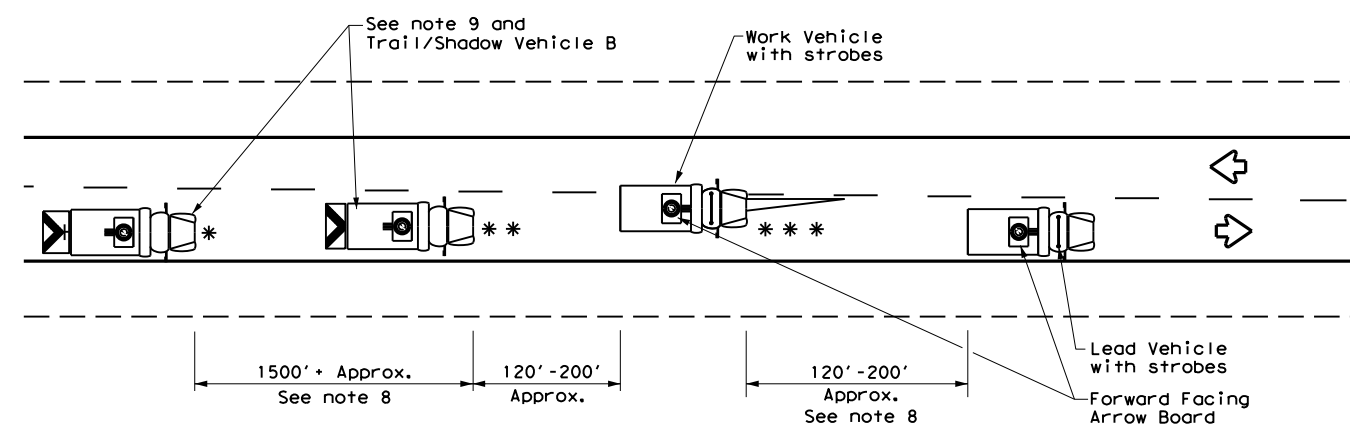
- TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
- The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
- The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
- Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
- Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
- Each vehicle shall have two-way radio communication capability.
- When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
- Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
- "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY" (CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
- On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



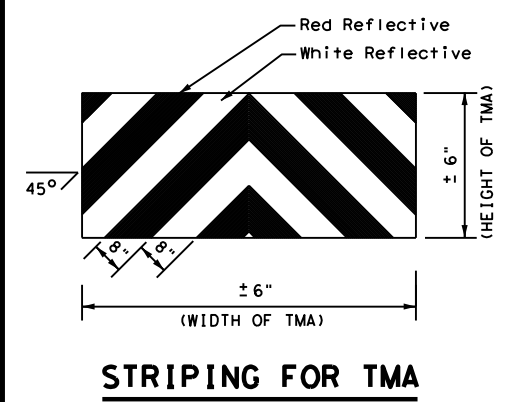
TCP (3-1b)  
**TWO-WAY ROADWAY WITH PAVED SHOULDERS**



**TRAIL/SHADOW VEHICLE B**  
 with Flashing Arrow Board in CAUTION display



TCP (3-1c)  
**TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS**



**STRIPING FOR TMA**



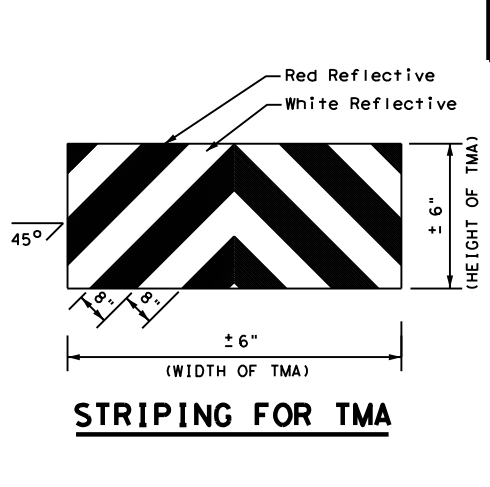
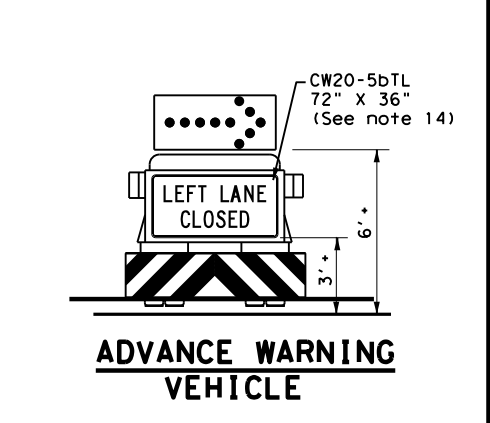
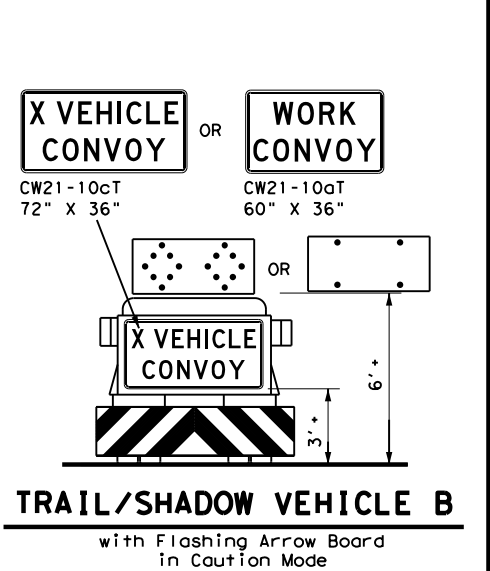
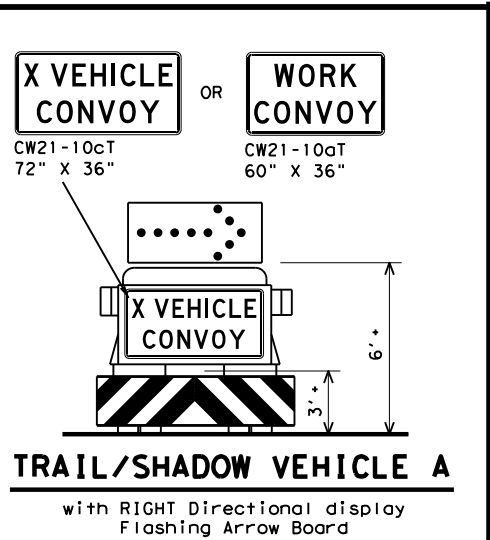
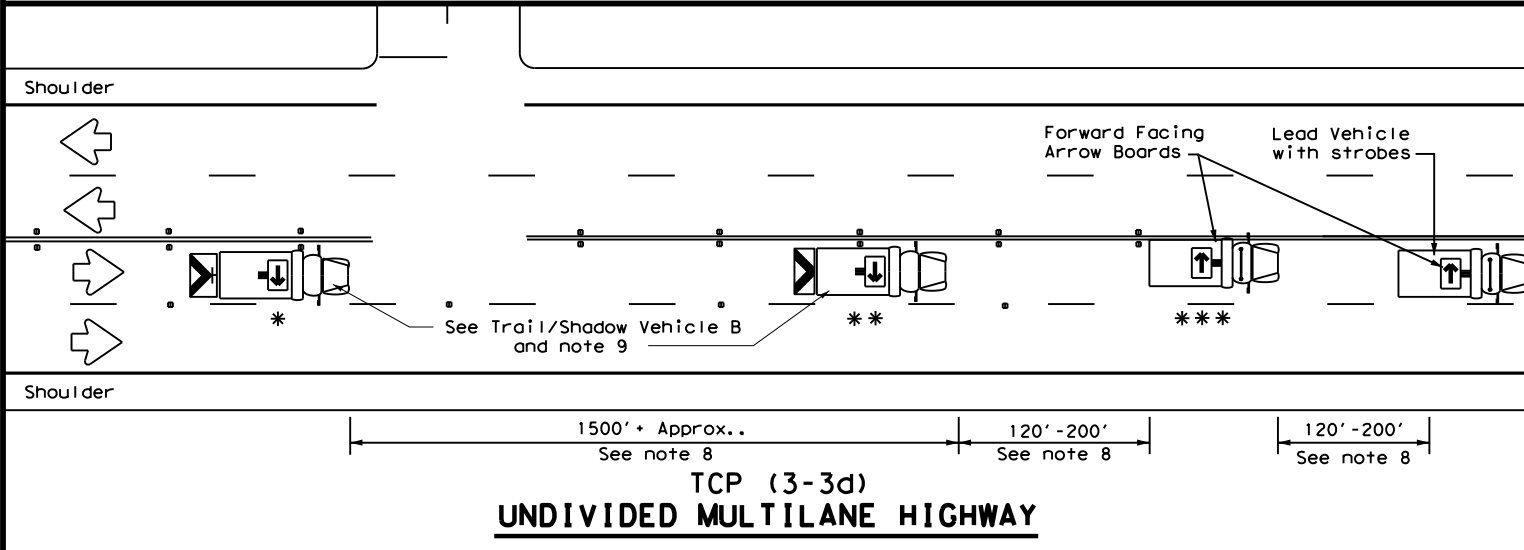
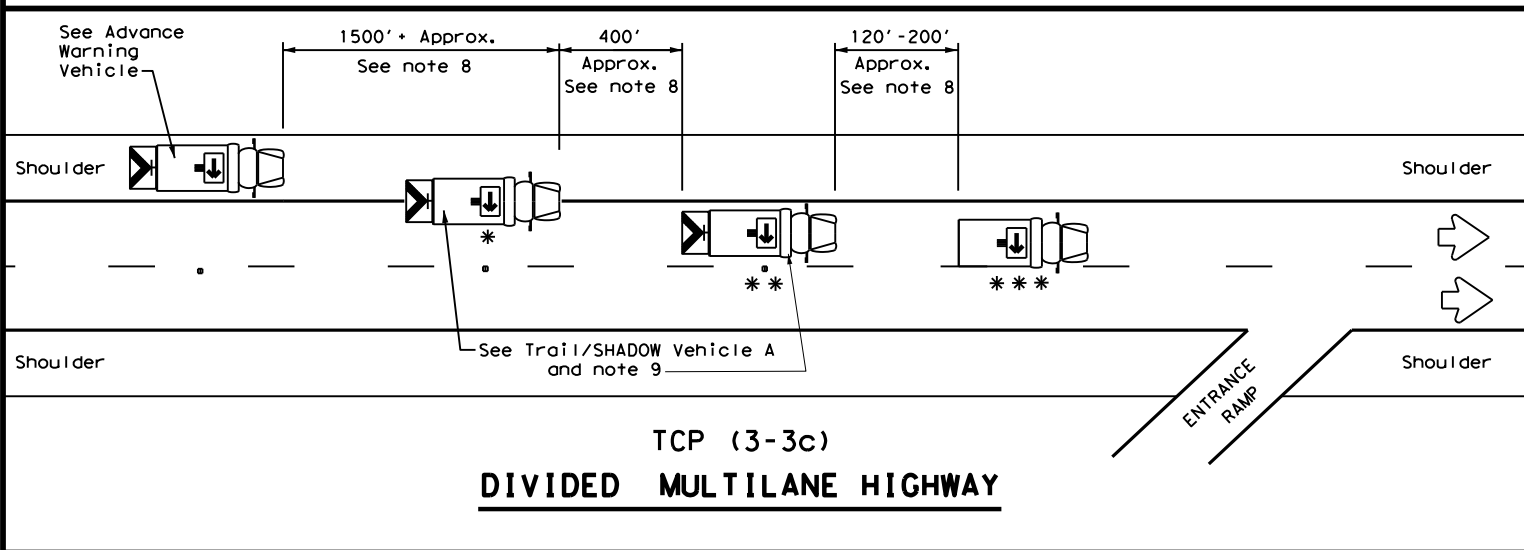
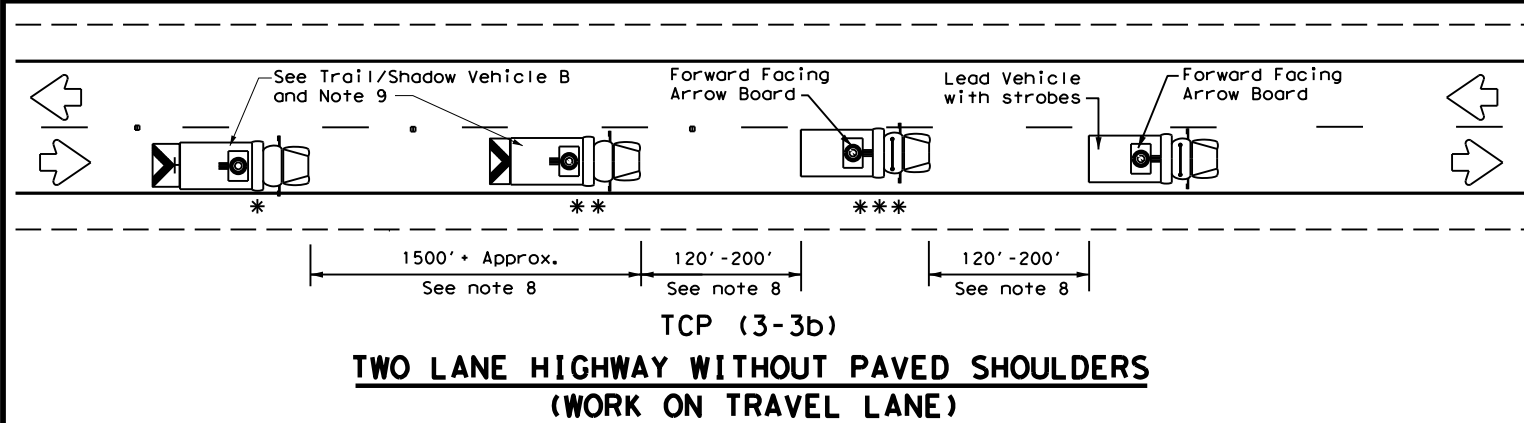
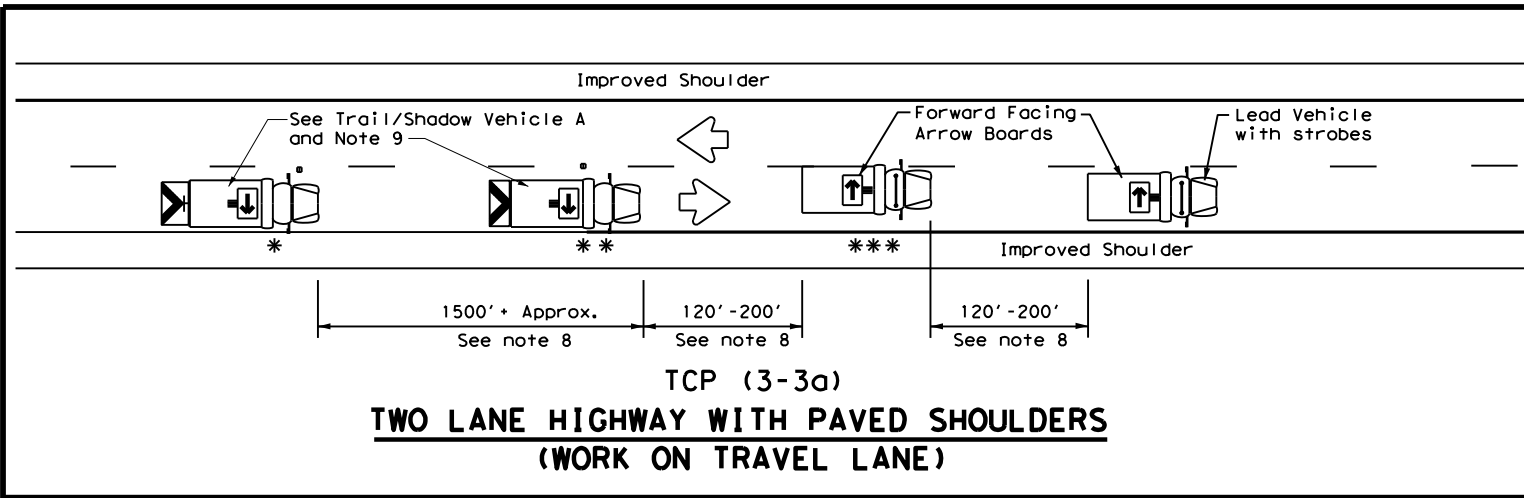
**TRAFFIC CONTROL PLAN  
 MOBILE OPERATIONS  
 UNDIVIDED HIGHWAYS**

**TCP (3-1) - 13**

FILE:	tcp3-1.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
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2-94	4-98	DIST	COUNTY	SHEET NO.					
8-95	7-13	SAT	MEDINA	90					
1-97									

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DATE: 1/31/2024 5:39:44 PM  
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LEGEND		
*	Trail Vehicle	ARROW BOARD DISPLAY
**	Shadow Vehicle	
** *	Work Vehicle	RIGHT Directional
☐	Heavy Work Vehicle	LEFT Directional
☒	Truck Mounted Attenuator (TMA)	Double Arrow
↔	Traffic Flow	CAUTION (Alternating Diamond or 4 Corner Flash)

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

**GENERAL NOTES**

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dTL) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

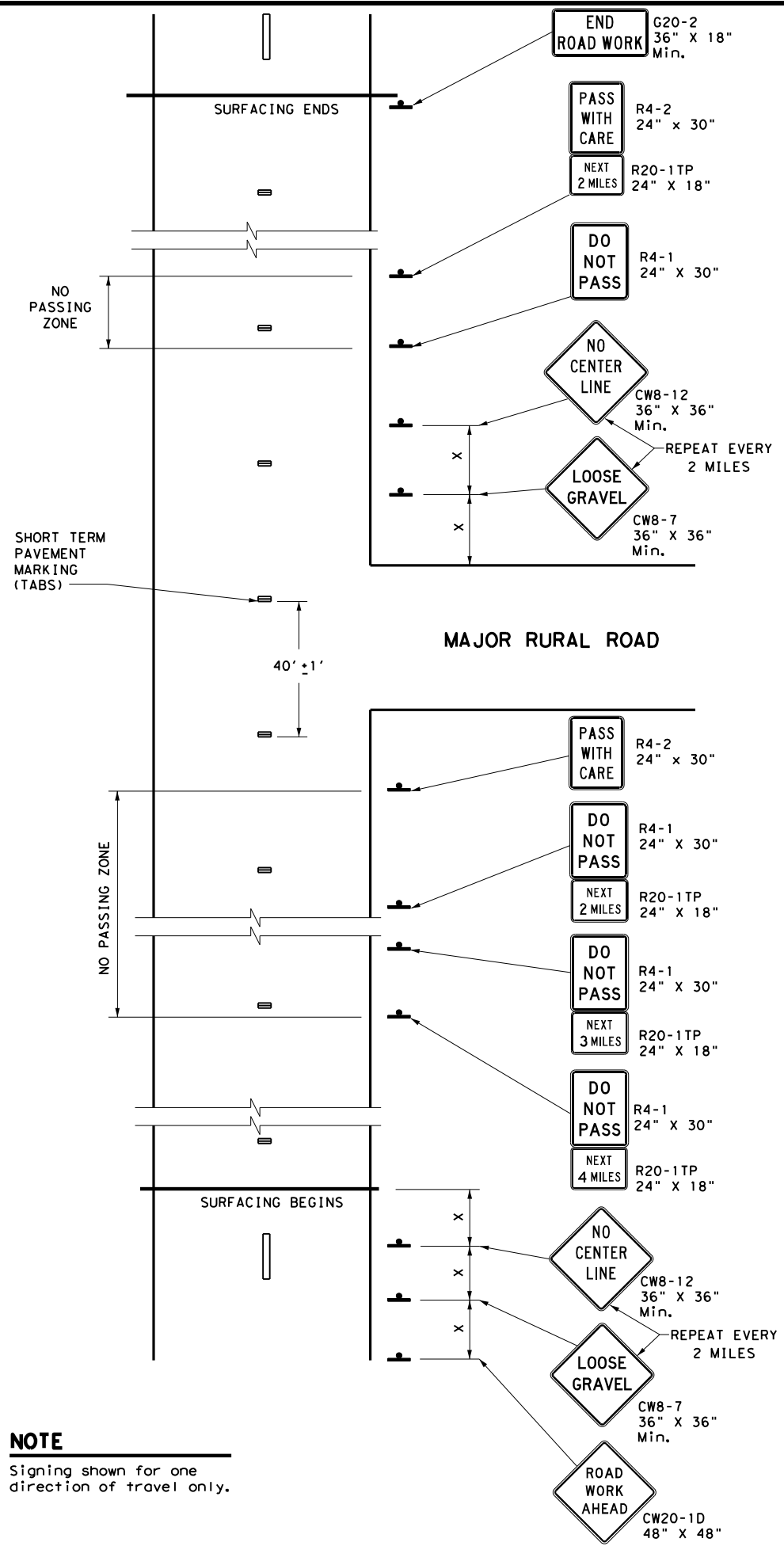
Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN  
MOBILE OPERATIONS  
RAISED PAVEMENT  
MARKER INSTALLATION/  
REMOVAL  
TCP (3-3) - 14**

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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8-95 7-13	SAT	MEDINA	91	
1-97 7-14				

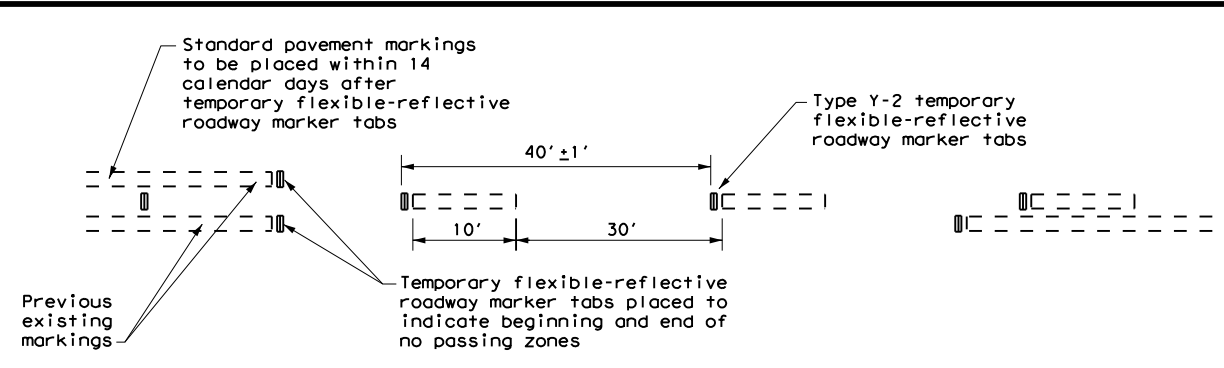
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**NOTE**  
 Signing shown for one direction of travel only.

**NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS**



**TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS**  
 For seal coat, micro-surface or similar operations

**"DO NOT PASS" SIGN (R4-1) and NO-PASSING ZONES**

- A. Prior to the beginning of construction, all currently striped no-passing zones shall be signed with the DO NOT PASS (R4-1) signs and PASS WITH CARE (R4-2) signs placed at the beginning and end of each zone for each direction of travel except as otherwise provided herein. Signs marking these individual no-passing zones need not be covered prior to construction if the signs supplement the existing pavement markings.
- B. At the discretion of the Engineer, in areas of numerous no-passing zones, several zones may be combined as a single zone. If passing is to be prohibited over one or more lengthy sections, a DO NOT PASS sign and a NEXT XX MILES (R20-1TP) plaque may be used at the beginning of such zones. The DO NOT PASS sign and the NEXT XX MILES plaque should be repeated every mile to the end of the no-passing zone. In areas where there is considerable distance between no-passing zones, the end of the no-passing zone may be signed with a PASS WITH CARE sign and a NEXT XX MILES plaque.
- C. Depending on traffic volumes and length of sections, it may be desirable to prohibit passing throughout the project to prevent damage to windshield and lights. The DO NOT PASS sign and NEXT XX MILES plaque should be used and repeated as often as necessary for this purpose. Where several existing zones are to be combined into one individual no-passing zone, the sign at the beginning of the zone should be covered until the surfacing operation has passed this location so as not to have the DO NOT PASS sign conflict with the existing pavement markings. Also, unless one days operation completes the entire length of such combined zones, appropriate DO NOT PASS and PASS WITH CARE signs should be placed at the beginning and end of the no-passing zones where the surfacing operation has stopped for the day.
- D. R4-1 and R4-2 are to remain in place until standard pavement markings are installed.

**"NO CENTER LINE" SIGN (CW8-12)**

- A. Center line markings are yellow pavement markings that delineate the separation of travel lanes that have opposite directions of travel on a roadway. Divided highways do not typically have center line markings.
- B. At the time construction activity obliterates the existing center line markings (low volume roads may not have an existing centerline), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately 2 mile intervals within the work area, beyond major intersections and other locations deemed necessary by the Engineer.
- C. The NO CENTER LINE signs are to remain in place until standard pavement markings are installed.

**"LOOSE GRAVEL" SIGN (CW8-7)**

- A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately 2 miles in rural areas and closer in urban areas.
- B. The LOOSE GRAVEL signs are to remain in place until the condition no longer exists.

**PAVEMENT MARKINGS**

- A. Temporary markings for surfacing projects shall be Temporary Flexible-reflective Roadway Marker Tabs unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement no more than two (2) days before the surfacing is applied. After the surfacing is rolled and swept, the cover over the reflective strip shall be removed.
- B. Tabs shall not be used to simulate edge lines.
- C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

**COORDINATION OF SIGN LOCATIONS**

- A. The location of warning signs at the beginning and end of a work area are to be coordinated with other signing typically shown on the Barricade and Construction Standards for project limits to ensure adequate sign spacing.
- B. Where possible the ROAD WORK AHEAD (CW20-1D), LOOSE GRAVEL (CW8-7), and NO CENTER LINE (CW8-12) signs should be placed in the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) and the TRAFFIC FINES DOUBLE (R20-5T) sign, and one "X" sign spacing prior to the CONTRACTOR (G20-6T) sign typically located at or near the limits of surfacing. LOOSE GRAVEL and NO CENTER LINE signs will then be repeated as described above.

Posted Speed *	Minimum Sign Spacing "X" Distance
30	120'
35	160'
40	240'
45	320'
50	400'
55	500'
60	600'
65	700'
70	800'
75	900'

\* Conventional Roads Only

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

**GENERAL NOTES**

1. The traffic control devices detailed on this sheet will be furnished and erected as directed by the Engineer on sections of roadway where tabs must be placed prior to the surfacing operation which will cover or obliterate the existing pavement markings.
2. The devices shown on this sheet are to be used to supplement those required by the BC Standards or others required elsewhere in the plans.
3. Signs shall be erected as detailed on the BC Standards or the Compliant Work Zone Traffic Control Devices List (CWZTCD) on supports approved for Long-Term / Intermediate-Term Work Zone Sign Supports.
4. When surfacing operations take place on divided highways, freeways or expressways, the size of diamond shaped construction warning signs shall be 48" x 48".
5. Signs on divided highways, freeways and expressways will be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.



**TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS**

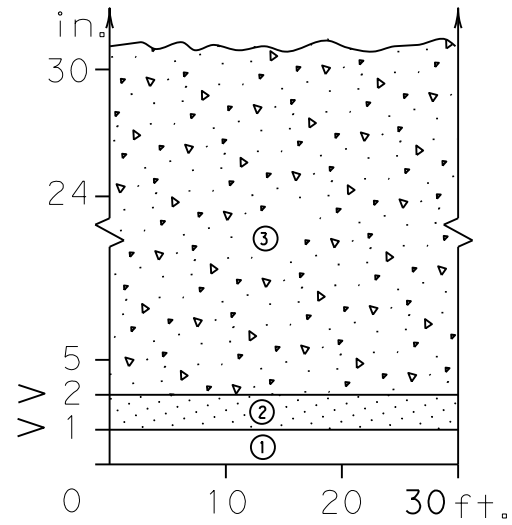
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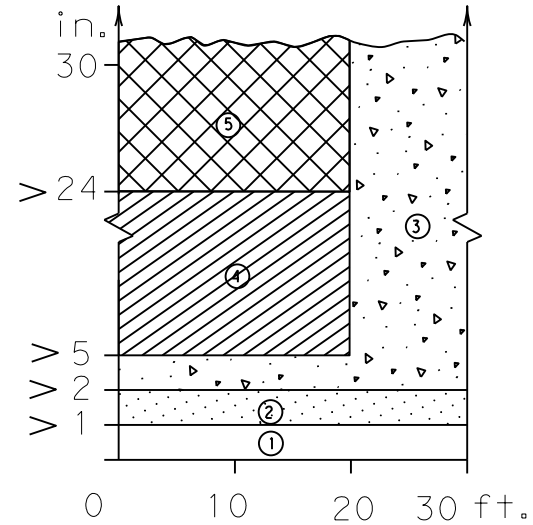
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## DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

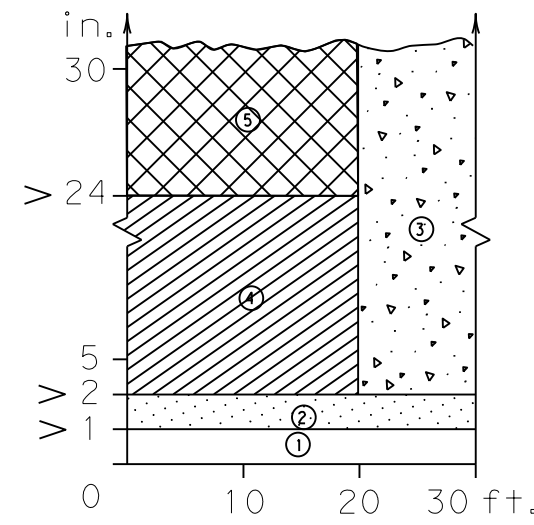
Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet



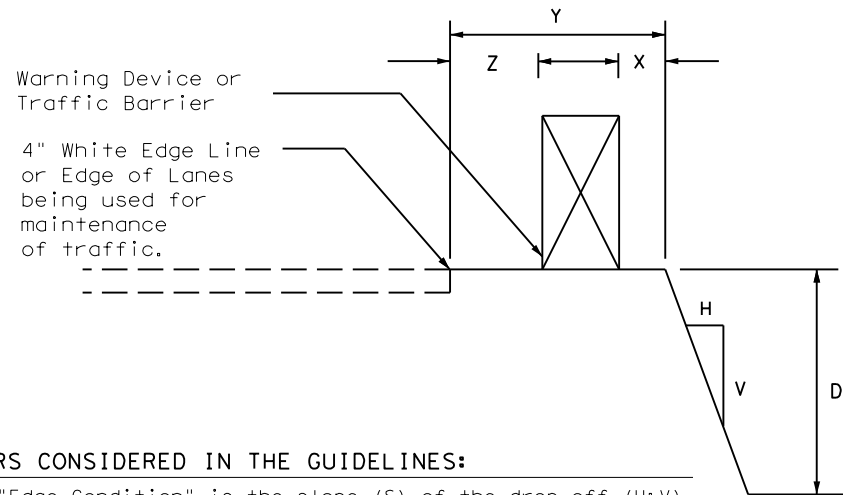
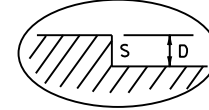
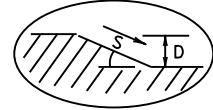
Edge Condition I  
S = (3:1) (or flatter)



Edge Condition II  
S = ((2.99):1) to (1:1)



Edge Condition III  
S is steeper than (1:1)



### FACTORS CONSIDERED IN THE GUIDELINES:

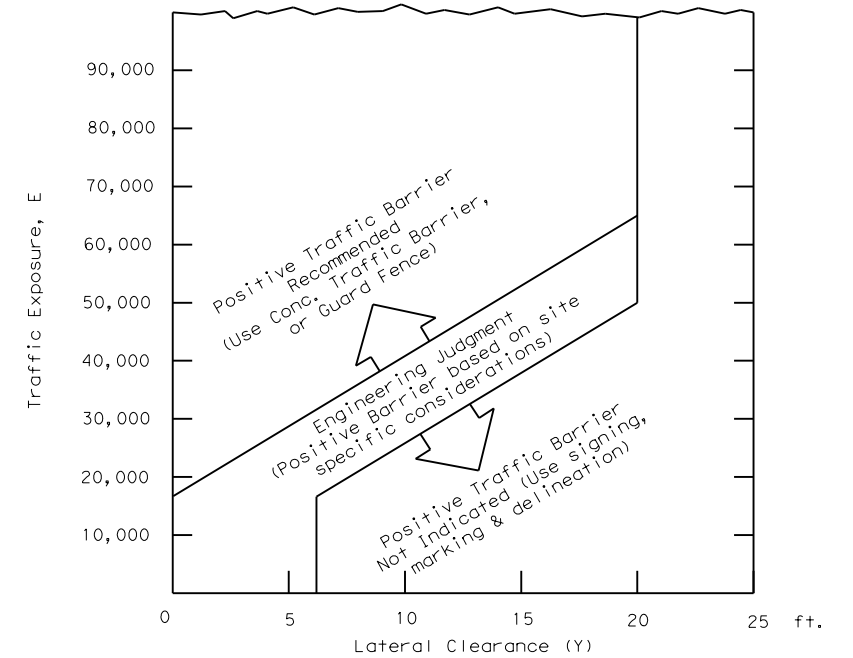
- The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height" is the depth of the drop-off "D".
- Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.
- In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.
- The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.
- If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the proferred Edge Condition I.
⑤	Check indications (Figure-1) for positive barrier. Where positive barrier is not indicated, the treatment shown above for Zone-4 may be used after consideration of other applicable factors.

### Edge Condition Notes:

- Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.
- Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exceeds 24 inches, the possibility for rollover is greater in most vehicles.
- Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.
- Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

## FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 ( [Cross-hatched] )



- $E = ADT \times T$   
Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the duration time in years of the dropoff condition.
- Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.
- An approved end treatment should be provided for any positive barrier end located within the clear zone.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

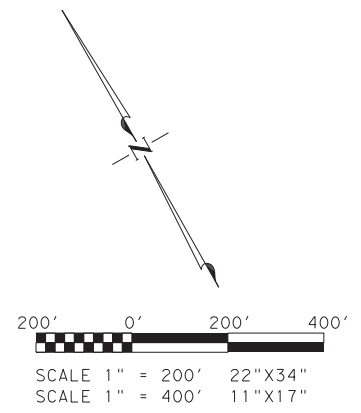
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Engineer's Seal		Texas Department of Transportation		Traffic Safety Division Standard	
<b>TREATMENT FOR VARIOUS EDGE CONDITIONS</b>					
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© TxDOT		REVISIONS		JOB	
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03-01		DIST		SHEET NO.	
08-01		COUNTY		93	
9-21		SAT		MEDINA	



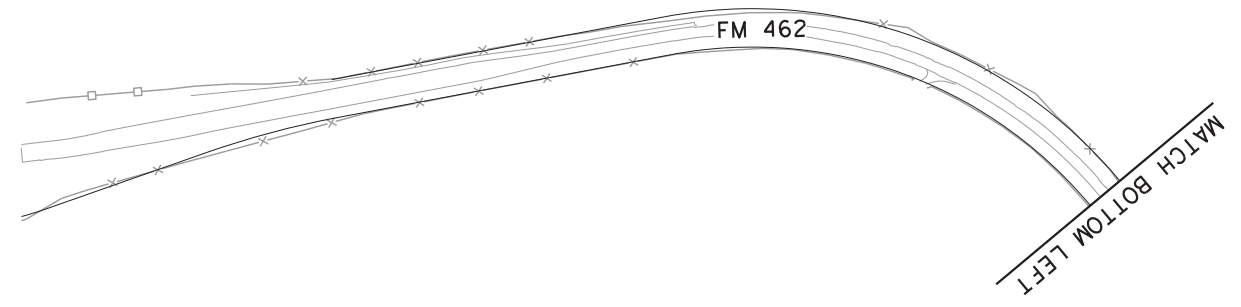
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POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
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14RMT8079858710	13,715,783.88'	1,905,730.72'	1,031.64'	TXDOT ALUMINUM DISK SET IN CONCRETE

SURVEY CONTROL POINTS - GRID COORDINATES				
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14RMT8079858710	13,714,001.06'	1,905,483.00'	1,031.64'	TXDOT ALUMINUM DISK SET IN CONCRETE



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  4. ALL ELEVATIONS SHOWN HEREON ARE NORTH AMERICAN VERTICAL DATUM (NAVD) 88 AND WERE DERIVED FROM GPS OBSERVATIONS.

▲  
14RMT7987860647



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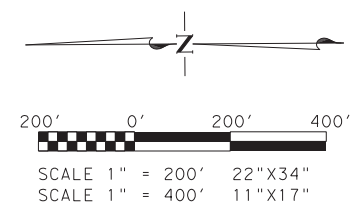
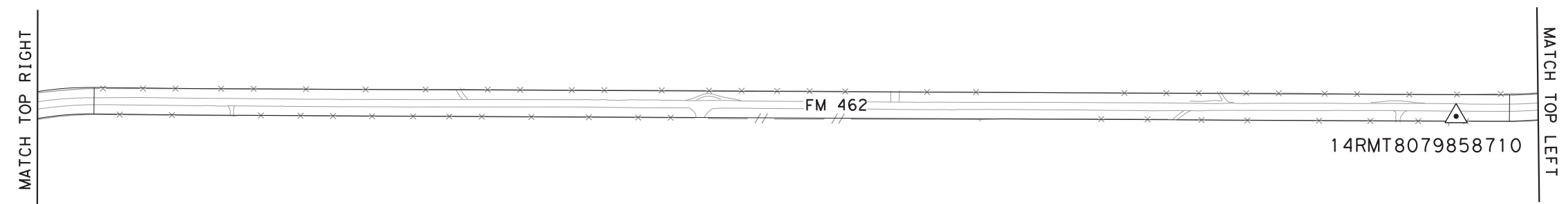


10/23/2023  
DATE  
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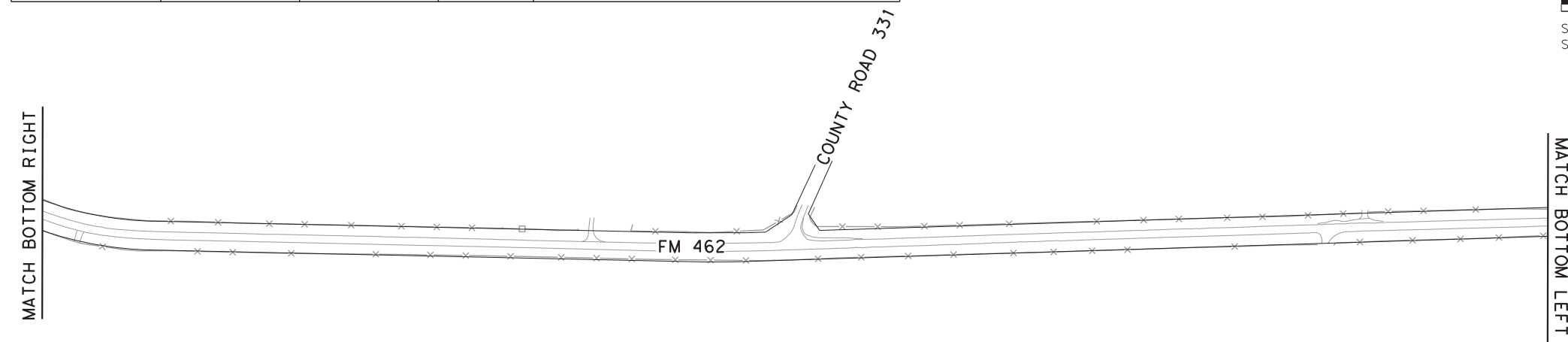
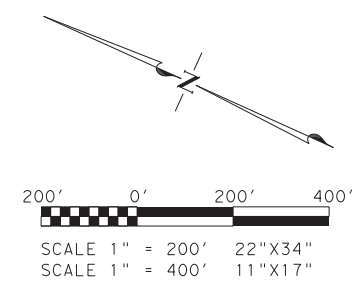


CONTROL INDEX SHEET

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STATE DISTRICT	COUNTY	TXDOT CONTROL-SECTION-JOB NO.	HWY. NO.
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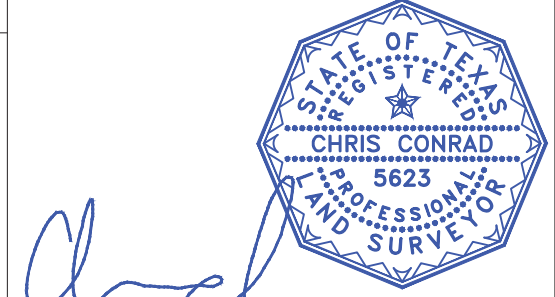
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14RMT8154056937	13,708,180.89'	1,907,921.10'	1,009.55'	TXDOT ALUMINUM DISK SET IN CONCRETE



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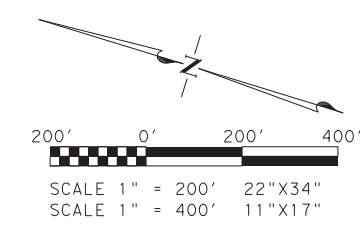
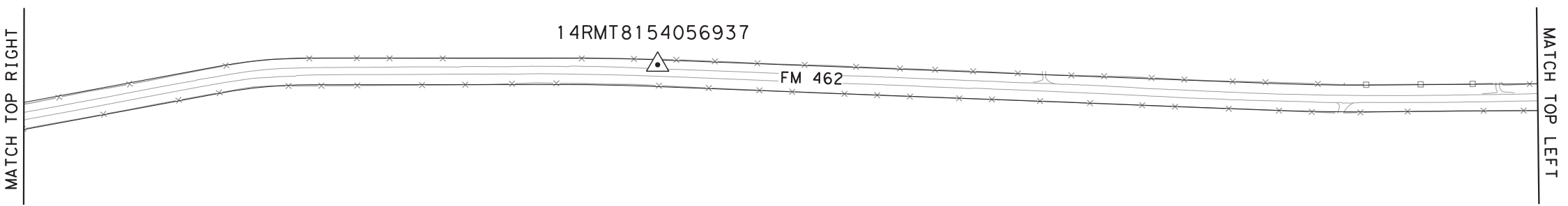


CHRIS I. CONRAD, REG. PROF. LAND SURVEYOR NO. 5623      10/23/2023 DATE



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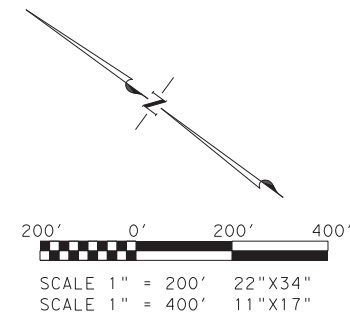


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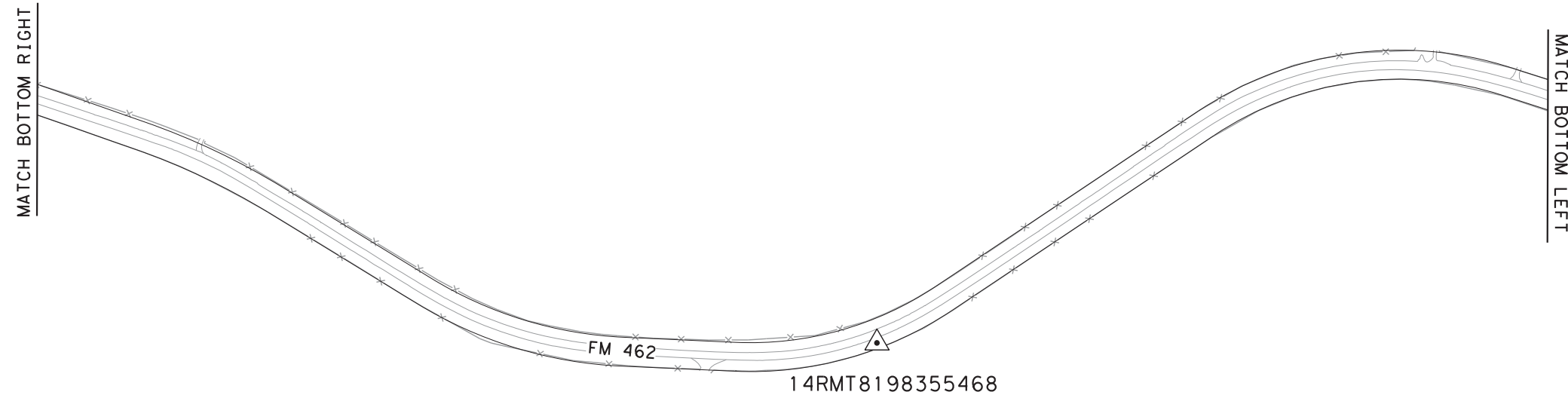
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STATE DISTRICT	COUNTY	TXDOT CONTROL-SECTION-JOB NO.	HWY. NO.
15	MEDINA	0848-04-052	FM 462

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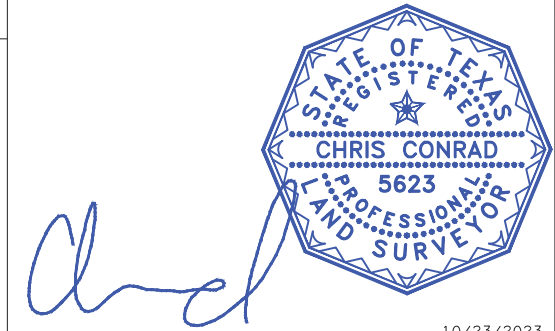
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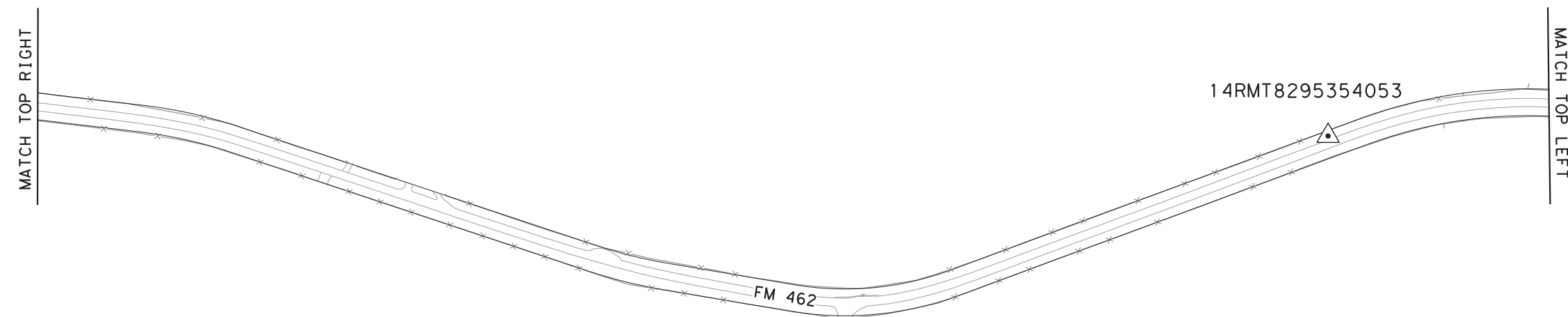
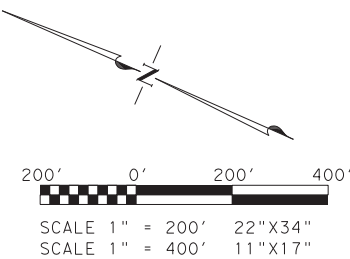
10/23/2023

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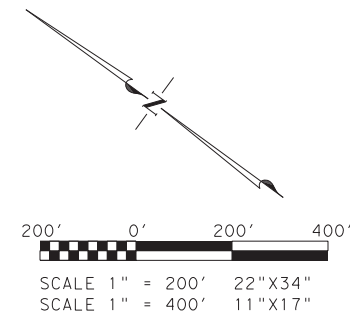


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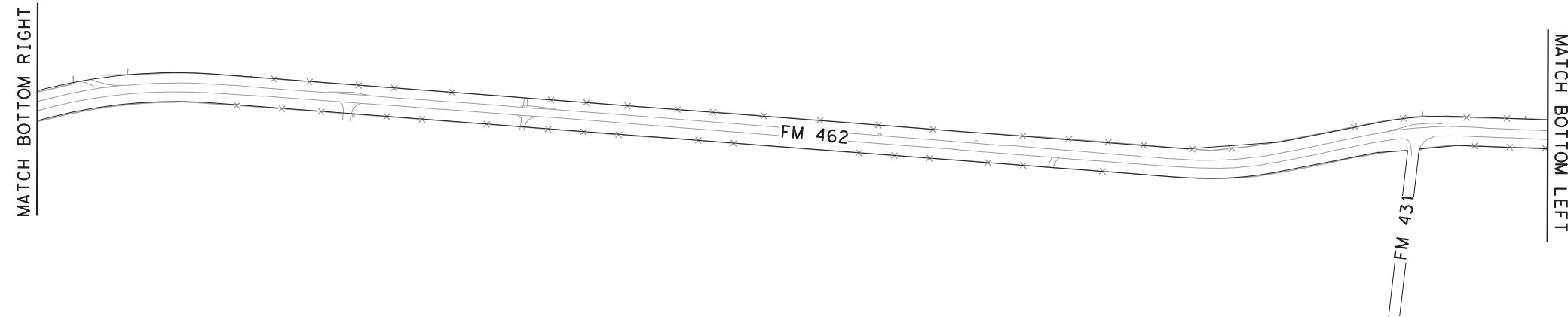
FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET
	TEXAS		3 OF 5
STATE DISTRICT	COUNTY	TXDOT CONTROL-SECTION-JOB NO.	HWY. NO.
15	MEDINA	0848-04-052	FM 462

SURVEY CONTROL POINTS - SURFACE COORDINATES				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
14RMT8324451942	13,693,568.30'	1,913,761.79'	954.81'	TXDOT ALUMINUM DISK SET IN CONCRETE

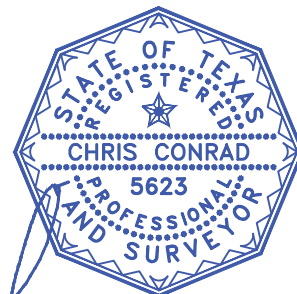
SURVEY CONTROL POINTS - GRID COORDINATES				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
14RMT8324451942	13,691,788.36'	1,913,513.03'	954.81'	TXDOT ALUMINUM DISK SET IN CONCRETE



- NOTES:
1. ALL COORDINATES SHOWN HEREON ARE SURFACE COORDINATES AND IN U.S. SURVEY FEET.
  2. THIS PROJECT IS REFERENCED, FOR ALL BEARING AND COORDINATE BASIS, TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM OF 1983 (2011) EPOCH 2010.00, GEOID 18.
  3. ALL COORDINATES SHOWN HEREON ARE SURFACE COORDINATES AND CAN BE ADJUSTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00013.
  4. ALL ELEVATIONS SHOWN HEREON ARE NORTH AMERICAN VERTICAL DATUM (NAVD) 88 AND WERE DERIVED FROM GPS OBSERVATIONS.



I HEREBY CERTIFY THAT THE HORIZONTAL AND VERTICAL DATA SHOWN HEREON WAS DETERMINED BY MULTIPLE GPS OBSERVATIONS (RTN) IN JULY 2023.



*Chris Conrad*

10/23/2023

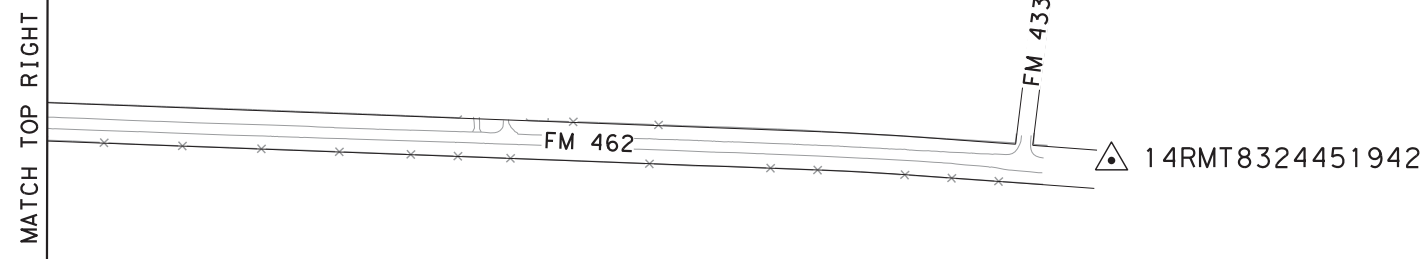
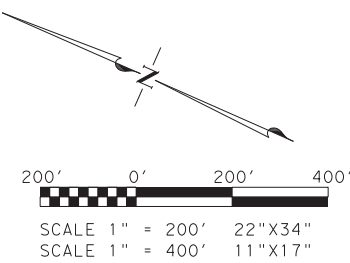
CHRIS I. CONRAD, REG. PROF. LAND SURVEYOR NO. 5623

DATE



McGRAY & McGRAY  
LAND SURVEYORS, INC.  
TBPELS SURVEY FIRM # 10095500  
3301 HANCOCK DRIVE #6  
AUSTIN, TEXAS 78731  
(512) 451-8591  
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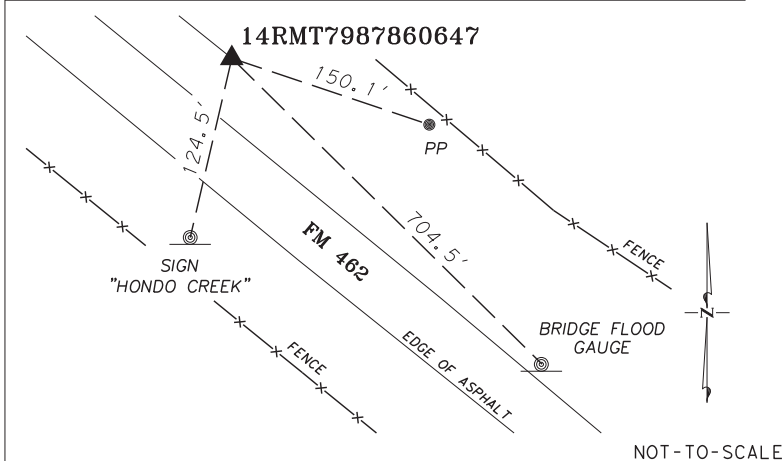
**FM 462 FROM 1.7 MI.  
NORTH OF CR 311  
TO CR 433**



CONTROL INDEX SHEET

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET
	TEXAS		4 OF 5
STATE DISTRICT	COUNTY	TXDOT CONTROL-SECTION-JOB NO.	HWY. NO.
15	MEDINA	0848-04-052	FM 462

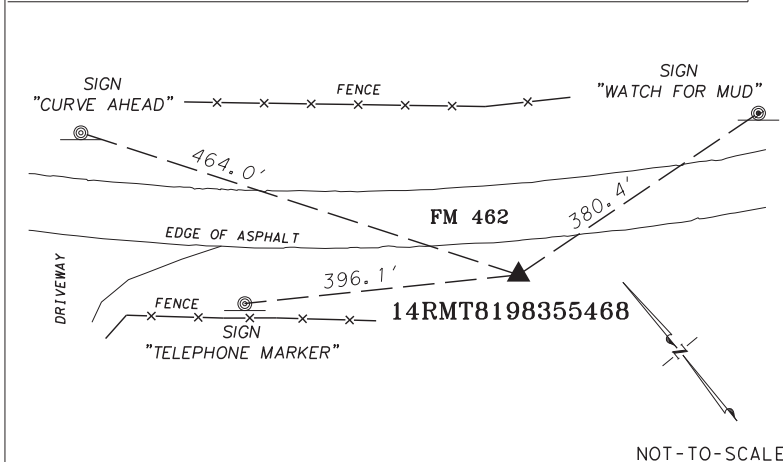
HORIZONTAL AND VERTICAL CONTROL POINT NO. 14RMT7987860647  
 N= 13,720,358.17' E= 1902464.82' ELEV.= 1,054.47'



NOT-TO-SCALE

DESCRIPTION: LOCATED ON THE EAST SIDE OF F.M. 462, +/- 5.7 MI. NORTH OF THE INTERSECTION OF F.M. 462 AND CR 431; 124.5' NORTHEAST OF A SIGN "HONDO CREEK", 704.5' NORTHWEST OF A BRIDGE FLOOD GAUGE, AND 150.1' NORTHWEST OF A POWERPOLE.

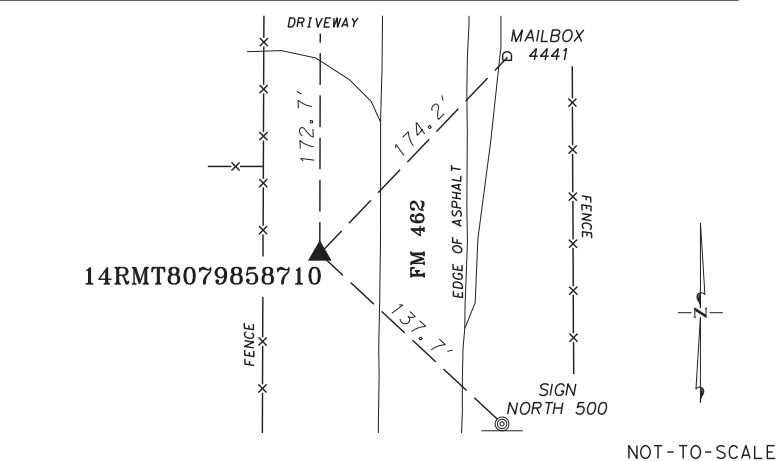
HORIZONTAL AND VERTICAL CONTROL POINT NO. 14RMT8198355468  
 N= 13,705,143.97' E= 1,909,620.91' ELEV.= 996.64'



NOT-TO-SCALE

DESCRIPTION: LOCATED ON THE WEST SIDE OF F.M. 462, +/- 2.0 MI. NORTH OF THE INTERSECTION OF F.M. 462 AND CR 431; 464.0' SOUTHEAST OF A SIGN "CURVE AHEAD", 380.4' SOUTHWEST OF A SIGN "WATCH FOR MUD", AND 396.1' SOUTHEAST OF A TMK.

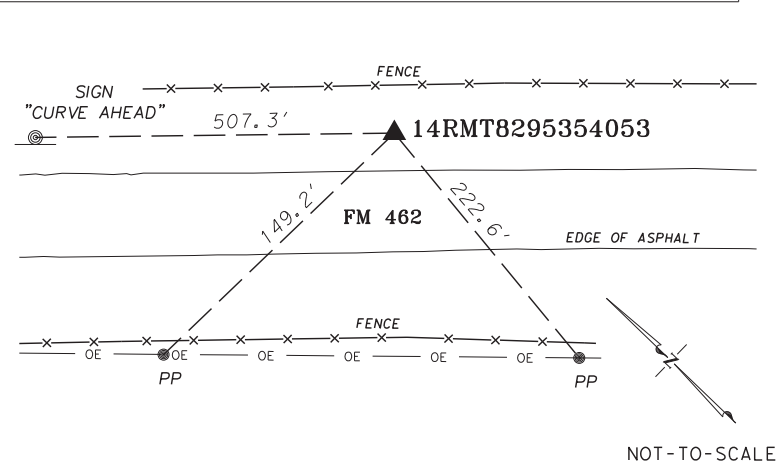
HORIZONTAL AND VERTICAL CONTROL POINT NO. 14RMT8079858710  
 N= 13,715,783.88' E= 1,905,730.72' ELEV.= 1,031.64'



NOT-TO-SCALE

DESCRIPTION: LOCATED ON THE EAST SIDE OF F.M. 462, +/- 4.2 MI. NORTH OF THE INTERSECTION OF F.M. 462 AND CR 431; 137.7' NORTHWEST OF A SIGN "NORTH 500", 174.2' SOUTHWEST OF A MAILBOX, AND 172.1' SOUTH OF A DRIVEWAY.

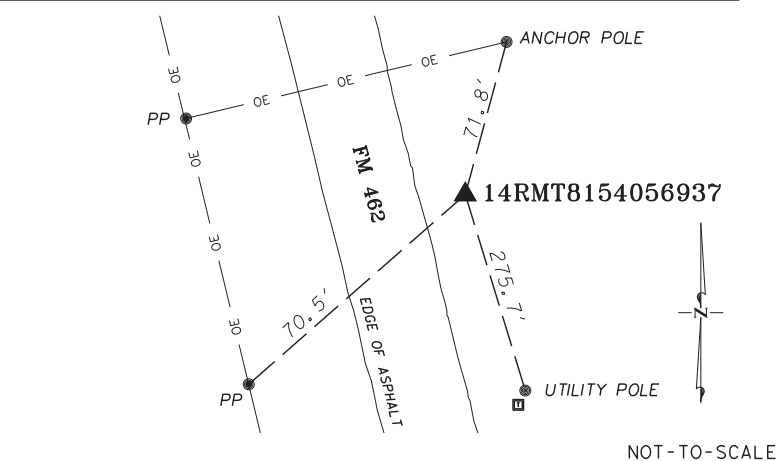
HORIZONTAL AND VERTICAL CONTROL POINT NO. 14RMT8295354053  
 N= 13,700,496.91' E= 1,912,802.35' ELEV.= 975.34'



NOT-TO-SCALE

DESCRIPTION: LOCATED ON THE EAST SIDE OF F.M. 462, +/- 4,500' NORTH OF THE INTERSECTION OF F.M. 462 AND CR 431; 507.3' SOUTHEAST OF A SIGN "CURVE AHEAD", 222.6' NORTHEAST OF A POWER POLE, AND 149.2' SOUTHEAST OF A POWER POLE.

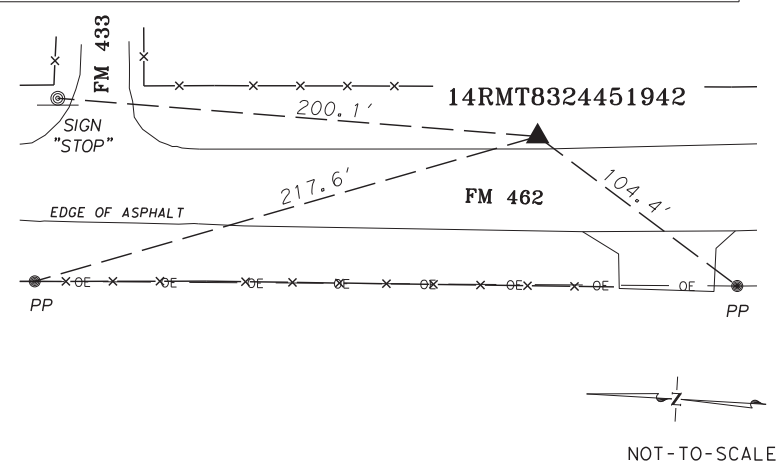
HORIZONTAL AND VERTICAL CONTROL POINT NO. 14RMT8154056937  
 N= 13,709,962.96' E= 1,908,169.13' ELEV.= 1,009.55'



NOT-TO-SCALE

DESCRIPTION: LOCATED ON THE EAST SIDE OF F.M. 462, +/- 2.9 MI. NORTH OF THE INTERSECTION OF F.M. 462 AND CR 431; 71.8' SOUTHWEST OF AN ANCHOR POLE, 70.5' NORTHEAST OF A POWER POLE, AND 275.7' NORTHWEST OF A UTILITY POLE.

HORIZONTAL AND VERTICAL CONTROL POINT NO. 14RMT8324451942  
 N= 13,693,568.30' E= 1,913,761.79' ELEV.= 954.81'



NOT-TO-SCALE

DESCRIPTION: LOCATED ON THE WEST SIDE OF F.M. 462, +/- 180.0' SOUTH OF THE INTERSECTION OF F.M. 462 AND CR 433; 200.1' SOUTH OF A SIGN "STOP", 217.6' SOUTHEAST OF A POWER POLE, AND 104.4' NORTHEAST OF A POWER POLE.

- NOTES:
1. ALL COORDINATES SHOWN HEREON ARE SURFACE COORDINATES AND IN U.S. SURVEY FEET.
  2. THIS PROJECT IS REFERENCED, FOR ALL BEARING AND COORDINATE BASIS, TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM OF 1983 (2011) EPOCH 2010.00, GEOID 18.
  3. ALL COORDINATES SHOWN HEREON ARE SURFACE COORDINATES AND CAN BE ADJUSTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00013.
  4. ALL ELEVATIONS SHOWN HEREON ARE NORTH AMERICAN VERTICAL DATUM (NAVD) 88 AND WERE DERIVED FROM GPS OBSERVATIONS.

I HEREBY CERTIFY THAT THE HORIZONTAL AND VERTICAL DATA SHOWN HEREON WAS DETERMINED BY MULTIPLE GPS OBSERVATIONS (RTN) IN JULY 2023.



*Chris Conrad*

10/23/2023

CHRIS I. CONRAD, REG. PROF. LAND SURVEYOR NO. 5623

DATE



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 www.mcgray.com

**FM 462 FROM 1.7 MI. NORTH OF CR 311 TO CR 433**

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET
	TEXAS		5 OF 5
STATE DISTRICT	COUNTY	TXDOT CONTROL-SECTION-JOB NO.	HWY. NO.
15	MEDINA	0848-04-052	FM 462

**HORIZONTAL & VERTICAL CONTROL SHEET**



DATE: 1/31/2024 2:45:33 PM  
 FILE: c:\pwwork1\02085597\FM462\_TEXT\_HAD.dgn

**FM 462**

Alignment Name: FM462  
 Alignment Description:  
 Alignment Style: Alignment\Baseline

Station	Northing	Easting
POT 79450.000 R1	13722016.34	1902820.468
PC 80122.187 R1	13721592.42	1903342.129
Tangential Direction: S50°54'06.243"E		
Tangential Length: 672.187		

**Element: Curve - 1**

PC 80122.187 R1	13721592.42	1903342.129
PI 80529.188 R1	13721335.75	1903657.989
CC 13723427.82	1904833.622	
PT 80928.294 R1	13721199.43	1904041.482
Radius: 2365		
Delta: 19°31'45.110" Left		
Degree of Curvature (Arc): 02°25'21.556"		
Length: 806.107		
Tangent: 407.002		
Chord: 802.211		
Middle Ordinate: 34.262		
External: 34.766		
Back Tangent Direction: S50°54'06.243"E		
Back Radial Direction: S39°05'53.757"W		
Chord Direction: S60°39'58.798"E		
Ahead Radial Direction: S19°34'08.647"W		
Ahead Tangent Direction: S70°25'51.353"E		

PT 80928.294 R1	13721199.43	1904041.482
PC 82094.633 R1	13720808.77	1905140.451
Tangential Direction: S70°25'51.353"E		
Tangential Length: 1166.339		

**Element: Curve - 2**

PC 82094.633 R1	13720808.77	1905140.451
PI 82784.805 R1	13720577.6	1905790.758
CC 13719899.51	1904817.231	
PT 83292.888 R1	13719887.48	1905782.156
Radius: 965		
Delta: 71°08'42.161" Right		
Degree of Curvature (Arc): 05°56'14.591"		
Length: 1198.255		
Tangent: 690.172		
Chord: 1122.745		
Middle Ordinate: 180.088		
External: 221.408		
Back Tangent Direction: S70°25'51.353"E		
Back Radial Direction: S19°34'08.647"W		
Chord Direction: S34°51'30.273"E		
Ahead Radial Direction: N89°17'09.192"W		
Ahead Tangent Direction: S00°42'50.808"W		

PT 83292.888 R1	13719887.48	1905782.156
PC 83908.278 R1	13719272.14	1905774.486
Tangential Direction: S00°42'50.808"W		
Tangential Length: 615.39		

**Element: Curve - 3**

PC 83908.278 R1	13719272.14	1905774.486
PI 83961.975 R1	13719218.45	1905773.817
CC 13719147.51	1915773.71	
PT 84015.672 R1	13719164.75	1905773.725
Radius: 10000		
Delta: 00°36'55.145" Left		
Degree of Curvature (Arc): 00°34'22.648"		
Length: 107.393		
Tangent: 53.697		
Chord: 107.393		
Middle Ordinate: 0.144		
External: 0.144		
Back Tangent Direction: S00°42'50.808"W		
Back Radial Direction: N89°17'09.192"W		
Chord Direction: S00°24'23.235"W		
Ahead Radial Direction: N89°54'04.338"W		
Ahead Tangent Direction: S00°05'55.662"W		

PT 84015.672 R1	13719164.75	1905773.725
PI 84779.378 R1	13718401.04	1905772.408
Tangential Direction: S00°05'55.662"W		
Tangential Length: 763.707		

PI 84779.378 R1	13718401.04	1905772.408
PI 85531.484 R1	13717648.96	1905766.13
Tangential Direction: S00°28'41.691"W		
Tangential Length: 752.105		

PI 85531.484 R1	13717648.96	1905766.13
PI 86467.827 R1	13716712.64	1905760.738
Tangential Direction: S00°19'47.819"W		
Tangential Length: 936.344		

PI 86467.827 R1	13716712.64	1905760.738
PC 87573.523 R1	13715606.95	1905757.364
Tangential Direction: S00°10'29.339"W		
Tangential Length: 1105.696		

**Element: Curve - 4**

PC 87573.523 R1	13715606.95	1905757.364
PI 87763.253 R1	13715417.22	1905756.785
CC 13715604.2	1906657.36	
PT 87947.507 R1	13715243.4	1905832.846
Radius: 900		
Delta: 23°48'30.804" Left		
Degree of Curvature (Arc): 06°21'58.312"		
Length: 373.984		
Tangent: 189.73		
Chord: 371.299		
Middle Ordinate: 19.356		
External: 19.781		
Back Tangent Direction: S00°10'29.339"W		
Back Radial Direction: N89°49'30.661"W		
Chord Direction: S11°43'46.063"E		
Ahead Radial Direction: S66°21'58.535"W		
Ahead Tangent Direction: S23°38'01.465"E		

PT 87947.507 R1	13715243.4	1905832.846
PC 89481.917 R1	13713837.69	1906447.973
Tangential Direction: S23°38'01.465"E		
Tangential Length: 1534.41		

**Element: Curve - 5**

PC 89481.917 R1	13713837.69	1906447.973
PI 89561.506 R1	13713764.77	1906479.88
CC 13715040.35	1909196.354	
PT 89641.058 R1	13713693.65	1906515.608
Radius: 3000		
Delta: 03°02'21.755" Left		
Degree of Curvature (Arc): 01°54'35.494"		
Length: 159.141		
Tangent: 79.589		
Chord: 159.123		
Middle Ordinate: 1.055		
External: 1.056		
Back Tangent Direction: S23°38'01.465"E		
Back Radial Direction: S66°21'58.535"W		
Chord Direction: S25°09'12.342"E		
Ahead Radial Direction: S63°19'36.780"W		
Ahead Tangent Direction: S26°40'23.220"E		

PT 89641.058 R1	13713693.65	1906515.608
PC 92398.775 R1	13711229.41	1907753.546
Tangential Direction: S26°40'23.220"E		
Tangential Length: 2757.717		

**Element: Curve - 6**

PC 92398.775 R1	13711229.41	1907753.546
PI 92550.003 R1	13711094.27	1907821.432
CC 13710466.28	1906234.456	
PT 92700.437 R1	13710949.28	1907864.399
Radius: 1700		
Delta: 10°10'01.324" Right		
Degree of Curvature (Arc): 03°22'13.224"		
Length: 301.662		
Tangent: 151.228		
Chord: 301.266		
Middle Ordinate: 6.687		
External: 6.713		
Back Tangent Direction: S26°40'23.220"E		
Back Radial Direction: S63°19'36.780"W		
Chord Direction: S21°35'22.558"E		
Ahead Radial Direction: S73°29'38.104"W		
Ahead Tangent Direction: S16°30'21.896"E		

PT 92700.437 R1	13710949.28	1907864.399
PC 93382.900 R1	13710294.94	1908058.298
Tangential Direction: S16°30'21.896"E		
Tangential Length: 682.463		

**Element: Curve - 7**

PC 93382.900 R1	13710294.94	1908058.298
PI 93494.948 R1	13710187.51	1908090.133
CC 13708874.35	1903264.35	
PT 93606.959 R1	13710078.76	1908117.123
Radius: 5000		
Delta: 02°34'03.105" Right		
Degree of Curvature (Arc): 01°08'45.296"		
Length: 224.059		
Tangent: 112.048		
Chord: 224.04		
Middle Ordinate: 1.255		
External: 1.255		
Back Tangent Direction: S16°30'21.896"E		
Back Radial Direction: S73°29'38.104"W		
Chord Direction: S15°13'20.344"E		
Ahead Radial Direction: S76°03'41.209"W		
Ahead Tangent Direction: S13°56'18.791"E		

PT 93606.959 R1	13710078.76	1908117.123
PC 94956.115 R1	13708769.33	1908442.109
Tangential Direction: S13°56'18.791"E		
Tangential Length: 1349.156		

**Element: Curve - 8**


PC 94956.115 R1	13708769.33	1908442.109
PI 95002.201 R1	13708724.6	1908453.211
CC 13706842.28	1900677.672	
PT 95048.285 R1	13708679.75	1908463.796
Radius: 8000		
Delta: 00°39'36.443" Right		
Degree of Curvature (Arc): 00°42'58.310"		
Length: 92.171		
Tangent: 46.086		
Chord: 92.17		
Middle Ordinate: 0.133		
External: 0.133		
Back Tangent Direction: S13°56'18.791"E		
Back Radial Direction: S76°03'41.209"W		
Chord Direction: S13°36'30.570"E		
Ahead Radial Direction: S76°43'17.651"W		
Ahead Tangent Direction: S13°16'42.349"E		

PT 95048.285 R1	13708679.75	1908463.796
PC 95318.382 R1	13708416.87	1908525.833
Tangential Direction: S13°16'42.349"E		
Tangential Length: 270.097		

**Element: Curve - 9**

PC 95318.382 R1	13708416.87	1908525.833
PI 95811.895 R1	13707936.55	1908639.184
CC 13711402.75	1921178.283	
PT 96304.935 R1	13707466.21	1908788.626
Radius: 13000		
Delta: 04°20'53.154" Left		
Degree of Curvature (Arc): 00°26'26.652"		
Length: 986.552		
Tangent: 493.513		
Chord: 986.316		
Middle Ordinate: 9.357		
External: 9.364		
Back Tangent Direction: S13°16'42.349"E		
Back Radial Direction: S76°43'17.651"W		
Chord Direction: S15°27'08.926"E		
Ahead Radial Direction: S72°22'24.497"W		
Ahead Tangent Direction: S17°37'35.503"E		

PT 96304.935 R1	13707466.21	1908788.626
PC 96677.371 R1	13707111.26	1908901.403
Tangential Direction: S17°37'35.503"E		
Tangential Length: 372.437		


  
 David Gutierrez
   
 1/31/2024

Kimley & Horn

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FM 462

HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	99	

CK: DW: CK: DW:

Element: Curve - 10
PC 96677.371 R1 13707111.26 1908901.403
PI 96849.974 R1 13706946.76 1908953.669
CC 13706672.18 1907519.48
PT 97020.959 R1 13706774.59 1908965.859
Radius: 1450
Delta: 13°34'35.968" Right
Degree of Curvature (Arc): 03°57'05.159"
Length: 343.588
Tangent: 172.602
Chord: 342.785
Middle Ordinate: 10.165
External: 10.237
Back Tangent Direction: S17°37'35.503"E
Back Radial Direction: S72°22'24.497"W
Chord Direction: S10°50'17.519"E
Ahead Radial Direction: S85°57'00.465"W
Ahead Tangent Direction: S04°02'59.535"E

Element: Linear
PT 97020.959 R1 13706774.59 1908965.859
PC 97551.491 R1 13706245.38 1909003.328
Tangential Direction: S04°02'59.535"E
Tangential Length: 530.531

Element: Curve - 11
PC 97551.491 R1 13706245.38 1909003.328
PI 97835.497 R1 13705962.08 1909023.386
CC 13706323.77 1910110.556
PT 98107.573 R1 13705723.23 1909177.041
Radius: 1110
Delta: 28°42'13.428" Left
Degree of Curvature (Arc): 05°09'42.415"
Length: 556.082
Tangent: 284.006
Chord: 550.285
Middle Ordinate: 34.641
External: 35.757
Back Tangent Direction: S04°02'59.535"E
Back Radial Direction: S85°57'00.465"W
Chord Direction: S18°24'06.249"E
Ahead Radial Direction: S57°14'47.037"W
Ahead Tangent Direction: S32°45'12.963"E

Element: Linear
PT 98107.573 R1 13705723.23 1909177.041
PC 98435.364 R1 13705447.56 1909354.385
Tangential Direction: S32°45'12.963"E
Tangential Length: 327.792

Element: Curve - 12
PC 98435.364 R1 13705447.56 1909354.385
PI 98763.152 R1 13705171.89 1909531.727
CC 13705975.06 1910174.365
PT 99067.792 R1 13705059.34 1909839.587
Radius: 975
Delta: 37°09'52.324" Left
Degree of Curvature (Arc): 05°52'35.365"
Length: 632.427
Tangent: 327.788
Chord: 621.399
Middle Ordinate: 50.83
External: 53.625
Back Tangent Direction: S32°45'12.963"E
Back Radial Direction: S57°14'47.037"W
Chord Direction: S51°20'09.125"E
Ahead Radial Direction: S20°04'54.713"W
Ahead Tangent Direction: S69°55'05.287"E

Element: Linear
PT 99067.792 R1 13705059.34 1909839.587
PC 99909.288 R1 13704770.4 1910629.922
Tangential Direction: S69°55'05.287"E
Tangential Length: 841.496

Element: Curve - 13
PC 99909.288 R1 13704770.4 1910629.922
PI 100389.783 R1 13704605.42 1911081.204
CC 13703845.28 1910291.71
PT 100803.372 R1 13704148.21 1911228.974
Radius: 985
Delta: 52°00'26.346" Right
Degree of Curvature (Arc): 05°49'00.589"
Length: 894.083
Tangent: 480.494
Chord: 863.704
Middle Ordinate: 99.715
External: 110.947
Back Tangent Direction: S69°55'05.287"E
Back Radial Direction: S20°04'54.713"W
Chord Direction: S43°54'52.114"E
Ahead Radial Direction: S72°05'21.059"W
Ahead Tangent Direction: S17°54'38.941"E

Element: Linear
PT 100803.372 R1 13704148.21 1911228.974
PC 101198.607 R1 13703772.13 1911350.523
Tangential Direction: S17°54'38.941"E
Tangential Length: 395.235

Element: Curve - 14
PC 101198.607 R1 13703772.13 1911350.523
PI 101385.599 R1 13703594.2 1911408.03
CC 13703203.18 1909590.181
PT 101571.326 R1 13703408.36 1911428.768
Radius: 1850
Delta: 11°32'36.151" Right
Degree of Curvature (Arc): 03°05'49.449"
Length: 372.719
Tangent: 186.993
Chord: 372.089
Middle Ordinate: 9.379
External: 9.426
Back Tangent Direction: S17°54'38.941"E
Back Radial Direction: S72°05'21.059"W
Chord Direction: S12°08'20.865"E
Ahead Radial Direction: S83°37'57.210"W
Ahead Tangent Direction: S06°22'02.790"E

Element: Linear
PT 101571.326 R1 13703408.36 1911428.768
PC 102469.321 R1 13702515.9 1911528.36
Tangential Direction: S06°22'02.790"E
Tangential Length: 897.995

Element: Linear
PT 101571.326 R1 13703408.36 1911428.768
PC 102469.321 R1 13702515.9 1911528.36
Tangential Direction: S06°22'02.790"E
Tangential Length: 897.995

Element: Curve - 15
PC 102469.321 R1 13702515.9 1911528.36
PI 102741.756 R1 13702245.15 1911558.574
CC 13702937.34 1915304.918
PT 103013.261 R1 13701981.47 1911627.103
Radius: 3800
Delta: 08°12'05.182" Left
Degree of Curvature (Arc): 01°30'28.021"
Length: 543.94
Tangent: 272.435
Chord: 543.476
Middle Ordinate: 9.728
External: 9.753
Back Tangent Direction: S06°22'02.790"E
Back Radial Direction: S83°37'57.210"W
Chord Direction: S10°28'05.381"E
Ahead Radial Direction: S75°25'52.028"W
Ahead Tangent Direction: S14°34'07.972"E

Element: Linear
PT 103013.261 R1 13701981.47 1911627.103
PC 103219.335 R1 13701782.02 1911678.94
Tangential Direction: S14°34'07.972"E
Tangential Length: 206.074

Element: Linear
PT 103013.261 R1 13701981.47 1911627.103
PC 103219.335 R1 13701782.02 1911678.94
Tangential Direction: S14°34'07.972"E
Tangential Length: 206.074

Element: Curve - 16
PC 103219.335 R1 13701782.02 1911678.94
PI 103501.066 R1 13701509.35 1911749.808
CC 13702041.11 1912675.821
PT 103769.344 R1 13701310.71 1911949.592
Radius: 1030
Delta: 30°35'43.341" Left
Degree of Curvature (Arc): 05°33'45.709"
Length: 550.01
Tangent: 281.731
Chord: 543.498
Middle Ordinate: 36.495
External: 37.835
Back Tangent Direction: S14°34'07.972"E
Back Radial Direction: S75°25'52.028"W
Chord Direction: S29°51'59.642"E
Ahead Radial Direction: S44°50'08.688"W
Ahead Tangent Direction: S45°09'51.312"E

Element: Linear
PT 103769.344 R1 13701310.71 1911949.592
PC 105035.505 R1 13700417.97 1912847.466
Tangential Direction: S45°09'51.312"E
Tangential Length: 1266.161

Element: Linear
PT 103769.344 R1 13701310.71 1911949.592
PC 105035.505 R1 13700417.97 1912847.466
Tangential Direction: S45°09'51.312"E
Tangential Length: 1266.161

Element: Curve - 17
PC 105035.505 R1 13700417.97 1912847.466
PI 105607.216 R1 13700014.87 1913252.883
CC 13699382.64 1911818.054
PT 106125.334 R1 13699443.66 1913276.778
Radius: 1460
Delta: 42°46'07.979" Right
Degree of Curvature (Arc): 03°55'27.726"
Length: 1089.828
Tangent: 571.71
Chord: 1064.702
Middle Ordinate: 100.514
External: 107.945
Back Tangent Direction: S45°09'51.312"E
Back Radial Direction: S44°50'08.688"W
Chord Direction: S23°46'47.323"E
Ahead Radial Direction: S87°36'16.666"W
Ahead Tangent Direction: S02°23'43.334"E

Element: Linear
PT 106125.334 R1 13699443.66 1913276.778
PI 107395.751 R1 13698174.35 1913329.875
Tangential Direction: S02°23'43.334"E
Tangential Length: 1270.417

Element: Linear
PT 106125.334 R1 13699443.66 1913276.778
PI 107395.751 R1 13698174.35 1913329.875
Tangential Direction: S02°23'43.334"E
Tangential Length: 1270.417

Element: Linear
PI 107395.751 R1 13698174.35 1913329.875
PC 108204.446 R1 13697366.19 1913359.369
Tangential Direction: S02°05'24.422"E
Tangential Length: 808.695

Element: Linear
PI 108204.446 R1 13697366.19 1913359.369
PC 108794.590 R1 13696776.52 1913382.84
Tangential Direction: S02°16'45.598"E
Tangential Length: 590.144

Element: Curve - 18
PC 108794.590 R1 13696776.52 1913382.84
PI 108936.171 R1 13696635.05 1913388.471
CC 13696816.29 1914382.049
PT 109075.882 R1 13696500.7 1913433.152
Radius: 1000
Delta: 16°07'00.754" Left
Degree of Curvature (Arc): 05°43'46.481"
Length: 281.293
Tangent: 141.581
Chord: 280.366
Middle Ordinate: 9.874
External: 9.973
Back Tangent Direction: S02°16'45.598"E
Back Radial Direction: S87°43'14.402"W
Chord Direction: S10°20'15.975"E
Ahead Radial Direction: S71°36'13.647"W
Ahead Tangent Direction: S18°23'46.353"E

Element: Linear
PT 109075.882 R1 13696500.7 1913433.152
PC 109302.491 R1 13696285.67 1913504.667
Tangential Direction: S18°23'46.353"E
Tangential Length: 226.609

Element: Linear
PT 109075.882 R1 13696500.7 1913433.152
PC 109302.491 R1 13696285.67 1913504.667
Tangential Direction: S18°23'46.353"E
Tangential Length: 226.609

Element: Curve - 19
PC 109302.491 R1 13696285.67 1913504.667
PI 109447.653 R1 13696147.93 1913550.478
CC 13695906.97 1912365.99
PT 109591.412 R1 13696003.24 1913562.123
Radius: 1200
Delta: 13°47'41.821" Right
Degree of Curvature (Arc): 04°46'28.734"
Length: 288.921
Tangent: 145.162
Chord: 288.223
Middle Ordinate: 8.685
External: 8.748
Back Tangent Direction: S18°23'46.353"E
Back Radial Direction: S71°36'13.647"W
Chord Direction: S11°29'55.442"E
Ahead Radial Direction: S85°23'55.468"W
Ahead Tangent Direction: S04°36'04.532"E

Element: Linear
PT 109591.412 R1 13696003.24 1913562.123
PI 110261.460 R1 13695335.35 1913615.875
Tangential Direction: S04°36'04.532"E
Tangential Length: 670.048

Element: Linear
PT 109591.412 R1 13696003.24 1913562.123
PI 110261.460 R1 13695335.35 1913615.875
Tangential Direction: S04°36'04.532"E
Tangential Length: 670.048

Element: Linear
PI 110261.460 R1 13695335.35 1913615.875
PC 110636.637 R1 13694961.5 1913647.409
Tangential Direction: S04°49'17.187"E
Tangential Length: 375.178



Kimley Horn logo and project information: FM 462 HORIZONTAL ALIGNMENT DATA SHEET 2 OF 3. Table with columns: CONT, SECT, JOB, HIGHWAY, DIST, COUNTY, SHEET NO., SAT, MEDINA, 100.

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Element: Linear  
 PI 110636.637 R1  
 PC 111406.606 R1  
 Tangential Direction: S04°34'37.849"E  
 Tangential Length: 769.969

**Element: Curve - 20**  
 PC 111406.606 R1 13694193.98 1913708.854  
 PI 111556.568 R1 13694044.5 1913720.821  
 CC 13693555.57 1905734.368  
 PT 111706.495 R1 13693894.67 1913727.177  
 Radius: 8000  
 Delta: 02°08'52.047" Right  
 Degree of Curvature (Arc): 00°42'58.310"  
 Length: 299.888  
 Tangent: 149.962  
 Chord: 299.871  
 Middle Ordinate: 1.405  
 External: 1.405  
 Back Tangent Direction: S04°34'37.849"E  
 Back Radial Direction: S85°25'22.151"W  
 Chord Direction: S03°30'11.826"E  
 Ahead Radial Direction: S87°34'14.198"W  
 Ahead Tangent Direction: S02°25'45.802"E

Element: Linear  
 PT 111706.495 R1 13693894.67 1913727.177  
 PC 112001.755 R1 13693599.68 1913739.693  
 Tangential Direction: S02°25'45.802"E  
 Tangential Length: 295.26

**Element: Curve - 21**  
 PC 112001.755 R1 13693599.68 1913739.693  
 PI 112098.663 R1 13693502.86 1913743.801  
 CC 13693811.62 1918735.199  
 PT 112195.546 R1 13693406.27 1913751.657  
 Radius: 5000  
 Delta: 02°13'14.489" Left  
 Degree of Curvature (Arc): 01°08'45.296"  
 Length: 193.792  
 Tangent: 96.908  
 Chord: 193.78  
 Middle Ordinate: 0.939  
 External: 0.939  
 Back Tangent Direction: S02°25'45.802"E  
 Back Radial Direction: S87°34'14.198"W  
 Chord Direction: S03°32'23.046"E  
 Ahead Radial Direction: S85°20'59.709"W  
 Ahead Tangent Direction: S04°39'00.291"E

Element: Linear  
 PT 112195.546 R1 13693406.27 1913751.657  
 POT 114199.986 R1 13691408.43 1913914.157  
 Tangential Direction: S04°39'00.291"E  
 Tangential Length: 2004.44

**CR 331**  
 Alignment Name: CR 331  
 Alignment Description:  
 Alignment Style: Alignment\Baseline

Station	Northing	Easting
POT 900.000 R1	13713601.74	1906561.783
PC 916.592 R1	13713609.18	1906576.609

Tangential Direction: N63°19'36.780"E  
 Tangential Length: 16.592



**Element: Curve - 1**  
 PC 916.592 R1 13713609.18 1906576.609  
 PI 949.742 R1 13713624.07 1906606.231  
 CC 13713475.15 1906643.944  
 PT 981.842 R1 13713625.08 1906639.365  
 Radius: 150  
 Delta: 24°55'25.499" Right  
 Degree of Curvature (Arc): 38°11'49.871"  
 Length: 65.25  
 Tangent: 33.149  
 Chord: 64.737  
 Middle Ordinate: 3.534  
 External: 3.619  
 Back Tangent Direction: N63°19'36.780"E  
 Back Radial Direction: S26°40'23.220"E  
 Chord Direction: N75°47'19.529"E  
 Ahead Radial Direction: S01°44'57.721"E  
 Ahead Tangent Direction: N88°15'02.279"E


Element: Linear  
 PT 981.842 R1 13713625.08 1906639.365  
 POT 1000.027 R1 13713625.63 1906657.541  
 Tangential Direction: N88°15'02.279"E  
 Tangential Length: 18.184

**CR 431**  
 Alignment Name: CR 431  
 Alignment Description:  
 Alignment Style: Alignment\Baseline

Station	Northing	Easting
POT 900.000 R1	13696139.89	1913343.368
POT 1100.000 R1	13696138.89	1913543.365

Tangential Direction: S89°42'55.384"E  
 Tangential Length: 200

  
 1/31/2024  




Texas Department of Transportation

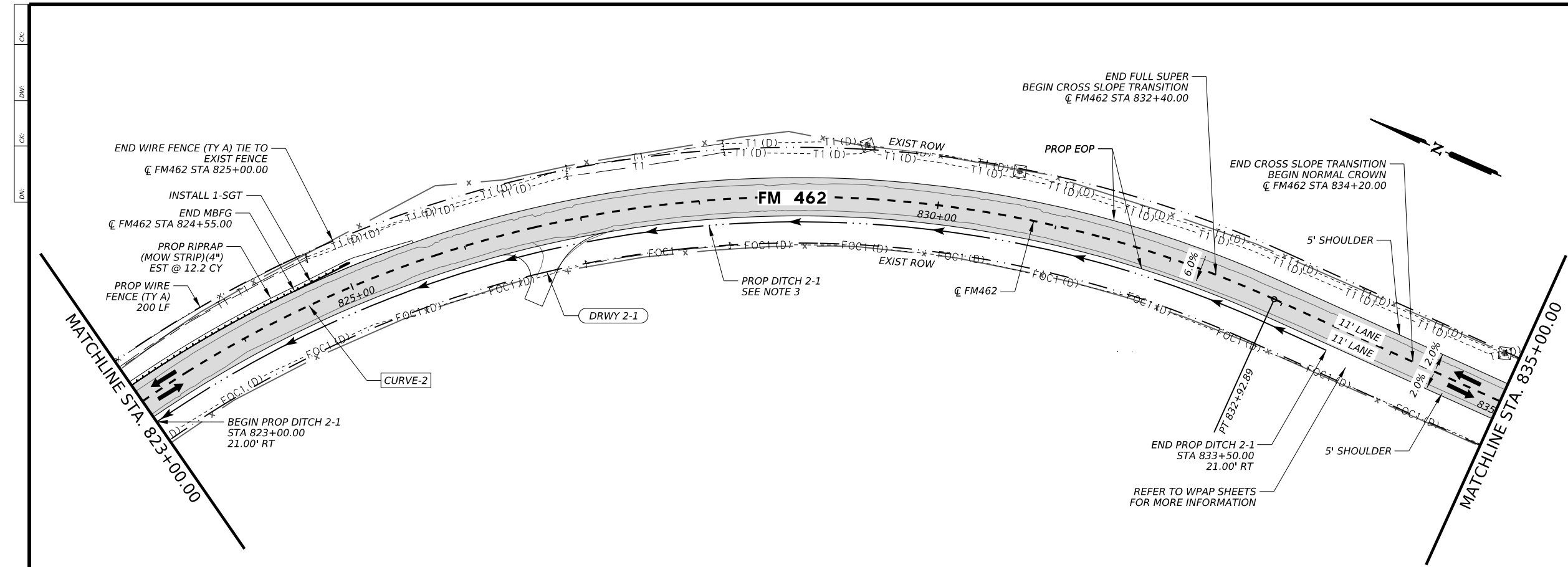
**FM 462**  
 HORIZONTAL ALIGNMENT  
 DATA

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	101	





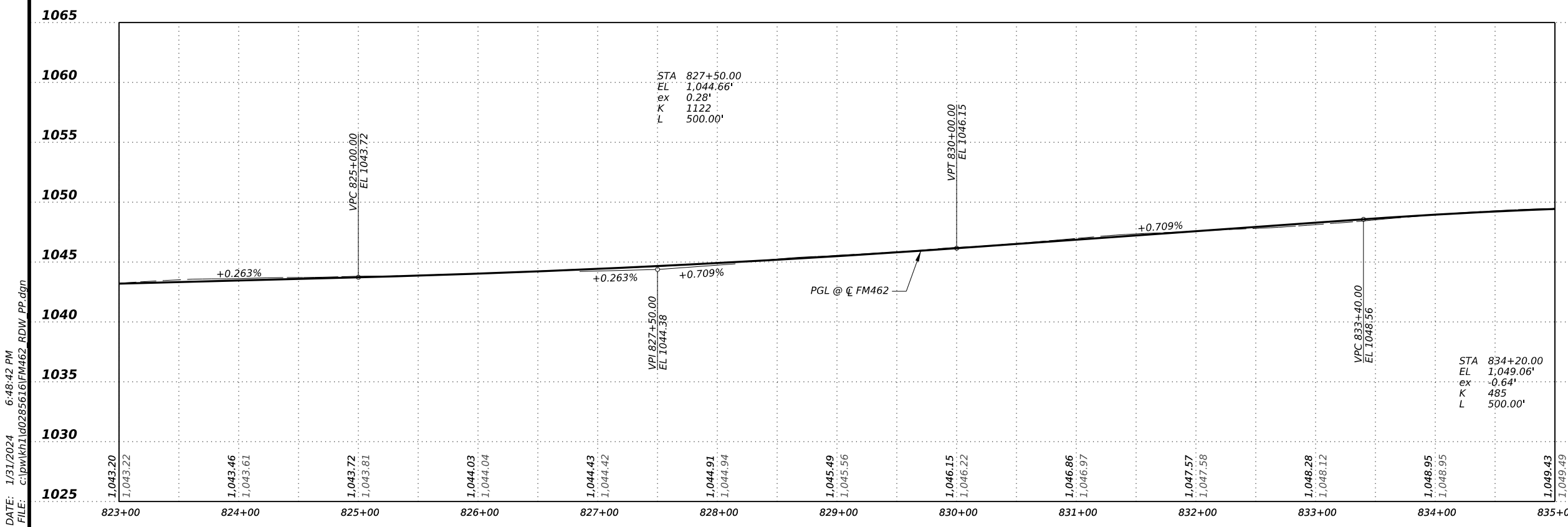


ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	755
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	274
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	671
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	82
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4512
0275 6001	CEMENT	TON	39
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	2256
0275 6004	CEMENT TREAT (MX EXST MTL & NW BS) (6")	SY	2256
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR(TY-PD GR-4 SAC-B)	#SY	4267
0432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	12.2
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	155
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0552 6001	WIRE FENCE (TY A)	LF	200

\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
 # FOR CONTRACTOR'S INFORMATION ONLY,  
 SEE BASIS OF ESTIMATE FOR BID ITEM QUANTITIES.  
 ~ FOR CEMENT TREAT BASE

- LEGEND**
- \*—\*— EXIST FENCE
  - — — EXIST FEATURES
  - - - - - EXIST RIGHT OF WAY
  - — — EXIST DITCH
  - — — PROP DITCH
  - ▬▬▬ PROP ROADWAY
  - E1 — MEDINA ELECTRIC
  - T1 — AT&T (TELE)
  - FOC1 — AT&T (FO/DUCT)
  - W1 — WEST MEDINA WSC
  - OH — OH MEDINA ELECTRIC
  - OH — OH AT&T TELE
  - OH — OH AT&T FO

- NOTES:**
1. LOCATION OF UTILITIES ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  2. SEE DRIVEWAY AND INTERSECTION PLAN AND PROFILE SHEETS FOR MORE INFORMATION.
  3. SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



1/31/2024

DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

0' 50' 100'  
 0' 5' 10'

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**ROADWAY**

**PLAN AND PROFILE**

SHEET 2 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	103	

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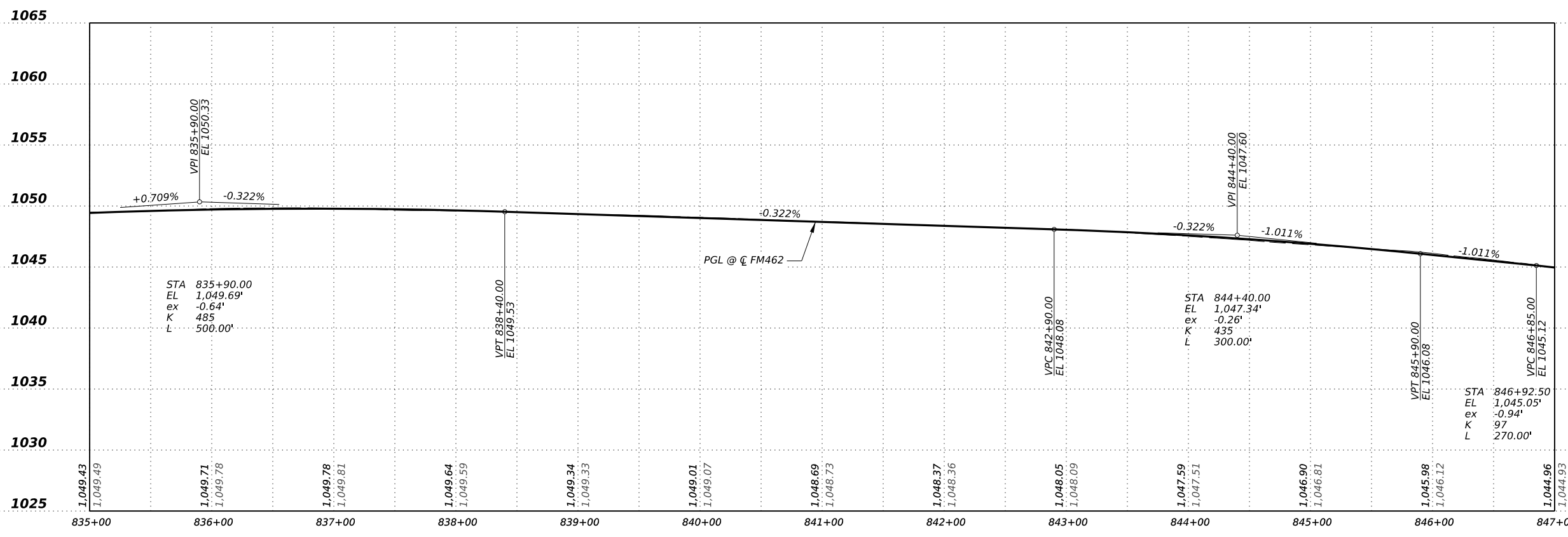
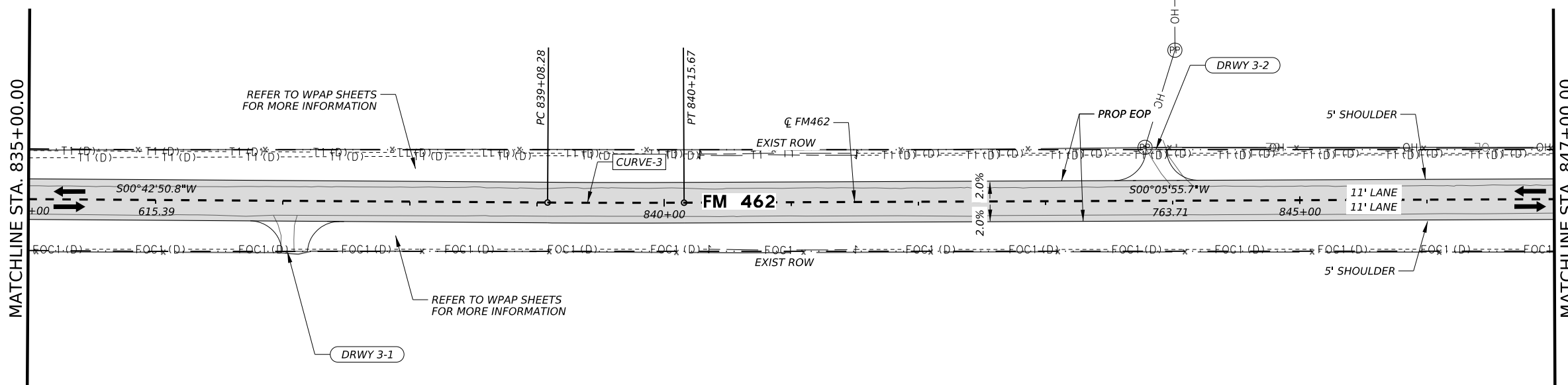
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ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	615
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	350
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	671
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4512
0275 6001	CEMENT	TON	39
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	4512
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR(TY-PD GR-4 SAC-B)	#SY	4267

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  - - - - - EXIST RIGHT OF WAY
  - — — EXIST DITCH
  - — — PROP DITCH
  - ▬▬▬ PROP ROADWAY
  - E1 — MEDINA ELECTRIC
  - T1 — AT&T (TELE)
  - FOC1 — AT&T (FO/DUCT)
  - W1 — WEST MEDINA WSC
  - OH — OH MEDINA ELECTRIC
  - OH — OH AT&T TELE
  - OH — OH AT&T FO

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1/31/2024

DAVID H. GUTIERREZ  
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**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**ROADWAY**

**PLAN AND PROFILE**

SHEET 3 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	104	

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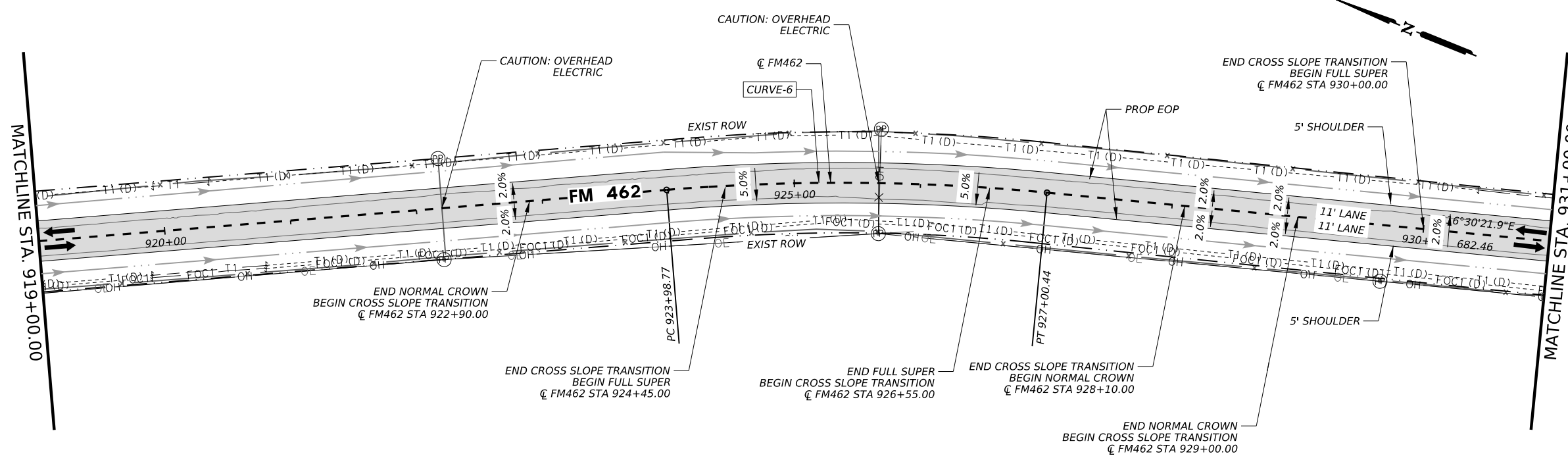






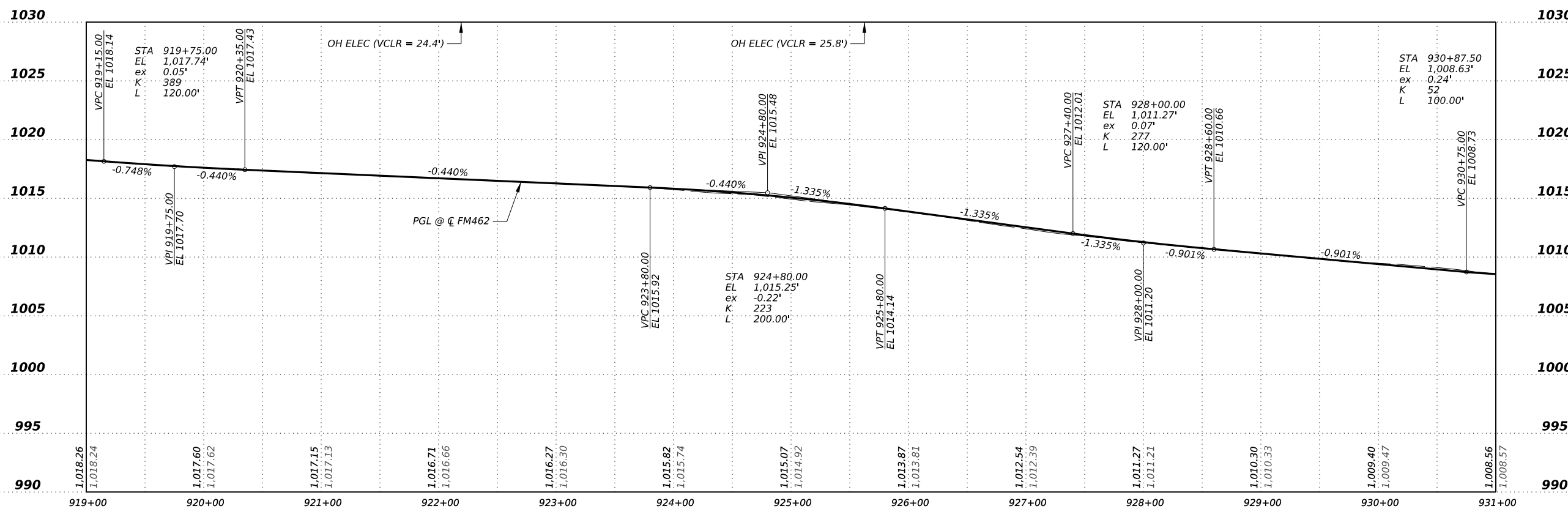
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ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	924
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	74
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4645
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	4645
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR(TY-PD GR-4 SAC-B)	#SY	4267



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  - E1 — MEDINA ELECTRIC
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OH AT&T FO
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  3. SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



1/31/2024

DAVID H. GUTIERREZ  
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 LICENSED PROFESSIONAL ENGINEER

0' 50' 100'  
 0' 5' 10'

**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**ROADWAY**

**PLAN AND PROFILE**

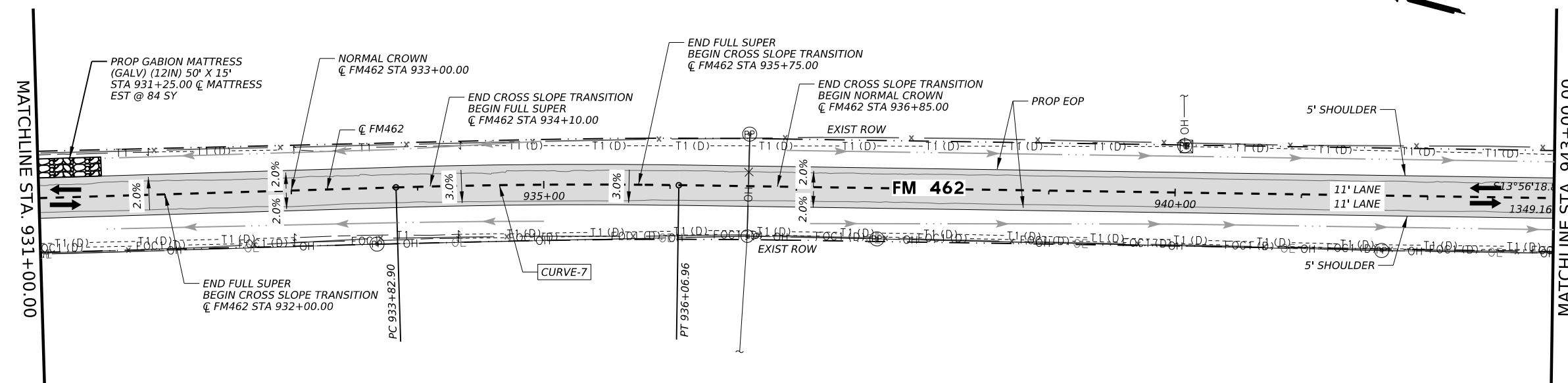
SHEET 10 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	111	

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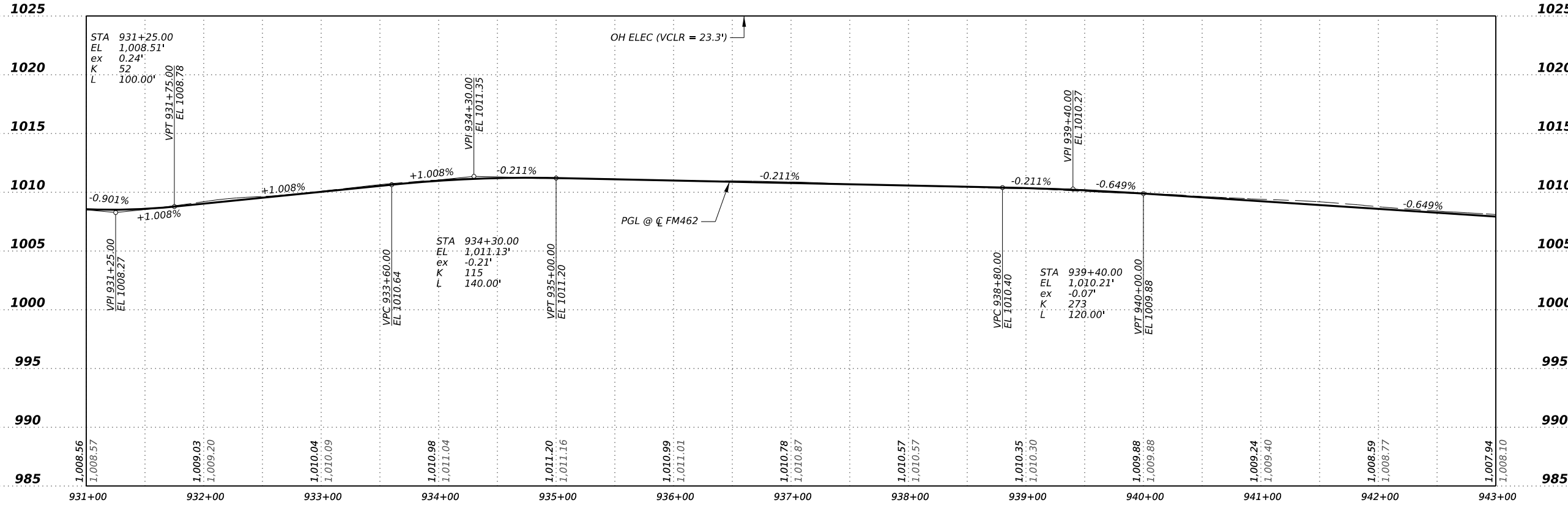
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	1015
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	46
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4645
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	4645
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR (TY-PD GR-4 SAC-B)	#SY	4267
0459 6007	GABION MATRESSES (GALV)(12 IN)	SY	84



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  - — — — — PROP DITCH
  - — — — — PROP ROADWAY
  - — — — — E1 — MEDINA ELECTRIC
  - — — — — T1 — AT&T (TELE)
  - — — — — FOC1 — AT&T (FO/DUCT)
  - — — — — W1 — WEST MEDINA WSC
  - — — — — OH — OH MEDINA ELECTRIC  
OH AT&T TELE  
OH AT&T FO

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1/31/2024

0' 50' 100'  
0' 5' 10'

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 Texas Department of Transportation

**FM 462**  
 ROADWAY  
 PLAN AND PROFILE

SHEET 11 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	112	

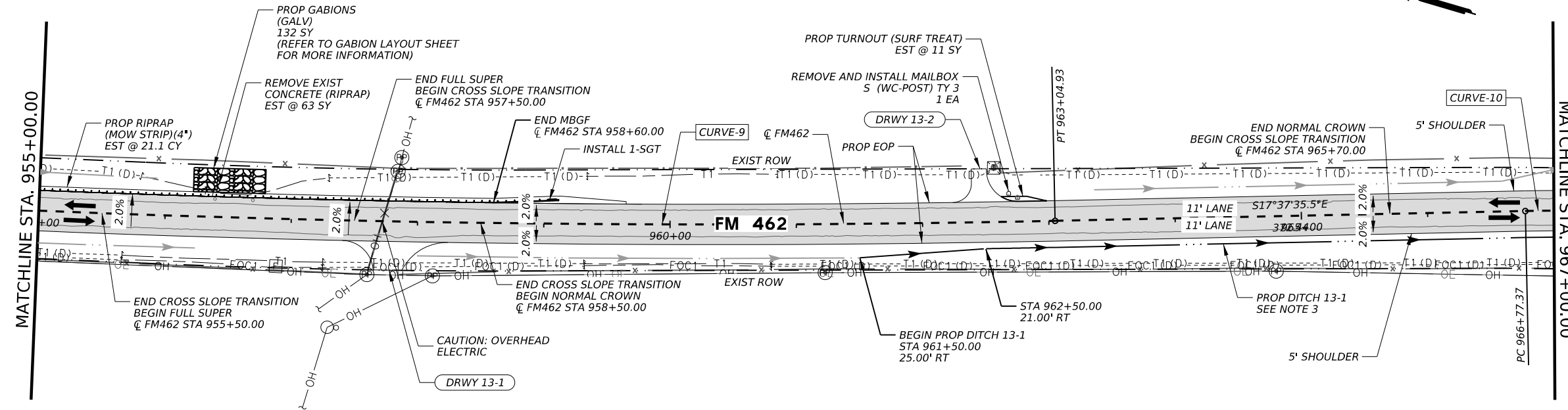






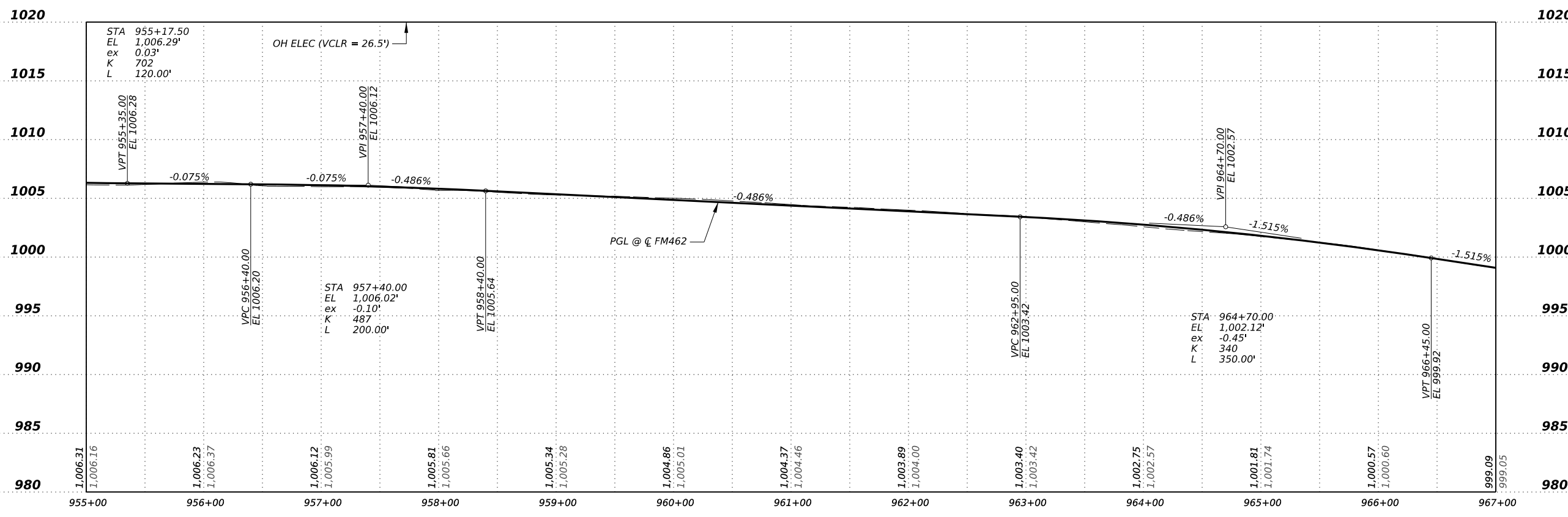
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ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	63
0110 6001	EXCAVATION (ROADWAY)	CY	1189
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	58
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4645
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	4645
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR(TY-PD GR-4 SAC-B)	#SY	4267
0432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	21.1
0459 6001	GABIONS (GALV)	CY	132
0530 6009	TURNOUTS (SURF TREAT)	SY	11
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	360
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0560 6007	MAILBOX INSTALL-S (WC-POST) TY 3	EA	1



\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
 # FOR CONTRACTOR'S INFORMATION ONLY.  
 SEE BASIS OF ESTIMATE FOR BID ITEM QUANTITIES.  
 ~ FOR CEMENT TREAT BASE

- LEGEND**
- x — x — EXIST FENCE
  - — — — EXIST FEATURES
  - — — — EXIST RIGHT OF WAY
  - — — — EXIST DITCH
  - — — — PROP DITCH
  - — — — PROP ROADWAY
  - E1 — MEDINA ELECTRIC
  - T1 — AT&T (TELE)
  - FOC1 — AT&T (FO/DUCT)
  - W1 — WEST MEDINA WSC
  - OH — OH MEDINA ELECTRIC
  - OH — OH AT&T TELE
  - OH — OH AT&T FO
- NOTES:**
1. LOCATION OF UTILITIES ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  2. SEE DRIVEWAY AND INTERSECTION PLAN AND PROFILE SHEETS FOR MORE INFORMATION.
  3. SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



1/31/2024

DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

0' 50' 100'  
 0' 5' 10'

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**ROADWAY**

**PLAN AND PROFILE**

SHEET 13 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	114	

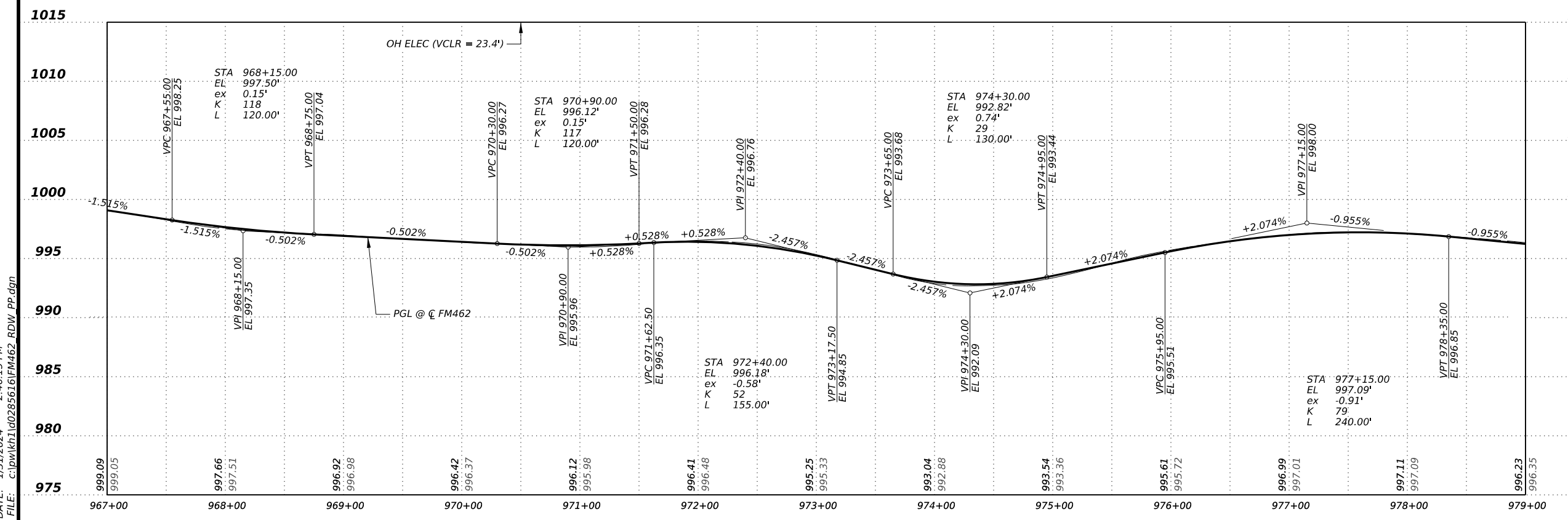
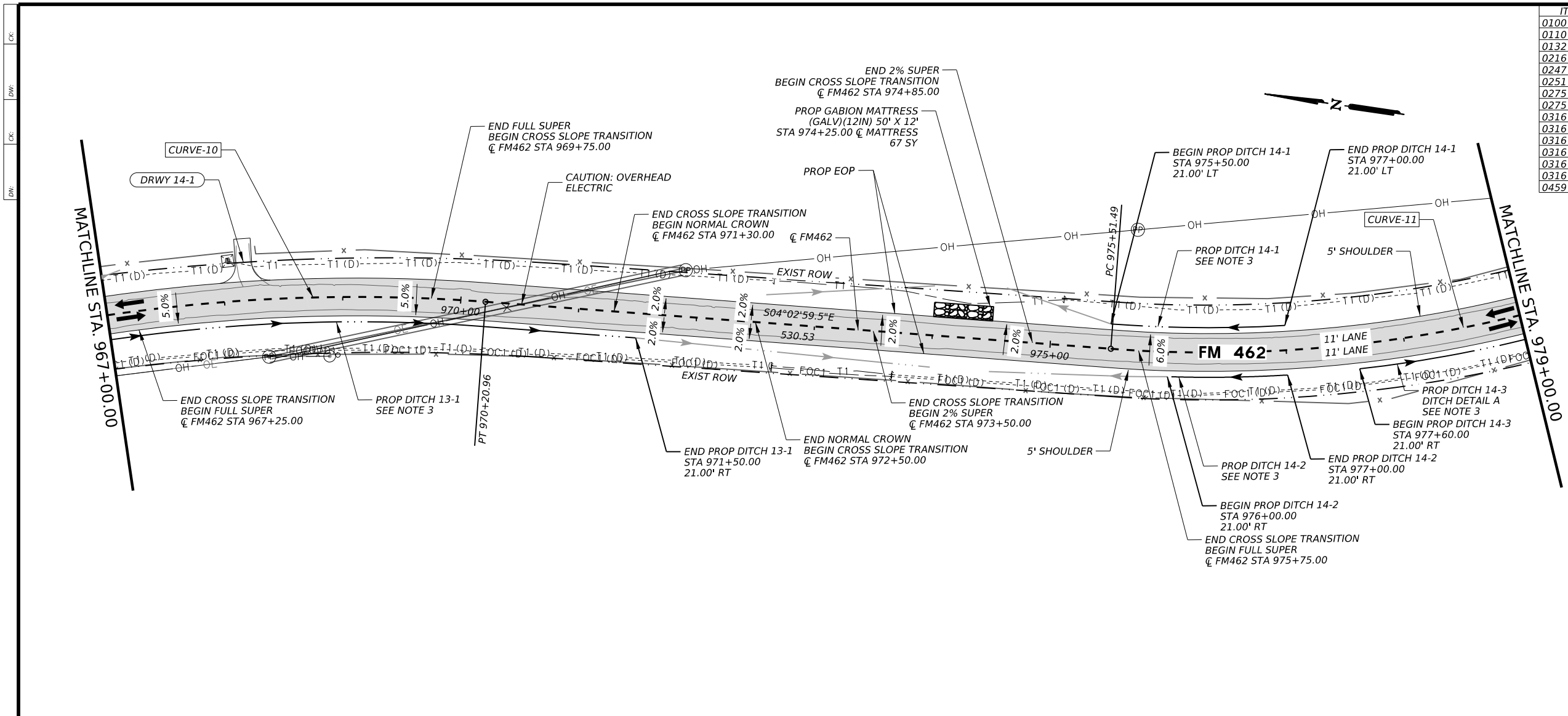
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ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	1422
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	49
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4645
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	4645
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR(TY-PD GR-4 SAC-B)	#SY	4267
0459 6007	GABION MATTRESSES (GALV)(12 IN)	SY	67

\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
 # FOR CONTRACTOR'S INFORMATION ONLY,  
 SEE BASIS OF ESTIMATE FOR BID ITEM QUANTITIES.  
 ~ FOR CEMENT TREAT BASE

- LEGEND**
- x — EXIST FENCE
  - — — EXIST FEATURES
  - - - - - EXIST RIGHT OF WAY
  - — — EXIST DITCH
  - — — PROP DITCH
  - — — PROP ROADWAY
  - E1 — MEDINA ELECTRIC
  - T1 — AT&T (TELE)
  - FOC1 — AT&T (FO/DUCT)
  - W1 — WEST MEDINA WSC
  - OH — OH MEDINA ELECTRIC
  - OH — OH AT&T TELE
  - OH — OH AT&T FO

- NOTES:**
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  2. SEE DRIVEWAY AND INTERSECTION PLAN AND PROFILE SHEETS FOR MORE INFORMATION.
  3. SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



1/31/2024

DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

0' 50' 100'  
 0' 5' 10'

**Kimley Horn** F-928

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 Texas Department of Transportation

**FM 462**

**ROADWAY**

**PLAN AND PROFILE**

SHEET 14 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	115	

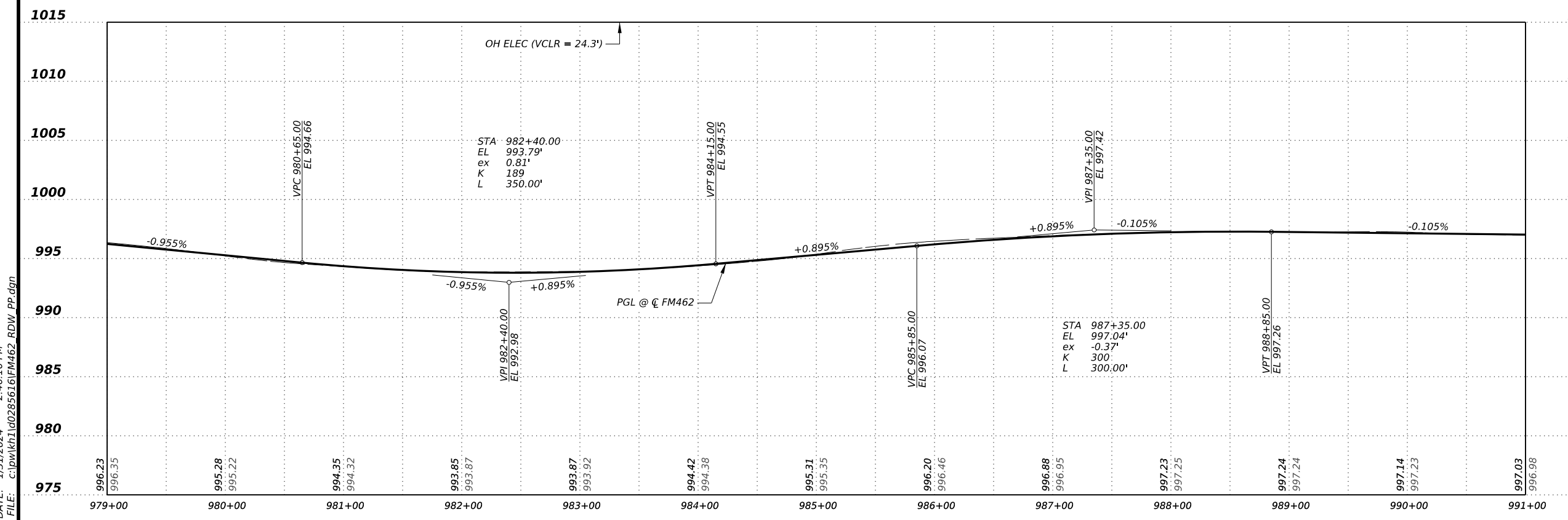
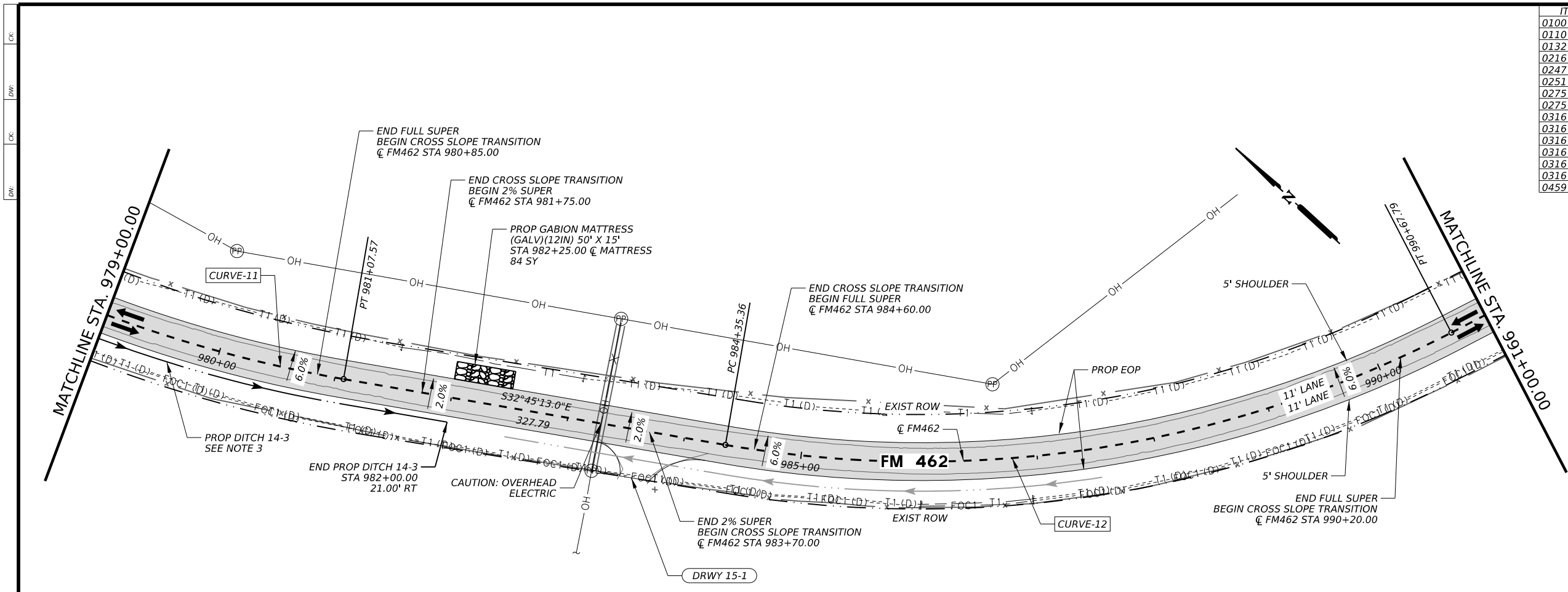
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ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	1078
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	27
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4645
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	4645
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR(TY-PD GR-4 SAC-B)	#SY	4267
0459 6007	GABION MATTRESSES (GALV)(12 IN)	SY	84

\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
 # FOR CONTRACTOR'S INFORMATION ONLY,  
 SEE BASIS OF ESTIMATE FOR BID ITEM QUANTITIES.  
 ~ FOR CEMENT TREAT BASE

- LEGEND**
- X — EXIST FENCE
  - — EXIST FEATURES
  - - - EXIST RIGHT OF WAY
  - (D) — EXIST DITCH
  - (D) — PROP DITCH
  - (D) — PROP ROADWAY
  - E1 — MEDINA ELECTRIC
  - T1 — AT&T (TELE)
  - FOC1 — AT&T (FO/DUCT)
  - W1 — WEST MEDINA WSC
  - OH — OH MEDINA ELECTRIC
  - OH — OH AT&T TELE
  - OH — OH AT&T FO

- NOTES:**
1. LOCATION OF UTILITIES ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
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1/31/2024

DAVID H. GUTIERREZ  
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0' 50' 100'  
 0' 5' 10'

**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**ROADWAY**

**PLAN AND PROFILE**

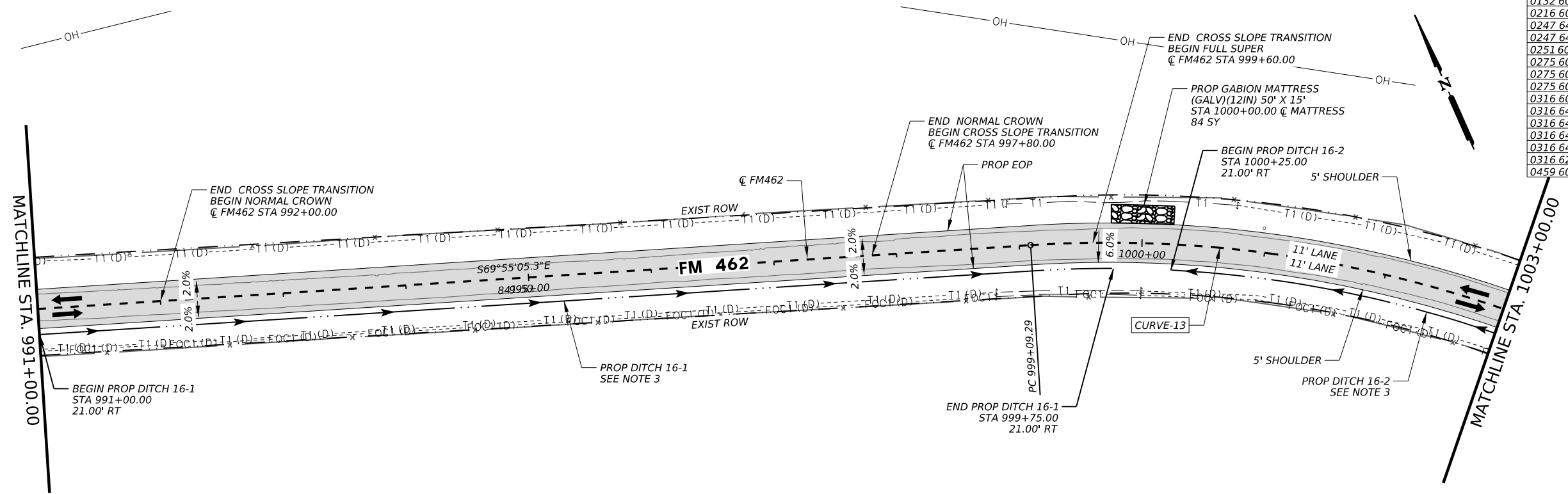
SHEET 15 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	116	

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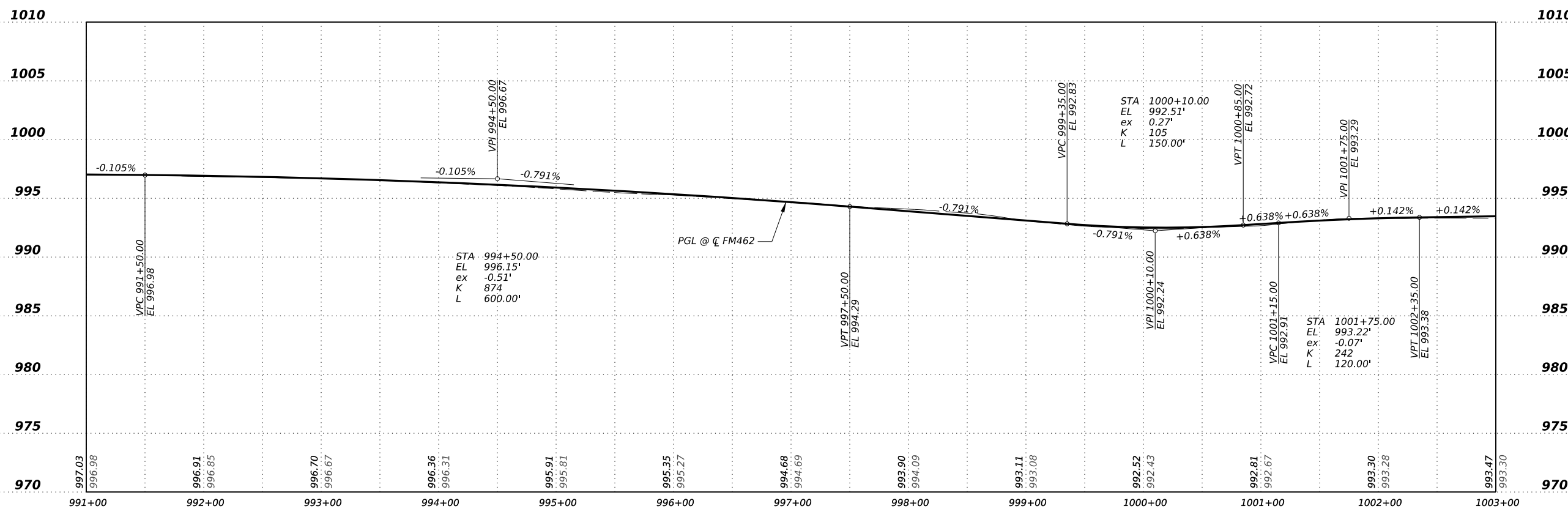
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	1387
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	30
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	56
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4646
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	2323
0275 6004	CEMENT TREAT (MX EXST MTL & NW BS) (6")	SY	2323
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR (TY-PD GR-4 SAC-B)	#SY	4267
0459 6007	GABION MATTRESSES (GALV)(12 IN)	SY	84



\* FIRST COURSE SURFACE TREATMENT  
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 # FOR CONTRACTOR'S INFORMATION ONLY,  
 SEE BASIS OF ESTIMATE FOR BID ITEM QUANTITIES.  
 ~ FOR CEMENT TREAT BASE

- LEGEND**
- X — EXIST FENCE
  - — EXIST FEATURES
  - - - EXIST RIGHT OF WAY
  - EXIST DITCH
  - PROP DITCH
  - ▬ PROP ROADWAY
  - E1 — MEDINA ELECTRIC
  - T1 — AT&T (TELE)
  - FOC1 — AT&T (FO/DUCT)
  - W1 — WEST MEDINA WSC
  - OH — OH MEDINA ELECTRIC
  - OH — OH AT&T TELE
  - OH — OH AT&T FO

- NOTES:**
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  2. SEE DRIVEWAY AND INTERSECTION PLAN AND PROFILE SHEETS FOR MORE INFORMATION.
  3. SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



1/31/2024

DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

0' 50' 100'  
 0' 5' 10'

**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**ROADWAY**

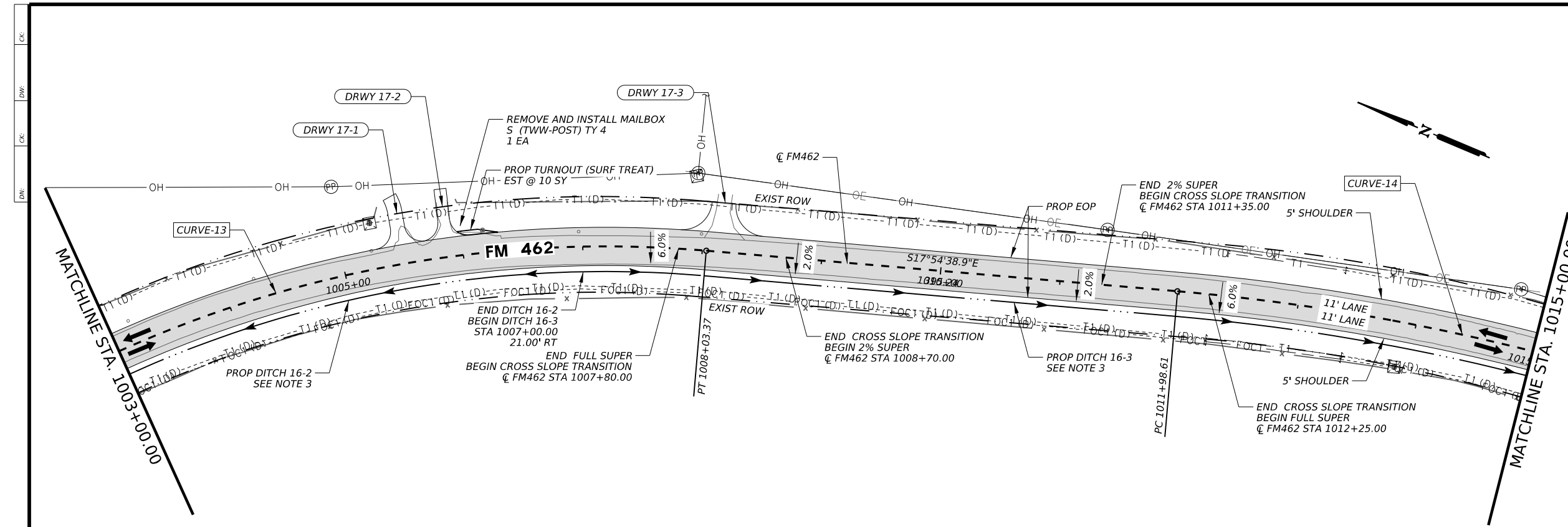
**PLAN AND PROFILE**

SHEET 16 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	117	

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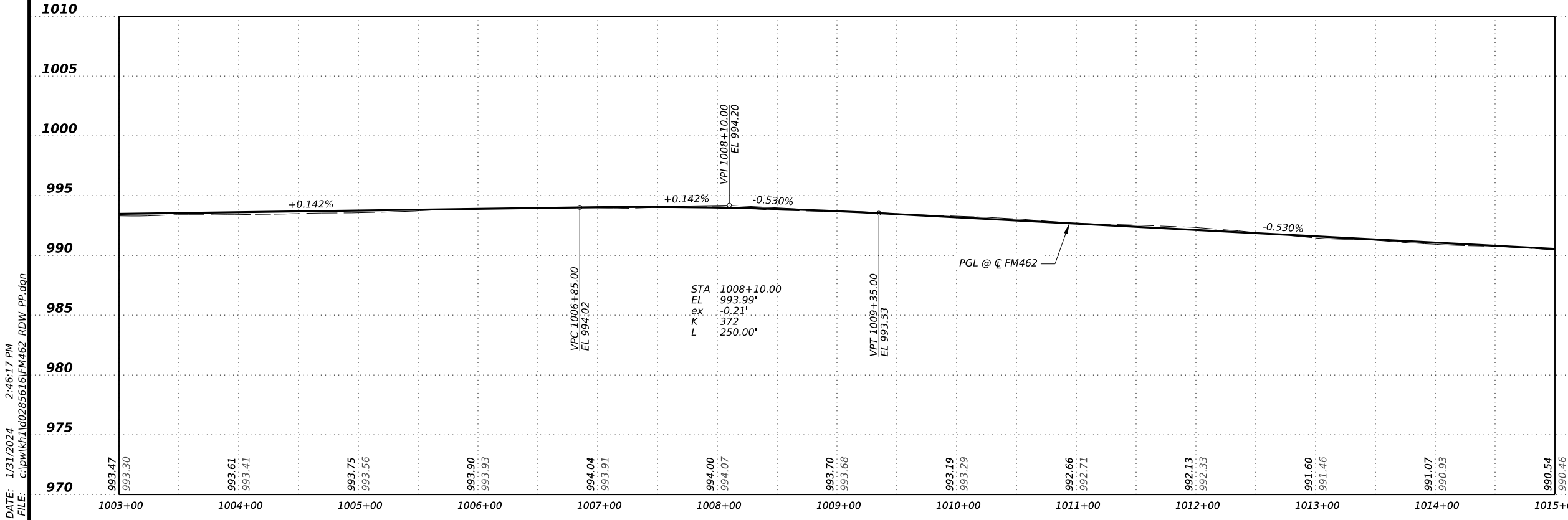


ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	1121
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	91
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	84
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4646
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	2323
0275 6004	CEMENT TREAT (MX EXST MTL & NW BS) (6")	SY	2323
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR (TY-PD GR-4 SAC-B)	#SY	4267
0530 6009	TURNOUTS (SURF TREAT)	SY	10
0560 6011	MAILBOX INSTALL-S (TWW-POST) TY 4	EA	1

\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
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 ~ FOR CEMENT TREAT BASE

- LEGEND**
- — — — — EXIST FENCE
  - — — — — EXIST FEATURES
  - — — — — EXIST RIGHT OF WAY
  - — — — — EXIST DITCH
  - — — — — PROP DITCH
  - — — — — PROP ROADWAY
  - E1 — MEDINA ELECTRIC
  - T1 — AT&T (TELE)
  - FOC1 — AT&T (FO/DUCT)
  - W1 — WEST MEDINA WSC
  - OH — OH MEDINA ELECTRIC
  - OH — OH AT&T TELE
  - OH — OH AT&T FO

- NOTES:**
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  3. SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



Signature: *David Gutierrez*  
 1/31/2024  
 Scale: 0' = 50' / 0' = 100'  
 0' = 5' / 0' = 10'

**Kimley Horn** F-928  
 Texas Department of Transportation  
**FM 462**  
**ROADWAY**  
**PLAN AND PROFILE**  
 SHEET 17 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	118	

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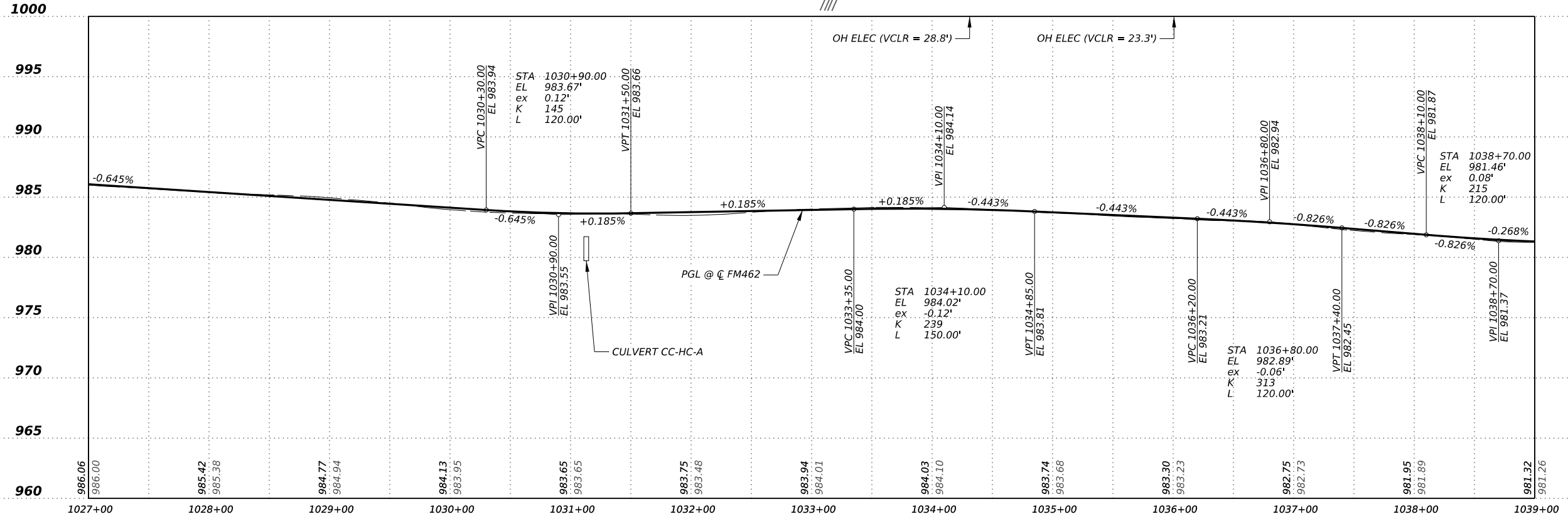
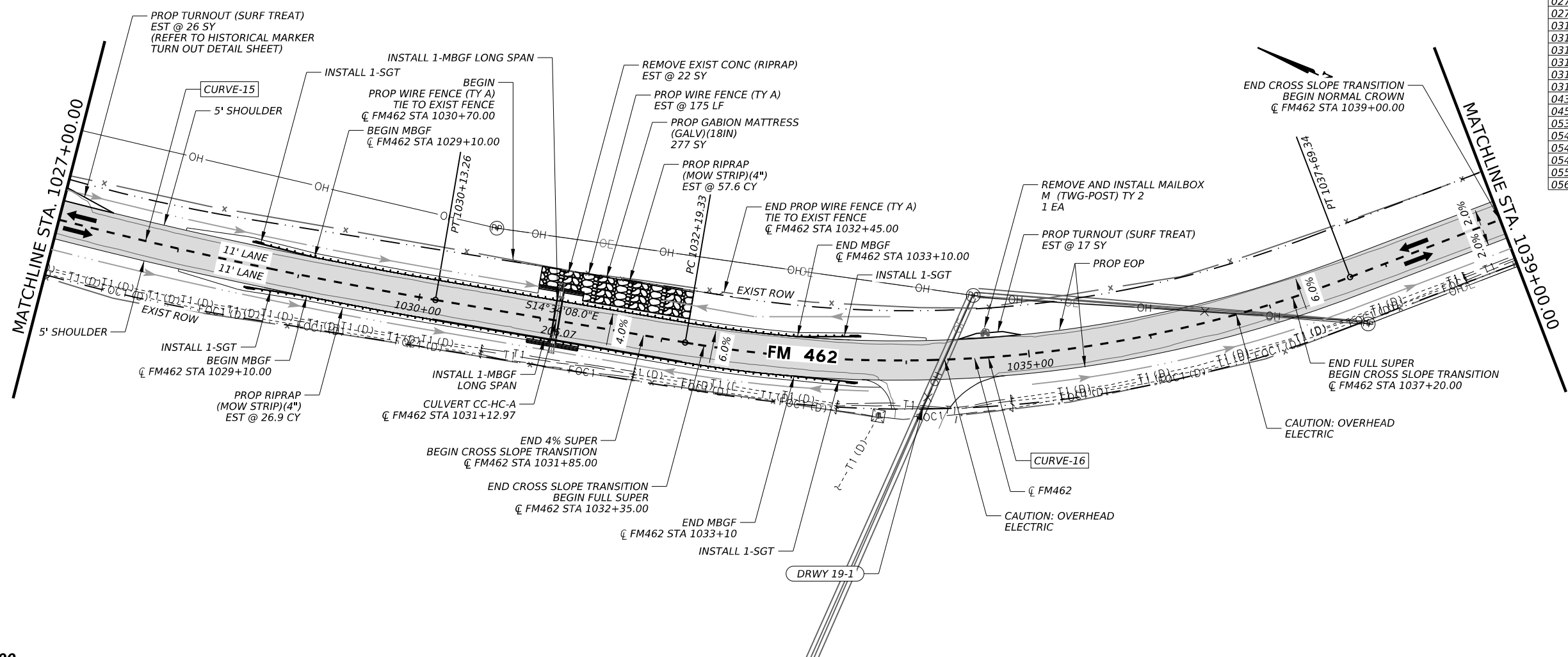
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	22
0110 6001	EXCAVATION (ROADWAY)	CY	823
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	345
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4645
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	4645
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR(TY-PD GR-4 SAC-B)	#SY	4267
0432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	57.6
0459 6008	GABION MATTRESSES (GALV)(18 IN)	SY	277
0530 6009	TURNOUTS (SURF TREAT)	SY	43
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	700
0540 6033	MTL BM GD FEN (LONG SPAN SYSTEM)	EA	2
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	4
0552 6001	WIRE FENCE (TY A)	LF	175
0560 6006	MAILBOX INSTALL-M (TWG-POST) TY 2	EA	1

\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
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 ~ FOR CEMENT TREAT BASE

**LEGEND**

	EXIST FENCE
	EXIST FEATURES
	EXIST RIGHT OF WAY
	EXIST DITCH
	PROP DITCH
	PROP ROADWAY
	E1 — MEDINA ELECTRIC
	T1 — AT&T (TELE)
	FOC1 — AT&T (FO/DUCT)
	W1 — WEST MEDINA WSC
	OH — OH MEDINA ELECTRIC OH AT&T TELE OH AT&T FO

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DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

1/31/2024

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**ROADWAY**

**PLAN AND PROFILE**

SHEET 19 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	120	

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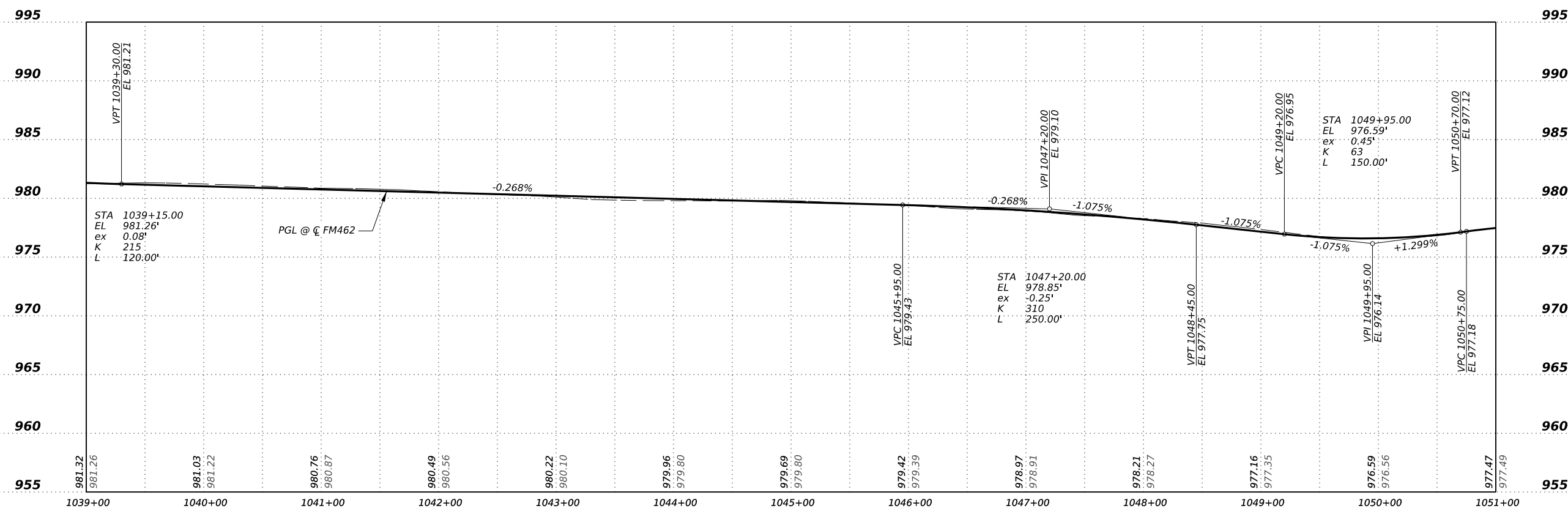
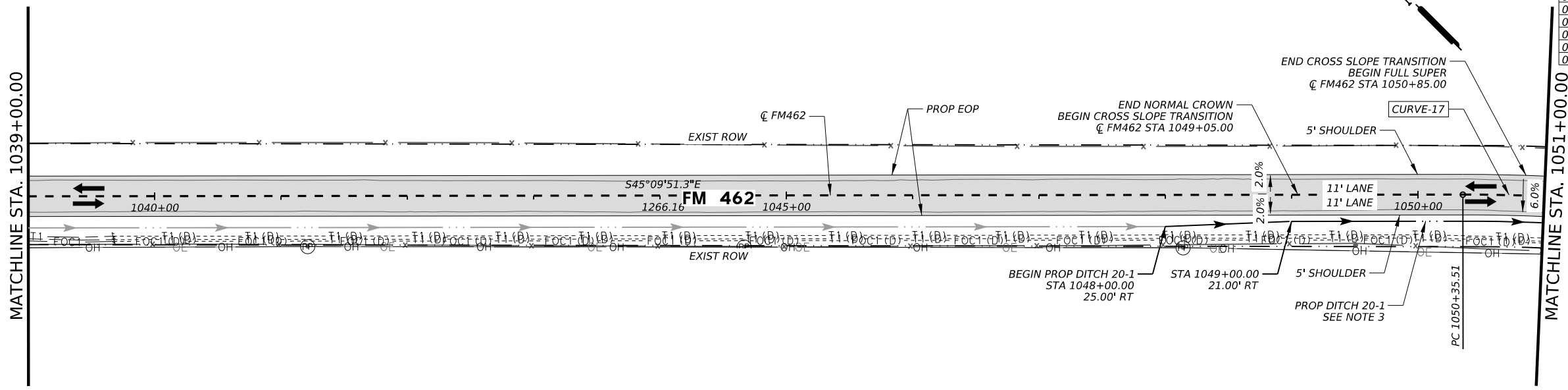
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	1226
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	24
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	47
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4646
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	2323
0275 6004	CEMENT TREAT (MX EXST MTL & NW BS) (6")	SY	2323
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR (TY-PD GR-4 SAC-B)	#SY	4267

\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
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 ~ FOR CEMENT TREAT BASE

**LEGEND**

	EXIST FENCE
	EXIST FEATURES
	EXIST RIGHT OF WAY
	EXIST DITCH
	PROP DITCH
	PROP ROADWAY
	E1 — MEDINA ELECTRIC
	T1 — AT&T (TELE)
	FOC1 — AT&T (FO/DUCT)
	W1 — WEST MEDINA WSC
	OH — OH MEDINA ELECTRIC
	OH — OH AT&T TELE
	OH — OH AT&T FO

- NOTES:**
1. LOCATION OF UTILITIES ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  2. SEE DRIVEWAY AND INTERSECTION PLAN AND PROFILE SHEETS FOR MORE INFORMATION.
  3. SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



1/31/2024

0' 50' 100'  
0' 5' 10'

**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**ROADWAY**

**PLAN AND PROFILE**

SHEET 20 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	121	

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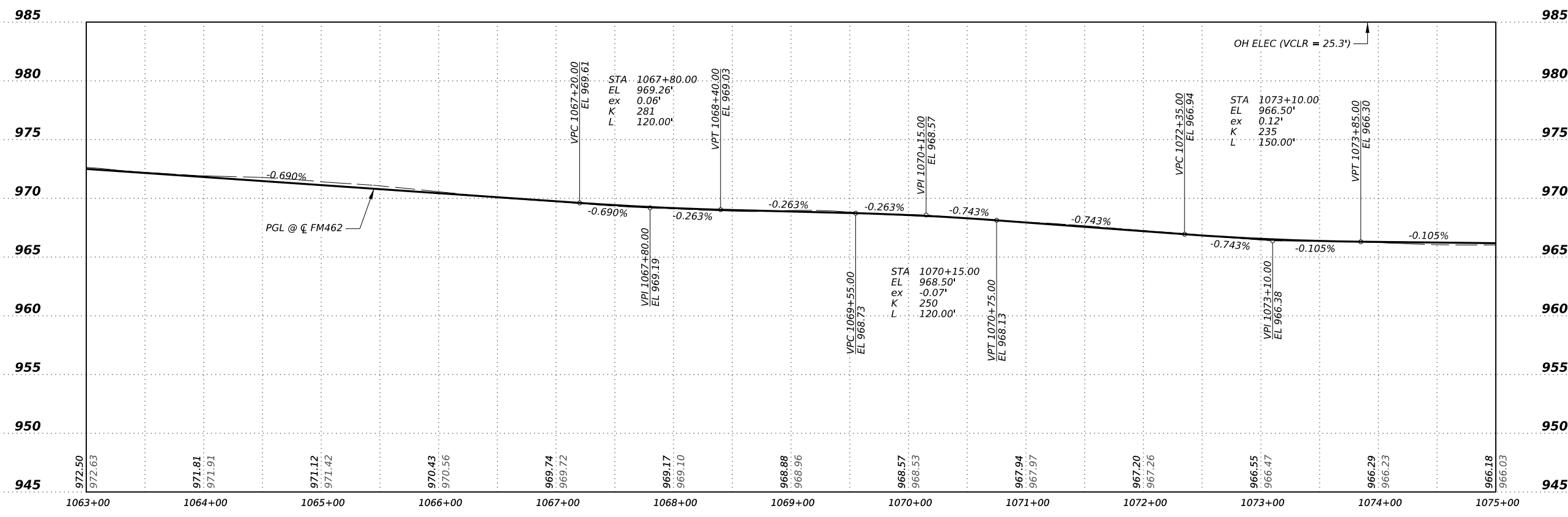
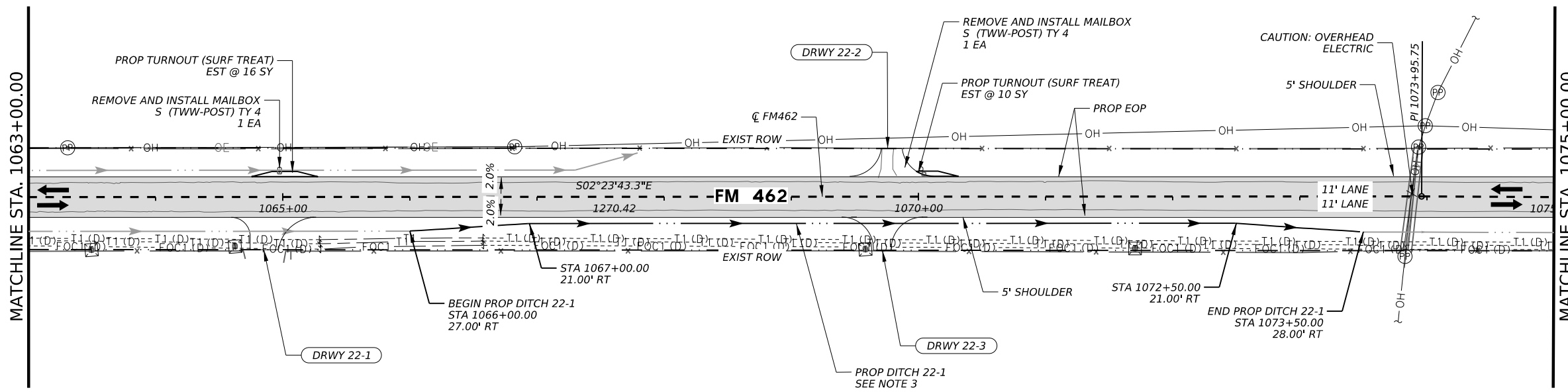
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CK:  
DN:

ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	1298
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	18
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	47
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4646
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	2323
0275 6004	CEMENT TREAT (MX EXST MTL & NW BS) (6")	SY	2323
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR (TY-PD GR-4 SAC-B)	#SY	4267
0530 6009	TURNOUTS (SURF TREAT)	SY	26
0560 6011	MAILBOX INSTALL-S (TWW-POST) TY 4	EA	2

\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
 # FOR CONTRACTOR'S INFORMATION ONLY,  
 SEE BASIS OF ESTIMATE FOR BID ITEM QUANTITIES.  
 ~ FOR CEMENT TREAT BASE

- LEGEND**
- x — EXIST FENCE
  - — — EXIST FEATURES
  - - - - EXIST RIGHT OF WAY
  - → → EXIST DITCH
  - → → PROP DITCH
  - ▬▬▬ PROP ROADWAY
  - E1 — MEDINA ELECTRIC
  - T1 — AT&T (TELE)
  - FOC1 — AT&T (FO/DUCT)
  - W1 — WEST MEDINA WSC
  - OH — OH MEDINA ELECTRIC
  - OH — OH AT&T TELE
  - OH — OH AT&T FO

- NOTES:**
- LOCATION OF UTILITIES ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - SEE DRIVEWAY AND INTERSECTION PLAN AND PROFILE SHEETS FOR MORE INFORMATION.
  - SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



Signature: *David Gutierrez*  
 1/31/2024  
 Scale: 0' 50' 100' / 0' 5' 10'



**Kimley & Horn** F-928  
 Texas Department of Transportation  
**FM 462**  
 ROADWAY  
 PLAN AND PROFILE  
 SHEET 22 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	123	

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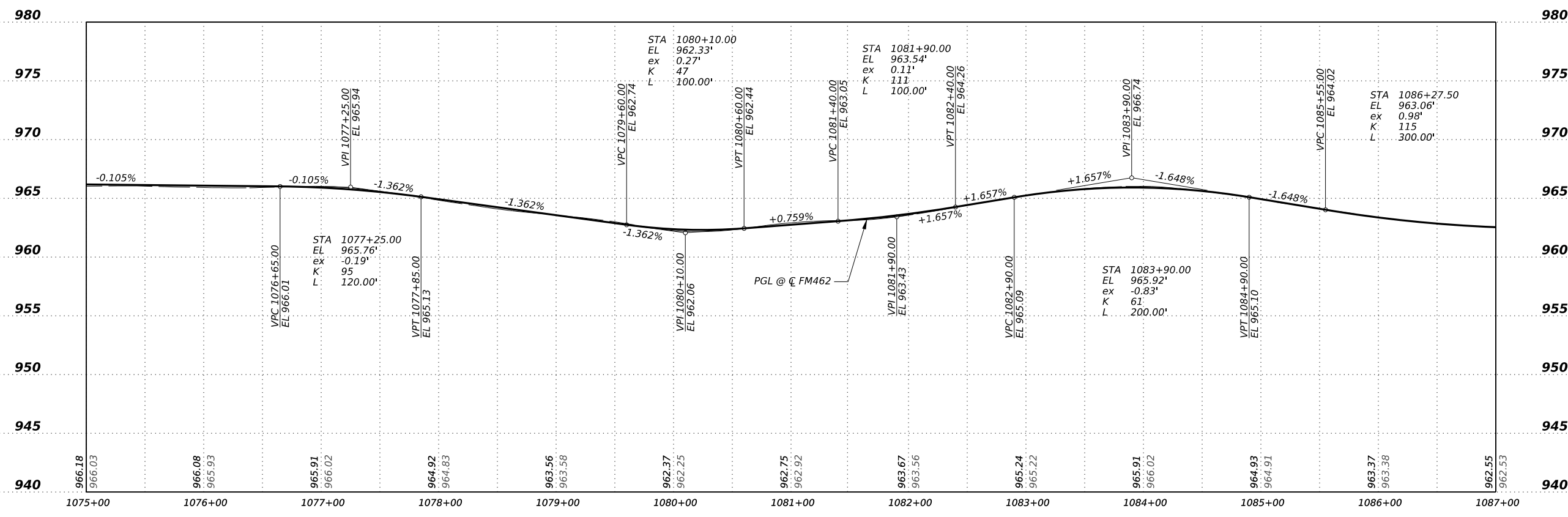
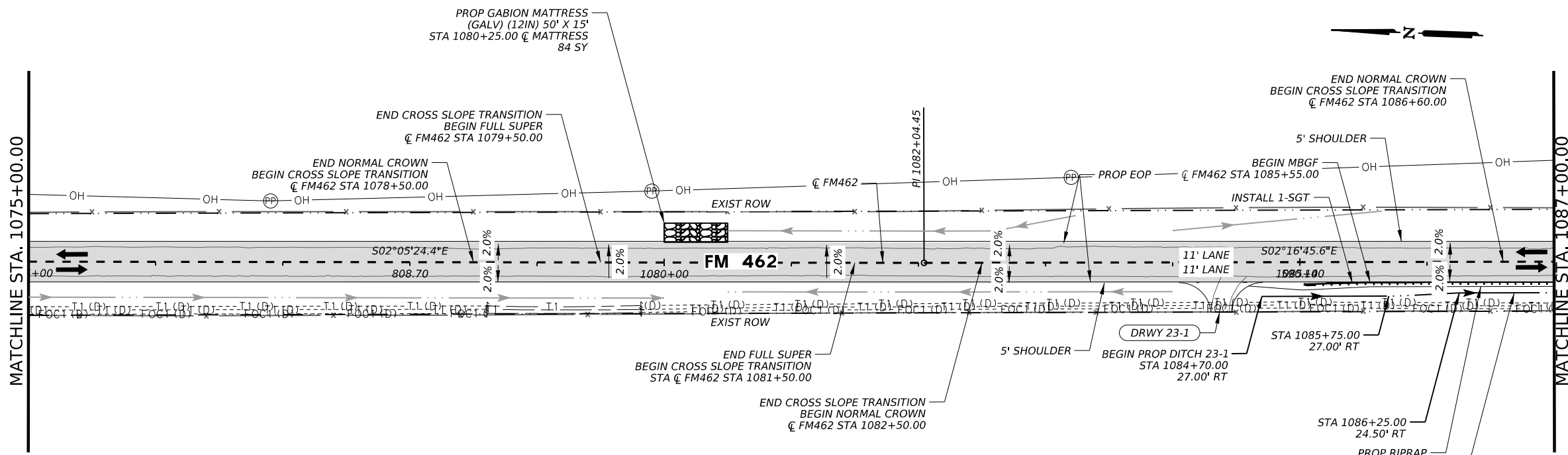
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CK:  
DW:

ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	1007
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	55
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	121
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4646
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	2323
0275 6004	CEMENT TREAT (MX EXST MTL & NW BS) (6")	SY	2323
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR(TY-PD GR-4 SAC-B)	#SY	4267
0432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	11.4
0459 6007	GABION MATTRESSES (GALV)(12 IN)	SY	84
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	145
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1

\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
 # FOR CONTRACTOR'S INFORMATION ONLY.  
 SEE BASIS OF ESTIMATE FOR BID ITEM QUANTITIES.  
 ~ FOR CEMENT TREAT BASE

- LEGEND**
- X — X — EXIST FENCE
  - — — — EXIST FEATURES
  - — — — EXIST RIGHT OF WAY
  - — — — EXIST DITCH
  - — — — PROP DITCH
  - — — — PROP ROADWAY
  - E1 — MEDINA ELECTRIC
  - T1 — AT&T (TELE)
  - FOC1 — AT&T (FO/DUCT)
  - W1 — WEST MEDINA WSC
  - OH — OH MEDINA ELECTRIC
  - OH — OH AT&T TELE
  - OH — OH AT&T FO

- NOTES:**
- LOCATION OF UTILITIES ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - SEE DRIVEWAY AND INTERSECTION PLAN AND PROFILE SHEETS FOR MORE INFORMATION.
  - SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



1/31/2024

DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**ROADWAY**

**PLAN AND PROFILE**

SHEET 23 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	124	

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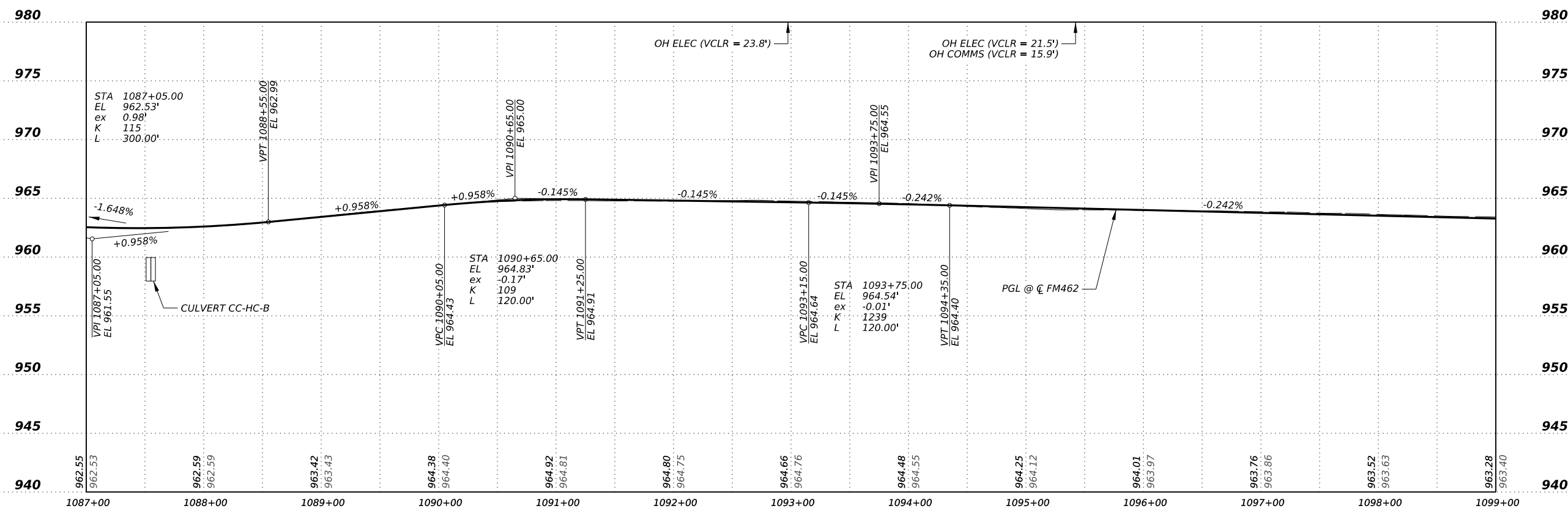
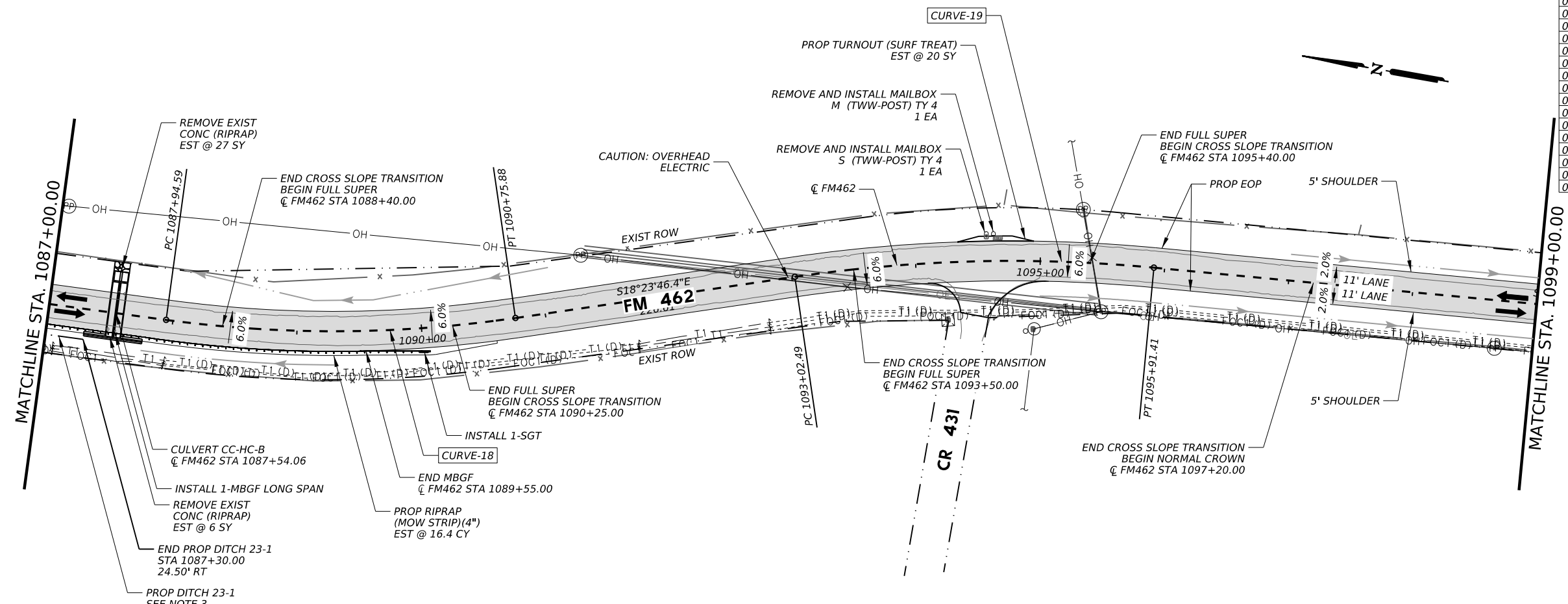
ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0104 6009	REMOVING CONC (RIPRAP)	SY	33
0110 6001	EXCAVATION (ROADWAY)	CY	923
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	269
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4645
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	4645
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR(TY-PD GR-4 SAC-B)	#SY	4267
0432 6045	RIPRAP (MOW STRIP)(4 IN)	CY	16.4
0459 6007	GABION MATTRESSES (GALV)(12 IN)	SY	9
0530 6009	TURNOUTS (SURF TREAT)	SY	20
0540 6001	MTL W-BEAM GD FEN (TIM POST)	LF	205
0540 6033	MTL BM GD FEN (LONG SPAN SYSTEM)	EA	1
0544 6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
0560 6011	MAILBOX INSTALL-S (TWW-POST) TY 4	EA	1
0560 6013	MAILBOX INSTALL-M (TWW-POST) TY 4	EA	1

\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
 # FOR CONTRACTOR'S INFORMATION ONLY,  
 SEE BASIS OF ESTIMATE FOR BID ITEM QUANTITIES.  
 ~ FOR CEMENT TREAT BASE

**LEGEND**

	EXIST FENCE
	EXIST FEATURES
	EXIST RIGHT OF WAY
	EXIST DITCH
	PROP DITCH
	PROP ROADWAY
	E1 — MEDINA ELECTRIC
	T1 — AT&T (TELE)
	FOC1 — AT&T (FO/DUCT)
	W1 — WEST MEDINA WSC
	OH — OH MEDINA ELECTRIC OH AT&T TELE OH AT&T FO

- NOTES:**
1. LOCATION OF UTILITIES ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  2. SEE DRIVEWAY AND INTERSECTION PLAN AND PROFILE SHEETS FOR MORE INFORMATION.
  3. SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



David Gutierrez  
 1/31/2024  
 143301  
 DAVID H. GUTIERREZ  
 LICENSED PROFESSIONAL ENGINEER  
 STATE OF TEXAS  
 0' 50' 100'  
 0' 5' 10'

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 Texas Department of Transportation  
**FM 462**  
**ROADWAY**  
**PLAN AND PROFILE**  
 SHEET 24 OF 26  

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	125

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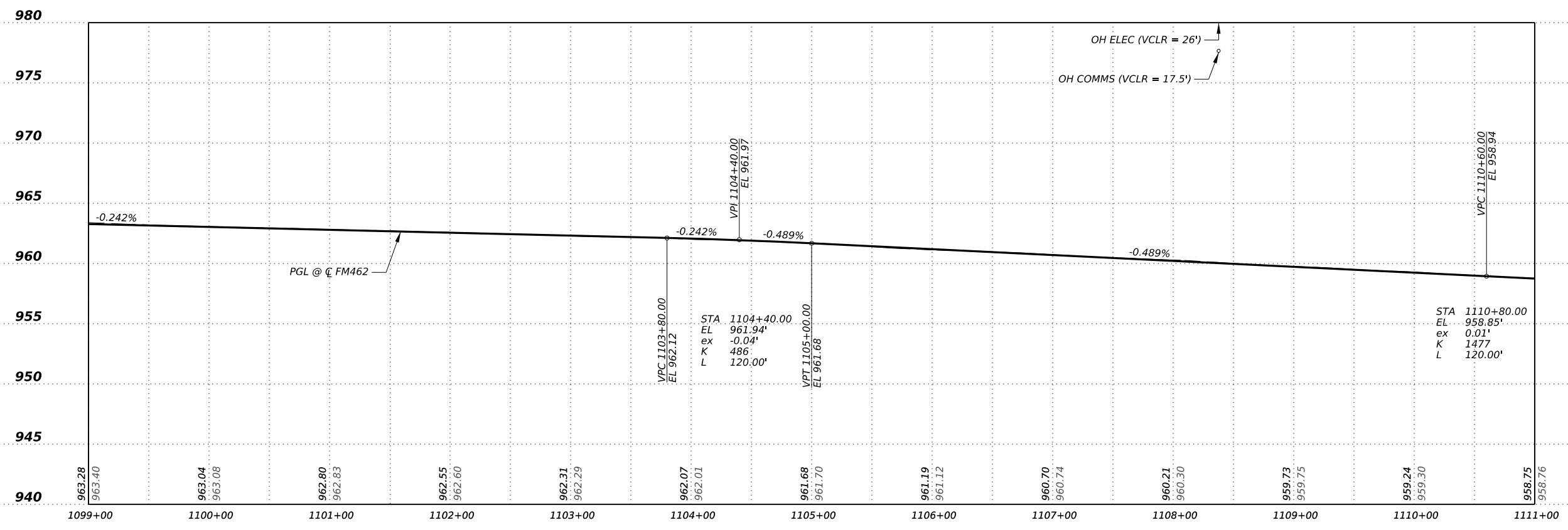
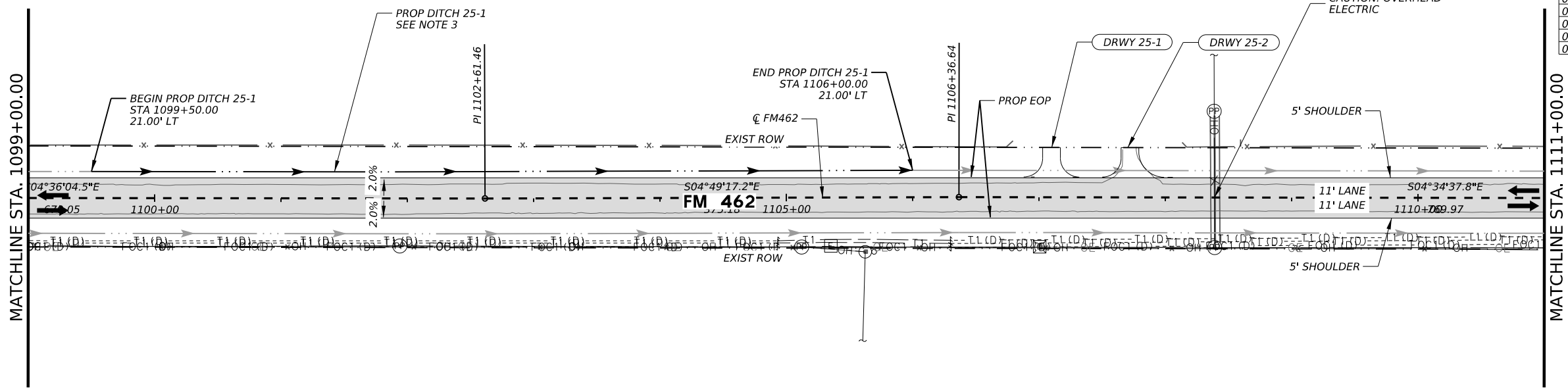
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ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	12
0110 6001	EXCAVATION (ROADWAY)	CY	1366
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	3
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	1053
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	4645
0275 6001	CEMENT	TON	40
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	4645
0316 6029	ASPH (RC-250)	#SY	4267
0316 6414	AGGR (TY-B GR-5)	#SY	4267
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6431*	AGGR (TY-PB GR-4)	#SY	4267
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	4267
0316 6240**	AGGR(TY-PD GR-4 SAC-B)	#SY	4267

\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
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 SEE BASIS OF ESTIMATE FOR BID ITEM QUANTITIES.  
 ~ FOR CEMENT TREAT BASE

- LEGEND**
- x — EXIST FENCE
  - — — EXIST FEATURES
  - - - - EXIST RIGHT OF WAY
  - — — EXIST DITCH
  - — — PROP DITCH
  - — — PROP ROADWAY
  - E1 — MEDINA ELECTRIC
  - T1 — AT&T (TELE)
  - FOC1 — AT&T (FO/DUCT)
  - W1 — WEST MEDINA WSC
  - OH — OH MEDINA ELECTRIC
  - OH — OH AT&T TELE
  - OH — OH AT&T FO

- NOTES:**
1. LOCATION OF UTILITIES ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  2. SEE DRIVEWAY AND INTERSECTION PLAN AND PROFILE SHEETS FOR MORE INFORMATION.
  3. SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



Signature: *David Gutierrez*  
 1/31/2024  
 143301  
 STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 LICENSED PROFESSIONAL ENGINEER

Scale: 0' 50' 100' / 0' 5' 10'

**Kimley Horn** F-928  
 Texas Department of Transportation

**FM 462**  
 ROADWAY  
 PLAN AND PROFILE

SHEET 25 OF 26

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	126	

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ITEM	DESCRIPTION	UNIT	QTY
0100 6002	PREPARING ROW	STA	8
0110 6001	EXCAVATION (ROADWAY)	CY	828
0132 6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	2
0216 6001	PROOF ROLLING	HR	1
0247 6475	FL BS (CIP) (TY D GR 1-2, OR 5) FINAL POS	CY	646
0251 6025	REWORK BS MTL (TY B) (6") (ORD COMP)	SY	2849
0275 6001	CEMENT	TON	25
0275 6002	CEMENT TREAT (EXIST MATL) (6")	SY	2849
0316 6029	ASPH (RC-250)	#SY	2617
0316 6414	AGGR (TY-B GR-5)	#SY	2617
0316 6419*	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	2840
0316 6431*	AGGR (TY-PB GR-4)	#SY	2840
0316 6419**	ASPH (AC-15P, AC-20-5TR OR AC-20XP)	#SY	2840
0316 6240**	AGGR(TY-PD GR-4 SAC-B)	#SY	2840

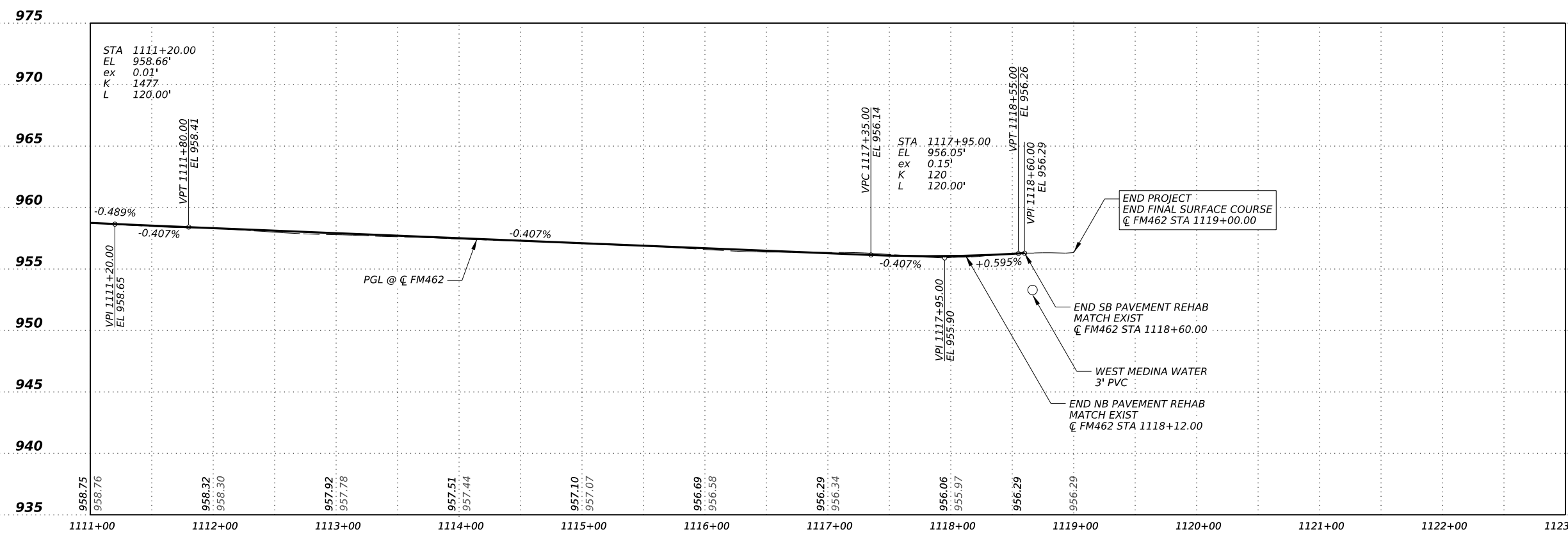
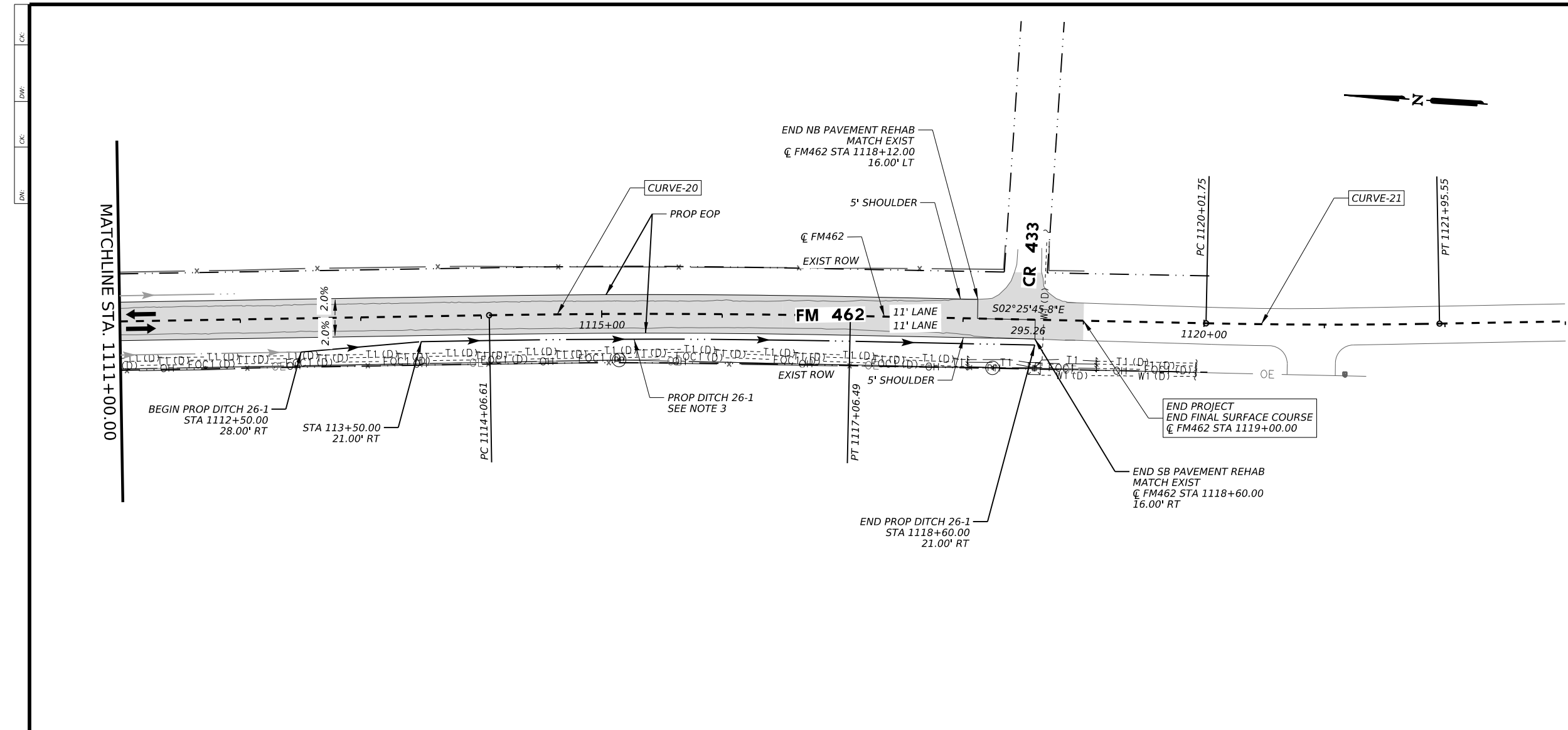
\* FIRST COURSE SURFACE TREATMENT  
 \*\* SECOND COURSE SURFACE TREATMENT  
 # FOR CONTRACTOR'S INFORMATION ONLY.  
 SEE BASIS OF ESTIMATE FOR BID ITEM QUANTITIES.  
 ~ FOR CEMENT TREAT BASE

**LEGEND**

- - - - - EXIST FENCE
- — — — EXIST FEATURES
- - - - - EXIST RIGHT OF WAY
- → → → EXIST DITCH
- → → → PROP DITCH
- ▬ ▬ ▬ ▬ PROP ROADWAY
- E1 — MEDINA ELECTRIC
- T1 — AT&T (TELE)
- FOC1 — AT&T (FO/DUCT)
- W1 — WEST MEDINA WSC
- OH — OH MEDINA ELECTRIC  
OH AT&T TELE  
OH AT&T FO

**NOTES:**

1. LOCATION OF UTILITIES ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
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3. SEE DITCH DETAILS SHEET FOR MORE INFORMATION.



Signature: *David Gutierrez*  
 1/31/2024  
 SCALE: 0' 50' 100' / 0' 5' 10'



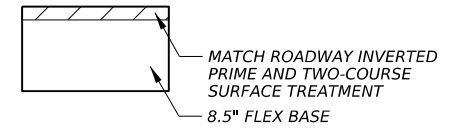
**Kimley & Horn**  
 F-928  
 Texas Department of Transportation  
**FM 462**  
 ROADWAY  
 PLAN AND PROFILE  
 SHEET 26 OF 26

COUNT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	127	

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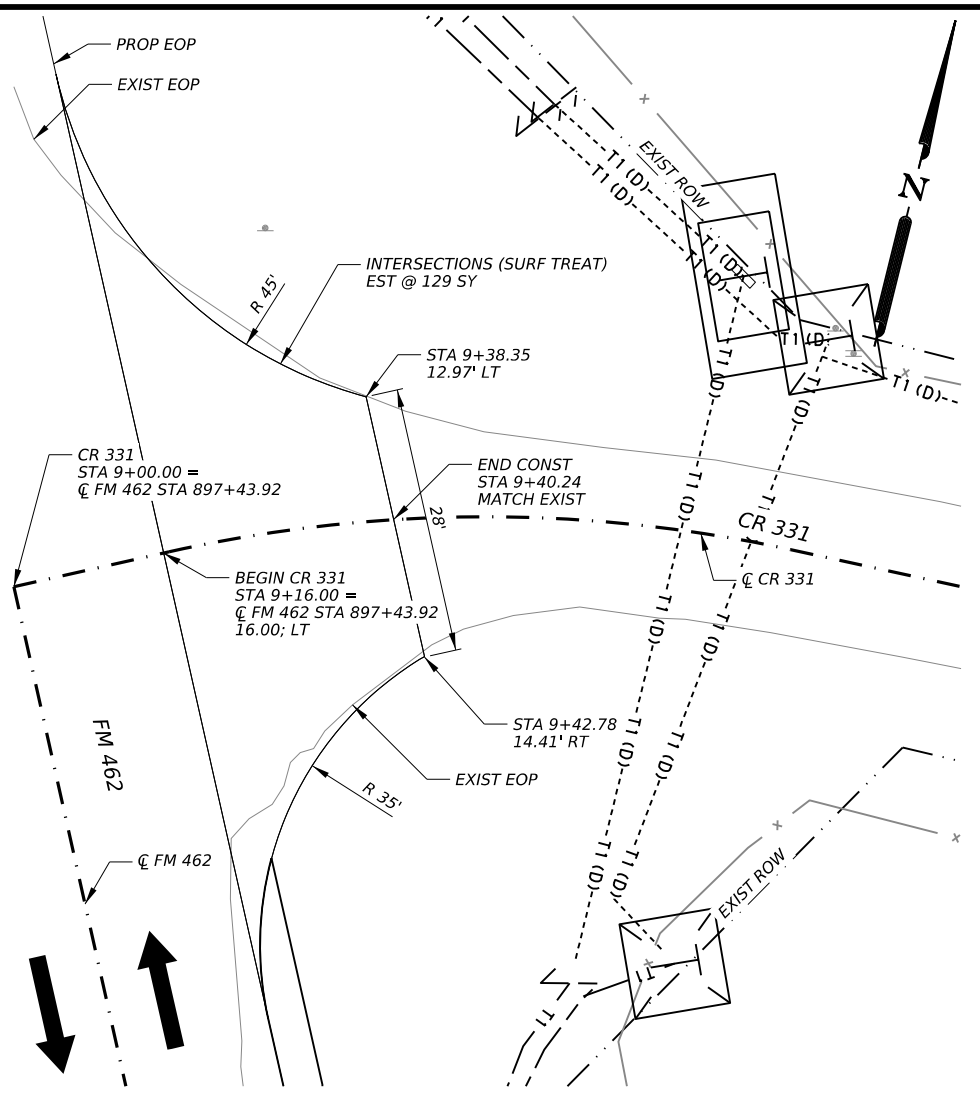
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0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	297
0530 6003	INTERSECTIONS (SURF TREAT)	SY	253



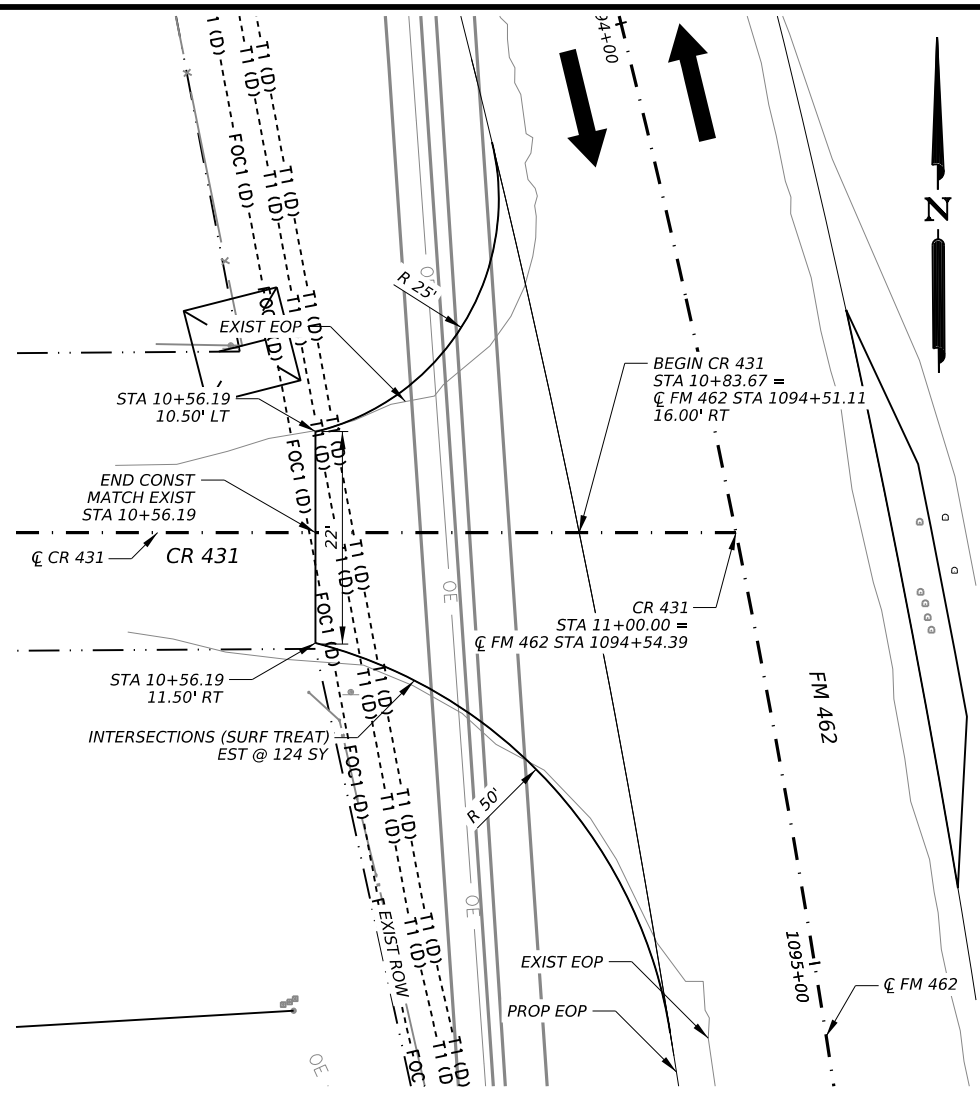
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 \*INTERSECTION PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6003.

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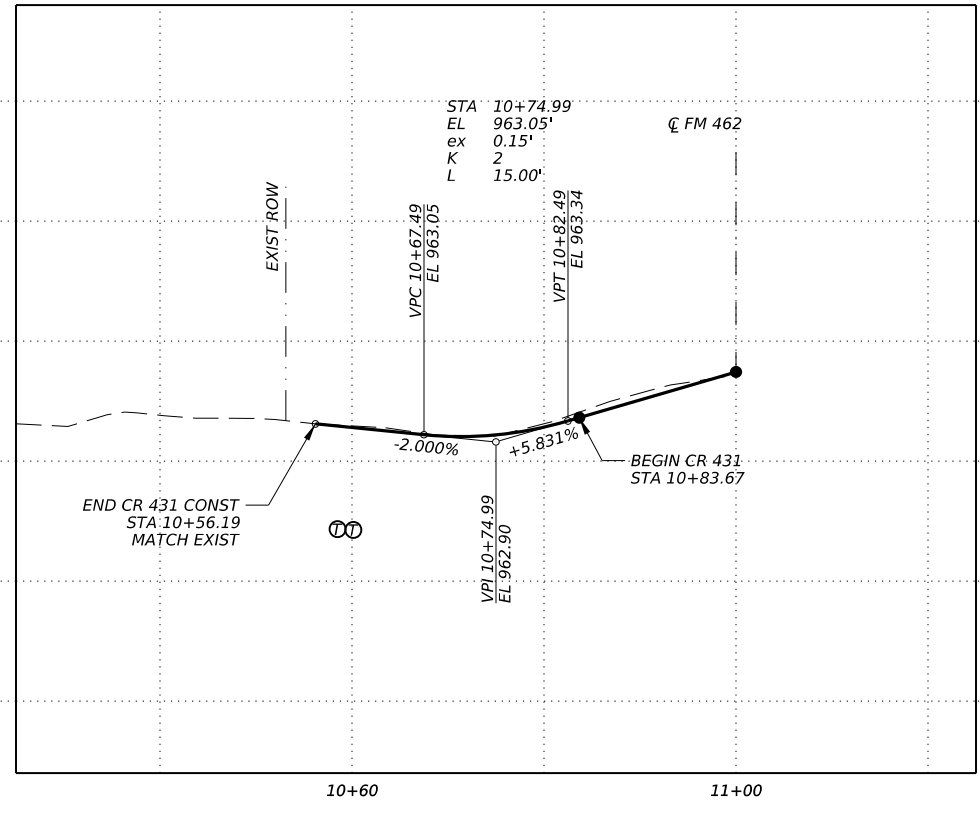
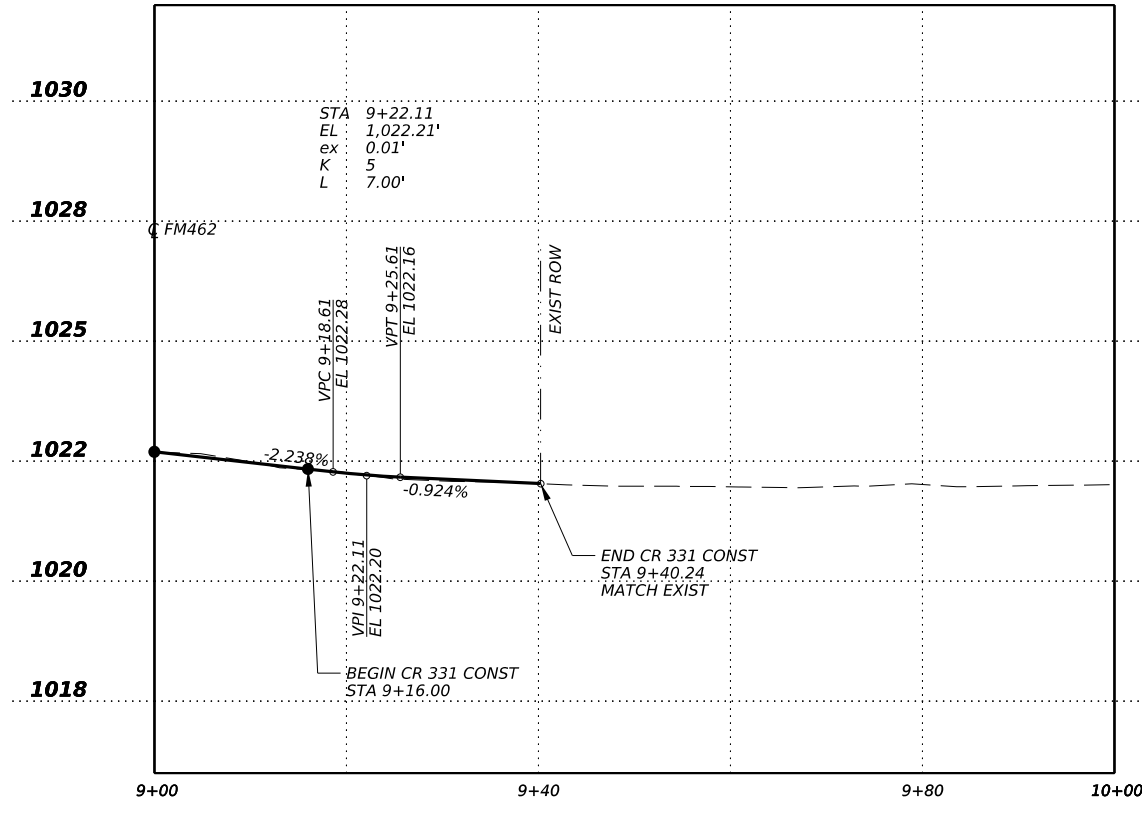
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EXIST FENCE	- x -
EXIST FEATURES	---



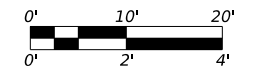
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CR 431



David Gutierrez  
 1/31/2024  
  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER



**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**INTERSECTION PLAN AND PROFILE**

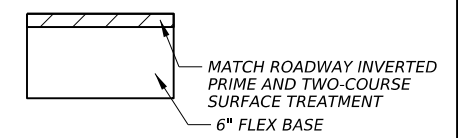
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	128	

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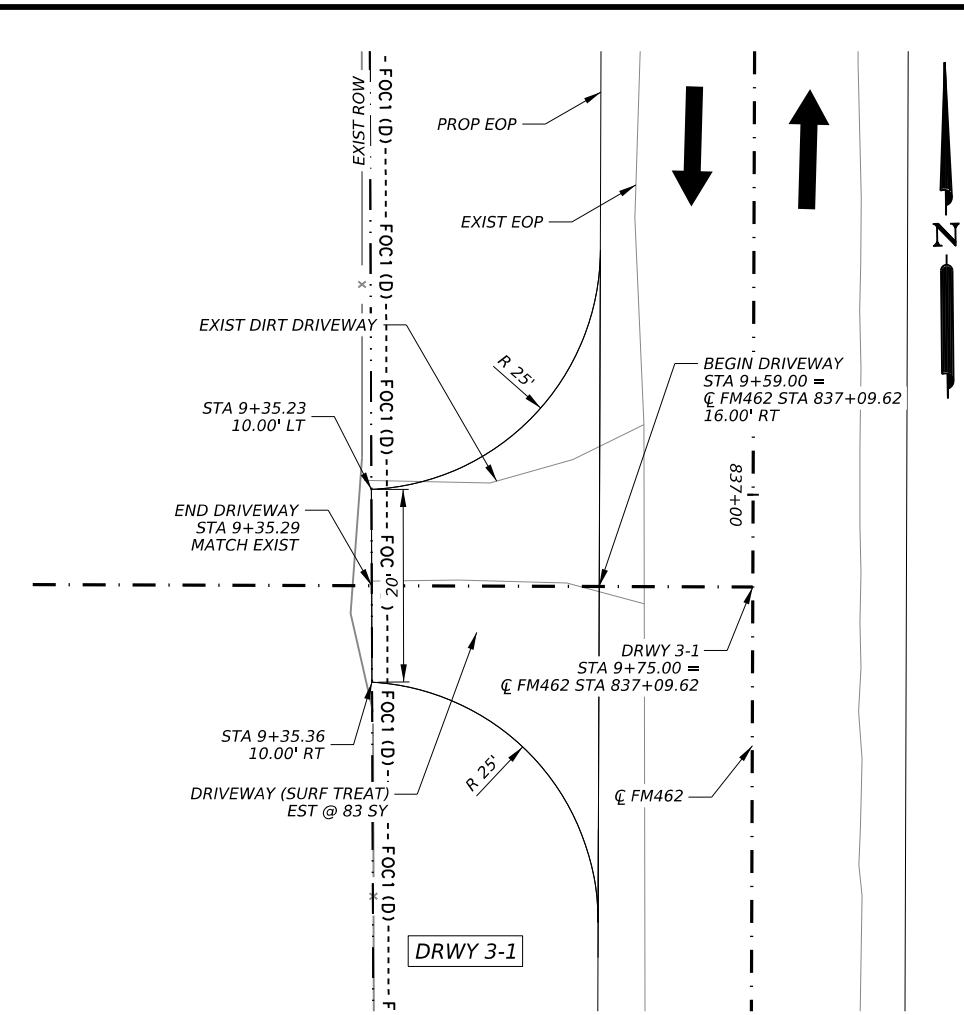
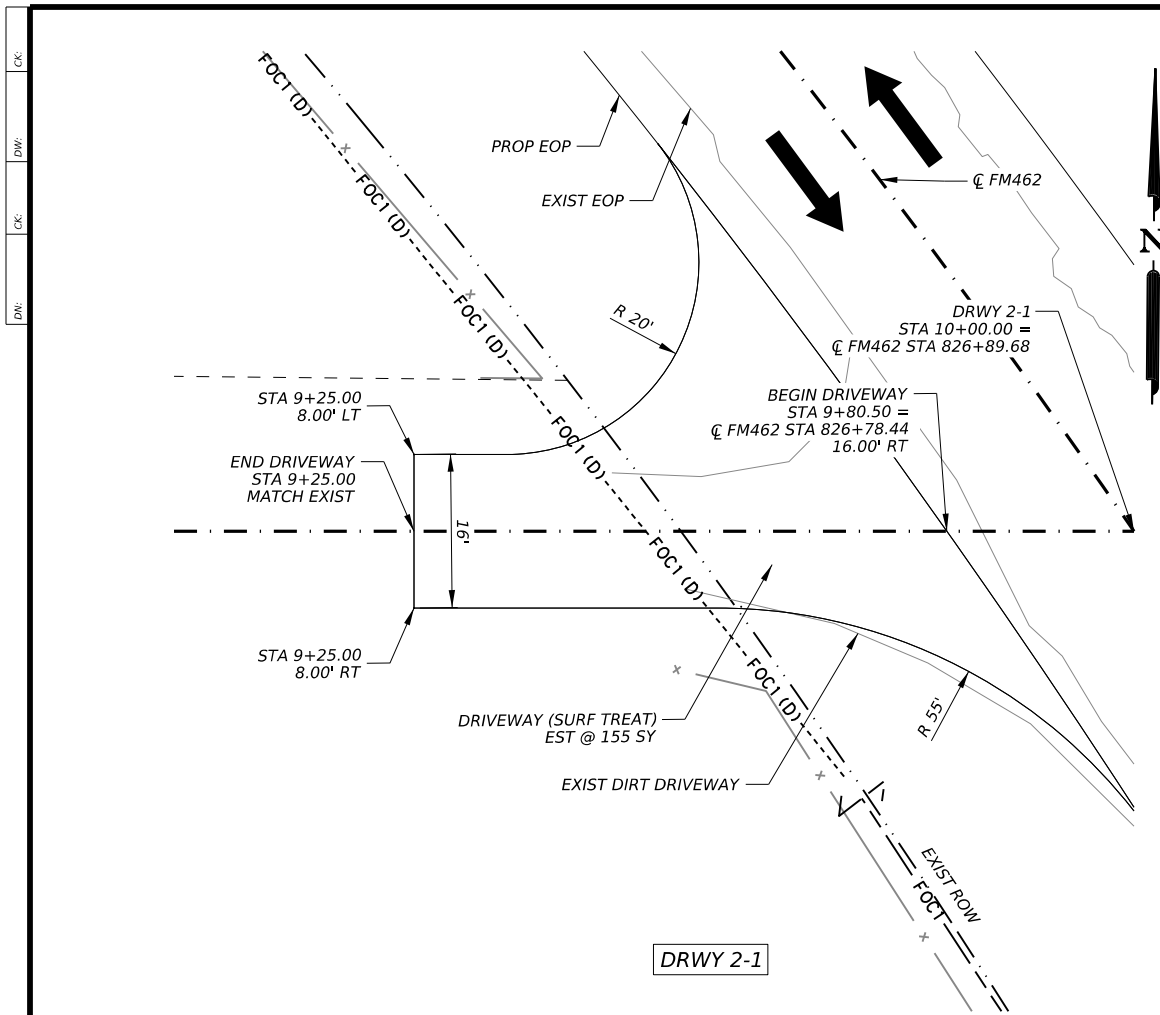
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0530 6006	DRIVEWAYS (SURF TREAT)	SY	238



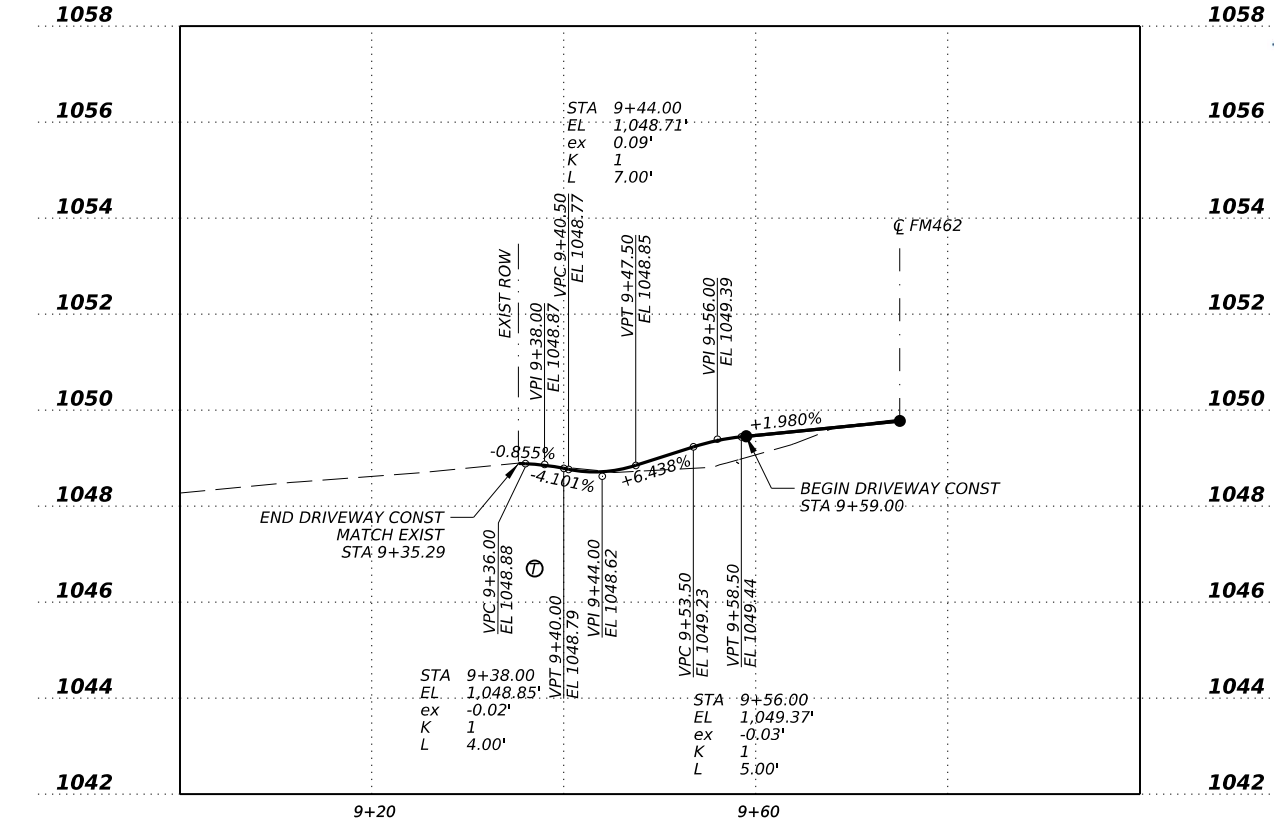
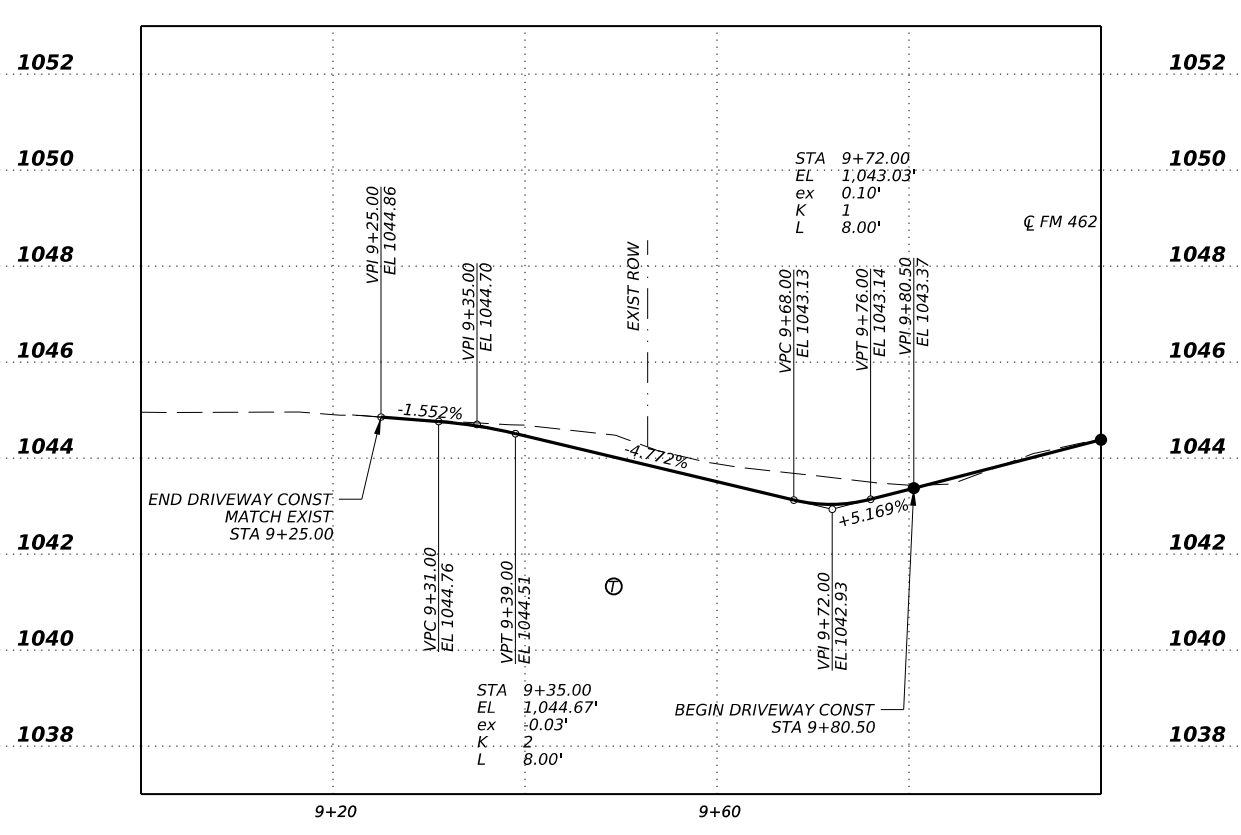
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\*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.

- LEGEND**
- EXIST ROW ————
  - EXIST FENCE — x —
  - EXIST FEATURES ————

- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - STATION/OFFSETS ARE TO DRIVEWAY CENTERLINE UNLESS NOTED OTHERWISE.

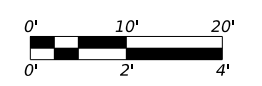


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1/31/2024

DAVID H. GUTIERREZ  
143301  
LICENSED PROFESSIONAL ENGINEER



**Kimley»Horn** F-928

Texas Department of Transportation

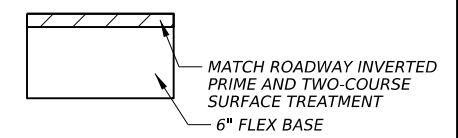
**FM 462**

**DRIVEWAY**  
**PLAN AND PROFILE**

SHEET 1 OF 16

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	129	

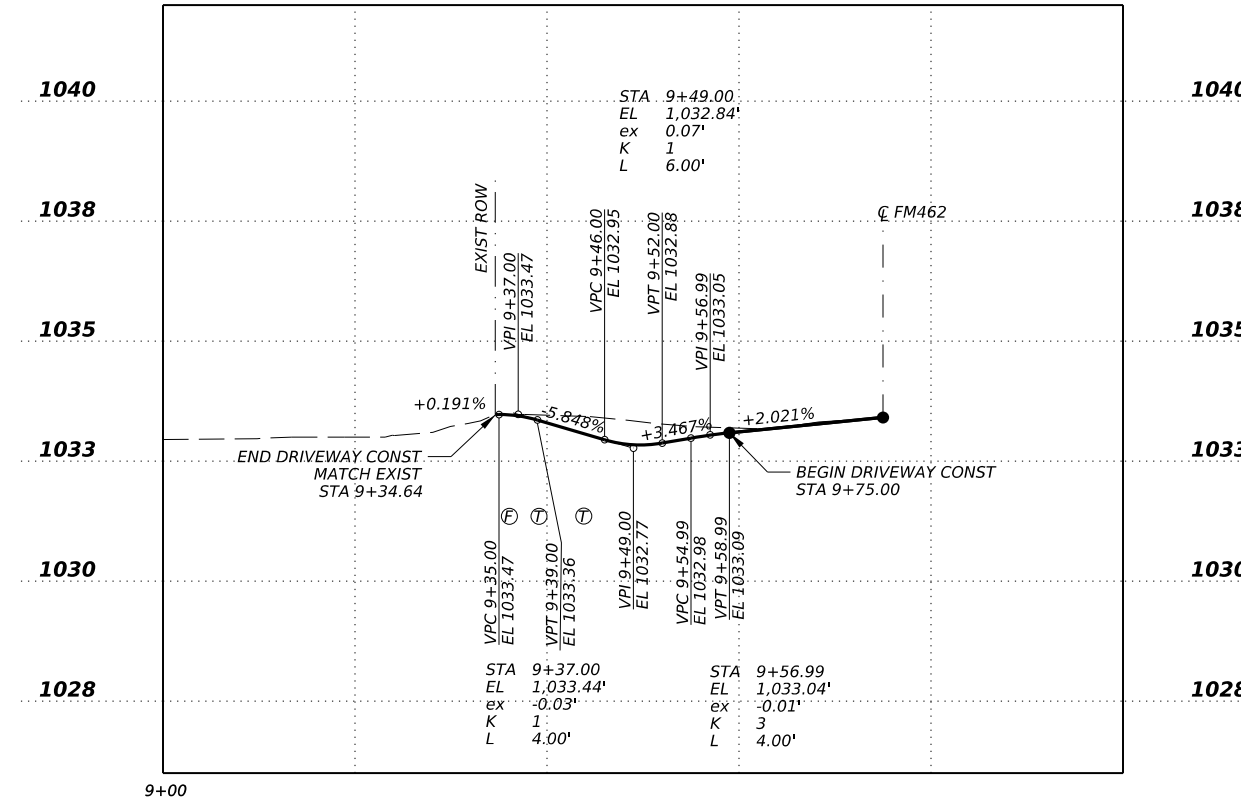
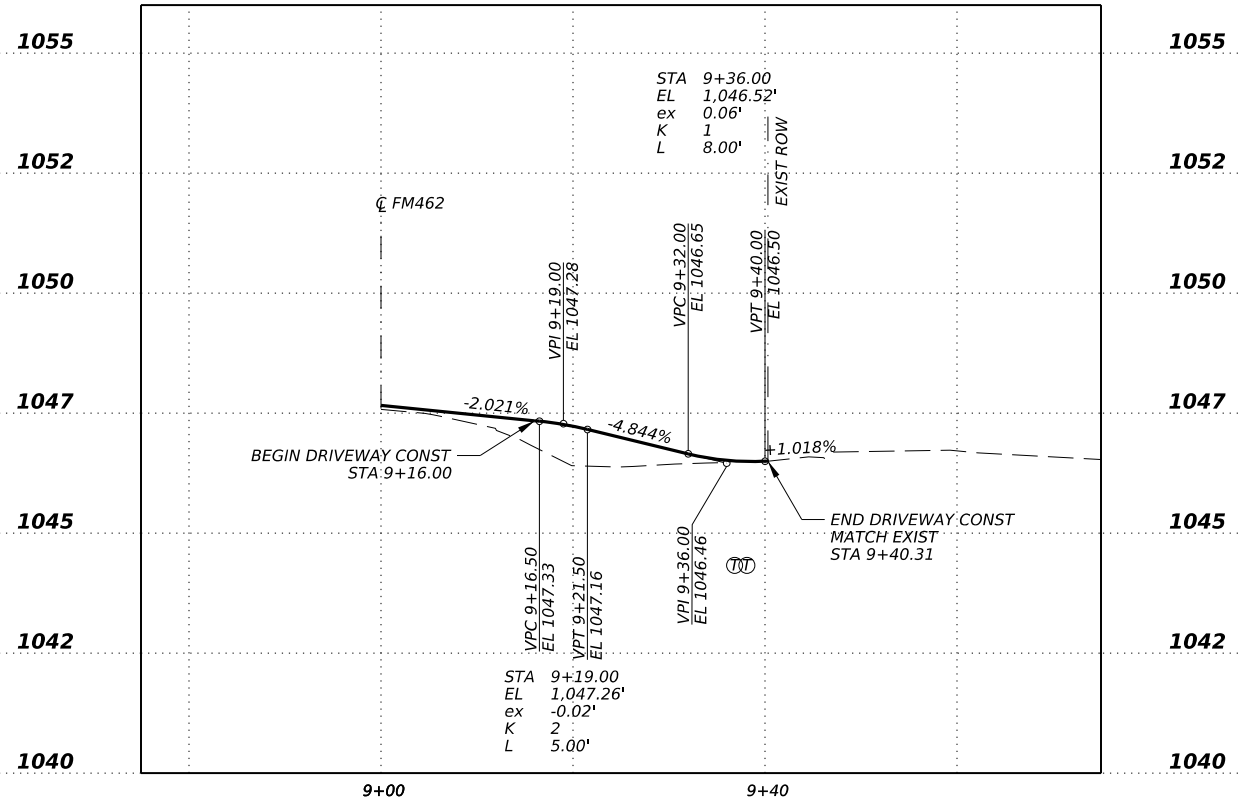
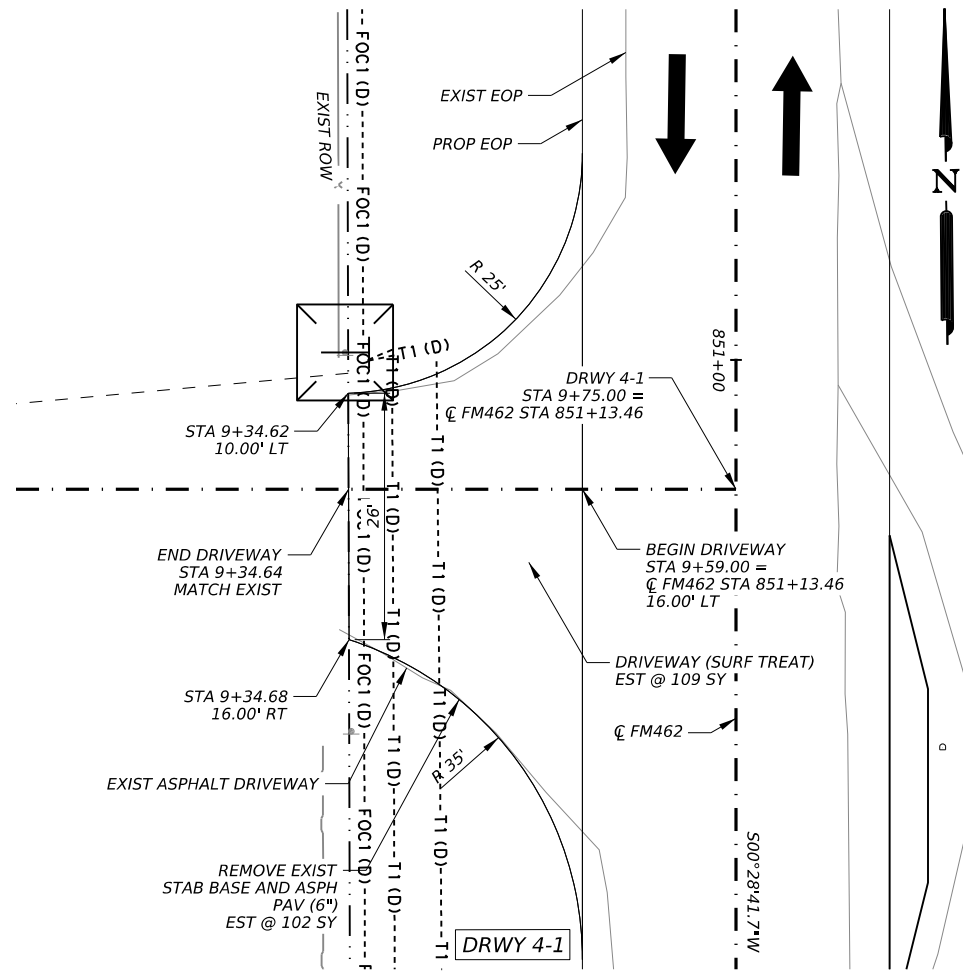
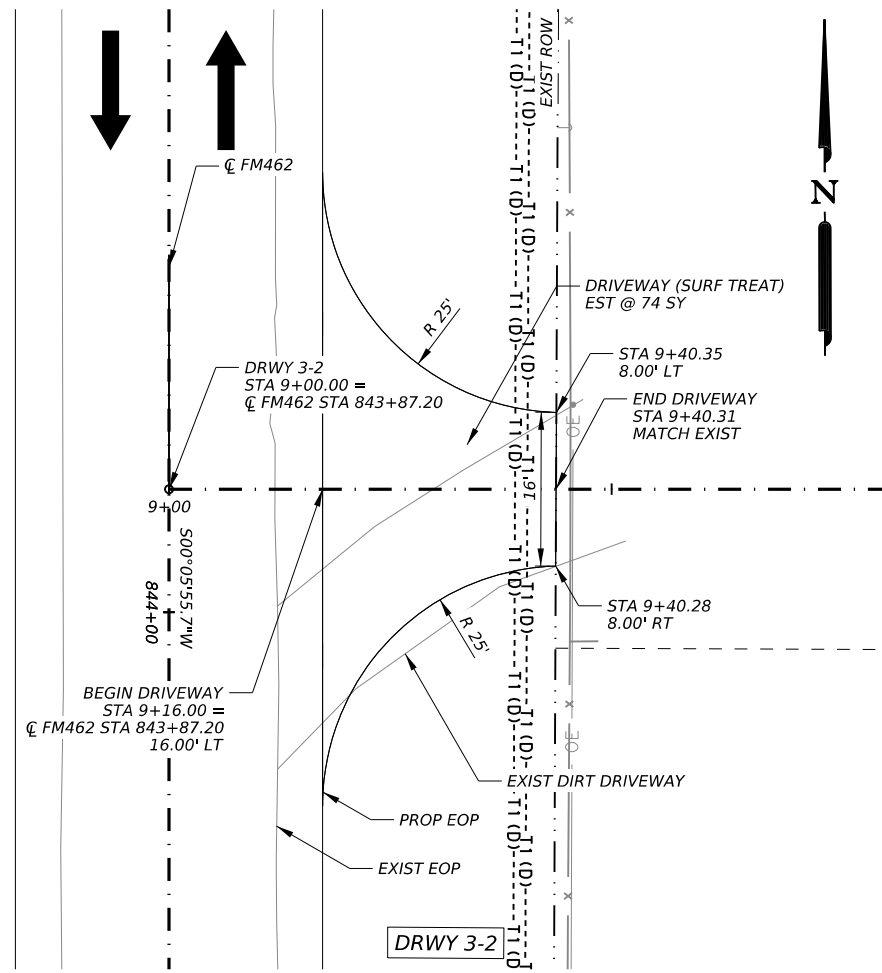
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0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	102
0530 6006	DRIVEWAYS (SURF TREAT)	SY	183



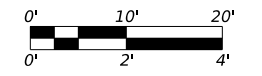
**PAVEMENT DETAIL**  
 \*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.

- LEGEND**
- EXIST ROW ————
  - EXIST FENCE — x —
  - EXIST FEATURES ————

- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - STATION/OFFSETS ARE TO DRIVEWAY CENTERLINE UNLESS NOTED OTHERWISE.



David Gutierrez  
 1/31/2024  
 STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

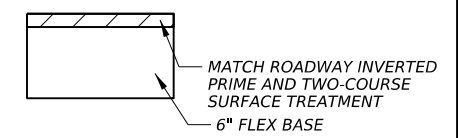


**Kimley»Horn**  
 F-928  
 Texas Department of Transportation

FM 462			
DRIVEWAY PLAN AND PROFILE			
SHEET 2 OF 16			
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	130	

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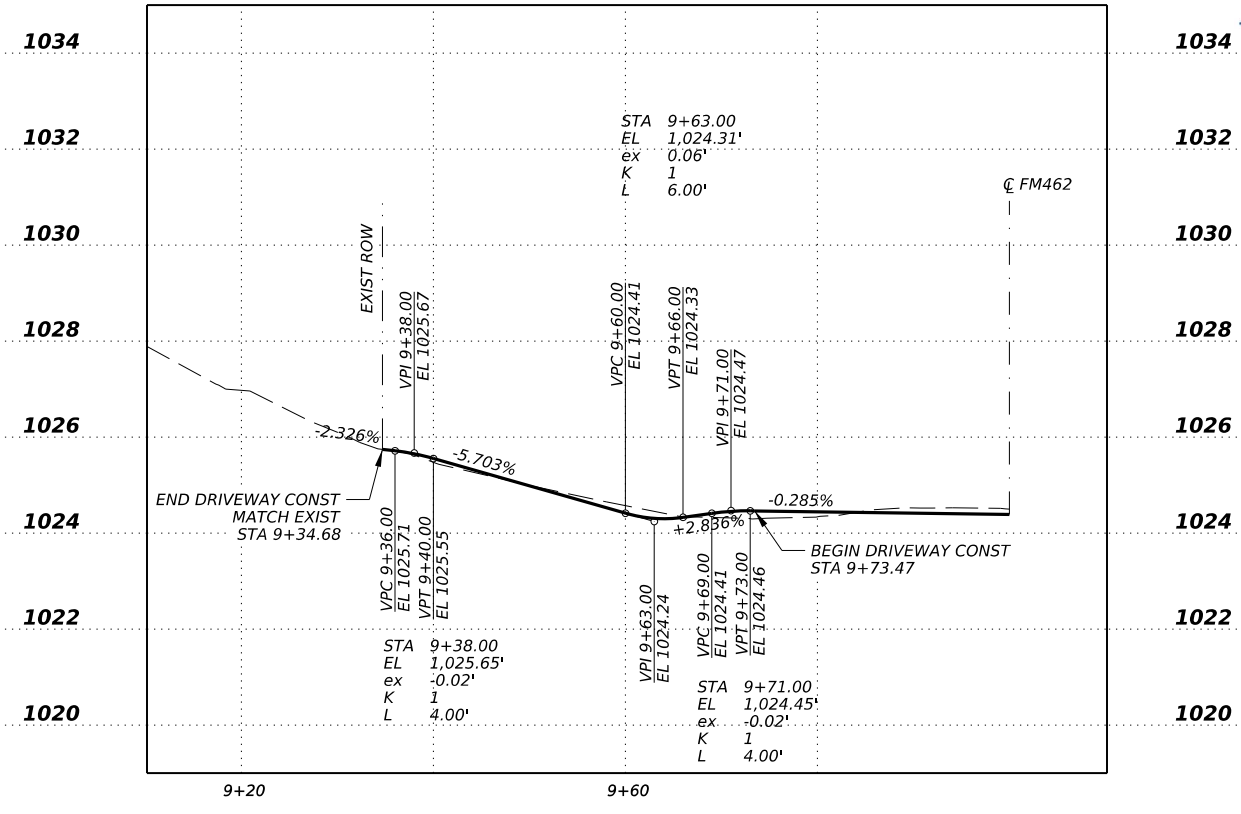
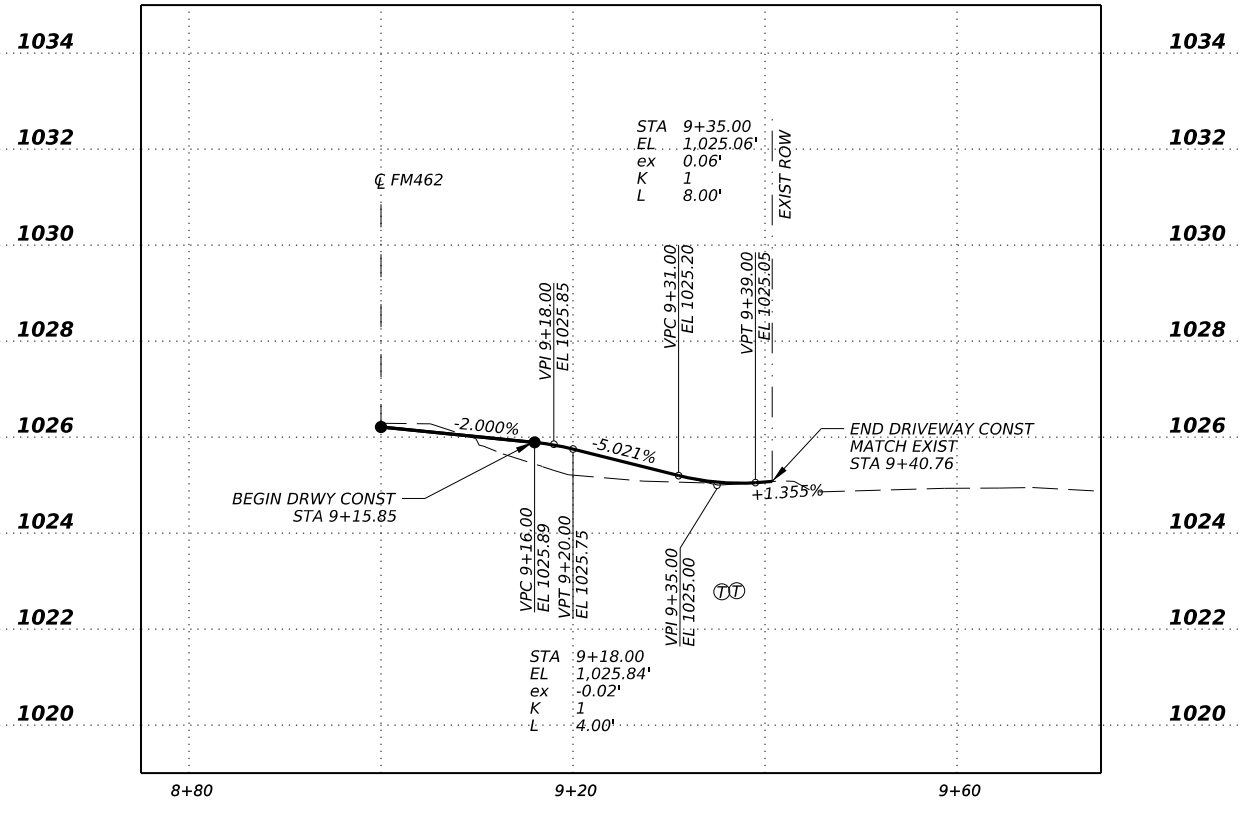
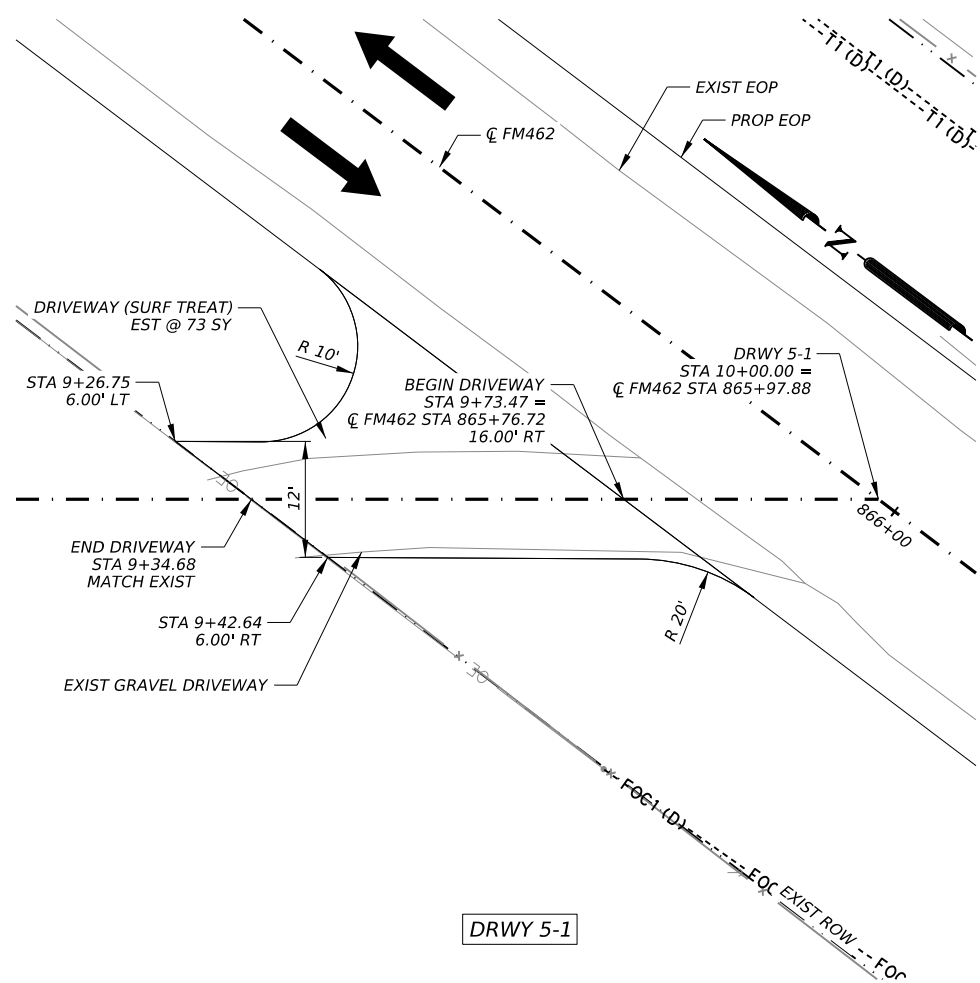
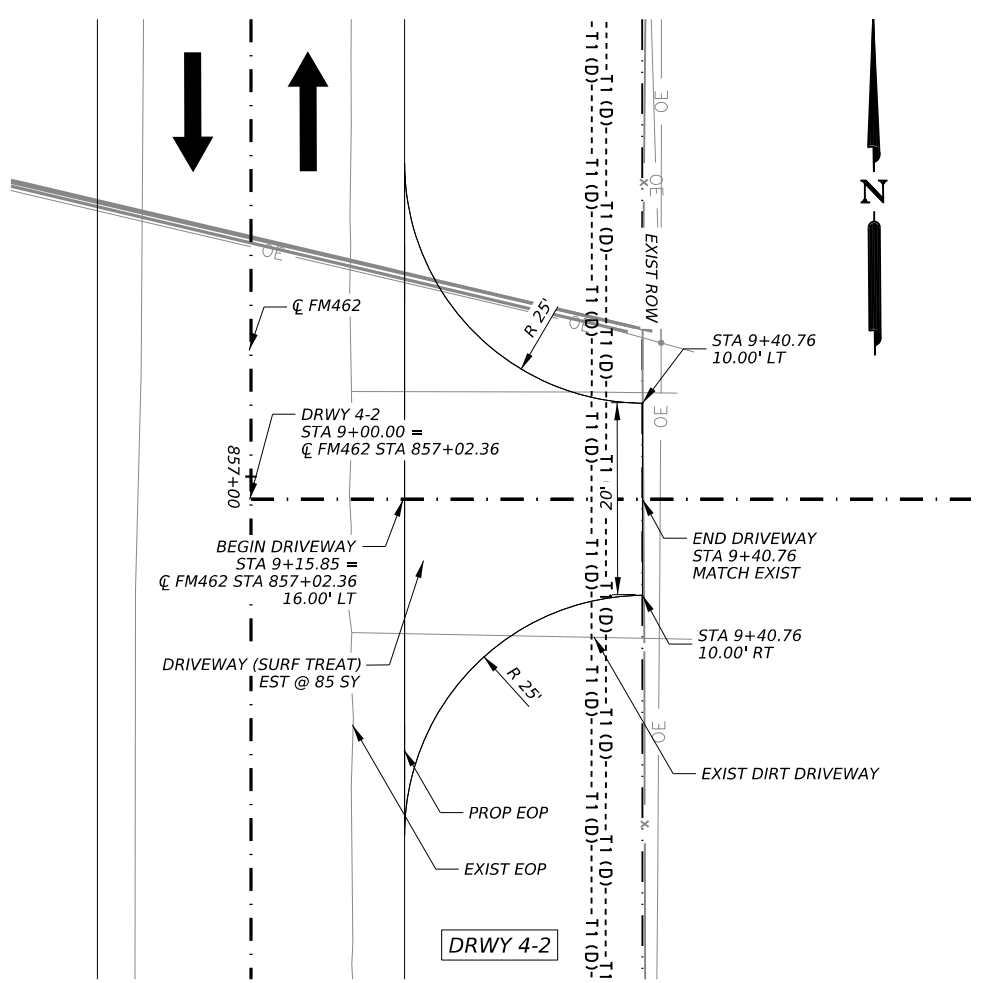
ITEM	DESCRIPTION	UNIT	QTY
0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	52
0530 6006	DRIVEWAYS (SURF TREAT)	SY	158



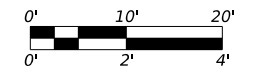
**PAVEMENT DETAIL**  
 \*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.

- LEGEND**
- EXIST ROW
  - EXIST FENCE
  - EXIST FEATURES

- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - STATION/OFFSETS ARE TO DRIVEWAY CENTERLINE UNLESS NOTED OTHERWISE.



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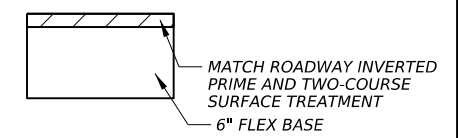


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FM 462			
DRIVEWAY			
PLAN AND PROFILE			
SHEET 3 OF 16			
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	131	

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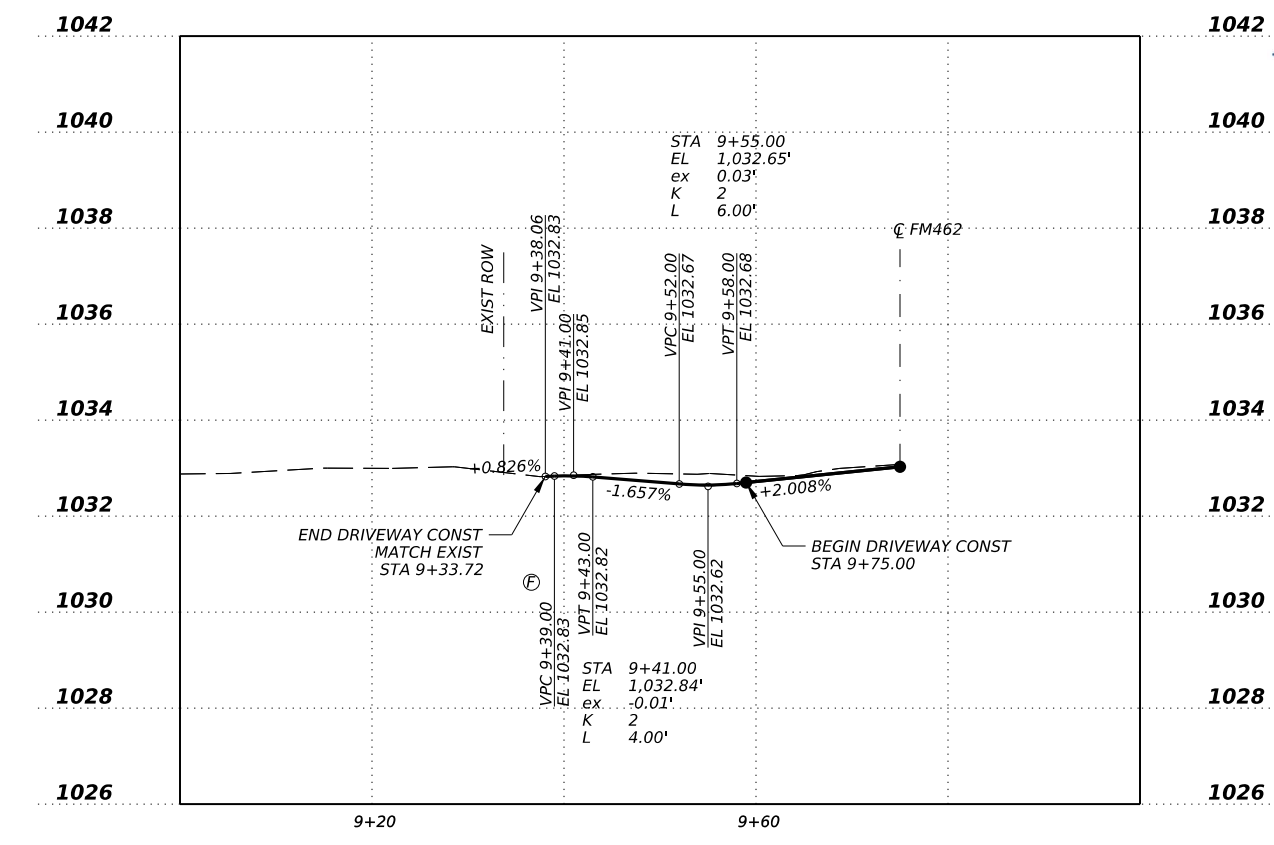
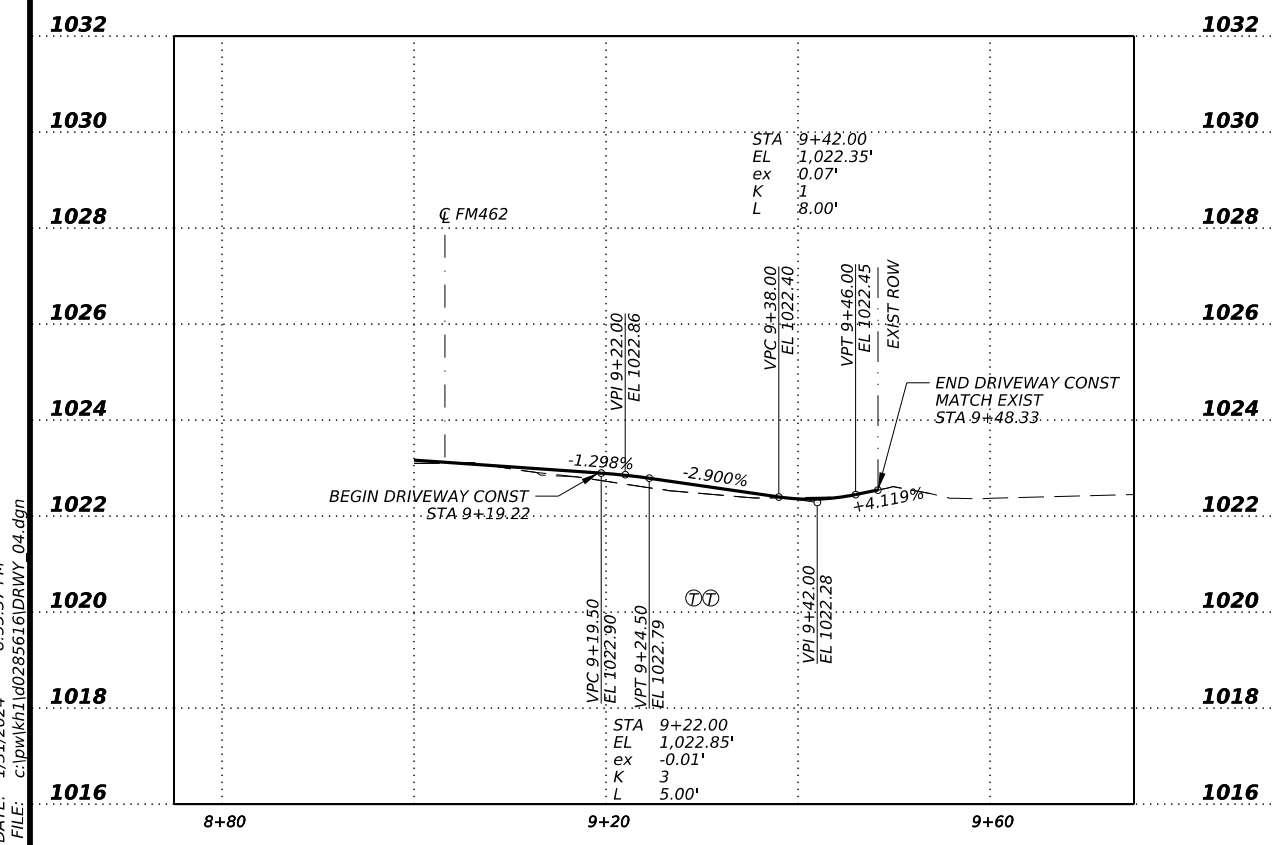
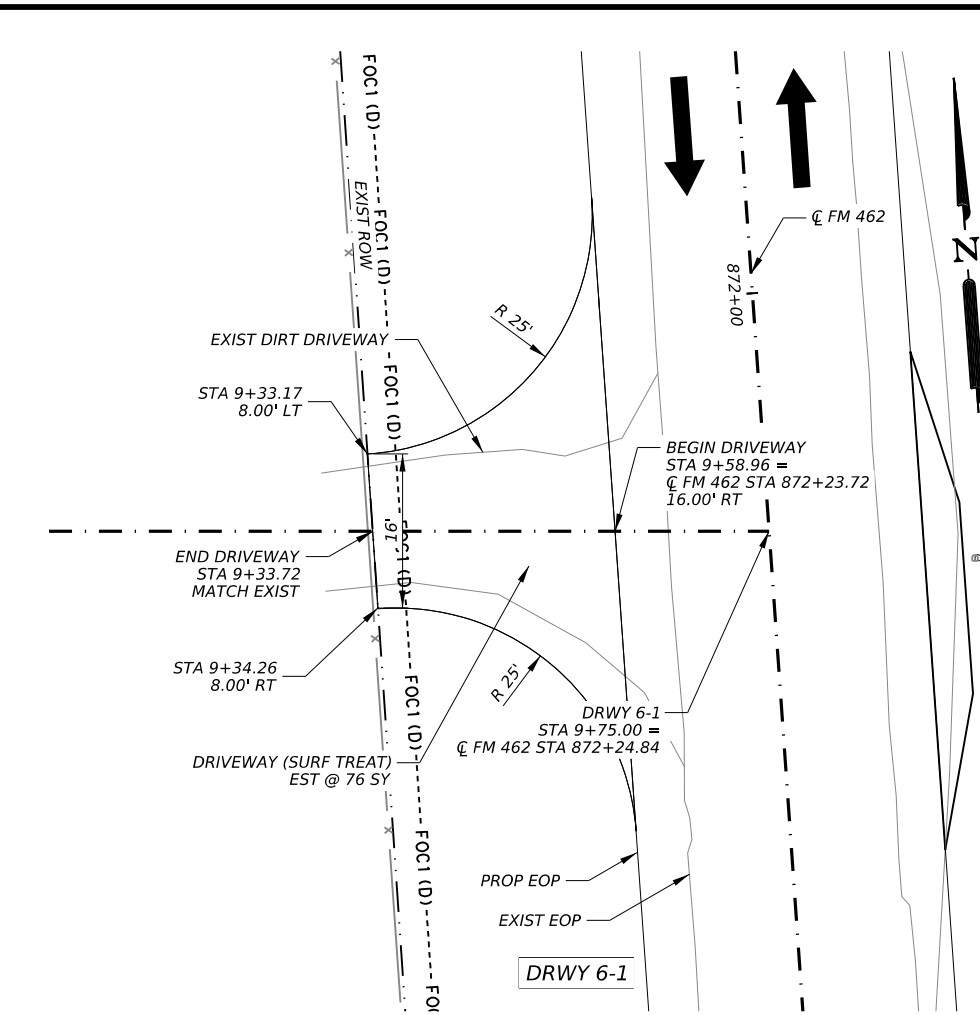
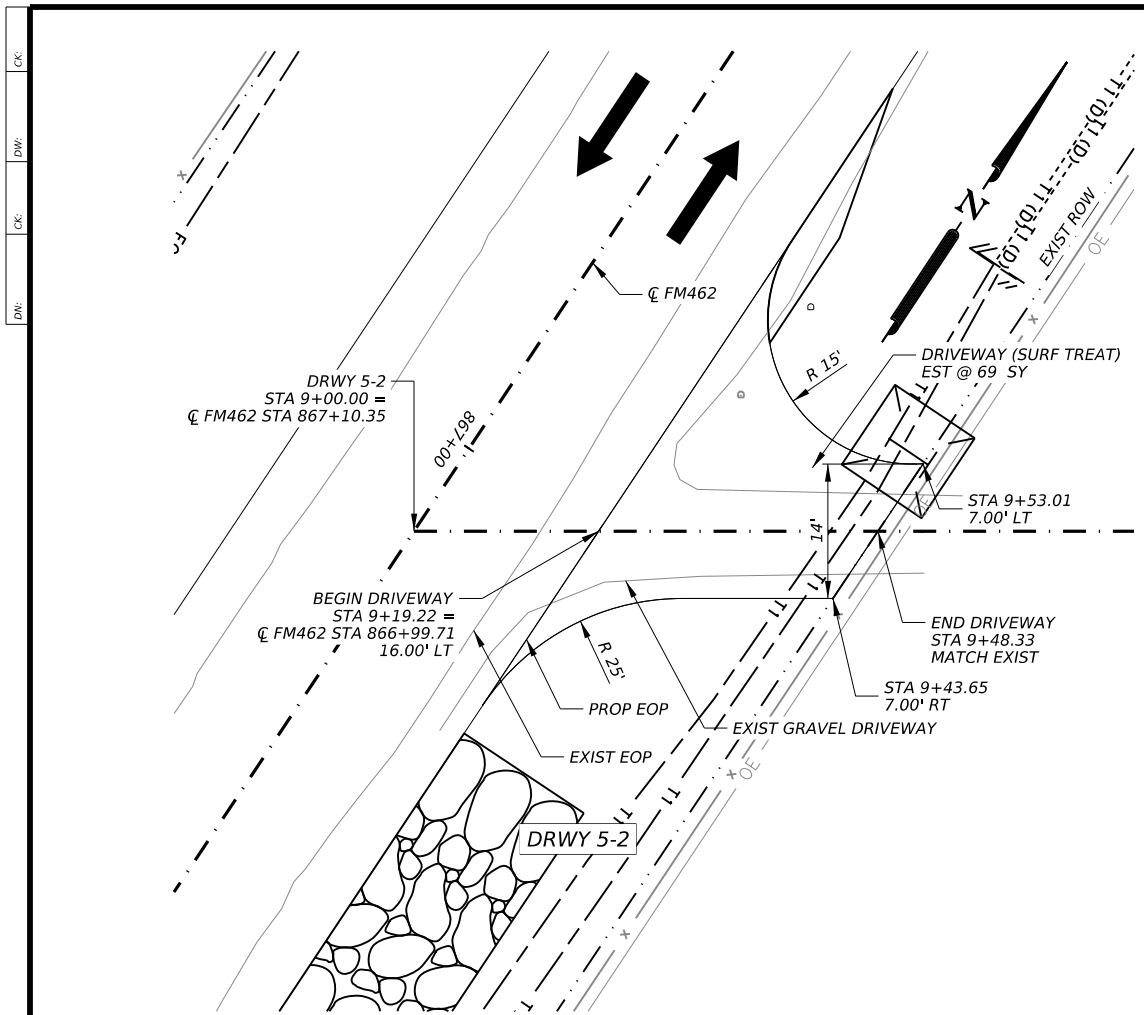
ITEM	DESCRIPTION	UNIT	QTY
0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	96
0530 6006	DRIVEWAYS (SURF TREAT)	SY	145



**PAVEMENT DETAIL**  
 \*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.

- LEGEND**
- EXIST ROW ————
  - EXIST FENCE — x —
  - EXIST FEATURES ————

- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - STATION/OFFSETS ARE TO DRIVEWAY CENTERLINE UNLESS NOTED OTHERWISE.



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**FM 462**

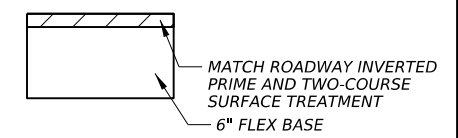
**DRIVEWAY PLAN AND PROFILE**

SHEET 4 OF 16

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	132	

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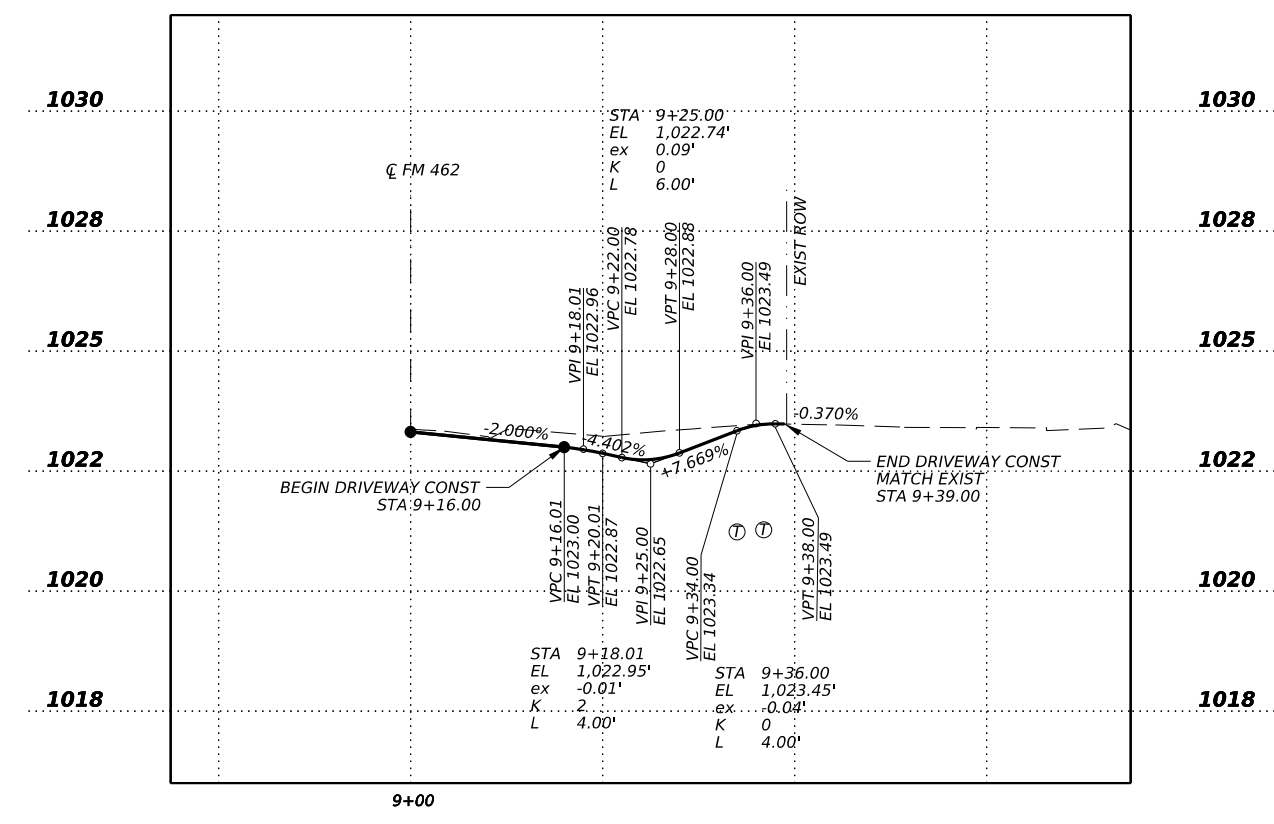
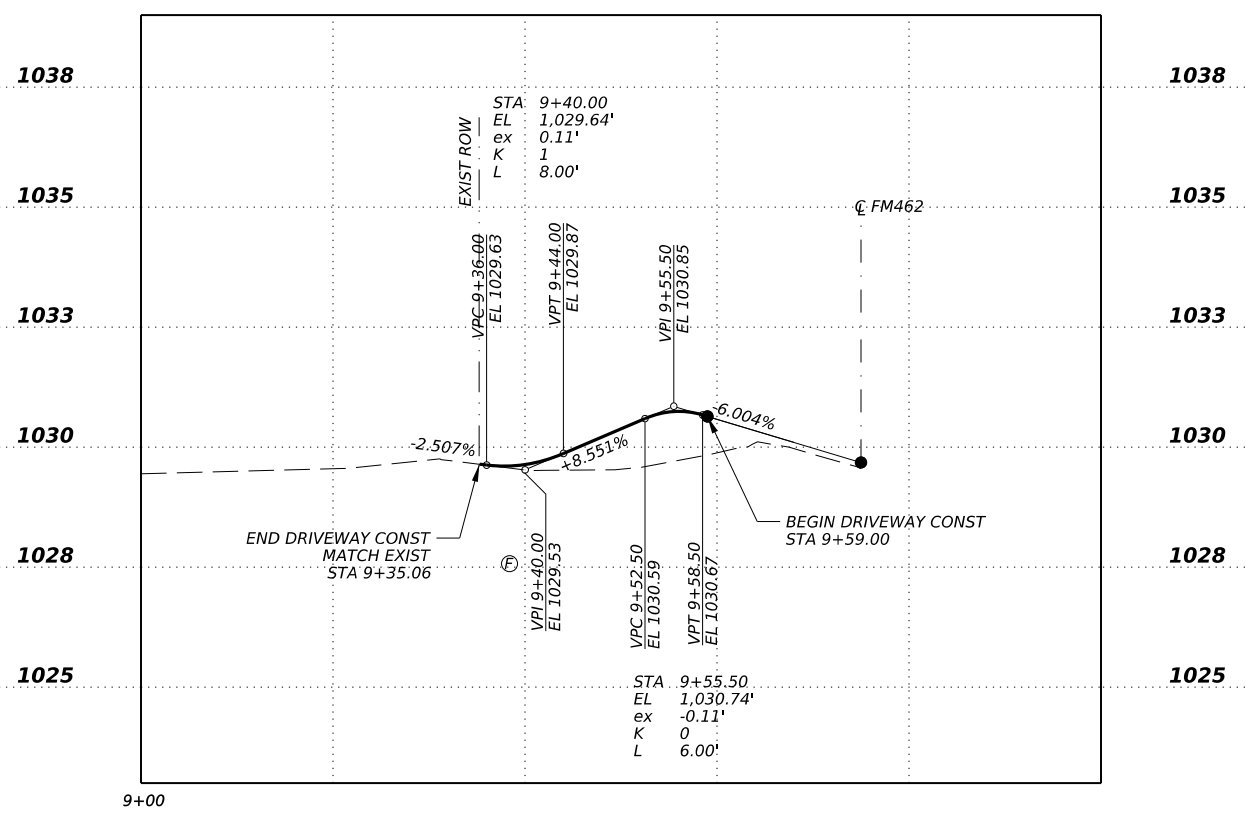
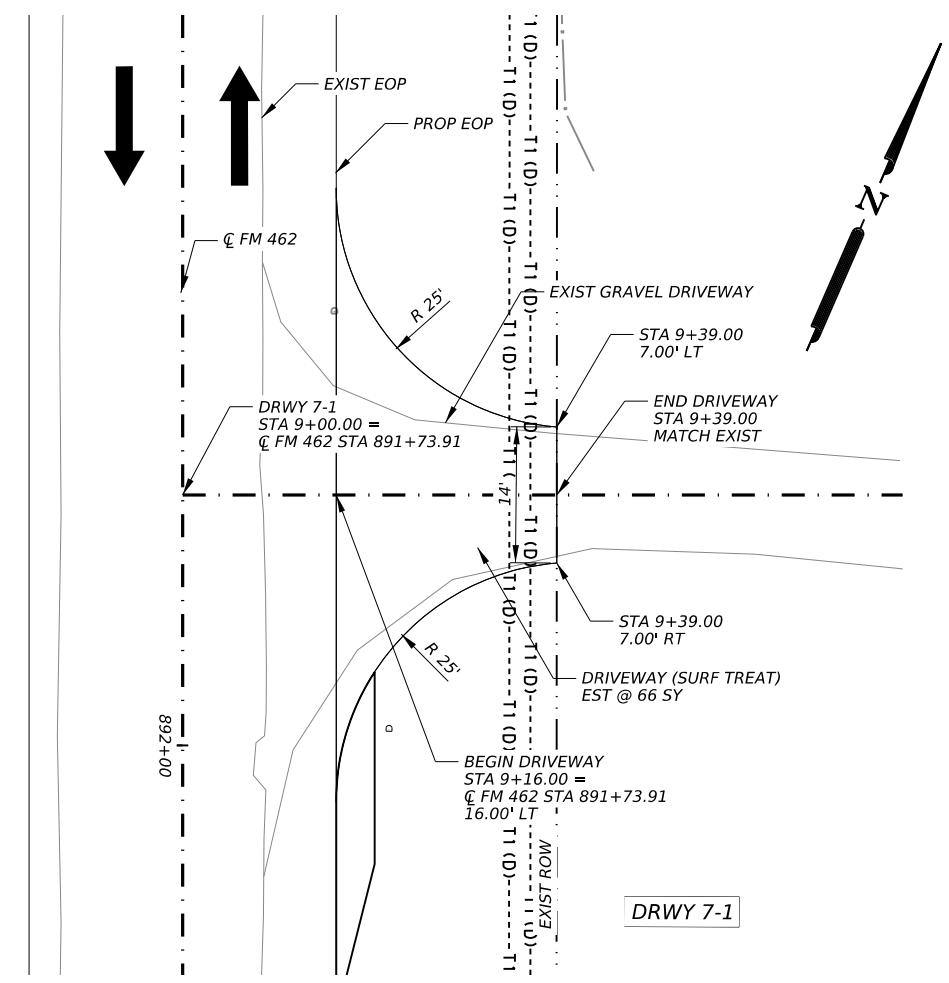
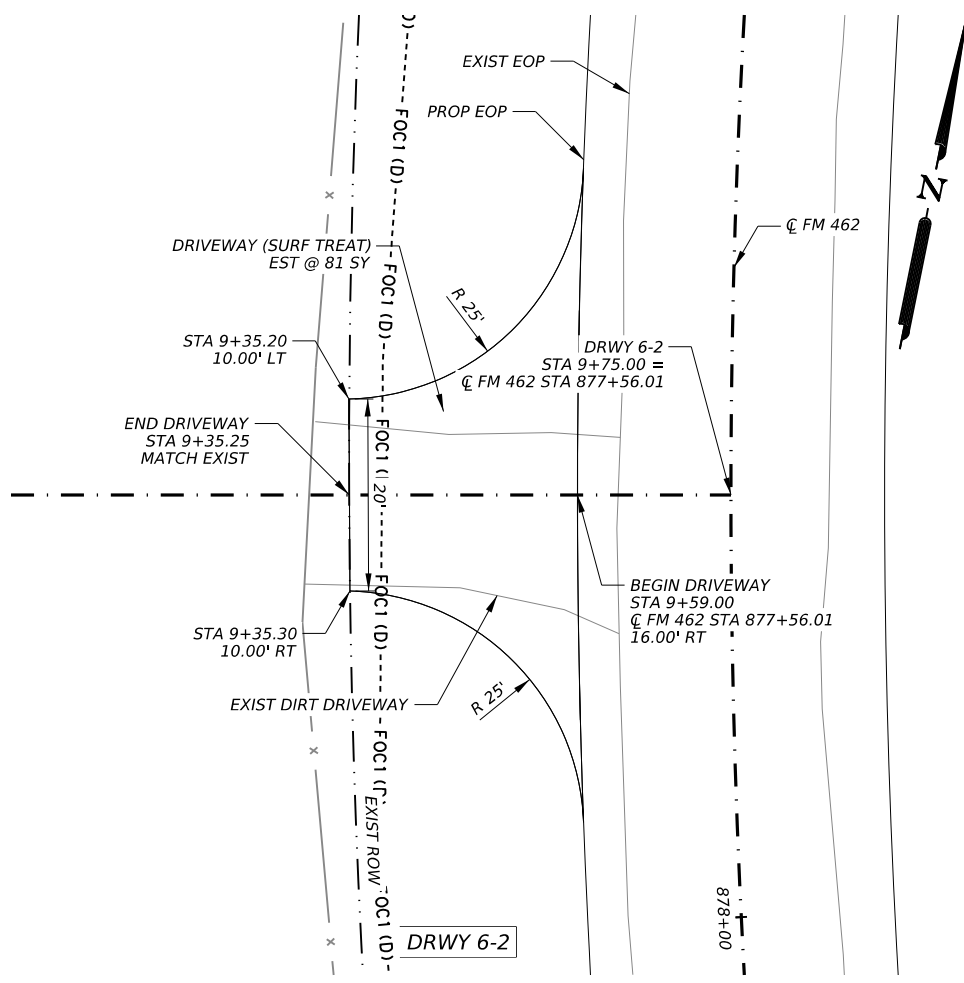
ITEM	DESCRIPTION	UNIT	QTY
0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	85
0530 6006	DRIVEWAYS (SURF TREAT)	SY	147



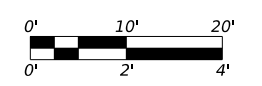
**PAVEMENT DETAIL**  
 \*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.



- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
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**FM 462**

**DRIVEWAY PLAN AND PROFILE**

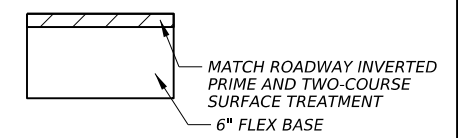
SHEET 5 OF 16

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	133	

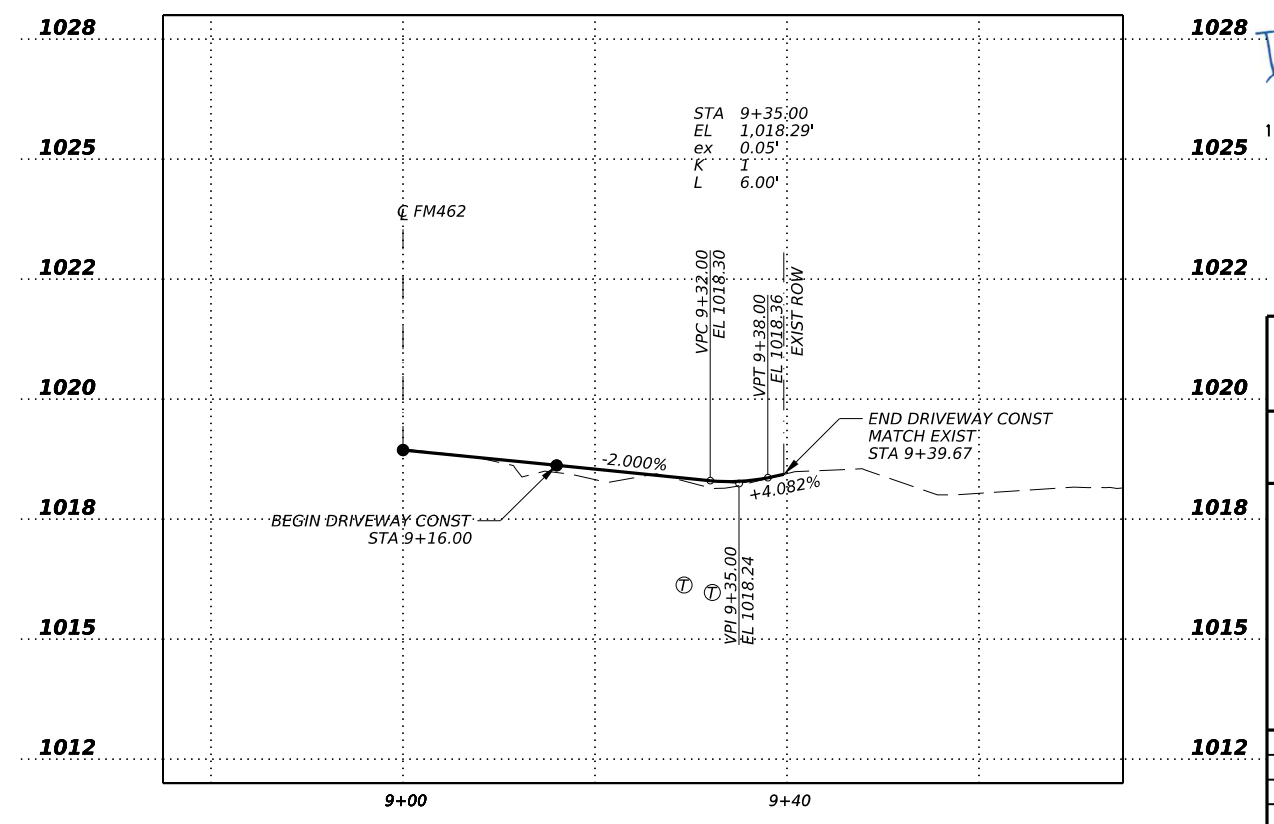
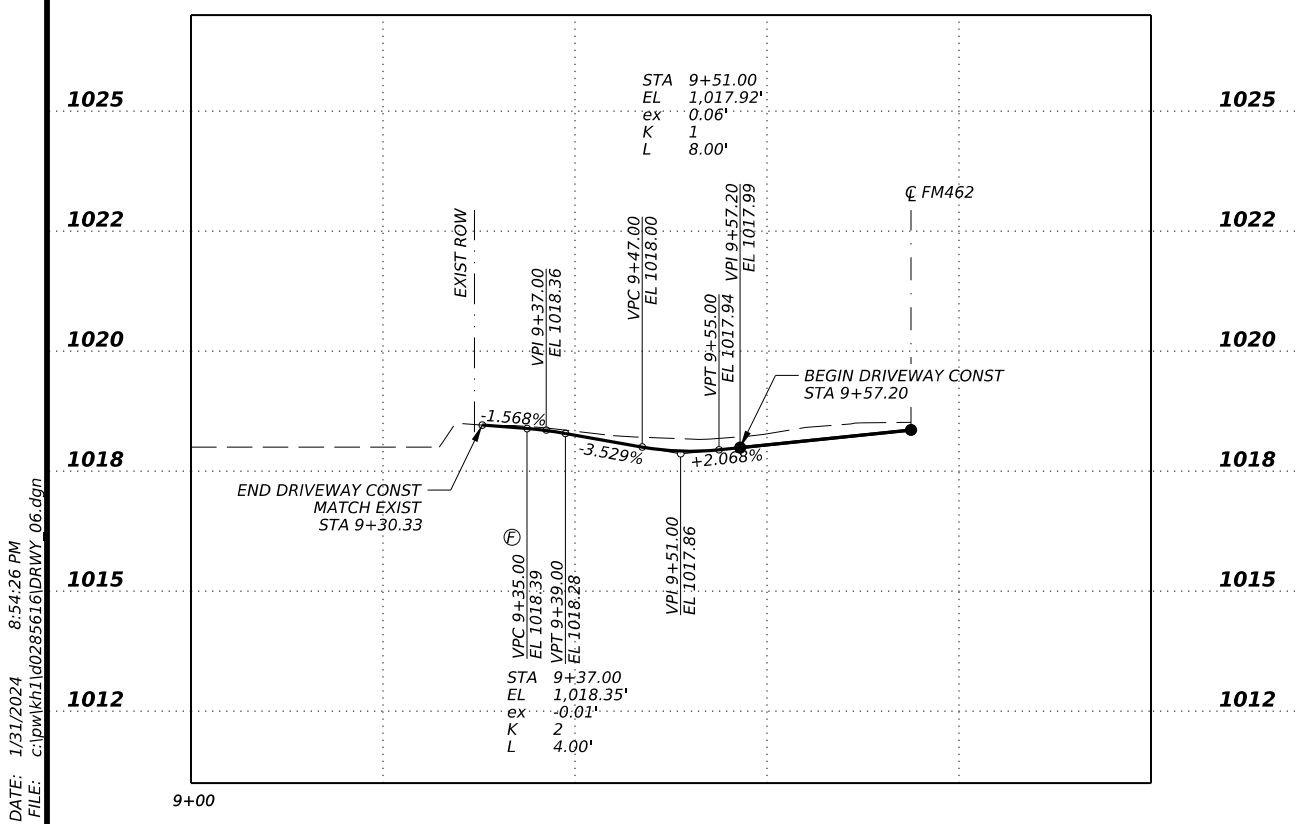
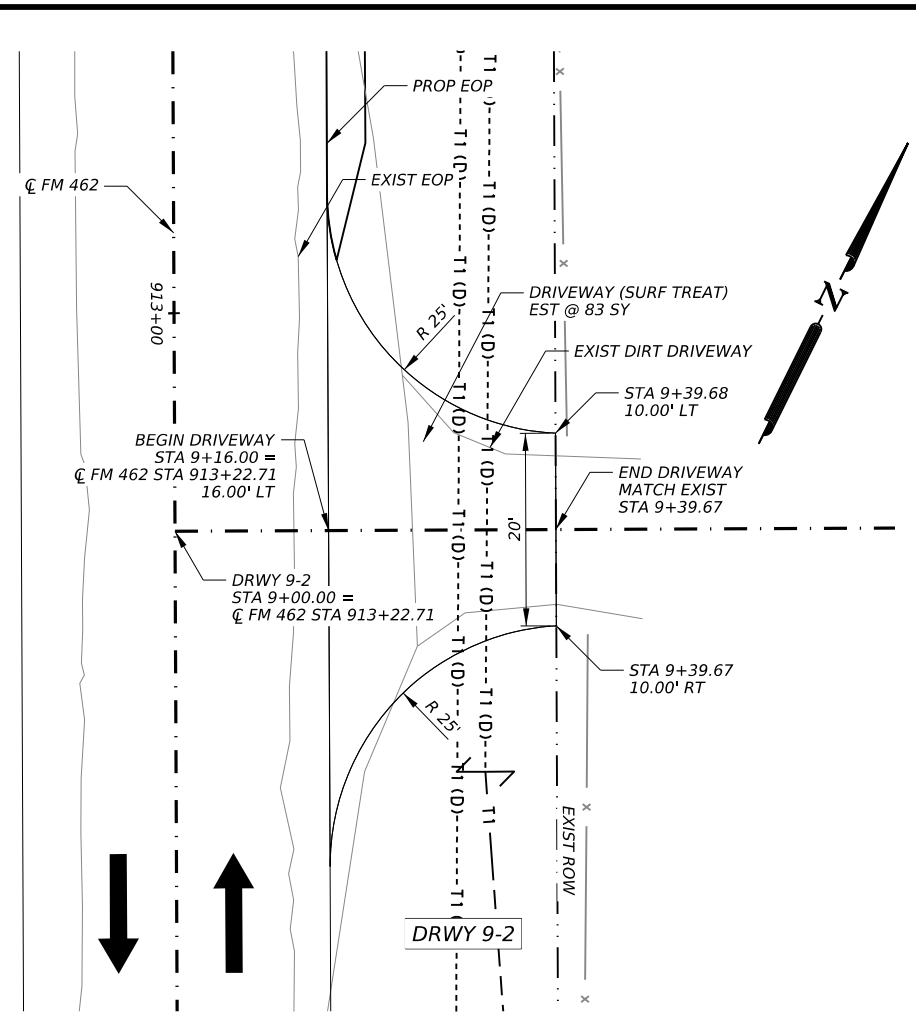
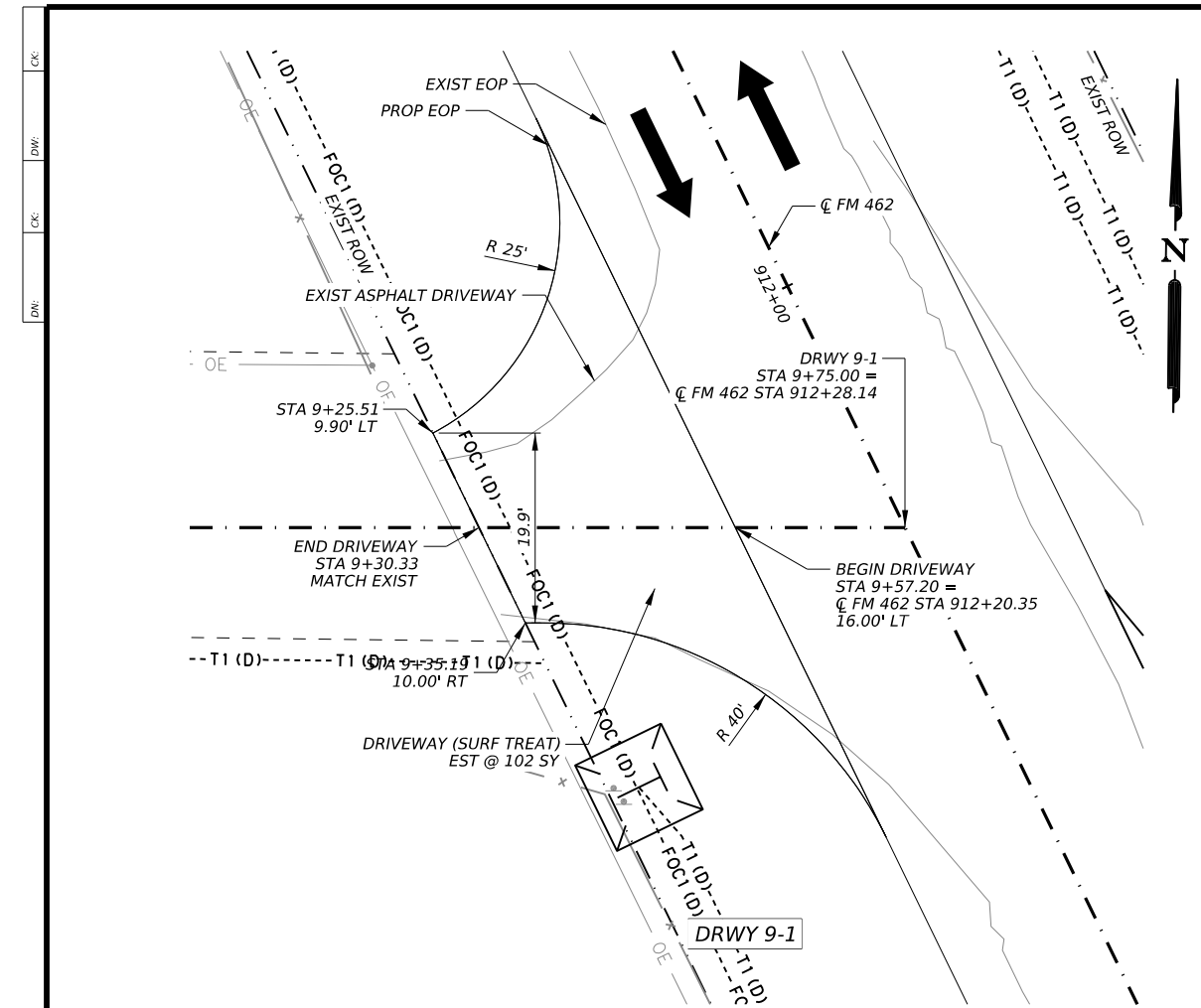
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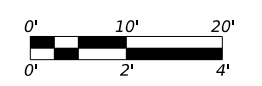
ITEM	DESCRIPTION	UNIT	QTY
0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	114
0530 6006	DRIVEWAYS (SURF TREAT)	SY	185



- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
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**FM 462**

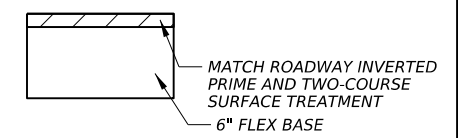
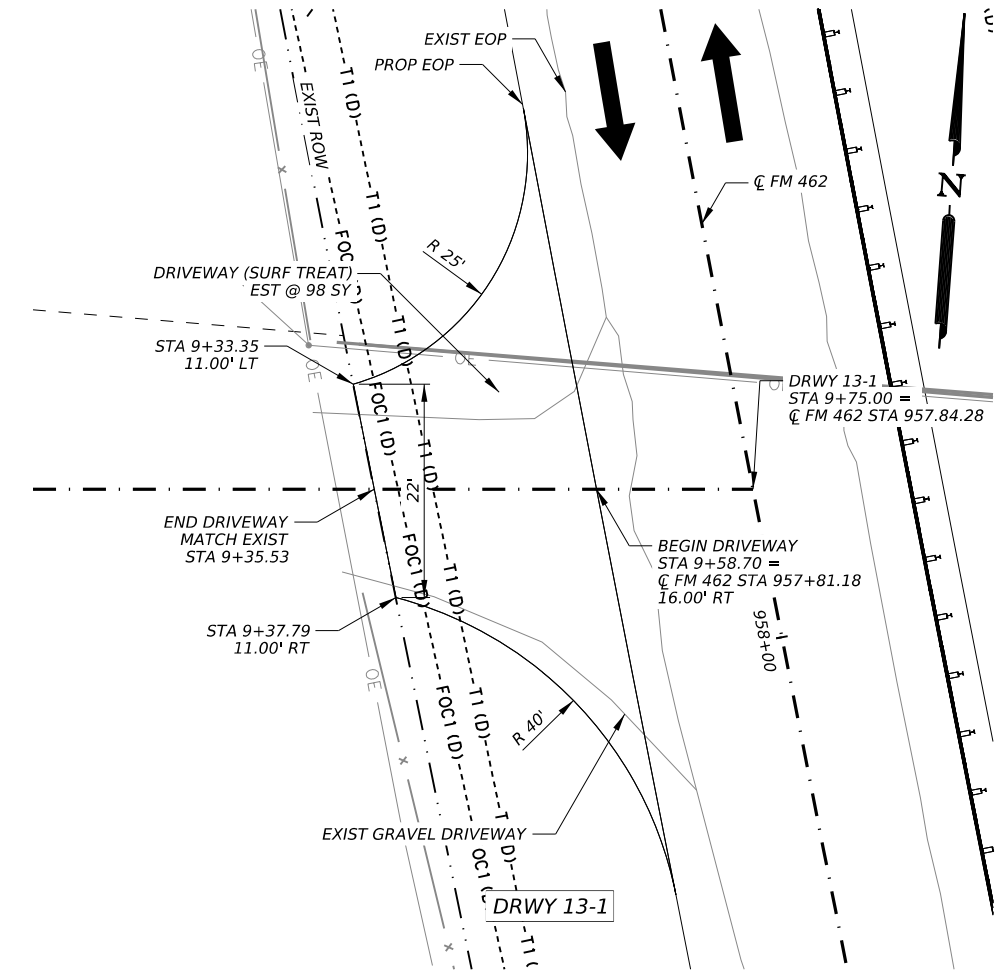
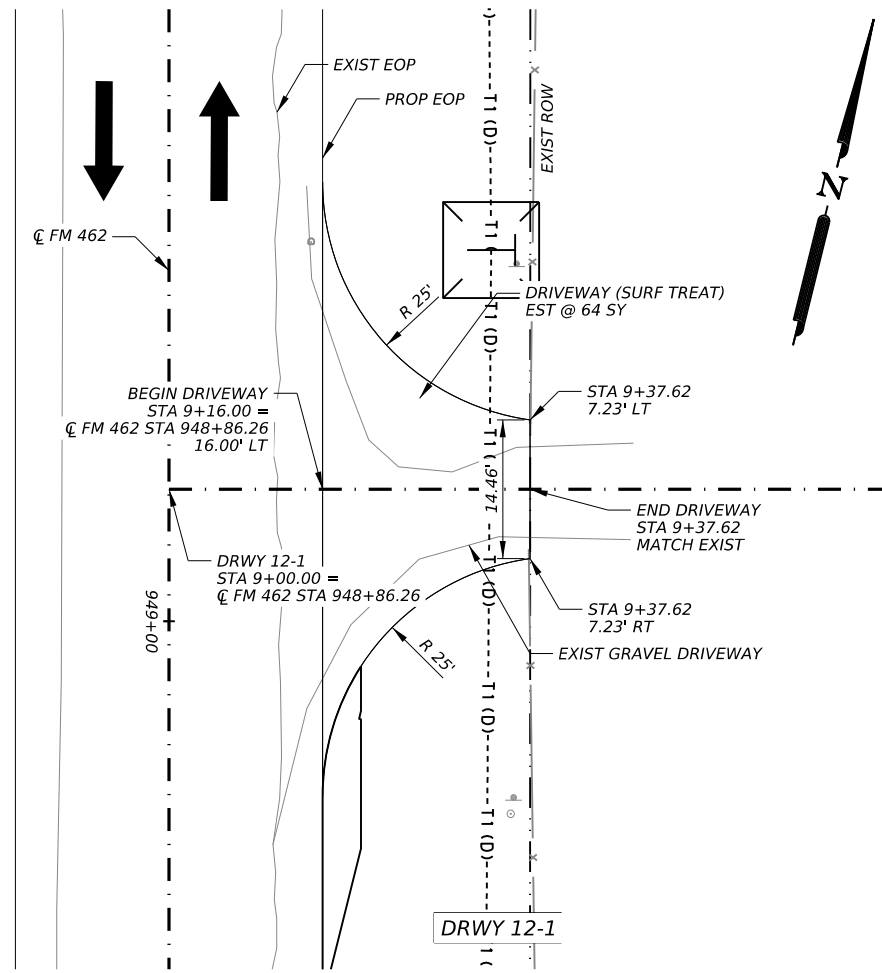
**DRIVEWAY PLAN AND PROFILE**

SHEET 6 OF 16

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	134	

DATE: 1/31/2024 8:54:26 PM  
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ITEM	DESCRIPTION	UNIT	QTY
0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	142
0530 6006	DRIVEWAYS (SURF TREAT)	SY	162

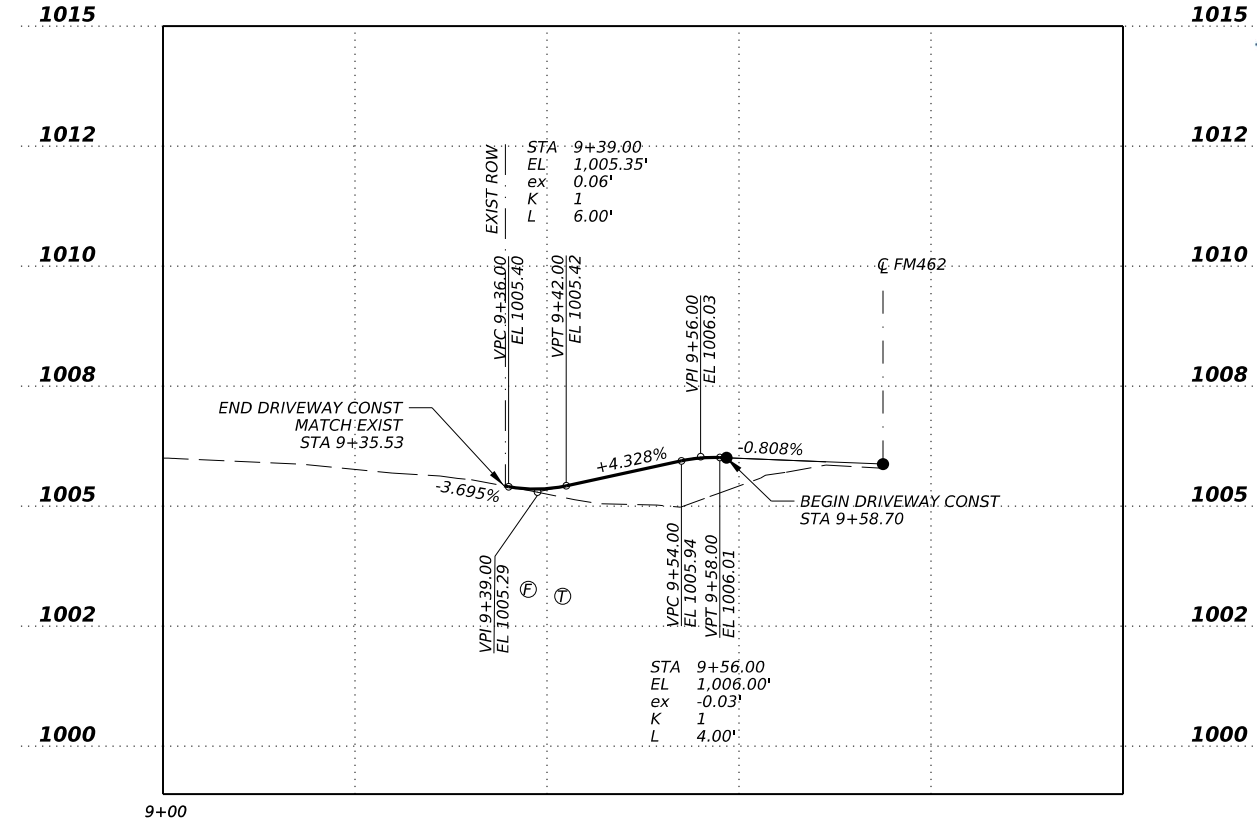
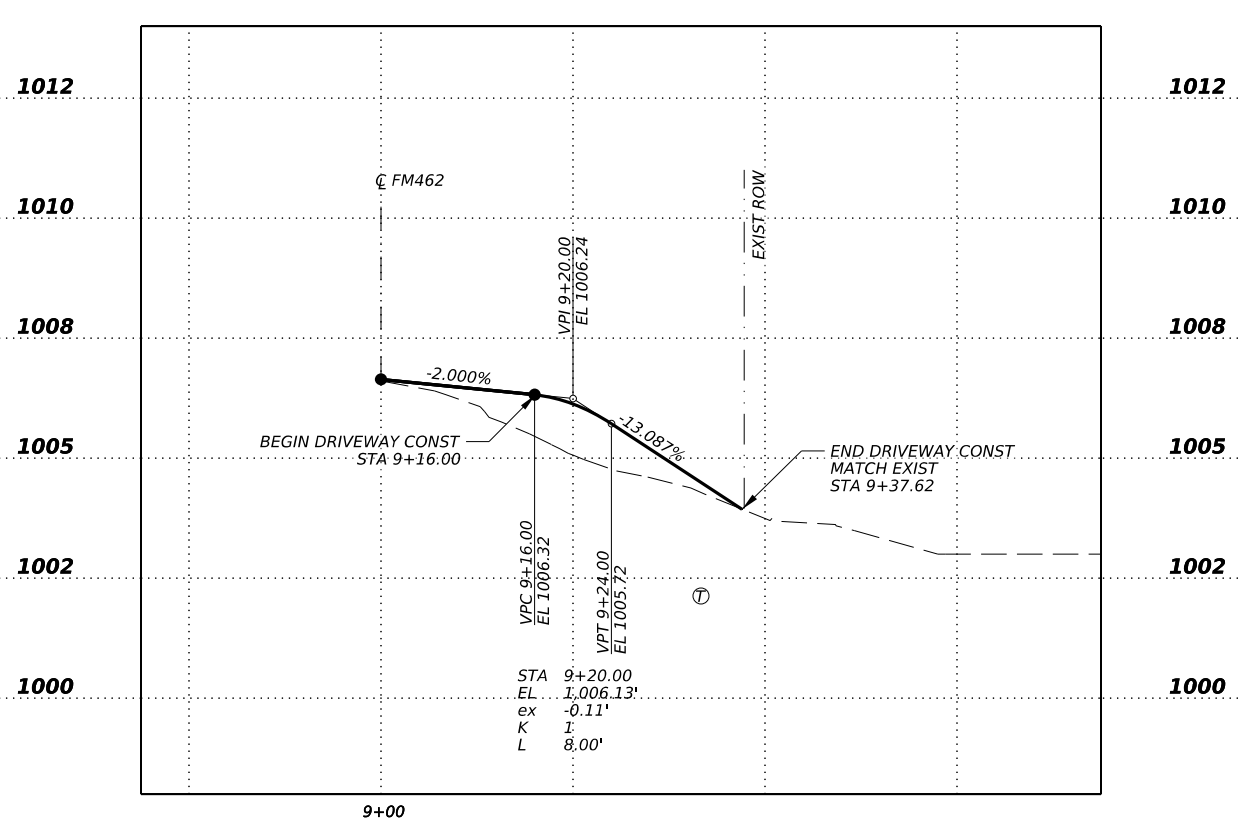


**PAVEMENT DETAIL**  
 \*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.

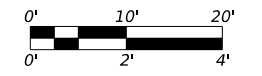
- LEGEND**
- EXIST ROW ————
  - EXIST FENCE — x —
  - EXIST FEATURES ————

- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - STATION/OFFSETS ARE TO DRIVEWAY CENTERLINE UNLESS NOTED OTHERWISE.

DATE: 1/31/2024 8:54:52 PM  
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Signature: *David Gutierrez*  
 1/31/2024  
  
 DAVID H. GUTIERREZ  
 143301  
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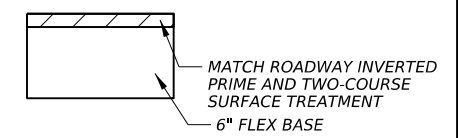
**FM 462**

**DRIVEWAY**  
**PLAN AND PROFILE**

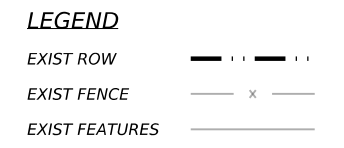
SHEET 7 OF 16

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	135	

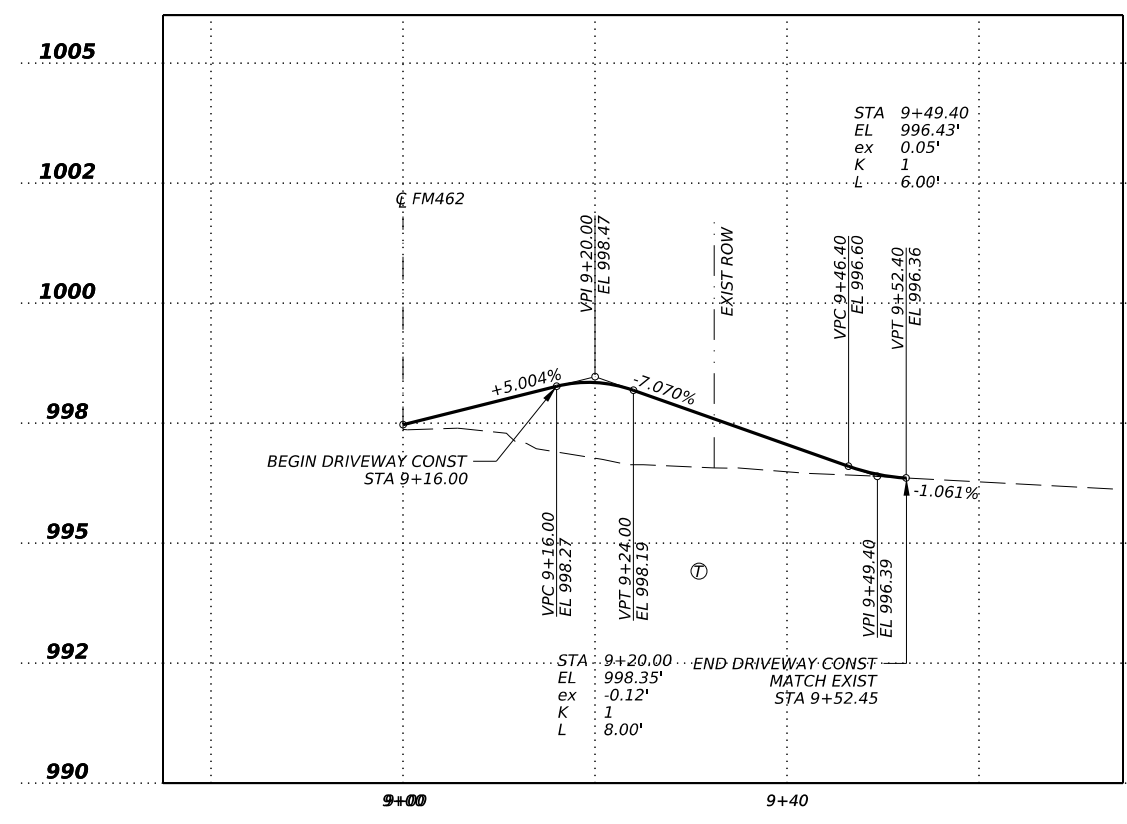
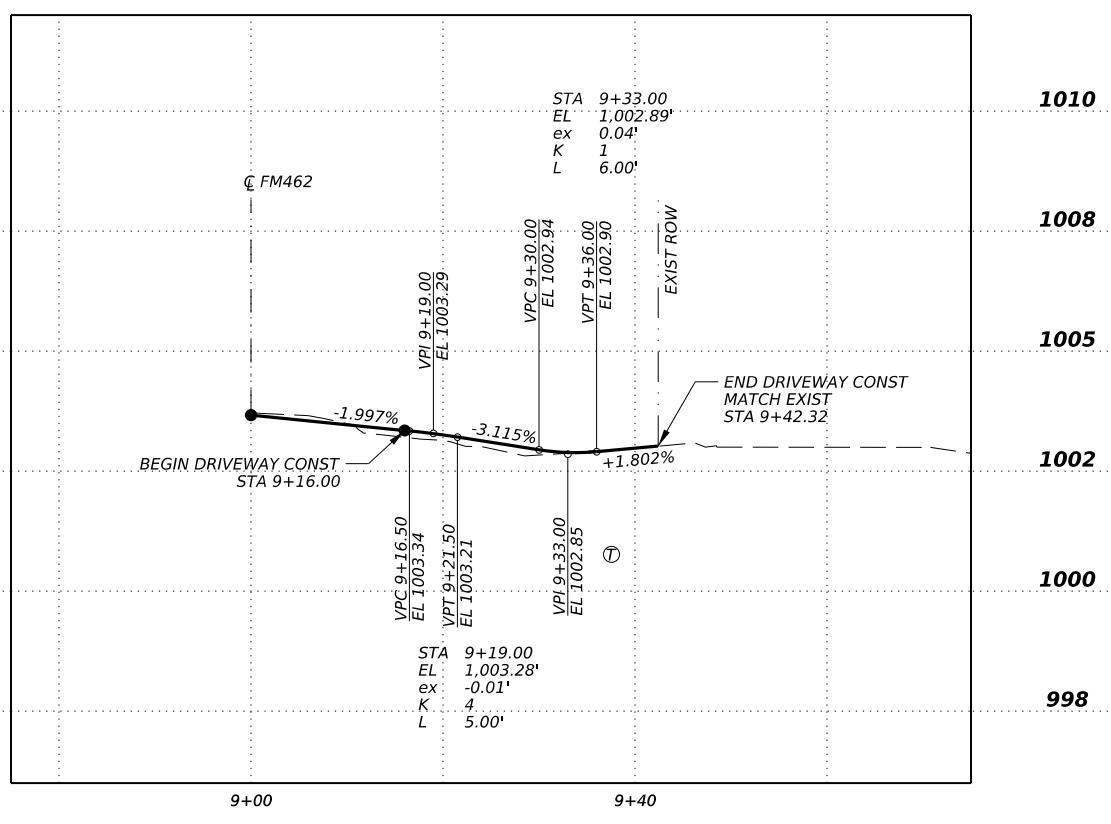
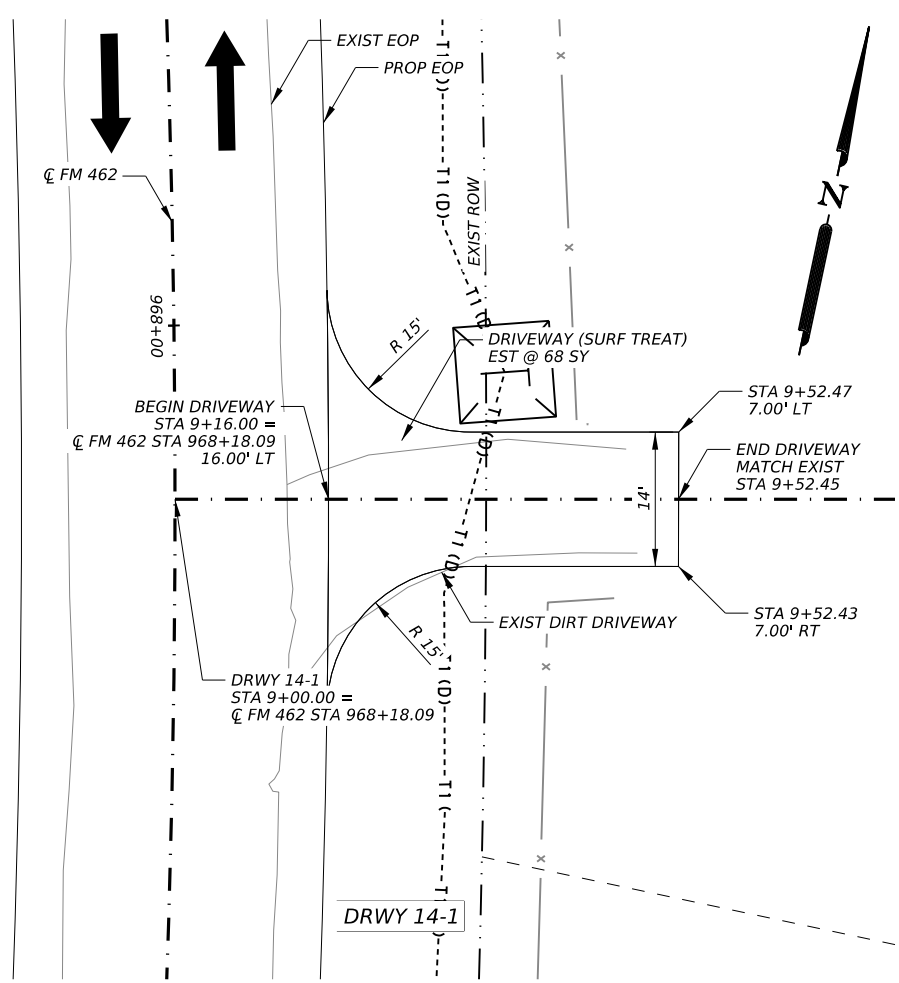
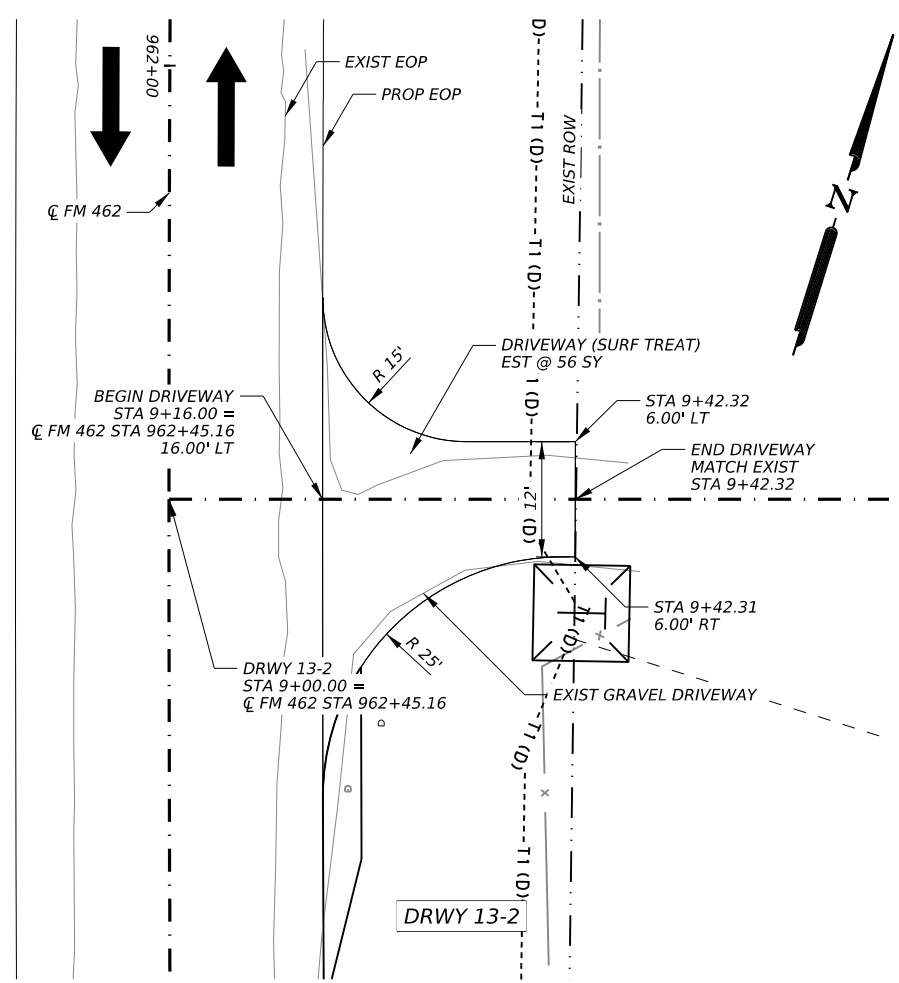
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0105 6008	REMOVING STAB BASE AND ASPH PAV. (6")	SY	89
0530 6006	DRIVEWAYS (SURF TREAT)	SY	124



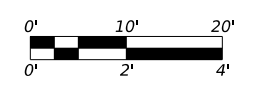
**PAVEMENT DETAIL**  
 \*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.



- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
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1/31/2024



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**FM 462**

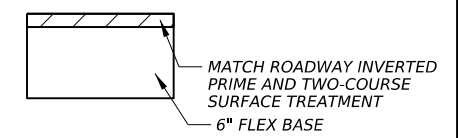
**DRIVEWAY PLAN AND PROFILE**

SHEET 8 OF 16

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	136	

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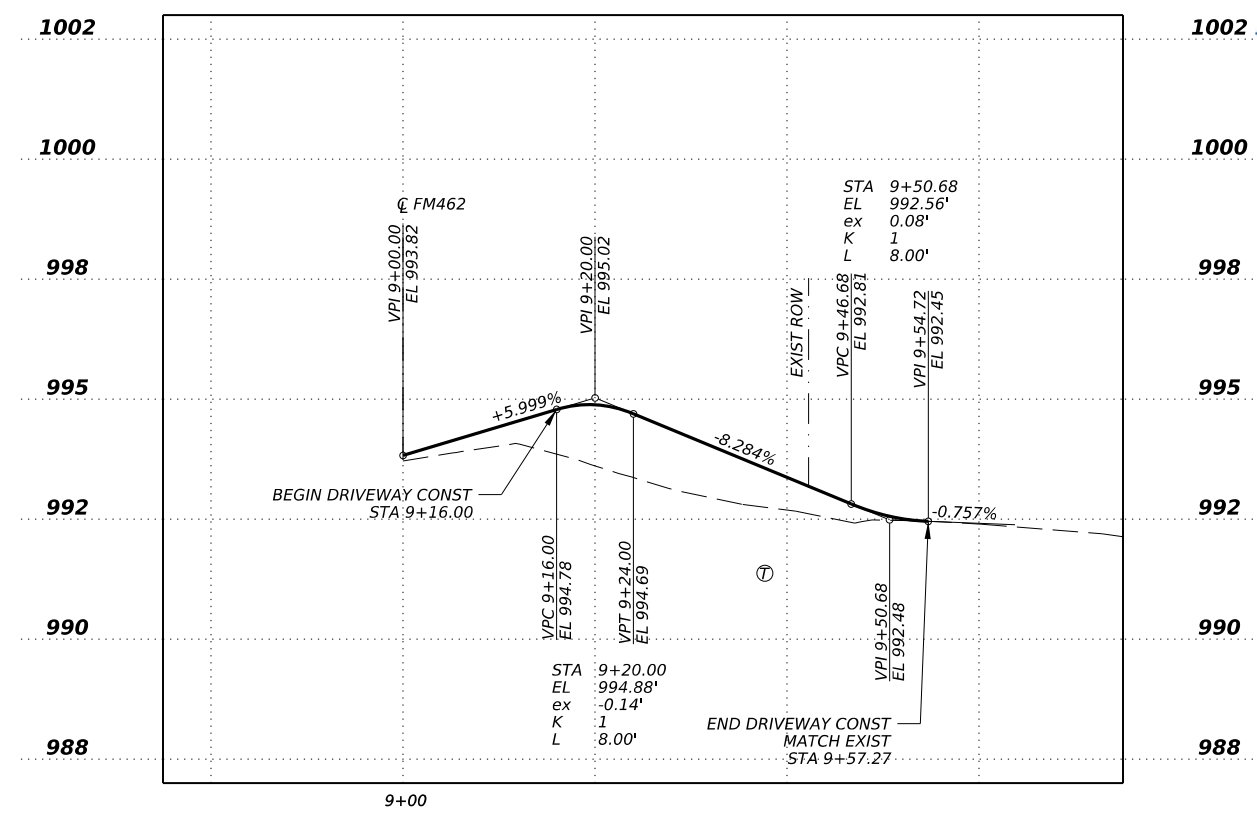
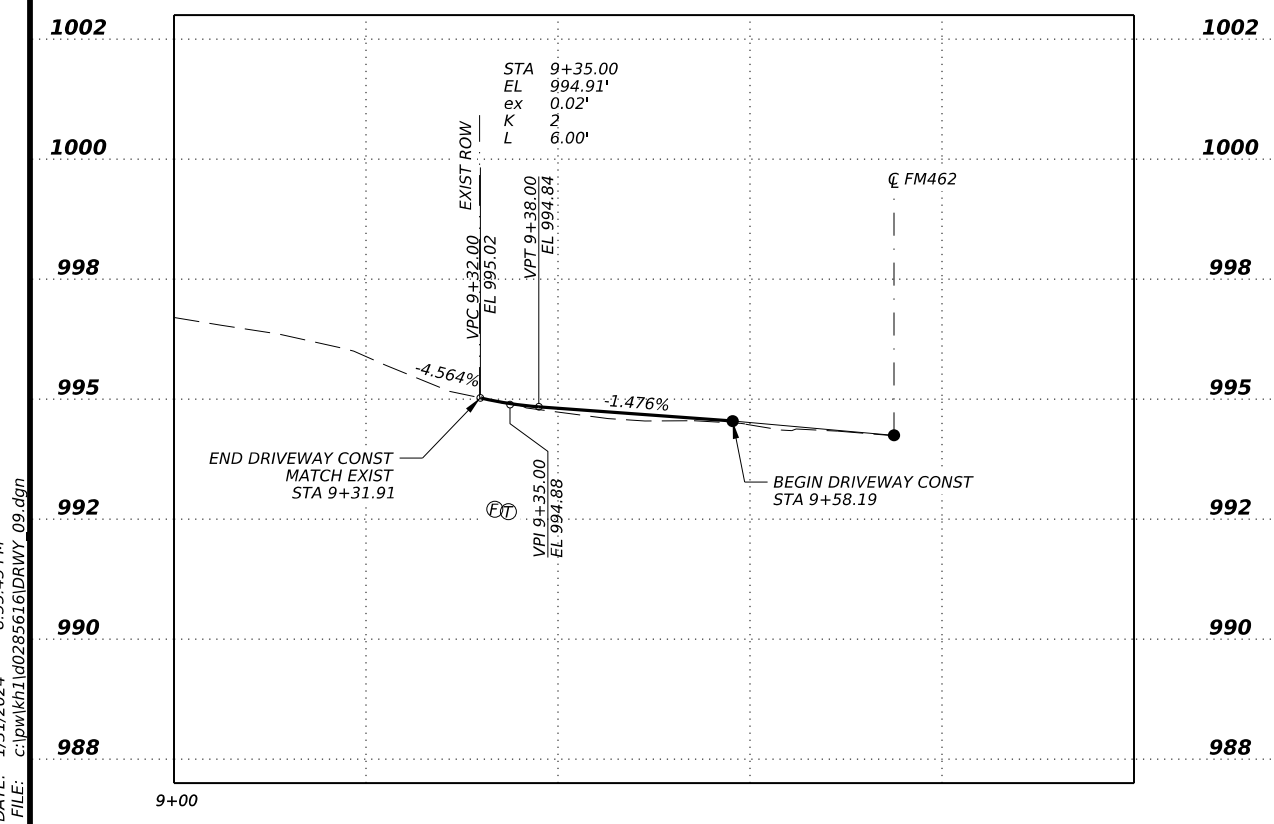
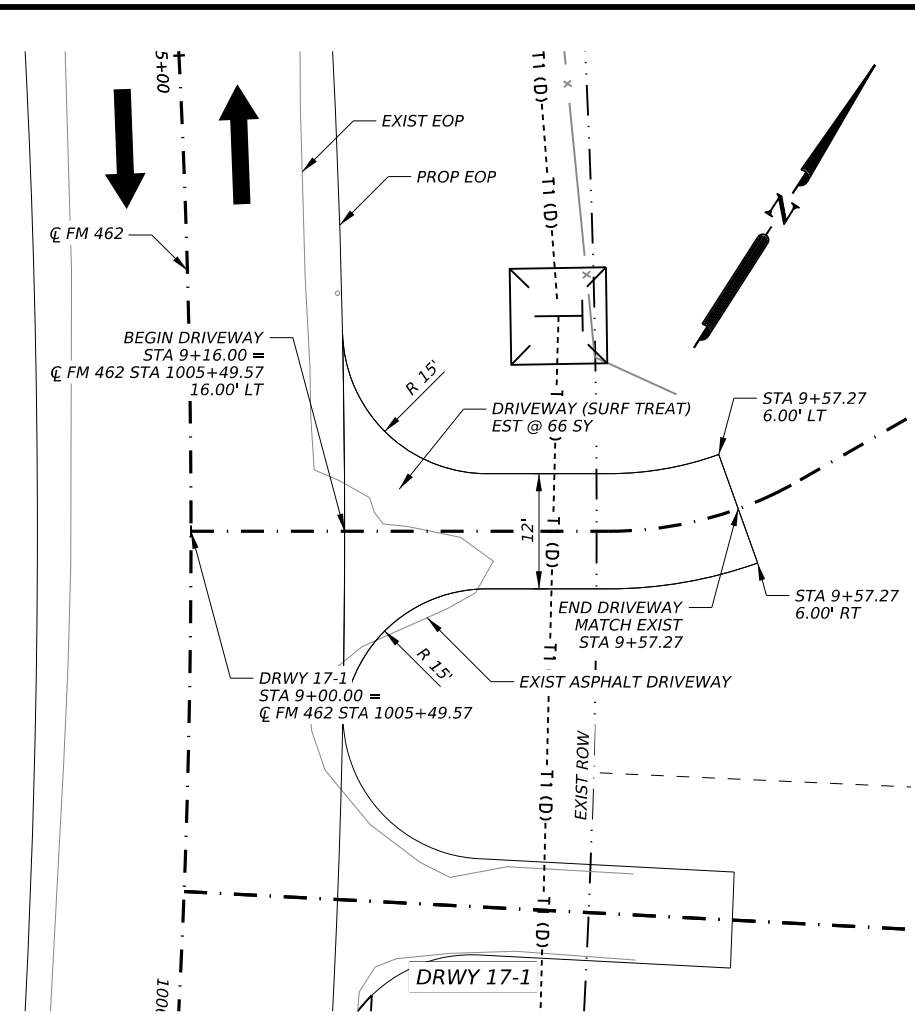
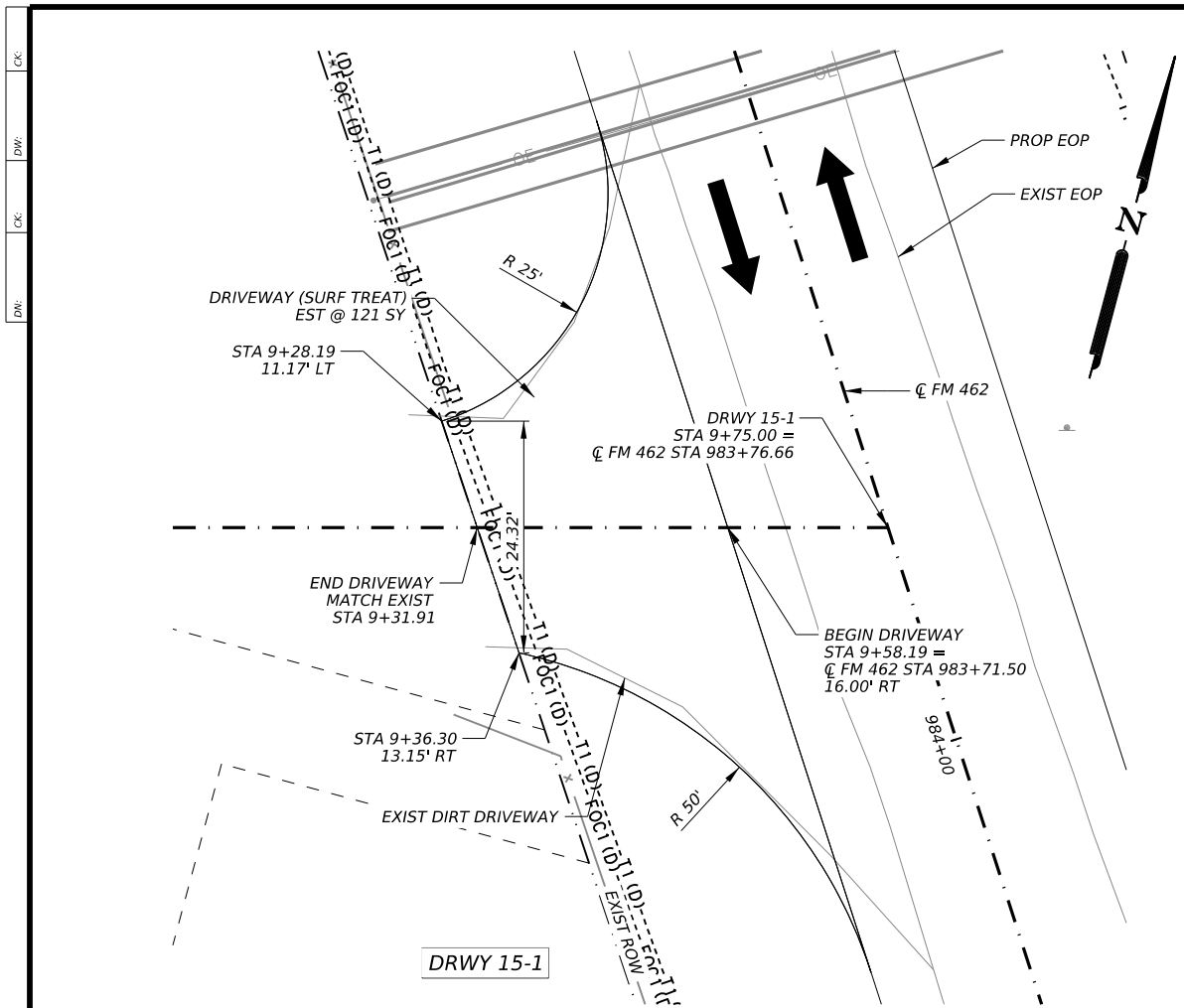
ITEM	DESCRIPTION	UNIT	QTY
0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	25
0530 6006	DRIVEWAYS (SURF TREAT)	SY	187



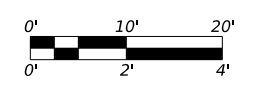
**PAVEMENT DETAIL**  
 \*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.

- LEGEND**
- EXIST ROW ————
  - EXIST FENCE — x —
  - EXIST FEATURES ————

- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - STATION/OFFSETS ARE TO DRIVEWAY CENTERLINE UNLESS NOTED OTHERWISE.



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 1/31/2024  
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**FM 462**

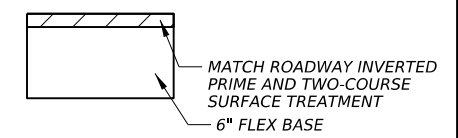
**DRIVEWAY PLAN AND PROFILE**

SHEET 9 OF 16

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	137	

DATE: 1/31/2024 8:55:45 PM  
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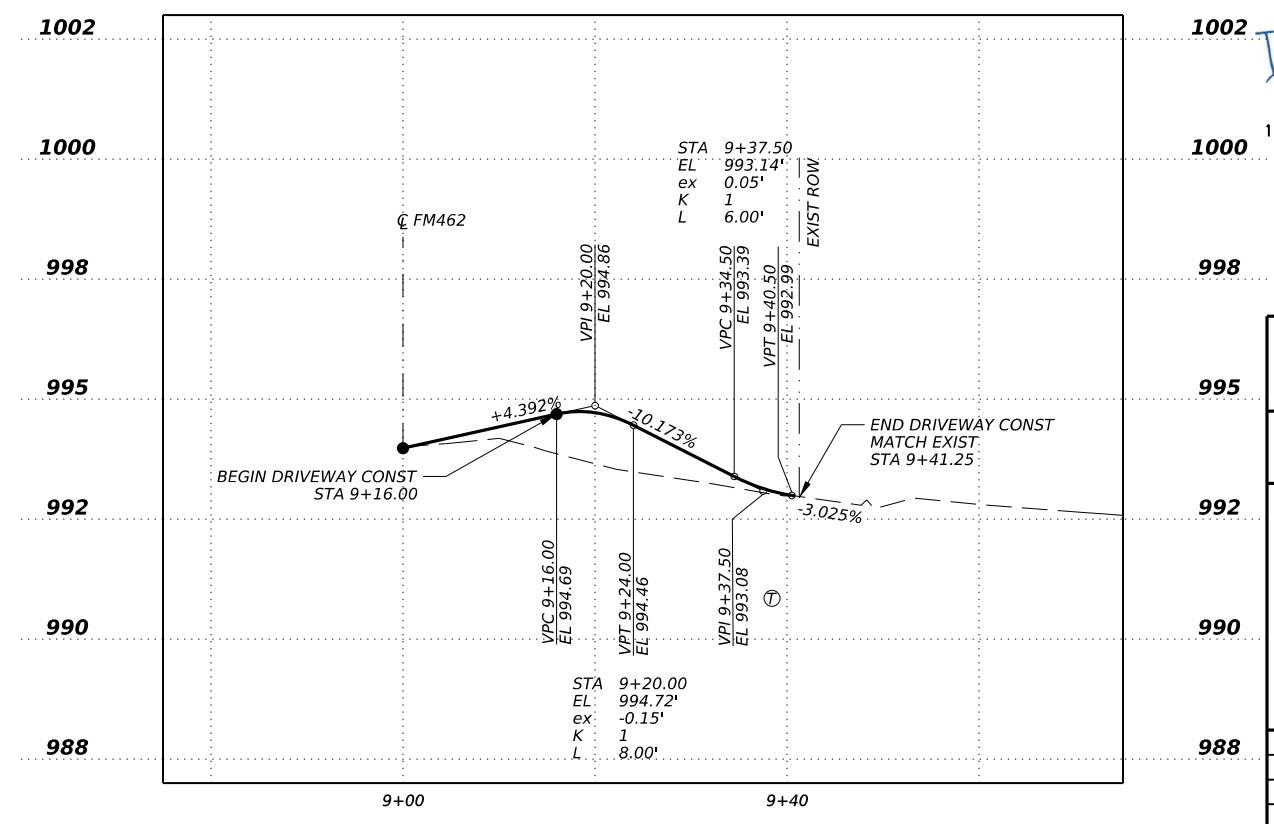
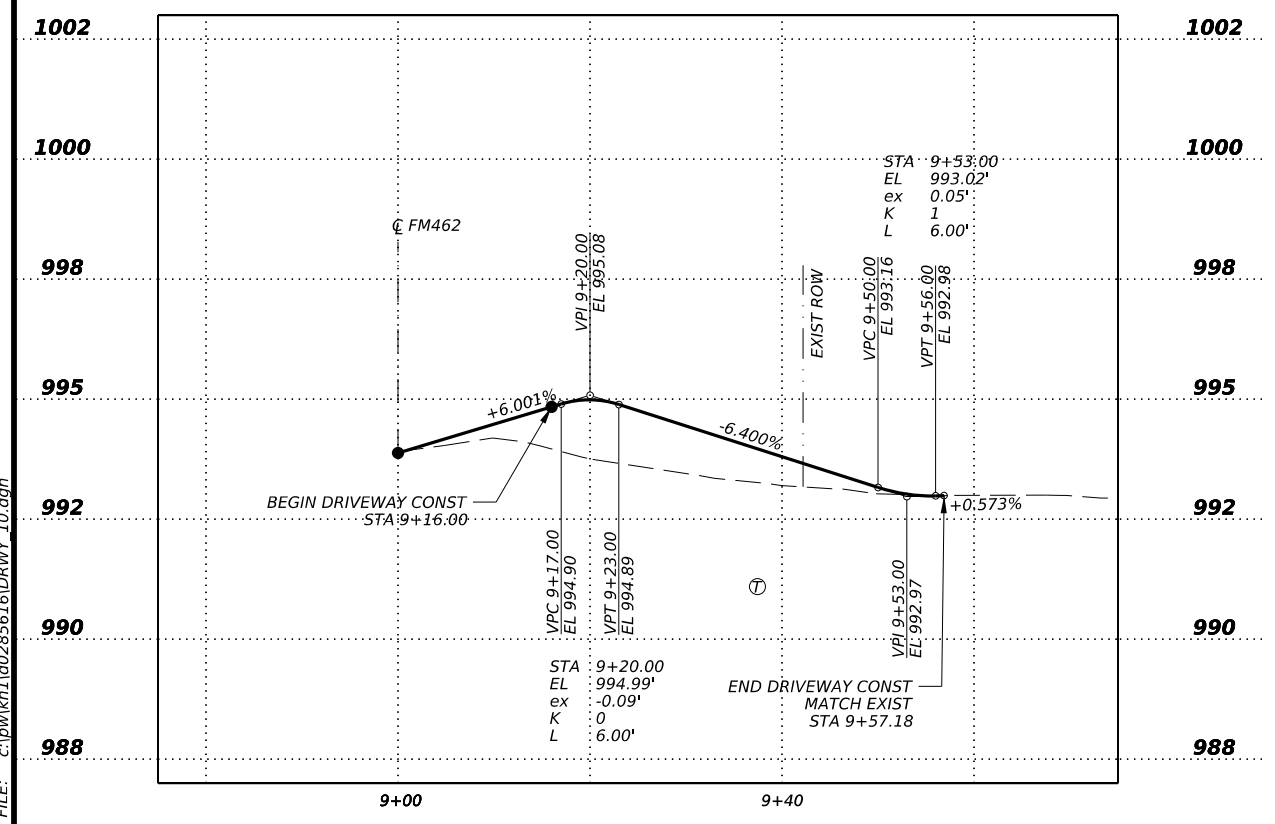
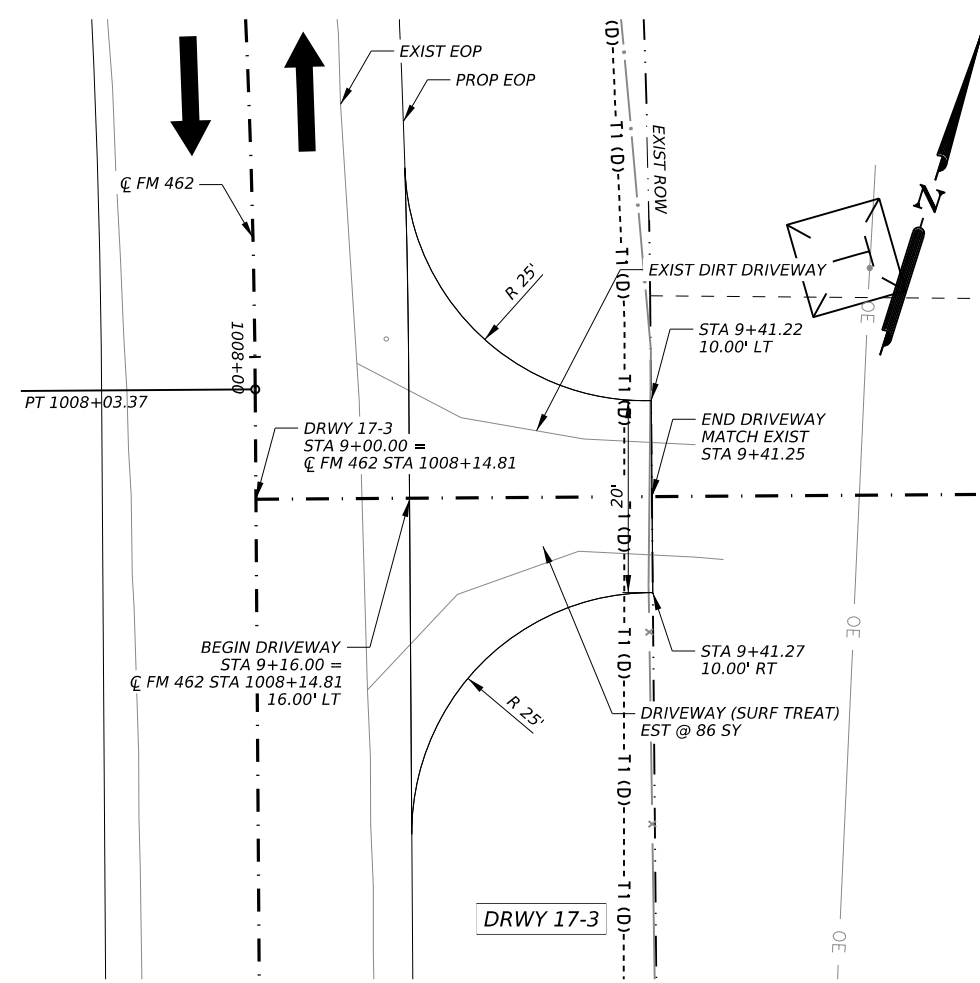
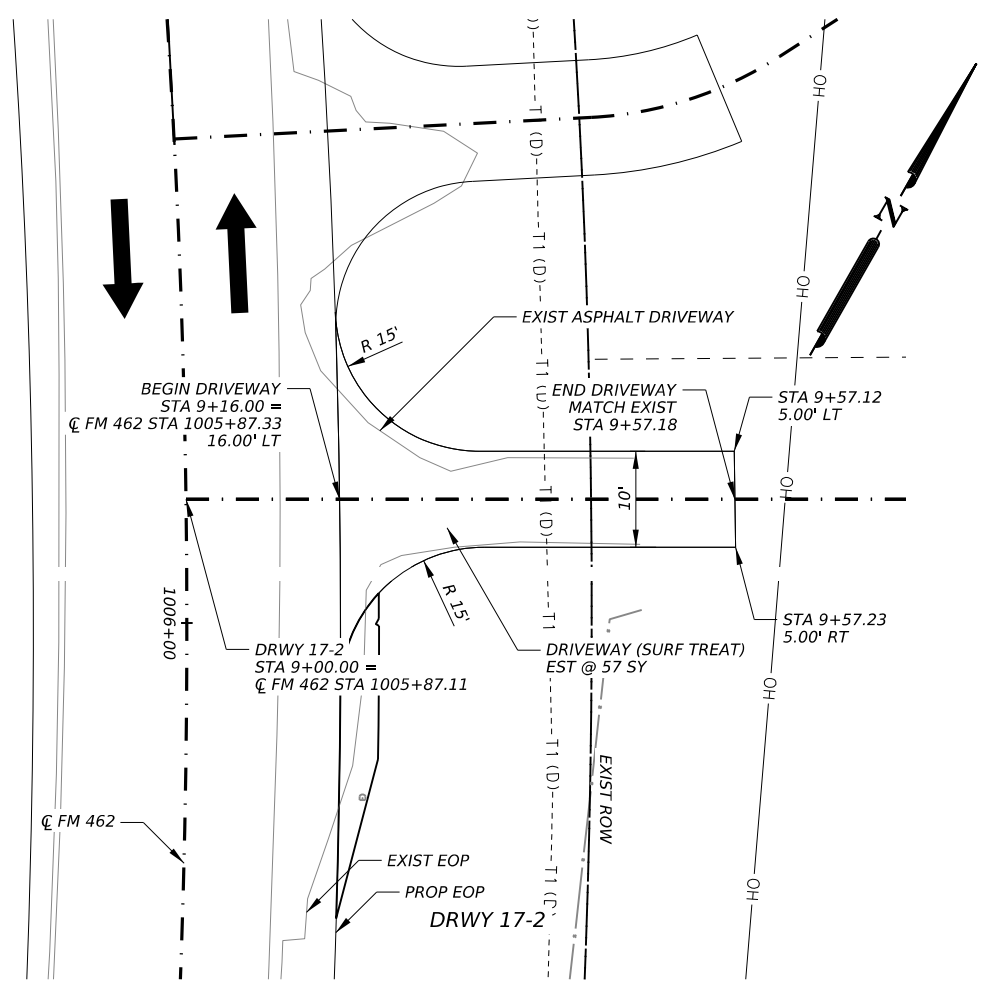
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0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	77
0530 6006	DRIVEWAYS (SURF TREAT)	SY	143



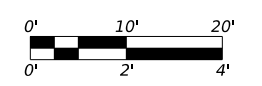
**PAVEMENT DETAIL**  
 \*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.

- LEGEND**
- EXIST ROW ————
  - EXIST FENCE — x —
  - EXIST FEATURES ————

- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
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**FM 462**

**DRIVEWAY**  
**PLAN AND PROFILE**

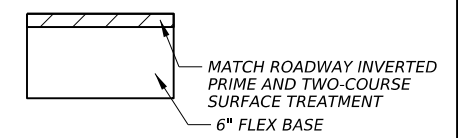
SHEET 10 OF 16

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	138	

DATE: 1/31/2024 8:56:11 PM  
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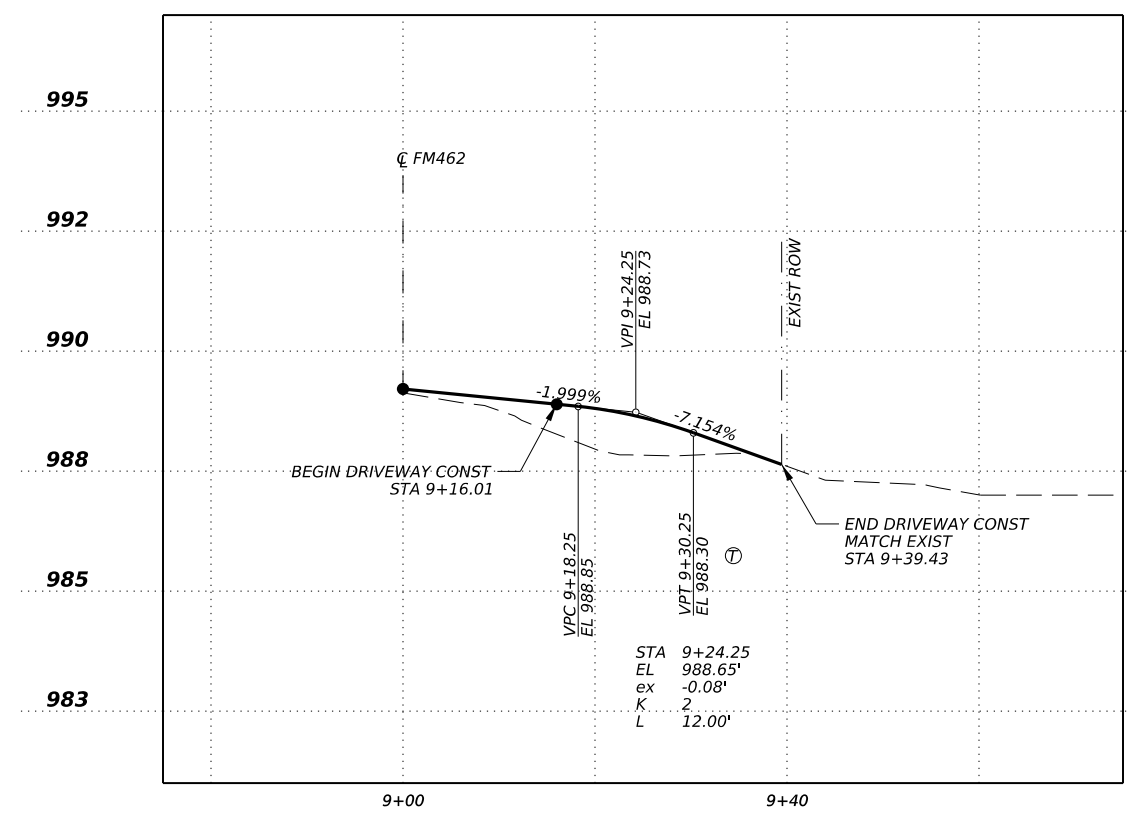
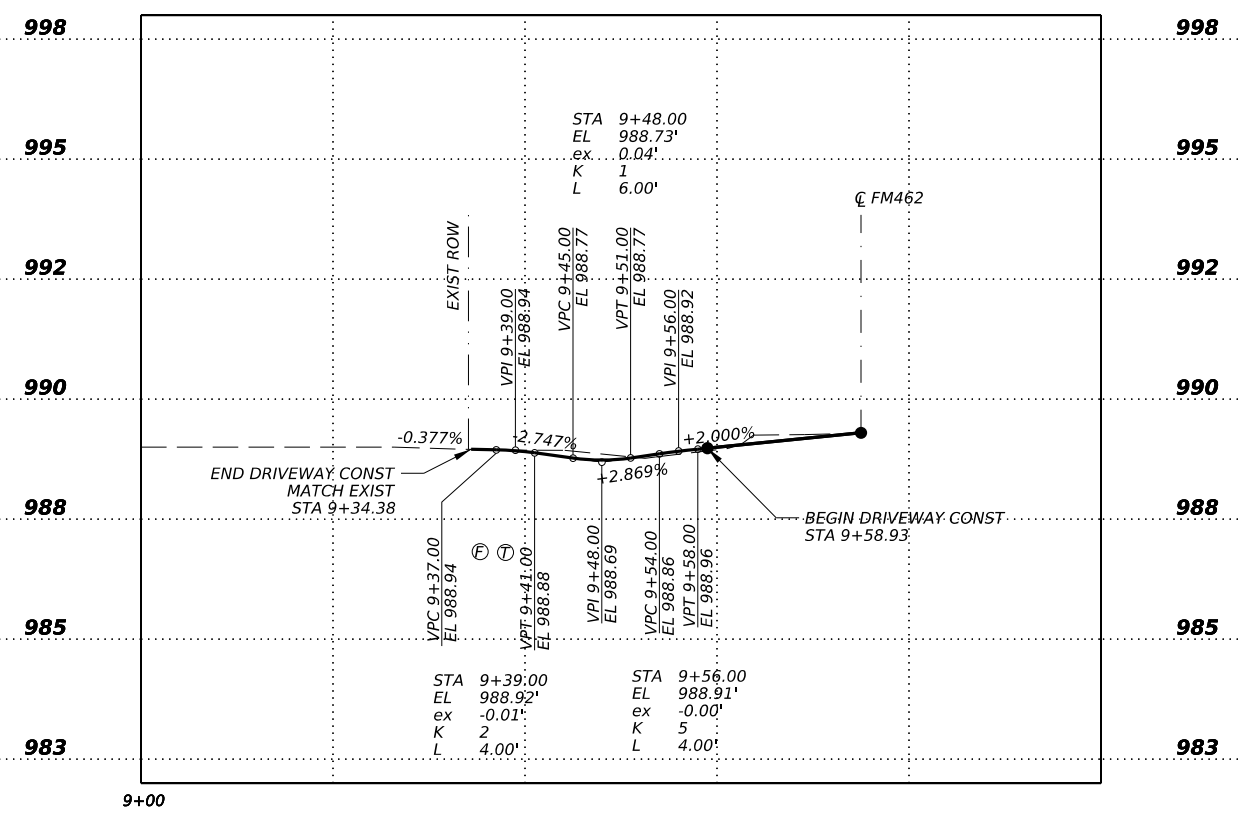
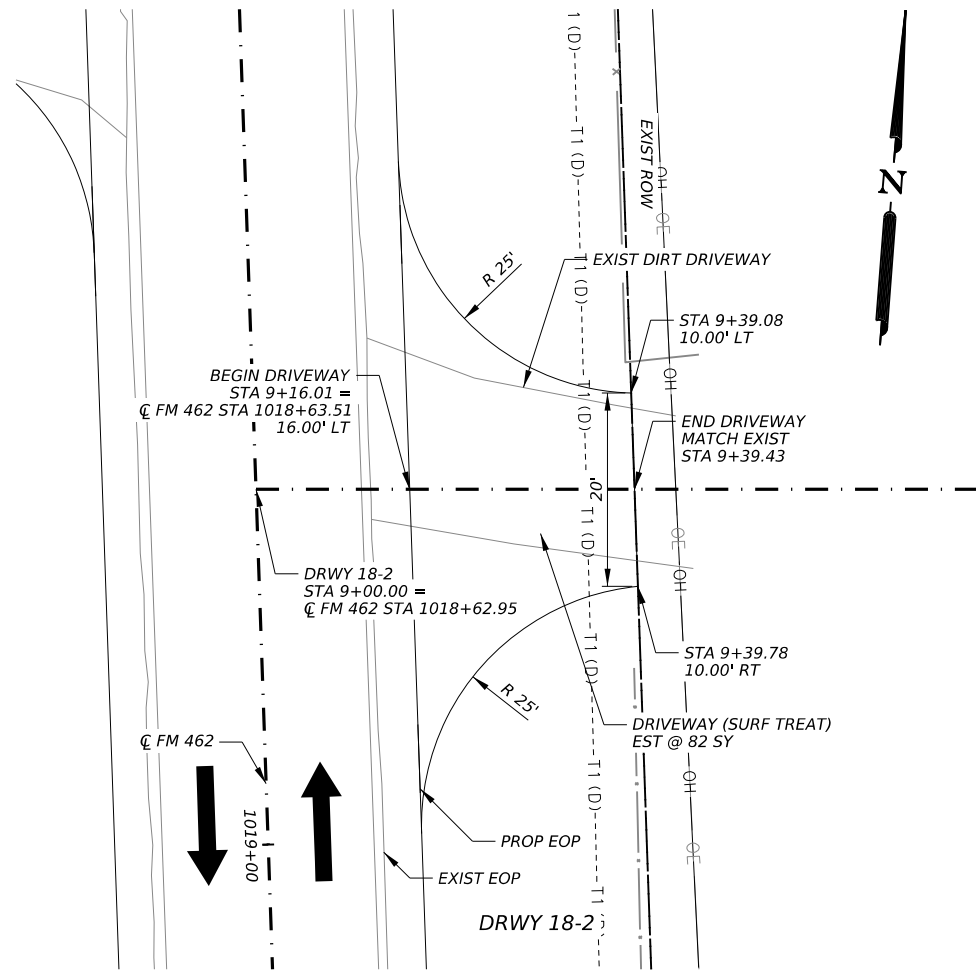
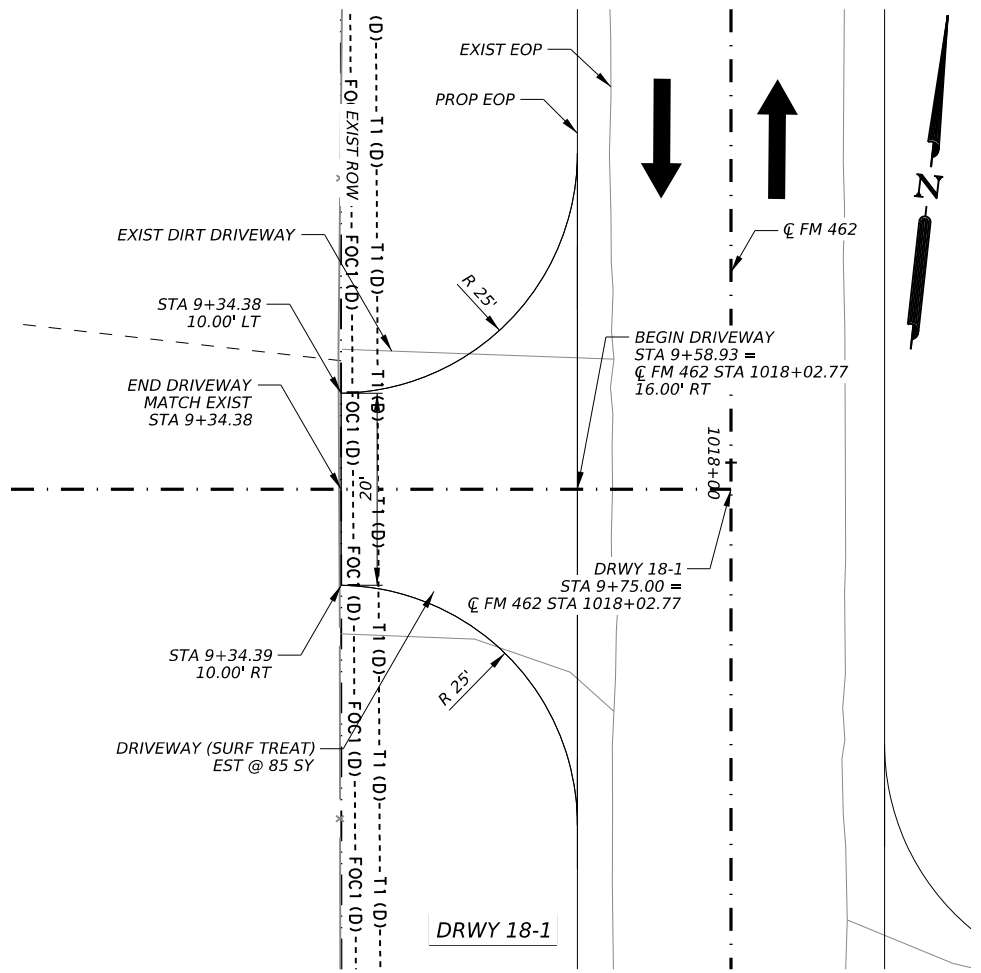
ITEM	DESCRIPTION	UNIT	QTY
0530 6006	DRIVEWAYS (SURF TREAT)	SY	167



**PAVEMENT DETAIL**  
 \*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.

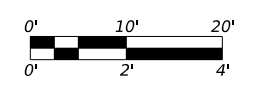


- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
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**FM 462**

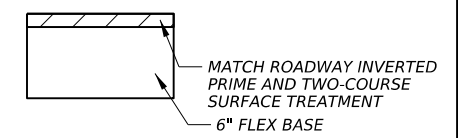
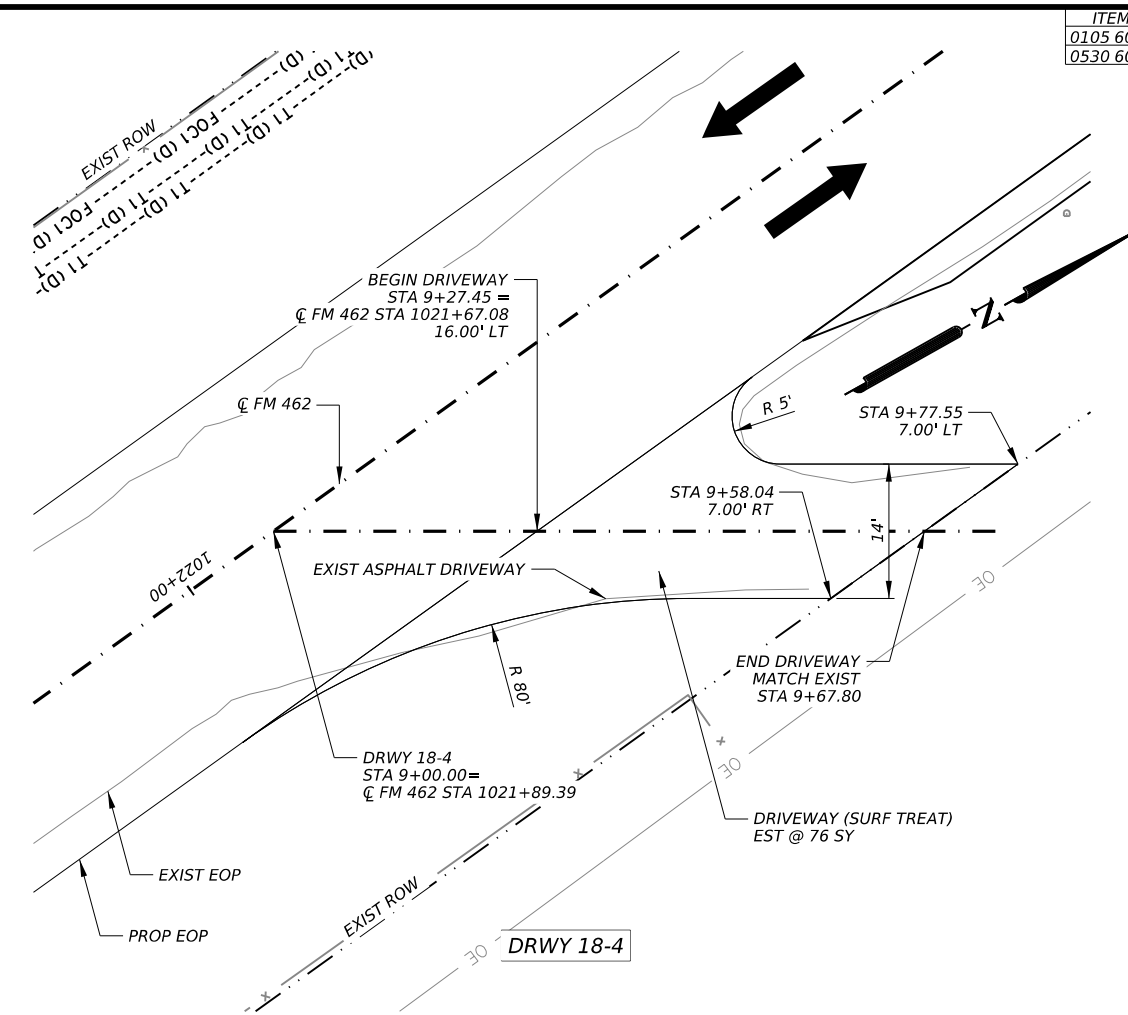
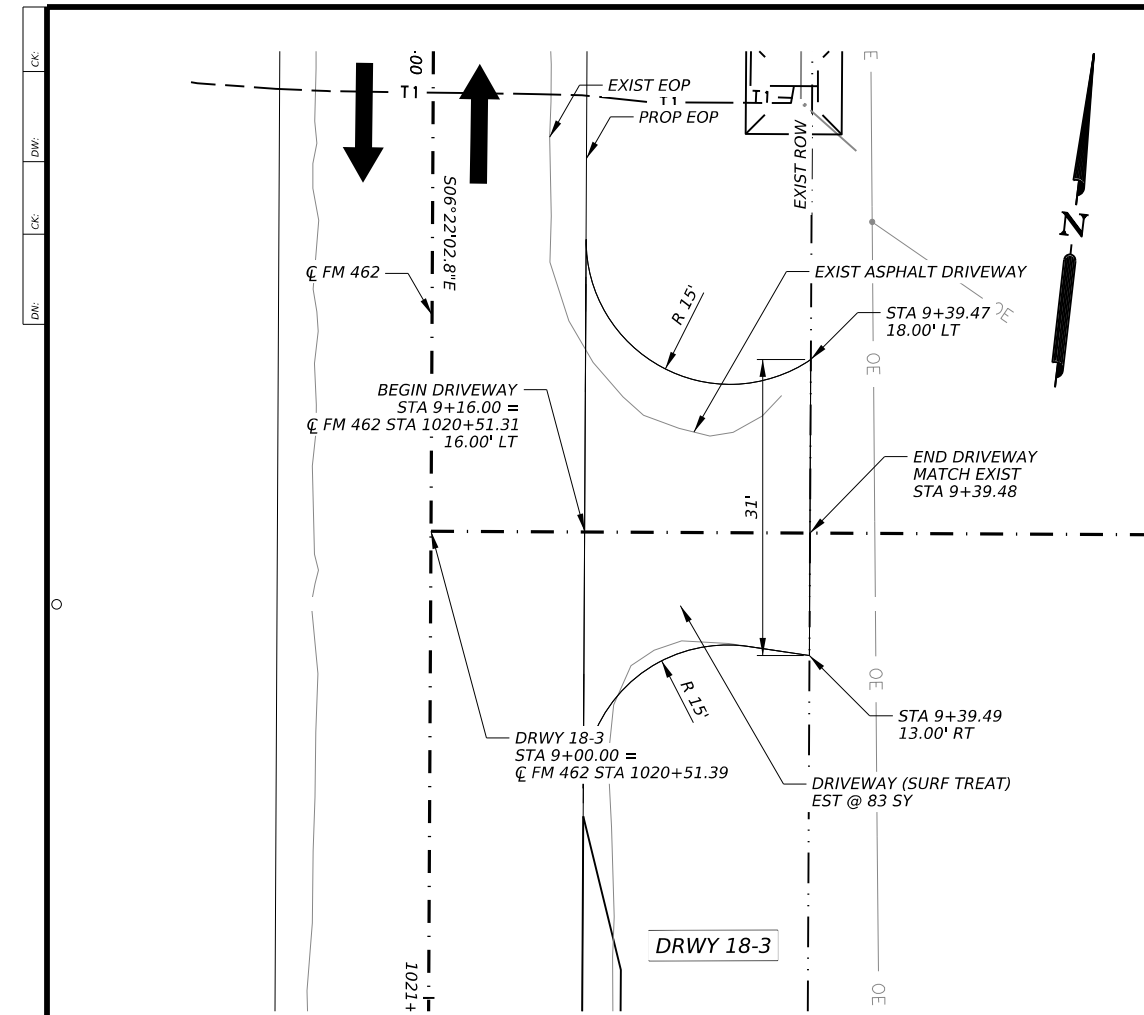
**DRIVEWAY PLAN AND PROFILE**

SHEET 11 OF 16

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	139

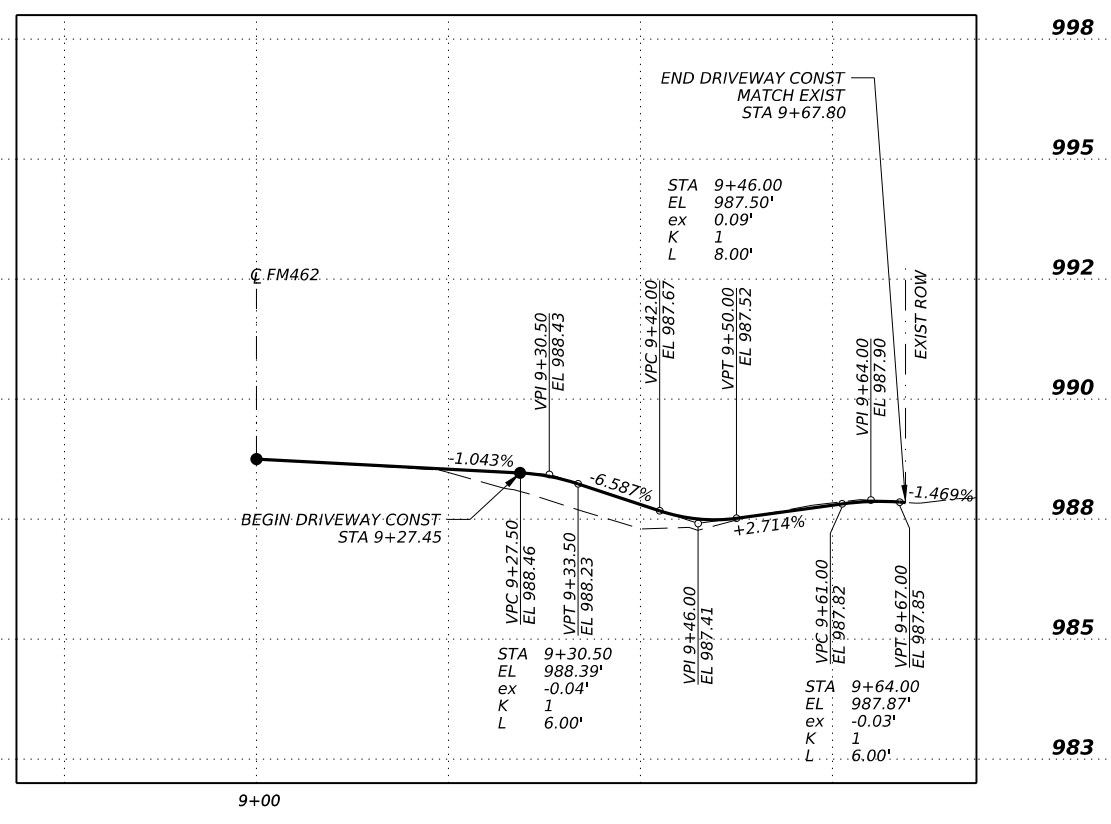
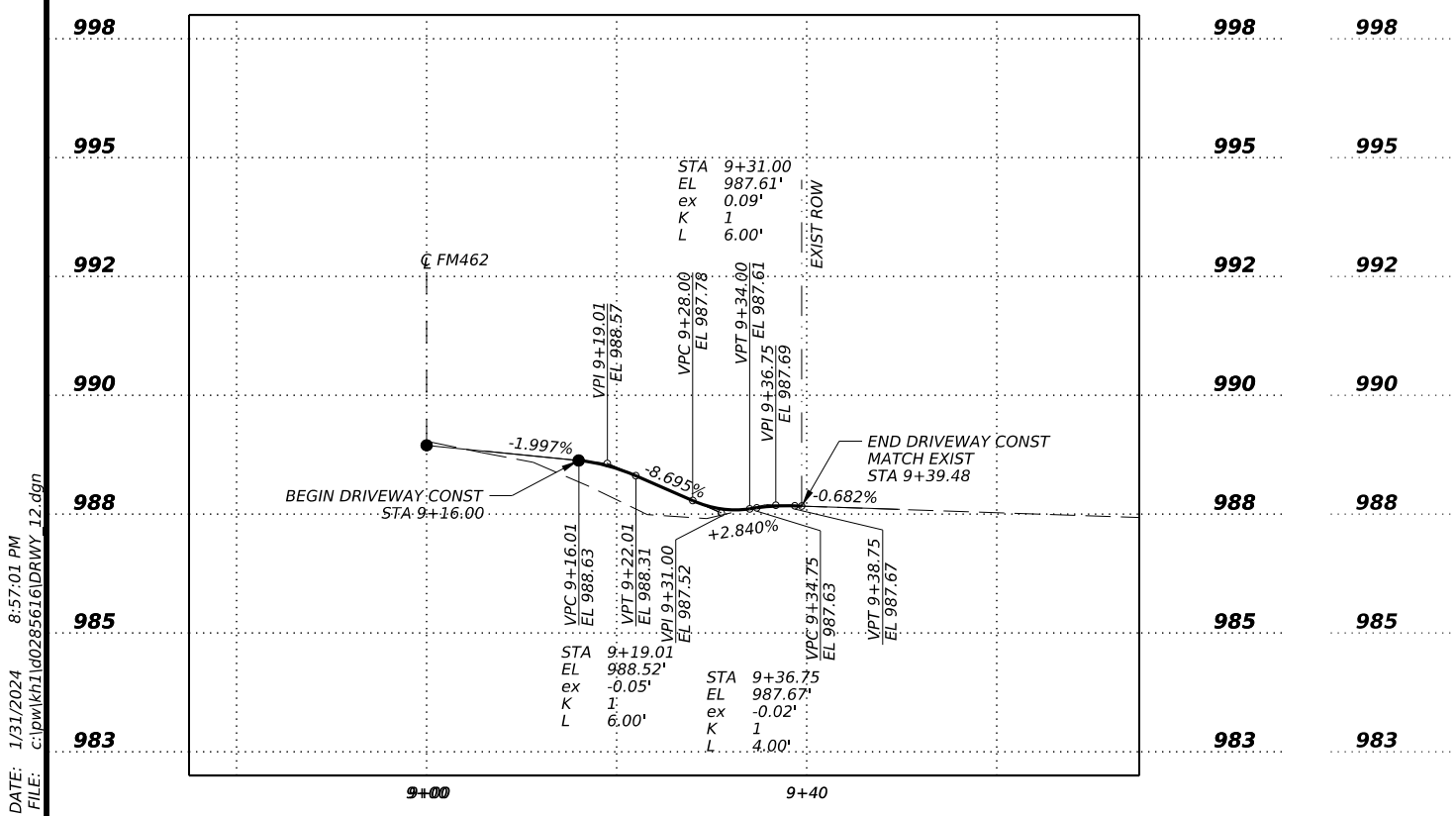
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ITEM	DESCRIPTION	UNIT	QTY
0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	202
0530 6006	DRIVEWAYS (SURF TREAT)	SY	159

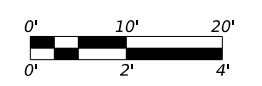


- LEGEND**
- EXIST ROW: - - - - -
  - EXIST FENCE: --- x ---
  - EXIST FEATURES: ———

- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - STATION/OFFSETS ARE TO DRIVEWAY CENTERLINE UNLESS NOTED OTHERWISE.



David Gutierrez  
 1/31/2024  
 STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

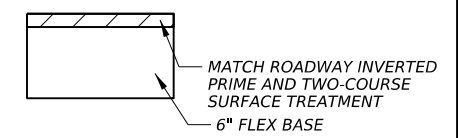


**Kimley»Horn** F-928  
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 Texas Department of Transportation  
**FM 462**  
**DRIVEWAY**  
**PLAN AND PROFILE**  
 SHEET 12 OF 16  

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	140	

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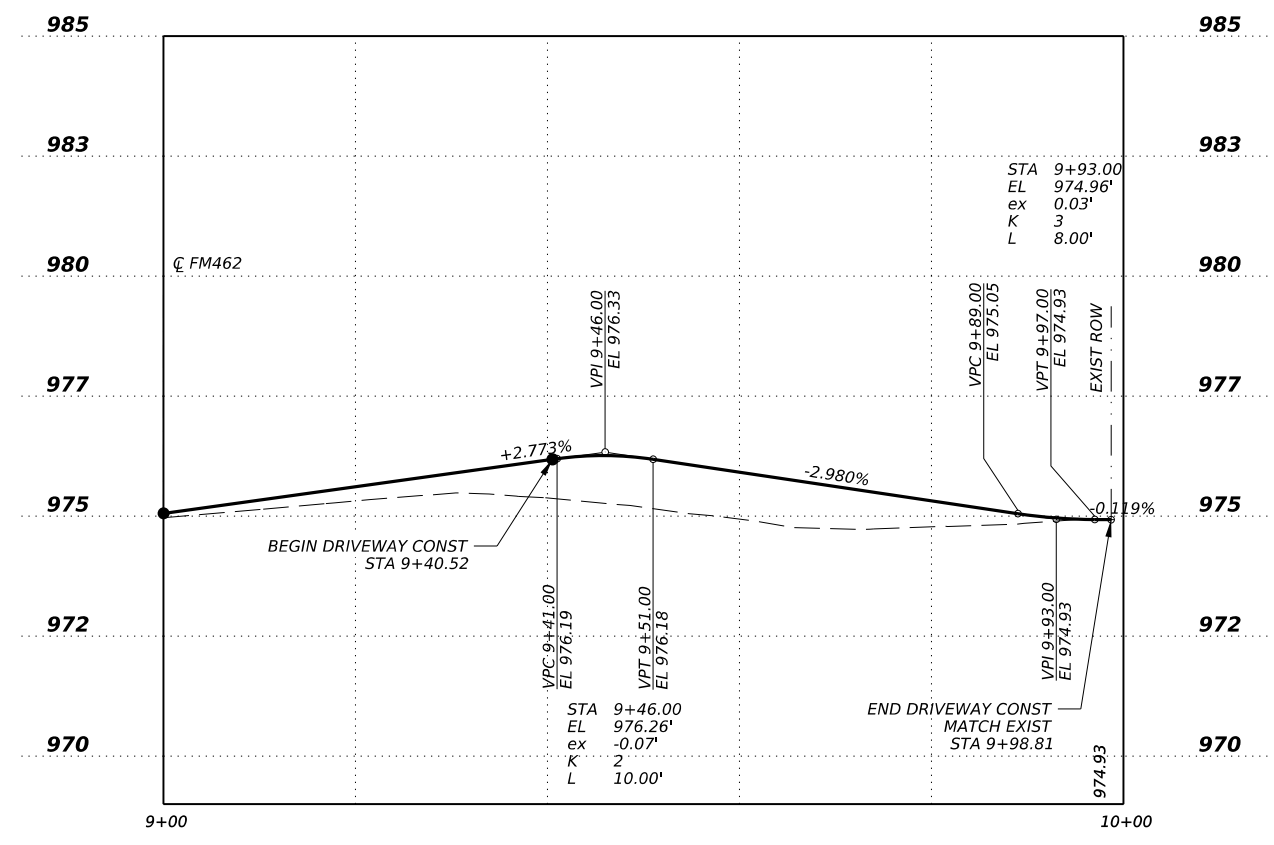
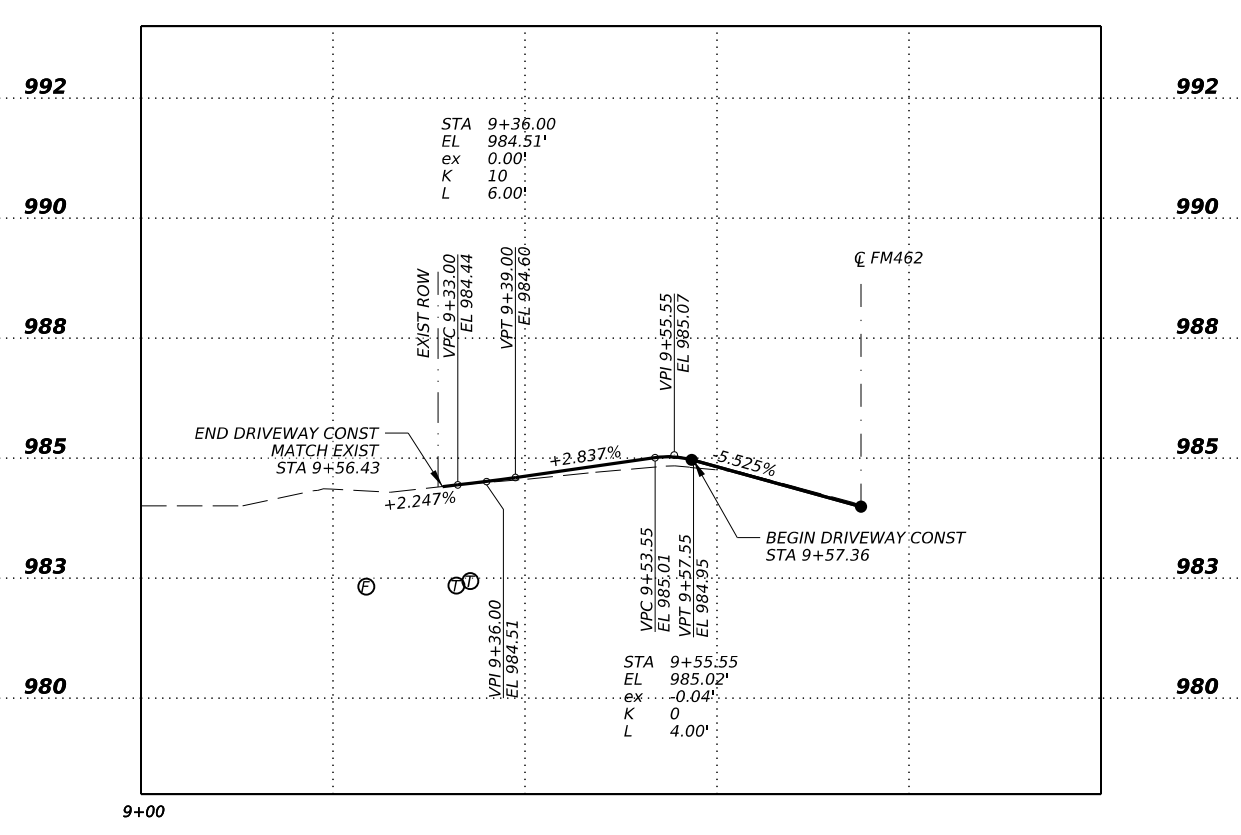
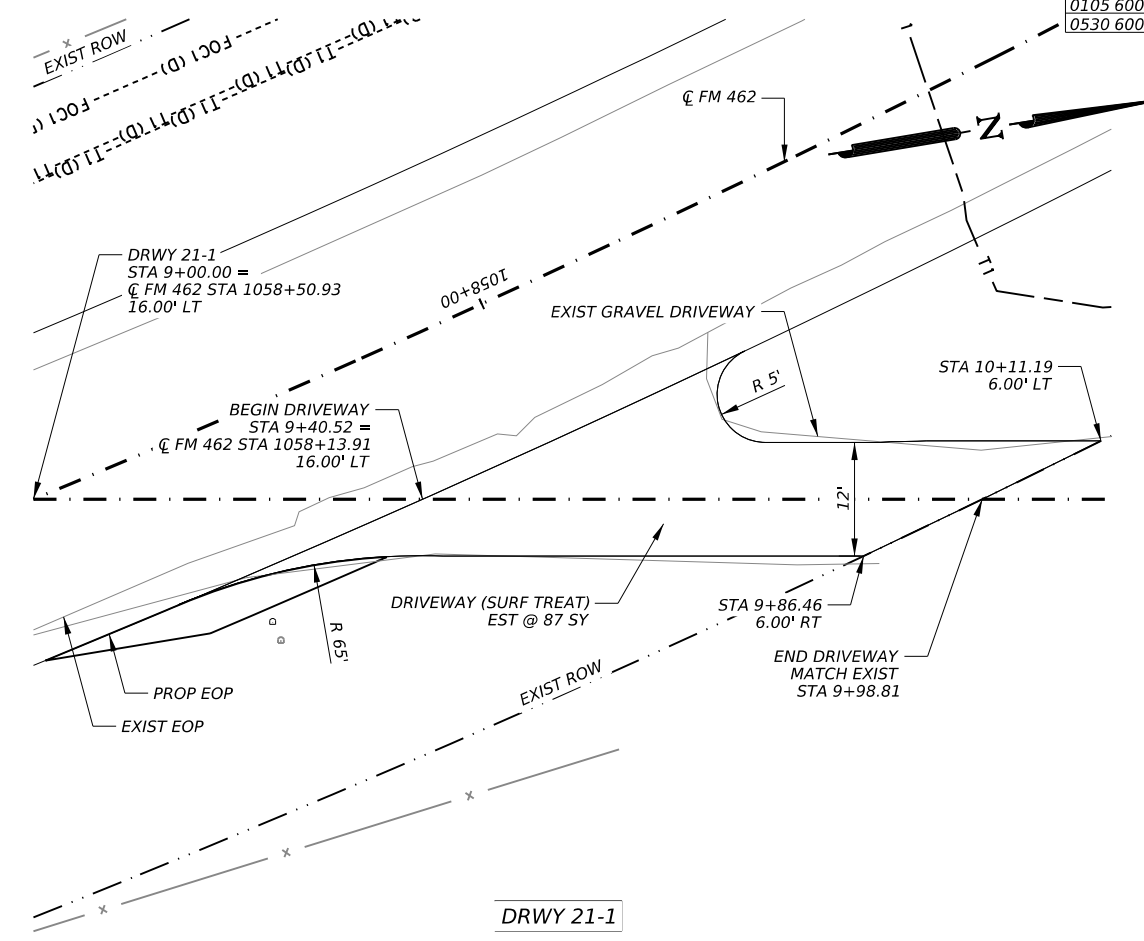
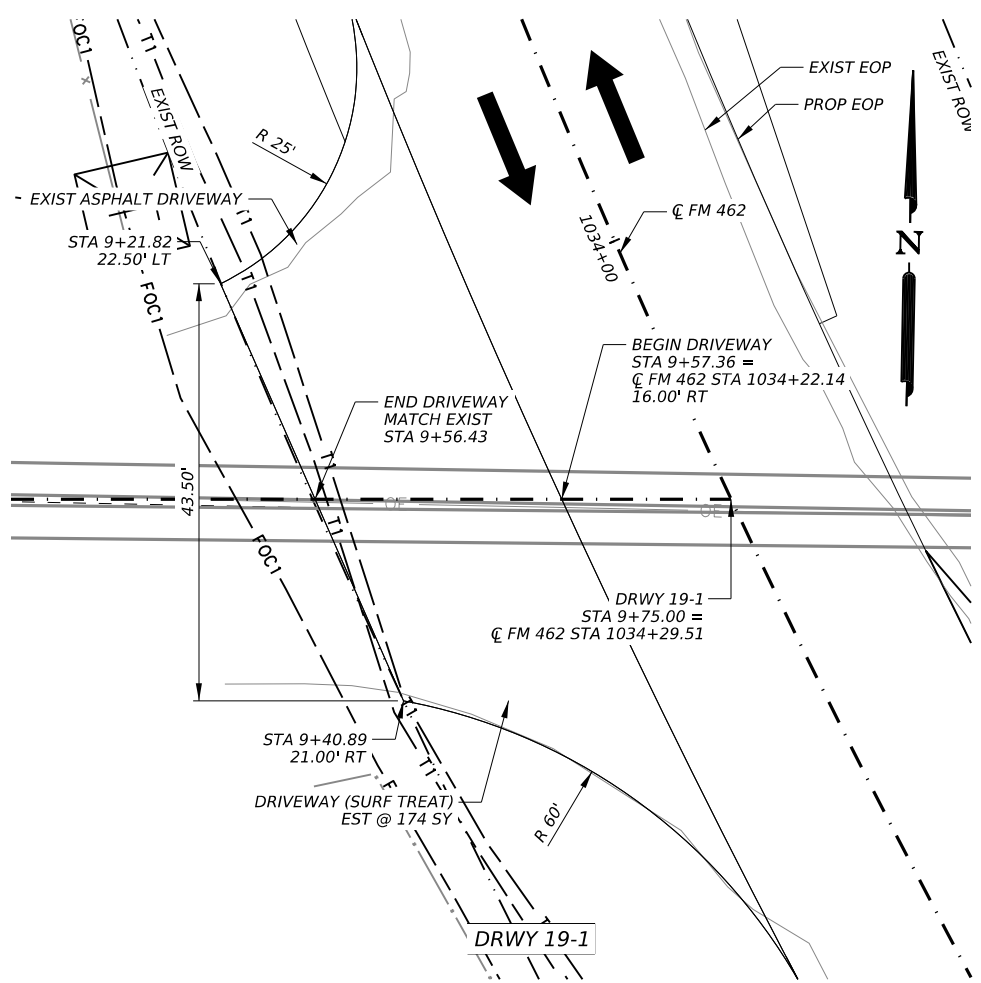
ITEM	DESCRIPTION	UNIT	QTY
0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	321
0530 6006	DRIVEWAYS (SURF TREAT)	SY	261



**LEGEND**

EXIST ROW	---
EXIST FENCE	x
EXIST FEATURES	---

- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - STATION/OFFSETS ARE TO DRIVEWAY CENTERLINE UNLESS NOTED OTHERWISE.



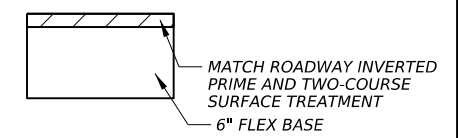
David Gutierrez  
 1/31/2024  
  
 0' 10' 20'  
 0' 2' 4'

**Kimley»Horn** F-928  
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 Texas Department of Transportation  
**FM 462**  
**DRIVEWAY**  
**PLAN AND PROFILE**  
 SHEET 13 OF 16  

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	141	

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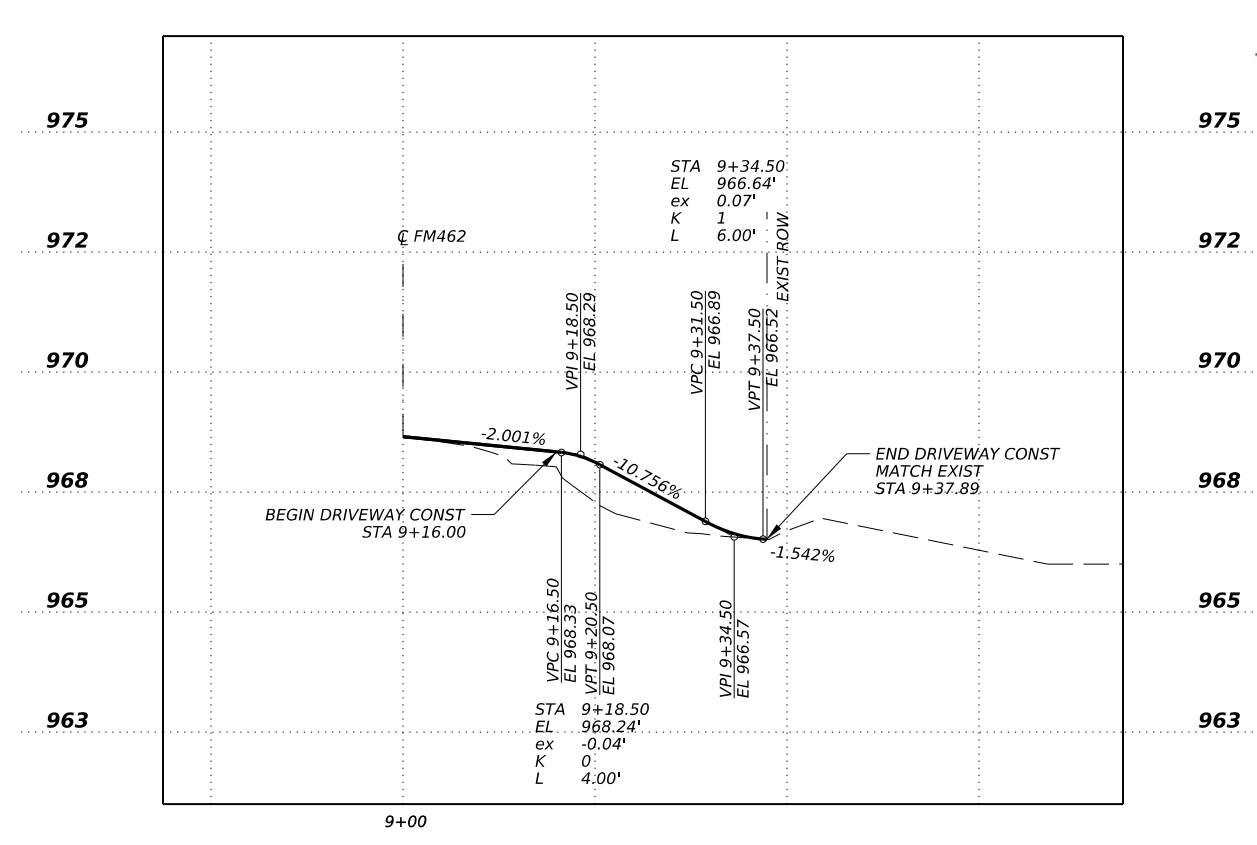
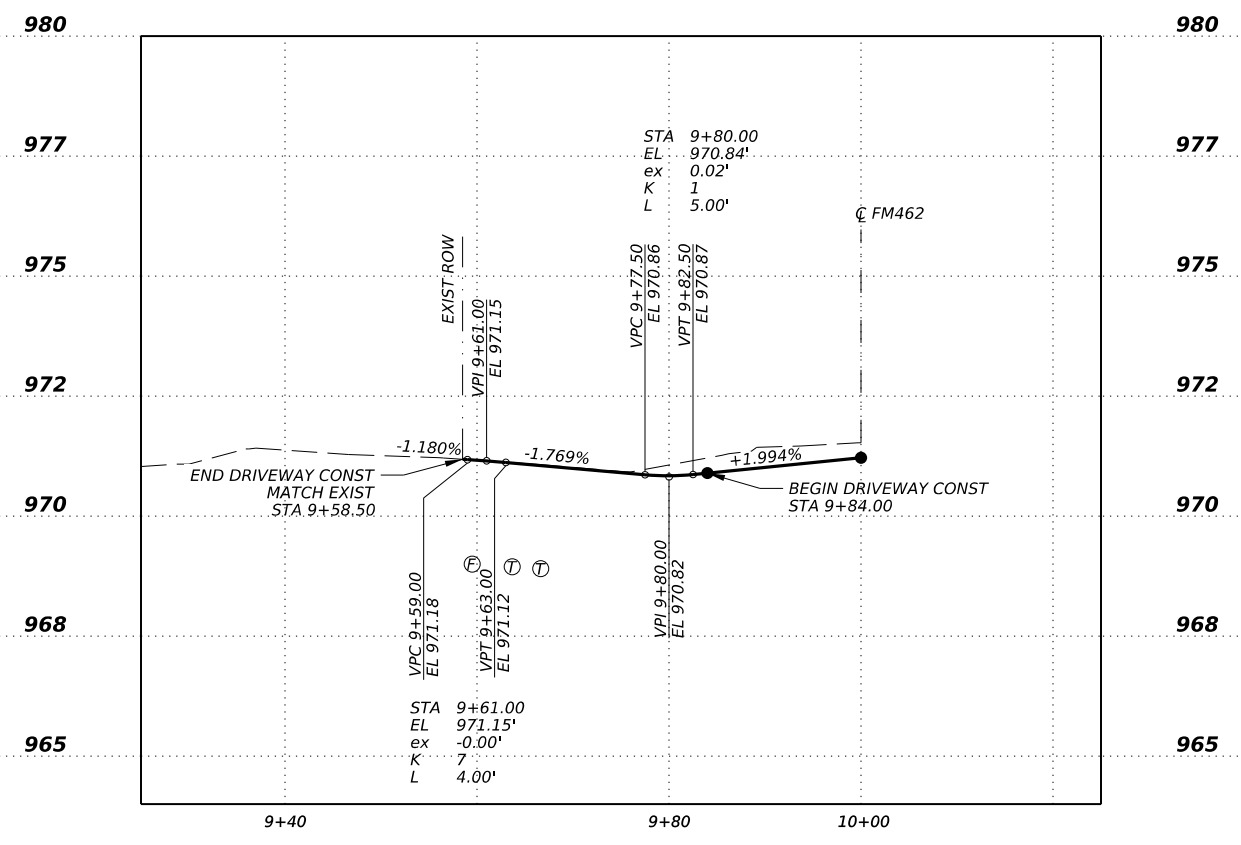
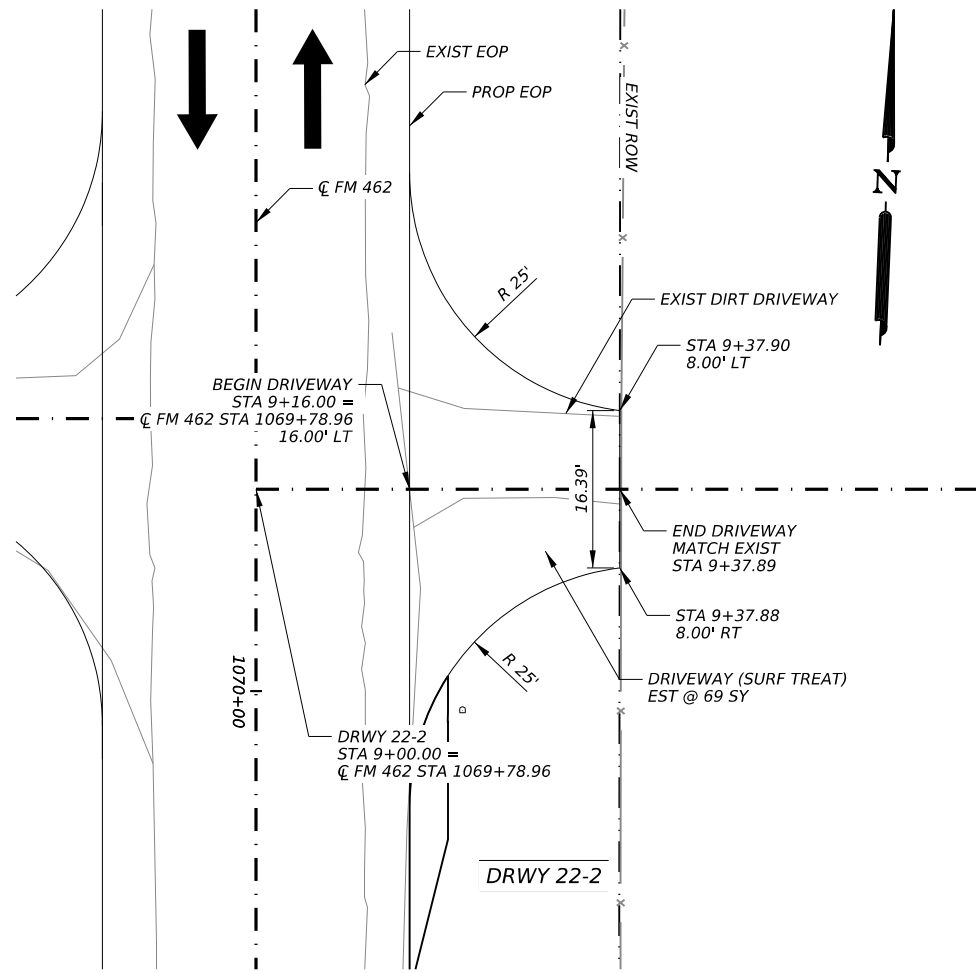
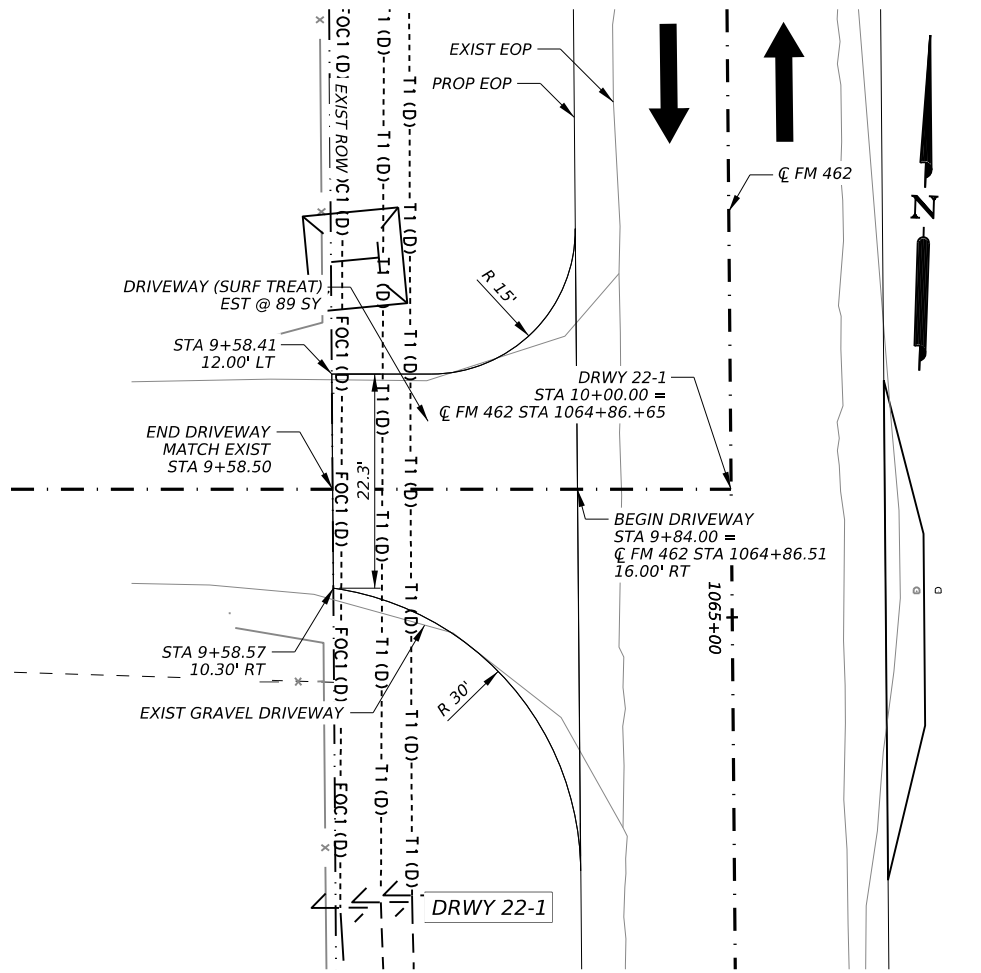
ITEM	DESCRIPTION	UNIT	QTY
0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	135
0530 6006	DRIVEWAYS (SURF TREAT)	SY	158



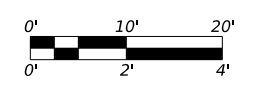
**PAVEMENT DETAIL**  
 \*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.

- LEGEND**
- EXIST ROW ————
  - EXIST FENCE — x —
  - EXIST FEATURES ————

- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - STATION/OFFSETS ARE TO DRIVEWAY CENTERLINE UNLESS NOTED OTHERWISE.



David Gutierrez  
 1/31/2024  
 STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER



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Texas Department of Transportation

**FM 462**

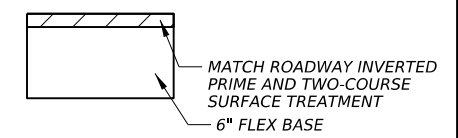
**DRIVEWAY PLAN AND PROFILE**

SHEET 14 OF 16

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	142	

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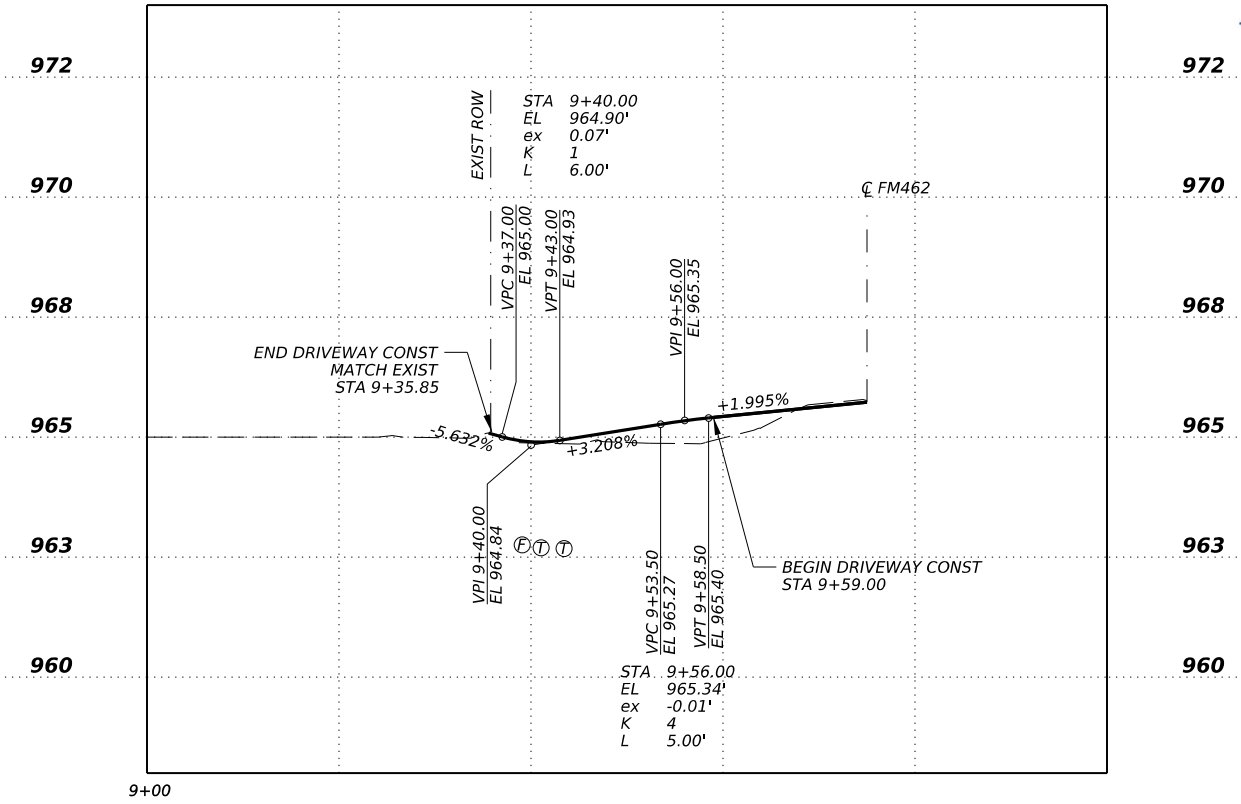
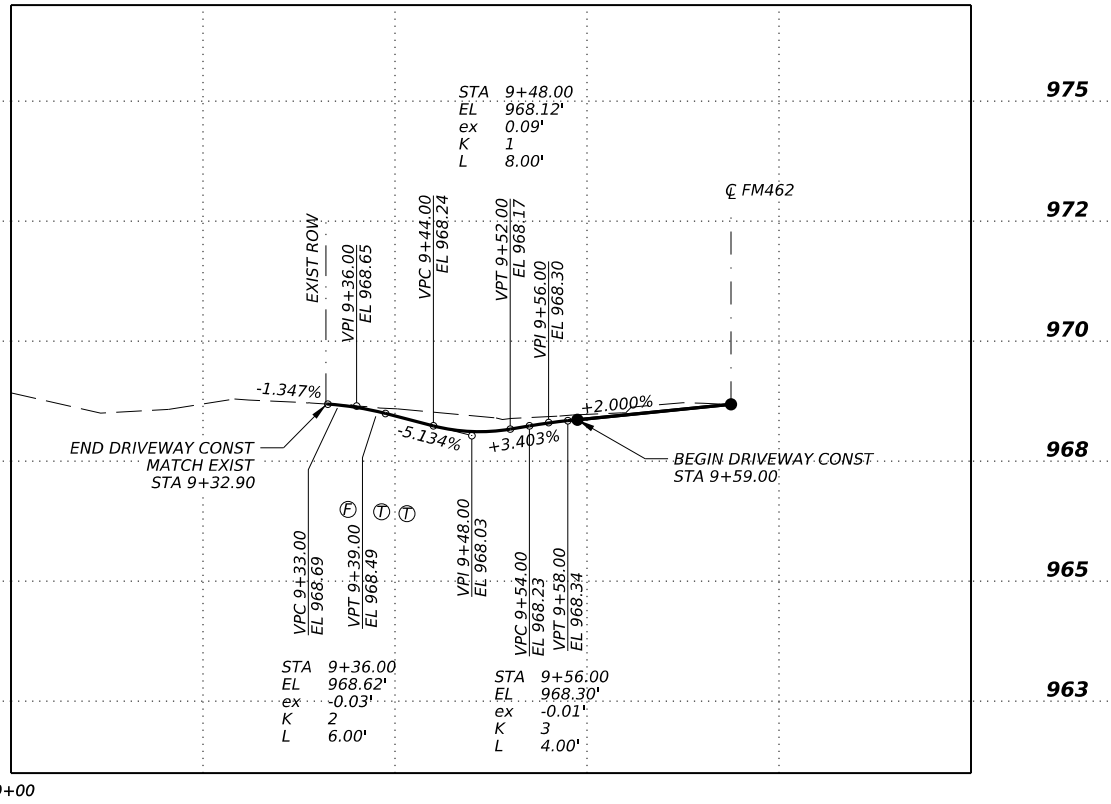
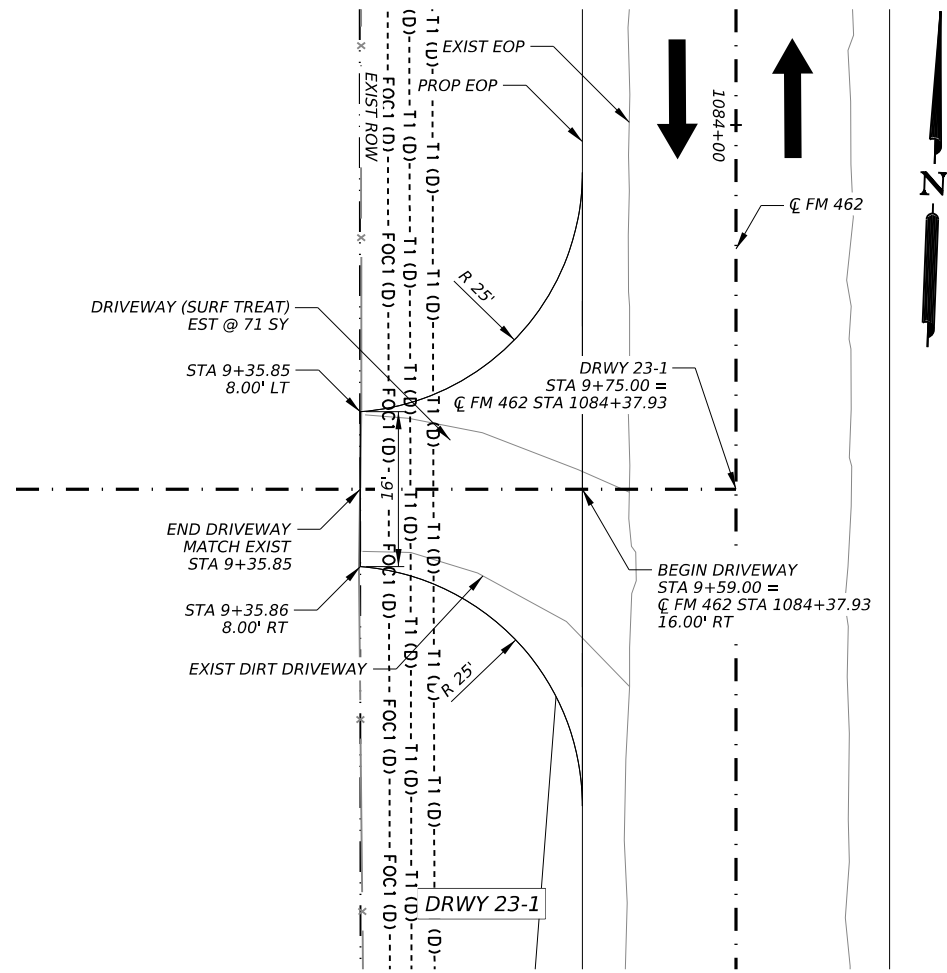
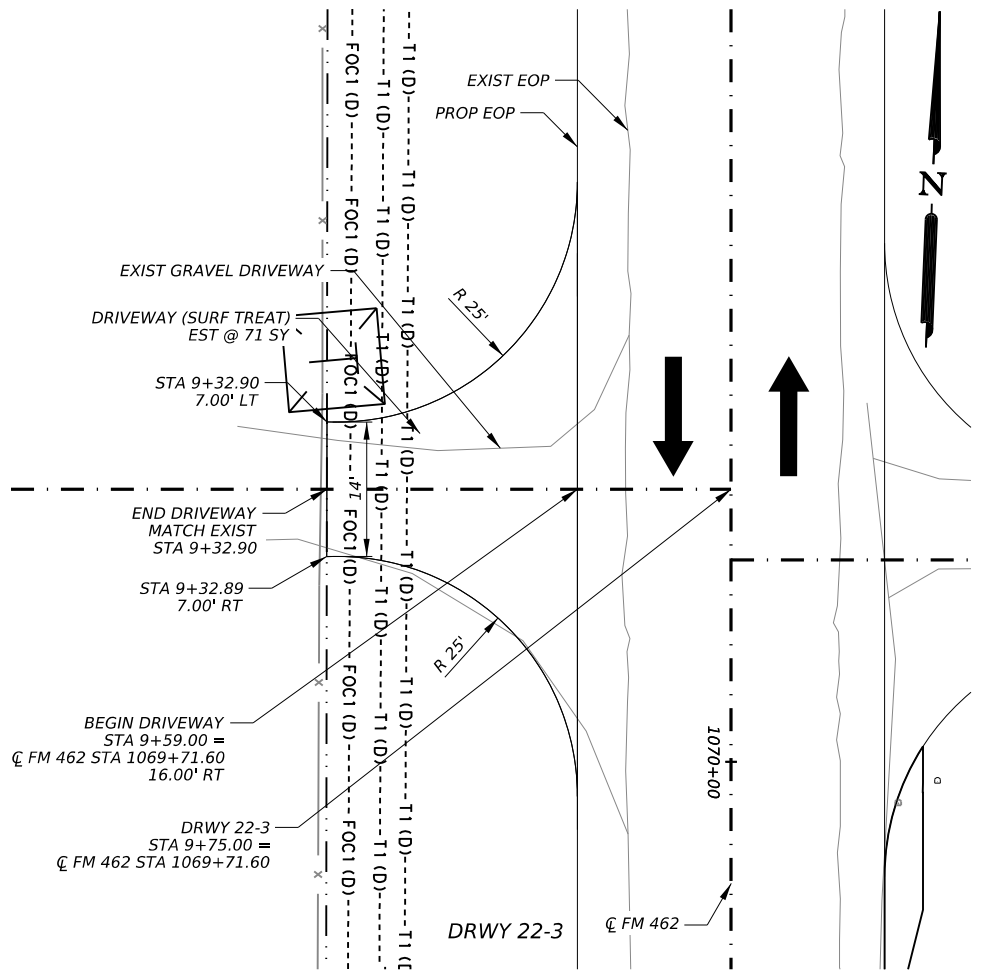
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0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	122
0530 6006	DRIVEWAYS (SURF TREAT)	SY	142



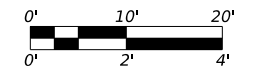
**PAVEMENT DETAIL**  
 \*DRIVEWAY PAVEMENT CONSTRUCTION WILL BE PAID FOR AS ITEM 0530 6006.



- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - STATION/OFFSETS ARE TO DRIVEWAY CENTERLINE UNLESS NOTED OTHERWISE.



1/31/2024



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**FM 462**

**DRIVEWAY PLAN AND PROFILE**

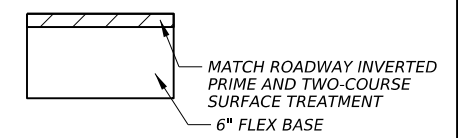
SHEET 15 OF 16

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	143

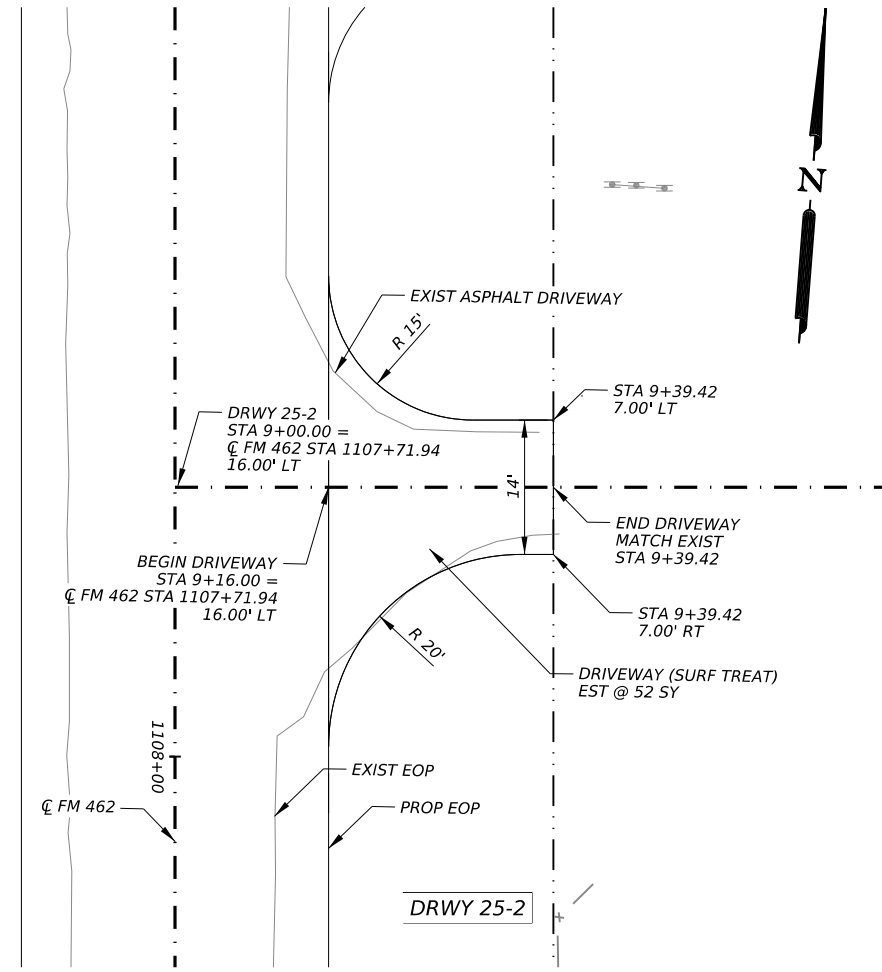
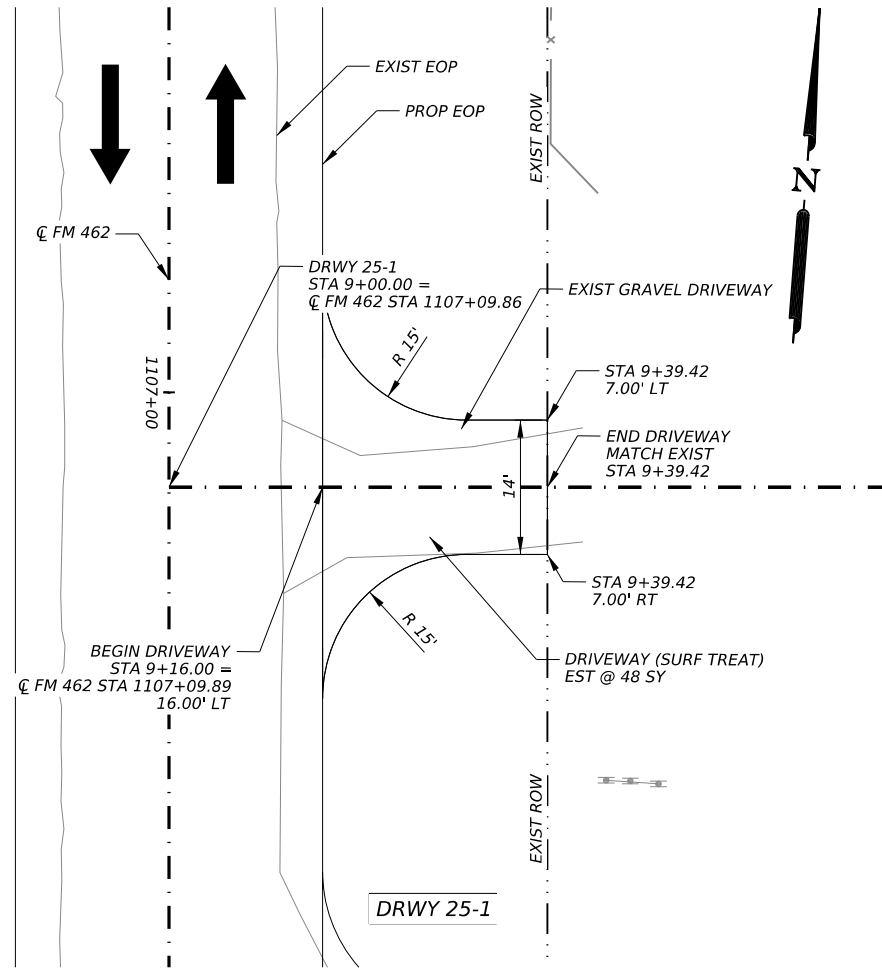
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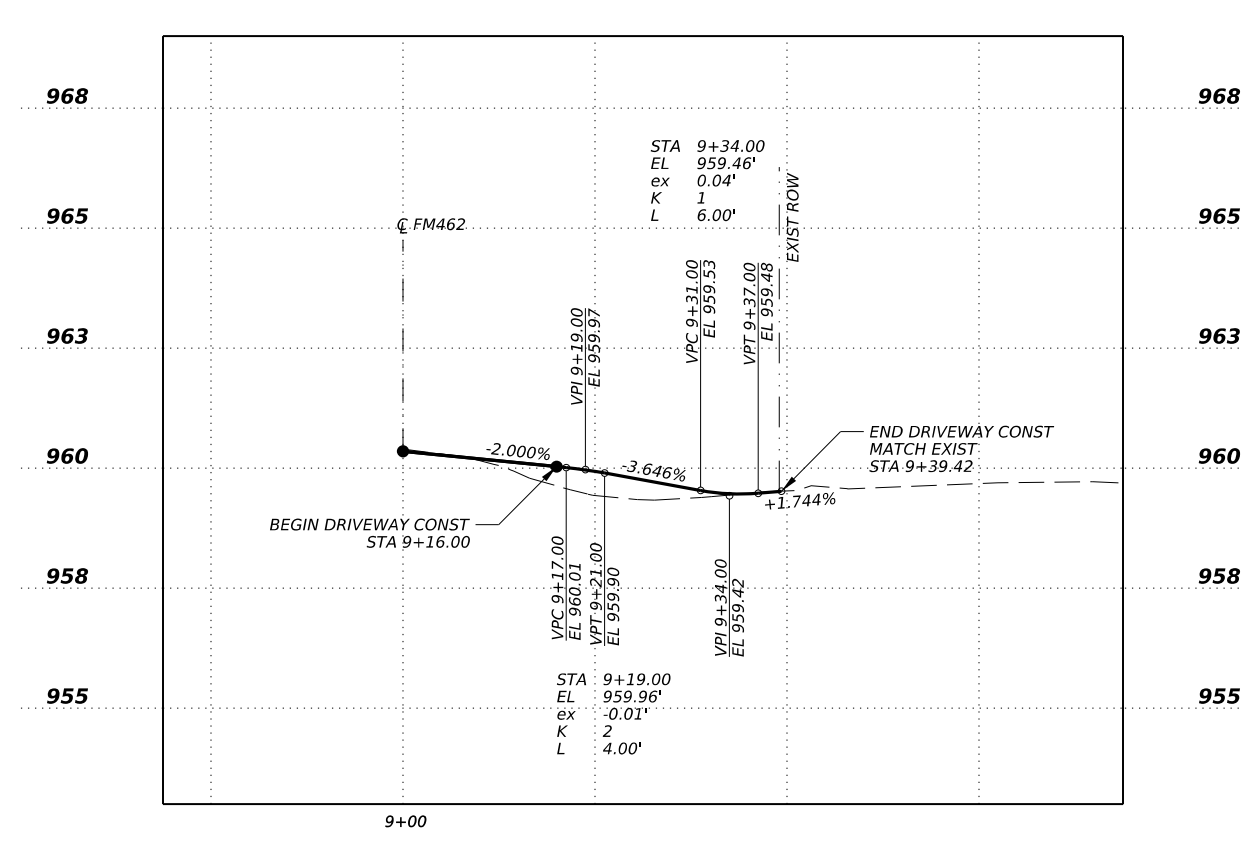
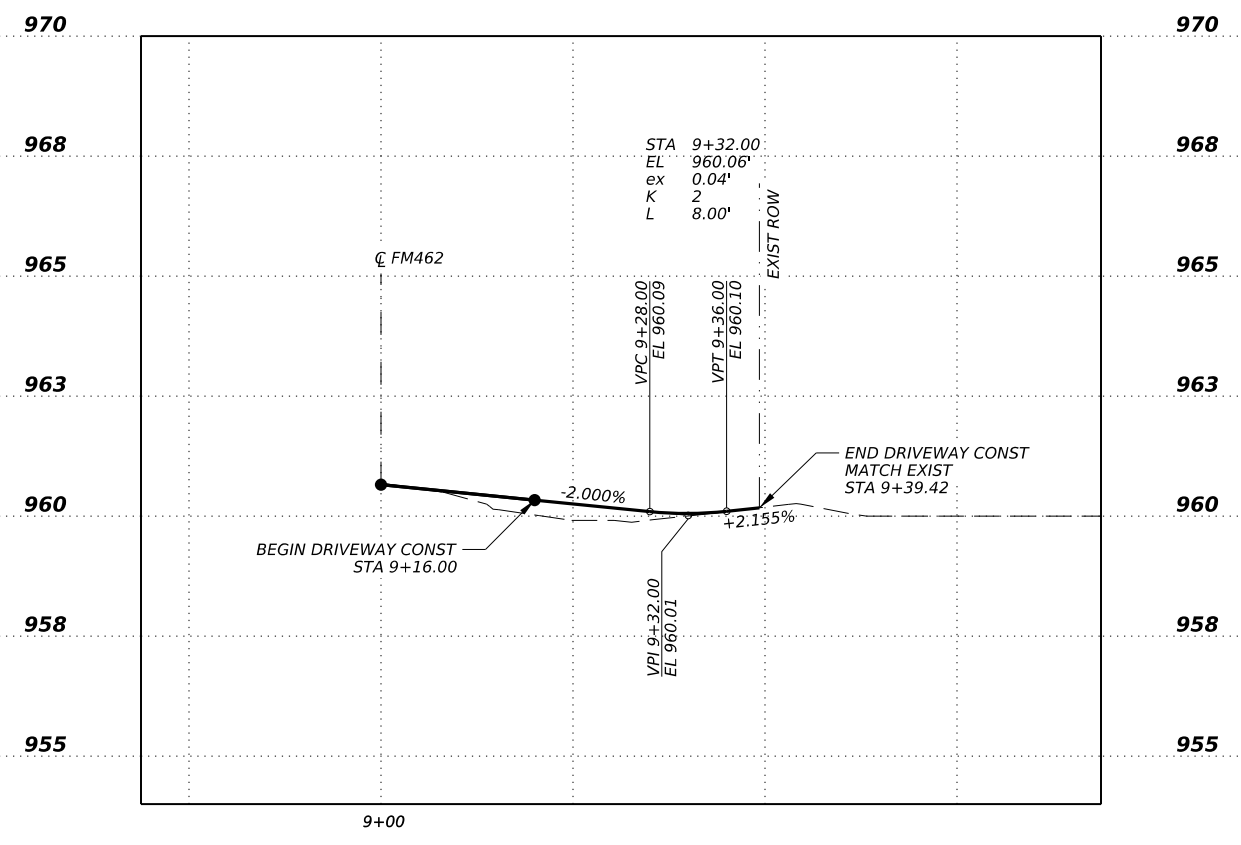
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0105 6008	REMOVING STAB BASE AND ASPH PAV (6")	SY	103
0530 6006	DRIVEWAYS (SURF TREAT)	SY	100



- NOTES:**
- CAUTION UNDERGROUND UTILITIES. CONTRACTOR TO FIELD VERIFY PRIOR TO CONSTRUCTION.
  - STATION/OFFSETS ARE TO DRIVEWAY CENTERLINE UNLESS NOTED OTHERWISE.



DATE: 1/31/2024 8:58:43 PM  
 FILE: c:\p\kh\1\0285616\DRWY\_16.dgn



1/31/2024

0' 10' 20'  
 0' 2' 4'

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**FM 462**

**DRIVEWAY**  
**PLAN AND PROFILE**

SHEET 16 OF 16

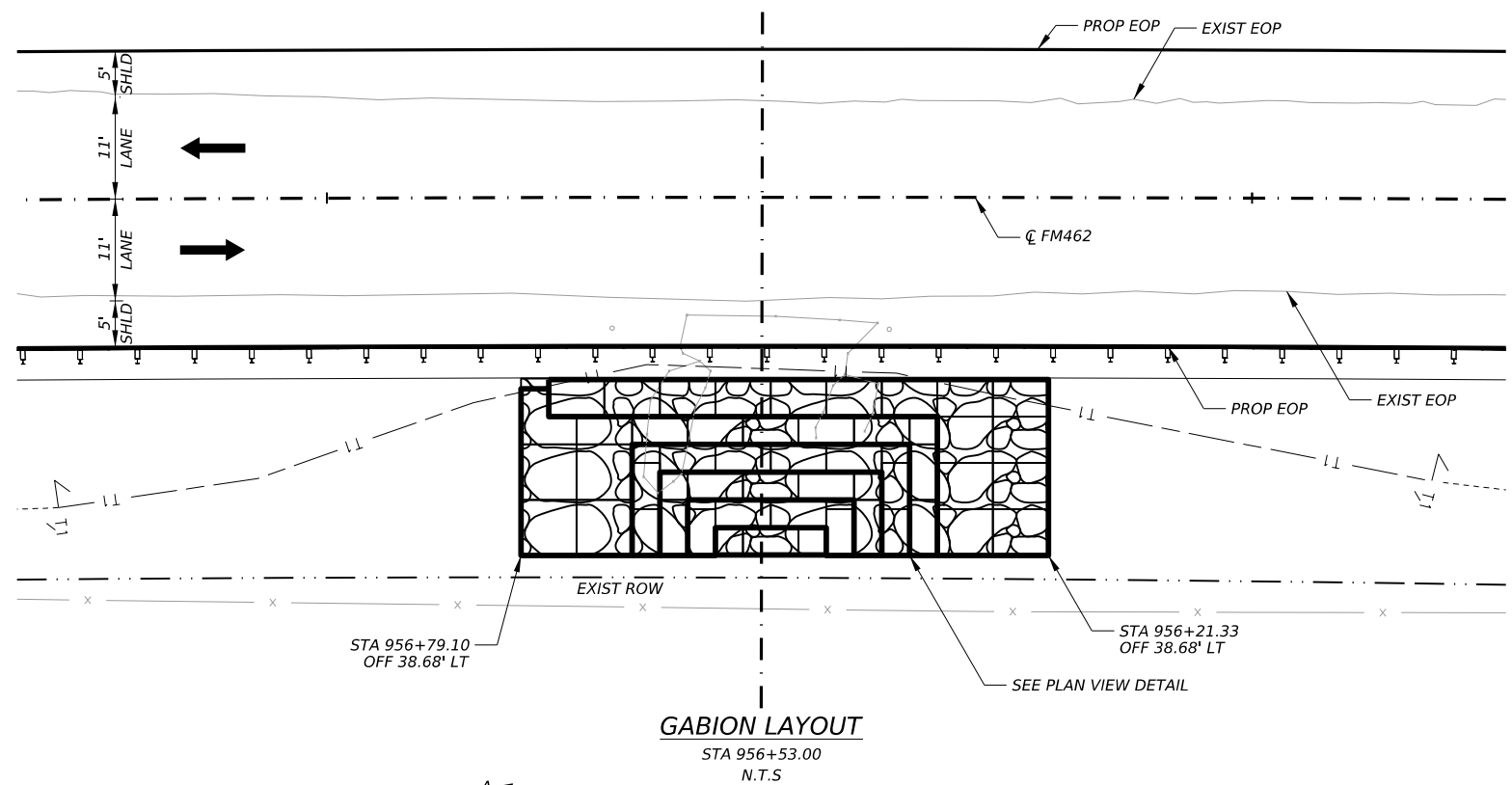
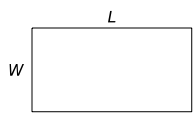
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0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	144	

CK:  
DW:  
CK:  
DW:

**TYPICAL GABION BASKET SIZE CHART**

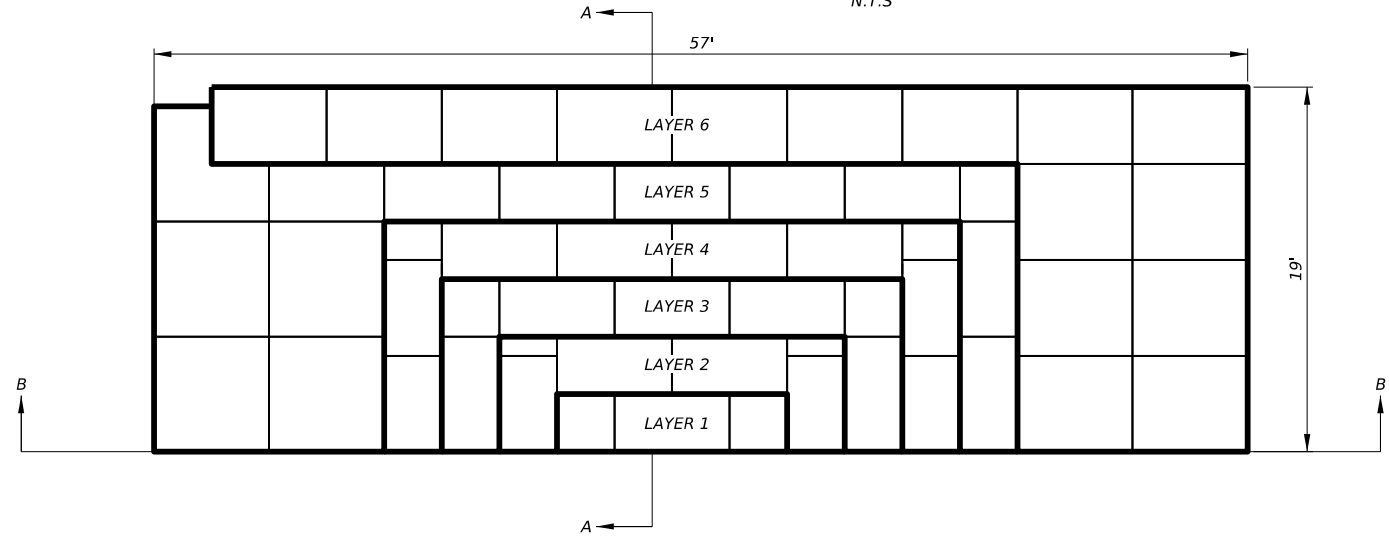
TYPE - (LENGTH X WIDTH X HEIGHT)

- A: GABION - (6' X 6' X 2')
- B: GABION - (6' X 5' X 2')
- C: GABION - (6' X 4' X 2')



**GABION LAYOUT**

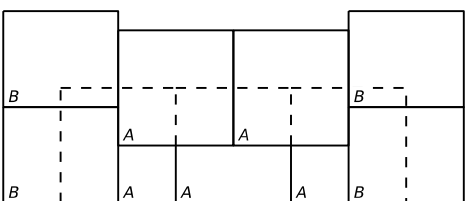
STA 956+53.00  
N.T.S



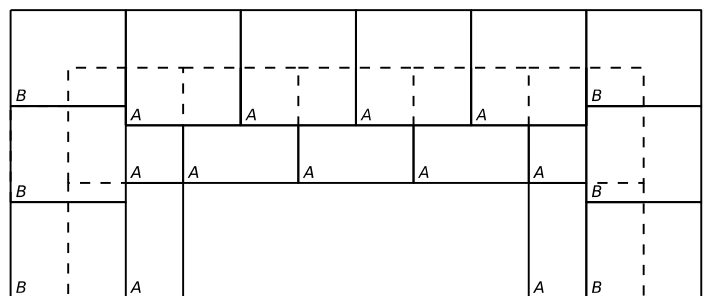
**PLAN VIEW DETAIL**

- NOTES:**
- ALL WORK WILL BE PERFORMED IN ACCORDANCE WITH ITEM 459 "GABIONS AND GABION MATTRESSES". ALL GABION BASKETS WILL BE GALVANIZED. USE TYPE 2 FILTER FABRIC WHERE GABION BASKETS ARE IN CONTACT WITH THE SOIL. (SUBSIDIARY TO ITEM 459)
  - CONTRACTOR TO CONNECT ALL ADJOINING GABION OR GABION MATTRESS UNITS
  - REFER TO ROADWAY PLAN & PROFILE SHEETS FOR QUANTITIES AND BID ITEMS.

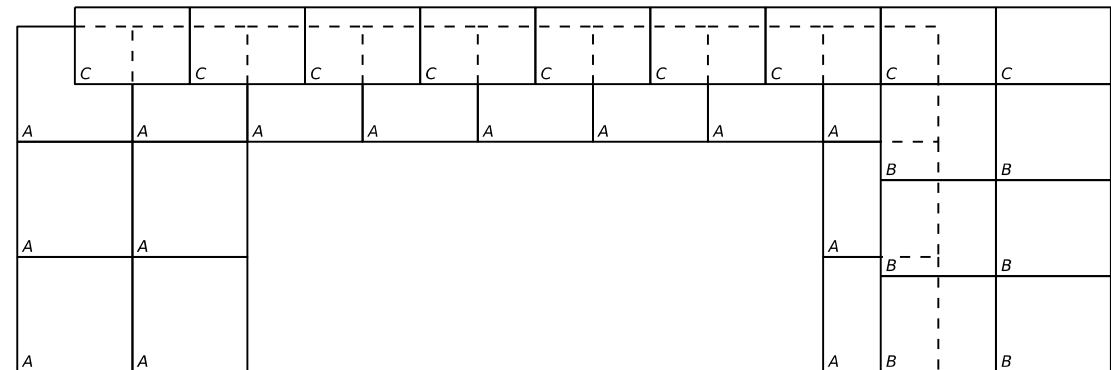
**PRELIMINARY**  
FOR REVIEW ONLY  
Not for construction, bidding, or permit purposes.  
**Kimley»Horn**  
Engineer: DAVID H. GUTIERREZ  
P. E. No. 143301 Date 1/31/2024



**LAYER 1 & 2**  
N.T.S



**LAYER 3 & 4**  
N.T.S



**LAYER 5 & 6**  
N.T.S

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**FM 462**  
**GABION DETAILS**  
SHEET 1 OF 2

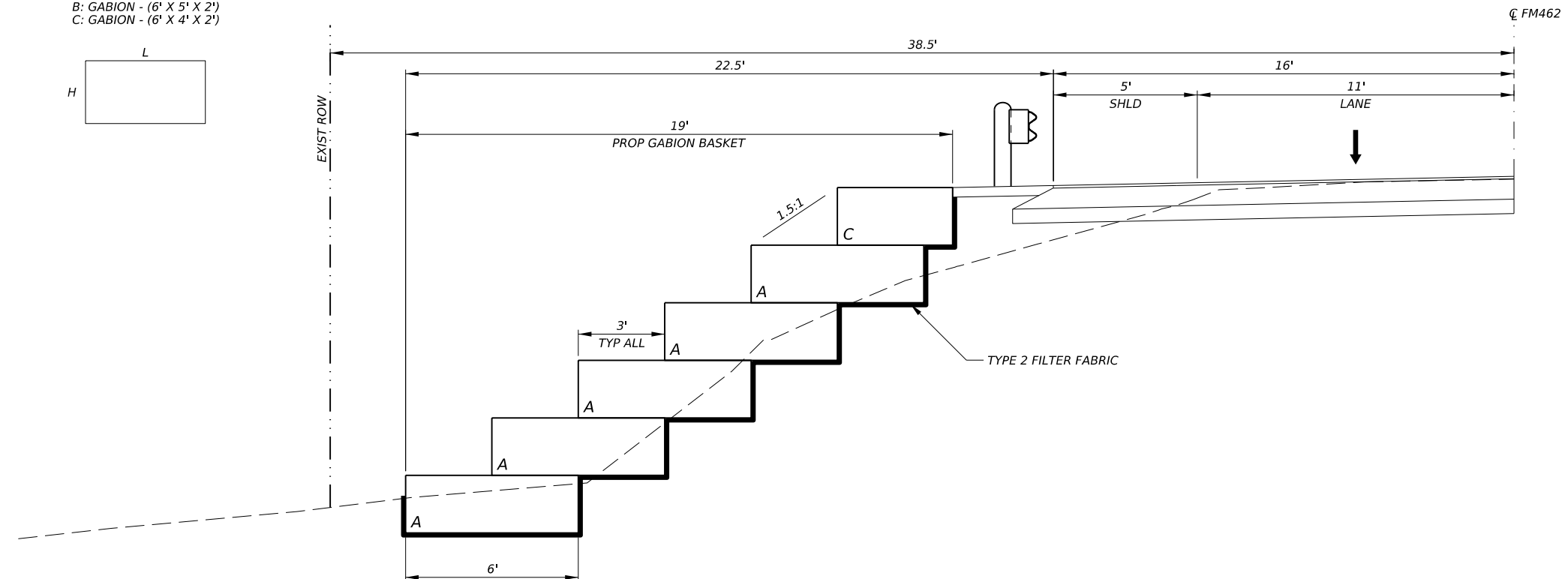
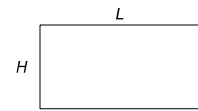
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	145	

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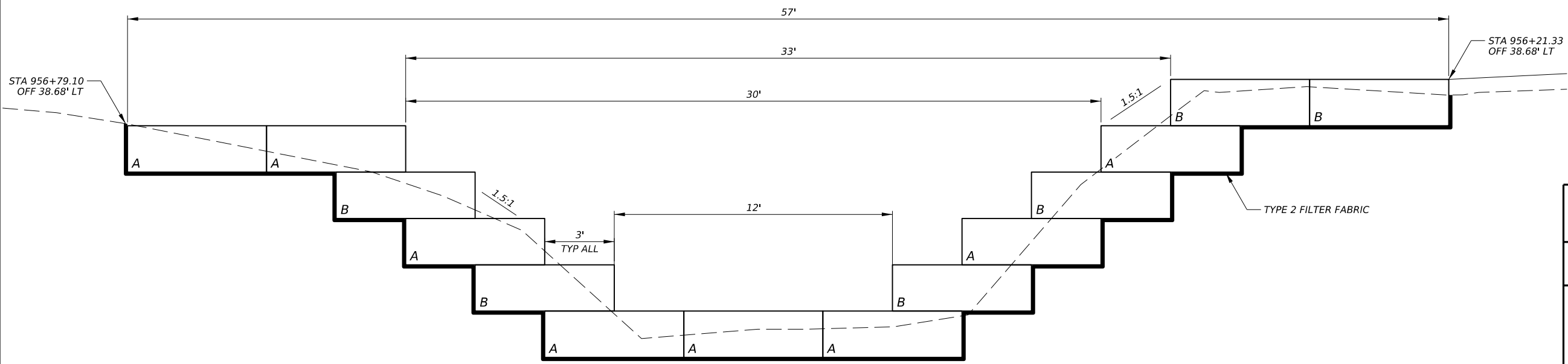
CK:  
DW:  
CK:  
DW:

**TYPICAL GABION BASKET SIZE CHART**

TYPE - (LENGTH X WIDTH X HEIGHT)  
 A: GABION - (6' X 6' X 2')  
 B: GABION - (6' X 5' X 2')  
 C: GABION - (6' X 4' X 2')



**SECTION A-A**  
N.T.S



**SECTION B-B**  
N.T.S

- NOTES:**
1. ALL WORK WILL BE PERFORMED IN ACCORDANCE WITH ITEM 459 "GABIONS AND GABION MATTRESSES". ALL GABION BASKETS WILL BE GALVANIZED. USE TYPE 2 FILTER FABRIC WHERE GABION BASKETS ARE IN CONTACT WITH THE SOIL. (SUBSIDIARY TO ITEM 459)
  2. CONTRACTOR TO CONNECT ALL ADJOINING GABION OR GABION MATTRESS UNITS
  3. REFER TO ROADWAY PLAN & PROFILE SHEETS FOR QUANTITIES AND BID ITEMS.

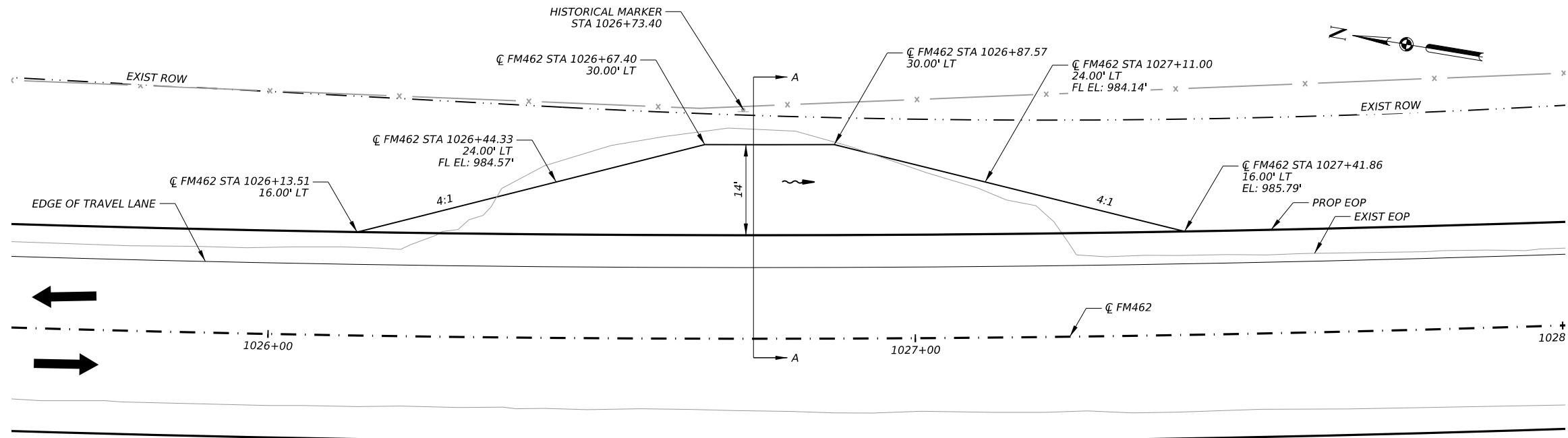
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 FOR REVIEW ONLY  
 Not for construction, bidding, or permit purposes.  
**Kimley»Horn**  
 Engineer: DAVID H. GUTIERREZ  
 P. E. No. 143301 Date 1/31/2024

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 Texas Department of Transportation  
 FM 462  
 GABION DETAILS  
 SHEET 2 OF 2

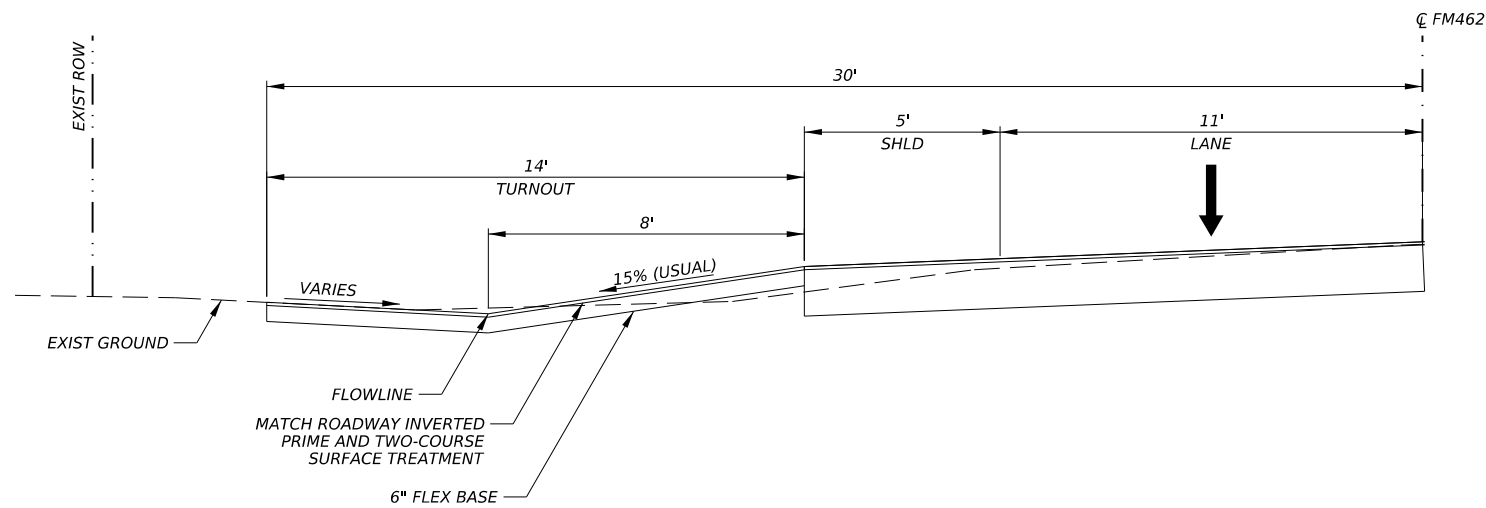
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0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	146	

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CK: DW: CK: DN:



TURNOUT AT HISTORICAL MARKER



SECTION A-A

David Gutierrez  
 1/31/2024  
 STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

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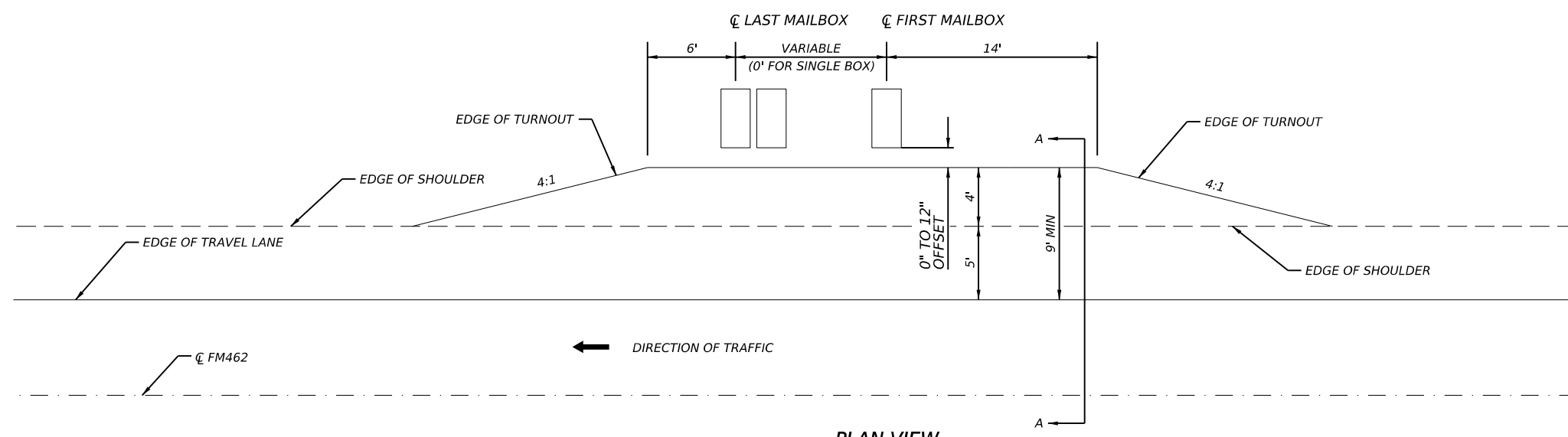
**HISTORICAL MARKER  
 TURNOUT DETAILS**

SHEET 1 OF 1

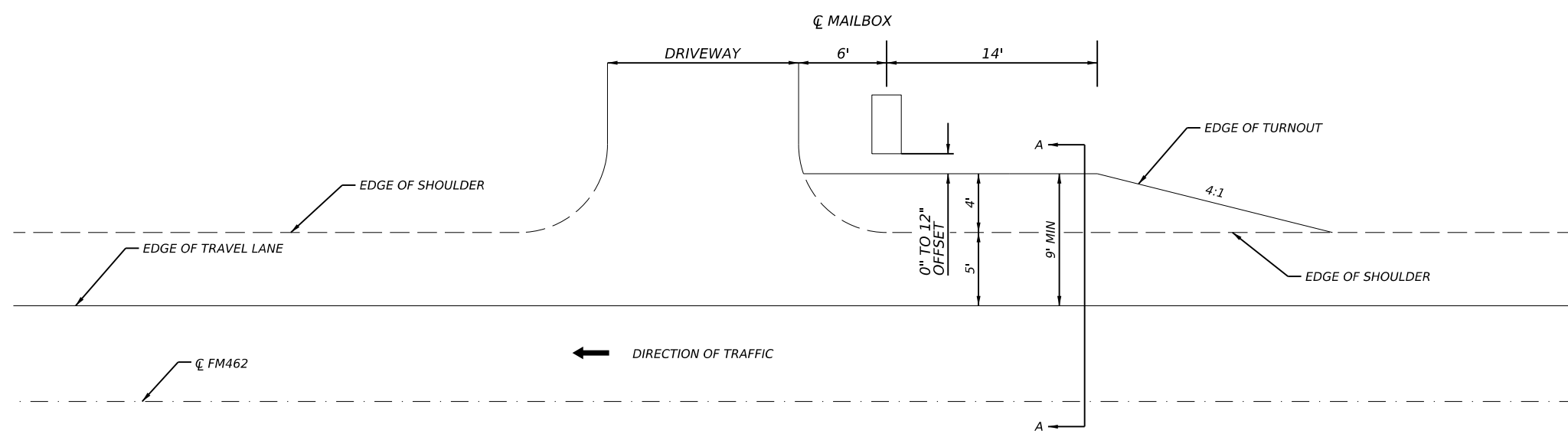
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0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	147	

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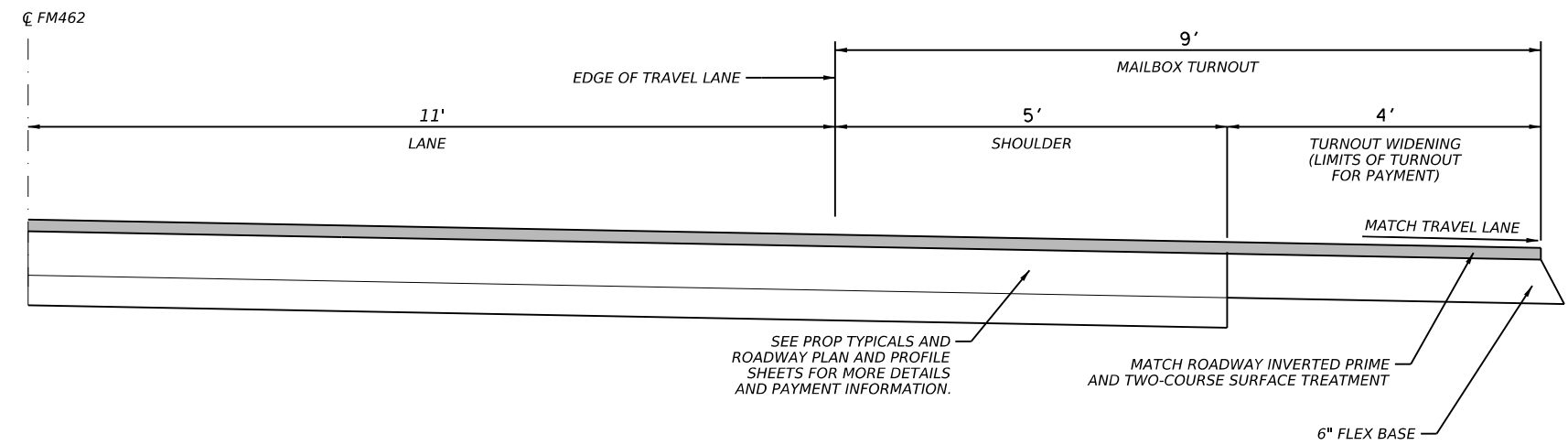
CK:  
DW:  
CK:  
DW:



**PLAN VIEW**  
MAILBOX TURNOUT  
N.T.S



**PLAN VIEW**  
MAILBOX TURNOUT (AT DRIVEWAY)  
N.T.S



**SECTION A-A**  
MAILBOX TURNOUT  
N.T.S

**NOTES:**

1. SEE DRIVEWAY PLAN & PROFILE SHEETS FOR LOCATIONS OF PROPOSED MAILBOX TURNOUTS.
2. SEE DRIVEWAY PLAN & PROFILE SHEETS FOR DRIVEWAY DETAILS.

*David Gutierrez*  
  
 1/31/2024

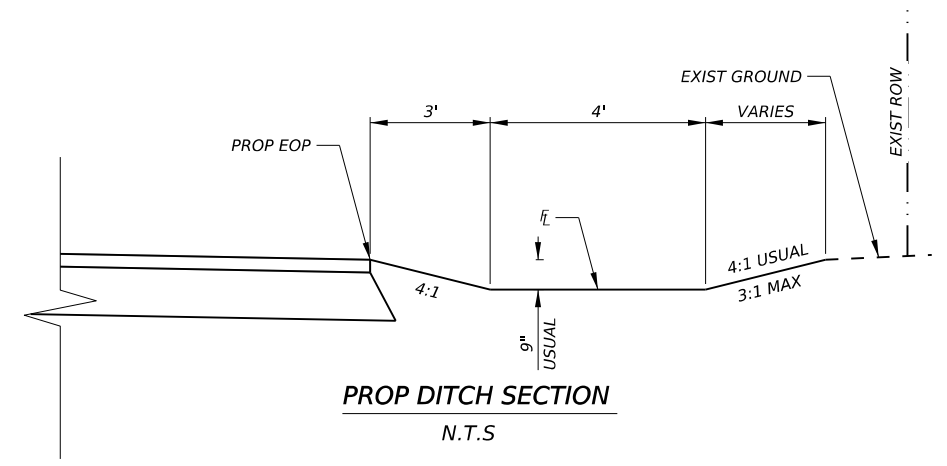
**Kimley»Horn** F-928  
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 Texas Department of Transportation  
 FM 462  
 MAILBOX TURNOUT  
 DETAILS  
 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	148	

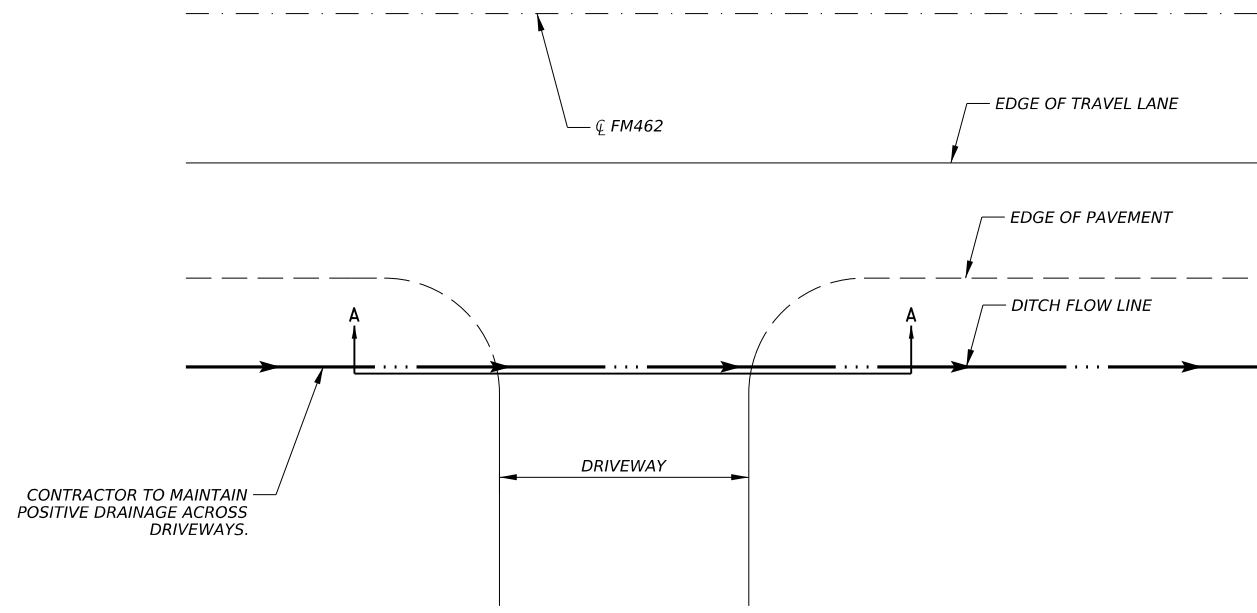
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DW: CK: DW: CK: CK:




- NOTES:**
- SEE ROADWAY PLAN AND PROFILE SHEETS FOR DITCH ALIGNMENT INFORMATION.



**PROP DITCH DRIVEWAY CROSSING DETAIL**

PLAN VIEW  
N.T.S  
DRIVEWAY  
2-1  
3-2  
7-1  
9-1  
18-1  
22-3

David Gutierrez  
  
 1/31/2024

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FM 462  
 DITCH DETAILS

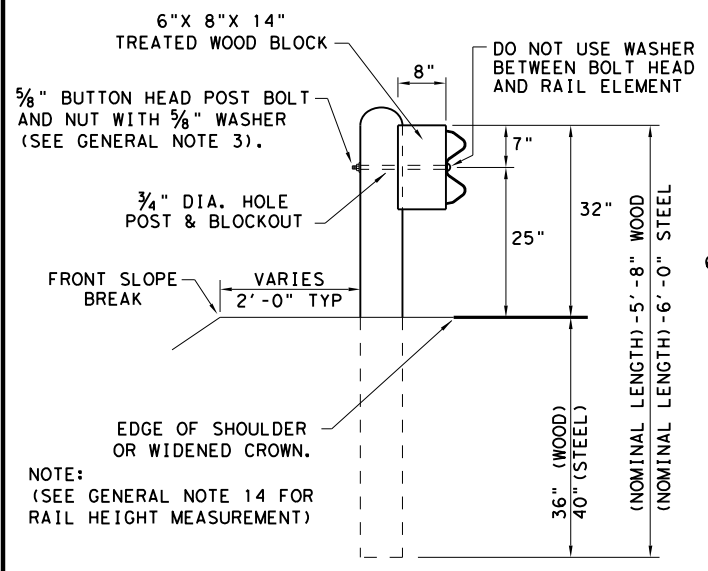
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	149	

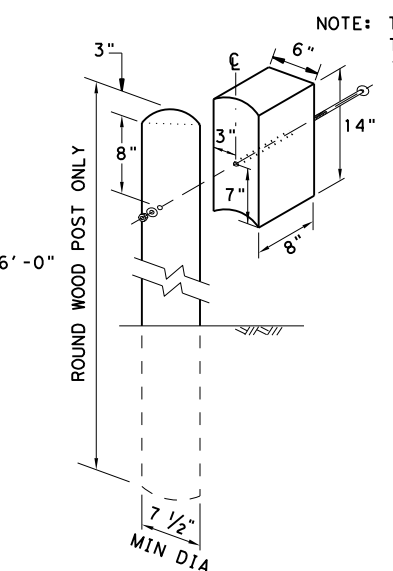
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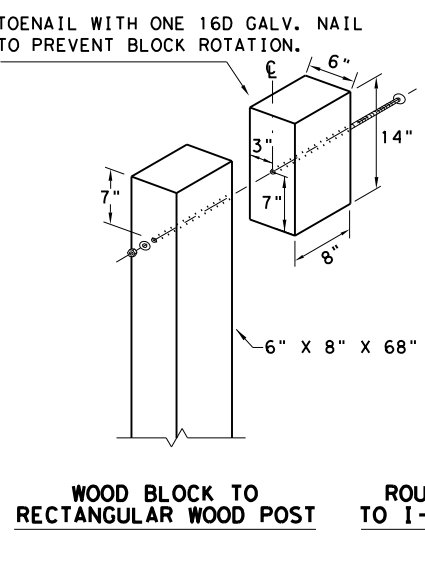
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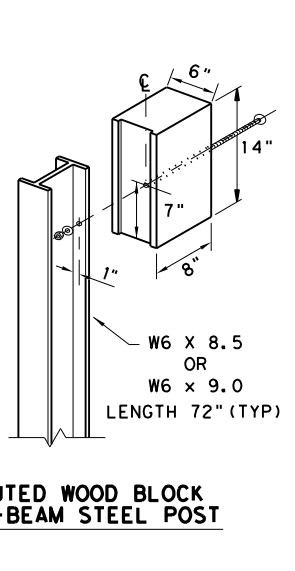
**TYPICAL POST PLACEMENT**



**WOOD BLOCK TO ROUND WOOD POST**

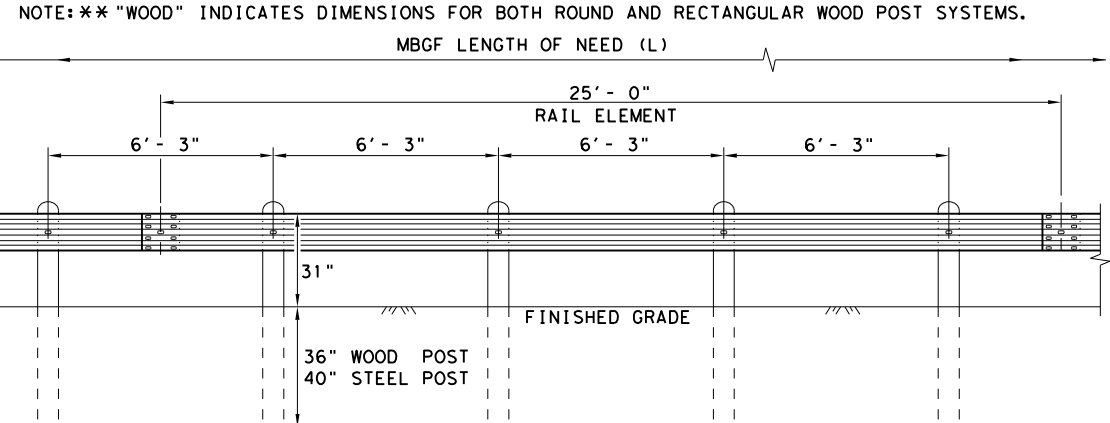


**WOOD BLOCK TO RECTANGULAR WOOD POST**



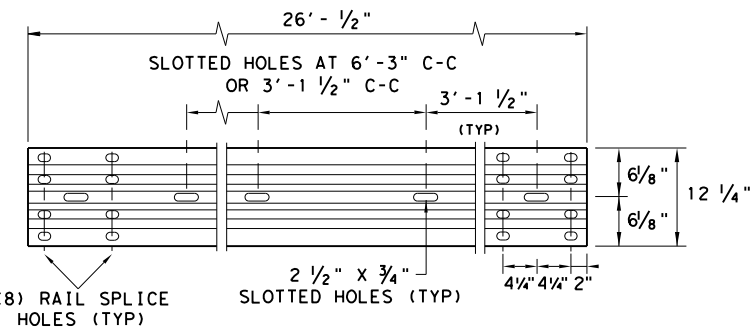
**ROUTED WOOD BLOCK TO I-BEAM STEEL POST**

- GENERAL NOTES**
1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
  2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'-0", OR 12'-6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
  3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16G) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
  4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
  5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
  6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
  7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
  8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
  9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
  10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
  11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
  12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TxDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
  13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
  14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.



**ELEVATION MID-SPAN RAIL SPLICE**

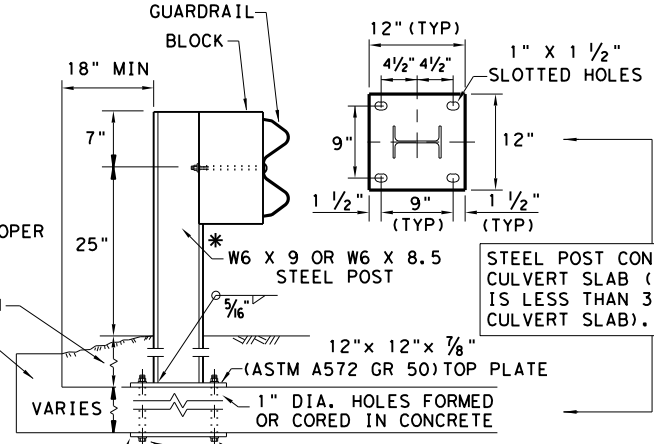
SHOWING A 25'-0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



**ELEVATION 25'-0" (NOM.) W-BEAM SECTION**

NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES. SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

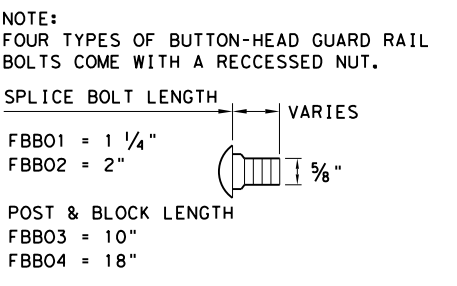
\* POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.



**LOW FILL CULVERT POST**

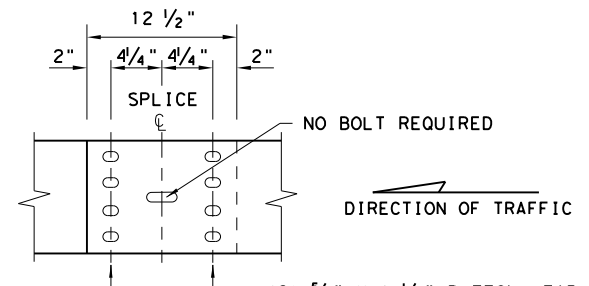
1. **BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS. NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
2. **EPOXY ANCHOR OPTION:** THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS 1/4" MIN. BEYOND NUT.

NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.



**BUTTON HEAD BOLT**

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



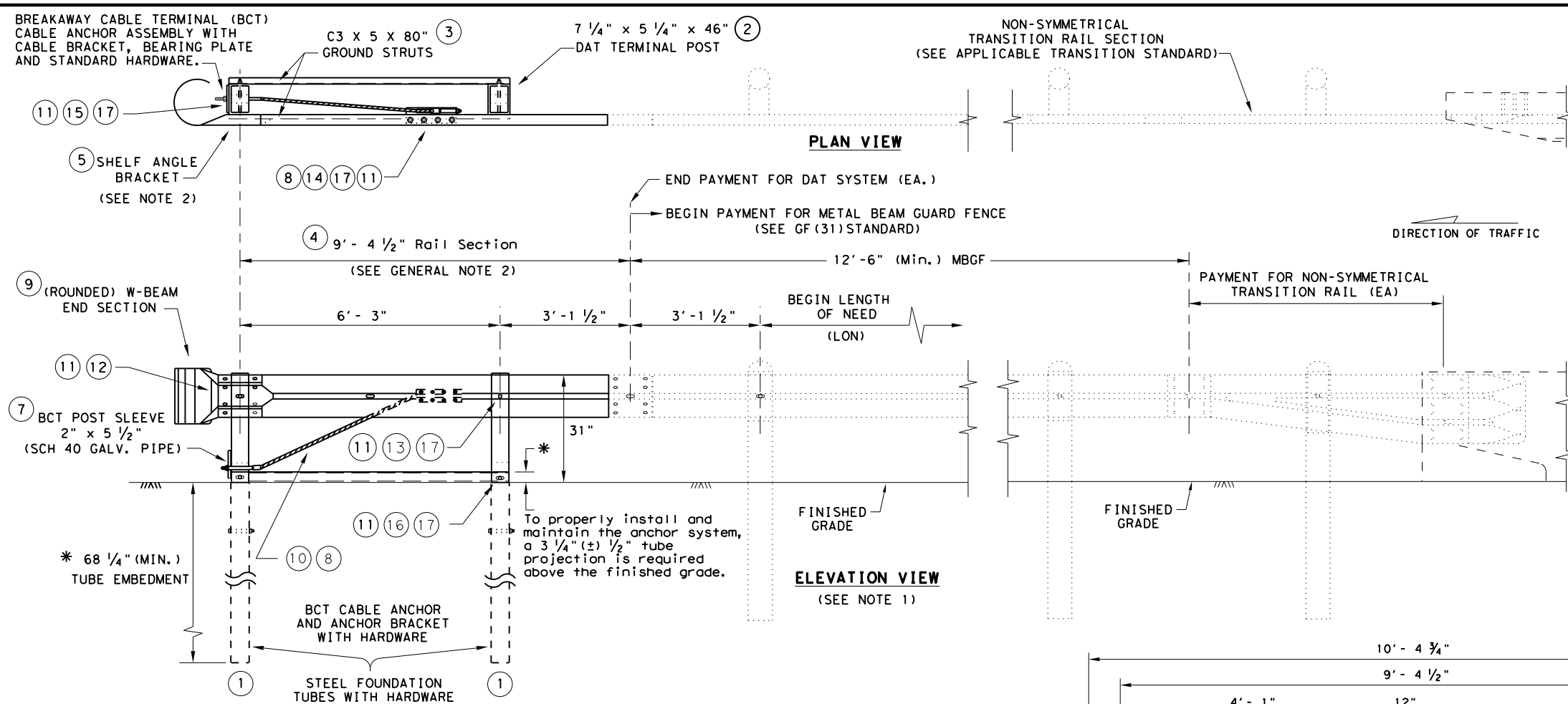
**MID-SPAN RAIL SPLICE DETAIL**

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.

		Design Division Standard	
<b>METAL BEAM GUARD FENCE</b> <b>TL-3 MASH COMPLIANT</b> <b>GF(31)-19</b>			
FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP
© TxDOT: NOVEMBER 2019	CONT	SECT	JOB
REVISIONS	0848	04	052
	DIST	COUNTY	SHEET NO.
	SAT	MEDINA	150

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DATE: 1/31/2024  
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NON-SYMMETRICAL  
 TRANSITION RAIL SECTION  
 (SEE APPLICABLE TRANSITION STANDARD)

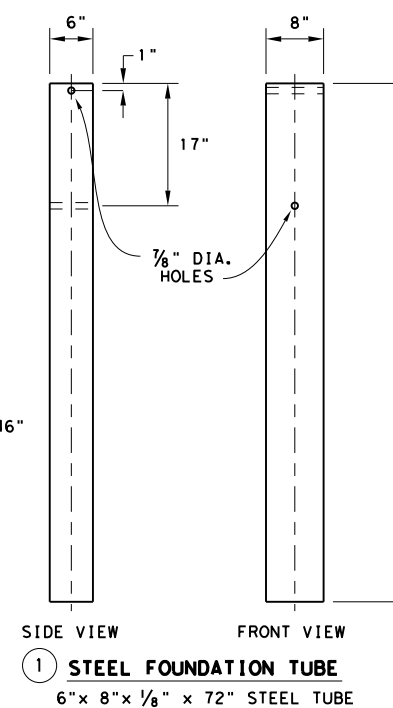
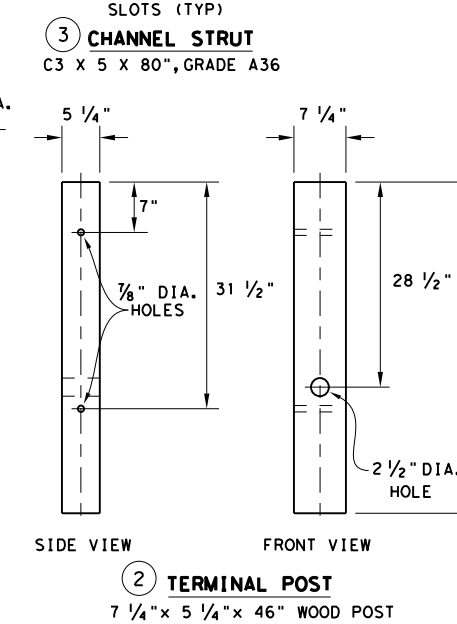
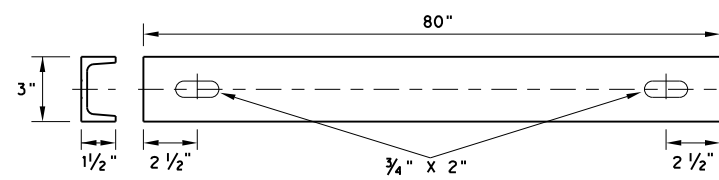
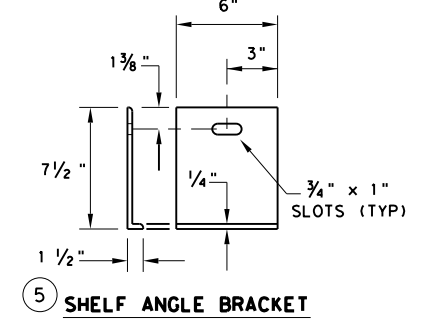
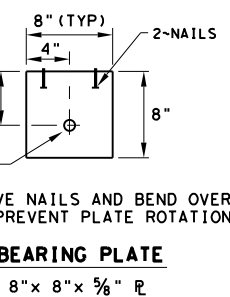
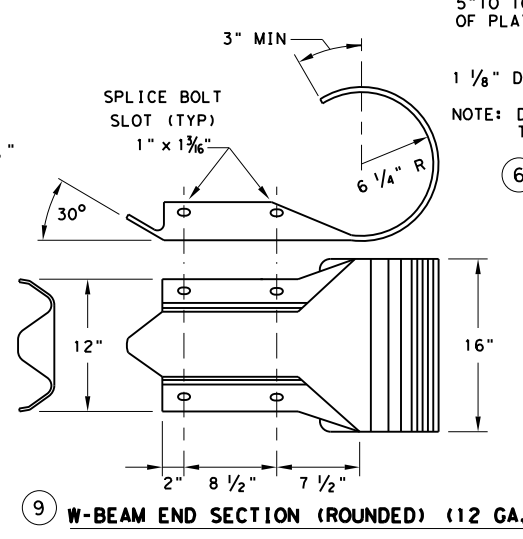
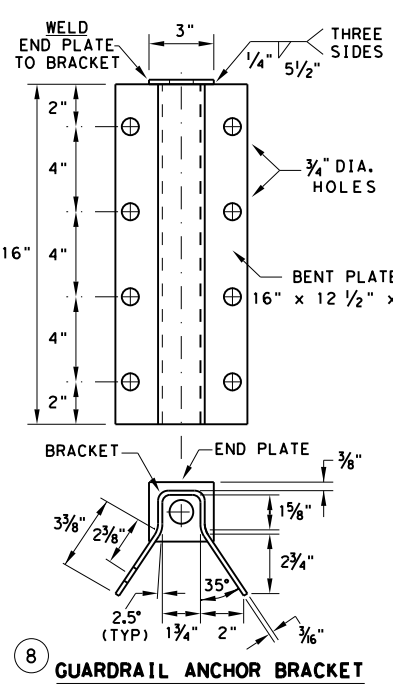
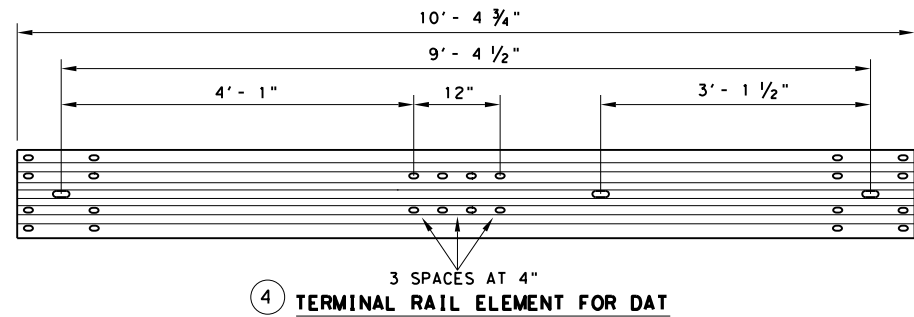
**GENERAL NOTES**

1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF (31) SHEET FOR TERMINAL CONNECTION DETAILS.

**MOW STRIP INSTALLATION**  
 IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

**DOWNSTREAM ANCHOR TERMINAL (DAT)**

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.



#	(DAT) PARTS LIST	QTY
1	STEEL FOUNDATION TUBE	2
2	DAT TERMINAL POST	2
3	CHANNEL STRUT	2
4	TERMINAL RAIL ELEMENT	1
5	SHELF ANGLE BRACKET	1
6	BCT BEARING PLATE	1
7	BCT POST SLEEVE	1
8	GUARDRAIL ANCHOR BRACKET	1
9	(ROUNDED) W-BEAM END SECTION	1
10	BCT CABLE ANCHOR	1
11	RECESSED NUT, GUARDRAIL	20
12	1 1/4" BUTTON HEAD BOLT	4
13	10" BUTTON HEAD BOLT	2
14	5/8" X 2" HEX HEAD BOLT	8
15	5/8" X 8" HEX HEAD BOLT	4
16	5/8" X 10" HEX HEAD BOLT	2
17	5/8" FLAT WASHER	18

Texas Department of Transportation  
 Design Division Standard

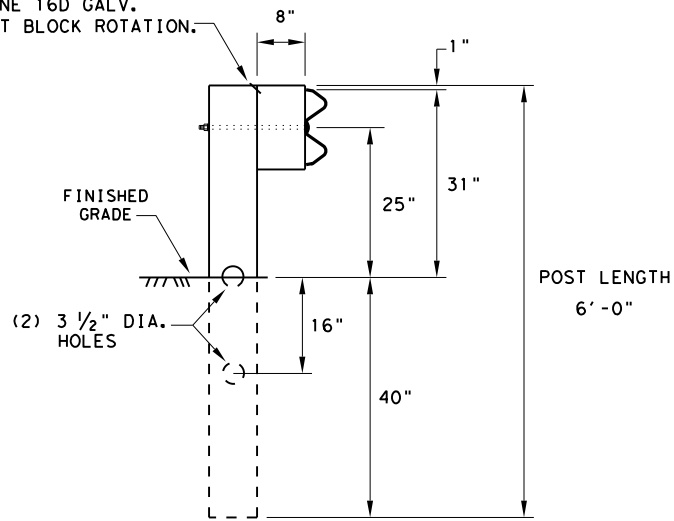
**METAL BEAM GUARD FENCE  
 (DOWNSTREAM ANCHOR TERMINAL)  
 TL-3 MASH COMPLIANT  
 GF (31) DAT-19**

FILE: gf31dat19.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG
© TXDOT: NOVEMBER 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0848	04	052	FM 462
	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	151	

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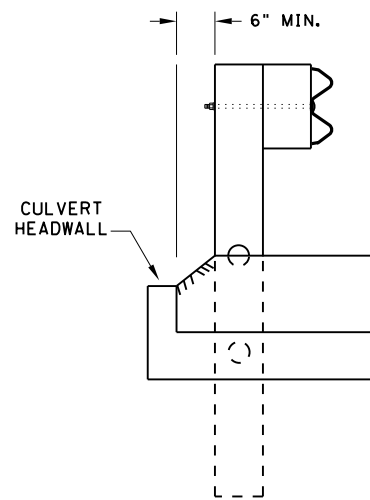
DATE: 1/31/2024  
FILE: c:\pwworking\dot285616\gf31\1s19.dgn

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.



**RECTANGULAR CRT POST  
(6" X 8" X 6' LONG)**

(6) CRT REQUIRED  
SEE ELEVATION DETAIL FOR LOCATIONS



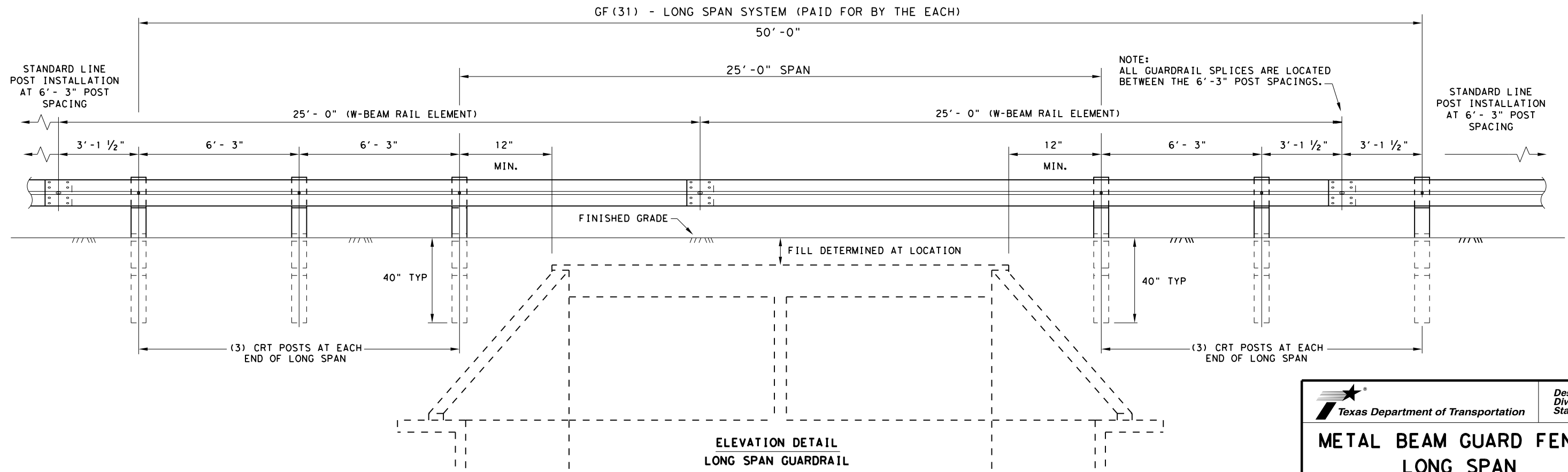
**LATERAL OFFSET BETWEEN THE  
GUARDRAIL AND THE CULVERT HEADWALL**

**GENERAL NOTES**

1. THE TYPE OF LINE POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF THE TRANSITIONS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENT SHALL MEET ALL REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 12'-6" OR 25'-0" NOMINAL LENGTHS.
3. RAIL POST HOLES ARE OFFSET 3'-1 1/2" FROM STANDARD GUARDRAIL TO ACCOMMODATE THE MIDSPAN SPLICING.
4. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC160) AND NO MORE THAN 1" BEYOND IT.
5. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
7. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
8. REFER TO GF(31) STANDARD SHEET FOR ADDITIONAL DETAILS.
9. FLAME CUTTING OF HOLES IN GUARDRAIL SHALL NOT BE PERMITTED. IF YOU ENCOUNTER MIS-ALIGNED BOLT HOLES IN GUARDRAIL CONTACT THE DESIGN DIVISION FOR ADDITIONAL INFORMATION & OPTIONS.

NOTE: SEE GF(31) STANDARD FOR STANDARD LINE POSTS.

DIRECTION OF TRAFFIC

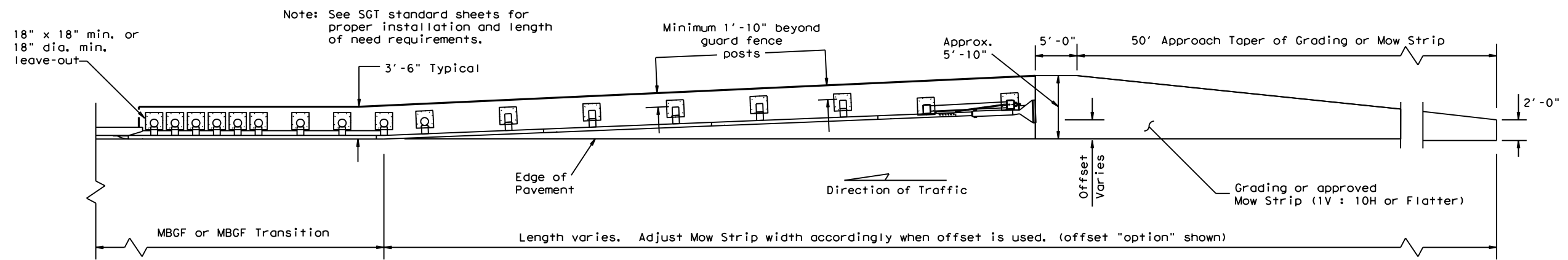


**ELEVATION DETAIL  
LONG SPAN GUARDRAIL**

		Design Division Standard	
<b>METAL BEAM GUARD FENCE LONG SPAN TL-3 MASH COMPLIANT</b>			
<b>GF(31)LS-19</b>			
FILE: gf31\1s19.dgn	DN: TxDOT	CK: KM	DW: VP
© TxDOT: NOVEMBER 2019	CONT	SECT	JOB
REVISIONS	0848	04	052
			FM 462
	DIST	COUNTY	SHEET NO.
	SAT	MEDINA	152

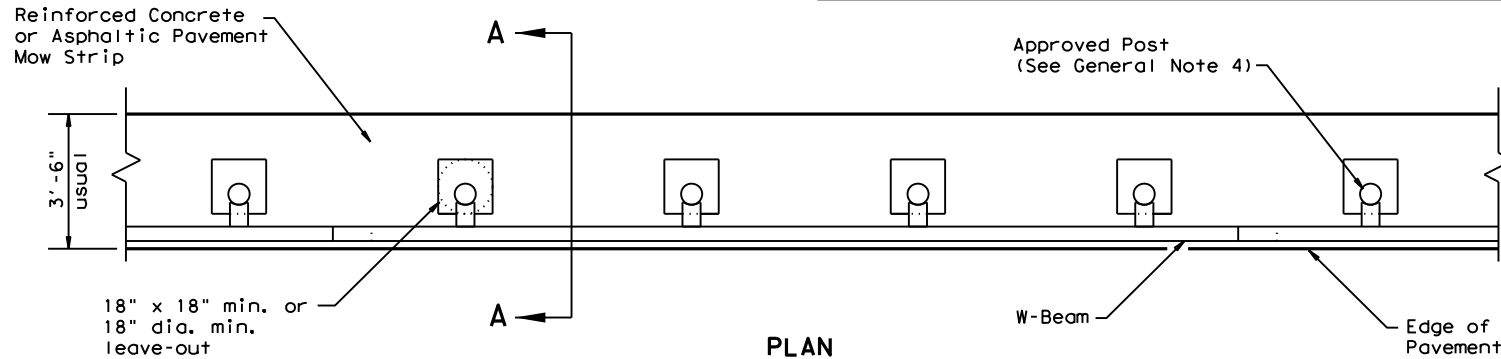
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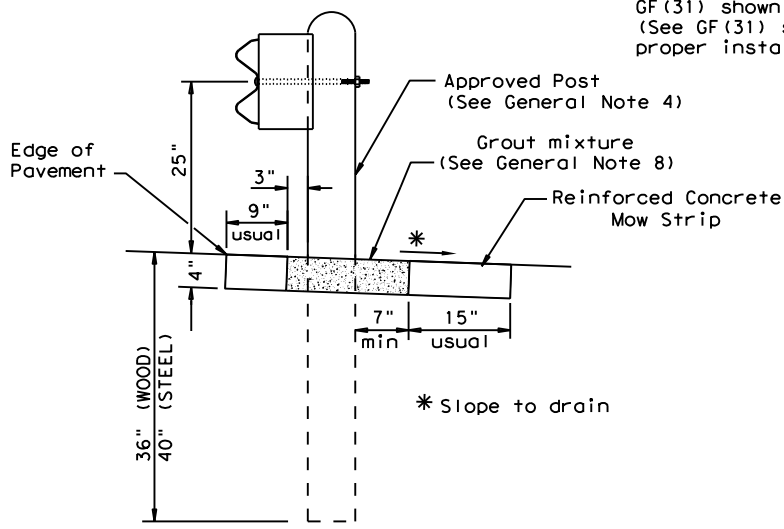
**GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS**

Note: Site Condition(s)  
 Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.  
 Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.



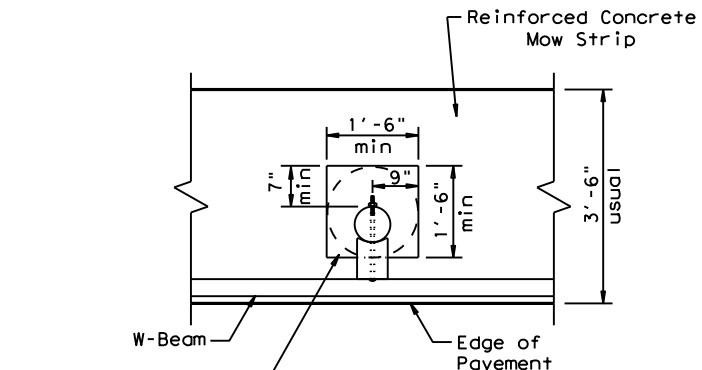
**PLAN**

GF(31) shown with Mow Strip  
 (See GF(31) standard sheet for proper installation)



**SECTION A-A**

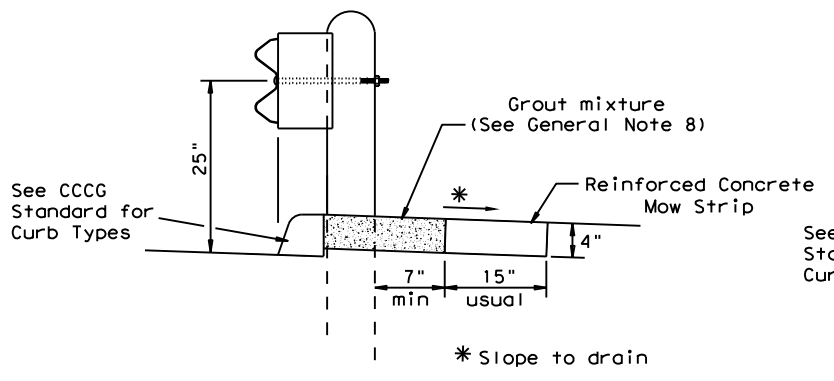
Typical



**MOW STRIP DETAIL**

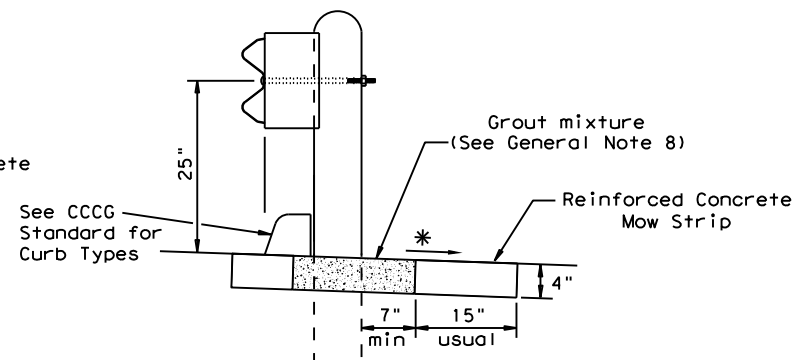
Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.

- GENERAL NOTES**
- This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
  - Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
  - The leave-out behind the post shall be a minimum of 7".
  - Only steel (W6 x 8.5 or W6 x 9.0), or 7 1/2" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
  - Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
  - Thickness of the mow strip will be 4".
  - The limits of payment for reinforced concrete will include leave-outs for the posts.
  - The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type I or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.



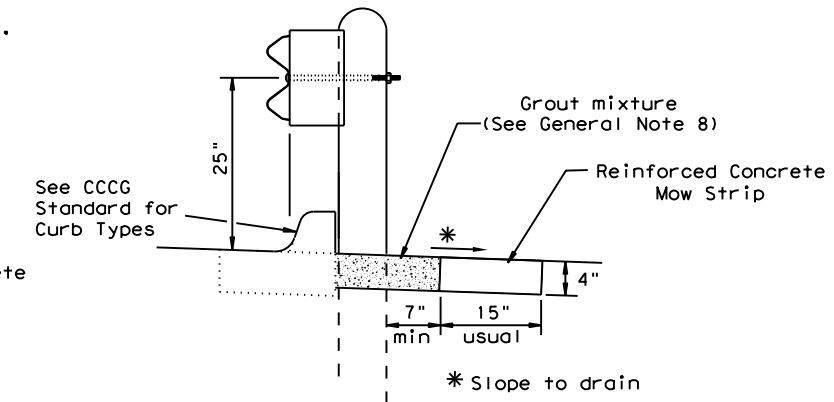
**CURB OPTION (1)**

This option will increase the post embedment throughout the system.



**CURB OPTION (2)**

Curb shown on top of mow strip



**CURB OPTION (3)**

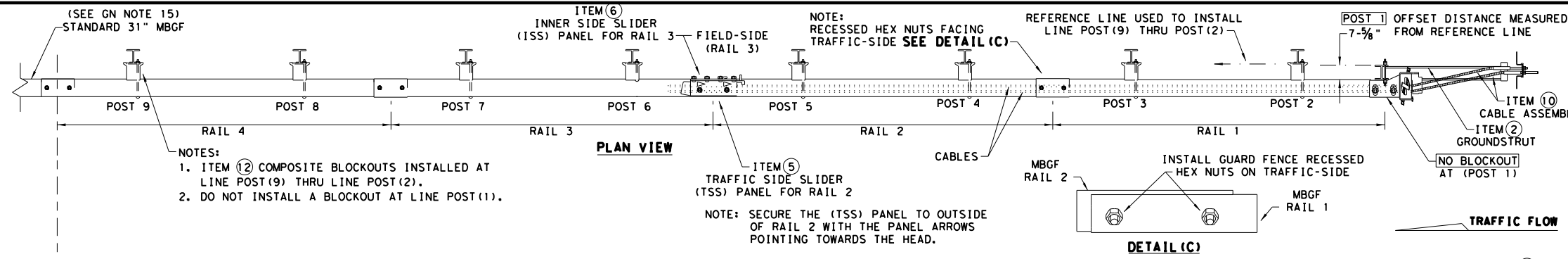
		Design Division Standard	
<b>METAL BEAM GUARD FENCE (MOW STRIP)</b> <b>TL-3 MASH COMPLIANT</b> <b>GF(31)MS-19</b>			
FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP
© TXDOT: NOVEMBER 2019	CONT	SECT	JOB
REVISIONS	0848	04	052
	DIST	COUNTY	SHEET NO.
	SAT	MEDINA	153





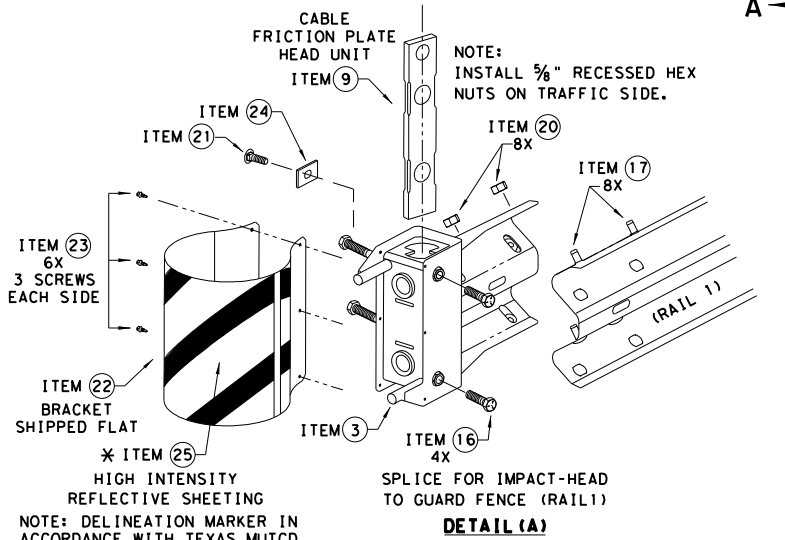
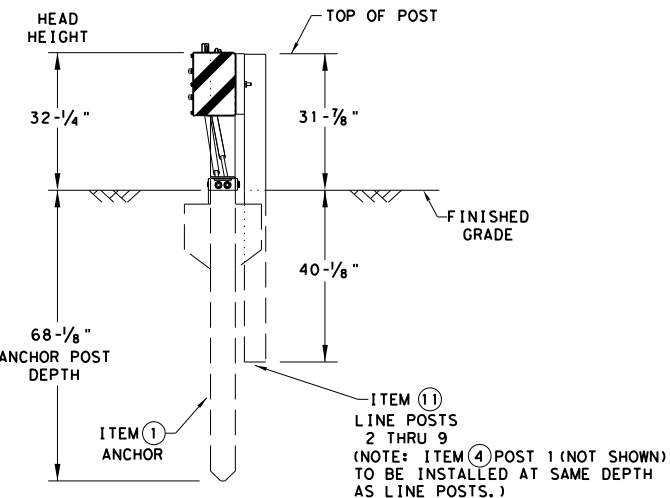
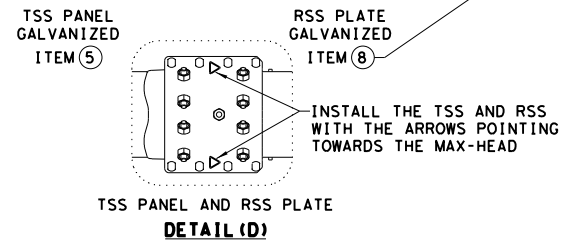
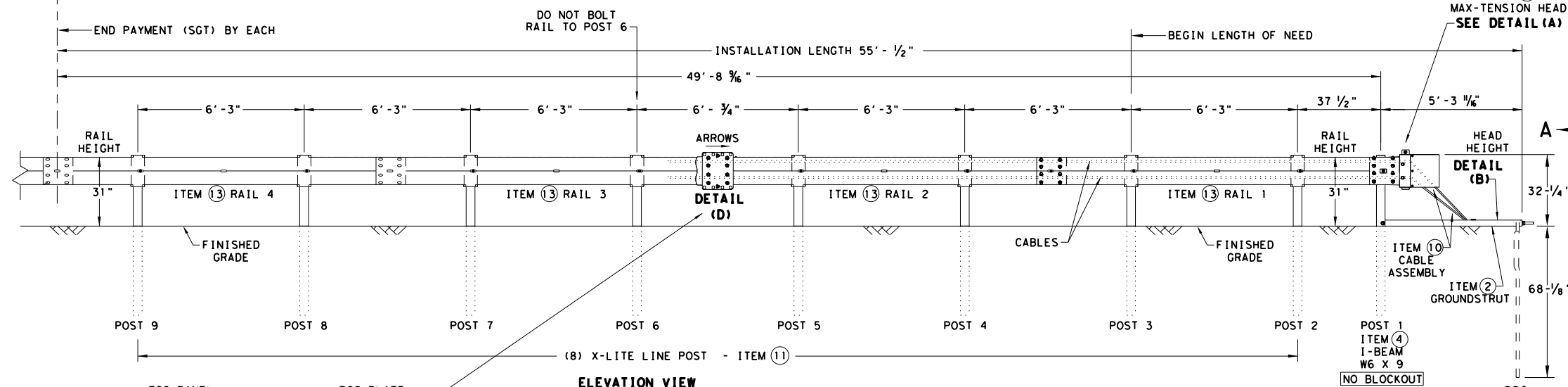
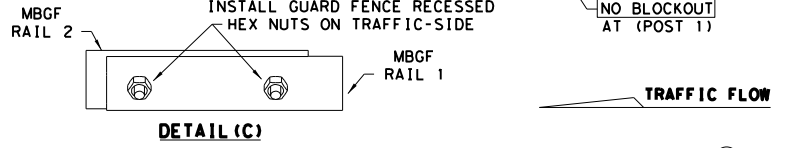
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DATE: 1/31/2024  
 FILE: c:\pwworking\0285616\sgt11s3118.dgn



- NOTES:
- ITEM (2) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST (9) THRU LINE POST (2).
  - DO NOT INSTALL A BLOCKOUT AT LINE POST (1).

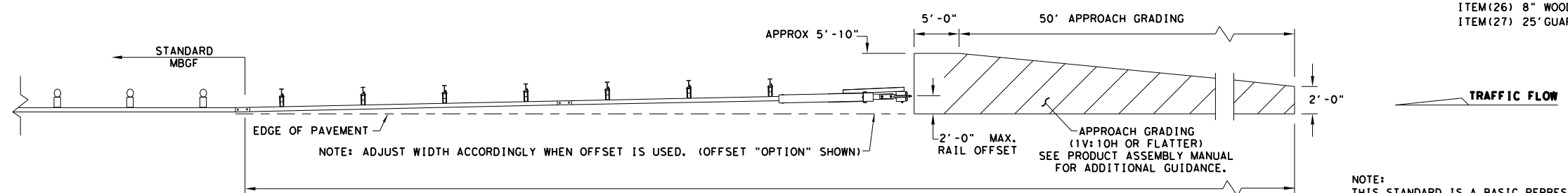
ITEM (5) TRAFFIC SIDE SLIDER (TSS) PANEL FOR RAIL 2  
 NOTE: SECURE THE (TSS) PANEL TO OUTSIDE OF RAIL 2 WITH THE PANEL ARROWS POINTING TOWARDS THE HEAD.



- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
  - FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE: MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
  - APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
  - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TxDOT'S LATEST ROADWAY MOW STRIP STANDARD.
  - ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
  - SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
  - COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
  - REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
  - IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
  - POSTS SHALL NOT BE SET IN CONCRETE.
  - A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
  - MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
  - IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
  - THE SYSTEM IS SHOWN WITH 12'-6" MBSF PANELS, 25'-0" MBSF PANELS ARE ALSO ALLOWED.
  - A MINIMUM OF 12'-6" OF 12GA. MBSF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM#	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT. -GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	3/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	3/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	3/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWRO3	1
25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL, 8-SPACE, 12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

\* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.  
 \*\* ALTERNATIVE ITEMS NOT SHOWN.  
 ITEM (26) 8" WOOD-BLOCKOUTS  
 ITEM (27) 25' GUARD FENCE PANELS



NOTE: TxDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

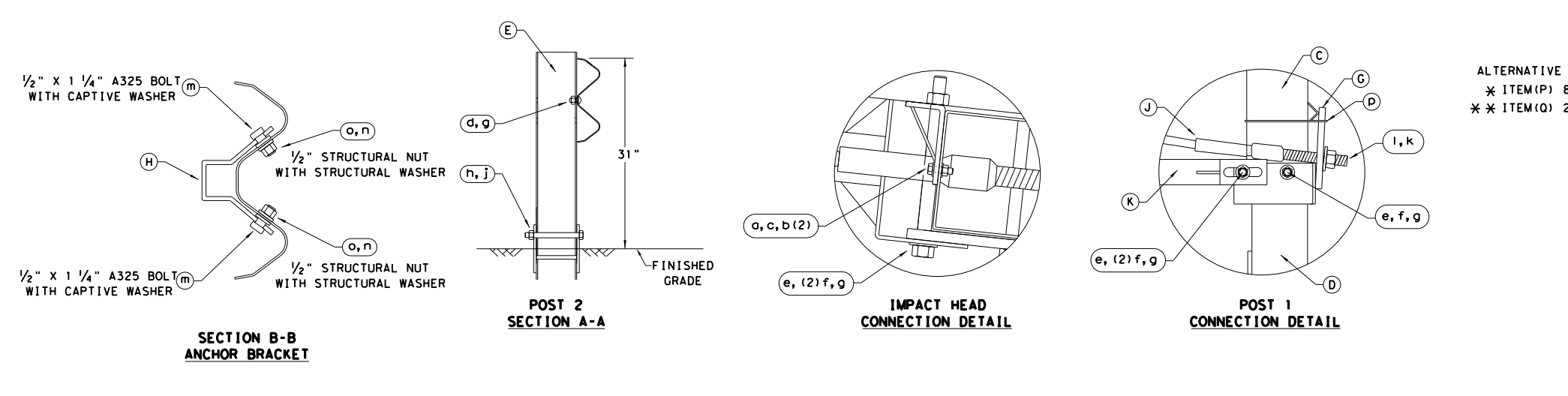
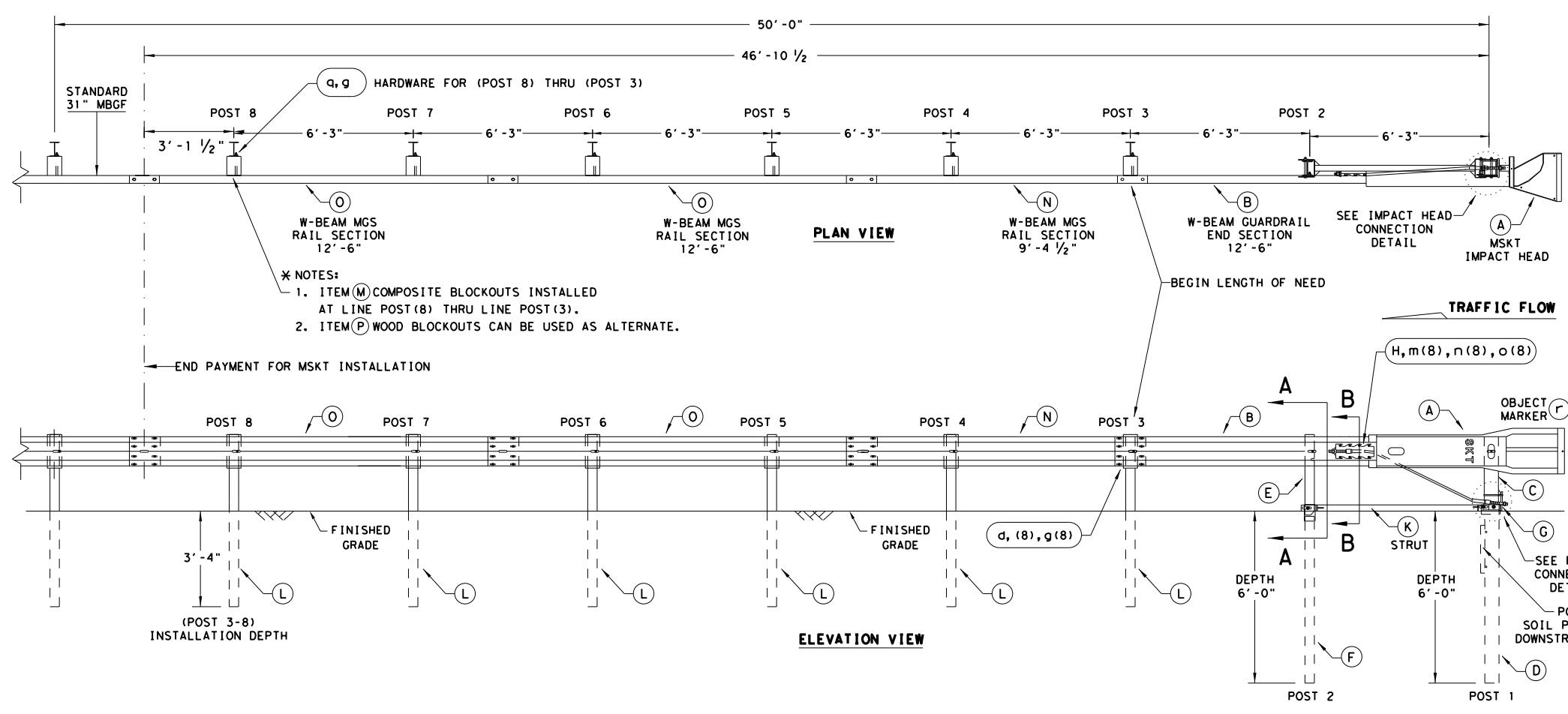
**Texas Department of Transportation**  
 Design Division Standard

**MAX-TENSION END TERMINAL**  
**MASH - TL-3**  
**SGT (11S) 31-18**

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT SECT	JOB	HIGHWAY	
REVISIONS	0848 04	052	FM 462	
	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	155	

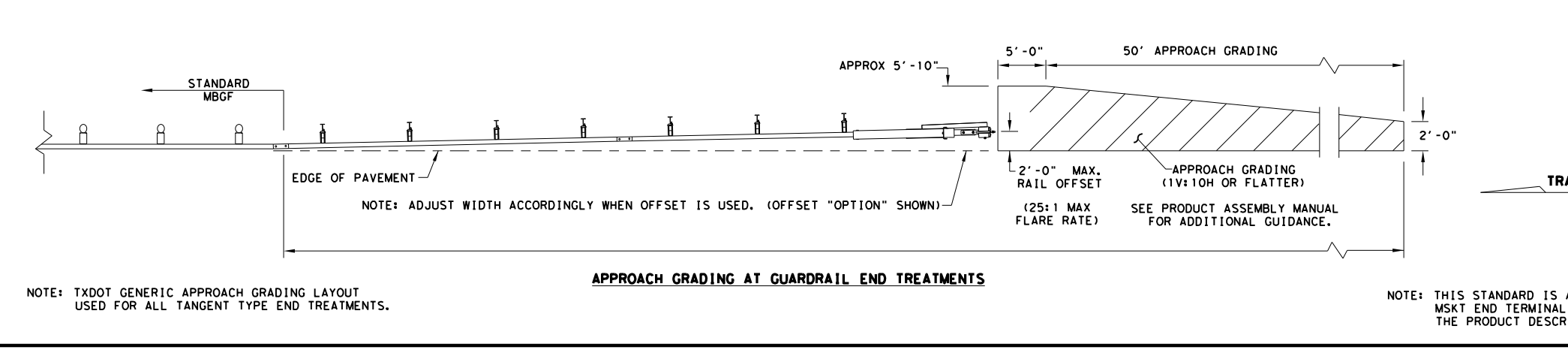
DISCLAIMER: THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

DATE: 1/31/2024  
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- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
  - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE: MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION-062717).
  - APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
  - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
  - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
  - SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
  - A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
  - IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
  - POSTS SHALL NOT BE SET IN CONCRETE.
  - SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
  - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
  - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCRANCHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
  - THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN ITS PLACE.
  - A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6X9 OR W6X8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
SMALL HARDWARE			
a	2	3/8" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	3/8" WASHER	W0516
c	2	3/8" HEX NUT	N0516
d	25	3/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	3/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	3/8" WASHER	W050
g	33	3/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/8" O.D. x 3/8" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	3/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



**Texas Department of Transportation**  
 Design Division Standard

## SINGLE GUARDRAIL TERMINAL

### MSKT-MASH-TL-3

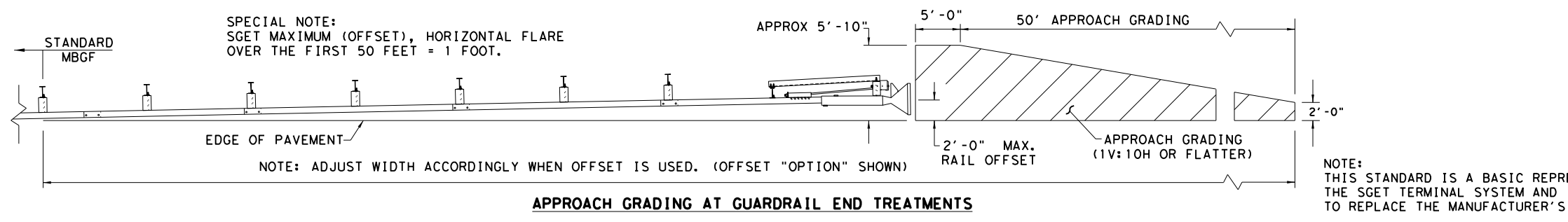
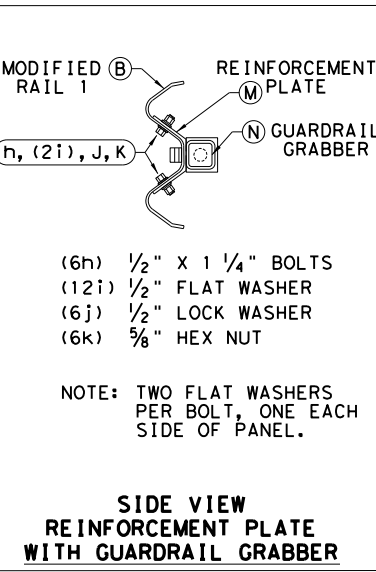
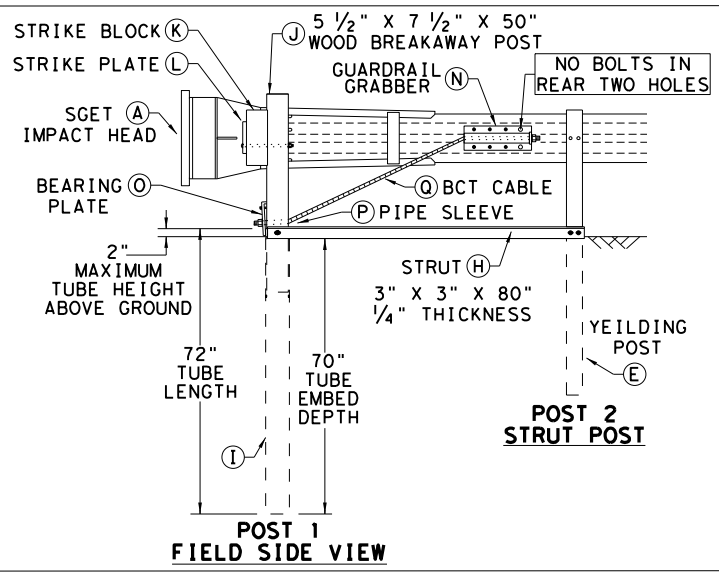
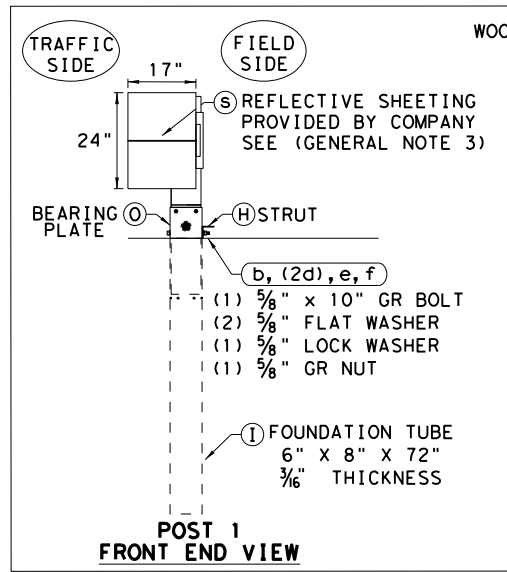
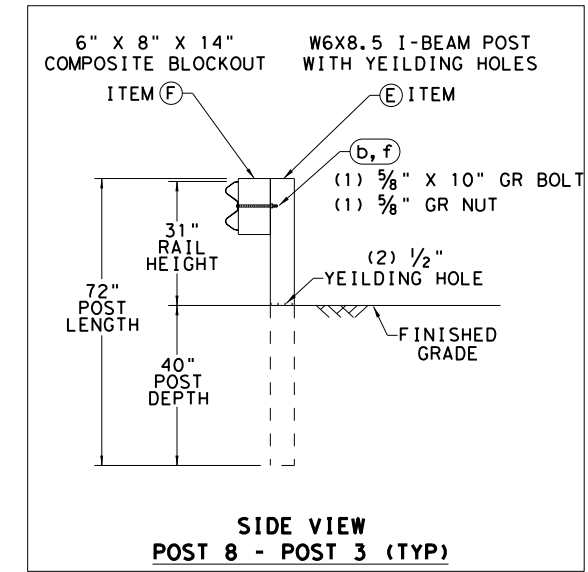
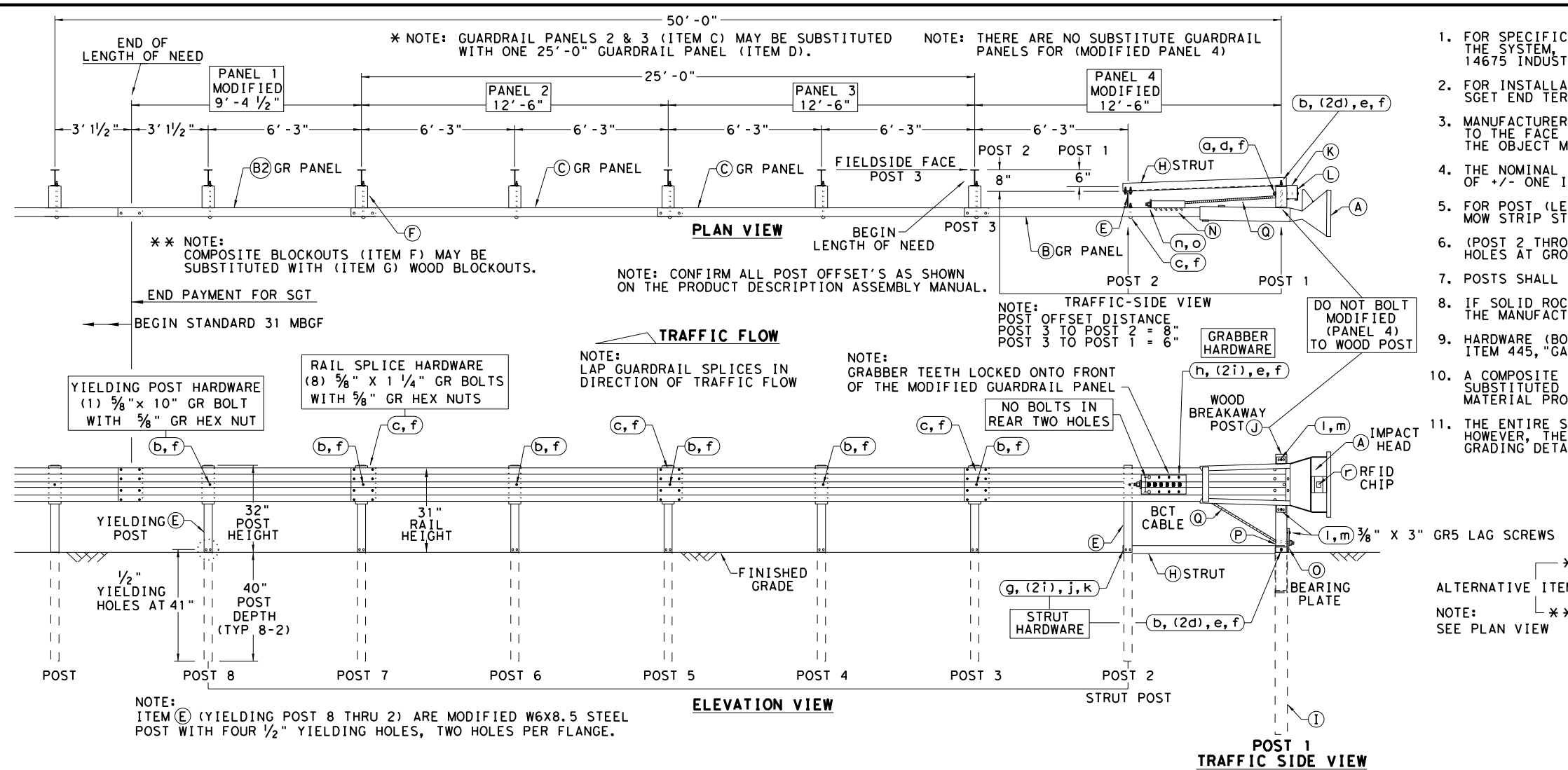
### SGT (12S) 31-18

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© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	156	

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

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: 1/31/2024  
FILE: c:\pwworking\153120.dgn



- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
  - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
  - MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
  - THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
  - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
  - (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
  - POSTS SHALL NOT BE SET IN CONCRETE.
  - IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
  - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
  - A COMPOSITE MATERIAL BLOCKOUT THAT MEETS DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
  - THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE OFFSET BY TWO FEET AS SHOWN ON THE APPROACH GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CB08
G	6	WOOD BLOCKOUT 6" X 8" X 14"	WB08
H	1	STRUT 3" X 3" X 80" X 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" X 3/8"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" X 7 1/2" X 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGRI17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81
SMALL HARDWARE			
a	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPLICE BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563HDG HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M

**Texas Department of Transportation**

**SPIG INDUSTRY, LLC**

**SINGLE GUARDRAIL TERMINAL**

**SGET - TL-3 - MASH**

**SGT (15) 31-20**

FILE: sg153120.dgn    DN: TXDOT    CK: KM    DW: VP    CK: VP

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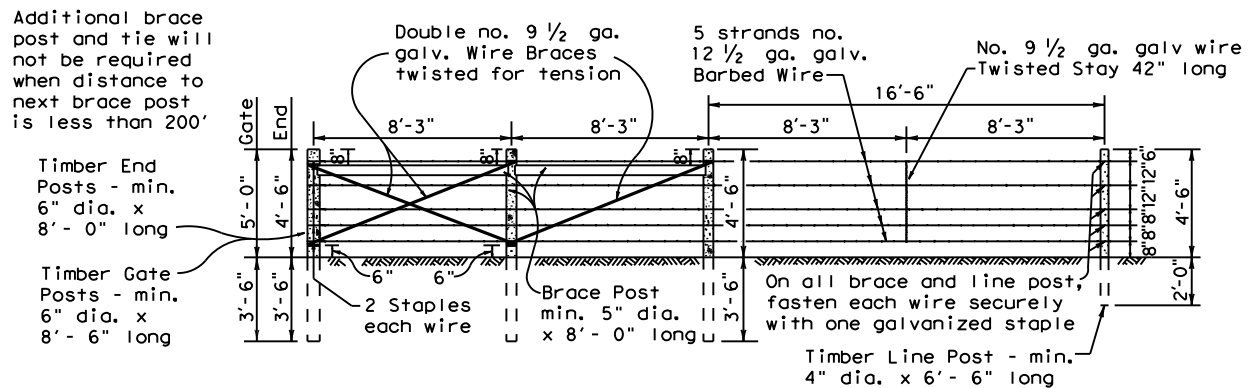
REVISIONS

DIST: SAT    COUNTY: MEDINA    SHEET NO.: 157

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

DISCLAIMER:  
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DATE: 1/31/2024  
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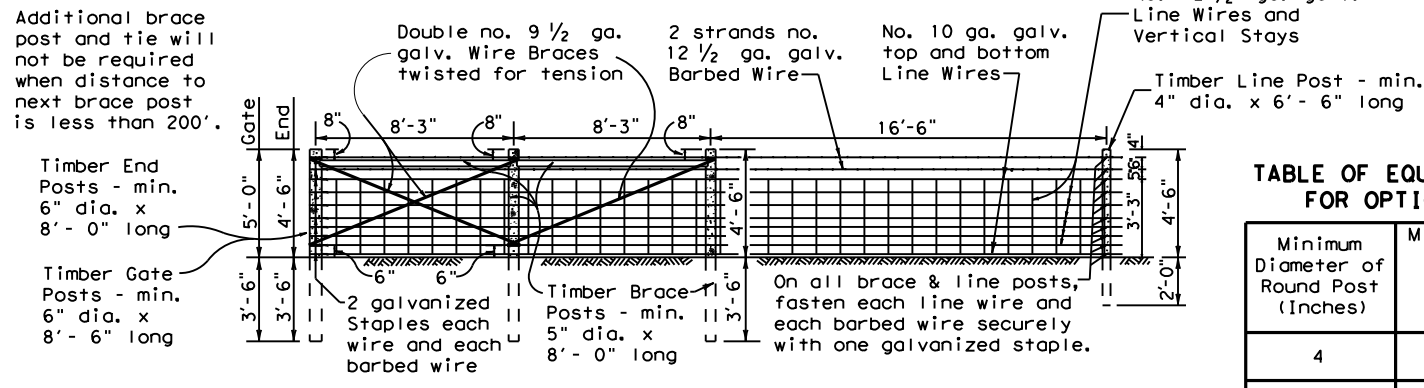


**SECTION GALVANIZED BARBED WIRE FENCE WITH WOOD POSTS**

Bracing Detail Used at Ends and Gates

**TYPE "A" FENCE**

(See General Note 6)



**SECTION GALVANIZED WOVEN WIRE FENCE WITH WOOD POSTS**

Bracing Detail Used at Ends and Gates

**TYPE "B" FENCE**

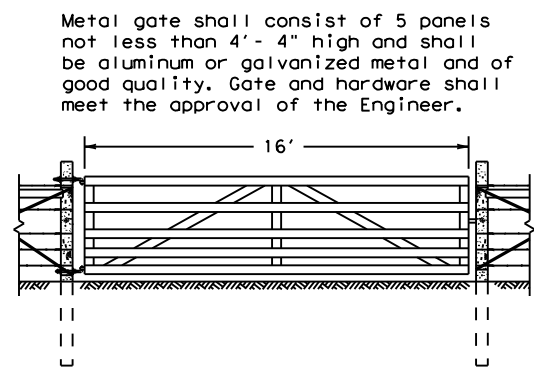
(See General Note 6)

**TABLE OF EQUIVALENT SIZES FOR OPTIONAL SHAPE**

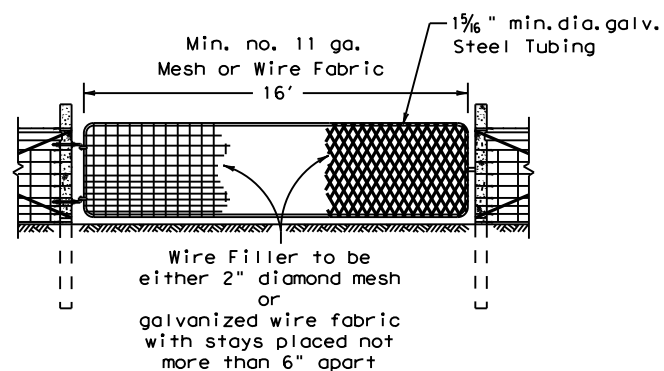
Minimum Diameter of Round Post (Inches)	Minimum Equivalent Dimension for Each Side of Square Post (Inches)
4	3 1/2
5	4 1/2
6	5 1/4

**GENERAL NOTES**

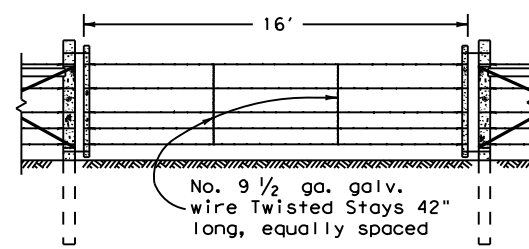
- Any high point which interferes with the placing of wire mesh shall be excavated to provide 2" clearance.
  - Latches for Type 1 and Type 2 gates shall be good commercial quality and design latches of the spring, fork or chain type. All latches shall be suitable for the gate and shall be approved by the Engineer.
  - Hinges for Type 2 gates shall be commercial design approved by the Engineer suitable for post and gate.
  - Concrete shall be of the design and consistency approved by the Engineer and shall contain not less than 4 sacks of cement per cubic yard. Concrete footings are to be crowned at the top to shed water.
  - If rock is encountered at a depth less than the embedded depth required, a 15" or larger diameter hole shall be drilled for the post and the post shall be set in concrete. If rock is encountered at a depth of 1'-6" or more below the ground surface, the hole shall be drilled to the required depth. If rock is encountered at a depth less than 1'-6" below the ground surface, the holes shall be drilled a minimum of 2'-0" into the rock or to the depth whichever is the lesser depth.
  - Barbed wire shall be in accordance with ASTM A 121 (Class 1) Design designation 12-2-4-1 4R or 12-2-5-1 4R, or as approved by the Engineer.
- Woven Wire Fence (Type B) shall be in accordance with ASTM A 116 (Class 1) No. 12-1/2 Grade 60 (See Table 1 ASTM A 116) to the height and design shown on the plans, or as approved by the Engineer.
- The location of gates and corner posts will be as indicated elsewhere on these plans.
  - Square wood posts may be used in lieu of round posts provided minimum equivalent size requirements, as shown are met. All wood posts shall be in accordance with Item 552, "Wire Fence."



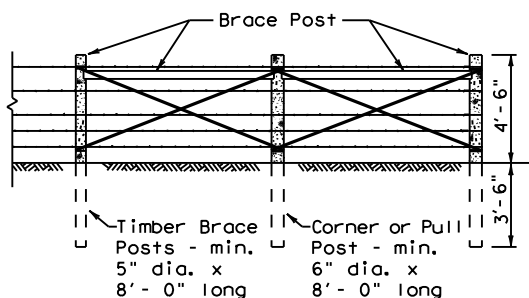
**DETAIL TYPE 1 GATE**



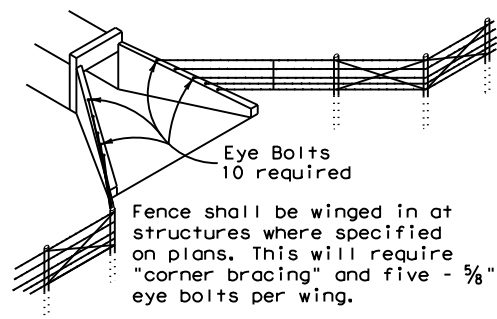
**DETAIL TYPE 2 GATE**



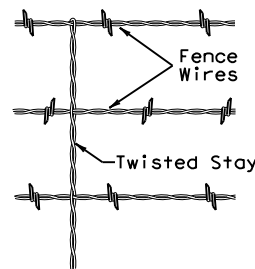
**DETAIL TYPE 3 GATE**



**CORNER OR PULL POST ASSEMBLY**

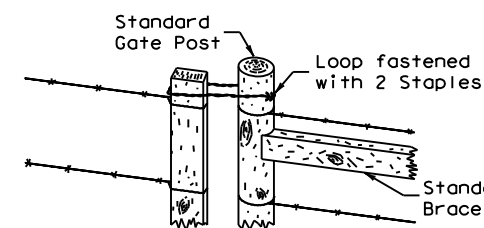


**DETAIL OF FENCE TREATMENT AT STRUCTURES**



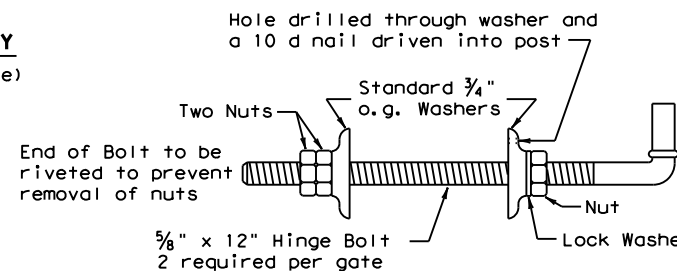
**DETAIL OF STAY**

(Barbed wire fence)

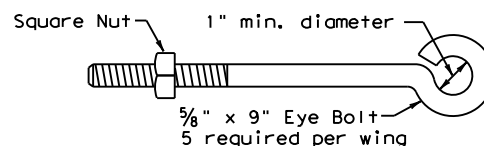


Loop to be made from two strands twisted no. 9 1/2 ga. galv. smooth wire, and to be securely fastened to gate post with two galv. staples.

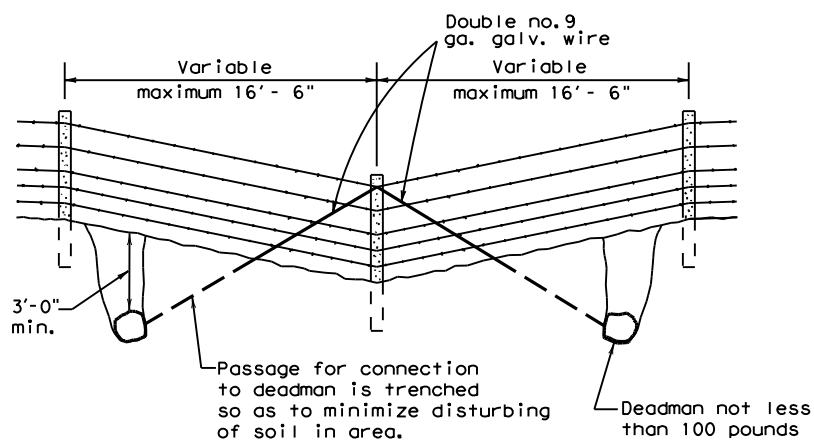
**DETAIL FASTENER TYPE 3 GATE**



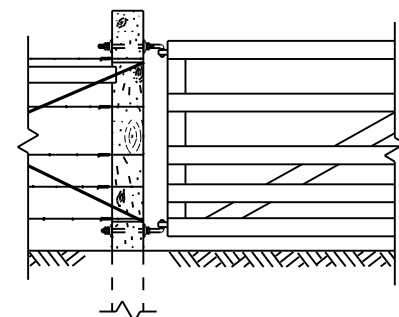
**DETAIL OF GATE HINGE BOLT ASSEMBLY**



**DETAIL OF EYE BOLT**



**DETAIL OF FENCE SAG**  
(Single Line Connection)



**DETAIL SHOWING INSTALLATION OF HINGES OF TYPE 1 & 2 GATE**

**BARBED WIRE AND WOVEN WIRE FENCE (WOOD POSTS) WF (1) - 10**

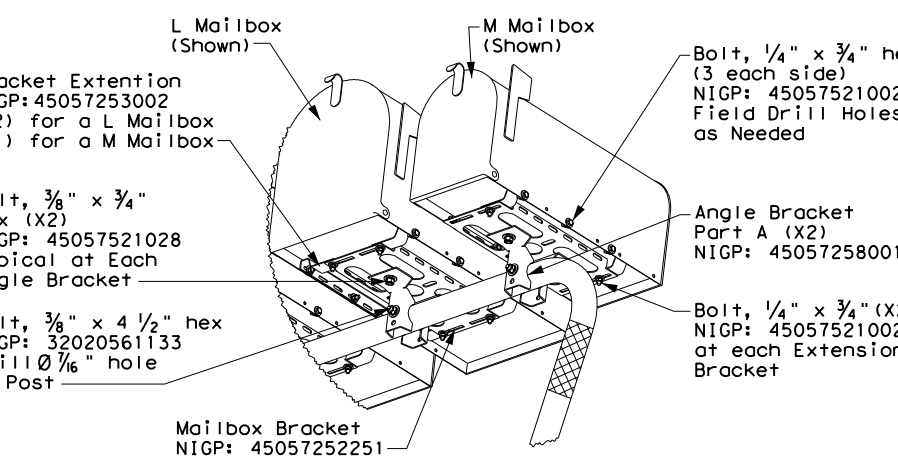
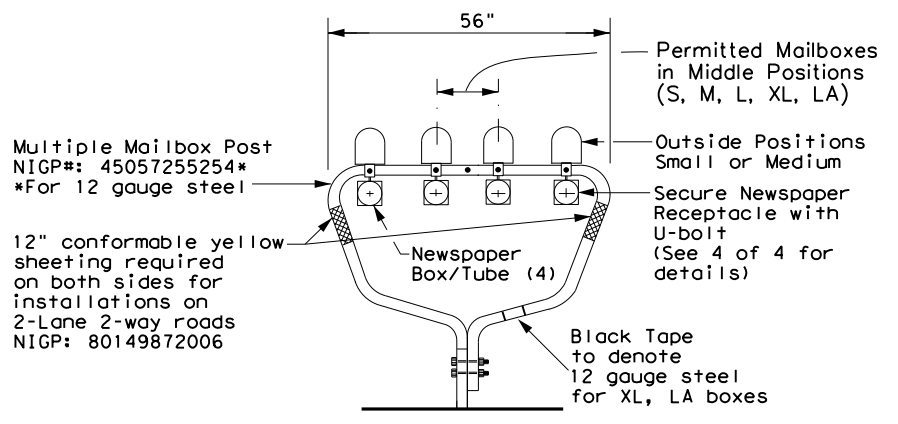
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	SAT	MEDINA		158



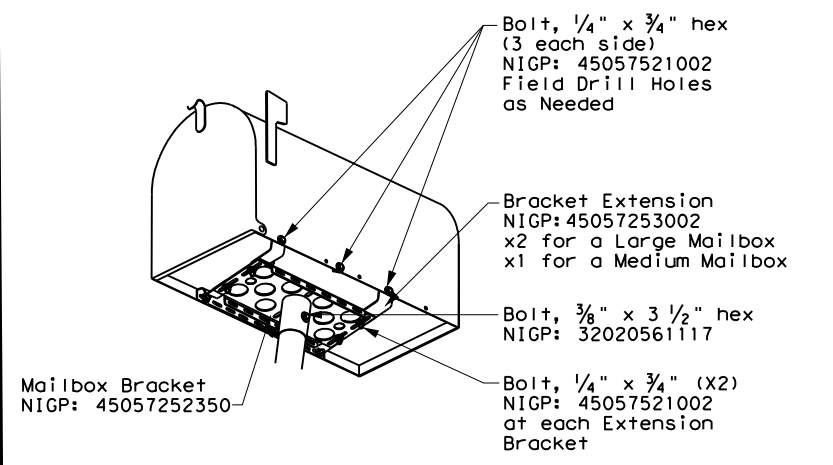
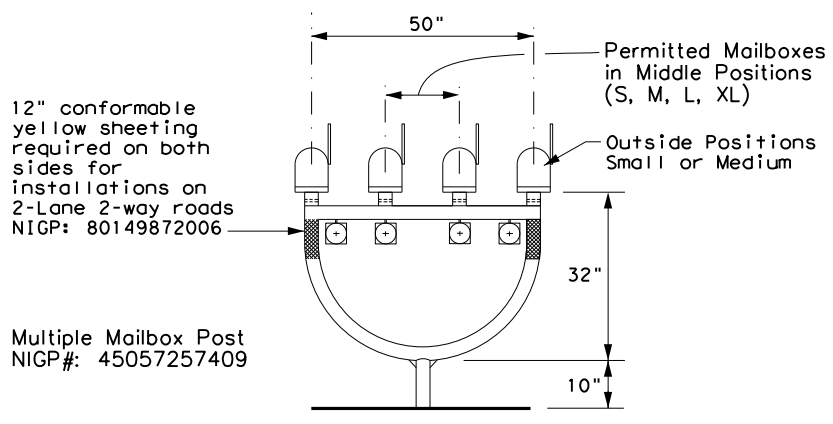
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 1/31/2024 2:59:38 PM  
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### TYPE 1 - MULTIPLE



### TYPE 4 - MULTIPLE



### MAILBOX SIZES

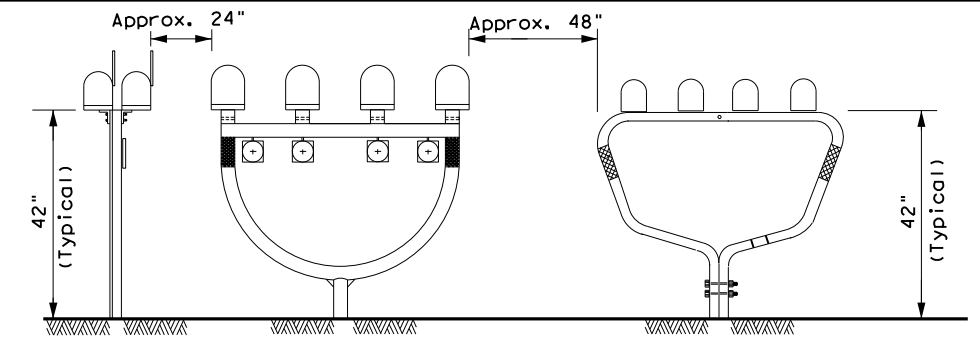
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX **
	LENGTH	WIDTH	HEIGHT	
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

### GENERAL NOTES:

- Dimensions shown (length, width, and height) are typical, not maximums. However, anytime a medium size mailbox is mounted on a single/double mount or on the outside position on a multi mount, the dimensions shown are maximums.
- Mailboxes shall be made of light weight sheet metal or light weight plastic. Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.

\* See Note 1.  
 \*\* Excluding Molded Plastic on 4 X 4 Post

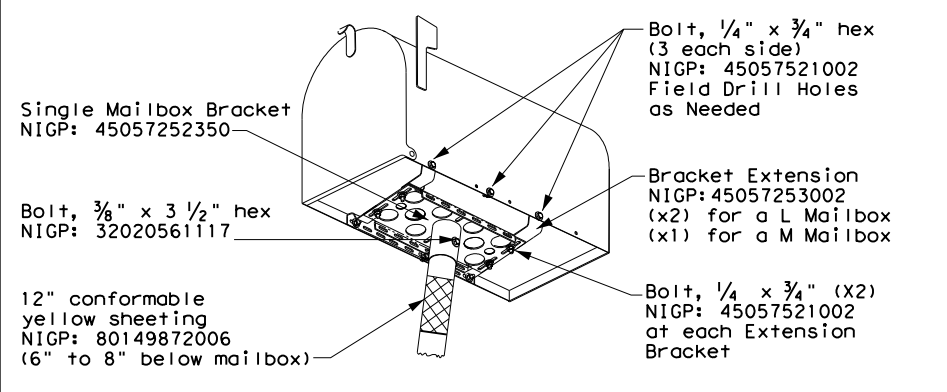
### TYPICAL INSTALLATION MEASUREMENTS



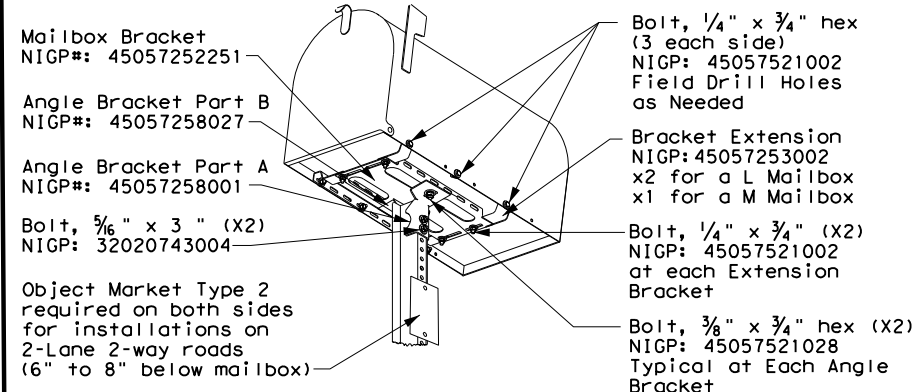
### NOTE:

Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Design Standard sheets PED-Pedestrian Facilities Curb Ramps.

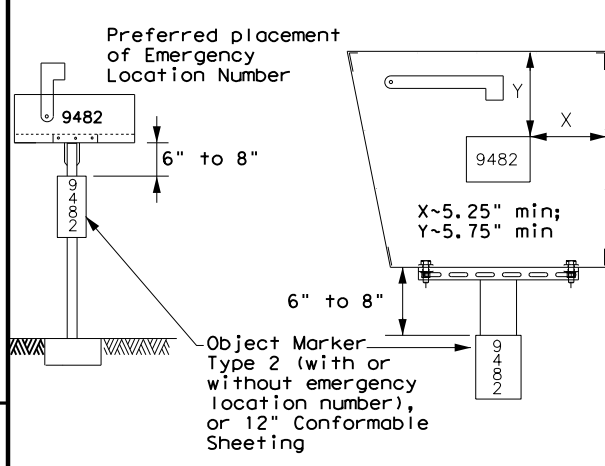
### TYPE 2 and 4 - SINGLE/DOUBLE



### TYPE 3 - SINGLE/DOUBLE

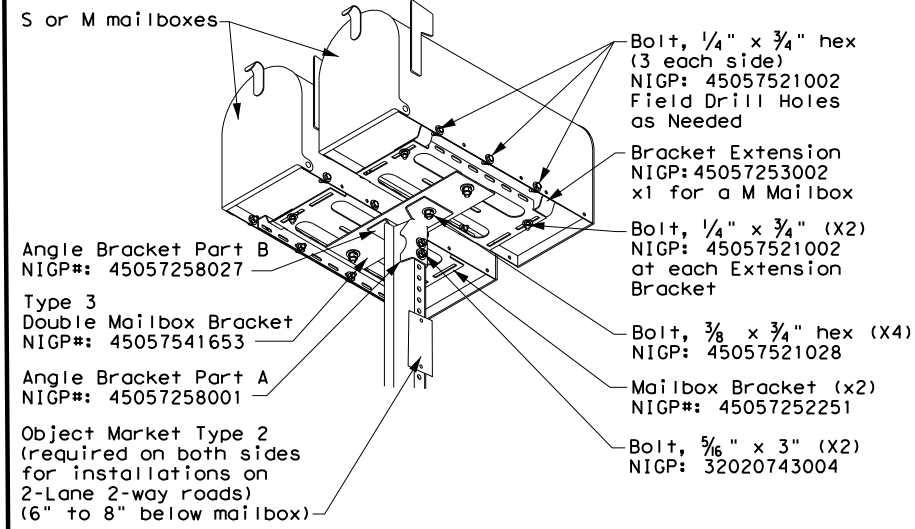
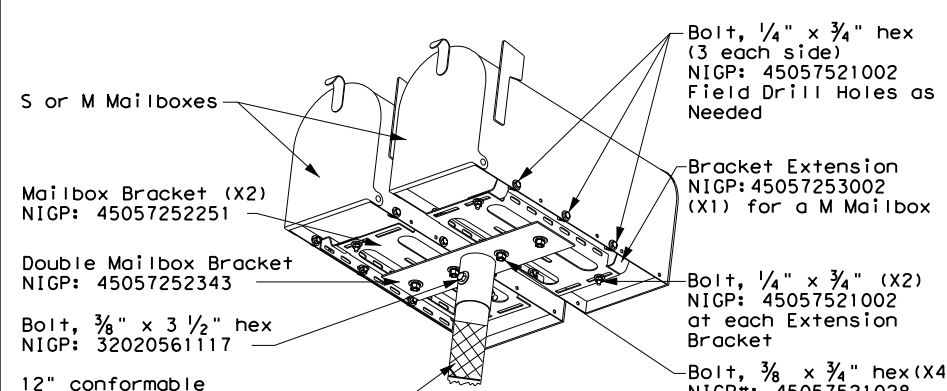


### PLACEMENT OF EMERGENCY LOCATION NUMBER

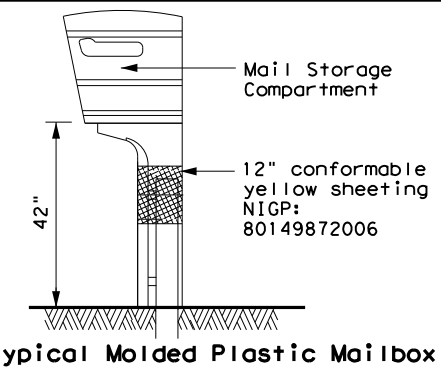


### NOTES:

- Location numbers are provided by homeowner. Minimum size 1" height.
- Location number is typically placed on the mailbox in a contrasting color.
- Black numbers may be placed on the Type 2 object marker if the numbers cannot be placed on the mailbox.
- Alternatively, a green or blue plate with white numbers attached may be mounted below the object marker. Other contrasting color configuration, as approved, may be used.
- See 3 of 4 for Foundation details.
- See 4 of 4 for Hardware details.



### TYPE 5



SHEET 1 OF 4



## MAILBOX MOUNTING AND ASSEMBLY

### MB(1)-21

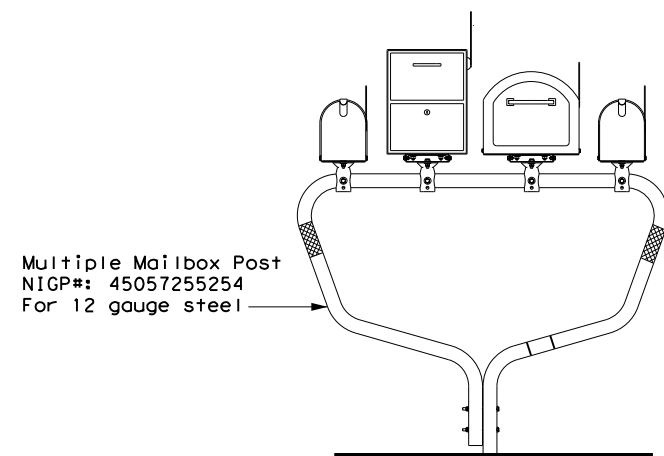
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© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
2/2005	11/2009	4/2015		
6/2005	1/2011			
11/2006	7/2014			
	DIST	COUNTY		SHEET NO.
	SAT	MEDINA		159

Maintenance Division Standard

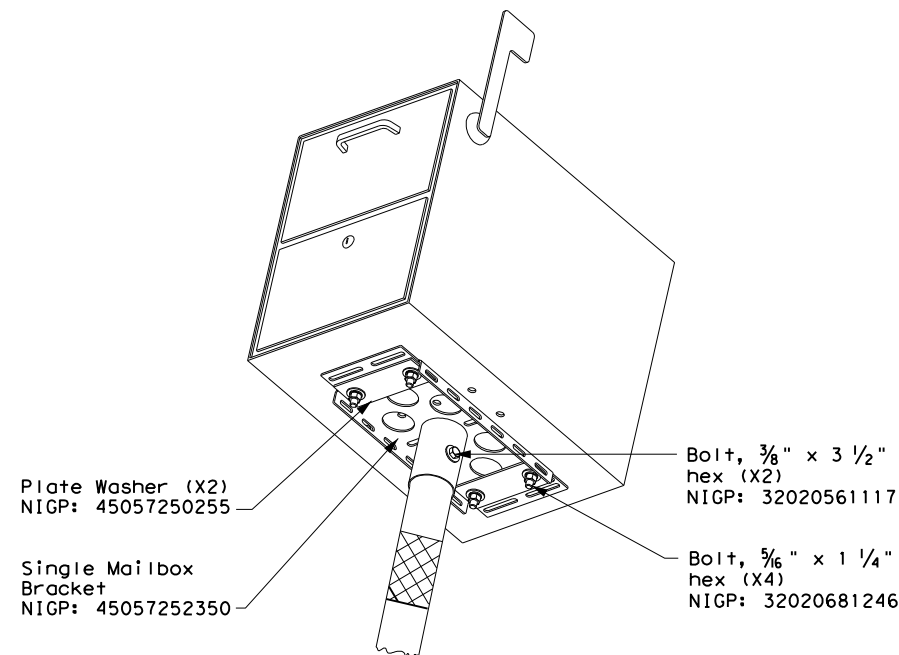
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 1/31/2024 2:59:39 PM  
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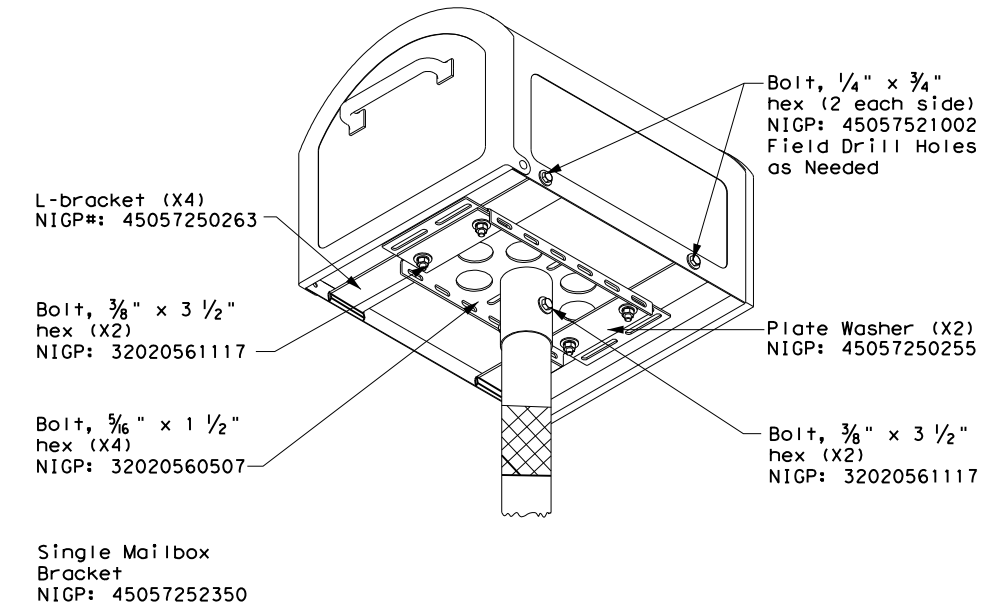
**TYPE 1 - MULTI LOCKABLE AND XL MAILBOX**



**TYPE 2/4 - SINGLE LOCKABLE MAILBOX**

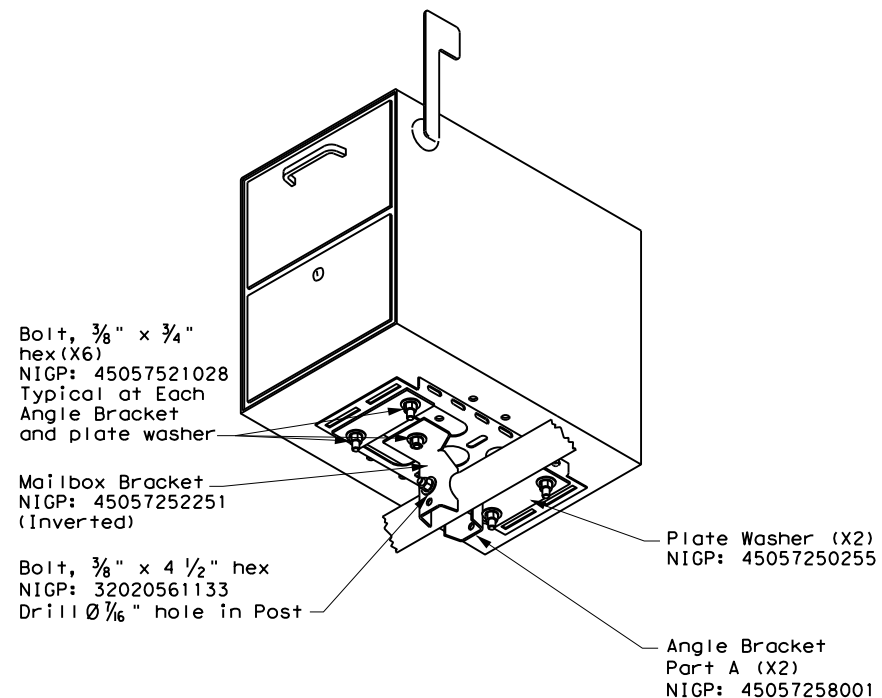


**TYPE 2/4 - SINGLE XL MAILBOX**

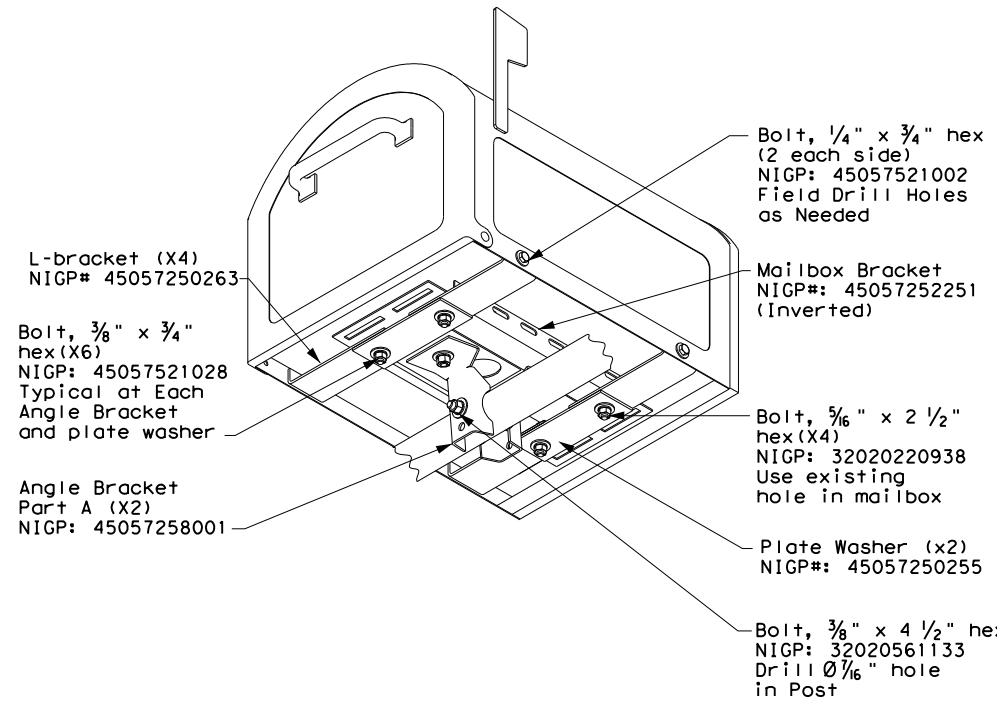


**NOTE:**  
 Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

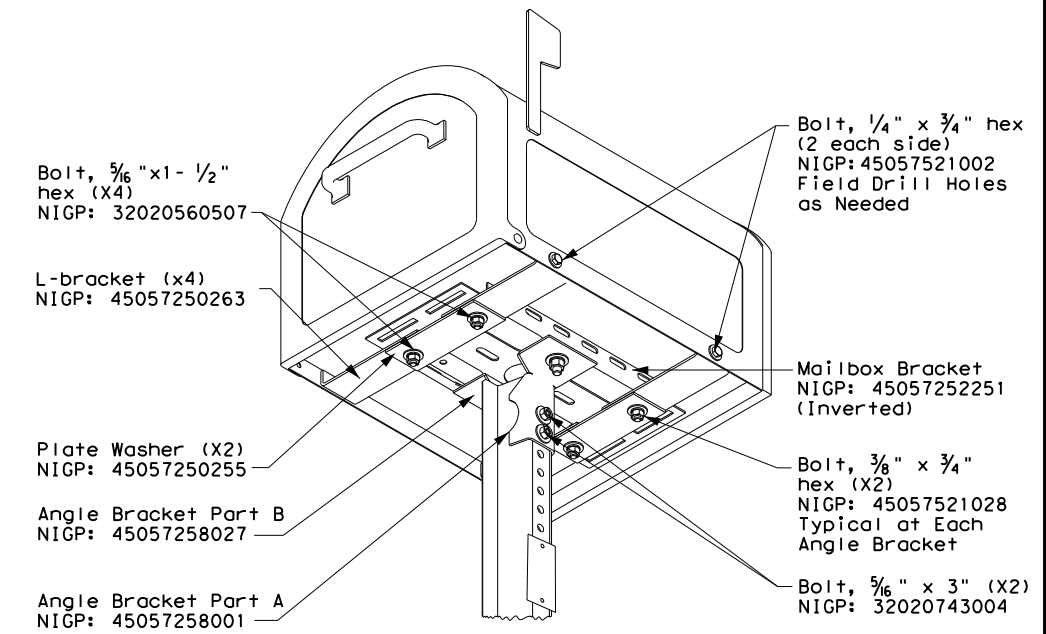
**TYPE 1 MULTI - LOCKABLE ARCHITECTURAL (LA)**



**TYPE 1 MULTI - XL MAILBOX**



**TYPE 3 - XL MAILBOX MOUNTING**



SHEET 2 OF 4

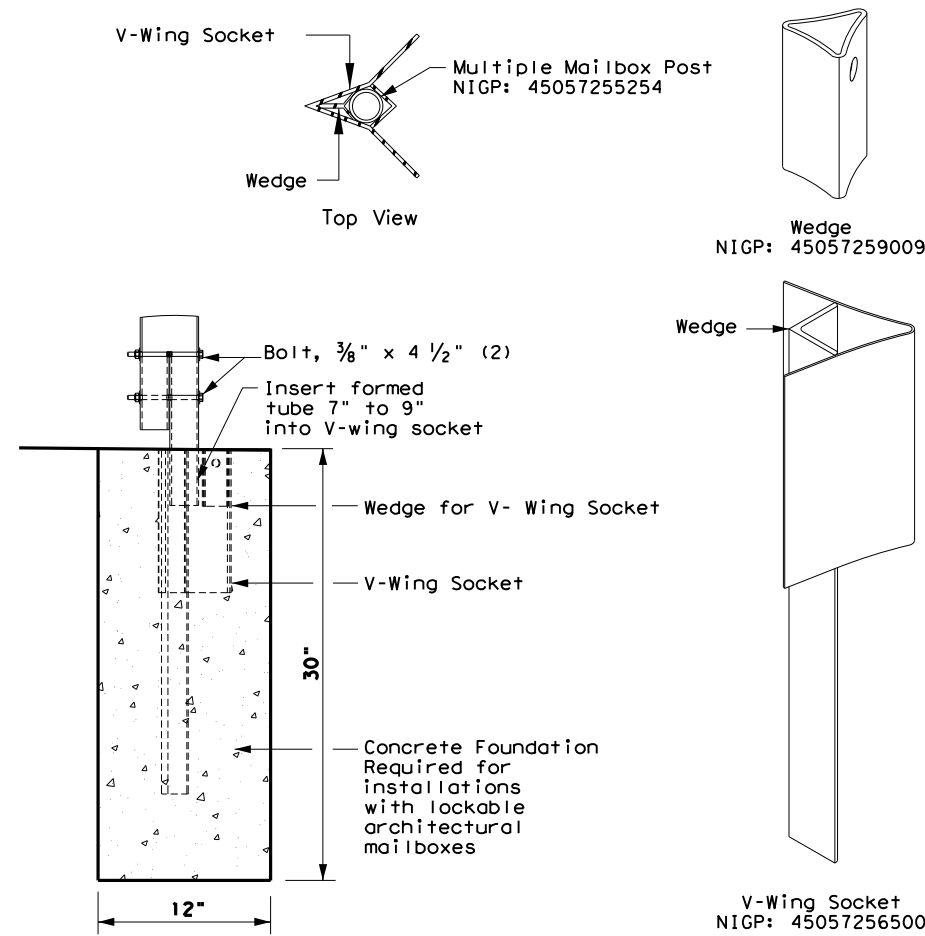
		Maintenance Division Standard	
<b>XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY</b> <b>MB (2) - 21</b>			
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT March 2004	CONT	SECT	JOB
2/2005	0848	04	052
6/2005			FM 462
11/2006	SAT	COUNTY	SHEET NO.
		MEDINA	160

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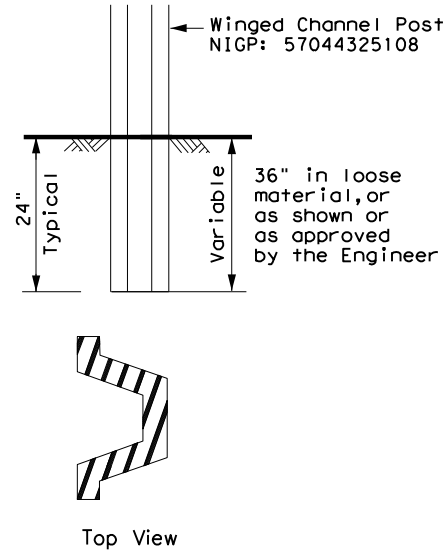
DATE: 1/31/2024 2:59:39 PM  
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### TYPE 1 - SUPPORT/FOUNDATION

Thin Wall Tube w/ V-LOC Anchorage



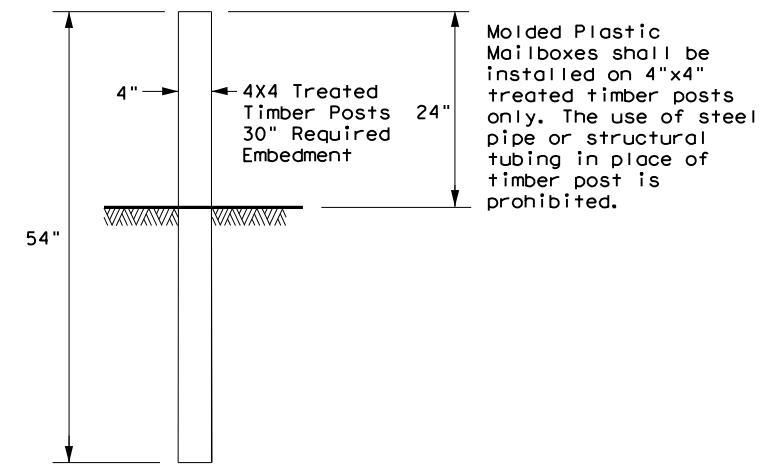
### TYPE 3 - SUPPORT/FOUNDATION



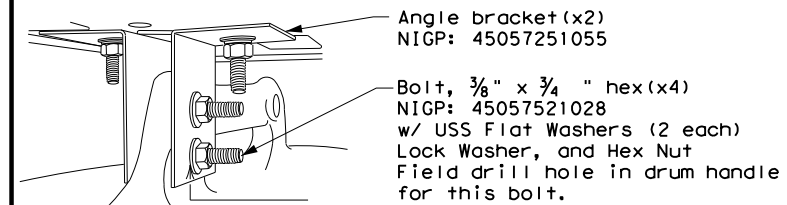
#### NOTES:

1. Attach Object Marker (OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

### TYPE 5 - SUPPORT/FOUNDATION



### TYPE 6 - TEMPORARY MAILBOX SUPPORT



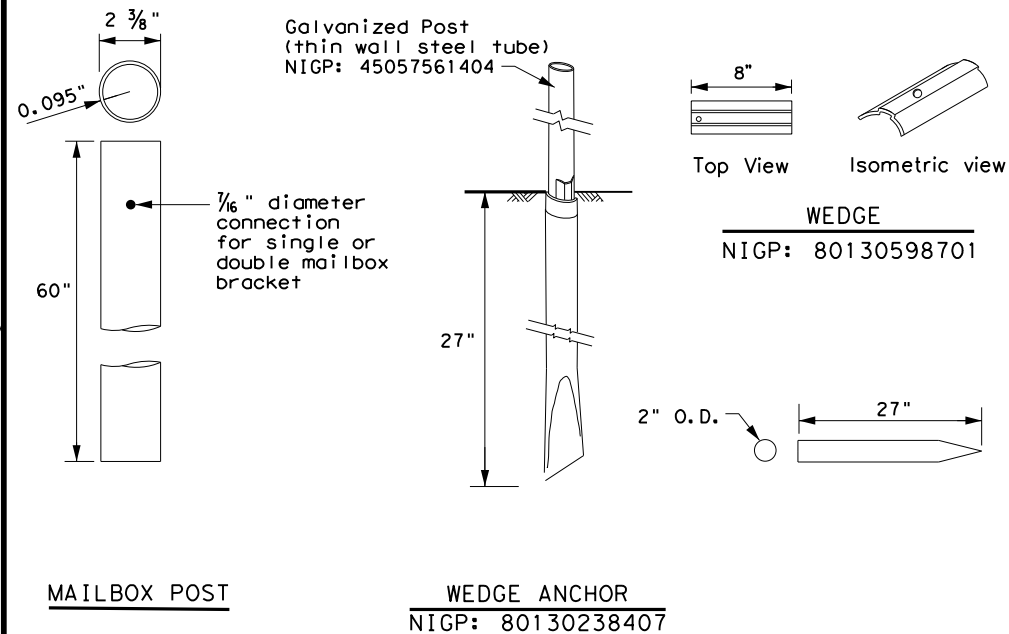
Plastic Drum NIGP: 55093383655  
 Rubber Collar NIGP: 55093387102

#### NOTES:

1. Place on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
2. Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

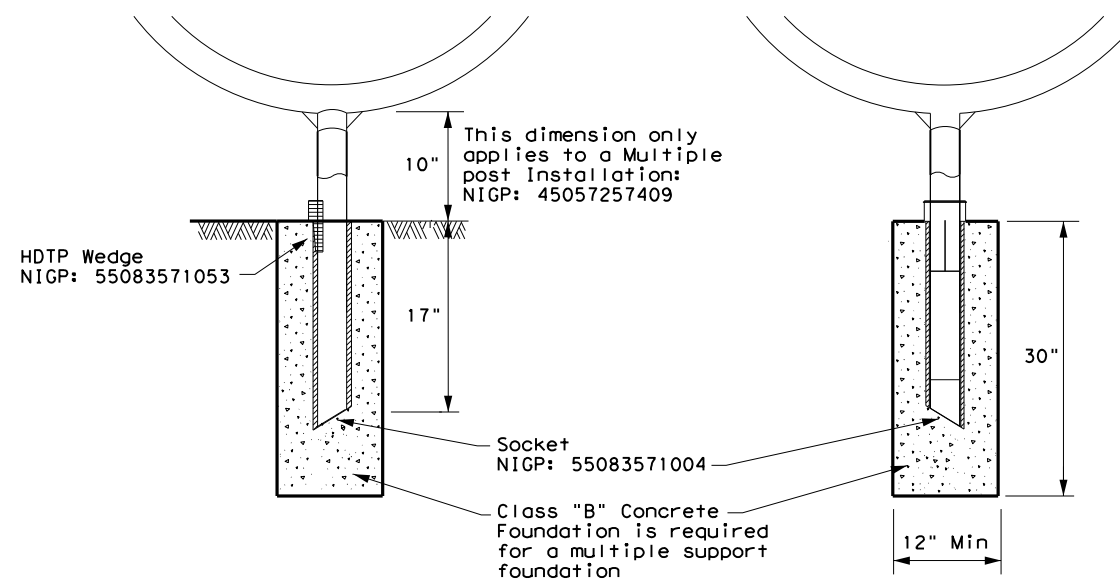
### TYPE 2 - SUPPORT/FOUNDATION

Thin Wall Steel Tube w/Wedge Anchor System



### TYPE 4 - SUPPORT/FOUNDATION

Whitecoated steel post NIGP: 45057561107  
 Multiple post NIGP: 45057257409  
 Recycled Rubber post (RR) NIGP: 45057561057



#### GENERAL NOTES:

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition, only on Type 1, Type 2, and Type 4

SHEET 3 OF 4



## MAILBOX SUPPORT AND FOUNDATION

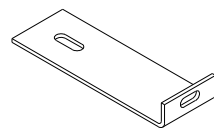
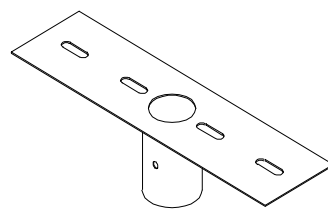
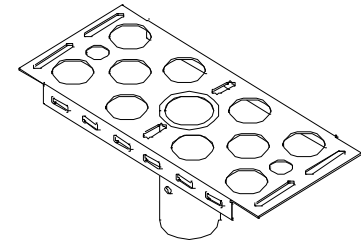
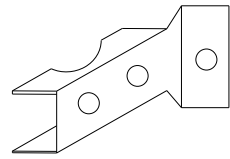
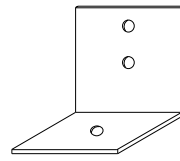
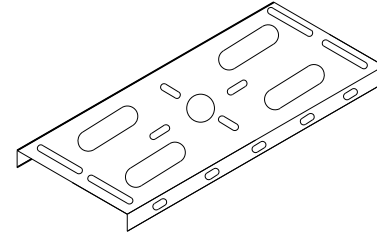
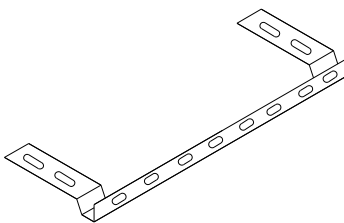
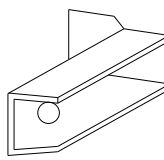
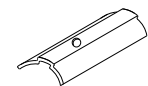

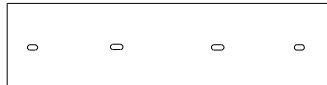
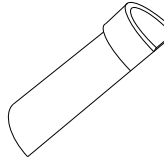
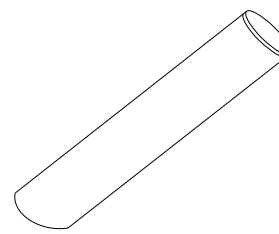

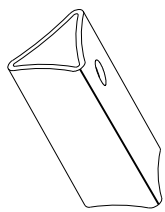
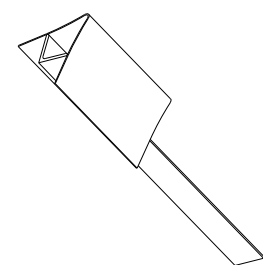
MB (3) - 21

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© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
2/2005	11/2009	4/2015		
6/2005	1/2011			
11/2006	7/2014			
	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	161	

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DATE: 1/31/2024 2:59:39 PM  
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TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: SS, SM, MM	S, M, L, XL, or LA	SS, SM, or MM	Outside Position: S or M Inside Position: S, M, L, or XL
Mailbox Post NIGP #	45057255254 (Galvanized Multiple)	45057561404 (Thin Walled Govanize)	57044325108 (Wing Channel Post)	45057561107 (Thin walled white powder coated) 45057561057 (Recycled Rubber Post: S or M only)	45057561107 (Thin Walled White Powder Coated)	45057257409 (White Powder Coated Multiple)
Post and Mailbox Hardware NIGP #	45057259009 (Wedge) 45057256500 (V-Wing Socket) 45057253002 (Bracket Extension) 45057252251 (Mailbox Bracket) 45057258001 (Part A Angle Bracket x2) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	80130598701 (Wedge) 80130238407 (Wedge Anchor) 45057253002 (Bracket Extension) 45057252343 (Double MB Bracket) 45057252350 (S. Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	45057541653 (Type 3 Double Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057253002 (Bracket Extension) 45057258001 (Part A Angle Bracket) 45057258027 (Part B Angle Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057252350 (Single Mailbox Bracket) 45057253002 (Bracket Extension) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252343 (Double Mount Bracket) 45057252251 (Mailbox Bracket x2)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252350 (Single Mount Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)
Foundation Used	Class B Concrete (Required for LA Mailboxes)	Class B Concrete (Required for LA Mailboxes)	None	Class B Concrete (not used with recycled rubber post, required for LA Mailboxes)	Class B Concrete (not required)	Class B Concrete

 NIGP: 45057250263 L-Bracket x4 for XL sized mailboxes	 NIGP: 45057252343 Double Mailbox Bracket For Type 2 and Type 4 double mount	 NIGP: 45057252350 Single Mailbox Bracket For Type 2 single and for Type 4 single and multi mount	 NIGP: 45057258001 Part "A" Angle Bracket For Type 1 multi (2 per mailbox) and Type 3 single and double
 NIGP: 45057251055 Type 6 Angle Bracket (2 per mailbox)	 NIGP: 45057252251 Mailbox Bracket For Type 1 multi and any double mount (use 2)	 NIGP: 45057253002 Bracket Extension Use 1 for a medium Mailbox Use 2 for a Large Mailbox	 NIGP: 45057258027 Part "B" Angle Bracket For Type 3 single and double
 NIGP: 80130598701 Wedge for Type 2	 NIGP: 45057250255 Plate Washer for Architecural and XL Mailboxes	 NIGP: 45057541653 Type 3 double mailbox bracket	 NIGP: 55083571053 Type 4 Mailbox Wedge
 NIGP: 55083571004 Type 4 Mailbox Socket	 NIGP: 80130238407 Type 2 Wedge Anchor	 NIGP: 45057259009 Wedge for Type 1 V-wing Socket	 NIGP: 45057256500 V-wing Socket for Type 1 Foundation

NIGP #	OBJECT MARKERS AND CONFORMABLE SHEETING
55008311759	Type 2 OM 4"x4" (3 Needed) for Type 3 Wing Channel Post
55008312906	Type 2 OM 6"x12" (1 needed) for Type 3 Wing Channel Post
80149872006	12" Conformable Reflective Yellow Sheeting for Flexible Posts

**NOTES:**

- Type 2 object marker in accordance with Traffic Engineering Standard Delineators & Object Markers.
- A light weight receptacle for newspaper delivery can be attached to mailbox posts if the receptacle does not touch the mailbox, present a hazard to traffic or delivery of the mail, extend beyond the front of the mailbox, or display advertising, except the publication title.

**BID CODES FOR CONTRACTS**

**MB-(X) ASSM TY (XXX) (X)**

Type of Mailbox \_\_\_\_\_

S = Single  
D = Double  
M = Multiple  
MP = Molded Plastic


Type of Post \_\_\_\_\_

WC = Winged Channel Post  
RR = Recycled Rubber  
TWW = Thin Walled White Tubing  
TWG = Thin Walled Galvanized Tubing  
TIM = Timber

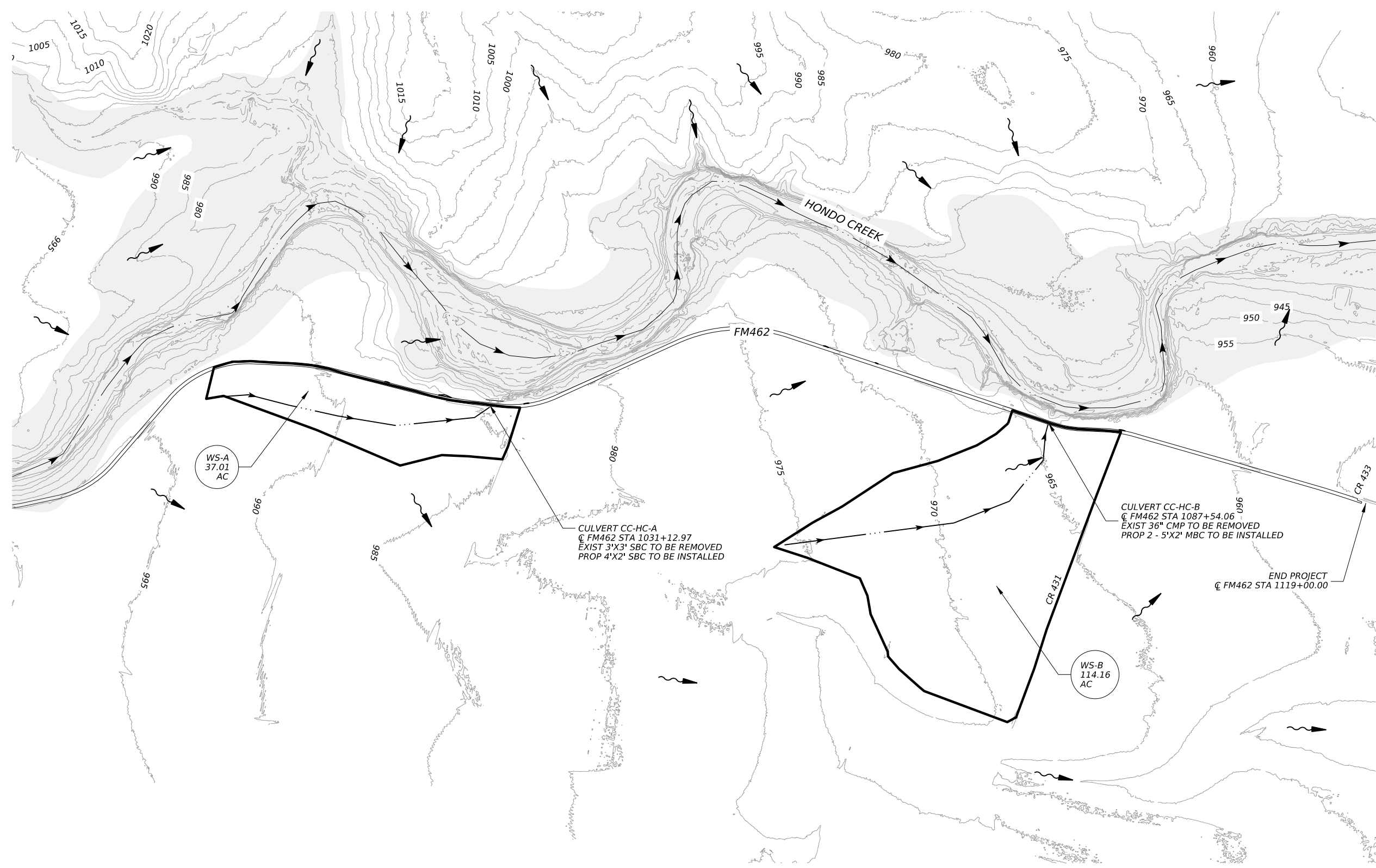
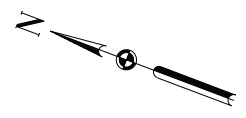
Type of Foundation \_\_\_\_\_

Ty 1 = V-Loc  
Ty 2 = Wedge Anchor Steel System  
Ty 3 = Winged Channel post  
Ty 4 = Wedge Anchor Plastic System  
Ty 5 = 4 X 4 Post

SHEET 4 OF 4

 Texas Department of Transportation				Maintenance Division Standard	
<b>NIGP PARTS LIST AND COMPATIBILITY</b>					
<b>MB(4)-21</b>					
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT	
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY	
	0848	04	052	FM 462	
2/2005	11/2009	4/2015			
6/2005	1/2011				
11/2006	7/2014	DIST		COUNTY	SHEET NO.
		SAT		MEDINA	162

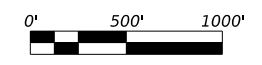
DW: CK: DW: CK: DW: CK:



- LEGEND**
- DRAINAGE AREA
  - STREAM CENTERLINE
  - 950 EXIST 5' CONTOURS
  - FEMA 100 YR FLOODPLAIN
  - xx-x  
xx.xx  
AC DRAINAGE AREA LABEL
  - DRAINAGE FLOW ARROWS

- NOTES:**
1. PREFIXES  
HC = HONDO CREEK
  2. FEMA FLOODPLAIN DATA BASED ON THE MEDINA COUNTY FEMA FIRM PANEL 48325C0325C, EFFECTIVE DATE 04/03/2012
  3. H&H FILES WERE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR PAT BRAUNER ON 1/10/2024
  4. DRAINAGE AREAS DELINEATED ON TNRIS 2018 LIDAR 5 FT CONTOURS
  5. RAINFALL DATA OBTAINED FROM TXDOT EBD LOOK UP FOR MEDINA COUNTY ZONE 3 AMS
  6. TIME OF CONCENTRATION CALCULATED USING NRCS METHOD N ACCORDANCE WITH TXDOT 2019-1 HDM CHAPTER 4 SECTION 11
  7. RUNOFF VALUES CALCULATED USING RATIONAL METHOD IN ACCORDANCE WITH TXDOT 2019-1 HDM CHAPTER 4 SECTION 12

1/31/2024



Name	AREA (AC)	C	TC (MIN)	Rational Flows, Q (cfs)													
				12-YR (IN/HR)	15-YR (IN/HR)	110-YR* (IN/HR)	125-YR (IN/HR)	150-YR (IN/HR)	1100-YR (IN/HR)	1500-YR (IN/HR)	2-YR	5-YR	10-YR*	25-YR	50-YR	100-YR	500-YR
WS-A	37.01	0.37	56	1.90	2.58	3.12	3.87	4.48	5.13	6.73	26	35	43	53	61	70	92
WS-B	114.16	0.37	52	2.00	2.71	3.27	4.06	4.69	5.36	7.02	84	114	138	171	198	226	297

\* DESIGN YEAR USED FOR PROPOSED CULVERTS

Name	TOC Calc Method	Time of Concentration	
		Sheet Flow Time t (min)	Shallow Concentrated Flow Time t (min)
CULV-A-EXIST	NRCS Method	16	40
CULV-B-EXIST	NRCS Method	9	43

NOTE: DUE TO FLAT TERRAIN, NO CHANNEL FLOW OBSERVED OR CALCULATED

**Kimley»Horn** F-928

© 2024  
Texas Department of Transportation

**FM 462**

**DRAINAGE AREA MAP**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY		SHEET NO.
SAT	MEDINA		163

DATE: 1/31/2024 4:32:45 PM  
 FILE: c:\pwworking\1\0285618\FM462\_DRG\_DAM.dgn



## EXISTING CULVERT CC-HC-A

### Site Data - CC-HC-A

Site Data Option: Culvert Invert Data

Inlet Station: 100.00 ft  
 Inlet Elevation: 979.62 ft  
 Outlet Station: 134.95 ft  
 Outlet Elevation: 978.93 ft  
 Number of Barrels: 1

### Culvert Data Summary - CC-HC-A

Barrel Shape: Concrete Box  
 Barrel Span: 3.00 ft  
 Barrel Rise: 3.00 ft  
 Barrel Material: Concrete  
 Embedment: 0.00 in  
 Barrel Manning's n: 0.0120  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge (0° flare) Wingwall  
 Inlet Depression: None

### Downstream Channel Rating Curve: CC-HC-A

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
26	979.32	0.67	6.13	3.23	1.68
35	979.42	0.77	6.58	3.7	1.71
43	979.49	0.84	6.92	4.06	1.73
53	979.57	0.93	7.29	4.45	1.75
61	979.63	0.99	7.53	4.74	1.77
70	979.70	1.05	7.70	5.06	1.78

### Tailwater Channel Data - CC-HC-A

Tailwater Channel Option: Irregular Channel

Channel Slope: 0.18  
 User Defined Channel

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	0	980.63	0.037
2	5	979.75	0.037
3	10	979.01	0.037
4	10.47	978.65	0.037
5	14.14	978.68	0.037
6	20	979.63	0.037
7	25	980.06	

### Roadway Data for Crossing - CC-HC-A

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Irregular Roadway Cross-Section

Coord No	Station (ft)	Elevation (ft)
0	103000	983.84
1	103100	983.65
2	103200	983.68
3	103300	984.33

Roadway Surface: Paved  
 Roadway Top Width: 22.00 ft

### Summary of Culvert Flows at Crossing: CC-HC-A

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Box Discharge (cfs)	Roadway Discharge (cfs)	Iterations
981.81	2-year	26	26	0.00	1
982.32	5-year	35	35	0.00	1
982.78	10-year	43	43	0.00	1
983.39	25-year	53	53	0.00	1
983.71	50-year	61	58	3.14	18
983.76	100-year	70	58.50	11.44	7
983.65	Overtopping	56.86	56.86	0.00	Overtopping

### Culvert Summary Table: CC-HC-A

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2-year	26	26	981.81	2.19	0.883	1-S2n	0.78	1.33	0.91	0.67	9.57	6.13
5-year	35	35	982.32	2.7	1.375	1-S2n	0.96	1.62	1.14	0.77	10.28	6.58
10-year	43	43	982.78	3.16	1.842	5-S2n	1.11	1.85	1.33	0.84	10.78	6.92
25-year	53	53	983.39	3.77	2.472	5-S2n	1.29	2.13	1.56	0.93	11.32	7.29
50-year	61	58	983.71	4.09	3.161	5-S2n	1.38	2.26	1.67	0.99	11.55	7.53
100-year	70	58.50	983.76	4.14	3.203	5-S2n	1.39	2.28	1.68	1.05	11.59	7.70

## PROPOSED CULVERT CC-HC-A

### Site Data - CC-HC-A Proposed

Site Data Option: Culvert Invert Data

Inlet Station: 100.00 ft  
 Inlet Elevation: 979.64 ft  
 Outlet Station: 146.00 ft  
 Outlet Elevation: 978.77 ft  
 Number of Barrels: 1

### Culvert Data Summary - CC-HC-A Proposed

Barrel Shape: Concrete Box  
 Barrel Span: 4.00 ft  
 Barrel Rise: 2.00 ft  
 Barrel Material: Concrete  
 Embedment: 0.00 in  
 Barrel Manning's n: 0.0120  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge (90°) Headwall (Ke=0.5)  
 Inlet Depression: None

### Downstream Channel Rating Curve: CC-HC-A Proposed

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
26	976.07	0.82	8.48	7.72	2.33
35	976.16	0.92	9.13	8.63	2.38
43	976.24	0.99	9.61	9.32	2.41
53	976.32	1.07	10.13	10.08	2.44
61	976.38	1.13	10.49	10.63	2.46
70	976.44	1.19	10.86	11.19	2.48

### Tailwater Channel Data - CC-HC-A Proposed

Tailwater Channel Option: Irregular Channel

Channel Slope: 0.18  
 User Defined Channel

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	0	981.02	0.037
2	6	980.46	0.037
3	12	976.67	0.037
4	18	975.25	0.037
5	24	976.48	0.037
6	30	980.85	0.037
7	36	981.62	0.037
8	42	981.46	

### Roadway Data for Crossing - CC-HC-A Proposed

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Irregular Roadway Cross-Section

Coord No	Station (ft)	Elevation (ft)
0	103000	984.77
1	103100	984.29
2	103200	984.49
3	103300	984.90

Roadway Surface: Paved  
 Roadway Top Width: 32.00 ft

### Summary of Culvert Flows at Crossing: CC-HC-A Proposed

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Box Discharge (cfs)	Roadway Discharge (cfs)	Iterations
981.47	2	26	26	0	1
981.91	5	35	35	0	1
982.34	10	43	43	0	1
982.95	25	53	53	0	1
983.52	50	61	61	0	1
984.27	100	70	70.00	0	1
984.29	Overtopping	70.22	70.22	0.00	Overtopping

### Culvert Summary Table: CC-HC-A Proposed

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2-year	26	26	981.47	1.83	0.524	1-S2n	0.62	1.09	0.70	0.82	9.32	8.48
5-year	35	35	981.91	2.27	1.008	5-S2n	0.76	1.33	0.87	0.92	10.01	9.13
10-year	43	43	982.34	2.7	1.715	5-S2n	0.88	1.53	1.02	0.99	10.52	9.61
25-year	53	53	982.95	3.31	2.256	5-S2n	1.01	1.76	1.20	1.07	11.05	10.13
50-year	61	61	983.52	3.88	2.748	5-S2n	1.12	1.93	1.33	1.13	11.44	10.49
100-year	70	70	984.27	4.63	3.304	5-S2n	1.23	2.00	1.48	1.19	11.81	10.86

1/31/2024



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FM 462

HYDRAULIC DATA  
 CULVERT CC-HC-A

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	164	

DATE: 1/31/2024 4:33:09 PM  
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DW: CK: DW: CK: DW: CK:

## EXISTING CULVERT CC-HC-B

### Site Data - CC-HC-B

Site Data Option: Culvert Invert Data

Inlet Station: 100.00 ft  
 Inlet Elevation: 958.20 ft  
 Outlet Station: 131.44 ft  
 Outlet Elevation: 956.60 ft  
 Number of Barrels: 1

### Culvert Data Summary - CC-HC-B

Barrel Shape: Circular  
 Barrel Diameter: 3.00 ft  
 Barrel Material: Corrugated Steel  
 Embedment: 0.00 in  
 Barrel Manning's n: 0.0240  
 Culvert Type: Straight  
 Inlet Configuration: Mitered to Conform to Slope  
 Inlet Depression: None

### Tailwater Channel Data - CC-HC-B

Tailwater Channel Option: Irregular Channel

Channel Slope: 0.07  
 User Defined Channel

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	0	957	0.025
2	8	956.34	0.025
3	16	955.57	0.035
4	24	955.22	0.035
5	32	955.77	0.035
6	40	956.41	0.025
7	48	956.84	0.025
8	56	957.12	

### Roadway Data for Crossing - CC-HC-B

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Irregular Roadway Cross-Section

Coord No	Station (ft)	Elevation (ft)
0	108700	962.30
1	108750	962.22
2	108800	962.61

Roadway Surface: Paved  
 Roadway Top Width: 22.00 ft

### Summary of Culvert Flows at Crossing: CC-HC-B

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Box Discharge (cfs)	Roadway Discharge (cfs)	Iterations
962.57	2-year	84	49.07	34.85	13
962.69	5-year	114	50.27	63.71	6
962.77	10-year	138	51.06	86.92	5
962.87	25-year	171	52.02	118.98	5
962.95	50-year	198	52.73	145.26	4
963.02	100-year	226	53.41	172.59	4
962.22	Overtopping	45.49	45.49	0.00	Overtopping

### Downstream Channel Rating Curve: CC-HC-B

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
84	956.04	0.82	7.53	4.03	1.96
114	956.15	0.93	8.21	4.56	2.01
138	956.22	1.00	8.66	4.92	2.04
171	956.31	1.09	9.20	5.37	2.08
198	956.38	1.16	9.57	5.70	2.10
226	956.44	1.22	9.97	5.99	2.14

### Culvert Summary Table: CC-HC-B

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2-year	84	49.07	962.57	4.37	2.890	5-S2n	1.68	2.28	1.74	0.82	11.51	7.53
5-year	114	50.27	962.69	4.49	2.995	5-S2n	1.7	2.31	1.77	0.93	11.58	8.21
10-year	138	51.06	962.77	4.57	3.065	5-S2n	1.72	2.32	1.79	1.00	11.62	8.66
25-year	171	52.02	962.87	4.67	3.151	5-S2n	1.74	2.34	1.81	1.09	11.67	9.20
50-year	198	52.73	962.95	4.75	3.215	5-S2n	1.75	2.36	1.83	1.16	11.70	9.57
100-year	226	53.41	963.02	4.82	3.278	5-S2n	1.77	2.37	1.84	1.22	11.74	9.97

## PROPOSED CULVERT CC-HC-B

### Site Data - CC-HC-B PROPOSED

Site Data Option: Culvert Invert Data

Inlet Station: 100.00 ft  
 Inlet Elevation: 958.36 ft  
 Outlet Station: 146.00 ft  
 Outlet Elevation: 956.21 ft  
 Number of Barrels: 2

### Culvert Data Summary - CC-HC-B PROPOSED

Barrel Shape: Concrete Box  
 Barrel Span: 5.00 ft  
 Barrel Rise: 2.00 ft  
 Barrel Material: Concrete  
 Embedment: 0.00 in  
 Barrel Manning's n: 0.0120  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge (90°) Headwall  
 Inlet Depression: None

### Tailwater Channel Data - CC-HC-B Proposed

Tailwater Channel Option: Irregular Channel

Channel Slope: 0.08  
 User Defined Channel

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	0	957	0.025
2	8	956.34	0.025
3	16	955.57	0.035
4	24	955.22	0.035
5	32	955.77	0.035
6	40	956.41	0.25
7	48	956.84	0.25
8	56	957.12	

### Roadway Data for Crossing - CC-HC-B Proposed

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Irregular Roadway Cross-Section

Coord No	Station (ft)	Elevation (ft)
0	108700	962.23
1	108750	962.62
2	108800	963.22

Roadway Surface: Paved  
 Roadway Top Width: 32.00 ft

### Summary of Culvert Flows at Crossing: CC-HC-B Proposed

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Box Discharge (cfs)	Roadway Discharge (cfs)	Iterations
960.54	2-year	84	84.00	0.00	1
961.18	5-year	114	114.00	0.00	1
961.79	10-year	138	138.00	0.00	1
962.55	25-year	171	163.03	7.93	8
962.75	50-year	198	169.01	28.87	8
962.90	100-year	226	173.13	52.82	7
962.62	Overtopping	152.93	152.93	0.00	Overtopping

### Downstream Channel Rating Curve: CC-HC-B Proposed

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
84	956.01	0.78	8.13	4.80	2.16
114	956.11	0.89	8.87	5.42	2.22
138	956.18	0.96	9.37	5.85	2.25
171	956.27	1.04	9.95	6.38	2.29
198	956.33	1.11	10.36	6.77	2.32
226	956.39	1.17	10.74	7.14	2.35

### Culvert Summary Table: CC-HC-B Proposed

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2-year	84	84.00	960.54	2.18	0.0*	5-S2n	0.54	1.30	0.64	0.78	13.06	8.13
5-year	114	114.00	961.18	2.82	0.550	5-S2n	0.66	1.59	0.82	0.89	13.89	8.87
10-year	138	138.00	961.79	3.43	1.081	5-S2n	0.74	1.81	0.95	0.96	14.45	9.37
25-year	171	163.03	962.55	4.19	1.703	5-S2n	0.83	2.00	1.09	1.04	14.92	9.95
50-year	198	169.01	962.75	4.39	1.842	5-S2n	0.85	2.00	1.13	1.11	15.02	10.36
100-year	226	173.13	962.90	4.54	1.941	5-S2n	0.87	2.00	1.15	1.17	15.11	10.74



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FM 462

HYDRAULIC DATA  
 CULVERT CC-HC-B

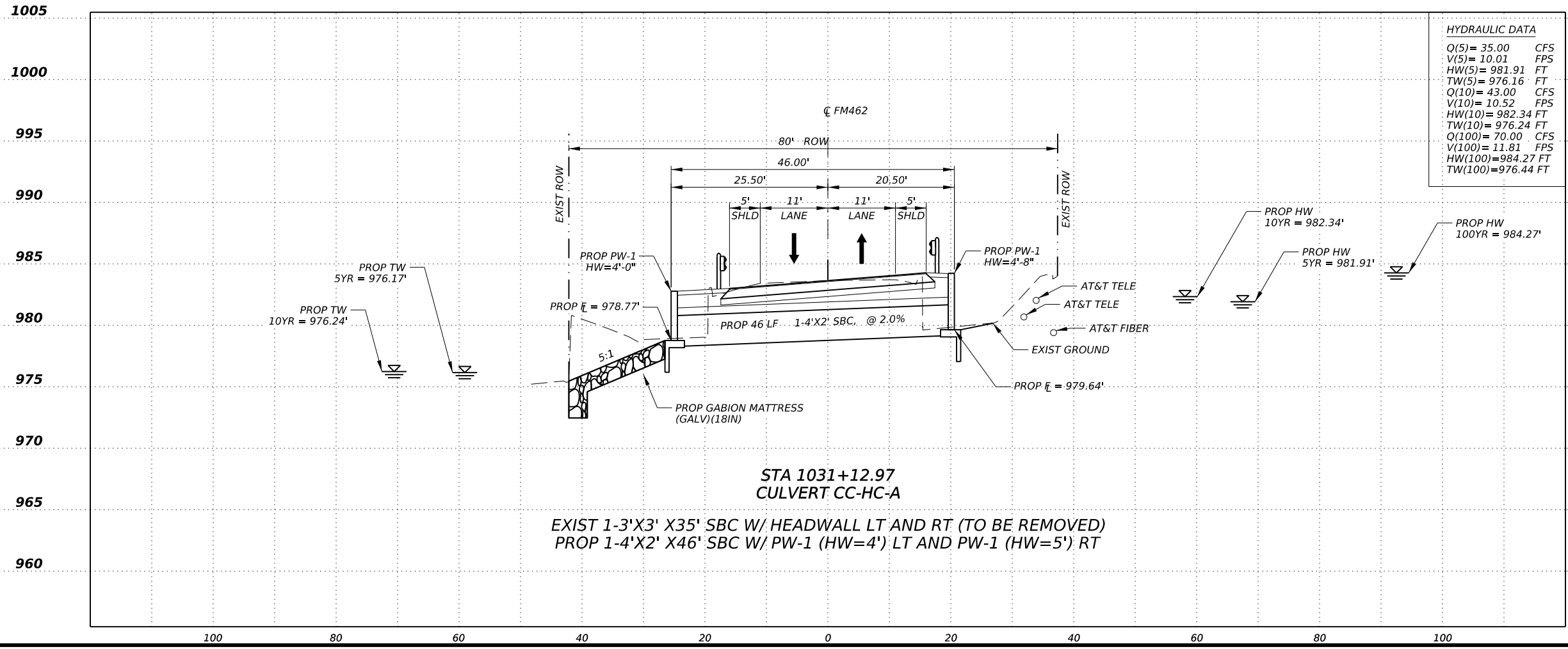
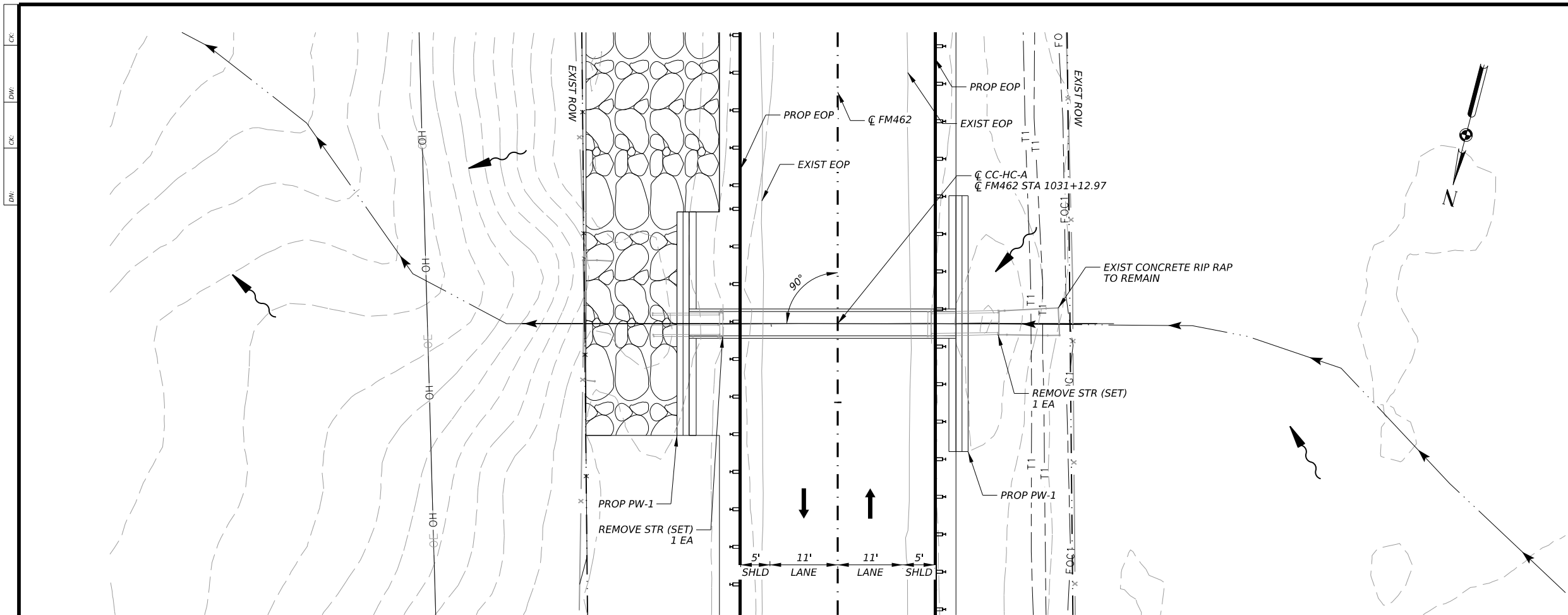
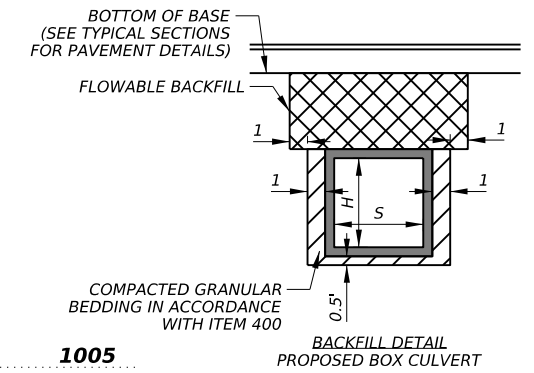
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	165	

ITEM	DESCRIPTION	UNIT	QTY
0401 6001	FLOWABLE BACKFILL	CY	15
0462 6003	CONC BOX CULV (4 FT X 2 FT)	LF	46
0466 6179	WINGWALL (PW - 1) (HW=4 FT)	EA	1
0466 6180	WINGWALL (PW - 1) (HW=5 FT)	EA	1
0496 6004	REMOV STR (SET)	EA	2
0496 6008	REMOV STR (BOX CULVERT)	LF	35

**LEGEND**

- FLOW LINE
- EXIST 1' CONTOURS
- EXIST ROW
- EXIST FENCE
- EXIST FEATURES



**HYDRAULIC DATA**

Q(5) = 35.00	CFS
V(5) = 10.01	FPS
HW(5) = 981.91	FT
TW(5) = 976.16	FT
Q(10) = 43.00	CFS
V(10) = 10.52	FPS
HW(10) = 982.34	FT
TW(10) = 976.24	FT
Q(100) = 70.00	CFS
V(100) = 11.81	FPS
HW(100) = 984.27	FT
TW(100) = 976.44	FT

1005

1000

995

990

985

980

975

970

965

960

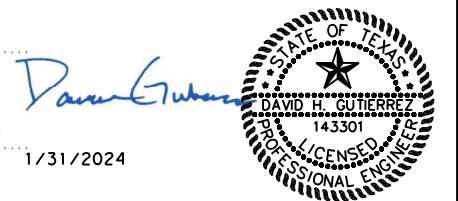
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V(5) = 10.01 FPS  
HW(5) = 981.91 FT  
TW(5) = 976.16 FT  
Q(10) = 43.00 CFS  
V(10) = 10.52 FPS  
HW(10) = 982.34 FT  
TW(10) = 976.24 FT  
Q(100) = 70.00 CFS  
V(100) = 11.81 FPS  
HW(100) = 984.27 FT  
TW(100) = 976.44 FT

1/31/2024

0' 10' 20' HORIZ  
0' 5' 10' VERT



**Kimley»Horn** F-928

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FM 462

CULVERT LAYOUT  
CC-HC-A

SHEET 1 OF 2

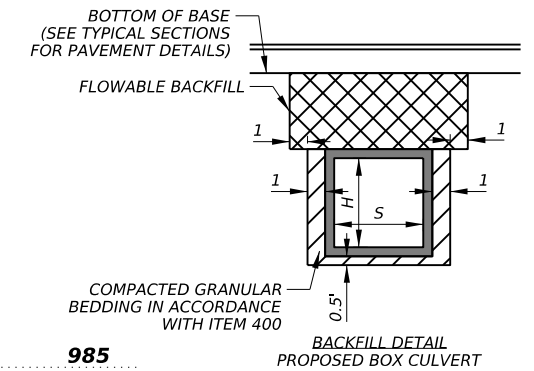
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0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	166

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ITEM	DESCRIPTION	UNIT	QTY
0401 6001	FLOWABLE BACKFILL	CY	20
0462 6006	CONC BOX CULV (5 FT X 2 FT)	LF	92
0466 6180	WINGWALL (PW - 1) (HW=5 FT)	EA	1
0467 6171	SET (TY I)(S= 5 FT)(HW= 3 FT)(3:1) (C)	EA	1
0496 6006	REMOV STR (HEADWALL)	EA	2
0496 6007	REMOV STR (PIPE)	LF	32

**LEGEND**

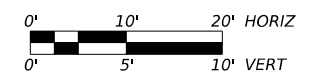
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- EXIST 1' CONTOURS
- EXIST ROW
- EXIST FENCE
- EXIST FEATURES



**HYDRAULIC DATA**

Q(5)	= 108.00	CFS
V(5)	= 13.89	FPS
HW(5)	= 961.18	FT
TW(5)	= 956.11	FT
Q(10)	= 138.00	CFS
V(10)	= 14.45	FPS
HW(10)	= 962.79	FT
TW(10)	= 956.18	FT
Q(100)	= 226.00	CFS
V(100)	= 15.11	FPS
HW(100)	= 962.90	FT
TW(100)	= 956.39	FT

1/31/2024



**Kimley»Horn** F-928

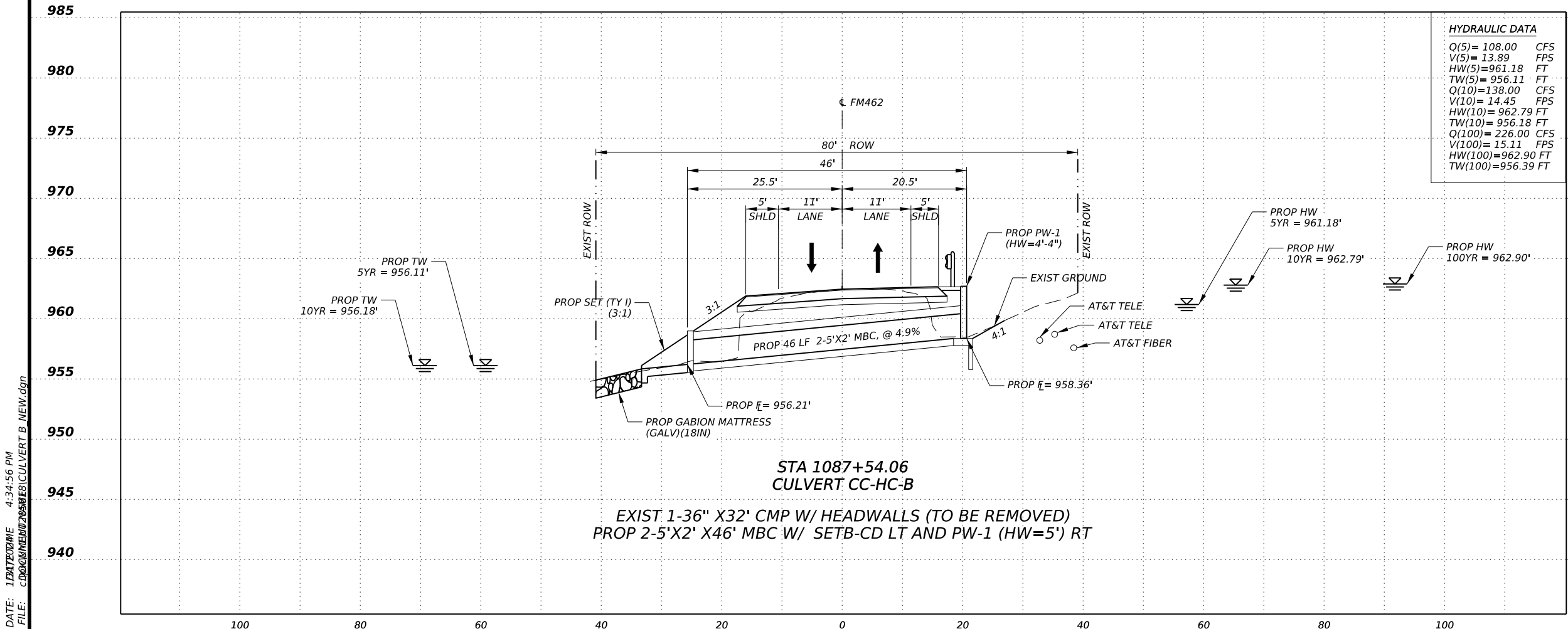
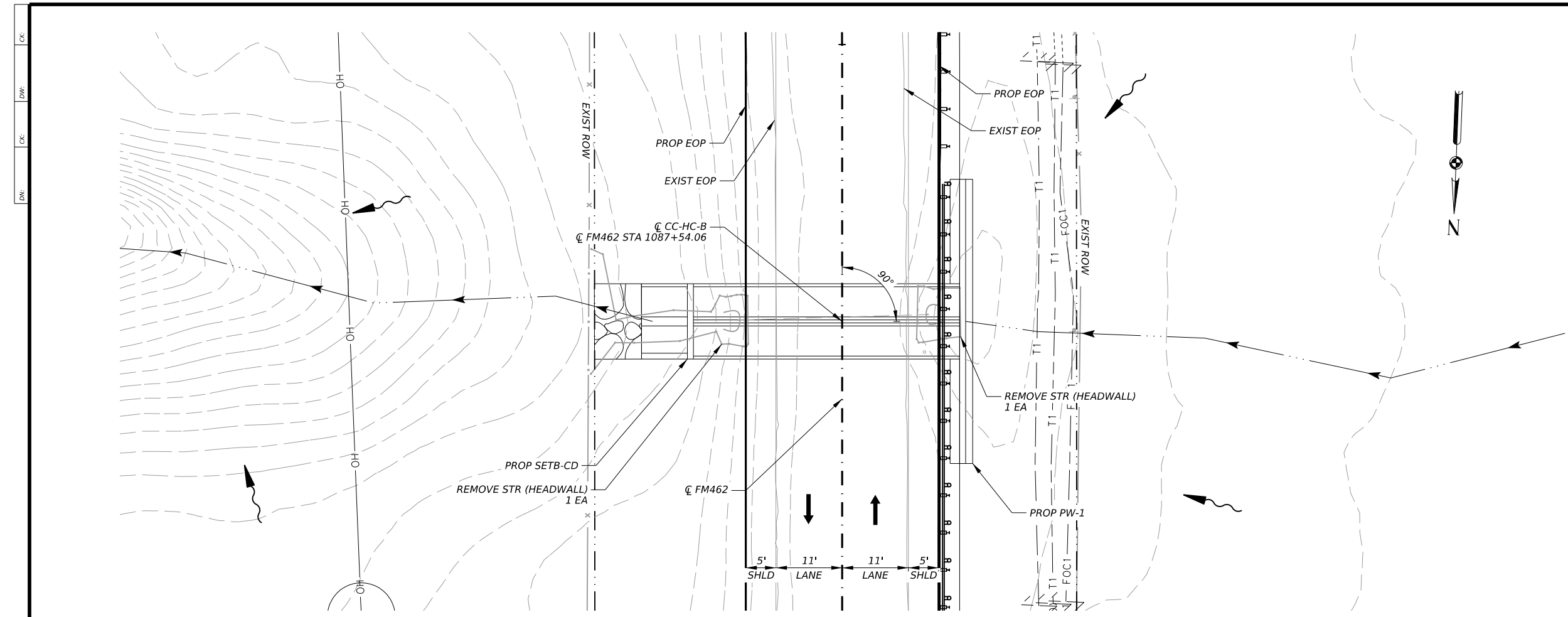
Texas Department of Transportation

FM 462

CULVERT LAYOUT  
CC-HC-B

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	167	



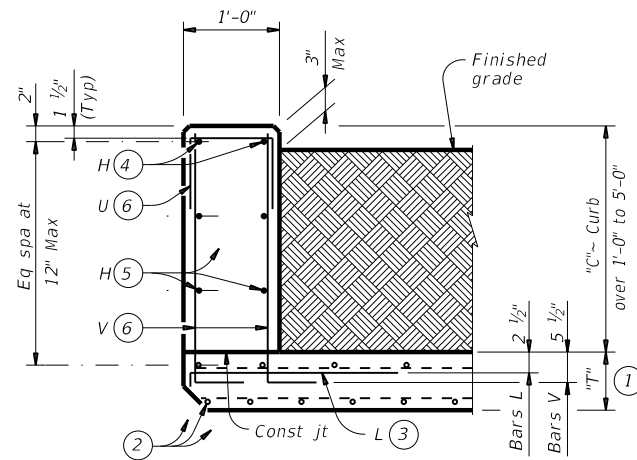
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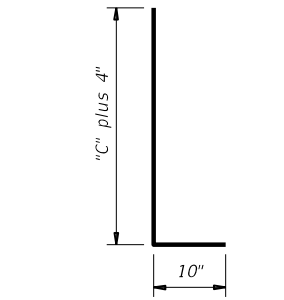
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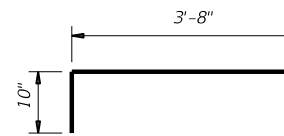
**TYPICAL SECTION**

Used for curbs over 1'-0" to 5'-0"



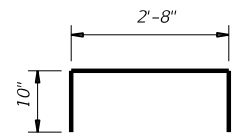
**BARS V (#5)**

Spaced at 12" Max



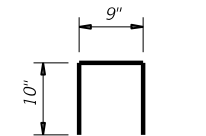
**BARS L (#5)**

Spaced at 12" Max



**OPTIONAL BARS L (#5)**

Spaced at 12" Max



**BARS U (#4)**

Spaced at 12" Max

- ① "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 8" thick, see SCP-MD standard for additional details.
- ② Adjust normal culvert slab bars as necessary to clear obstructions.
- ③ Place bars L as shown. Tilt hook as necessary to maintain cover.
- ④ Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.
- ⑤ Additional bars H(#4) as required to maintain 12" Max spacing.
- ⑥ Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.
- ⑦ Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.
- ⑧ Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

**TABLE OF ESTIMATED CURB QUANTITIES**

Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)
1'-0"	0.037	10.4
1'-6"	0.056	14.5
2'-0"	0.074	15.6
2'-6"	0.093	18.0
3'-0"	0.111	19.0
3'-6"	0.130	21.3
4'-0"	0.148	22.4
4'-6"	0.167	24.8
5'-0"	0.185	25.9

**CONSTRUCTION NOTES:**

Adjust reinforcing steel as necessary to provide 1 1/4" cover. For vehicle safety, top of the curb must not project more than 3" above the finished grade.

**MATERIAL NOTES:**

Provide Grade 60 reinforcing steel.  
Provide galvanized reinforcing steel if required elsewhere in the plans.  
Provide Class "C" concrete (f'c = 3,600 psi) minimum for curbs.  
Provide bar laps, where required, as follows:  
• Coated or galvanized ~ #4 = 1'-8" Min

**GENERAL NOTES:**

Designed according to AASHTO LRFD Bridge Design Specifications.  
These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with PR11, PR22 and PR3 type rails. These details are not suitable for the mounting of other rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.  
This Curb is considered as part of the Box Culvert for payment.

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



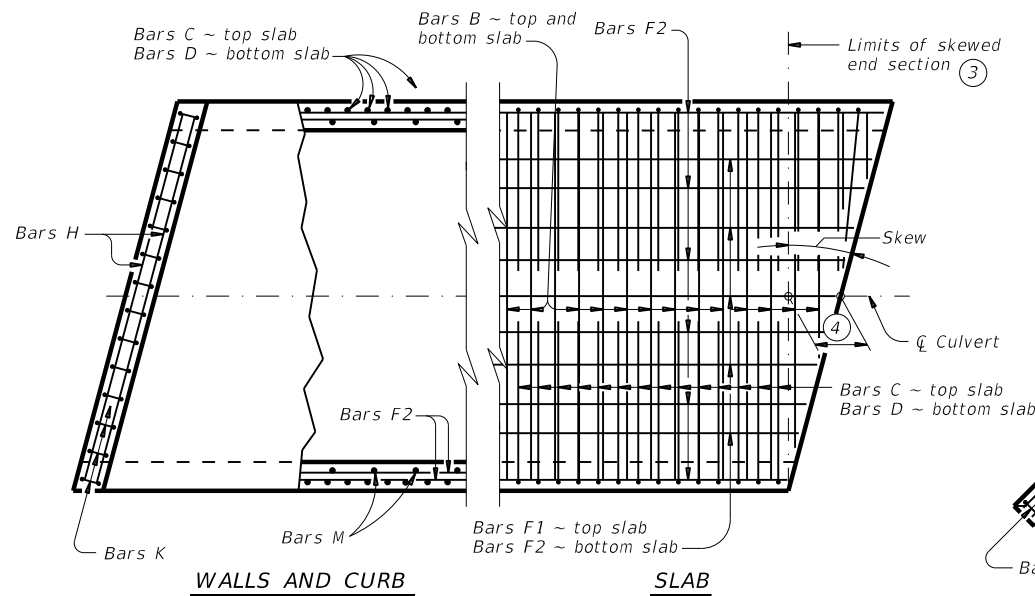
**EXTENDED CURB DETAILS FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL**

**ECD**

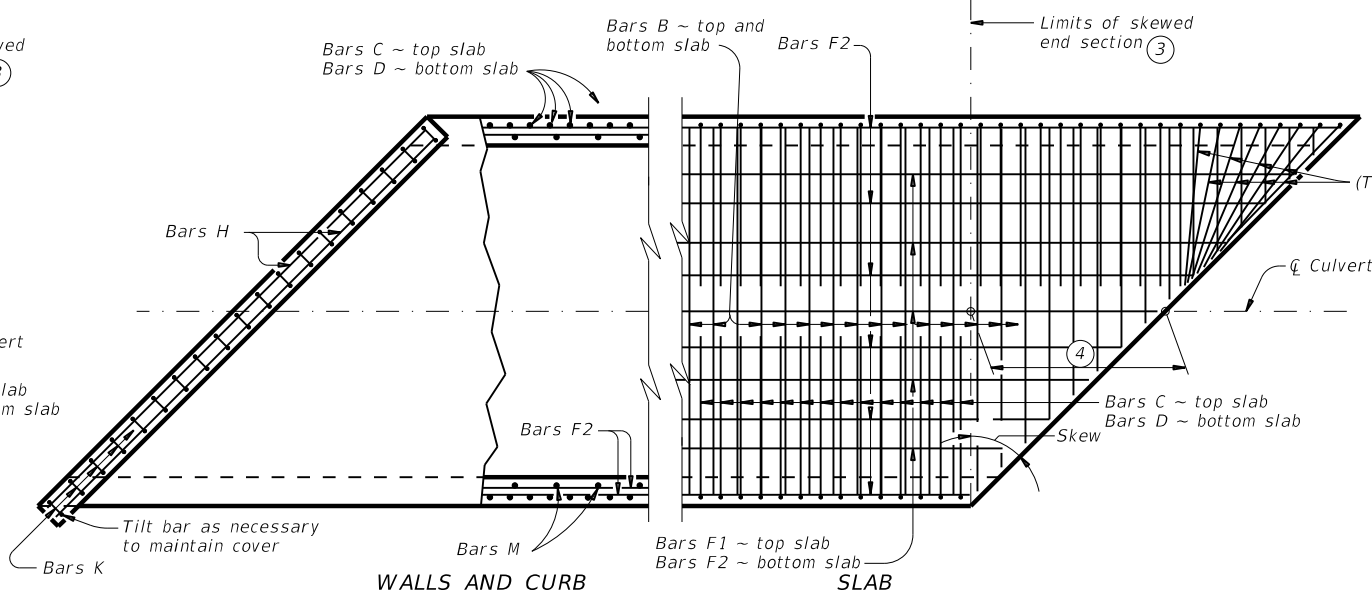
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	169	

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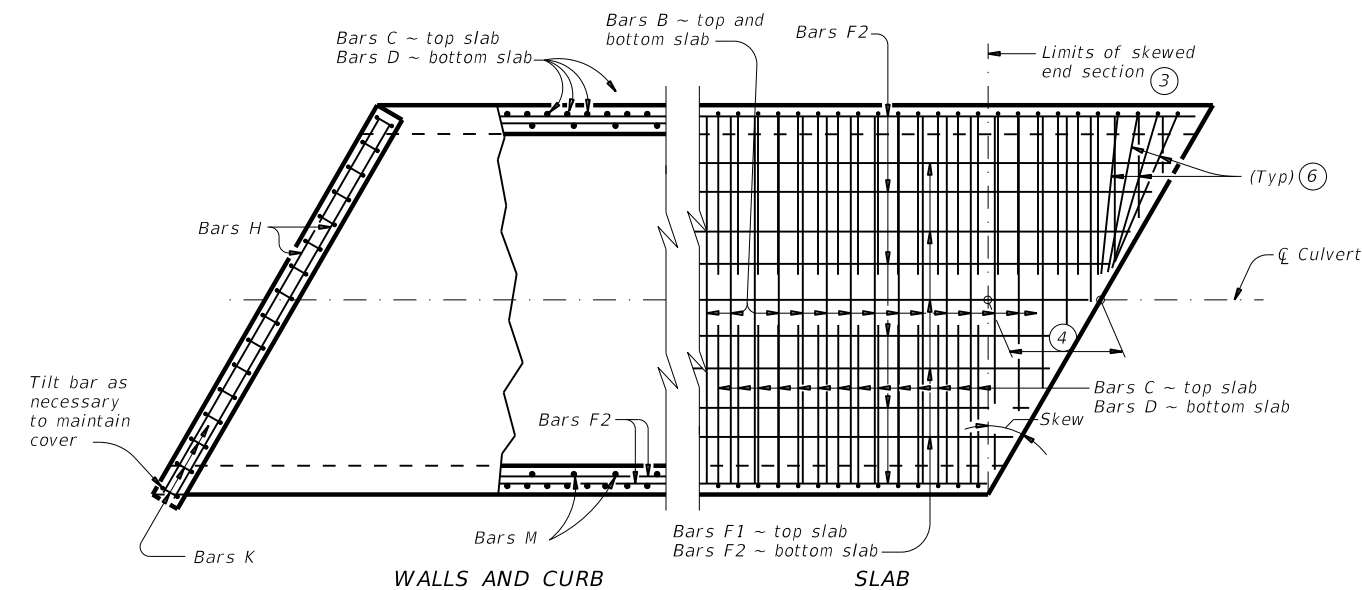
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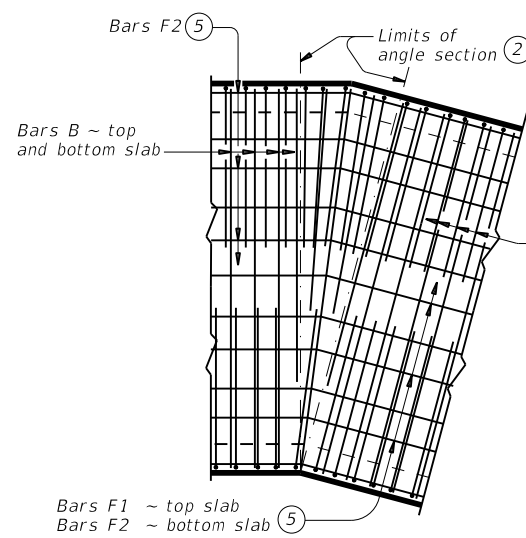
PLAN OF SKEWED ENDS ~ FROM 0° TO 15°



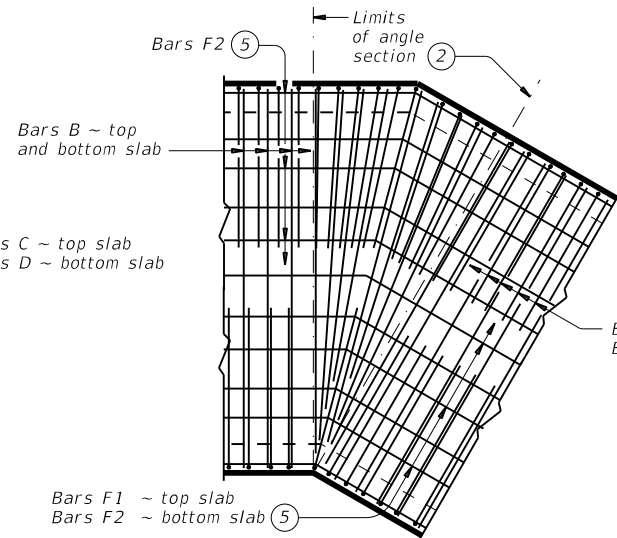
PLAN OF SKEWED ENDS ~ OVER 30° TO 45°



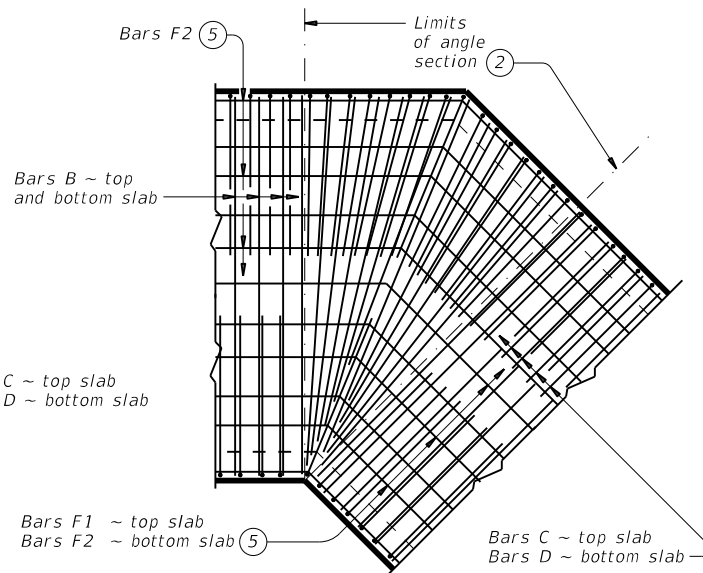
PLAN OF SKEWED ENDS ~ OVER 15° TO 30°



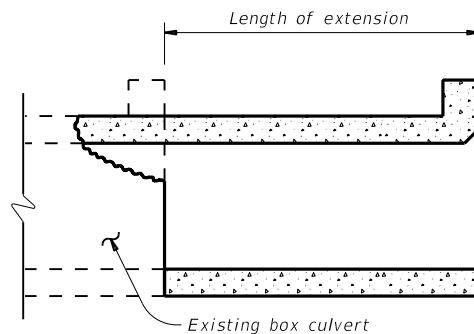
PLAN OF ANGLE SECTION ~ FROM 0° TO 15°



PLAN OF ANGLE SECTION ~ OVER 15° TO 30°



PLAN OF ANGLE SECTION ~ OVER 30° TO 45°



LENGTHENING DETAIL

- For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.  
 For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, C, D, E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.  
 Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.

- When the spacing between Bars B becomes less than half of the normal spacing, cut bars to avoid conflict.
- The length of Bars B vary in the skewed end sections.
- $[One\ half\ of\ overall\ width] \times [tangent\ of\ the\ skew\ angle]$
- Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.
- When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.
- At the Contractor's option, for skews of 15° or less, place Bars B, C, and D parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B shown on the Single Box Culverts Cast-In-Place (SCC) standards sheets to accommodate the skew.

**CONSTRUCTION NOTES:**

Do not use permanent forms.  
 When required, lap Bars H 1'-8" for uncoated or galvanized bars.  
 Provide a minimum of 1 1/2" clear cover.

**MATERIAL NOTES:**

Provide Grade 60 reinforcing steel.  
 Provide galvanized reinforcing steel, if required elsewhere in the plans.  
 Provide Class C concrete ( $f'c = 3,600$  psi) with these exceptions:  
 provide Class S concrete ( $f'c = 4,000$  psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

**GENERAL NOTES:**

Designed according to AASHTO LRFD Bridge Design Specifications.  
 Refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for details of straight sections of culvert.  
 For skewed sections and angle sections, refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.  
 For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the culvert Single Box Culverts Cast-In-Place (SCC) standard sheets by the cosine of the skew angle.

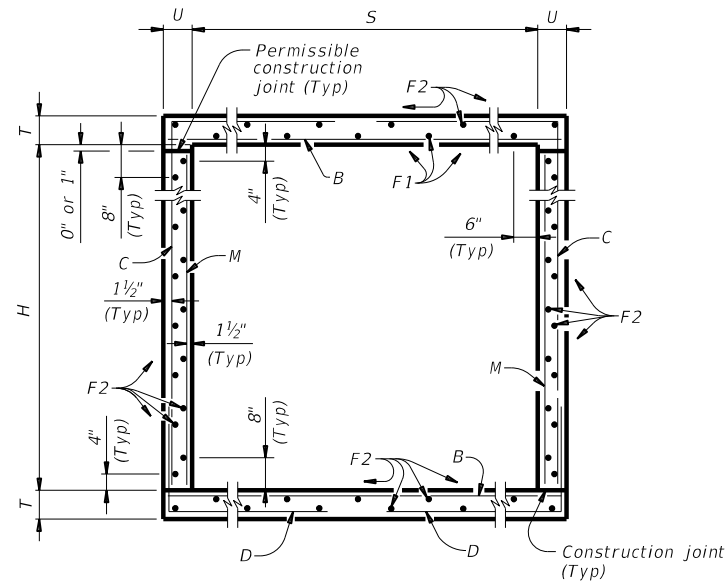
Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

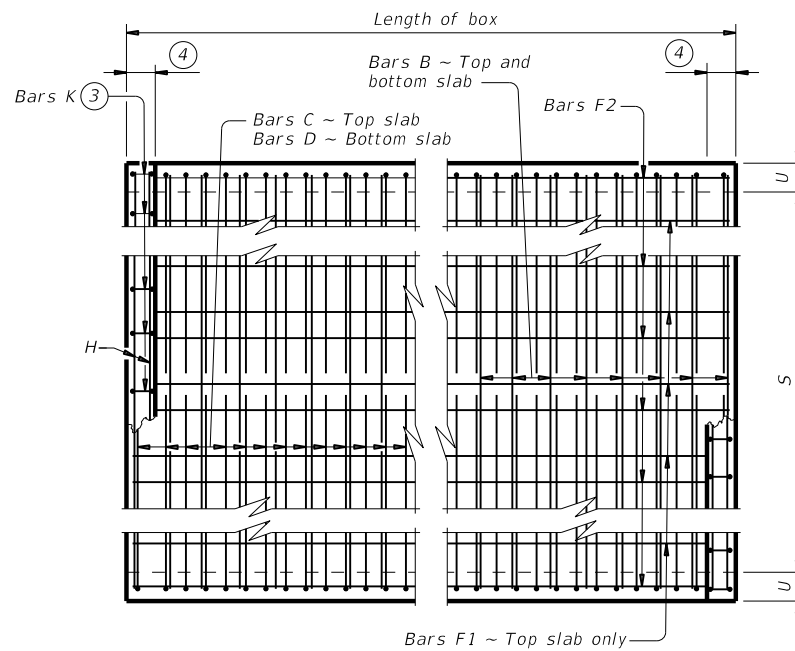
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<b>SINGLE BOX CULVERTS          CAST-IN-PLACE          MISCELLANEOUS DETAILS</b>			
<b>SCC-MD</b>			
FILE: CD-SCC-MD-20.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT February 2020	CONT SECT	JOB	HIGHWAY
REVISIONS	0848 04	052	FM 462
	DIST	COUNTY	SHEET NO.
	SAT	MEDINA	170

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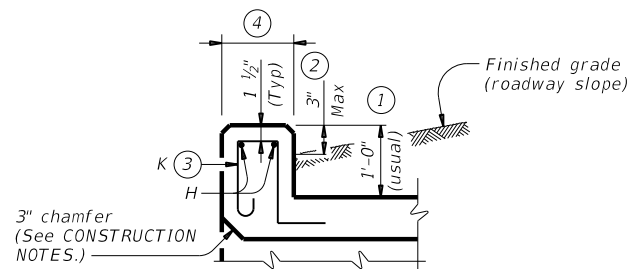
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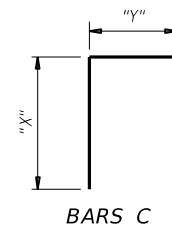
**TYPICAL SECTION**



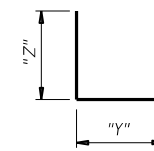
**PLAN OF REINF STEEL**



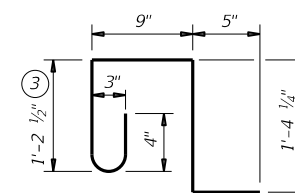
**SECTION THRU CURB**



BARS C



BARS D



BARS K (#4)  
 (Spa = 1'-0" Max)  
 (Length = 4'-2")

- ① 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 Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- ② For vehicle safety, the following requirements must be met:
  - For structures without bridge rail, construct curbs no more than 3" 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.
- ③ For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- ④ 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.  
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.  
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

**CONSTRUCTION NOTES:**

Do not use permanent forms.  
 Chamfer the bottom edge of the top slab 3" at the entrance.  
 Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

**MATERIAL NOTES:**

Provide Grade 60 reinforcing steel.  
 Provide galvanized reinforcing steel if required elsewhere in the plans.  
 Provide Class C concrete ( $f'_c = 3,600$  psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete ( $f'_c = 4,000$  psi) for top slabs of:
 

- culverts with overlay,
- culverts with 1-to-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

 Provide bar laps, where required, as follows:
 

- Uncoated or galvanized ~ #4 = 1'-8" Min
- Uncoated or galvanized ~ #5 = 2'-1" Min

**GENERAL NOTES:**

Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.  
 See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

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

HL93 LOADING SHEET 1 OF 2



**SINGLE BOX CULVERTS  
 CAST-IN-PLACE  
 0' TO 30' FILL**

**SCC-3 & 4**

FILE: CD-SCC34-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	171	


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SECTION DIMENSIONS				FILL HEIGHT ⑤	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																								QUANTITIES														
					Bars B				Bars C				Bars D				Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total								
					S	H	T	U	No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)
3' - 0"	2' - 0"	8"	7"	30'	108	#5	9"	3' - 11"	441	108	#4	9"	5' - 4"	385	2' - 6"	2' - 10"	108	#4	9"	5' - 1"	367	2' - 10"	2' - 3"	108	9"	2' - 0"	144	3	39' - 9"	80	19	39' - 9"	505	3' - 11"	10	10	28	0.292	48.1	0.3	38	12.0	1,960
3' - 0"	3' - 0"	8"	7"	30'	108	#5	9"	3' - 11"	441	108	#4	9"	6' - 4"	457	3' - 6"	2' - 10"	108	#4	9"	5' - 1"	367	2' - 10"	2' - 3"	108	9"	3' - 0"	216	3	39' - 9"	80	23	39' - 9"	611	3' - 11"	10	10	28	0.335	54.3	0.3	38	13.7	2,210
4' - 0"	2' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	5' - 8"	613	2' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	2' - 0"	144	3	39' - 9"	80	21	39' - 9"	558	4' - 11"	13	12	33	0.342	63.4	0.4	46	14.1	2,581
4' - 0"	3' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	6' - 8"	721	3' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	3' - 0"	216	3	39' - 9"	80	25	39' - 9"	664	4' - 11"	13	12	33	0.385	70.5	0.4	46	15.8	2,867
4' - 0"	4' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	7' - 8"	830	4' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	4' - 0"	289	3	39' - 9"	80	25	39' - 9"	664	4' - 11"	13	12	33	0.428	75.1	0.4	46	17.5	3,049

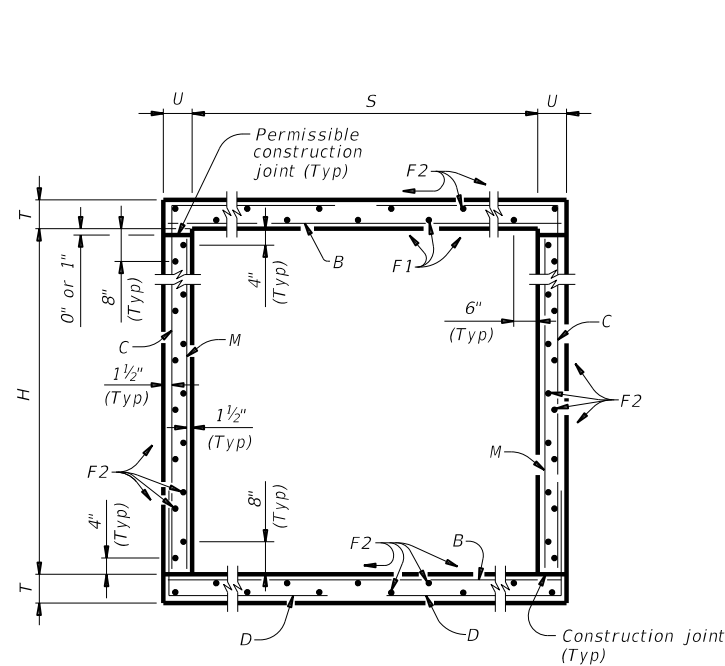
⑤ For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

HL93 LOADING SHEET 2 OF 2

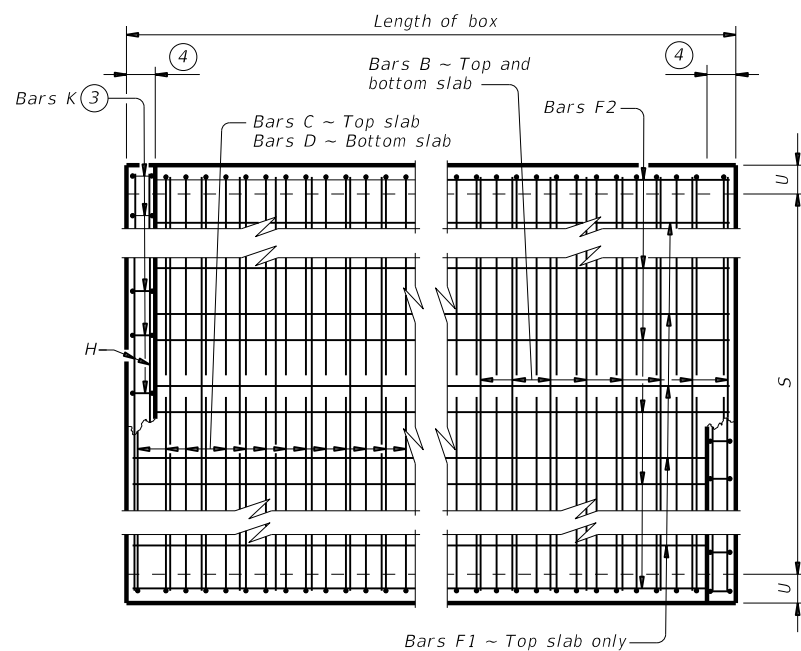
				<b>Bridge Division Standard</b>	
<p><b>SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL</b></p> <p><b>SCC-3 &amp; 4</b></p>					
FILE: CD-SCC34-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT	
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0848	04	052	FM	462
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.		
	SAT	MEDINA			172

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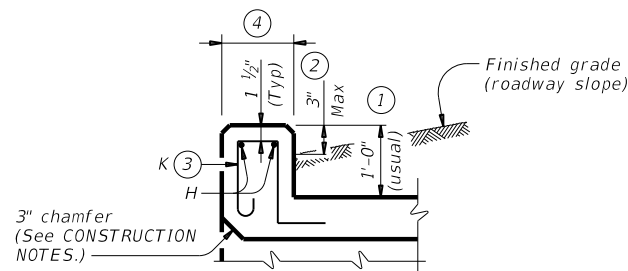
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**TYPICAL SECTION**



**PLAN OF REINF STEEL**



**SECTION THRU CURB**

- ① 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 Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- ② For vehicle safety, the following requirements must be met:
  - For structures without bridge rail, construct curbs no more than 3" 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.
- ③ For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- ④ 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.  
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.  
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

**CONSTRUCTION NOTES:**

- Do not use permanent forms.
- Chamfer the bottom edge of the top slab 3" at the entrance.
- Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

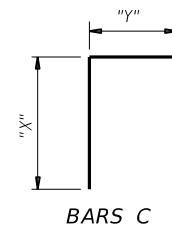
**MATERIAL NOTES:**

- Provide Grade 60 reinforcing steel.
- Provide galvanized reinforcing steel if required elsewhere in the plans.
- Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
  - culverts with overlay,
  - culverts with 1-to-2 course surface treatment, or
  - culverts with the top slab as the final riding surface.
- Provide bar laps, where required, as follows:
  - Uncoated or galvanized ~ #4 = 1'-8" Min
  - Uncoated or galvanized ~ #5 = 2'-1" Min
  - Uncoated or galvanized ~ #6 = 2'-6" Min

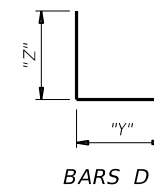
**GENERAL NOTES:**

- Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
- See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

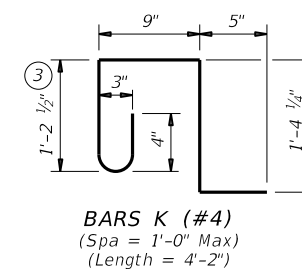
Cover dimensions are clear dimensions, unless noted otherwise.  
 Reinforcing bar dimensions shown are out-to-out of bar.



BARS C



BARS D



BARS K (#4)  
 (Spa = 1'-0" Max)  
 (Length = 4'-2")



**SINGLE BOX CULVERTS  
 CAST-IN-PLACE  
 0' TO 30' FILL**

**SCC-5 & 6**

FILE: CD-SCC56-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
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REVISIONS	0848	04	052	FM 462
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	173	




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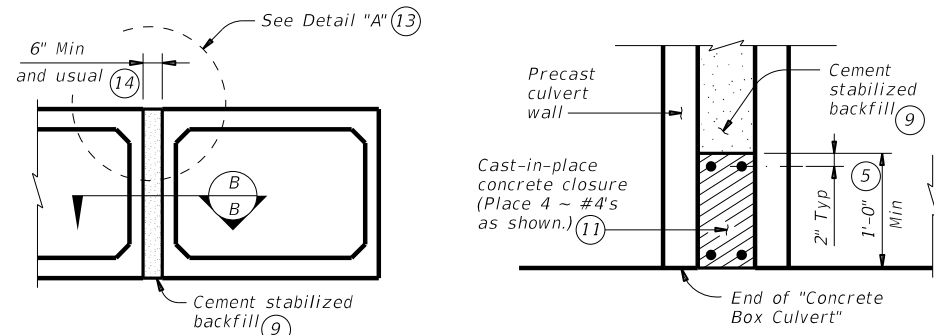
SECTION DIMENSIONS				FILL HEIGHT ⑤	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																								QUANTITIES														
					Bars B					Bars C					Bars D					Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total					
S	H	T	U		No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
5'-0"	2'-0"	8"	7"	26'	108	#6	9"	5'-11"	960	108	#5	9"	6'-3"	704	2'-6"	3'-9"	108	#5	9"	6'-5"	723	3'-9"	2'-8"	108	9"	2'-0"	144	4	39'-9"	106	22	39'-9"	584	5'-11"	16	14	39	0.391	80.5	0.5	55	16.1	3,276
5'-0"	2'-0"	9"	7"	30'	108	#6	9"	5'-11"	960	108	#5	9"	6'-4"	713	2'-7"	3'-9"	108	#5	9"	6'-6"	732	3'-9"	2'-9"	108	9"	2'-0"	144	4	39'-9"	106	22	39'-9"	584	5'-11"	16	14	39	0.429	81.0	0.5	55	17.6	3,294
5'-0"	3'-0"	8"	7"	26'	108	#6	9"	5'-11"	960	108	#5	9"	7'-3"	817	3'-6"	3'-9"	108	#5	9"	6'-5"	723	3'-9"	2'-8"	108	9"	3'-0"	216	4	39'-9"	106	26	39'-9"	690	5'-11"	16	14	39	0.434	87.8	0.5	55	17.8	3,567
5'-0"	3'-0"	9"	7"	30'	108	#6	9"	5'-11"	960	108	#5	9"	7'-4"	826	3'-7"	3'-9"	108	#5	9"	6'-6"	732	3'-9"	2'-9"	108	9"	3'-0"	216	4	39'-9"	106	26	39'-9"	690	5'-11"	16	14	39	0.472	88.3	0.5	55	19.3	3,585
5'-0"	4'-0"	8"	7"	26'	108	#6	9"	5'-11"	960	108	#5	9"	8'-3"	929	4'-6"	3'-9"	108	#5	9"	6'-5"	723	3'-9"	2'-8"	108	9"	4'-0"	289	4	39'-9"	106	26	39'-9"	690	5'-11"	16	14	39	0.477	92.4	0.5	55	19.5	3,752
5'-0"	4'-0"	9"	7"	30'	108	#6	9"	5'-11"	960	108	#5	9"	8'-4"	939	4'-7"	3'-9"	108	#5	9"	6'-6"	732	3'-9"	2'-9"	108	9"	4'-0"	289	4	39'-9"	106	26	39'-9"	690	5'-11"	16	14	39	0.515	92.9	0.5	55	21.1	3,771
5'-0"	5'-0"	8"	7"	26'	108	#6	9"	5'-11"	960	108	#5	9"	9'-3"	1,042	5'-6"	3'-9"	108	#5	9"	6'-5"	723	3'-9"	2'-8"	108	9"	5'-0"	361	4	39'-9"	106	30	39'-9"	797	5'-11"	16	14	39	0.521	99.7	0.5	55	21.3	4,044
5'-0"	5'-0"	9"	7"	30'	108	#6	9"	5'-11"	960	108	#5	9"	9'-4"	1,051	5'-7"	3'-9"	108	#5	9"	6'-6"	732	3'-9"	2'-9"	108	9"	5'-0"	361	4	39'-9"	106	30	39'-9"	797	5'-11"	16	14	39	0.559	100.2	0.5	55	22.8	4,062
6'-0"	2'-0"	8"	7"	20'	108	#6	9"	6'-11"	1,122	108	#5	9"	6'-7"	742	2'-6"	4'-1"	108	#5	9"	6'-9"	760	4'-1"	2'-8"	108	9"	2'-0"	144	5	39'-9"	133	25	39'-9"	664	6'-11"	18	16	45	0.440	89.1	0.5	63	18.1	3,628
6'-0"	2'-0"	9"	7"	26'	108	#6	9"	6'-11"	1,122	162	#5	6"	6'-8"	1,126	2'-7"	4'-1"	162	#5	6"	6'-10"	1,155	4'-1"	2'-9"	108	9"	2'-0"	144	5	39'-9"	133	25	39'-9"	664	6'-11"	18	16	45	0.485	108.6	0.5	63	19.9	4,407
6'-0"	2'-0"	10"	8"	30'	108	#6	9"	7'-1"	1,149	162	#5	6"	6'-10"	1,155	2'-8"	4'-2"	162	#5	6"	7'-0"	1,183	4'-2"	2'-10"	82	12"	2'-0"	110	5	39'-9"	133	25	39'-9"	664	7'-1"	19	18	50	0.551	109.9	0.5	69	22.6	4,463
6'-0"	3'-0"	8"	7"	20'	108	#6	9"	6'-11"	1,122	108	#5	9"	7'-7"	854	3'-6"	4'-1"	108	#5	9"	6'-9"	760	4'-1"	2'-8"	108	9"	3'-0"	216	5	39'-9"	133	29	39'-9"	770	6'-11"	18	16	45	0.484	96.4	0.5	63	19.9	3,918
6'-0"	3'-0"	9"	7"	26'	108	#6	9"	6'-11"	1,122	162	#5	6"	7'-8"	1,295	3'-7"	4'-1"	162	#5	6"	6'-10"	1,155	4'-1"	2'-9"	108	9"	3'-0"	216	5	39'-9"	133	29	39'-9"	770	6'-11"	18	16	45	0.528	117.3	0.5	63	21.6	4,754
6'-0"	3'-0"	10"	8"	30'	108	#6	9"	7'-1"	1,149	162	#5	6"	7'-10"	1,324	3'-8"	4'-2"	162	#5	6"	7'-0"	1,183	4'-2"	2'-10"	82	12"	3'-0"	164	5	39'-9"	133	29	39'-9"	770	7'-1"	19	18	50	0.601	118.1	0.5	69	24.6	4,792
6'-0"	4'-0"	8"	7"	20'	108	#6	9"	6'-11"	1,122	108	#5	9"	8'-7"	967	4'-6"	4'-1"	108	#5	9"	6'-9"	760	4'-1"	2'-8"	108	9"	4'-0"	289	5	39'-9"	133	29	39'-9"	770	6'-11"	18	16	45	0.527	101.0	0.5	63	21.6	4,104
6'-0"	4'-0"	9"	7"	26'	108	#6	9"	6'-11"	1,122	162	#5	6"	8'-8"	1,464	4'-7"	4'-1"	162	#5	6"	6'-10"	1,155	4'-1"	2'-9"	108	9"	4'-0"	289	5	39'-9"	133	29	39'-9"	770	6'-11"	18	16	45	0.571	123.3	0.5	63	23.4	4,996
6'-0"	4'-0"	10"	8"	30'	108	#6	9"	7'-1"	1,149	162	#5	6"	8'-10"	1,493	4'-8"	4'-2"	162	#5	6"	7'-0"	1,183	4'-2"	2'-10"	82	12"	4'-0"	219	5	39'-9"	133	29	39'-9"	770	7'-1"	19	18	50	0.650	123.7	0.5	69	26.5	5,016
6'-0"	5'-0"	8"	7"	20'	108	#6	9"	6'-11"	1,122	108	#5	9"	9'-7"	1,080	5'-6"	4'-1"	108	#5	9"	6'-9"	760	4'-1"	2'-8"	108	9"	5'-0"	361	5	39'-9"	133	33	39'-9"	876	6'-11"	18	16	45	0.570	108.3	0.5	63	23.3	4,395
6'-0"	5'-0"	9"	7"	26'	108	#6	9"	6'-11"	1,122	162	#5	6"	9'-8"	1,633	5'-7"	4'-1"	162	#5	6"	6'-10"	1,155	4'-1"	2'-9"	108	9"	5'-0"	361	5	39'-9"	133	33	39'-9"	876	6'-11"	18	16	45	0.614	132.0	0.5	63	25.1	5,343
6'-0"	5'-0"	10"	8"	30'	108	#6	9"	7'-1"	1,149	162	#5	6"	9'-10"	1,661	5'-8"	4'-2"	162	#5	6"	7'-0"	1,183	4'-2"	2'-10"	82	12"	5'-0"	274	5	39'-9"	133	33	39'-9"	876	7'-1"	19	18	50	0.700	131.9	0.5	69	28.5	5,345
6'-0"	6'-0"	8"	7"	20'	108	#6	9"	6'-11"	1,122	108	#5	9"	10'-7"	1,192	6'-6"	4'-1"	108	#5	9"	6'-9"	760	4'-1"	2'-8"	108	9"	6'-0"	433	5	39'-9"	133	37	39'-9"	982	6'-11"	18	16	45	0.613	115.6	0.5	63	25.0	4,685
6'-0"	6'-0"	9"	7"	26'	108	#6	9"	6'-11"	1,122	162	#5	6"	10'-8"	1,802	6'-7"	4'-1"	162	#5	6"	6'-10"	1,155	4'-1"	2'-9"	108	9"	6'-0"	433	5	39'-9"	133	37	39'-9"	982	6'-11"	18	16	45	0.657	140.7	0.5	63	26.8	5,690
6'-0"	6'-0"	10"	8"	30'	108	#6	9"	7'-1"	1,149	162	#5	6"	10'-10"	1,830	6'-8"	4'-2"	162	#5	6"	7'-0"	1,183	4'-2"	2'-10"	82	12"	6'-0"	329	5	39'-9"	133	37	39'-9"	982	7'-1"	19	18	50	0.749	140.2	0.5	69	30.5	5,675

⑤ For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

				Bridge Division Standard	
<b>SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL</b>					
<b>SCC-5 &amp; 6</b>					
FILE: CD-SCC56-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT	
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0848	04	052	FM 462	
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.		
	SAT	MEDINA	174		

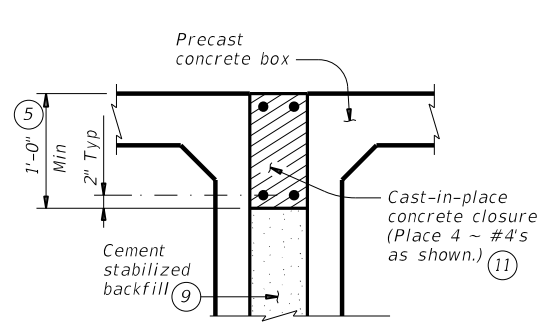
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 1/31/2024 4:37:28 PM  
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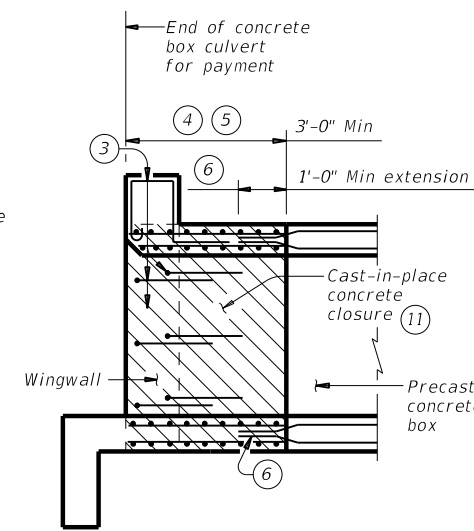


**MULTIPLE UNIT PLACEMENT**

**SECTION B-B**

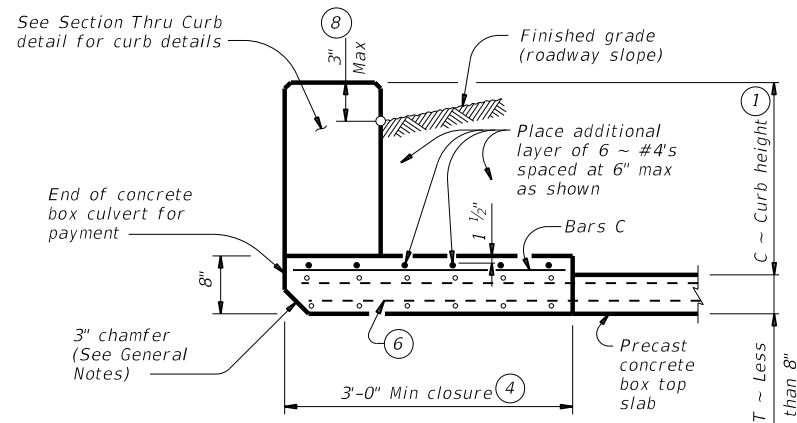


**DETAIL "A"**

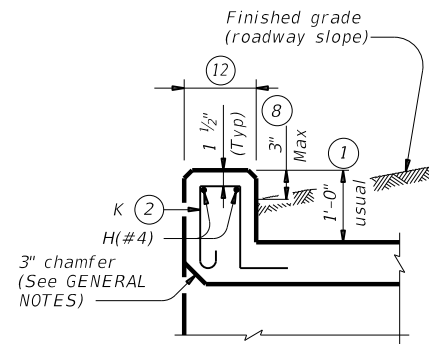


**WINGWALL CONNECTION**

(Also applies to safety end treatment.)

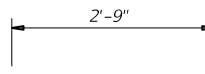


**SECTION THRU TOP SLABS LESS THAN 8"**

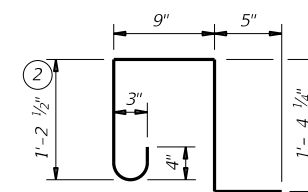


**SECTION THRU CURB**

QUANTITIES PER FOOT OF CURB (10)	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY



**BARS C (#4)**  
(Spa = 1'-0" Max)



**BARS K (#4)**  
(Spa = 1'-0" Max)  
(Length = 4'-2")

- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle 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.
- For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.
- Provide a 3'-0" Min cast-in-place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast-in-place closure flush with the inside and outside faces of the precast box section.
- For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'-0" Min cast-in-place closure in the top slab, bottom slab, and exterior wall. See Section B-B detail when interior walls are cast full length.
- Extend precast box reinforcing a minimum of 1'-0" into concrete closure (Typ).
- Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.
- For vehicle safety, the following requirements must be met:
  - For structures without bridge rail, construct curbs no more than 3" 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.
- Cement stabilized backfill between boxes is considered part of the box culvert for payment.
- All curb concrete and reinforcing is considered part of the box culvert for payment.
- Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.
- 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".
- This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box." No payment will be made for any additional material in the gap between adjacent boxes.

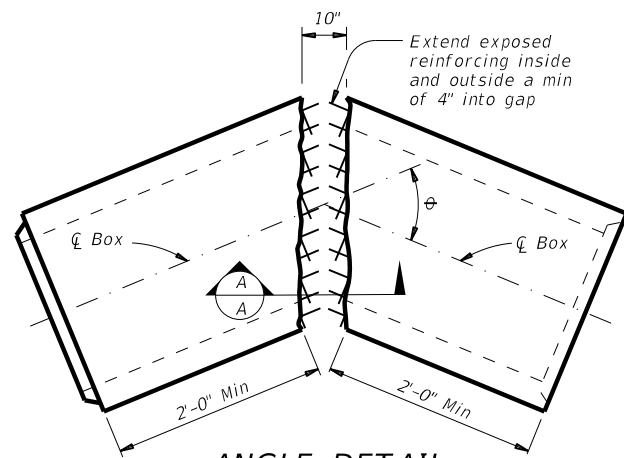
**MATERIAL NOTES:**

- Provide Grade 60 reinforcing steel.
- Provide ASTM A1064 welded wire reinforcement.
- Provide Class C concrete (f'c = 3,600 psi) for the closures.
- Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
- Any additional concrete required for the closures will be considered subsidiary to the box culvert.

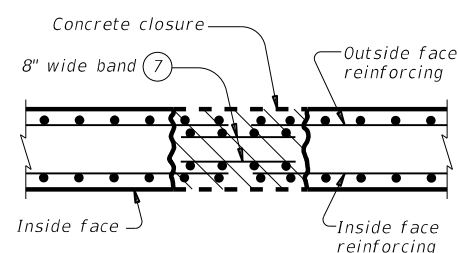
**GENERAL NOTES:**

- Designed according to AASHTO LRFD Bridge Design Specifications.
- Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
- Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

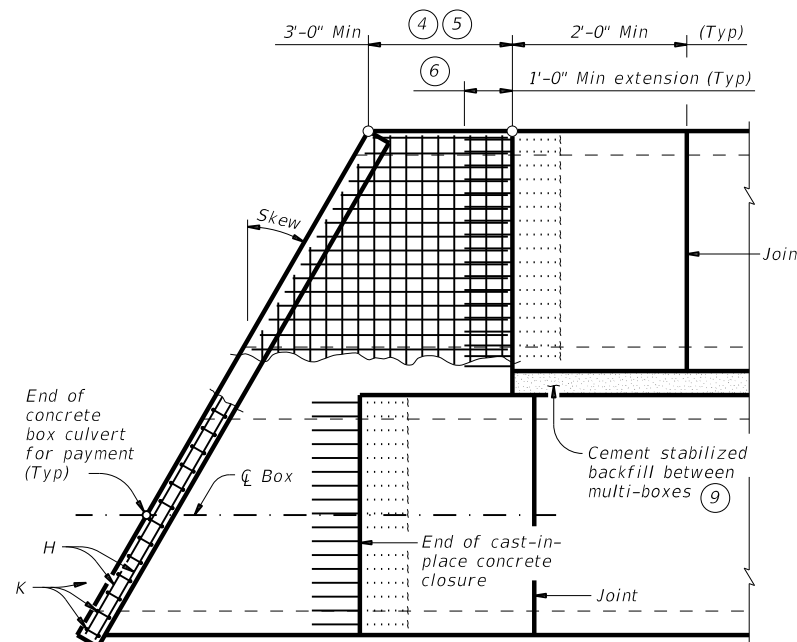
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bars dimensions are out-to-out of bars.



**ANGLE DETAIL**



**SECTION A-A**



**PLAN OF SKEWED ENDS**

(Showing multi-box placement.)

HL93 LOADING

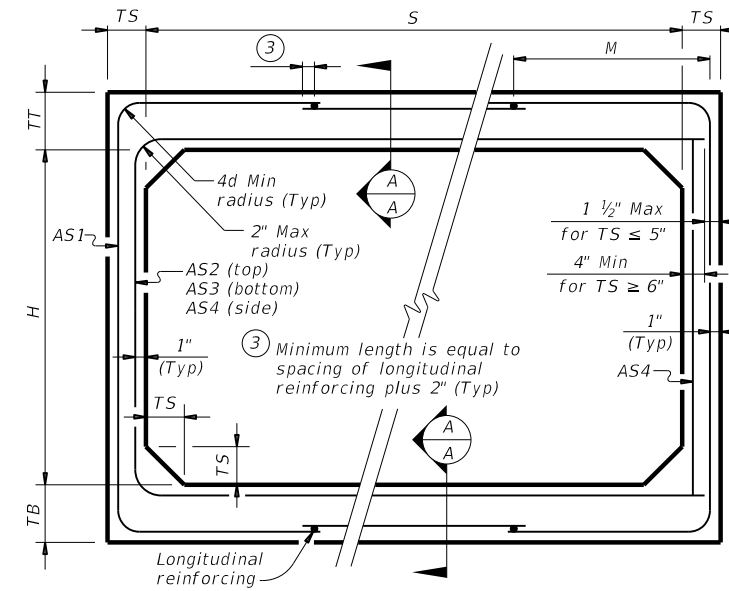
		<b>Bridge Division Standard</b>	
<b>BOX CULVERTS PRECAST MISCELLANEOUS DETAILS</b>			
<b>SCP-MD</b>			
FILE: CD-SCP-MD-20.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT
©TxDOT	February 2020	CONTRACT NO: 0848	SECTION: 04
REVISIONS:		JOB NO: 052	HIGHWAY: FM 462
		DIST: SAT	COUNTY: MEDINA
			SHEET NO: 175

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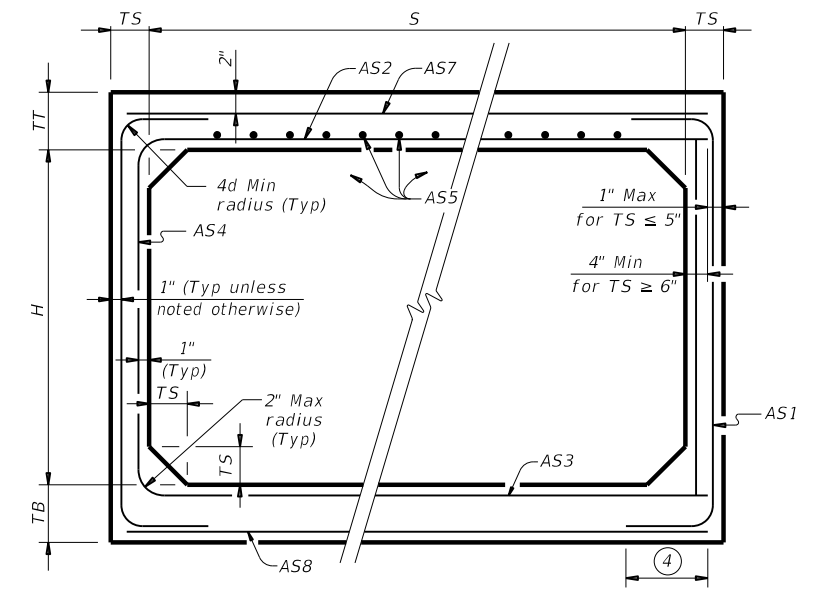
**BOX DATA**

SECTION DIMENSIONS					Fill Height (ft.)	M (Min) (in.)	REINFORCING (sq. in. / ft.) <sup>②</sup>							① Lift Weight (tons)
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)			AS1	AS2	AS3	AS4	AS5	AS7	AS8	
4	2	7.5	6	5	< 2	-	0.18	0.27	0.15	0.12	0.18	0.18	0.14	4.5
4	2	5	5	5	2 < 3	38	0.18	0.19	0.17	0.12	-	-	-	3.6
4	2	5	5	5	3 - 5	38	0.13	0.13	0.13	0.12	-	-	-	3.6
4	2	5	5	5	10	38	0.12	0.12	0.12	0.12	-	-	-	3.6
4	2	5	5	5	15	38	0.14	0.16	0.16	0.12	-	-	-	3.6
4	2	5	5	5	20	38	0.18	0.20	0.21	0.12	-	-	-	3.6
4	2	5	5	5	25	38	0.23	0.25	0.25	0.12	-	-	-	3.6
4	2	5	5	5	30	38	0.28	0.30	0.30	0.12	-	-	-	3.6
4	3	7.5	6	5	< 2	-	0.18	0.31	0.18	0.12	0.18	0.18	0.14	5.0
4	3	5	5	5	2 < 3	38	0.15	0.23	0.20	0.12	-	-	-	4.1
4	3	5	5	5	3 - 5	38	0.12	0.16	0.16	0.12	-	-	-	4.1
4	3	5	5	5	10	38	0.12	0.14	0.14	0.12	-	-	-	4.1
4	3	5	5	5	15	38	0.12	0.18	0.18	0.12	-	-	-	4.1
4	3	5	5	5	20	38	0.14	0.23	0.24	0.12	-	-	-	4.1
4	3	5	5	5	25	38	0.17	0.29	0.29	0.12	-	-	-	4.1
4	3	5	5	5	30	38	0.21	0.35	0.35	0.12	-	-	-	4.1
4	4	7.5	6	5	< 2	-	0.18	0.33	0.20	0.12	0.18	0.18	0.14	5.5
4	4	5	5	5	2 < 3	38	0.12	0.26	0.23	0.12	-	-	-	4.6
4	4	5	5	5	3 - 5	38	0.12	0.18	0.18	0.12	-	-	-	4.6
4	4	5	5	5	10	38	0.12	0.15	0.15	0.12	-	-	-	4.6
4	4	5	5	5	15	38	0.12	0.19	0.20	0.12	-	-	-	4.6
4	4	5	5	5	20	38	0.12	0.25	0.25	0.12	-	-	-	4.6
4	4	5	5	5	25	38	0.14	0.31	0.31	0.12	-	-	-	4.6
4	4	5	5	5	30	38	0.17	0.37	0.37	0.12	-	-	-	4.6



**CORNER OPTION "A"**      **CORNER OPTION "B"**

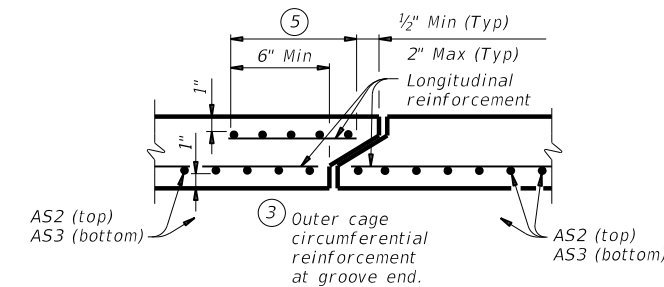
**FILL HEIGHT 2 FT AND GREATER**



**CORNER OPTION "A"**      **CORNER OPTION "B"**

**FILL HEIGHT LESS THAN 2 FT**

④ Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



**SECTION A-A**

(Showing top and bottom slab joint reinforcement.)

**MATERIAL NOTES:**

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.  
 Provide Class H concrete (f'c = 5,000 psi).

**GENERAL NOTES:**

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.  
 See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.  
 In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)."

HL93 LOADING

		<b>Bridge Division Standard</b>	
<b>SINGLE BOX CULVERTS PRECAST</b> <b>4'-0" SPAN</b>			
<b>SCP-4</b>			
FILE: CD-SCP04-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT February 2020	CONT	SECT	HIGHWAY
REVISIONS	0848	04	052 FM 462
	DIST	COUNTY	SHEET NO.
	SAT	MEDINA	176

① For box length = 8'-0"

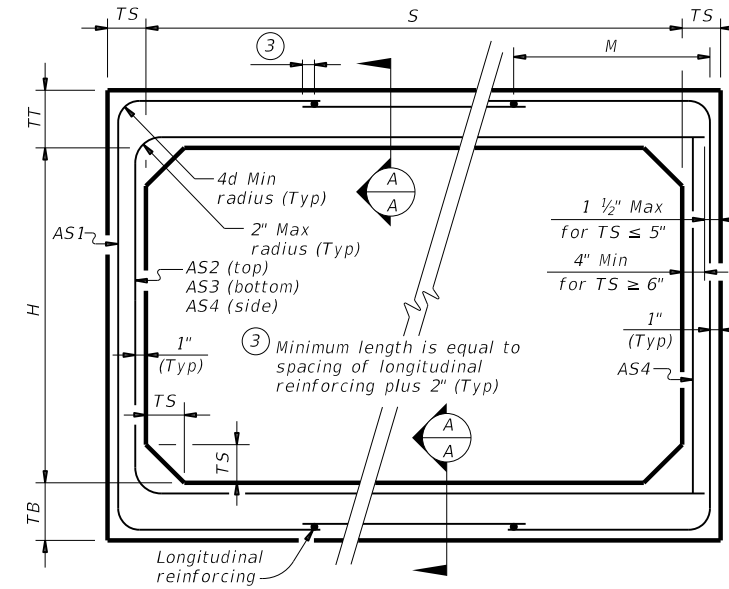
② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.

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DATE: 1/31/2024 4:38:17 PM  
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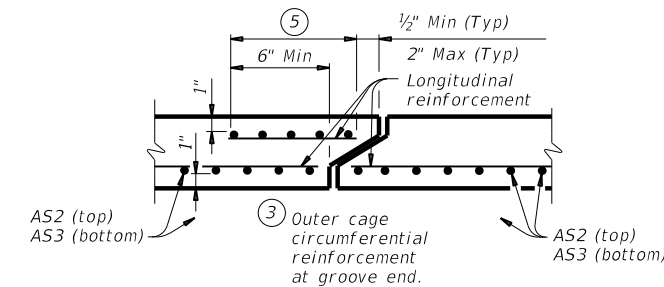
**BOX DATA**

SECTION DIMENSIONS					Fill Height (ft.)	M (Min) (in.)	REINFORCING (sq. in. / ft.) <sup>②</sup>								① Lift Weight (tons)
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)			AS1	AS2	AS3	AS4	AS5	AS7	AS8		
5	2	8	7	6	< 2	-	0.19	0.27	0.18	0.14	0.19	0.19	0.17	6.0	
5	2	6	6	6	2 < 3	44	0.22	0.20	0.16	0.14	-	-	-	5.1	
5	2	6	6	6	3 - 5	44	0.16	0.14	0.14	0.14	-	-	-	5.1	
5	2	6	6	6	10	36	0.15	0.14	0.14	0.14	-	-	-	5.1	
5	2	6	6	6	15	36	0.20	0.18	0.18	0.14	-	-	-	5.1	
5	2	6	6	6	20	36	0.26	0.23	0.24	0.14	-	-	-	5.1	
5	2	6	6	6	25	36	0.33	0.29	0.29	0.14	-	-	-	5.1	
5	2	6	6	6	30	36	0.39	0.34	0.35	0.14	-	-	-	5.1	
5	3	8	7	6	< 2	-	0.19	0.31	0.21	0.14	0.19	0.19	0.17	6.6	
5	3	6	6	6	2 < 3	45	0.18	0.24	0.19	0.14	-	-	-	5.7	
5	3	6	6	6	3 - 5	36	0.14	0.17	0.16	0.14	-	-	-	5.7	
5	3	6	6	6	10	36	0.14	0.16	0.17	0.14	-	-	-	5.7	
5	3	6	6	6	15	35	0.16	0.21	0.22	0.14	-	-	-	5.7	
5	3	6	6	6	20	35	0.21	0.27	0.28	0.14	-	-	-	5.7	
5	3	6	6	6	25	35	0.26	0.34	0.34	0.14	-	-	-	5.7	
5	3	6	6	6	30	35	0.31	0.41	0.41	0.14	-	-	-	5.7	
5	4	8	7	6	< 2	-	0.19	0.33	0.24	0.14	0.19	0.19	0.17	7.2	
5	4	6	6	6	2 < 3	45	0.16	0.27	0.22	0.14	-	-	-	6.3	
5	4	6	6	6	3 - 5	45	0.14	0.19	0.18	0.14	-	-	-	6.3	
5	4	6	6	6	10	36	0.14	0.18	0.18	0.14	-	-	-	6.3	
5	4	6	6	6	15	35	0.14	0.23	0.24	0.14	-	-	-	6.3	
5	4	6	6	6	20	35	0.17	0.30	0.31	0.14	-	-	-	6.3	
5	4	6	6	6	25	35	0.21	0.37	0.38	0.14	-	-	-	6.3	
5	4	6	6	6	30	35	0.25	0.44	0.45	0.14	-	-	-	6.3	
5	5	8	7	6	< 2	-	0.19	0.35	0.26	0.14	0.19	0.19	0.17	7.8	
5	5	6	6	6	2 < 3	45	0.14	0.29	0.24	0.14	-	-	-	6.9	
5	5	6	6	6	3 - 5	45	0.14	0.21	0.20	0.14	-	-	-	6.9	
5	5	6	6	6	10	45	0.14	0.19	0.20	0.14	-	-	-	6.9	
5	5	6	6	6	15	36	0.14	0.24	0.25	0.14	-	-	-	6.9	
5	5	6	6	6	20	35	0.15	0.31	0.32	0.14	-	-	-	6.9	
5	5	6	6	6	25	35	0.18	0.38	0.39	0.14	-	-	-	6.9	
5	5	6	6	6	30	35	0.21	0.46	0.47	0.14	-	-	-	6.9	

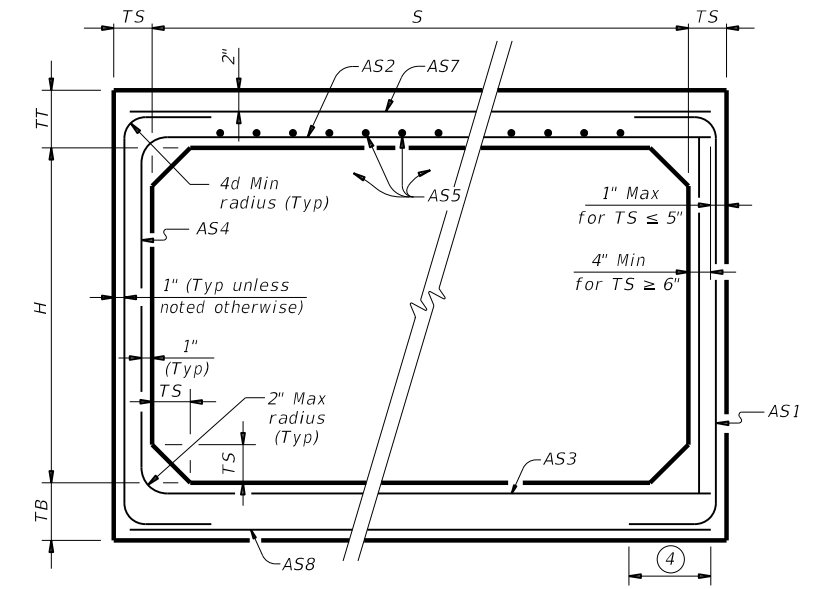


**CORNER OPTION "A"      CORNER OPTION "B"**

**FILL HEIGHT 2 FT AND GREATER**



**SECTION A-A**  
 (Showing top and bottom slab joint reinforcement.)



**CORNER OPTION "A"      CORNER OPTION "B"**

**FILL HEIGHT LESS THAN 2 FT**

④ Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)

**MATERIAL NOTES:**

Provide 0.03 sq. in./ft. minimum longitudinal reinforcing at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.  
 Provide Class H concrete (f'c = 5,000 psi).

**GENERAL NOTES:**

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.  
 See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.  
 In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)."

**HL93 LOADING**

		<b>Bridge Division Standard</b>	
<b>SINGLE BOX CULVERTS PRECAST</b> <b>5'-0" SPAN</b>			
<b>SCP-5</b>			
FILE: CD-SCP05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT February 2020	CONT	SECT	JOB
REVISIONS	0848	04	052
	DIST	COUNTY	SHEET NO.
	SAT	MEDINA	177

① For box length = 8'-0"

② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcing per linear foot of box length. AS5 is minimum required area of reinforcing per linear foot of box width.

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

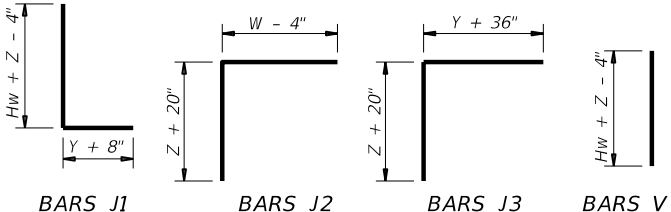
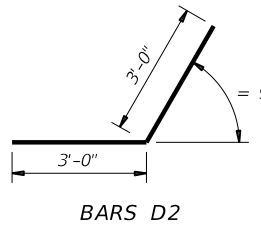
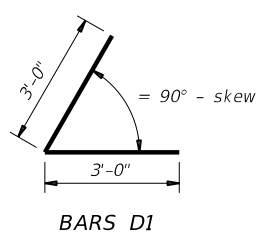
Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing (2-wings) (4)		Estimated Quantities per ft of Toewall (1-toewall)	
	W	X	Y	Z	Bars J1		Bars J2		Reinf Lb/Ft	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
					Size	Spa	Size	Spa				
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

**TABLE OF WINGWALL REINFORCING**  
 (2-wings)

Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

**TABLE OF TOEWALL REINFORCING**

Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



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

$Hw = H + T + C$   
 $Lw = (Hw)(SL) \div \cosine(\theta)$  for Type PW-1  
 $Lw = (Hw - 1')(SL) \div \cosine(\theta)$  for Type PW-2 and  $Hw \ge 4'$   
 $Lw = (Hw - 0.5')(SL) \div \cosine(\theta)$  for Type PW-2 and  $Hw < 4'$

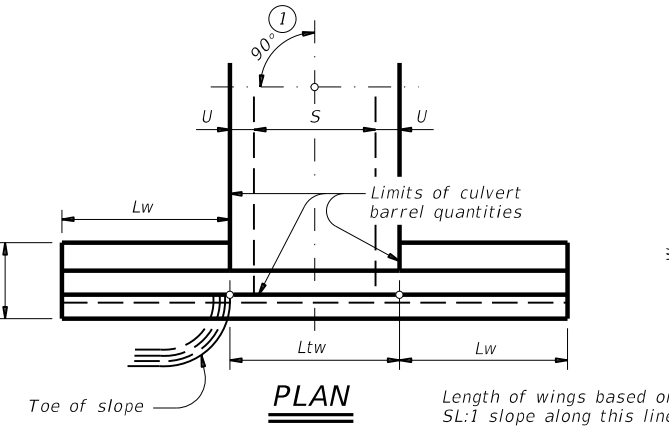
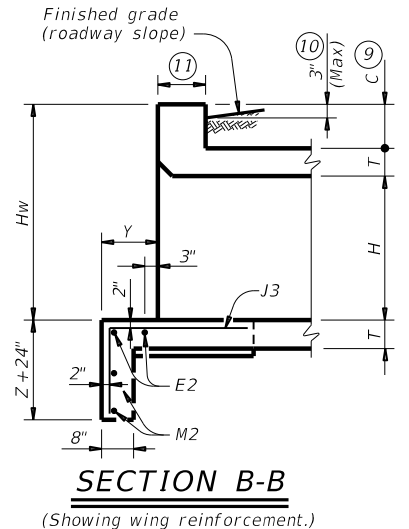
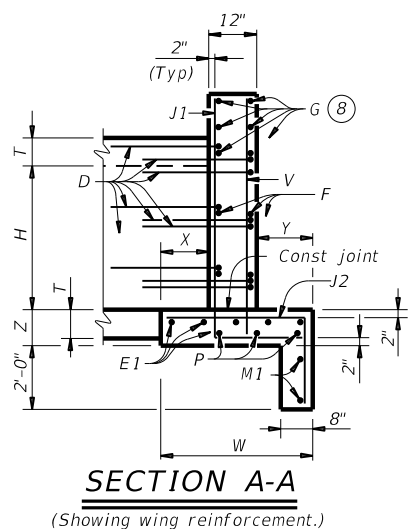
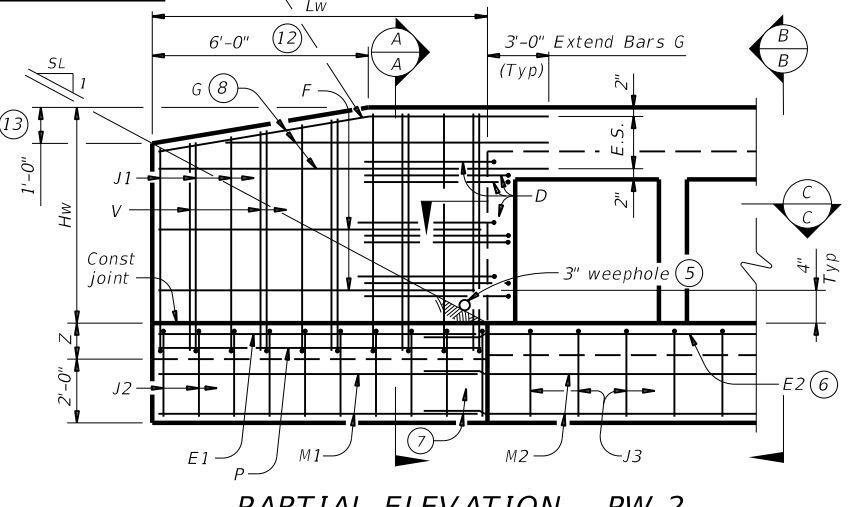
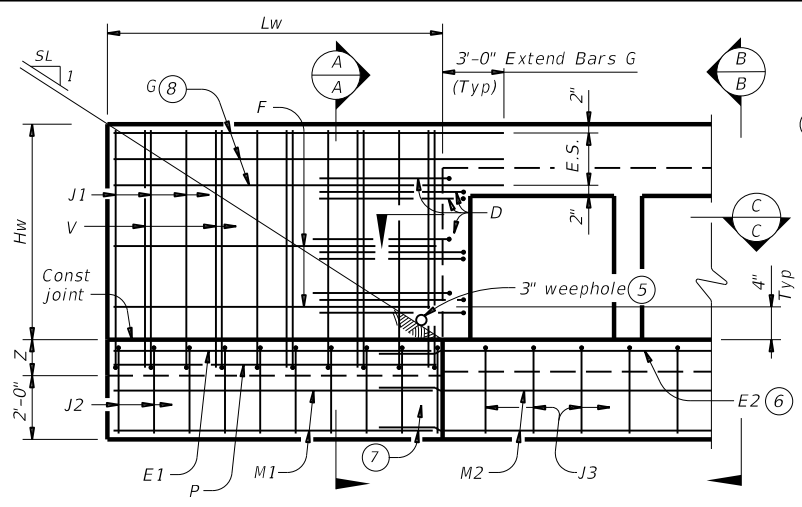
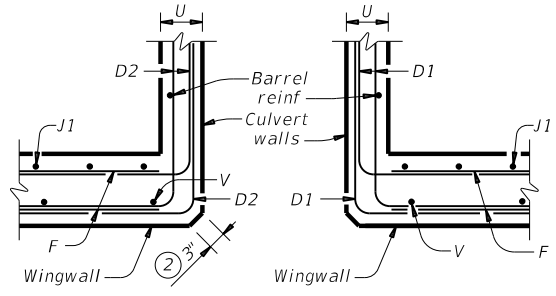
For cast-in-place culverts:  
 $Ltw = [(N)(S) + (N + 1)(U)] \div \cosine(\theta)$

For precast culverts:  
 $Ltw = [(N)(2U + S) + (N - 1)(0.5')] \div \cosine(\theta)$   
 Total Wingwall Area (two wings ~ SF)  
 $= (2)(Hw)(Lw)$  for Type PW-1  
 $= (2)(Hw)(Lw) - 6 SF$  for Type PW-2 and  $Hw \ge 4'$   
 $= (2)(Hw)(Lw) - 1.5 SF$  for Type PW-2 and  $Hw < 4'$

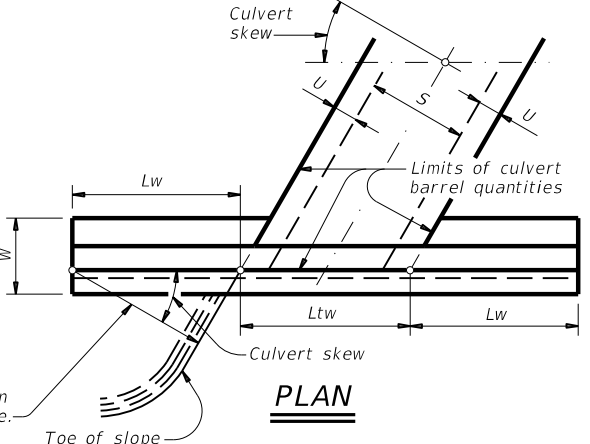
$Hw$  = Height of wingwall  
 $Lw$  = Length of wingwall  
 $Ltw$  = Culvert toewall length  
 $N$  = Number of culvert spans  
 $SL:1$  = Channel slope ratio. (horizontal: 1 vertical, usual value is 2:1)  
 $\theta$  = Culvert skew

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

- Skew = 0°
- At discharge end, chamfer may be 3/4" minimum.
- For 15° skew ~ 1"  
For 30° skew ~ 2"  
For 45° skew ~ 3"
- Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
- Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
- Extend Bars E2 1'-6" minimum into the wingwall footing.
- Lap Bars M1 1'-6" minimum with Bars M2.
- Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
- 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.
- For vehicle safety, the following requirements must be met:
  - For structures without bridge rail, construct curbs no more than 3" 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.
- 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- 3'-0" for Hw < 4'.
- 6" for Hw < 4'.



**DETAILS FOR NON-SKEWED BOX CULVERTS**



**DETAILS FOR SKEWED BOX CULVERTS**  
 (Showing 30° skew.)

**DESIGNER NOTES:**  
 Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall. Type PW-2 can only be used for applications without a railing mounted to the wingwall.

**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.

**GENERAL NOTES:**  
 Designed in accordance with AASHTO LRFD Bridge Design Specifications.  
 Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.  
 See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information.  
 Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

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

Texas Department of Transportation  
 Bridge Division Standard

**CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2**

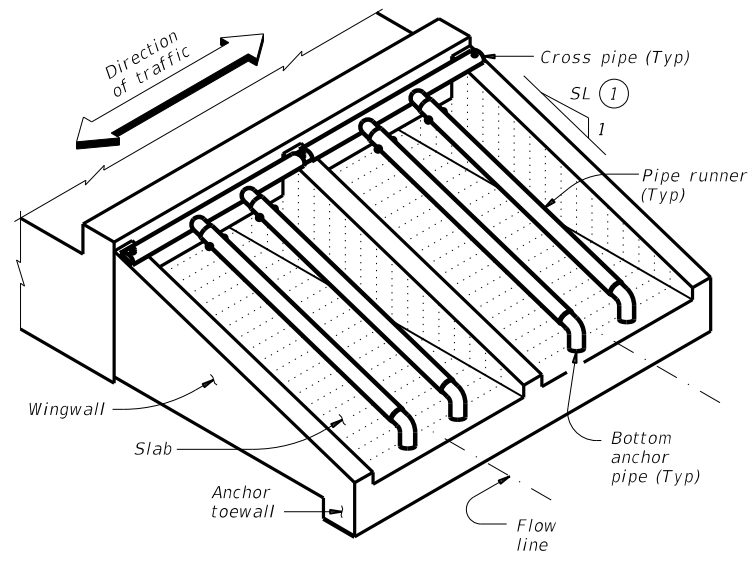
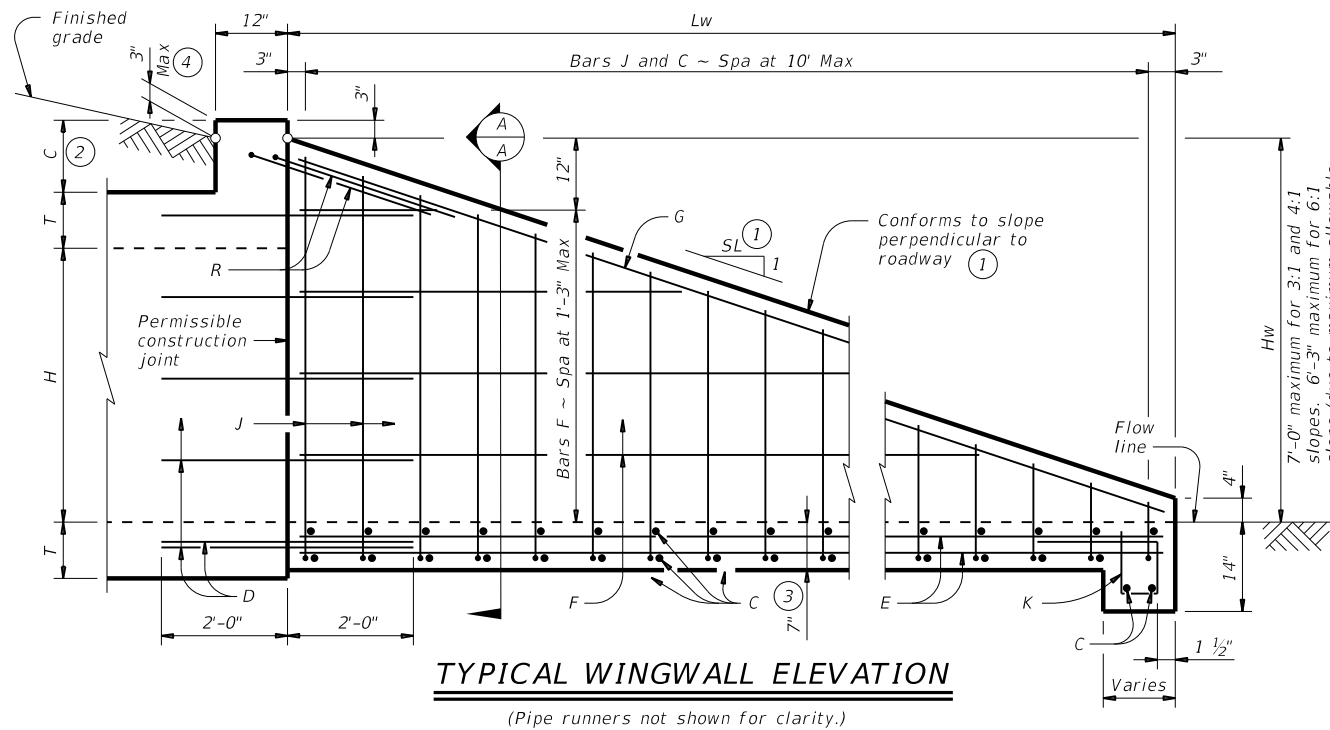
PW

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REVISIONS	CONT	SECT	JOB	HIGHWAY
	0848	04	052	FM 462
	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	178	



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**WING DIMENSION CALCULATIONS:**

$$Hw = H + T + C - 0.250'$$

$$Lw = (Hw - 0.333') (SL)$$

For cast-in-place culverts:  
 $Atw = (N) (S) + (N + 1) (U)$

For precast culverts:  
 $Atw = (N) (2U + S) + (N - 1) (0.500')$

Total Wingwall Area (SF)  
 $= (0.5) (Hw + 0.333') (Lw) (N + 1)$

Total Concrete Volume (CY)  
 $= [(Wingwall Area) (0.583') + (Lw) (Atw) (0.583') + (Atw) (1.167') (1.167' - 0.583')] \div (27)$

**PIPE RUNNER DIMENSION CALCULATIONS:**

Pipe Runner Length  
 $= (Lw) (K1) - (1.917')$

Total Reinforcing (Lb)  
 $= (1.55) (Lw) (Atw) + (4.43) (Atw) + (K2) (Hw) (N + 1) (\sqrt{Lw})$

C = Height of curb above top of top slab (feet)  
 Hw = Height of wingwall (feet)  
 K = Constant value for use in formulas

Slope SL:1	K1	K2
3:1	~ 1.054	~ 7.45
4:1	~ 1.031	~ 8.49
6:1	~ 1.014	~ 10.30

Atw = Anchor toewall length (feet)  
 Lw = Length of wingwall (feet)  
 N = Number of culvert barrels  
 SL:1 = Side slope ratio (horizontal : 1 vertical)

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

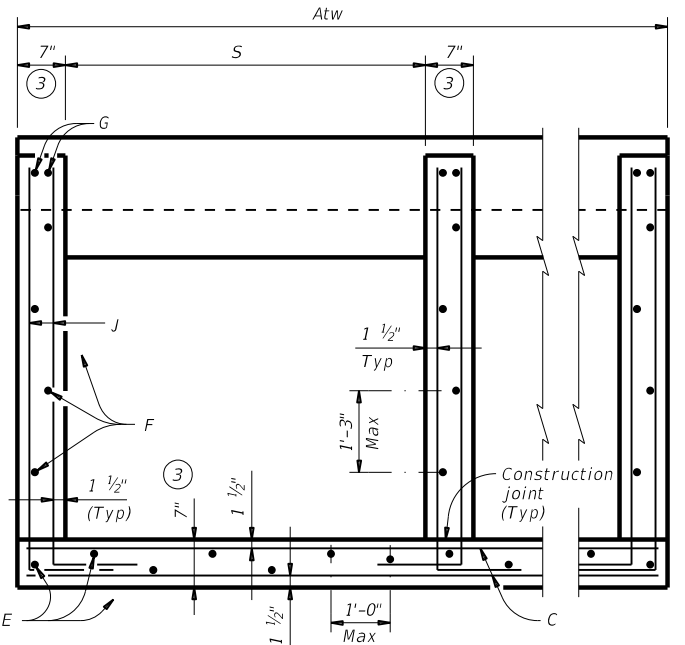
**MATERIAL NOTES:**

Provide Grade 60 reinforcing steel.  
 Provide galvanized reinforcing steel if required elsewhere in the plans.  
 Adjust reinforcing as necessary to provide a minimum clear cover of 1 1/2".  
 Provide Class "C" concrete (f'c = 3,600 psi).  
 Provide pipe runners, cross pipes, and anchor pipes meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.  
 Provide ASTM A307 bolts.  
 Galvanize all steel components, except the concrete reinforcing, unless required elsewhere in the plans, after fabrication.  
 Repair galvanizing damaged during transport or construction in accordance with the Item 445, "Galvanizing."

**GENERAL NOTES:**

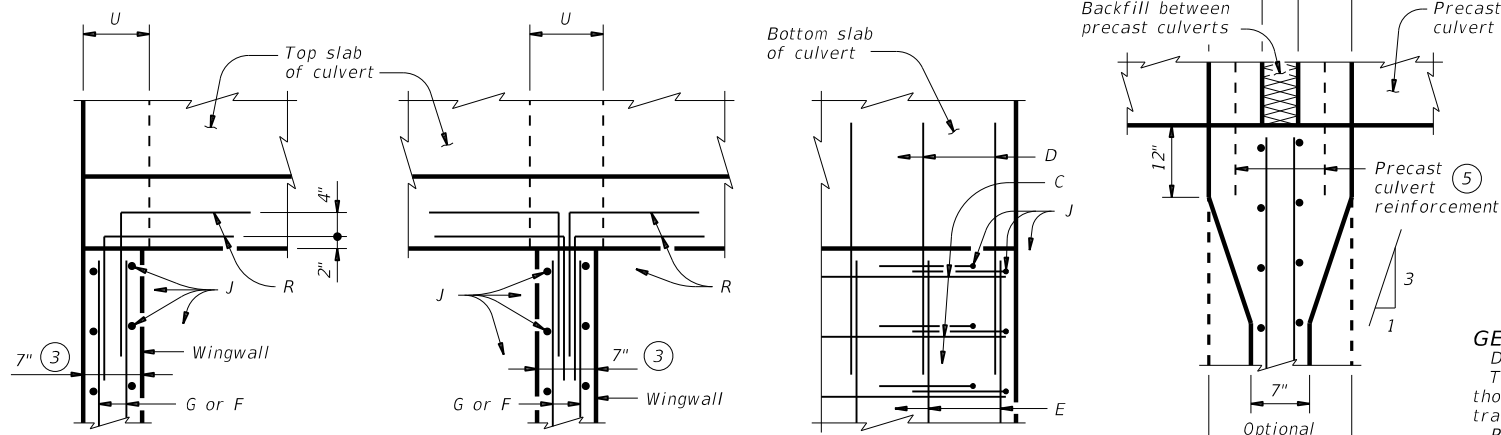
Designed according to AASHTO LRFD Bridge Design Specifications.  
 The safety end treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.  
 Pipe runners are designed for a traversing 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.  
 The quantities for pipe runners, reinforcing steel, and concrete resulting from the formulas given herein are for Contractor's information only.  
 See the Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.  
 Alternate design drawings bearing the seal of a professional engineer will be acceptable for precast construction of the safety end treatments.

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



**SECTION A-A**

(Showing typical wingwall and wing slab reinforcing. Pipe runners not shown for clarity.)

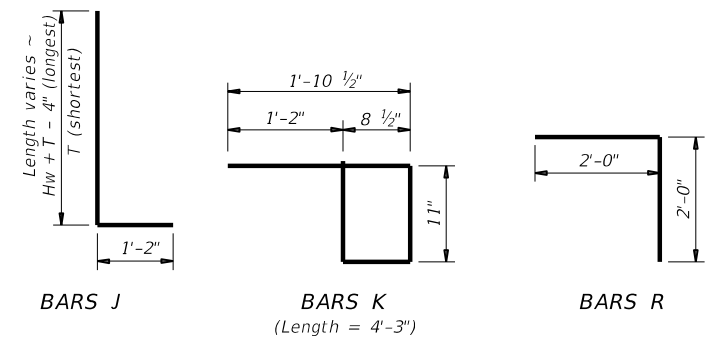


**PLAN VIEWS OF CORNER DETAILS**

- Recommended values of slope are: 3:1, 4:1, and 6:1. Provide 3:1 or flatter slope.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet.
- Wingwall and slab thicknesses may be the same as the adjacent culvert wall and slab thicknesses (7" minimum). If thicknesses greater than the minimum (7") are used, no changes will be made in quantities and no additional compensation will be allowed.
- For vehicle safety, reduce curb height, if necessary, to provide a maximum 3" projection. No changes will be made in quantities and no additional compensation will be allowed for this work.
- For culverts with C = 0", the precast culvert reinforcing may extend 1'-0" minimum into wingwall. Wingwall Bars D and R may be omitted. Otherwise, refer to the Wingwall Connection detail on the Box Culvert Precast Miscellaneous Details (SCP-MD) standard sheet.

**TABLE OF REINFORCING BAR SIZES AND SPACING**

Bar	Size	Spacing
C	#4	10" Max
D	#4	Match F and E
E	#4	1'-0" Max
F	#4	1'-3" Max
G	#6	As shown
J	#4	10" Max
K	#4	1'-0" Max
R	#4	As shown



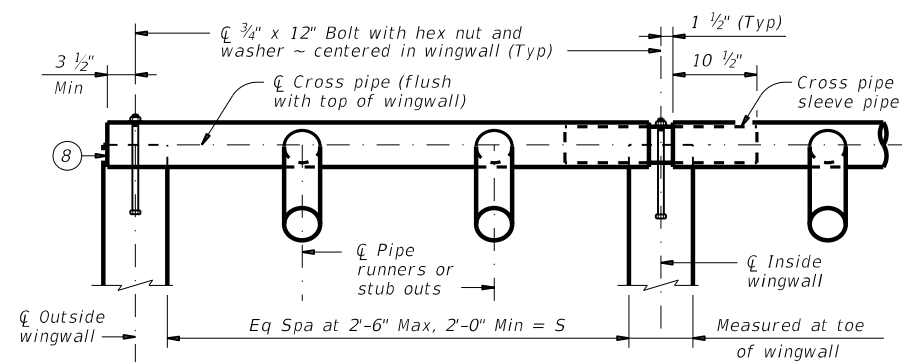
Texas Department of Transportation  
 Bridge Division Standard

**SAFETY END TREATMENT FOR 0° SKEW BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ CROSS DRAINAGE SETB-CD**

FILE: CD-SETBCD-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	179	

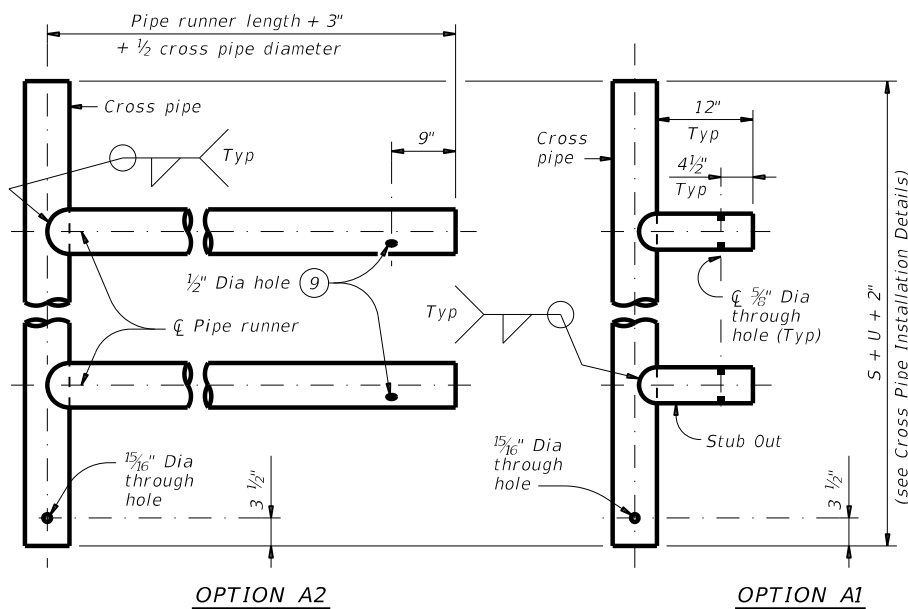
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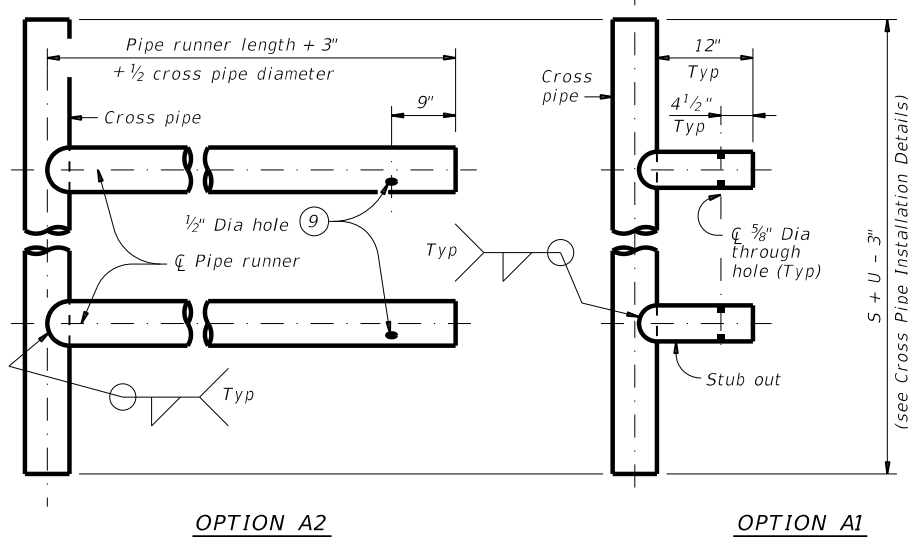


NOTE: At Contractor's option, make the cross pipe continuous across the inside wingwalls. If option is selected, omit the sleeve pipe and make a 1 5/16 inch diameter through hole in the cross pipe to accept the anchor bolt at the centerline of each inside wingwall.

**CROSS PIPE INSTALLATION DETAILS**

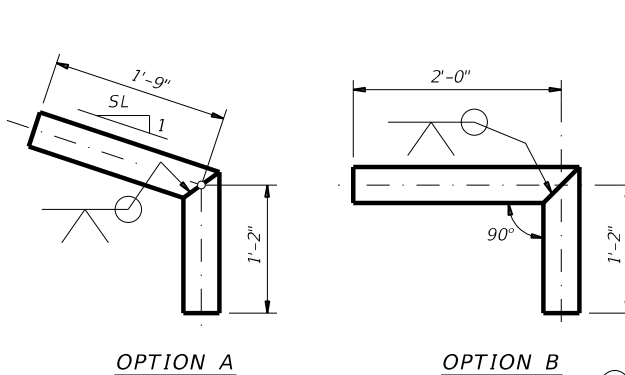


OPTION A2 FOR USE IN OUTSIDE CULVERT BAY

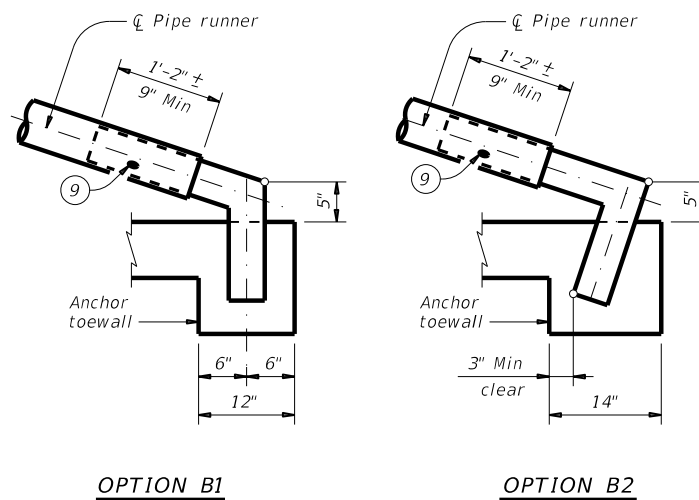


OPTION A2 FOR USE IN INSIDE CULVERT BAY

**CROSS PIPE AND CONNECTIONS DETAILS**

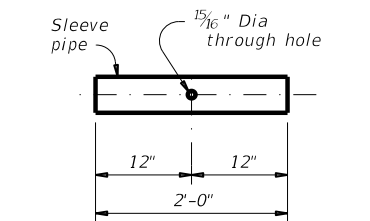


OPTION A OPTION B  
**BOTTOM ANCHOR PIPE DETAILS**

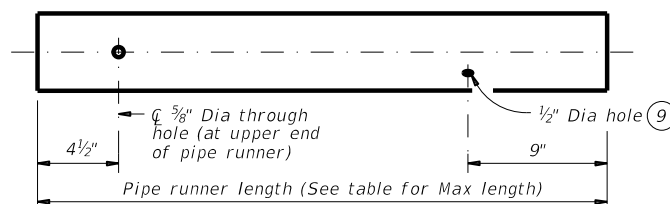


OPTION B1 OPTION B2  
**BOTTOM ANCHOR TOEWALL DETAILS**

(Wingwall not shown for clarity.)



**CROSS PIPE SLEEVE PIPE DETAILS**

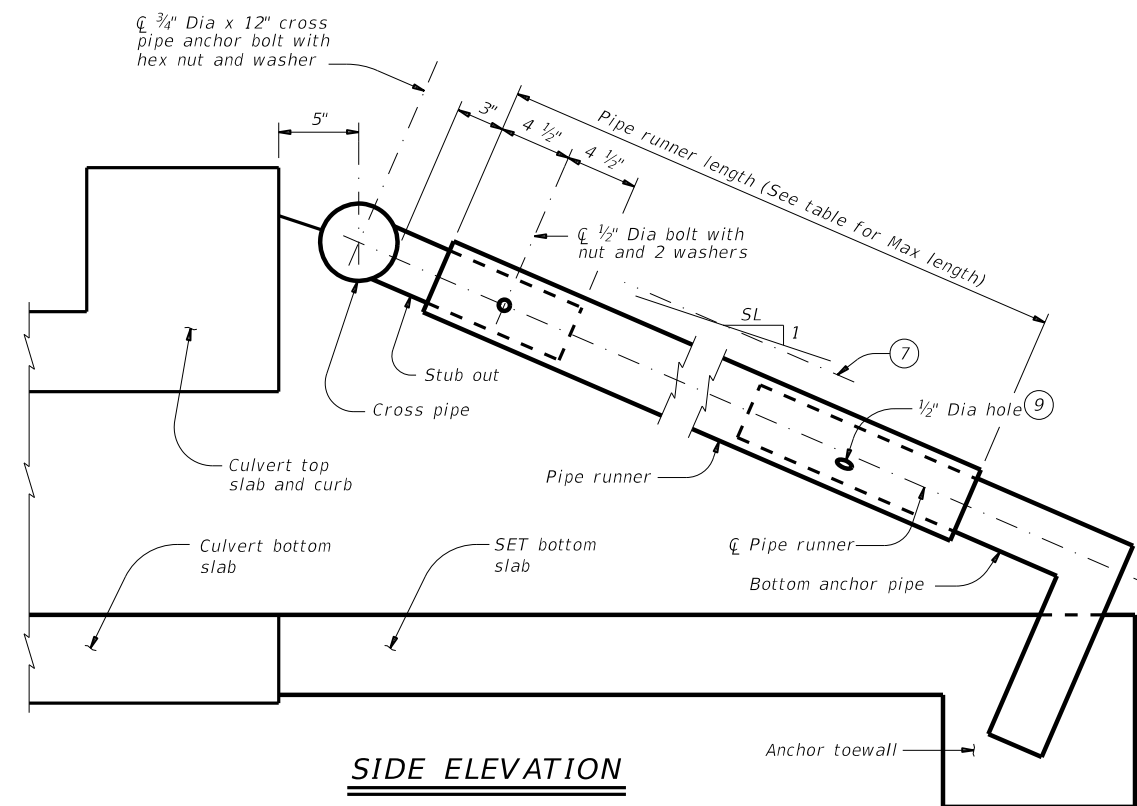


NOTE: The separate pipe runner shown is required when Cross Pipe Connection Option A1 is used.

**PIPE RUNNER DETAILS**

- ⑥ Cross pipe is the same size as the pipe runner. Cross pipe stub out is the same size as the anchor pipe.
- ⑦ Note that actual slope of safety pipe runner may vary slightly from side slope.
- ⑧ Take care to 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 1#2 hole to ensure that the lap of the safety 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.

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



**SIDE ELEVATION**

(Showing pipe runner with Cross Pipe Connection Option A1 and Bottom Anchor Toewall Option B2. Wingwall not shown for clarity.)

SHEET 2 OF 2

				<b>Bridge Division Standard</b>	
<b>SAFETY END TREATMENT FOR 0° SKEW BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ CROSS DRAINAGE SETB-CD</b>					
FILE: CD-SETBCD-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT	
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0848	04	052	FM 462	
	DIST	COUNTY	SHEET NO.		
	SAT	MEDINA	180		

**SPECIAL NOTES**

1. ALL PIPE SIZES WERE TAKEN FROM UTILITY RECORDS WHERE POSSIBLE. THE UTILITIES DEPICTED WERE INVESTIGATED BY THE RIOS GROUP, INC.. ALL OTHER PLAN INFORMATION, NOTABLY THE BACKGROUND INFORMATION, WAS PROVIDED BY OTHERS AND THE RIOS GROUP, INC. DISCLAIMS RESPONSIBILITY FOR ITS ACCURACY.

2. EXISTING SUBSURFACE UTILITY INVESTIGATIONS WERE COMPLETED ON 12/20/2023. THE RIOS GROUP, INC. EXPRESSLY DISCLAIMS ANY AND ALL RESPONSIBILITY FOR NEW UTILITY INSTALLATIONS, MODIFICATIONS, AND/OR ADJUSTMENTS TO EXISTING UTILITIES AFTER THE COMPLETION DATE.

3. UTILITY LOCATIONS ON THESE DRAWINGS ARE INTENDED FOR DESIGN PURPOSES AND NOT CONSTRUCTION. THEY REFLECT SUBSURFACE UTILITIES AT THE TIME OF FIELD INVESTIGATION. CALL TEXAS ONE CALL SYSTEM (800)245-4545 FOR UTILITY LOCATIONS 48 HOURS PRIOR TO ANY WORK.

4. WHERE POSSIBLE, WATER, GAS, AND COMMUNICATION SERVICE LINES WERE DESIGNATED. HOWEVER, SOME SERVICE LINES ARE CONSTRUCTED OF NON-CONDUCTIVE MATERIAL AND UTILITY COMPANY DRAWINGS MAY NOT SHOW SERVICE LINE LOCATIONS. THEREFORE ALL SERVICE LINES MAY NOT BE SHOWN.

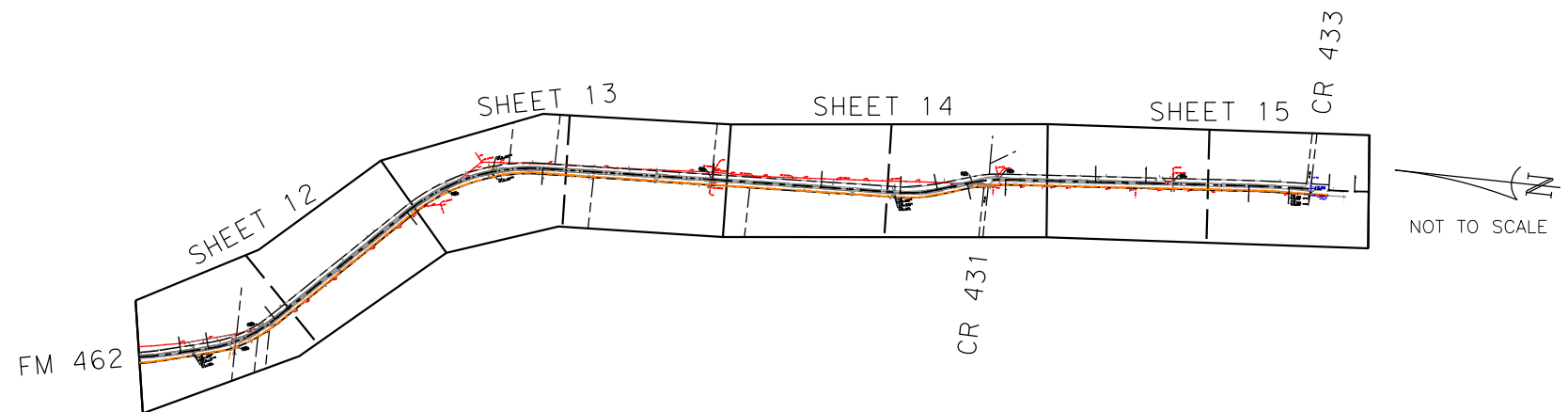
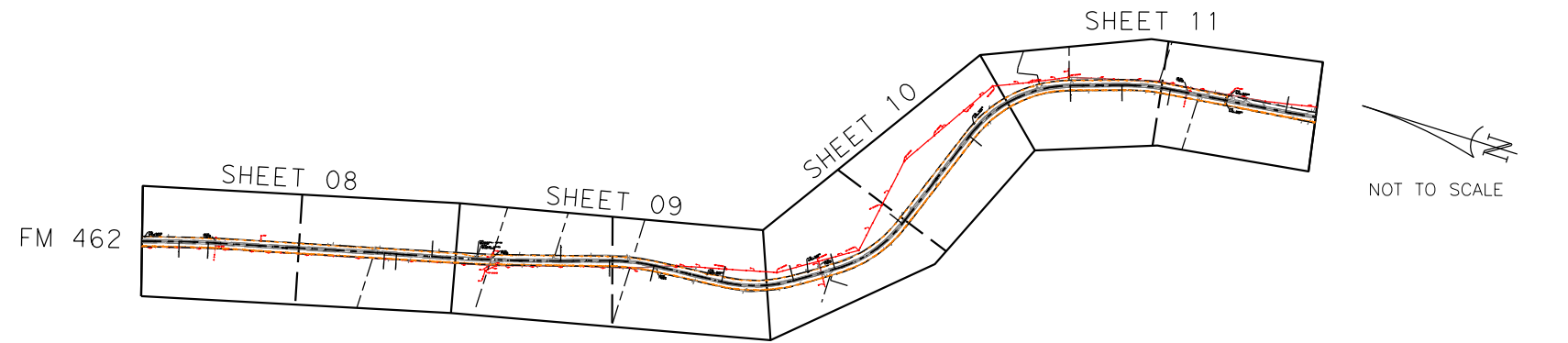
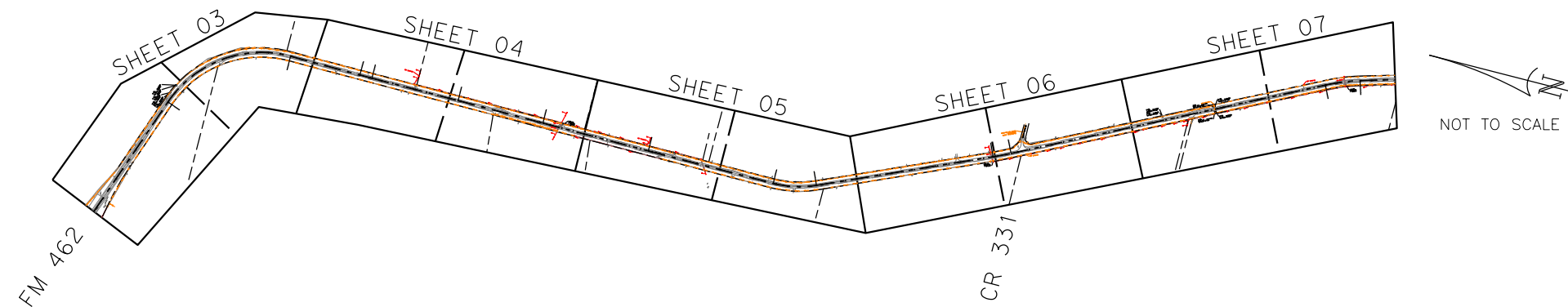
**QUALITY LEVELS**

Quality Level "D" - Information derived from existing records and/or oral collection.

Quality Level "C" - Information obtained by surveying and plotting visible above ground utility features and by using professional judgment in correlating information to Quality Level "D" information.

Quality Level "B" - Designate: Two-dimensional horizontal mapping. This information is obtained through the application and interpretation of appropriate non-destructive surface geophysical methods. Utility indications are referenced to established survey control. Incorporates Quality Levels "C" and "D" information to produce Quality Level "B" information.

Quality Level "A" - Locate: Precise horizontal and vertical location of utilities obtained by the actual exposure and subsequent measurement of subsurface utilities at a specific point. Diameters shown are verified visually and may not be exact.



**MATERIAL ABBREVIATIONS**

- |                                |                               |
|--------------------------------|-------------------------------|
| STL - STEEL                    | VC - VITRIFIED CLAY           |
| PE - POLYETHYLENE              | FG - FIBERGLASS               |
| AC - TRANSITE                  | CSC - CONCRETE/STEEL CYLINDER |
| CI - CAST IRON                 | CMP - CORRUGATED METAL PIPE   |
| DI - DUCTILE IRON              | CONC - CONCRETE               |
| PVC - POLYVINYL CHLORIDE       | CLAY - CLAY                   |
| DBC - DIRECT BURIED CABLE      | UNK - UNKNOWN                 |
| RCP - REINFORCED CONCRETE PIPE |                               |

**Subsurface Utility Engineering (SUE) Certification**

The engineer's seal hereon is to certify that the utilities shown have been investigated in accordance with standard SUE industry practices. Where indicated utility sizes and materials taken from best available records. All other information hereon has been provided by others and is not a part of this certification.

**LEGEND OF UTILITY TYPES**

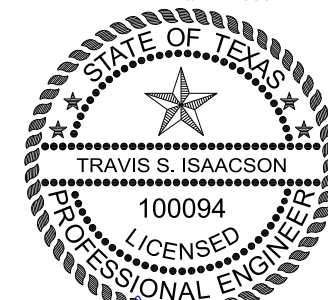
<b>QUALITY LEVELS</b>	
QUALITY LEVEL "B"	--- X# ---
QUALITY LEVEL "C"	- - - - X#(C) - - - -
QUALITY LEVEL "D"	..... X#(D) .....
ABANDONED UTILITY	---
PROPOSED UTILITY	---
UNKNOWN UTILITY	---
<b>ELECTRIC / POWER</b>	
MEDINA ELECTRIC	QL "B" --- E1 ---
<b>COMMUNICATIONS</b>	
AT&T (TELE)	QL "B" --- T1 ---
AT&T (FOIDUCT)	--- FOC1 ---
<b>POTABLE WATER</b>	
WEST MEDINA WSC	QL "B" --- W1 ---
<b>OVERHEAD UTILITY</b>	
OH - 1 MEDINA ELECTRIC	QL "C"/QL "D" --- OH ---
OH - 2 AT&T TELE	
OH - 2 AT&T FO	

**LEGEND OF UTILITY SYMBOLS**

END CAP	C
QUALITY LEVEL CHANGE	t
TEST HOLE	⊙
UTILITY CONTINUATION	z
CATV CABINET	[C]
CATV HANDHOLE	C
CATV PEDESTAL	[C]
FIBER HANDHOLE	F
TELEPHONE CABINET	[T]
TELEPHONE HANDHOLE (VAULT)	T
TELEPHONE MANHOLE	⊙
TELEPHONE PEDESTAL	⊙
TELEPHONE POLE	⊙
TELEPHONE POLE W/RISER	⊙
ELECTRIC HANDHOLE	E
ELECTRIC JUNCTION BOX (CABINET)	[E]
ELECTRIC MANHOLE	⊙
ELECTRIC POLE (POWER)	⊙
ELECTRIC POLE W/RISER	⊙
LIGHT POLE	⊙
SIGNAL POLE	⊙
SIGNAL HANDHOLE/BOX	[S]
TRANSMISSION POLE	⊙
GAS METER	[G]
GAS TEST STATION	G
GAS VALVE	V
GAS VENT PIPE (GAS RISER)	V
WASTE WATER CLEANOUT	W
WASTE WATER MANHOLE	⊙
FIRE HYDRANT	⊙
WATER MANHOLE	⊙
WATER METER	⊙
WATER VALVE	V
WATER VAULT	⊙

REV	DATE	BY	DESCRIPTION

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TBPE Firm # F-14595



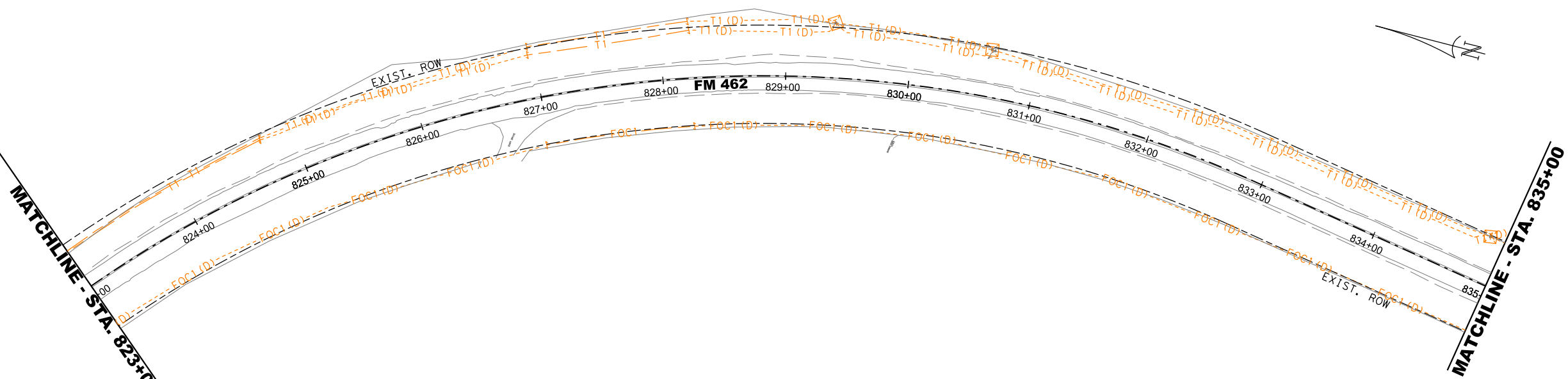
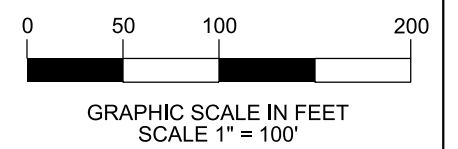
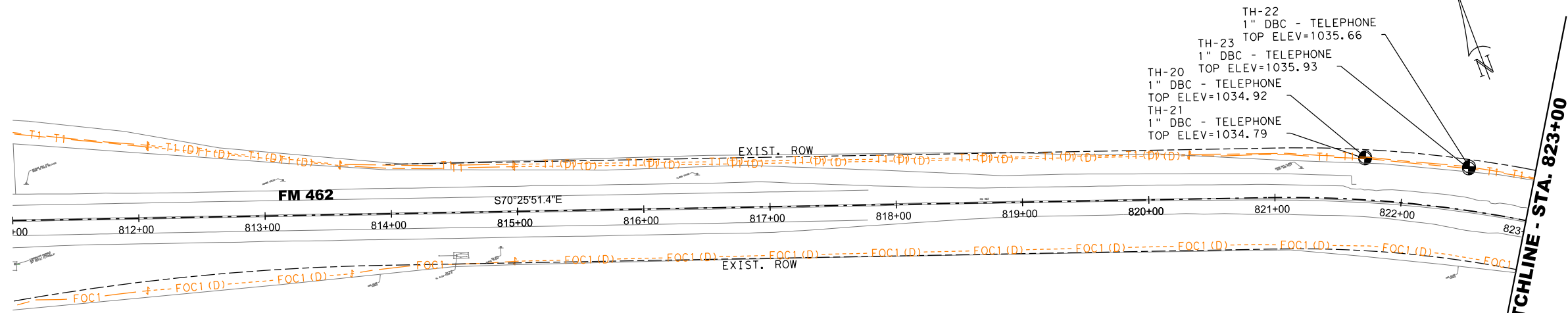
01-30-2024



FM 462  
FM 433  
to  
S EMBANKMENT OF HONDO CREEK  
**S.U.E. PLAN SHEET**

**LAYOUT INDEX**

DESIGNED BY: SJ	CHECKED BY: TI	DATE: 01-30-2024
APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	02 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	181	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA



**LEGEND OF UTILITY TYPES**

**QUALITY LEVELS**

QUALITY LEVEL "B"	---	X#
QUALITY LEVEL "C"	----	X#(C)
QUALITY LEVEL "D"	-----	X#(D)
ABANDONED UTILITY	---	
PROPOSED UTILITY	---	
UNKNOWN UTILITY	---	

**ELECTRIC / POWER**

MEDINA ELECTRIC	QL "B"	---	E1
-----------------	--------	-----	----

**COMMUNICATIONS**

AT&T (TELE)	QL "B"	---	T1
AT&T (FOIDUCT)		---	FOC1

**POTABLE WATER**

WEST MEDINA WSC	QL "B"	---	W1
-----------------	--------	-----	----

**OVERHEAD UTILITY**

OH - 1 MEDINA ELECTRIC	QL "C"/QL "D"	---	OH
OH - 2 AT&T TELE		---	OH
OH - 2 AT&T FO		---	OH

**LEGEND OF UTILITY SYMBOLS**

END CAP	[Symbol]
QUALITY LEVEL CHANGE	[Symbol]
TEST HOLE	[Symbol]
UTILITY CONTINUATION	[Symbol]
CATV CABINET	[Symbol]
CATV HANDHOLE	[Symbol]
CATV PEDESTAL	[Symbol]
FIBER HANDHOLE	[Symbol]
TELEPHONE CABINET	[Symbol]
TELEPHONE HANDHOLE (VAULT)	[Symbol]
TELEPHONE MANHOLE	[Symbol]
TELEPHONE PEDESTAL	[Symbol]
TELEPHONE POLE	[Symbol]
TELEPHONE POLE W/ RISER	[Symbol]
ELECTRIC HANDHOLE	[Symbol]
ELECTRIC JUNCTION BOX (CABINET)	[Symbol]
ELECTRIC MANHOLE	[Symbol]
ELECTRIC POLE (POWER)	[Symbol]
ELECTRIC POLE W/ RISER	[Symbol]
LIGHT POLE	[Symbol]
SIGNAL HANDHOLE/BOX	[Symbol]
TRANSMISSION POLE	[Symbol]
GAS METER	[Symbol]
GAS TEST STATION	[Symbol]
GAS VALVE	[Symbol]
GAS VENT PIPE (GAS RISER)	[Symbol]
WASTE WATER CLEANOUT	[Symbol]
WASTE WATER MANHOLE	[Symbol]
FIRE HYDRANT	[Symbol]
WATER MANHOLE	[Symbol]
WATER METER	[Symbol]
WATER VALVE	[Symbol]
WATER VAULT	[Symbol]

REV	DATE	BY	DESCRIPTION



FM 462  
FM 433  
to  
S EMBANKMENT OF HONDO CREEK  
**S.U.E. PLAN SHEET**

**STA. START TO STA. 835+00**

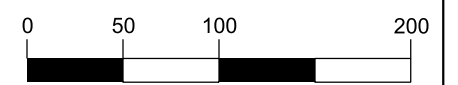
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APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	03 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	182	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA

**Subsurface Utility Engineering (SUE) Certification**

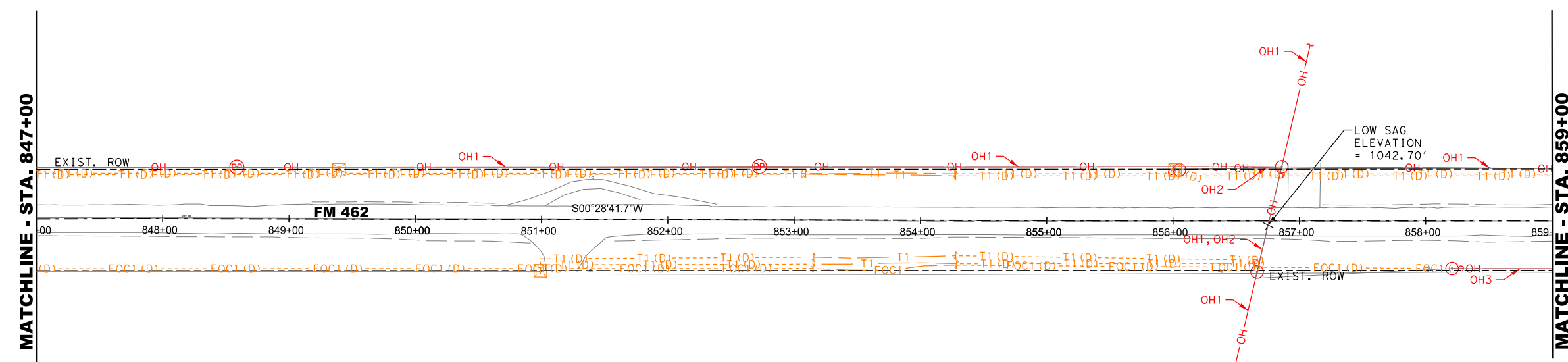
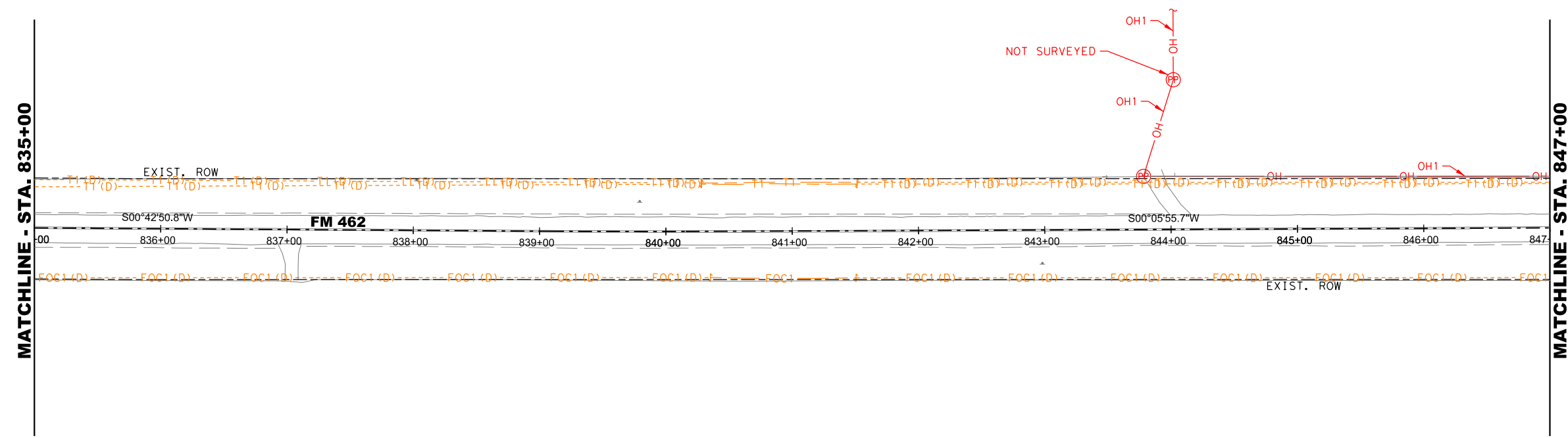
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The Rios Group, Inc.  
TBPE Firm # F-14595

01-30-2024



GRAPHIC SCALE IN FEET  
SCALE 1" = 100'



**LEGEND OF UTILITY TYPES**

**QUALITY LEVELS**

QUALITY LEVEL "B" --- X# ---  
 QUALITY LEVEL "C" - - - - X#(C) - - - -  
 QUALITY LEVEL "D" - - - - - X#(D) - - - -

ABANDONED UTILITY ---  
 PROPOSED UTILITY ---  
 UNKNOWN UTILITY ---

**ELECTRIC / POWER** QL "B" --- E1 ---

**COMMUNICATIONS** QL "B" --- T1 ---  
 AT&T (FOIDUCT) --- FOC1 ---

**POTABLE WATER** QL "B" --- W1 ---

**OVERHEAD UTILITY** QL "C"/QL "D" --- OH ---  
 OH - 1 MEDINA ELECTRIC  
 OH - 2 AT&T TELE  
 OH - 2 AT&T FO

**LEGEND OF UTILITY SYMBOLS**

END CAP [Symbol]  
 QUALITY LEVEL CHANGE [Symbol]  
 TEST HOLE [Symbol]  
 UTILITY CONTINUATION [Symbol]

CATV CABINET [Symbol]  
 CATV HANDHOLE [Symbol]  
 CATV PEDESTAL [Symbol]

FIBER HANDHOLE [Symbol]  
 TELEPHONE CABINET [Symbol]  
 TELEPHONE HANDHOLE (VAULT) [Symbol]  
 TELEPHONE MANHOLE [Symbol]  
 TELEPHONE PEDESTAL [Symbol]  
 TELEPHONE POLE [Symbol]  
 TELEPHONE POLE W/RISER [Symbol]

ELECTRIC HANDHOLE [Symbol]  
 ELECTRIC JUNCTION BOX (CABINET) [Symbol]  
 ELECTRIC MANHOLE [Symbol]  
 ELECTRIC POLE (POWER) [Symbol]  
 ELECTRIC POLE W/RISER [Symbol]  
 LIGHT POLE [Symbol]  
 SIGNAL POLE [Symbol]  
 SIGNAL HANDHOLE/BOX [Symbol]  
 TRANSMISSION POLE [Symbol]

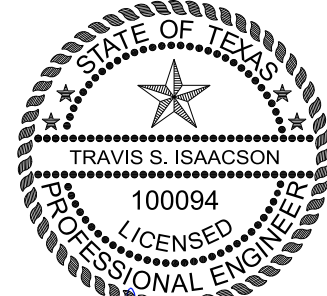
GAS METER [Symbol]  
 GAS TEST STATION [Symbol]  
 GAS VALVE [Symbol]  
 GAS VENT PIPE (GAS RISER) [Symbol]

WASTE WATER CLEANOUT [Symbol]  
 WASTE WATER MANHOLE [Symbol]

FIRE HYDRANT [Symbol]  
 WATER MANHOLE [Symbol]  
 WATER METER [Symbol]  
 WATER VALVE [Symbol]  
 WATER VAULT [Symbol]

REV	DATE	BY	DESCRIPTION

The Rios Group, Inc.  
TBPE Firm # F-14595



*Travis Isaacson*  
01-30-2024



FM 462  
FM 433  
to  
S EMBANKMENT OF HONDO CREEK  
**S.U.E. PLAN SHEET**

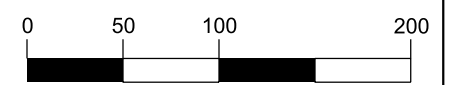
**STA. 835+00 TO STA. 859+00**

DESIGNED BY: SJ	CHECKED BY: TI	DATE: 01-30-2024
APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER KHA_2320.01	SUE SHEET NO. 04 OF 15	DATE 01-30-2024
CSJ NUMBER 0848-04-052	PLAN SHEET NO. 183	
STATE TX	DISTRICT SAT	COUNTY MEDINA

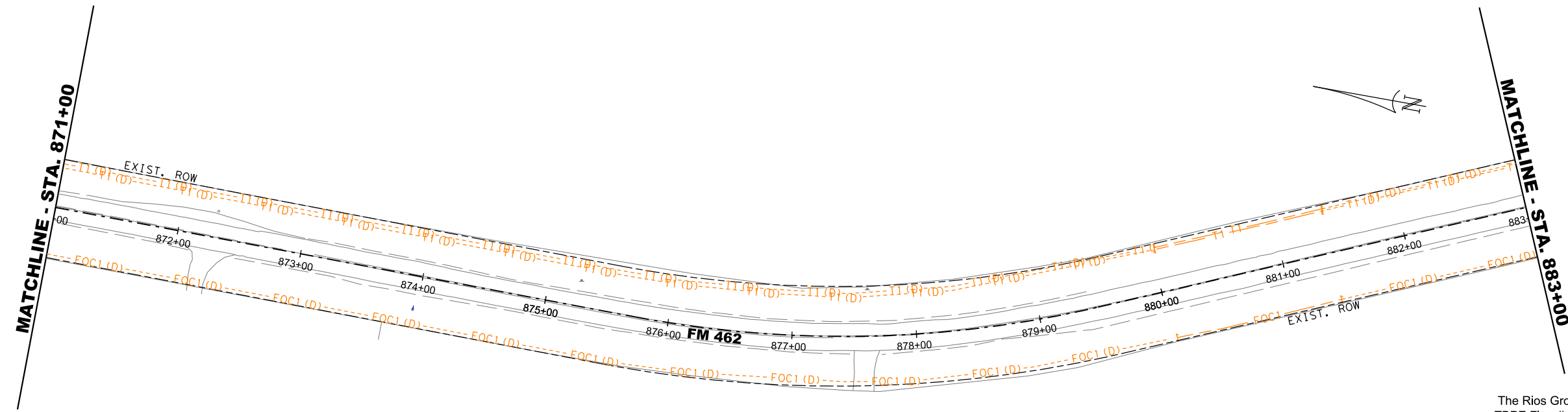
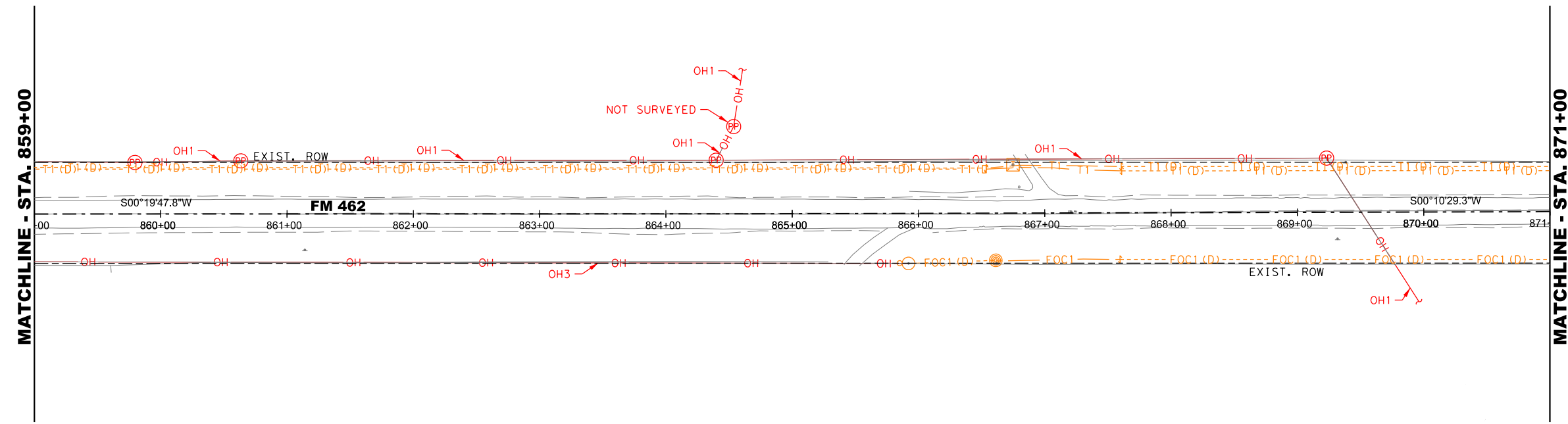
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GRAPHIC SCALE IN FEET  
SCALE 1" = 100'



**LEGEND OF UTILITY TYPES**

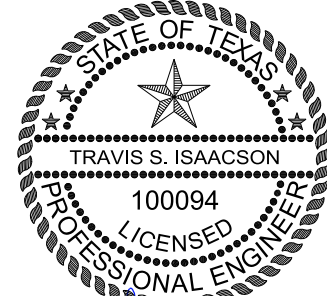
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QUALITY LEVEL "B"	--- X# ---
QUALITY LEVEL "C"	--- X#(C) ---
QUALITY LEVEL "D"	--- X#(D) ---
ABANDONED UTILITY	---
PROPOSED UTILITY	---
UNKNOWN UTILITY	---
<b>ELECTRIC / POWER</b>	QL "B" --- E1 ---
MEDINA ELECTRIC	---
<b>COMMUNICATIONS</b>	QL "B" --- T1 ---
AT&T (TELE)	---
AT&T (FOIDUCT)	---
<b>POTABLE WATER</b>	QL "B" --- W1 ---
WEST MEDINA WSC	---
<b>OVERHEAD UTILITY</b>	QL "C"/QL "D" --- OH ---
OH - 1 MEDINA ELECTRIC	---
OH - 2 AT&T TELE	---
OH - 2 AT&T FO	---

**LEGEND OF UTILITY SYMBOLS**

END CAP	⊥
QUALITY LEVEL CHANGE	⊕
TEST HOLE	⊙
UTILITY CONTINUATION	⋮
CATV CABINET	⊠
CATV HANDHOLE	⊞
CATV PEDESTAL	⊞
FIBER HANDHOLE	⊞
TELEPHONE CABINET	⊠
TELEPHONE HANDHOLE (VAULT)	⊞
TELEPHONE MANHOLE	⊞
TELEPHONE PEDESTAL	⊞
TELEPHONE POLE	⊙
TELEPHONE POLE W/RISER	⊙
ELECTRIC HANDHOLE	⊞
ELECTRIC JUNCTION BOX (CABINET)	⊠
ELECTRIC MANHOLE	⊞
ELECTRIC POLE (POWER)	⊙
ELECTRIC POLE W/RISER	⊙
LIGHT POLE	⊙
SIGNAL POLE	⊙
SIGNAL HANDHOLE/BOX	⊞
TRANSMISSION POLE	⊙
GAS METER	⊞
GAS TEST STATION	⊞
GAS VALVE	⊞
GAS VENT PIPE (GAS RISER)	⊞
WASTE WATER CLEANOUT	⊞
WASTE WATER MANHOLE	⊞
FIRE HYDRANT	⊞
WATER MANHOLE	⊞
WATER METER	⊞
WATER VALVE	⊞
WATER VAULT	⊞

REV	DATE	BY	DESCRIPTION

The Rios Group, Inc.  
TBPE Firm # F-14595



*Travis Isaacson*  
01-30-2024



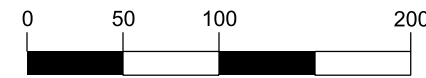
FM 462  
FM 433  
to  
S EMBANKMENT OF HONDO CREEK  
**S.U.E. PLAN SHEET**

**STA. 859+00 TO STA. 883+00**

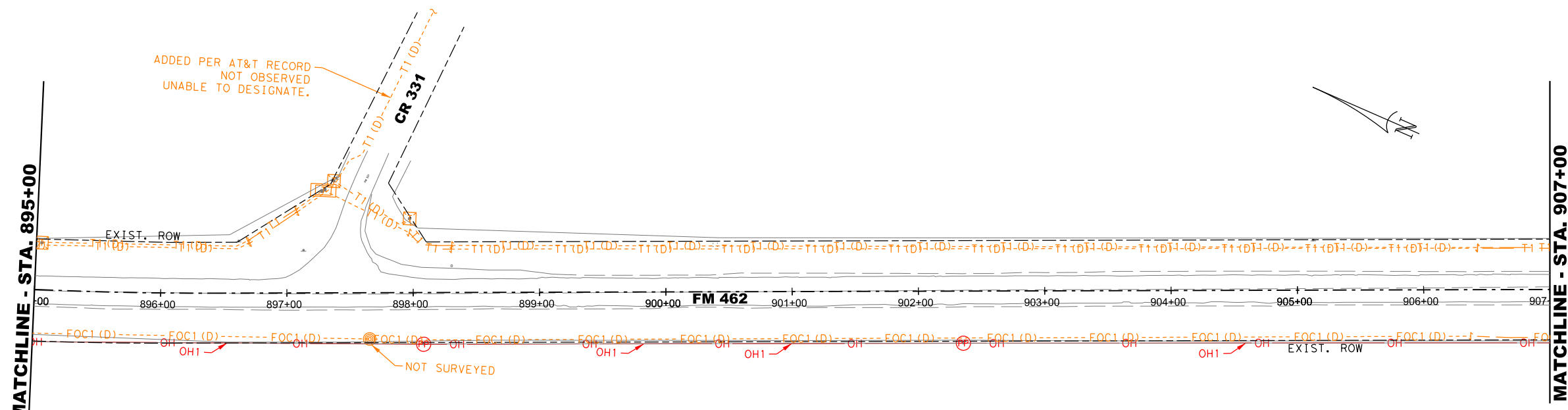
DESIGNED BY: SJ	CHECKED BY: TI	DATE: 01-30-2024
APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	05 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	184	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA

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GRAPHIC SCALE IN FEET  
SCALE 1" = 100'



**LEGEND OF UTILITY TYPES**

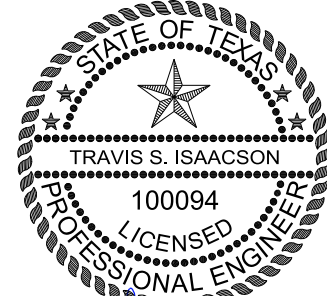
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QUALITY LEVEL "B"	--- X# ---
QUALITY LEVEL "C"	- - - - X# (C) - - - -
QUALITY LEVEL "D"	- - - - - X# (D) - - - -
ABANDONED UTILITY	---
PROPOSED UTILITY	---
UNKNOWN UTILITY	---
ELECTRIC / POWER	
MEDINA ELECTRIC	QL "B" --- E1 ---
COMMUNICATIONS	
AT&T (TELE)	QL "B" --- T1 ---
AT&T (FOIDUCT)	--- FOC1 ---
POTABLE WATER	
WEST MEDINA WSC	QL "B" --- W1 ---
OVERHEAD UTILITY	
OH - 1 MEDINA ELECTRIC	QL "C"/QL "D" --- OH ---
OH - 2 AT&T TELE	---
OH - 2 AT&T FO	---

**LEGEND OF UTILITY SYMBOLS**

END CAP	[Symbol]
QUALITY LEVEL CHANGE	[Symbol]
TEST HOLE	[Symbol]
UTILITY CONTINUATION	[Symbol]
CATV CABINET	[Symbol]
CATV HANDHOLE	[Symbol]
CATV PEDESTAL	[Symbol]
FIBER HANDHOLE	[Symbol]
TELEPHONE CABINET	[Symbol]
TELEPHONE HANDHOLE (VAULT)	[Symbol]
TELEPHONE MANHOLE	[Symbol]
TELEPHONE PEDESTAL	[Symbol]
TELEPHONE POLE	[Symbol]
TELEPHONE POLE W/RISER	[Symbol]
ELECTRIC HANDHOLE	[Symbol]
ELECTRIC JUNCTION BOX (CABINET)	[Symbol]
ELECTRIC MANHOLE	[Symbol]
ELECTRIC POLE (POWER)	[Symbol]
ELECTRIC POLE W/RISER	[Symbol]
LIGHT POLE	[Symbol]
SIGNAL POLE	[Symbol]
SIGNAL HANDHOLE/BOX	[Symbol]
TRANSMISSION POLE	[Symbol]
GAS METER	[Symbol]
GAS TEST STATION	[Symbol]
GAS VALVE	[Symbol]
GAS VENT PIPE (GAS RISER)	[Symbol]
WASTE WATER CLEANOUT	[Symbol]
WASTE WATER MANHOLE	[Symbol]
FIRE HYDRANT	[Symbol]
WATER MANHOLE	[Symbol]
WATER METER	[Symbol]
WATER VALVE	[Symbol]
WATER VAULT	[Symbol]

REV	DATE	BY	DESCRIPTION

The Rios Group, Inc.  
TBPE Firm # F-14595



*Travis S. Isaacson*  
01-30-2024



FM 462  
FM 433  
to  
S EMBANKMENT OF HONDO CREEK  
**S.U.E. PLAN SHEET**

**STA. 883+00 TO STA. 907+00**

DESIGNED BY: SJ	CHECKED BY: TI	DATE: 01-30-2024
APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	06 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	185	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA

**Subsurface Utility Engineering (SUE) Certification**

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MATCHLINE - STA. 907+00

MATCHLINE - STA. 919+00

MATCHLINE - STA. 919+00

MATCHLINE - STA. 931+00

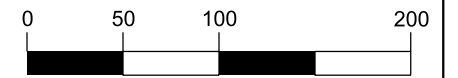
TH-24  
1" DBC - TELEPHONE  
TOP ELEV=1013.96  
TH-25  
1" DBC - TELEPHONE  
TOP ELEV=1013.32

TH-01  
0.50" DBC - TELEPHONE  
TOP ELEV=1014.60

TH-02  
4" PVC - TELEPHONE  
TOP ELEV=1014.69

TH-03  
0.50" DBC - TELEPHONE  
TOP ELEV=1014.64

TH-04  
4" PVC - TELEPHONE  
TOP ELEV=1014.62



GRAPHIC SCALE IN FEET  
SCALE 1" = 100'

**LEGEND OF UTILITY TYPES**

QUALITY LEVELS	
QUALITY LEVEL "B"	--- X# ---
QUALITY LEVEL "C"	- - - - X#(C) - - - -
QUALITY LEVEL "D"	- - - - - X#(D) - - - - -
ABANDONED UTILITY	---
PROPOSED UTILITY	---
UNKNOWN UTILITY	---
ELECTRIC / POWER	
MEDINA ELECTRIC	QL "B" --- E1 ---
COMMUNICATIONS	
AT&T (TELE)	QL "B" --- T1 ---
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POTABLE WATER	
WEST MEDINA WSC	QL "B" --- W1 ---
OVERHEAD UTILITY	
OH - 1 MEDINA ELECTRIC	QL "C"/"D" --- OH ---
OH - 2 AT&T TELE	--- OH ---
OH - 2 AT&T FO	--- OH ---

**LEGEND OF UTILITY SYMBOLS**

END CAP	[Symbol]
QUALITY LEVEL CHANGE	[Symbol]
TEST HOLE	[Symbol]
UTILITY CONTINUATION	[Symbol]
CATV CABINET	[Symbol]
CATV HANDHOLE	[Symbol]
CATV PEDESTAL	[Symbol]
FIBER HANDHOLE	[Symbol]
TELEPHONE CABINET	[Symbol]
TELEPHONE HANDHOLE (VAULT)	[Symbol]
TELEPHONE MANHOLE	[Symbol]
TELEPHONE PEDESTAL	[Symbol]
TELEPHONE POLE	[Symbol]
TELEPHONE POLE W/RISER	[Symbol]
ELECTRIC HANDHOLE	[Symbol]
ELECTRIC JUNCTION BOX (CABINET)	[Symbol]
ELECTRIC MANHOLE	[Symbol]
ELECTRIC POLE (POWER)	[Symbol]
ELECTRIC POLE W/RISER	[Symbol]
LIGHT POLE	[Symbol]
SIGNAL POLE	[Symbol]
SIGNAL HANDHOLE/BOX	[Symbol]
TRANSMISSION POLE	[Symbol]
GAS METER	[Symbol]
GAS TEST STATION	[Symbol]
GAS VALVE	[Symbol]
GAS VENT PIPE (GAS RISER)	[Symbol]
WASTE WATER CLEANOUT	[Symbol]
WASTE WATER MANHOLE	[Symbol]
FIRE HYDRANT	[Symbol]
WATER MANHOLE	[Symbol]
WATER METER	[Symbol]
WATER VALVE	[Symbol]
WATER VAULT	[Symbol]

REV	DATE	BY	DESCRIPTION



FM 462  
FM 433  
to  
S EMBANKMENT OF HONDO CREEK  
**S.U.E. PLAN SHEET**

**STA. 907+00 TO STA. 931+00**

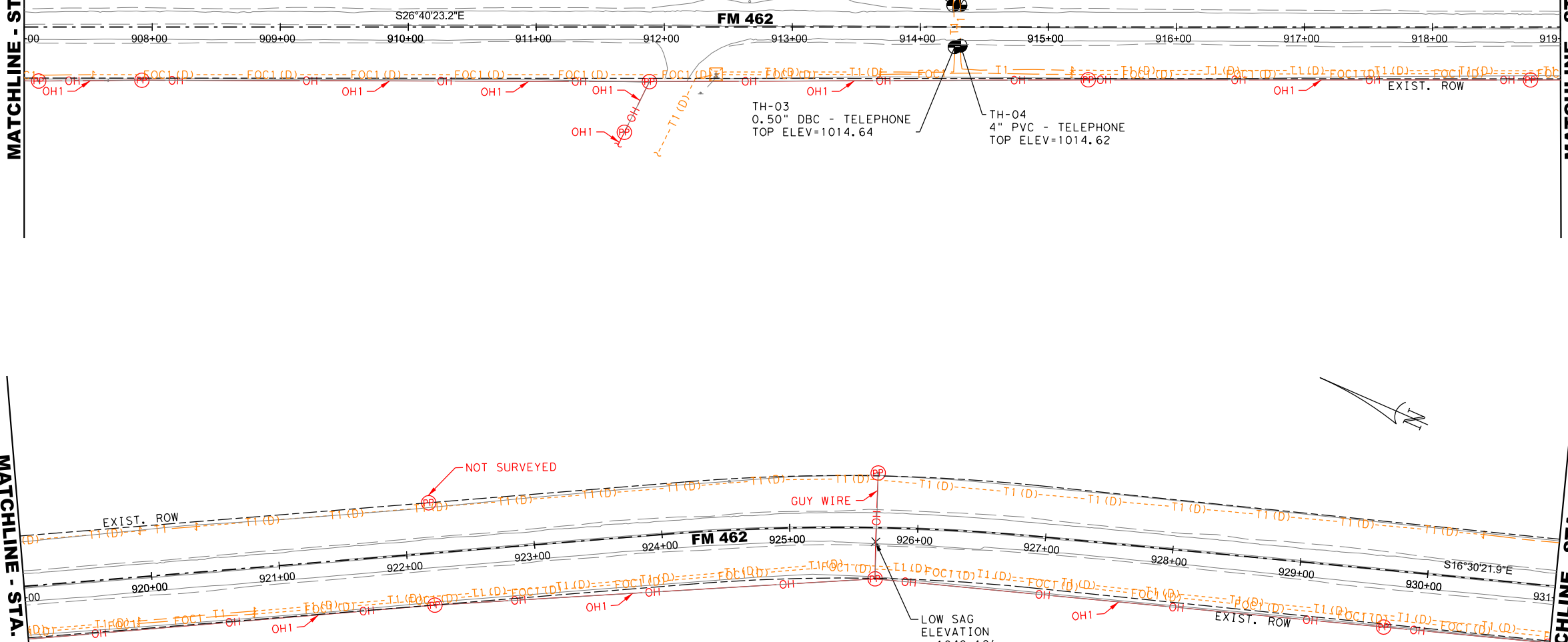
DESIGNED BY: SJ	CHECKED BY: TI	DATE: 01-30-2024
APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	07 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	186	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA

The Rios Group, Inc.  
TBPE Firm # F-14595

01-30-2024

**Subsurface Utility Engineering (SUE) Certification**

The engineer's seal hereon is to certify that the utilities shown have been investigated in accordance with standard SUE industry practices. Where indicated utility sizes and materials taken from best available records. All other information hereon has been provided by others and is not a part of this certification.

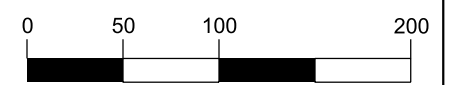


MATCHLINE - STA. 931+00

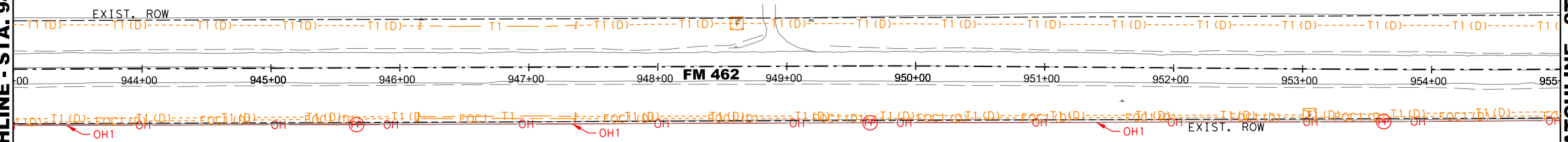
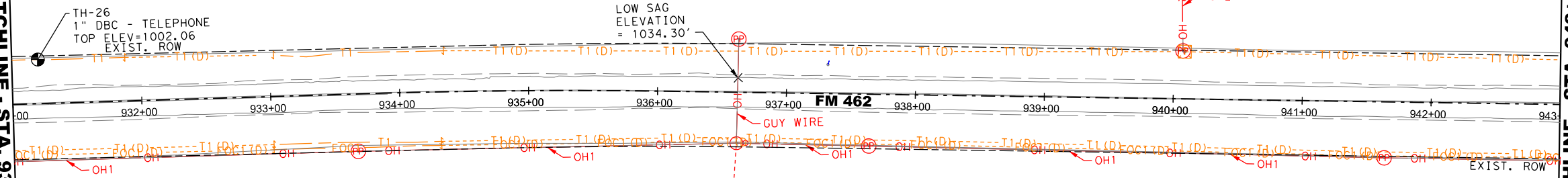
MATCHLINE - STA. 943+00

MATCHLINE - STA. 943+00

MATCHLINE - STA. 955+00



GRAPHIC SCALE IN FEET  
SCALE 1" = 100'



**LEGEND OF UTILITY TYPES**

**QUALITY LEVELS**

QUALITY LEVEL "B" X# ---  
 QUALITY LEVEL "C" X#(C) ---  
 QUALITY LEVEL "D" X#(D) ---  
 ABANDONED UTILITY ---  
 PROPOSED UTILITY ---  
 UNKNOWN UTILITY ---

**ELECTRIC / POWER** QL "B" --- E1 ---  
 MEDINA ELECTRIC

**COMMUNICATIONS** QL "B" --- T1 ---  
 AT&T (TELE) --- FOC1 ---  
 AT&T (FOIDUCT)

**POTABLE WATER** QL "B" --- W1 ---  
 WEST MEDINA WSC

**OVERHEAD UTILITY** QL "C"/QL "D" --- OH ---  
 OH - 1 MEDINA ELECTRIC  
 OH - 2 AT&T TELE  
 OH - 2 AT&T FO

**LEGEND OF UTILITY SYMBOLS**

END CAP [Symbol]  
 QUALITY LEVEL CHANGE [Symbol]  
 TEST HOLE [Symbol]  
 UTILITY CONTINUATION [Symbol]  
 CATV CABINET [Symbol]  
 CATV HANDHOLE [Symbol]  
 CATV PEDESTAL [Symbol]  
 FIBER HANDHOLE [Symbol]  
 TELEPHONE CABINET [Symbol]  
 TELEPHONE HANDHOLE (VAULT) [Symbol]  
 TELEPHONE MANHOLE [Symbol]  
 TELEPHONE PEDESTAL [Symbol]  
 TELEPHONE POLE [Symbol]  
 TELEPHONE POLE W/RISER [Symbol]  
 ELECTRIC HANDHOLE [Symbol]  
 ELECTRIC JUNCTION BOX (CABINET) [Symbol]  
 ELECTRIC MANHOLE [Symbol]  
 ELECTRIC POLE (POWER) [Symbol]  
 ELECTRIC POLE W/RISER [Symbol]  
 LIGHT POLE [Symbol]  
 SIGNAL POLE [Symbol]  
 SIGNAL HANDHOLE/BOX [Symbol]  
 TRANSMISSION POLE [Symbol]  
 GAS METER [Symbol]  
 GAS TEST STATION [Symbol]  
 GAS VALVE [Symbol]  
 GAS VENT PIPE (GAS RISER) [Symbol]  
 WASTE WATER CLEANOUT [Symbol]  
 WASTE WATER MANHOLE [Symbol]  
 FIRE HYDRANT [Symbol]  
 WATER MANHOLE [Symbol]  
 WATER METER [Symbol]  
 WATER VALVE [Symbol]  
 WATER VAULT [Symbol]

REV	DATE	BY	DESCRIPTION

The Rios Group, Inc.  
 TBPE Firm # F-14595

*Travis S. Isaacson*  
 01-30-2024

THE RIOS GROUP  
 SUBSURFACE UTILITY ENGINEERING  
 UTILITY COORDINATION

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FM 462  
 FM 433  
 to  
 S EMBANKMENT OF HONDO CREEK

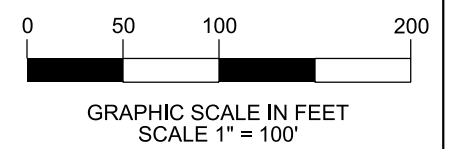
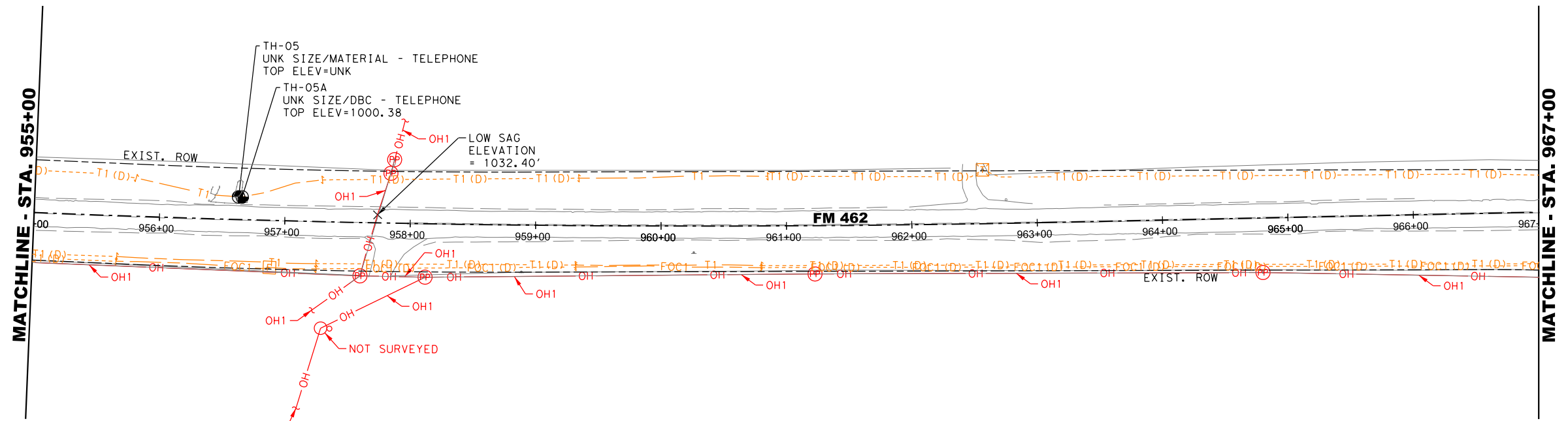
**S.U.E. PLAN SHEET**

**STA. 931+00 TO STA. 955+00**

DESIGNED BY: SJ	CHECKED BY: TI	DATE: 01-30-2024
APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER KHA_2320.01	SUE SHEET NO. 08 OF 15	DATE 01-30-2024
CSJ NUMBER 0848-04-052	PLAN SHEET NO. 187	
STATE TX	DISTRICT SAT	COUNTY MEDINA

**Subsurface Utility Engineering (SUE) Certification**

The engineer's seal hereon is to certify that the utilities shown have been investigated in accordance with standard SUE industry practices. Where indicated utility sizes and materials taken from best available records. All other information hereon has been provided by others and is not a part of this certification.



**LEGEND OF UTILITY TYPES**

**QUALITY LEVELS**

QUALITY LEVEL "B" --- X# ---  
 QUALITY LEVEL "C" - - - - X#(C) - - - -  
 QUALITY LEVEL "D" - - - - - X#(D) - - - -  
 ABANDONED UTILITY ---  
 PROPOSED UTILITY ---  
 UNKNOWN UTILITY ---

**ELECTRIC / POWER** QL "B" --- E1 ---  
 MEDINA ELECTRIC

**COMMUNICATIONS** QL "B" --- T1 ---  
 AT&T (TELE) --- FOC1 ---  
 AT&T (FOIDUCT)

**POTABLE WATER** QL "B" --- W1 ---  
 WEST MEDINA WSC

**OVERHEAD UTILITY** QL "C"/QL "D" --- OH ---  
 OH - 1 MEDINA ELECTRIC  
 OH - 2 AT&T TELE  
 OH - 2 AT&T FO

**LEGEND OF UTILITY SYMBOLS**

END CAP [Symbol]  
 QUALITY LEVEL CHANGE [Symbol]  
 TEST HOLE [Symbol]  
 UTILITY CONTINUATION [Symbol]

CATV CABINET [Symbol]  
 CATV HANDHOLE [Symbol]  
 CATV PEDESTAL [Symbol]

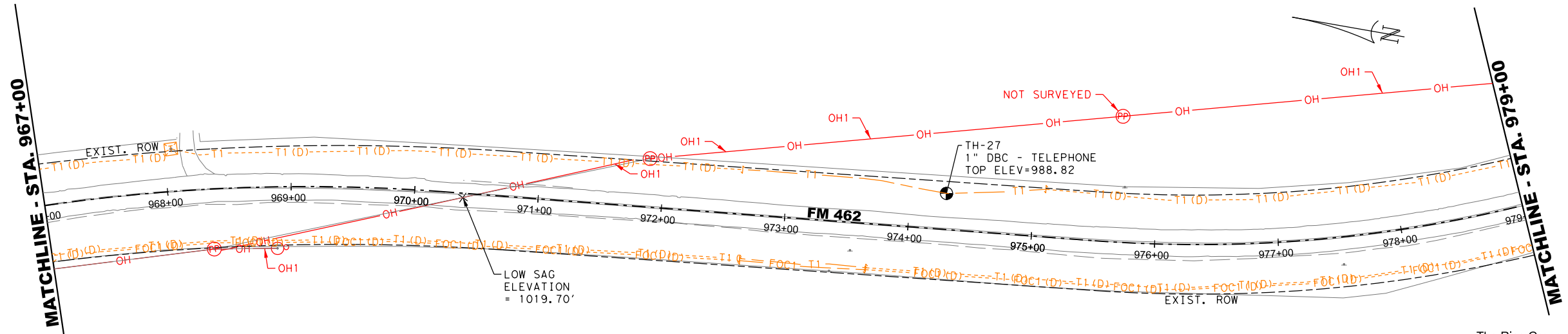
FIBER HANDHOLE [Symbol]  
 TELEPHONE CABINET [Symbol]  
 TELEPHONE HANDHOLE (VAULT) [Symbol]  
 TELEPHONE MANHOLE [Symbol]  
 TELEPHONE PEDESTAL [Symbol]  
 TELEPHONE POLE [Symbol]  
 TELEPHONE POLE W/ RISER [Symbol]

ELECTRIC HANDHOLE [Symbol]  
 ELECTRIC JUNCTION BOX (CABINET) [Symbol]  
 ELECTRIC MANHOLE [Symbol]  
 ELECTRIC POLE (POWER) [Symbol]  
 ELECTRIC POLE W/ RISER [Symbol]  
 LIGHT POLE [Symbol]  
 SIGNAL POLE [Symbol]  
 SIGNAL HANDHOLE/BOX [Symbol]  
 TRANSMISSION POLE [Symbol]

GAS METER [Symbol]  
 GAS TEST STATION [Symbol]  
 GAS VALVE [Symbol]  
 GAS VENT PIPE (GAS RISER) [Symbol]

WASTE WATER CLEANOUT [Symbol]  
 WASTE WATER MANHOLE [Symbol]

FIRE HYDRANT [Symbol]  
 WATER MANHOLE [Symbol]  
 WATER METER [Symbol]  
 WATER VALVE [Symbol]  
 WATER VAULT [Symbol]



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The Rios Group, Inc.  
 TBPE Firm # F-14595

01-30-2024

**THE RIOS GROUP**  
 SUBSURFACE UTILITY ENGINEERING  
 UTILITY COORDINATION

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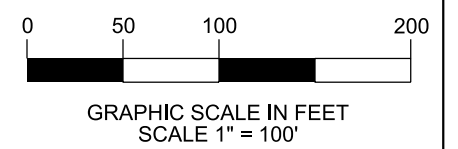
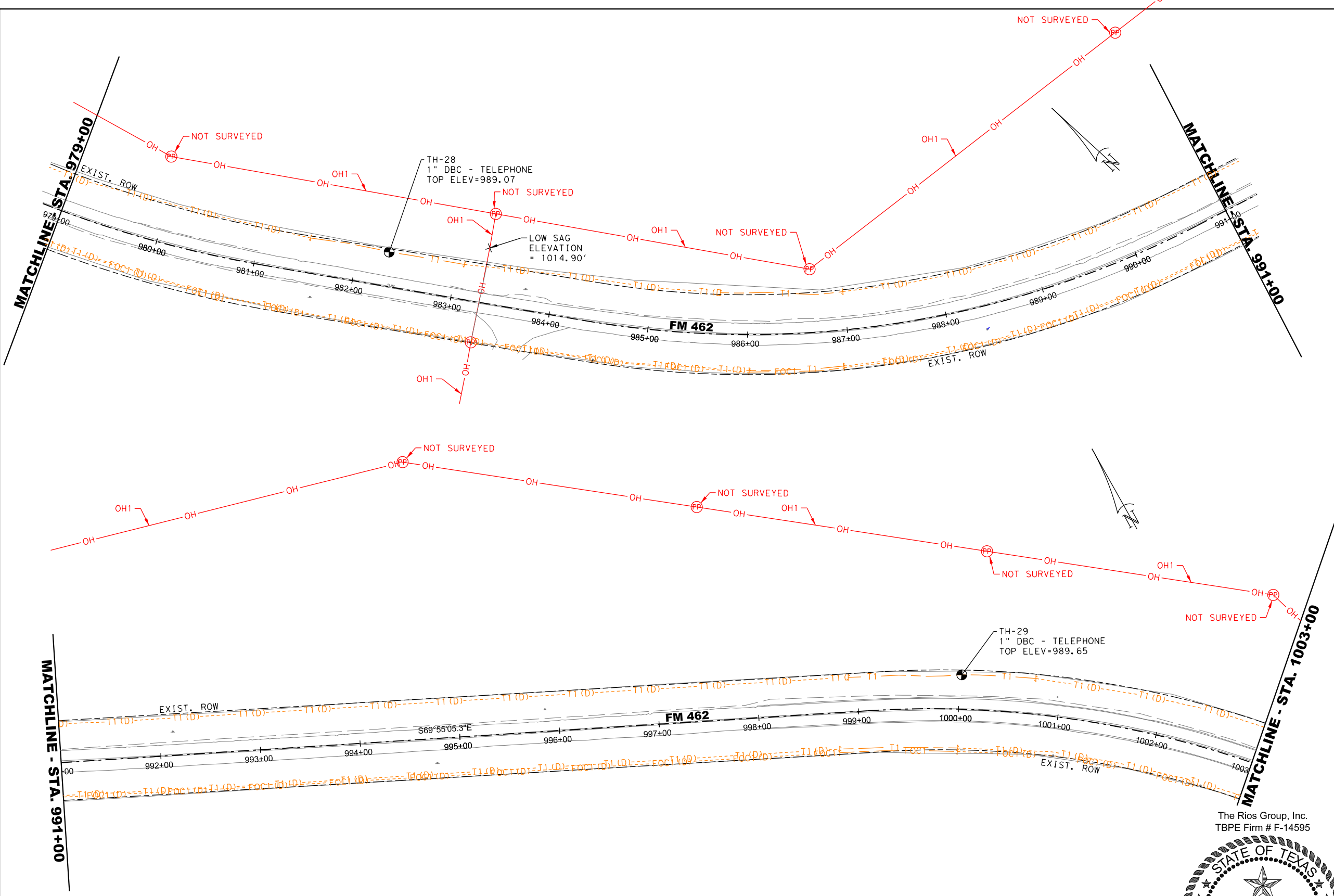
FM 462  
 FM 433  
 to  
 S EMBANKMENT OF HONDO CREEK

**S.U.E. PLAN SHEET**

**STA. 955+00 TO STA. 979+00**

DESIGNED BY: SJ	CHECKED BY: TI	DATE: 01-30-2024
APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	09 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	188	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA





**LEGEND OF UTILITY TYPES**

**QUALITY LEVELS**

QUALITY LEVEL "B"	---	X#
QUALITY LEVEL "C"	- - - - -	X#(C)
QUALITY LEVEL "D"	- - - - -	X#(D)
ABANDONED UTILITY	---	
PROPOSED UTILITY	---	
UNKNOWN UTILITY	---	

**ELECTRIC / POWER**

MEDINA ELECTRIC	QL "B"	E1
-----------------	--------	----

**COMMUNICATIONS**

AT&T (TELE)	QL "B"	T1
AT&T (FOIDUCT)		FOC1

**POTABLE WATER**

WEST MEDINA WSC	QL "B"	W1
-----------------	--------	----

**OVERHEAD UTILITY**

OH - 1 MEDINA ELECTRIC	QL "C"/QL "D"	OH
OH - 2 AT&T TELE		OH
OH - 2 AT&T FO		OH

**LEGEND OF UTILITY SYMBOLS**

END CAP	[Symbol]
QUALITY LEVEL CHANGE	[Symbol]
TEST HOLE	[Symbol]
UTILITY CONTINUATION	[Symbol]
CATV CABINET	[Symbol]
CATV HANDHOLE	[Symbol]
CATV PEDESTAL	[Symbol]
FIBER HANDHOLE	[Symbol]
TELEPHONE CABINET	[Symbol]
TELEPHONE HANDHOLE (VAULT)	[Symbol]
TELEPHONE MANHOLE	[Symbol]
TELEPHONE PEDESTAL	[Symbol]
TELEPHONE POLE	[Symbol]
TELEPHONE POLE W/RISER	[Symbol]
ELECTRIC HANDHOLE	[Symbol]
ELECTRIC JUNCTION BOX (CABINET)	[Symbol]
ELECTRIC MANHOLE	[Symbol]
ELECTRIC POLE (POWER)	[Symbol]
ELECTRIC POLE W/RISER	[Symbol]
LIGHT POLE	[Symbol]
SIGNAL POLE	[Symbol]
SIGNAL HANDHOLE/BOX	[Symbol]
TRANSMISSION POLE	[Symbol]
GAS METER	[Symbol]
GAS TEST STATION	[Symbol]
GAS VALVE	[Symbol]
GAS VENT PIPE (GAS RISER)	[Symbol]
WASTE WATER CLEANOUT	[Symbol]
WASTE WATER MANHOLE	[Symbol]
FIRE HYDRANT	[Symbol]
WATER MANHOLE	[Symbol]
WATER METER	[Symbol]
WATER VALVE	[Symbol]
WATER VAULT	[Symbol]

REV	DATE	BY	DESCRIPTION

The Rios Group, Inc.  
TBPE Firm # F-14595

01-30-2024

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FM 462  
FM 433  
to  
S EMBANKMENT OF HONDO CREEK

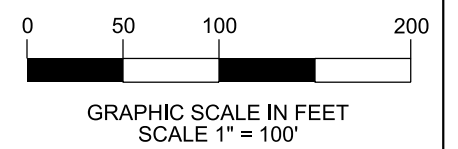
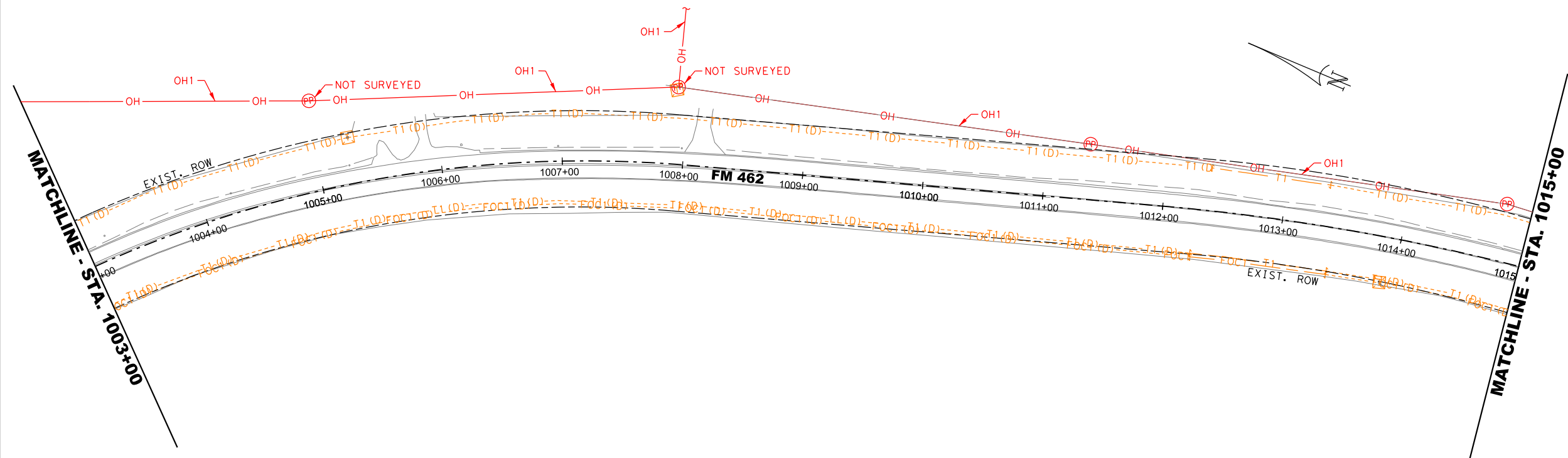
**S.U.E. PLAN SHEET**

**STA. 979+00 TO STA. 1003+00**

DESIGNED BY: SJ	CHECKED BY: TI	DATE: 01-30-2024
APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	10 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	189	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA

**Subsurface Utility Engineering (SUE) Certification**

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**LEGEND OF UTILITY TYPES**

**QUALITY LEVELS**

QUALITY LEVEL "B"	---	X#
QUALITY LEVEL "C"	- - - -	X#(C)
QUALITY LEVEL "D"	- - - - -	X#(D)
ABANDONED UTILITY	---	
PROPOSED UTILITY	---	
UNKNOWN UTILITY	---	

**ELECTRIC / POWER**

MEDINA ELECTRIC	QL "B"	E1
-----------------	--------	----

**COMMUNICATIONS**

AT&T (TELE)	QL "B"	T1
AT&T (FOIDUCT)		FOC1

**POTABLE WATER**

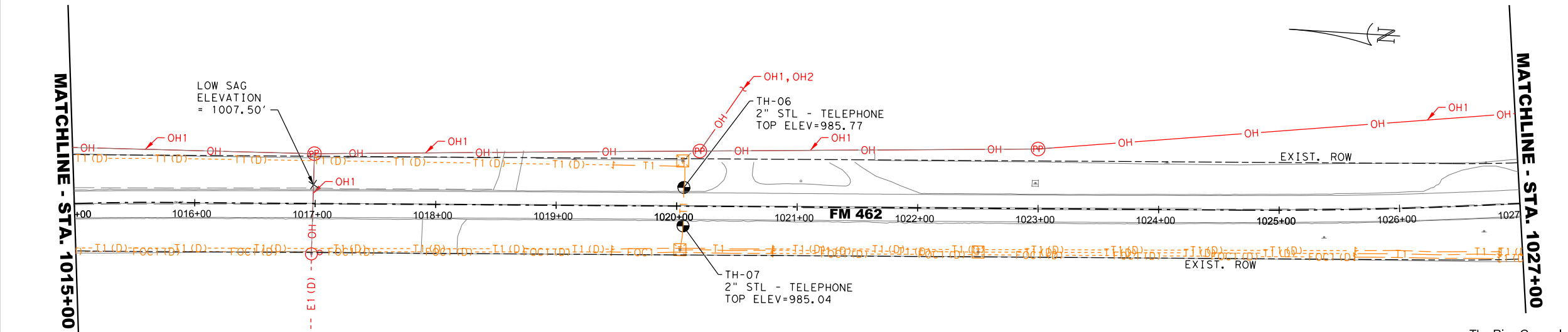
WEST MEDINA WSC	QL "B"	W1
-----------------	--------	----

**OVERHEAD UTILITY**

OH - 1 MEDINA ELECTRIC	QL "C"/QL "D"	OH
OH - 2 AT&T TELE		OH
OH - 2 AT&T FO		OH

**LEGEND OF UTILITY SYMBOLS**

END CAP	C
QUALITY LEVEL CHANGE	t
TEST HOLE	z
UTILITY CONTINUATION	z
CATV CABINET	[C]
CATV HANDHOLE	C
CATV PEDESTAL	[C]
FIBER HANDHOLE	[F]
TELEPHONE CABINET	[T]
TELEPHONE HANDHOLE (VAULT)	T
TELEPHONE MANHOLE	T
TELEPHONE PEDESTAL	[T]
TELEPHONE POLE	⊙
TELEPHONE POLE W/ RISER	⊙
ELECTRIC HANDHOLE	[E]
ELECTRIC JUNCTION BOX (CABINET)	[E]
ELECTRIC MANHOLE	E
ELECTRIC POLE (POWER)	⊙
ELECTRIC POLE W/ RISER	⊙
LIGHT POLE	⊙
SIGNAL POLE	⊙
SIGNAL HANDHOLE/BOX	[S]
TRANSMISSION POLE	⊙
GAS METER	[G]
GAS TEST STATION	[G]
GAS VALVE	G
GAS VENT PIPE (GAS RISER)	G
WASTE WATER CLEANOUT	[W]
WASTE WATER MANHOLE	W
FIRE HYDRANT	[F]
WATER MANHOLE	W
WATER METER	[M]
WATER VALVE	W
WATER VAULT	[W]



**Subsurface Utility Engineering (SUE) Certification**

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The Rios Group, Inc.  
TBPE Firm # F-14595

01-30-2024

**THE RIOS GROUP**  
SUBSURFACE UTILITY ENGINEERING  
UTILITY COORDINATION

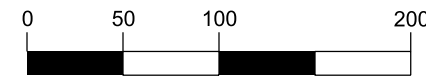
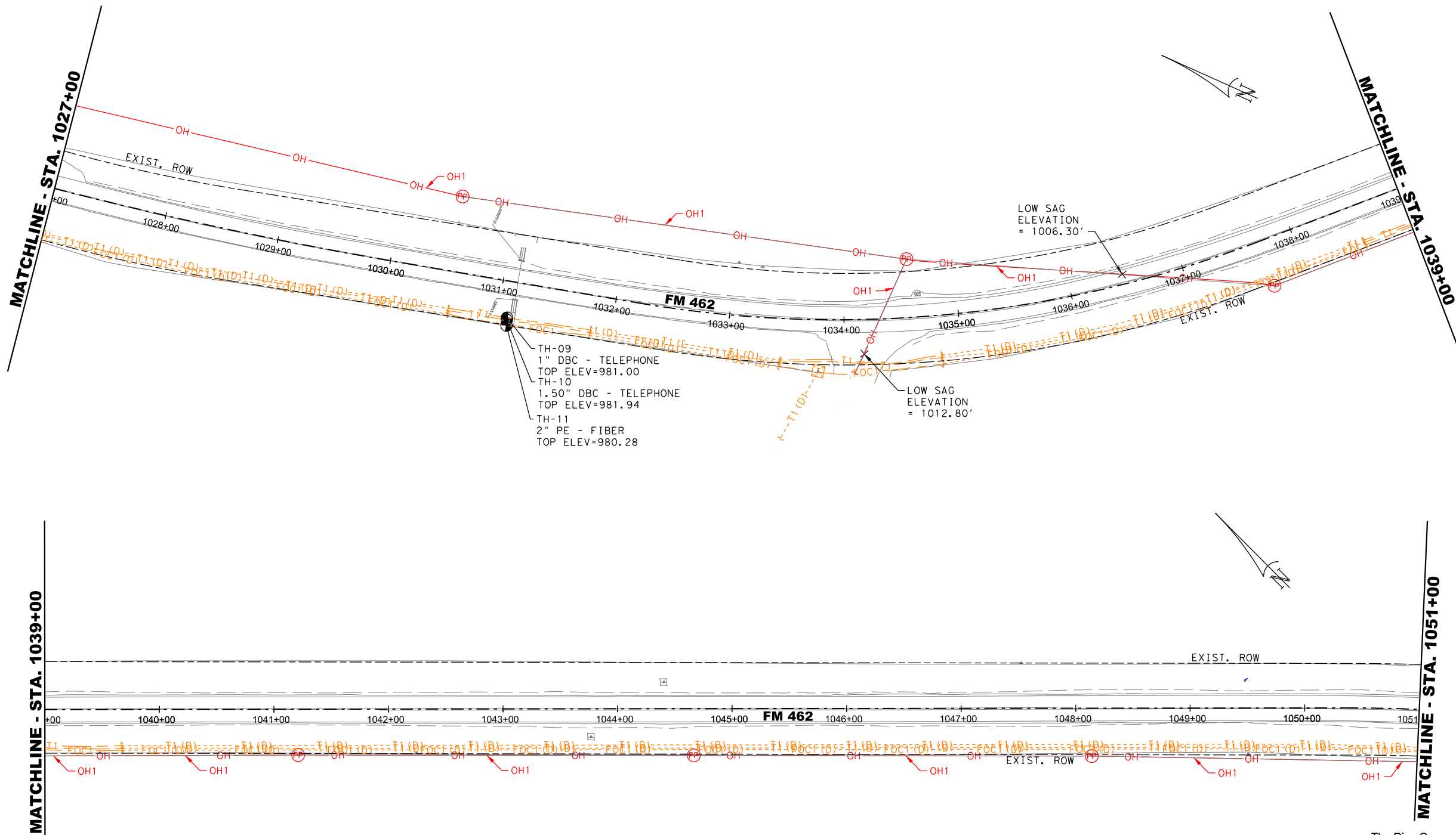
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FM 462  
FM 433  
to  
S EMBANKMENT OF HONDO CREEK

**S.U.E. PLAN SHEET**

**STA. 1003+00 TO STA. 1027+00**

DESIGNED BY: SJ	CHECKED BY: TI	DATE: 01-30-2024
APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	11 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	190	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA



GRAPHIC SCALE IN FEET  
SCALE 1" = 100'

**LEGEND OF UTILITY TYPES**

QUALITY LEVELS	
QUALITY LEVEL "B"	--- X# ---
QUALITY LEVEL "C"	- - - - X#(C) - - - -
QUALITY LEVEL "D"	- - - - - X#(D) - - - -
ABANDONED UTILITY	---
PROPOSED UTILITY	---
UNKNOWN UTILITY	---
ELECTRIC / POWER	
MEDINA ELECTRIC	QL "B" --- E1 ---
COMMUNICATIONS	
AT&T (TELE)	QL "B" --- T1 ---
AT&T (FOIDUCT)	--- FOC1 ---
POTABLE WATER	
WEST MEDINA WSC	QL "B" --- W1 ---
OVERHEAD UTILITY	
OH - 1 MEDINA ELECTRIC	QL "C"/QL "D" --- OH ---
OH - 2 AT&T TELE	---
OH - 2 AT&T FO	---

**LEGEND OF UTILITY SYMBOLS**

END CAP	[Symbol]
QUALITY LEVEL CHANGE	[Symbol]
TEST HOLE	[Symbol]
UTILITY CONTINUATION	[Symbol]
CATV CABINET	[Symbol]
CATV HANDHOLE	[Symbol]
CATV PEDESTAL	[Symbol]
FIBER HANDHOLE	[Symbol]
TELEPHONE CABINET	[Symbol]
TELEPHONE HANDHOLE (VAULT)	[Symbol]
TELEPHONE MANHOLE	[Symbol]
TELEPHONE PEDESTAL	[Symbol]
TELEPHONE POLE	[Symbol]
TELEPHONE POLE W/RISER	[Symbol]
ELECTRIC HANDHOLE	[Symbol]
ELECTRIC JUNCTION BOX (CABINET)	[Symbol]
ELECTRIC MANHOLE	[Symbol]
ELECTRIC POLE (POWER)	[Symbol]
ELECTRIC POLE W/RISER	[Symbol]
LIGHT POLE	[Symbol]
SIGNAL POLE	[Symbol]
SIGNAL HANDHOLE/BOX	[Symbol]
TRANSMISSION POLE	[Symbol]
GAS METER	[Symbol]
GAS TEST STATION	[Symbol]
GAS VALVE	[Symbol]
GAS VENT PIPE (GAS RISER)	[Symbol]
WASTE WATER CLEANOUT	[Symbol]
WASTE WATER MANHOLE	[Symbol]
FIRE HYDRANT	[Symbol]
WATER MANHOLE	[Symbol]
WATER METER	[Symbol]
WATER VALVE	[Symbol]
WATER VAULT	[Symbol]

REV	DATE	BY	DESCRIPTION



FM 462  
FM 433  
to  
S EMBANKMENT OF HONDO CREEK  
**S.U.E. PLAN SHEET**

**STA. 1027+00 TO STA. 1051+00**

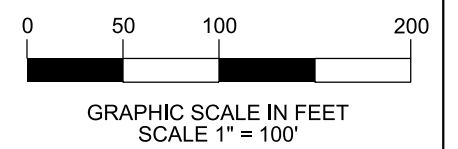
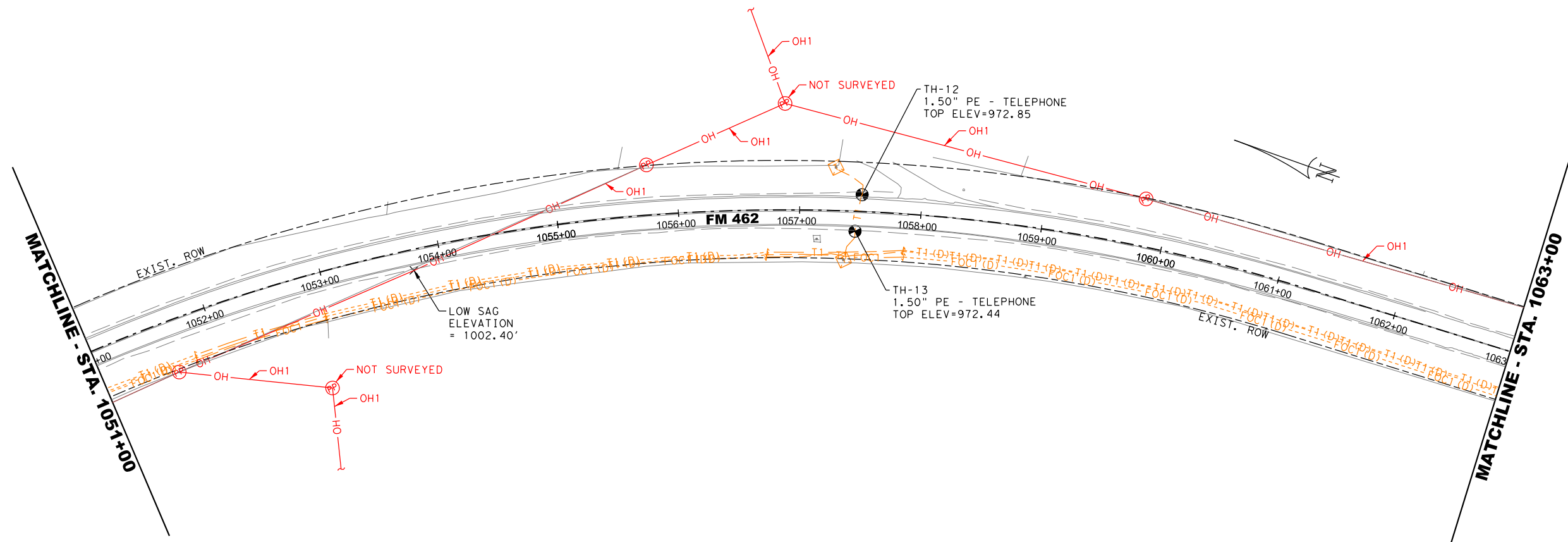
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APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	12 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	191	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA

The Rios Group, Inc.  
TBPE Firm # F-14595

01-30-2024

**Subsurface Utility Engineering (SUE) Certification**

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**LEGEND OF UTILITY TYPES**

**QUALITY LEVELS**

QUALITY LEVEL "B"	---	X#
QUALITY LEVEL "C"	- - - - -	X#(C)
QUALITY LEVEL "D"	- - - - -	X#(D)
ABANDONED UTILITY	---	
PROPOSED UTILITY	---	
UNKNOWN UTILITY	---	

**ELECTRIC / POWER**

MEDINA ELECTRIC	QL "B"	---	E1
-----------------	--------	-----	----

**COMMUNICATIONS**

AT&T (TELE)	QL "B"	---	T1
AT&T (FOIDUCT)		---	FOC1

**POTABLE WATER**

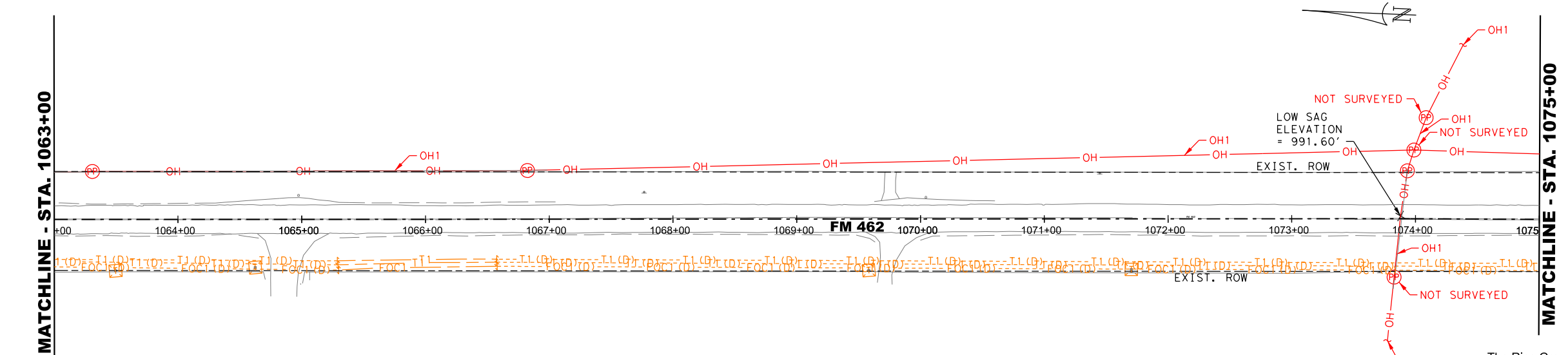
WEST MEDINA WSC	QL "B"	---	W1
-----------------	--------	-----	----

**OVERHEAD UTILITY**

OH - 1 MEDINA ELECTRIC	QL "C"/QL "D"	---	OH
OH - 2 AT&T TELE		---	OH
OH - 2 AT&T FO		---	OH

**LEGEND OF UTILITY SYMBOLS**

END CAP	C
QUALITY LEVEL CHANGE	t
TEST HOLE	z
UTILITY CONTINUATION	z
CATV CABINET	[C]
CATV HANDHOLE	[C]
CATV PEDESTAL	[C]
FIBER HANDHOLE	[F]
TELEPHONE CABINET	[T]
TELEPHONE HANDHOLE (VAULT)	[T]
TELEPHONE MANHOLE	[T]
TELEPHONE PEDESTAL	[T]
TELEPHONE POLE	[T]
TELEPHONE POLE W/ RISER	[T]
ELECTRIC HANDHOLE	[E]
ELECTRIC JUNCTION BOX (CABINET)	[E]
ELECTRIC MANHOLE	[E]
ELECTRIC POLE (POWER)	[E]
ELECTRIC POLE W/ RISER	[E]
LIGHT POLE	[L]
SIGNAL POLE	[S]
SIGNAL HANDHOLE/BOX	[S]
TRANSMISSION POLE	[T]
GAS METER	[G]
GAS TEST STATION	[G]
GAS VALVE	[G]
GAS VENT PIPE (GAS RISER)	[G]
WASTE WATER CLEANOUT	[W]
WASTE WATER MANHOLE	[W]
FIRE HYDRANT	[F]
WATER MANHOLE	[W]
WATER METER	[W]
WATER VALVE	[W]
WATER VAULT	[W]



The Rios Group, Inc.  
TBPE Firm # F-14595

01-30-2024

**Subsurface Utility Engineering (SUE) Certification**

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REV	DATE	BY	DESCRIPTION

**THE RIOS GROUP**  
SUBSURFACE UTILITY ENGINEERING  
UTILITY COORDINATION

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**TEXAS DEPARTMENT OF TRANSPORTATION**

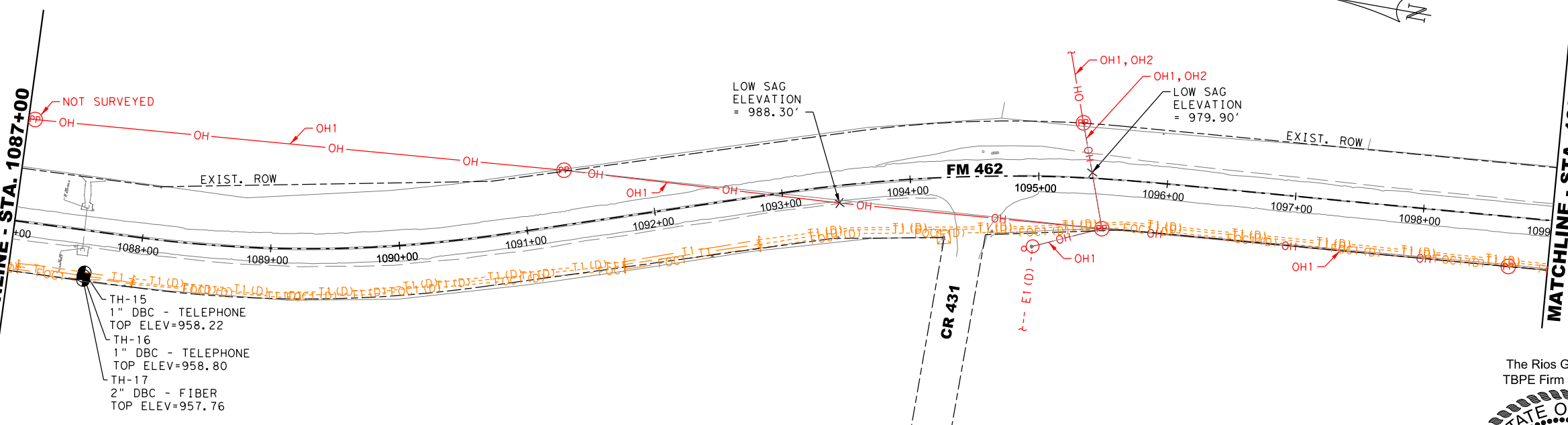
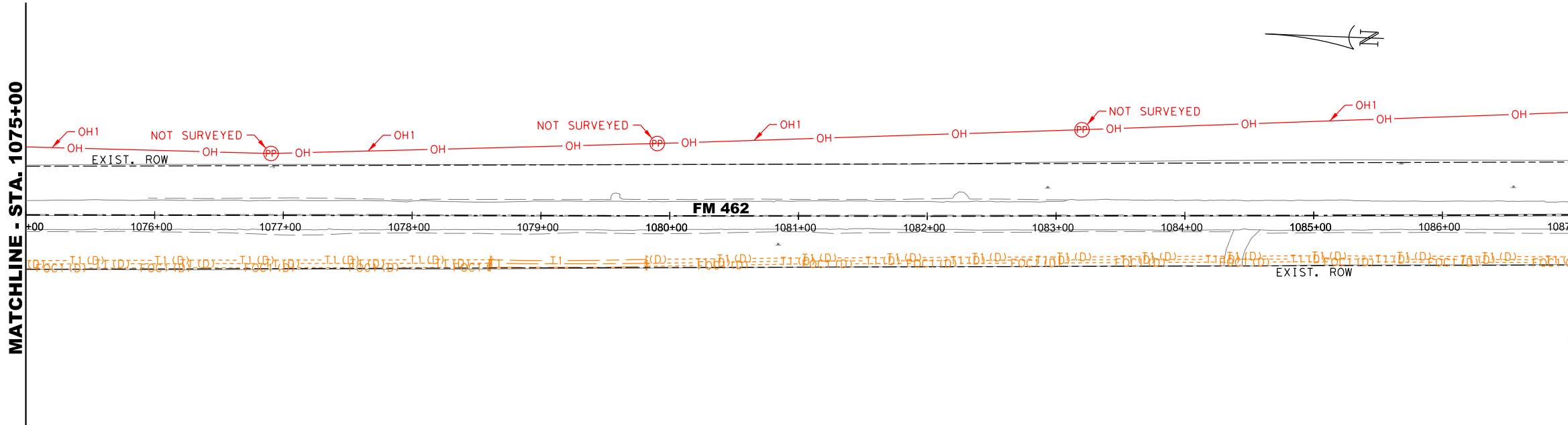
FM 462  
FM 433  
to  
S EMBANKMENT OF HONDO CREEK

**S.U.E. PLAN SHEET**

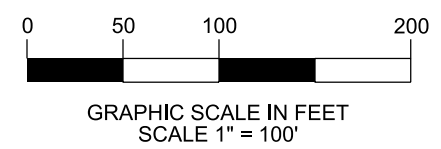
**STA. 1051+00 TO STA. 1075+00**

DESIGNED BY: SJ	CHECKED BY: TI	DATE: 01-30-2024
APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	13 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	192	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA





- TH-15  
1" DBC - TELEPHONE  
TOP ELEV=958.22
- TH-16  
1" DBC - TELEPHONE  
TOP ELEV=958.80
- TH-17  
2" DBC - FIBER  
TOP ELEV=957.76



**LEGEND OF UTILITY TYPES**

**QUALITY LEVELS**

QUALITY LEVEL "B" --- X# ---  
 QUALITY LEVEL "C" - - - - X#(C) - - - -  
 QUALITY LEVEL "D" - - - - - X#(D) - - - -  
 ABANDONED UTILITY ---  
 PROPOSED UTILITY ---  
 UNKNOWN UTILITY ---

**ELECTRIC / POWER** QL "B" --- E1 ---

**COMMUNICATIONS** QL "B" --- T1 ---  
 AT&T (FOIDUCT) --- FOC1 ---

**POTABLE WATER** QL "B" --- W1 ---

**OVERHEAD UTILITY** QL "C"/QL "D" --- OH ---  
 OH - 1 MEDINA ELECTRIC  
 OH - 2 AT&T TELE  
 OH - 2 AT&T FO

**LEGEND OF UTILITY SYMBOLS**

- END CAP [Symbol]
- QUALITY LEVEL CHANGE [Symbol]
- TEST HOLE [Symbol]
- UTILITY CONTINUATION [Symbol]
- CATV CABINET [Symbol]
- CATV HANDHOLE [Symbol]
- CATV PEDESTAL [Symbol]
- FIBER HANDHOLE [Symbol]
- TELEPHONE CABINET [Symbol]
- TELEPHONE HANDHOLE (VAULT) [Symbol]
- TELEPHONE MANHOLE [Symbol]
- TELEPHONE PEDESTAL [Symbol]
- TELEPHONE POLE [Symbol]
- TELEPHONE POLE W/ RISER [Symbol]
- ELECTRIC HANDHOLE [Symbol]
- ELECTRIC JUNCTION BOX (CABINET) [Symbol]
- ELECTRIC MANHOLE [Symbol]
- ELECTRIC POLE (POWER) [Symbol]
- ELECTRIC POLE W/ RISER [Symbol]
- LIGHT POLE [Symbol]
- SIGNAL POLE [Symbol]
- SIGNAL HANDHOLE/BOX [Symbol]
- TRANSMISSION POLE [Symbol]
- GAS METER [Symbol]
- GAS TEST STATION [Symbol]
- GAS VALVE [Symbol]
- GAS VENT PIPE (GAS RISER) [Symbol]
- WASTE WATER CLEANOUT [Symbol]
- WASTE WATER MANHOLE [Symbol]
- FIRE HYDRANT [Symbol]
- WATER MANHOLE [Symbol]
- WATER METER [Symbol]
- WATER VALVE [Symbol]
- WATER VAULT [Symbol]

REV	DATE	BY	DESCRIPTION

The Rios Group, Inc.  
 TBPE Firm # F-14595

01-30-2024



FM 462  
 FM 433  
 to  
 S EMBANKMENT OF HONDO CREEK

**S.U.E. PLAN SHEET**

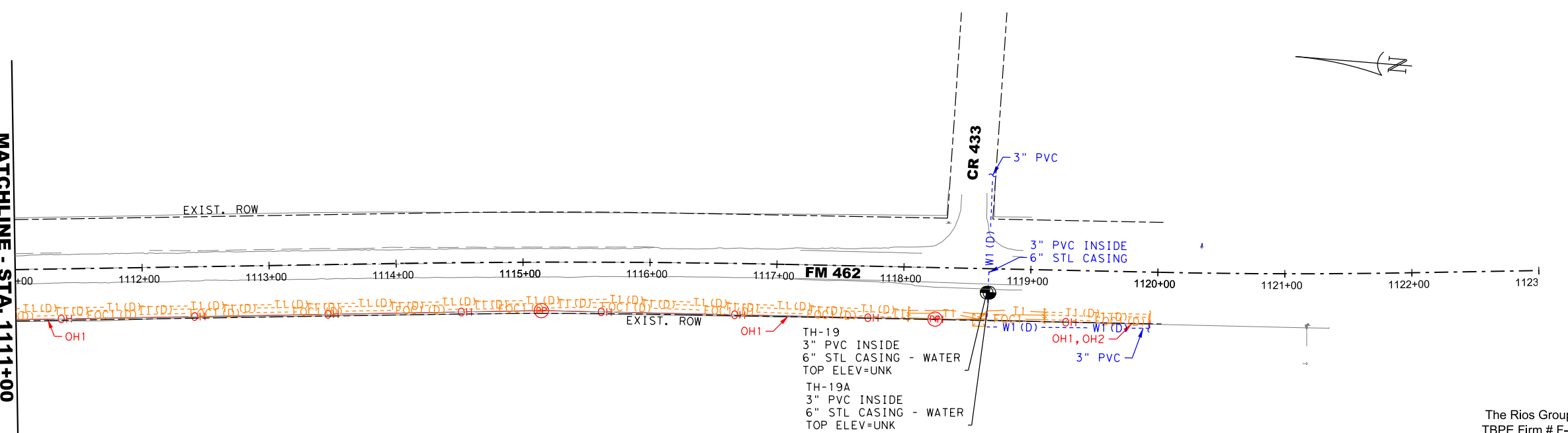
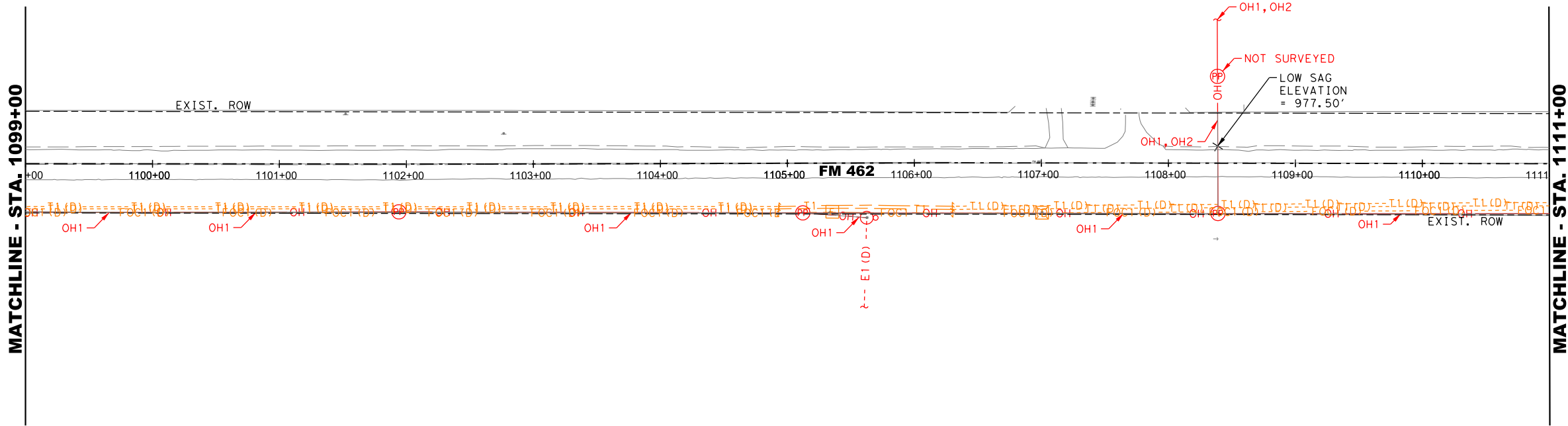
**STA. 1075+00 TO STA. 1099+00**

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APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	14 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	193	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA

**Subsurface Utility Engineering (SUE) Certification**

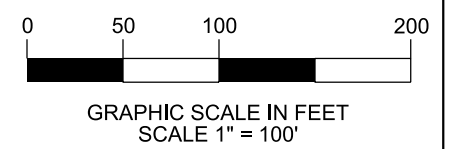
The engineer's seal hereon is to certify that the utilities shown have been investigated in accordance with standard SUE industry practices. Where indicated utility sizes and materials taken from best available records. All other information hereon has been provided by others and is not a part of this certification.





**Subsurface Utility Engineering (SUE) Certification**

The engineer's seal hereon is to certify that the utilities shown have been investigated in accordance with standard SUE industry practices. Where indicated utility sizes and materials taken from best available records. All other information hereon has been provided by others and is not a part of this certification.



**LEGEND OF UTILITY TYPES**

**QUALITY LEVELS**

QUALITY LEVEL "B" --- X# ---  
 QUALITY LEVEL "C" - - - - X#(C) - - - -  
 QUALITY LEVEL "D" - - - - - X#(D) - - - -  
 ABANDONED UTILITY ---  
 PROPOSED UTILITY ---  
 UNKNOWN UTILITY ---

**ELECTRIC / POWER** QL "B" --- E1 ---

**COMMUNICATIONS** QL "B" --- T1 ---  
 AT&T (FOIDUCT) --- FOC1 ---

**POTABLE WATER** QL "B" --- W1 ---

**OVERHEAD UTILITY** QL "C"/QL "D" --- OH ---  
 OH - 1 MEDINA ELECTRIC  
 OH - 2 AT&T TELE  
 OH - 2 AT&T FO

**LEGEND OF UTILITY SYMBOLS**

END CAP [Symbol]  
 QUALITY LEVEL CHANGE [Symbol]  
 TEST HOLE [Symbol]  
 UTILITY CONTINUATION [Symbol]  
 CATV CABINET [Symbol]  
 CATV HANDHOLE [Symbol]  
 CATV PEDESTAL [Symbol]  
 FIBER HANDHOLE [Symbol]  
 TELEPHONE CABINET [Symbol]  
 TELEPHONE HANDHOLE (VAULT) [Symbol]  
 TELEPHONE MANHOLE [Symbol]  
 TELEPHONE PEDESTAL [Symbol]  
 TELEPHONE POLE [Symbol]  
 TELEPHONE POLE W/ RISER [Symbol]  
 ELECTRIC HANDHOLE [Symbol]  
 ELECTRIC JUNCTION BOX (CABINET) [Symbol]  
 ELECTRIC MANHOLE [Symbol]  
 ELECTRIC POLE (POWER) [Symbol]  
 ELECTRIC POLE W/ RISER [Symbol]  
 LIGHT POLE [Symbol]  
 SIGNAL POLE [Symbol]  
 SIGNAL HANDHOLE/BOX [Symbol]  
 TRANSMISSION POLE [Symbol]  
 GAS METER [Symbol]  
 GAS TEST STATION [Symbol]  
 GAS VALVE [Symbol]  
 GAS VENT PIPE (GAS RISER) [Symbol]  
 WASTE WATER CLEANOUT [Symbol]  
 WASTE WATER MANHOLE [Symbol]  
 FIRE HYDRANT [Symbol]  
 WATER MANHOLE [Symbol]  
 WATER METER [Symbol]  
 WATER VALVE [Symbol]  
 WATER VAULT [Symbol]

REV	DATE	BY	DESCRIPTION

The Rios Group, Inc.  
 TBPE Firm # F-14595

01-30-2024

**THE RIOS GROUP**  
 SUBSURFACE UTILITY ENGINEERING  
 UTILITY COORDINATION

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 TEXAS DEPARTMENT OF TRANSPORTATION

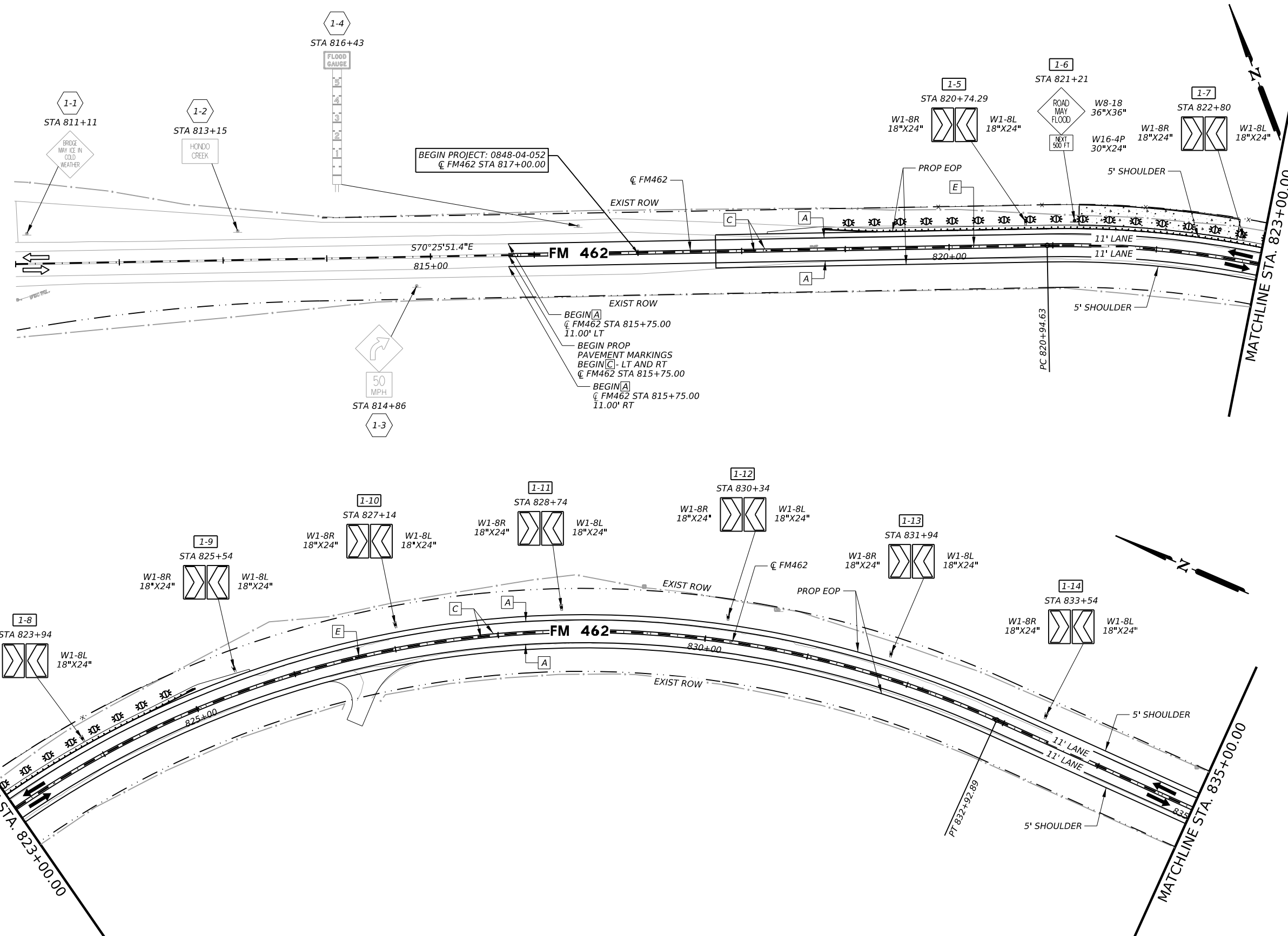
FM 462  
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 to  
 S EMBANKMENT OF HONDO CREEK

**S.U.E. PLAN SHEET**

**STA. 1099+00 TO END**

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APPROVED BY:	CHECKED BY:	DATE:
TRG PROJECT NUMBER	SUE SHEET NO.	DATE
KHA_2320.01	15 OF 15	01-30-2024
CSJ NUMBER	PLAN SHEET NO.	
0848-04-052	194	
STATE	DISTRICT	COUNTY
TX	SAT	MEDINA

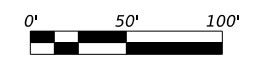
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0644 6076	REMOVE SM RD SN SUP&AM	EA	1
0658 6062	INSTL DEL ASSM (D-SWISZ 1(BRF)GF2(B))	EA	24
0666 6225	PAVEMENT SEALER 6"	LF	7700
A 0666 6343	REFL PROF PAV MRK TY I (W) 6"(SLD)(100MIL)	LF	3850
C 0666 6347	REFL PROF PAV MRK TY I (Y) 6"(SLD)(100MIL)	LF	3850
E 0672 6009	REFL PAV MRKR TY II-A-A	EA	49
0678 6002	PAV SURF PREP FOR MRK (6")	LF	7700





**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- DIRECTION OF TRAVEL
- PROP SIGN
- PROP SIGN
- EXIST SIGN TO REMAIN
- PROP DELINEATOR
- PROP OBJECT MARKER

  
 STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER  
 1/31/2024



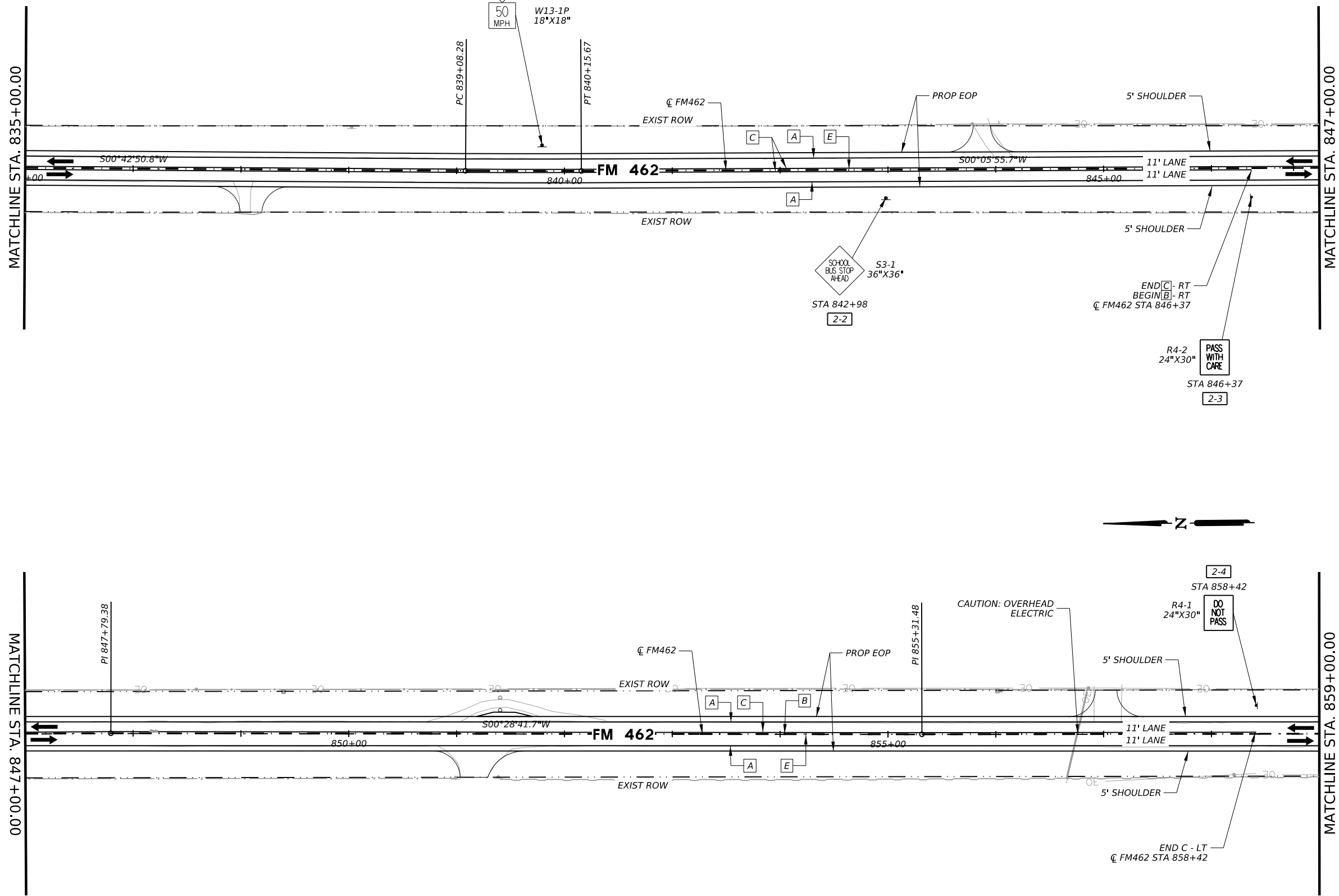
 F-928  
 © 2024  
  
**FM 462**  
**SIGN AND PAVEMENT MARKING LAYOUT**  
 SHEET 1 OF 13  

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0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	195	

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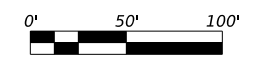
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0644.6001	IN SM RD SN SUP&AM TY 10BWG(1)SA(P)	EA	4
0644.6076	REMOVE SM RD SN SUP&AM	EA	2
0666.6225	PAVEMENT SEALER 6"	LF	8599
A 0666.6343	REFL PROF PAV MRK TY I (W) 6"(SLD)(100MIL)	LF	4800
B 0666.6346	REFL PROF PAV MRK TY I (Y) 6"(BRK)(100MIL)	LF	320
C 0666.6347	REFL PROF PAV MRK TY I (Y) 6"(SLD)(100MIL)	LF	3479
E 0672.6009	REFL PAV MRKR TY II-A-A	EA	60
0678.6002	PAV SURF PREP FOR MRK (6")	LF	8599



**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- DIRECTION OF TRAVEL
- PROP SIGN
- PROP SIGN
- EXIST SIGN TO REMAIN
- PROP DELINEATOR
- PROP OBJECT MARKER

David Gutierrez  
 1/31/2024



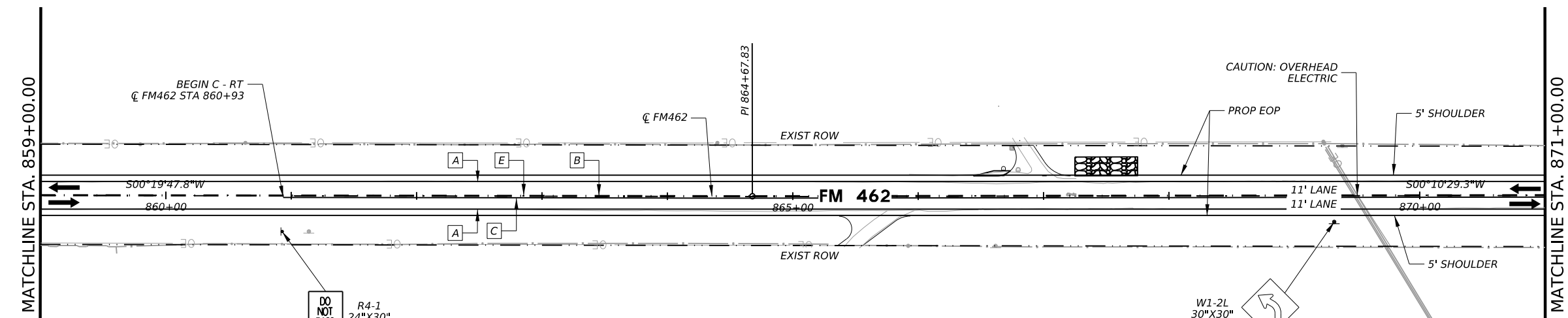
**Kimley»Horn** F-928  
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 Texas Department of Transportation  
**FM 462**  
 SIGN AND PAVEMENT MARKING LAYOUT

SHEET 2 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	196	

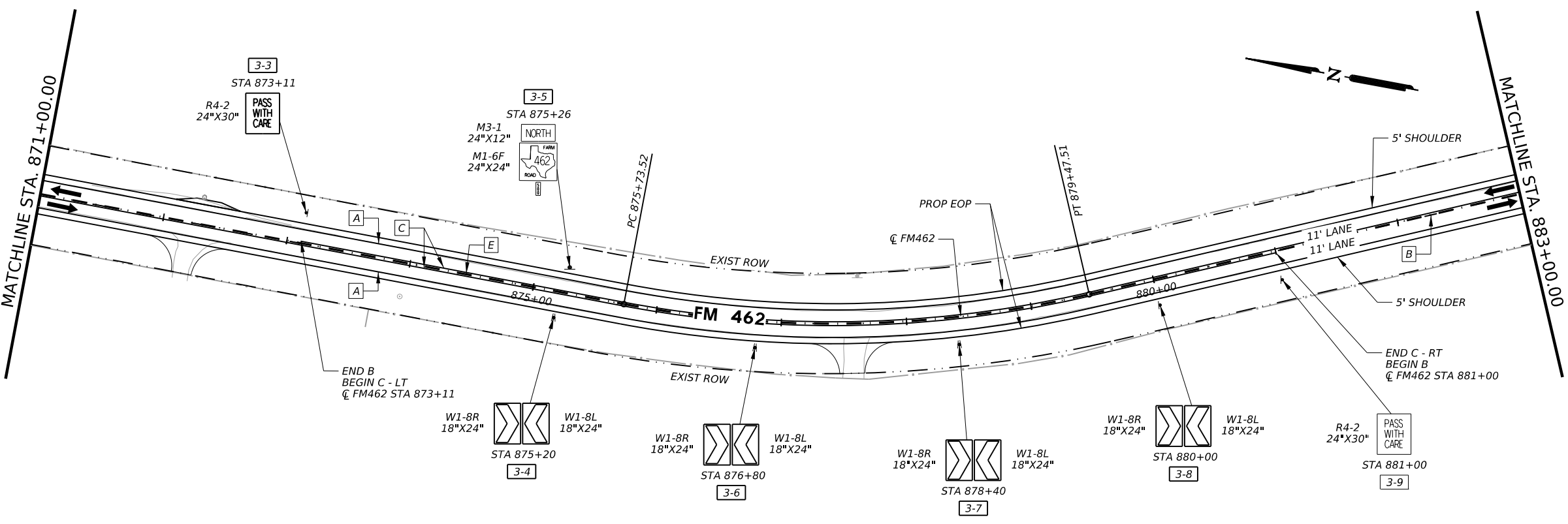
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0644.6076	REMOVE SM RD SN SUP&AM	EA	2
0666.6225	PAVEMENT SEALER 6"	LF	8206
A 0666.6343	REFL PROF PAV MRK TY I (W) 6"(SLD)(100MIL)	LF	4800
B 0666.6346	REFL PROF PAV MRK TY I (Y) 6"(BRK)(100MIL)	LF	410
C 0666.6347	REFL PROF PAV MRK TY I (Y) 6"(SLD)(100MIL)	LF	2996
E 0672.6009	REFL PAV MRKR TY II-A-A	EA	60
0678.6002	PAV SURF PREP FOR MRK (6")	LF	18206



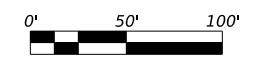
**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- DIRECTION OF TRAVEL
- PROP SIGN
- PROP SIGN
- EXIST SIGN TO REMAIN
- PROP DELINEATOR
- PROP OBJECT MARKER



David Gutierrez  
 STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

1/31/2024



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**FM 462**

**SIGN AND PAVEMENT MARKING LAYOUT**

SHEET 3 OF 13

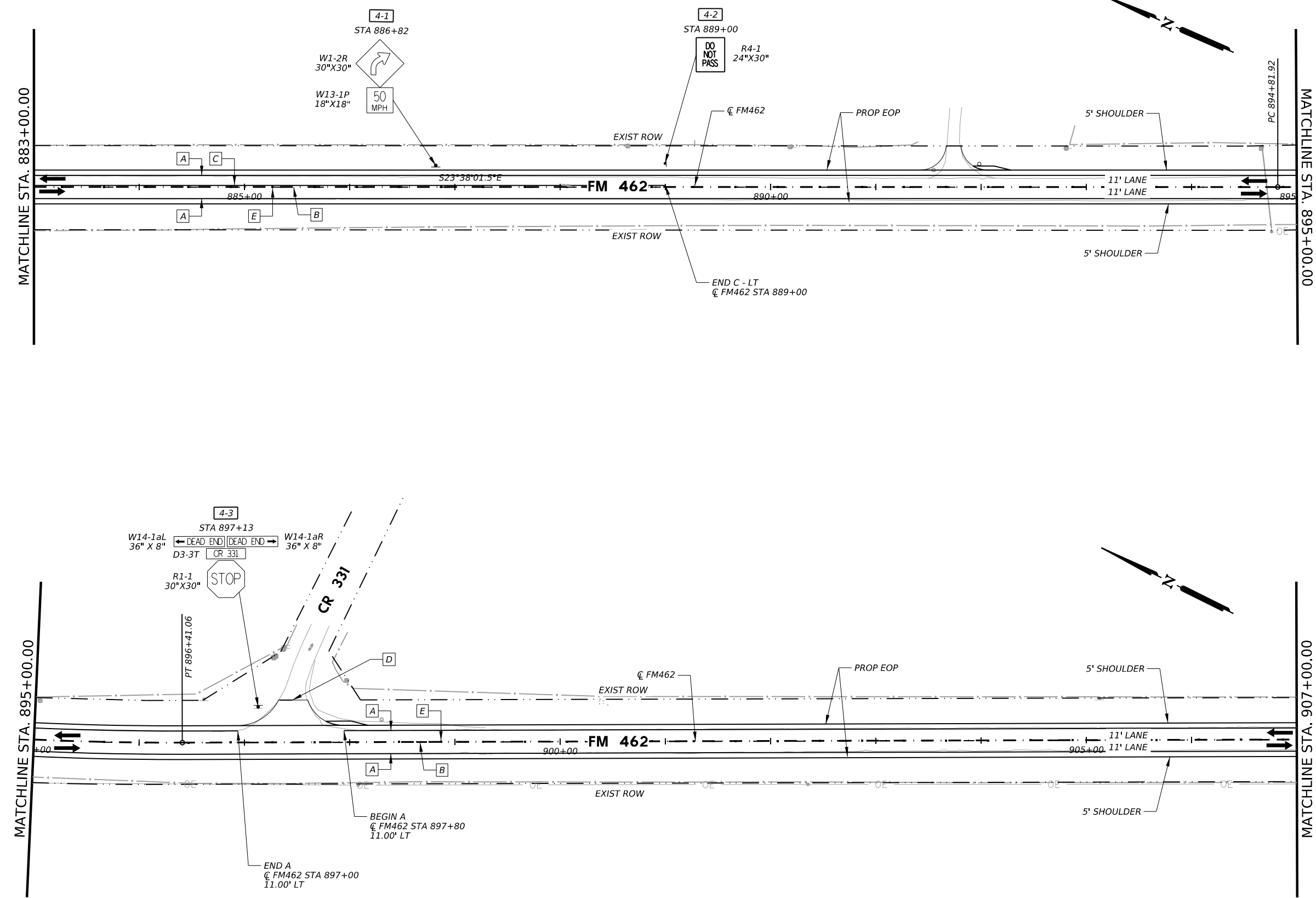
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0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	197	

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0644 6001	IN SM RD SN SUP&AM TY 10BWG(1)SA(P)	EA	3
0644 6076	REMOVE SM RD SN SUP&AM	EA	2
0666 6048	REFL PAV MRK TY I(W)24"(SLD)(100MIL)	LF	12
0666 6225	PAVEMENT SEALER 6"	LF	5900
0666 6230	PAVEMENT SEALER 24"	LF	12
A 0666 6343	REFL PROF PAV MRK TY I(W)6"(SLD)(100MIL)	LF	4700
B 0666 6346	REFL PROF PAV MRK TY I(Y)6"(BRK)(100MIL)	LF	600
C 0666 6347	REFL PROF PAV MRK TY I(Y)6"(SLD)(100MIL)	LF	600
E 0672 6009	REFL PAV MRKR TY II-A-A	EA	60
0678 6002	PAV SURF PREP FOR MRK (6")	LF	5900
0678 6008	PAV SURF PREP FOR MRK (24")	LF	12



**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- DIRECTION OF TRAVEL
- PROP SIGN
- PROP SIGN
- EXIST SIGN TO REMAIN
- PROP DELINEATOR
- PROP OBJECT MARKER

David Gutierrez  
 1/31/2024  
  
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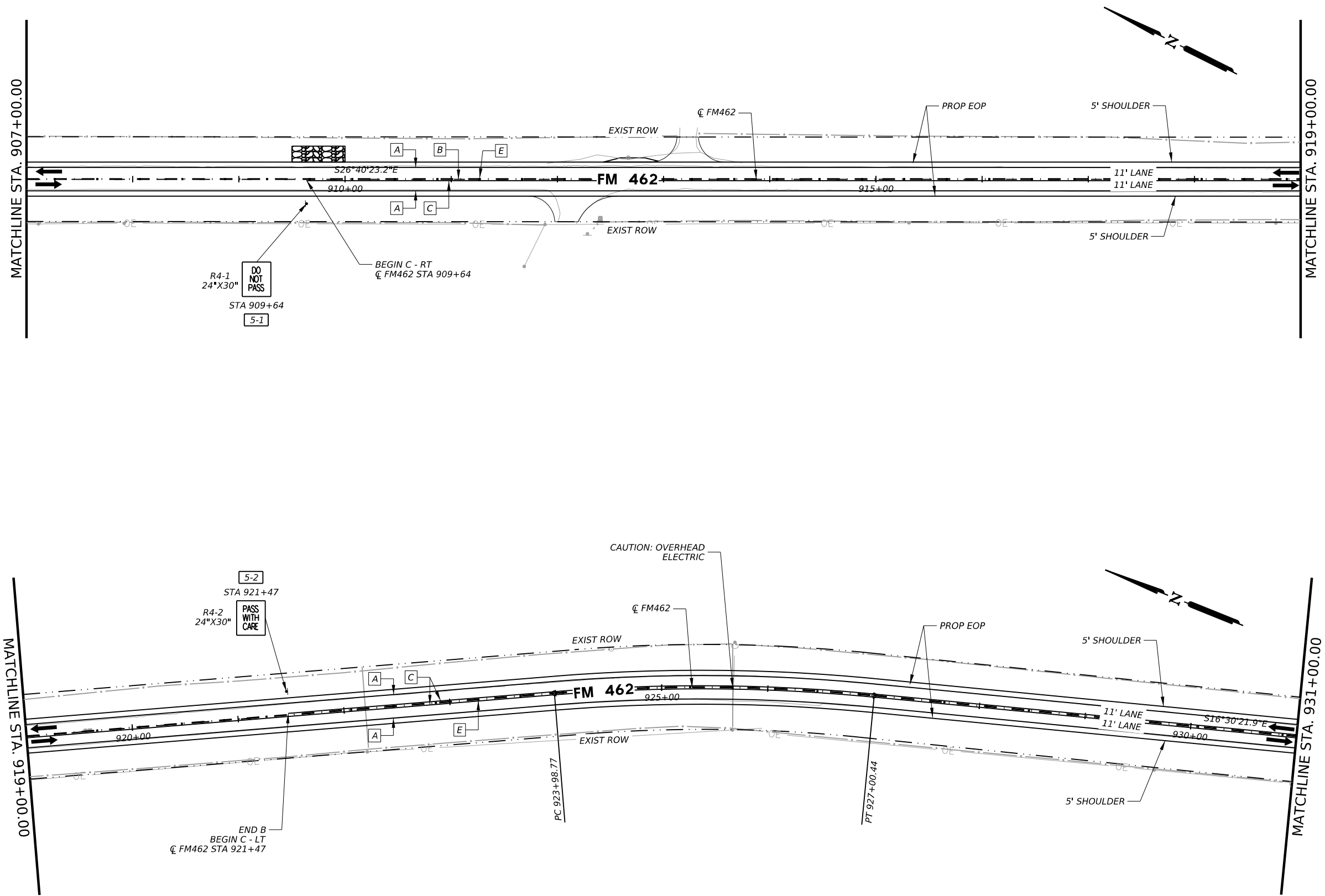
**Kimley»Horn** F-928  
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**FM 462**  
**SIGN AND PAVEMENT MARKING LAYOUT**  
 SHEET 4 OF 13  

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	198	

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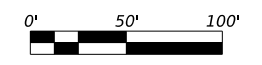
ITEM	DESCRIPTION	UNIT	QTY
0644.6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2
0686.6225	PAVEMENT SEALER 6"	LF	8259
A 0686.6343	REFL PROF PAV MRK TY I (W) 6"(SLD)(100MIL)	LF	4800
B 0686.6346	REFL PROF PAV MRK TY I (Y) 6"(BRK)(100MIL)	LF	370
C 0686.6347	REFL PROF PAV MRK TY I (Y) 6"(SLD)(100MIL)	LF	3089
E 0672.6009	REFL PAV MRKR TY II-A-A	EA	60
0678.6002	PAV SURF PREP FOR MRK (6")	LF	8259



**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- DIRECTION OF TRAVEL
- PROP SIGN
- EXIST SIGN TO REMAIN
- PROP DELINEATOR
- PROP OBJECT MARKER

David Gutierrez  
 1/31/2024



**Kimley Horn** F-928  
 Texas Department of Transportation  
**FM 462**  
**SIGN AND PAVEMENT MARKING LAYOUT**  
 SHEET 5 OF 13

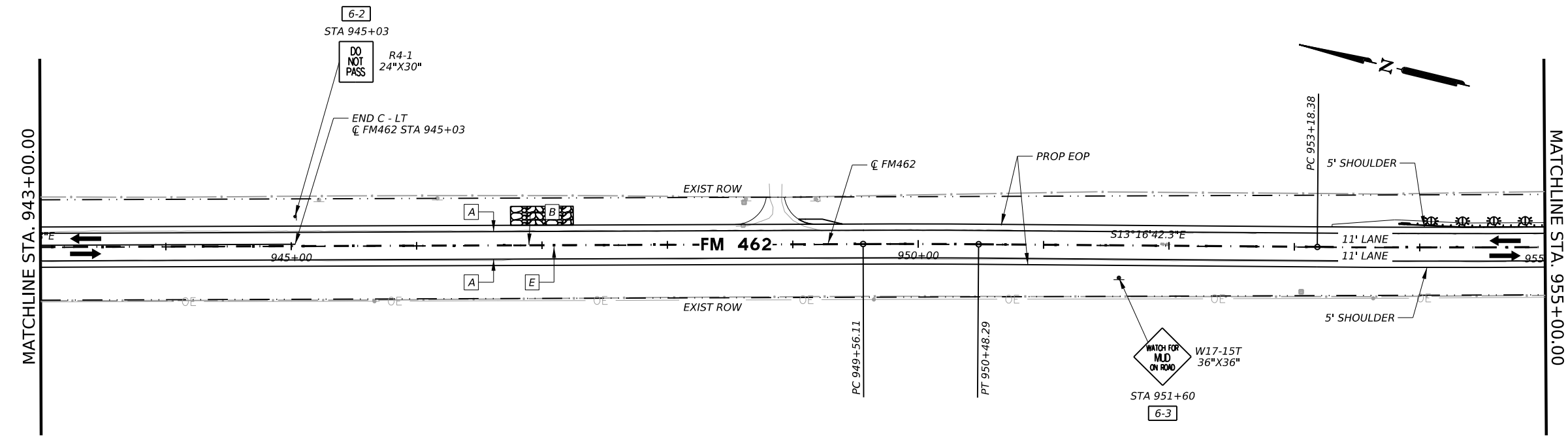
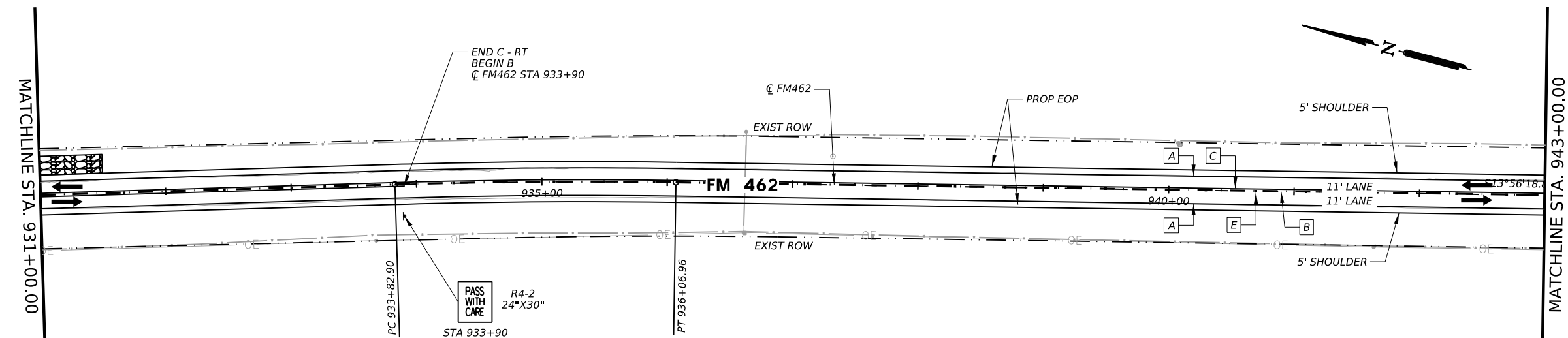
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
SAT	COUNTY	SHEET NO.	
	MEDINA	199	

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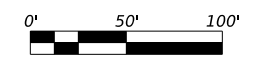
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ITEM	DESCRIPTION	UNIT	QTY
0644 6001	IN SM RD SN SUP&AM TY 10BWG(1)SA(P)	EA	3
0644 6076	REMOVE SM RD SN SUP&AM	EA	1
0658 6062	INSTL DEL ASSM (D-SWISZ 1(BRF)GF2(B))	EA	4
0666 6225	PAVEMENT SEALER 6"	LF	7024
A 0666 6343	REFL PROF PAV MRK TY I (W) 6"(SLD)(100MIL)	LF	4800
B 0666 6346	REFL PROF PAV MRK TY I (Y) 6"(BRK)(100MIL)	LF	530
C 0666 6347	REFL PROF PAV MRK TY I (Y) 6"(SLD)(100MIL)	LF	1694
E 0672 6009	REFL PAV MRKR TY II-A-A	EA	60
0678 6002	PAV SURF PREP FOR MRK (6")	LF	7024



- LEGEND**
- EXIST FENCE
  - EXIST FEATURES
  - EXIST RIGHT OF WAY
  - DIRECTION OF TRAVEL
  - PROP SIGN
  - EXIST SIGN TO REMAIN
  - PROP DELINEATOR
  - PROP OBJECT MARKER

1/31/2024



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**FM 462**

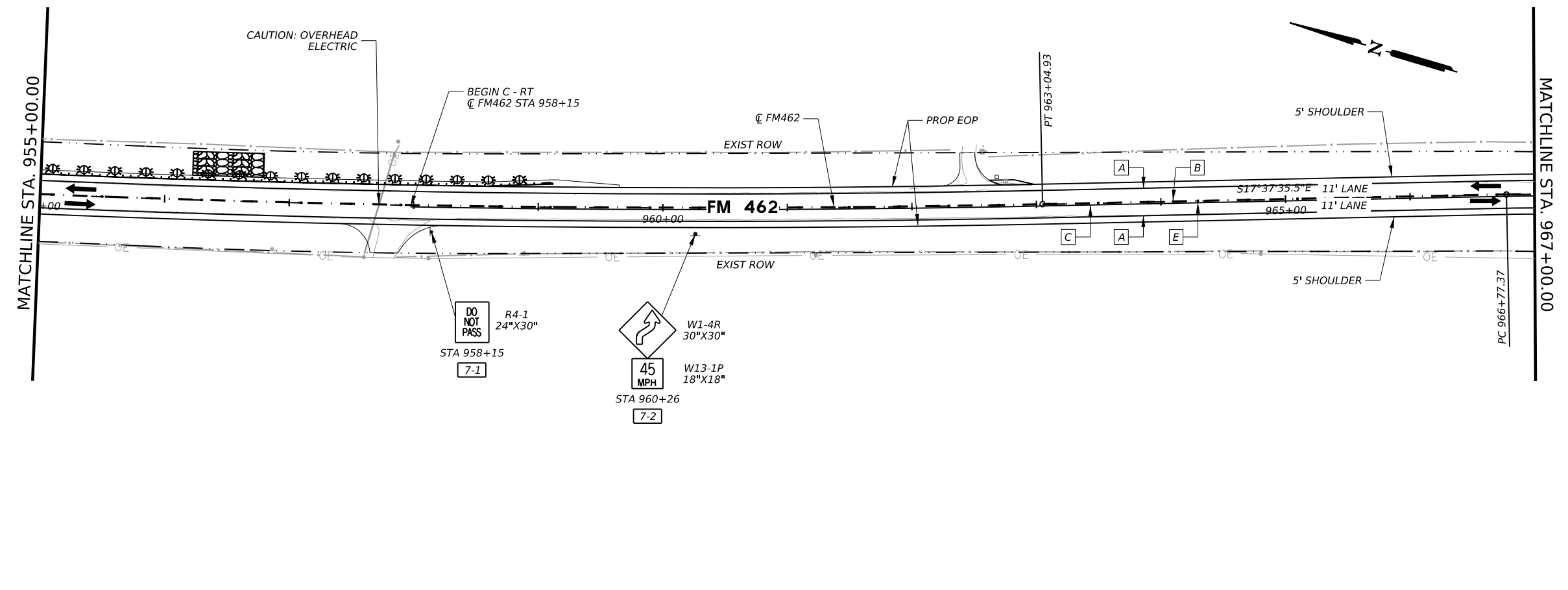
**SIGN AND PAVEMENT MARKING LAYOUT**

SHEET 6 OF 13

CONT	SECT	JOB	HIGHWAY
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SAT	COUNTY	SHEET NO.	
	MEDINA	200	

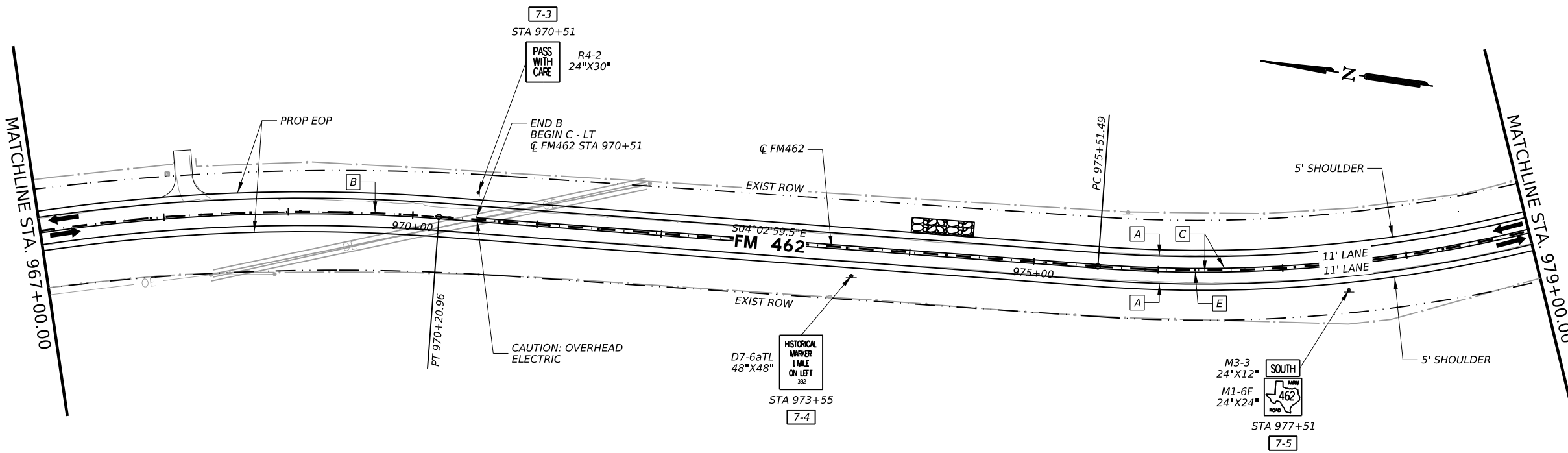
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0644 6076	REMOVE SM RD SN SUP&AM	EA	3
0658 6062	IN STL DEL ASSM (D-SWISZ 1(BRF)GF2(B))	EA	16
0666 6225	PAVEMENT SEALER 6"	LF	8141
A 0666 6343	REFL PROF PAV MRK TY I (W) 6"(SLD)(100MIL)	LF	4800
B 0666 6346	REFL PROF PAV MRK TY I (Y) 6"(BRK)(100MIL)	LF	390
C 0666 6347	REFL PROF PAV MRK TY I (Y) 6"(SLD)(100MIL)	LF	2951
E 0672 6009	REFL PAV MRKR TY II-A-A	EA	60
0678 6002	PAV SURF PREP FOR MRK (6")	LF	8141

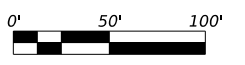


**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- DIRECTION OF TRAVEL
- PROP SIGN
- EXIST SIGN TO REMAIN
- PROP DELINEATOR
- PROP OBJECT MARKER



David Gutierrez  
 STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER  
 1/31/2024



**Kimley Horn** F-928

Texas Department of Transportation

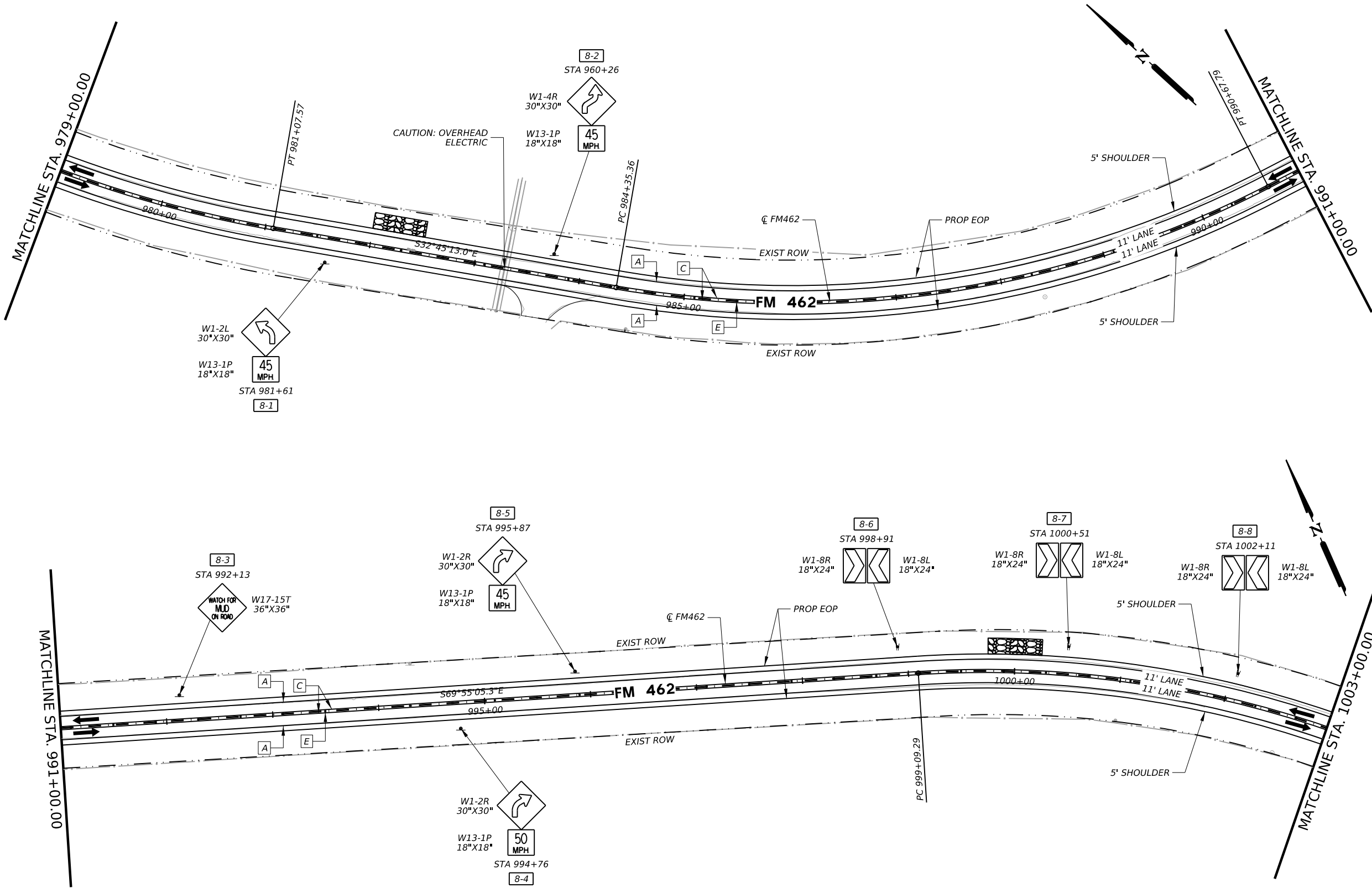
**FM 462**  
**SIGN AND PAVEMENT MARKING LAYOUT**

SHEET 7 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	201

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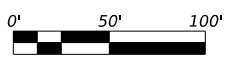
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0644.6076	REMOVE SM RD SN SUP&AM	EA	5
0666.6225	PAVEMENT SEALER 6"	LF	9600
A 0666.6343	REFL PROF PAV MRK TY I (W) 6"(SLD)(100MIL)	LF	4800
C 0666.6347	REFL PROF PAV MRK TY I (Y) 6"(SLD)(100MIL)	LF	4800
E 0672.6009	REFL PAV MRKR TY II-A-A	EA	60
0678.6002	PAV SURF PREP FOR MRK (6")	LF	9600



**LEGEND**

- EXIST FENCE
- ..... EXIST FEATURES
- - - - EXIST RIGHT OF WAY
- DIRECTION OF TRAVEL
- ↓ PROP SIGN
- ## PROP SIGN
- ## EXIST SIGN TO REMAIN
- ⊘ PROP DELINEATOR
- PROP OBJECT MARKER

David Gutierrez  
 1/31/2024  

**Kimley Horn** F-928  
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 Texas Department of Transportation  
**FM 462**  
**SIGN AND PAVEMENT MARKING LAYOUT**  
 SHEET 8 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	202	

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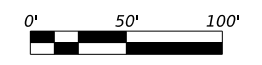
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0644 6004	IN SM RD SN SUP&AM TY 10BWG(1)SA(T)	EA	1
0644 6076	REMOVE SM RD SN SUP&AM	EA	3
0666 6225	PAVEMENT SEALER 6"	LF	8648
A 0666 6343	REFL PROF PAV MRK TY I (W) 6"(SLD)(100MIL)	LF	4800
B 0666 6346	REFL PROF PAV MRK TY I (Y) 6"(BRK)(100MIL)	LF	310
C 0666 6347	REFL PROF PAV MRK TY I (Y) 6"(SLD)(100MIL)	LF	3538
E 0672 6009	REFL PAV MRKR TY II-A-A	EA	60
0678 6002	PAV SURF PREP FOR MRK (6")	LF	8648

**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- DIRECTION OF TRAVEL
- PROP SIGN
- EXIST SIGN TO REMAIN
- PROP DELINEATOR
- PROP OBJECT MARKER



1/31/2024



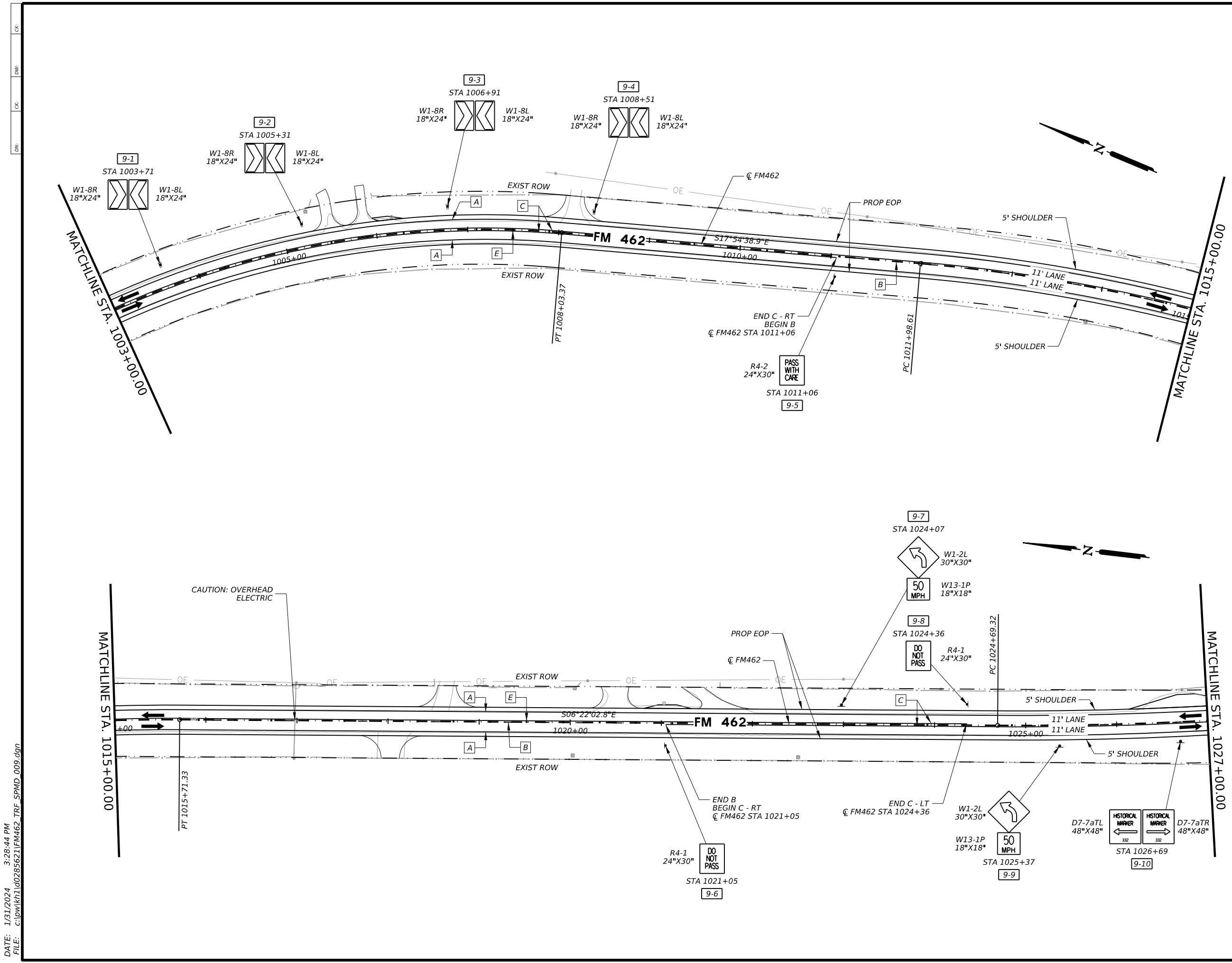
**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**  
**SIGN AND PAVEMENT MARKING LAYOUT**

SHEET 9 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	203	



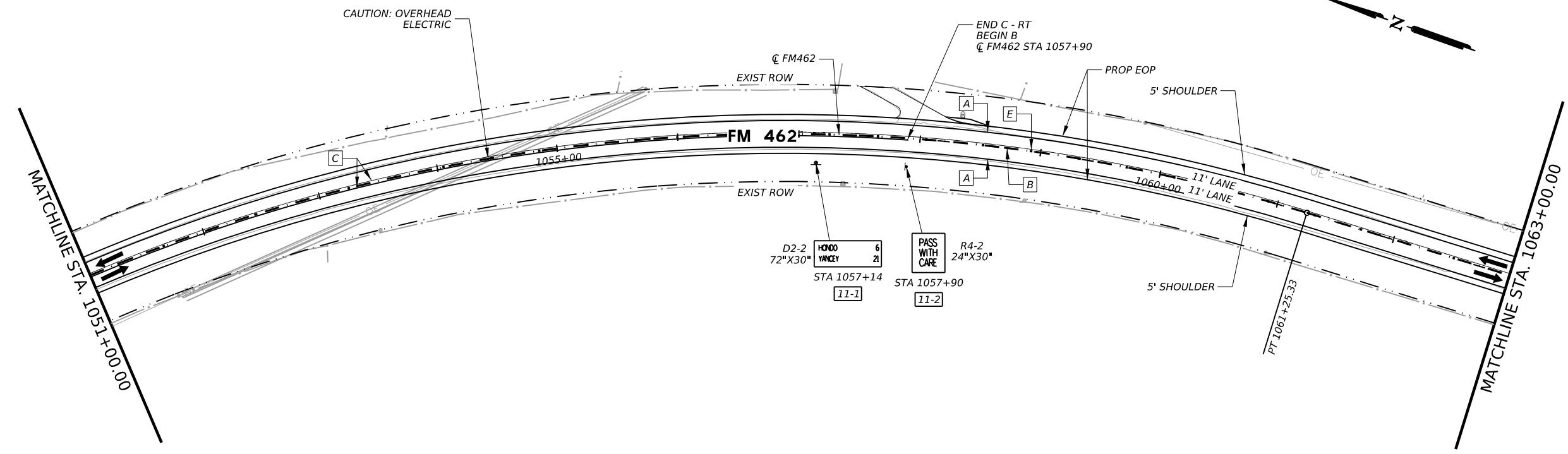
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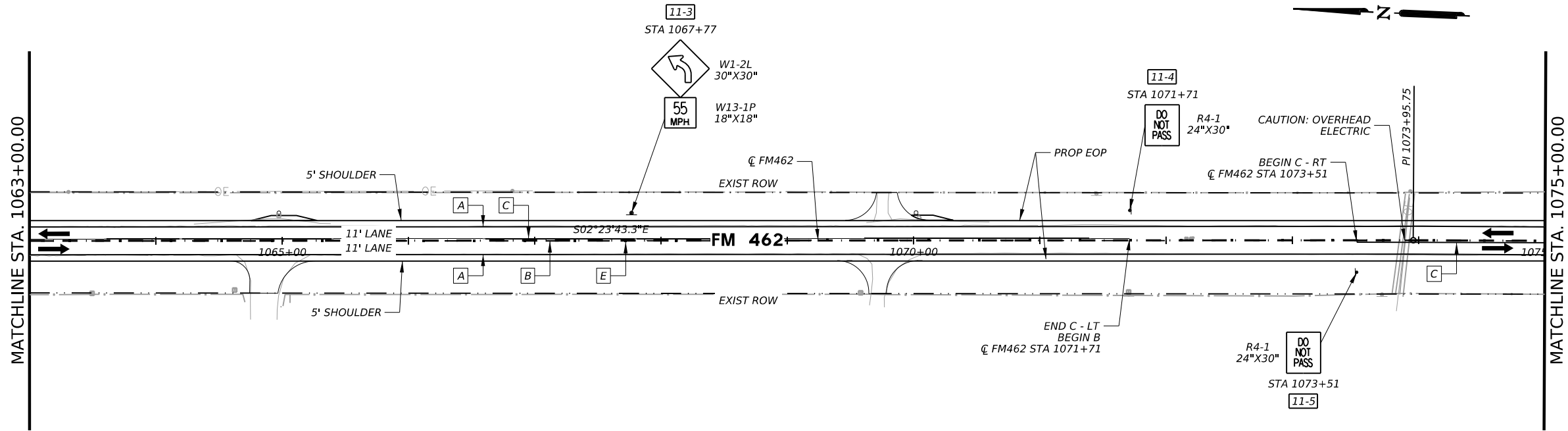
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0644.6004	IN SM RD SN SUP&AM TY 10BWG(1)SA(T)	EA	1
0644.6076	REMOVE SM RD SN SUP&AM	EA	2
0666.6225	PAVEMENT SEALER 6"	LF	8141
A 0666.6343	REFL PROF PAV MRK TY I (W) 6"(SLD)(100MIL)	LF	4800
B 0666.6346	REFL PROF PAV MRK TY I (Y) 6"(BRK)(100MIL)	LF	430
C 0666.6347	REFL PROF PAV MRK TY I (Y) 6"(SLD)(100MIL)	LF	2911
E 0672.6009	REFL PAV MRKR TY II-A-A	EA	60
0678.6002	PAV SURF PREP FOR MRK (6")	LF	8141



**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- DIRECTION OF TRAVEL
- PROP SIGN
- #-# PROP SIGN
- #-# EXIST SIGN TO REMAIN
- PROP DELINEATOR
- PROP OBJECT MARKER



1/31/2024

0' 50' 100'

STATE OF TEXAS  
DAVID H. GUTIERREZ  
143301  
LICENSED PROFESSIONAL ENGINEER

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**SIGN AND PAVEMENT MARKING LAYOUT**

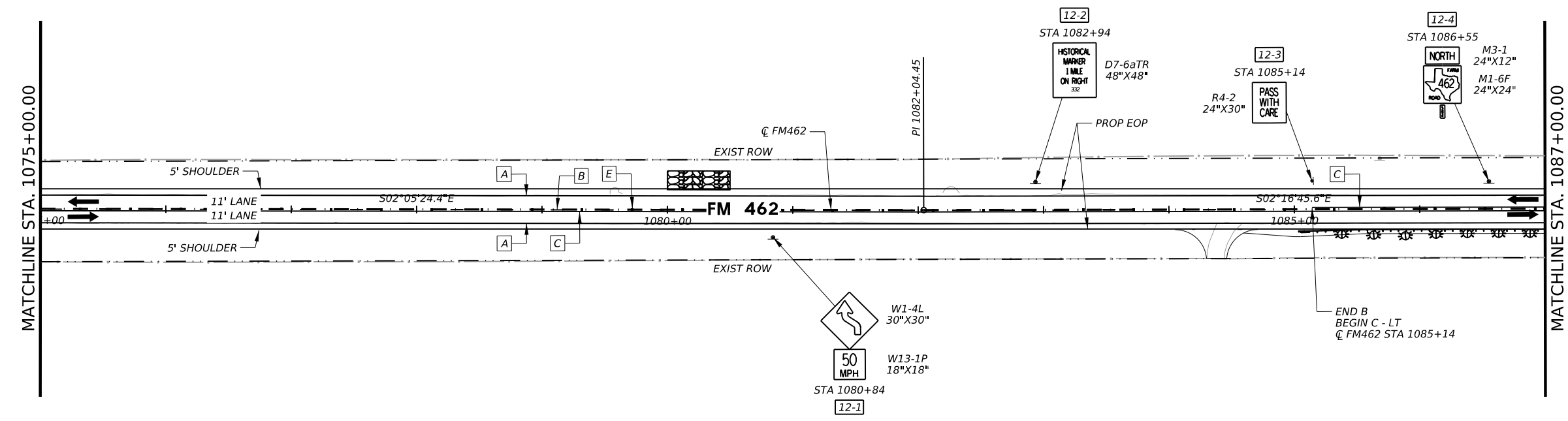
SHEET 11 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	205	

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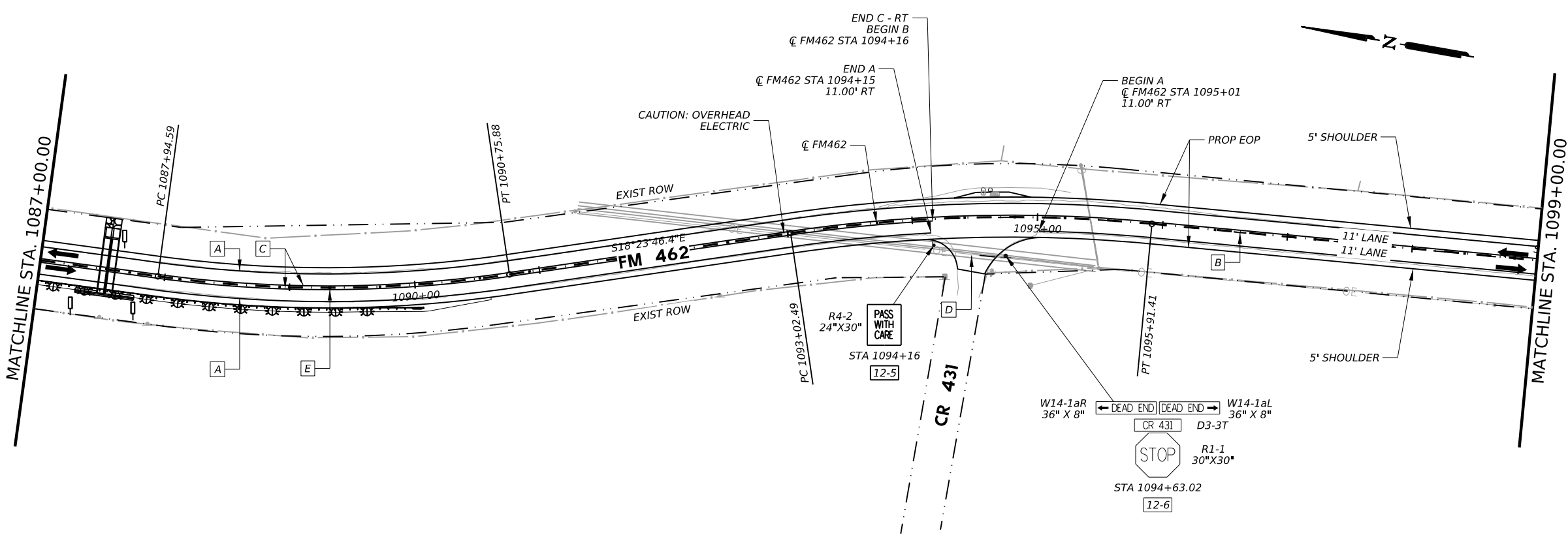
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ITEM	DESCRIPTION	UNIT	QTY
0644 6001	IN SM RD SN SUP&AM TY 10BWG(1)SA(P)	EA	5
0644 6004	IN SM RD SN SUP&AM TY 10BWG(1)SA(T)	EA	1
0644 6076	REMOVE SM RD SN SUP&AM	EA	4
0658 6046	IN STL OM ASSM (OM-2X)WCIGND	EA	3
0658 6062	IN STL DEL ASSM (D-SWISZ 1(BRF)GF2(B))	EA	18
0666 6048	REFL PAV MRK TY 1(W)24"(SLD)(100MIL)	LF	12
0666 6225	PAVEMENT SEALER 6"	LF	8388
0666 6230	PAVEMENT SEALER 24"	LF	12
A 0666 6343	REFL PROF PAV MRK TY 1(W)6"(SLD)(100MIL)	LF	4715
B 0666 6346	REFL PROF PAV MRK TY 1(Y)6"(BRK)(100MIL)	LF	370
C 0666 6347	REFL PROF PAV MRK TY 1(Y)6"(SLD)(100MIL)	LF	3303
E 0672 6009	REFL PAV MRKR TY II-A-A	EA	60
0678 6002	PAV SURF PREP FOR MRK (6")	LF	8388
0678 6008	PAV SURF PREP FOR MRK (24")	LF	12

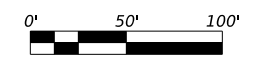


**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- DIRECTION OF TRAVEL
- PROP SIGN
- EXIST SIGN TO REMAIN
- PROP DELINEATOR
- PROP OBJECT MARKER



David Gutierrez  
 1/31/2024  
  
 143301  
 LICENSED PROFESSIONAL ENGINEER

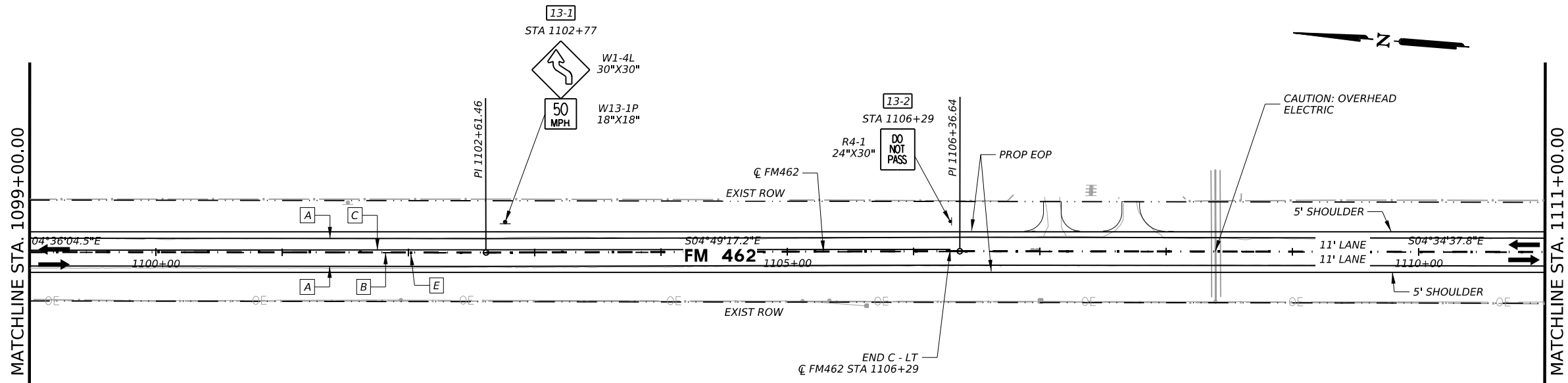


**Kimley Horn** F-928  
 Texas Department of Transportation  
**FM 462**  
**SIGN AND PAVEMENT MARKING LAYOUT**  
 SHEET 12 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	206	

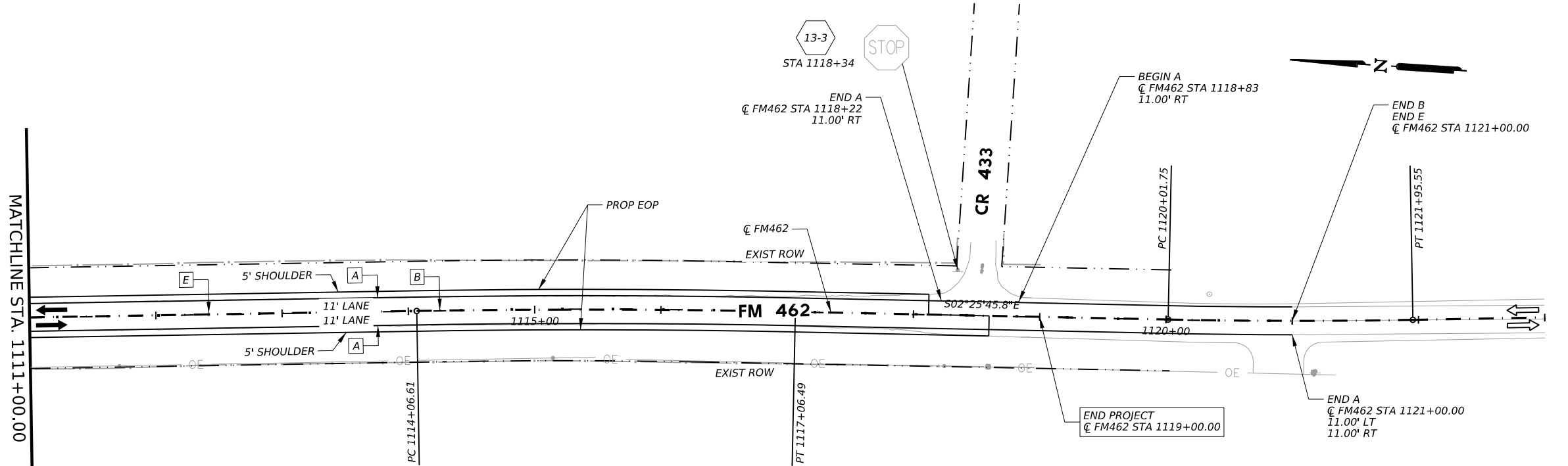
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ITEM	DESCRIPTION	UNIT	QTY
0644.6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2
0644.6076	REMOVE SM RD SN SUP&AM	EA	1
0666.6225	PAVEMENT SEALER 6"	LF	5680
A 0666.6343	REFL PROF PAV MRK TY I(W) 6"(SLD)(100MIL)	LF	4400
B 0666.6346	REFL PROF PAV MRK TY I(Y) 6"(BRK)(100MIL)	LF	550
C 0666.6347	REFL PROF PAV MRK TY I(Y) 6"(SLD)(100MIL)	LF	730
E 0672.6009	REFL PAV MRKR TY II-A-A	EA	55
0678.6002	PAV SURF PREP FOR MRK (6")	LF	5680

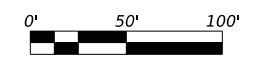



**LEGEND**


- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- DIRECTION OF TRAVEL
- PROP SIGN
- PROP SIGN
- EXIST SIGN TO REMAIN
- PROP DELINEATOR
- PROP OBJECT MARKER



  
 1/31/2024  





**FM 462**  
**SIGN AND PAVEMENT MARKING LAYOUT**

SHEET 13 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	207

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DATE: 1/31/2024 3:31:38 PM  
 FILE: c:\pwworking\dot285597\FM462\_TEXT\_SOSS.dgn

# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)			BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							Post Type	Anchor Type	Mounting Designation		
1	5	W1-8R		18 x 24			10BWG	1	SA	P	
		W1-8L		18 x 24							
1	6	W8-18		36 x 36			10BWG	1	SA	P	
		W16-4P		30 x 24							
1	7	W1-8R		18 x 24			10BWG	1	SA	P	
		W1-8L		18 x 24							
1	8	W1-8R		18 x 24			10BWG	1	SA	P	
		W1-8L		18 x 24							
1	9	W1-8R		18 x 24			10BWG	1	SA	P	
		W1-8L		18 x 24							
1	10	W1-8R		18 x 24			10BWG	1	SA	P	
		W1-8L		18 x 24							
1	11	W1-8R		18 x 24			10BWG	1	SA	P	
		W1-8L		18 x 24							
1	12	W1-8R		18 x 24			10BWG	1	SA	P	
		W1-8L		18 x 24							
1	13	W1-8R		18 x 24			10BWG	1	SA	P	
		W1-8L		18 x 24							
1	14	W1-8R		18 x 24			10BWG	1	SA	P	
		W1-8L		18 x 24							

ALUMINUM SIGN BLANKS THICKNESS	
SQUARE FEET	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:  
<http://www.txdot.gov/>

- NOTE:**
- Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
  - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

				Traffic Operations Division Standard	
<h2>SUMMARY OF SMALL SIGNS</h2>					
<h3>SOSS</h3>					
SHEET 1 OF 8					
FILE: slms16.dgn	DN: IxDOT	CK: IxDOT	DW: IxDOT	CR: IxDOT	
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0848	04	052	FM 462	
4-16	DIST	COUNTY	SHEET NO.		
8-16	SAT	MEDINA	208		



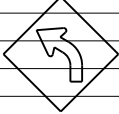





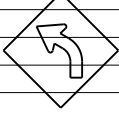


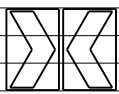
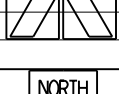


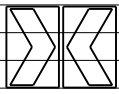
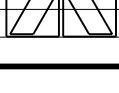
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DATE: 1/31/2024 3:31:38 PM  
 FILE: c:\pwworking\dot285597\FM462\_TEXT\_SOSS.dgn

# SUMMARY OF SMALL SIGNS

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

BRIDGE MOUNT CLEARANCE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)			BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)			
							Post Type	Anchor Type	Mounting Designation				
							FRP = Fiberglass TWT = Thin-wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plastic	P = Prefab. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S	
2	1	W1-2L		30 x 30				10BWG	1	SA	P		
		W13-1P		18 x 18									
2	2	S3-1		36 x 36				10BWG	1	SA	P		
2	3	R4-2		24 x 30				10BWG	1	SA	P		
2	4	R4-1		24 x 30				10BWG	1	SA	P		
3	1	R4-1		24 x 30				10BWG	1	SA	P		
3	2	W1-2L		30 x 30				10BWG	1	SA	P		
		W13-1P		18 x 18									
3	3	R4-2		24 x 30				10BWG	1	SA	P		
3	4	W1-8R		18 x 24				10BWG	1	SA	P		
		W1-8L		18 x 24									
3	5	M3-1		24 x 12				10BWG	1	SA	P		
		M1-6F		24 x 24									
3	6	W1-8R		18 x 24				10BWG	1	SA	P		
		W1-8L		18 x 24									

ALUMINUM SIGN BLANKS THICKNESS	
SQUARE FEET	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:  
<http://www.txdot.gov/>

- NOTE:**
- Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
  - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation  
 Traffic Operations Division Standard

## SUMMARY OF SMALL SIGNS

SOSS SHEET 2 OF 8

FILE: slums16.dgn	DN: IxDOT	CK: IxDOT	DW: IxDOT	CR: IxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
4-16	DIST	COUNTY	SHEET NO.	
8-16	SAT	MEDINA	209	

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DATE: 1/31/2024 3:31:38 PM  
 FILE: c:\pwworking\dot285597\FM462\_TEXT\_SOSS.dgn

# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)			BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)		
							Post Type	Anchor Type	Mounting Designation			
							FRP = Fiberglass TWT = Thin-wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plastic	P = Prefab. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
3	7	W1-8R		18 x 24				10BWG	1	SA	P	
		W1-8L		18 x 24								
3	8	W1-8R		18 x 24				10BWG	1	SA	P	
		W1-8L		18 x 24								
3	9	R4-2		24 x 30				10BWG	1	SA	P	
4	1	W1-2R		30 x 30				10BWG	1	SA	P	
		W13-1P		18 x 18								
4	2	R4-1		24 x 30				10BWG	1	SA	P	
4	3	W14-1aL		36 x 8								
		W14-1aR		36 x 8								
4	3	D3-3T		30 x 8				10BWG	1	SA	P	
		R1-1		30 x 30								
5	1	R4-1		24 x 30				10BWG	1	SA	P	
5	2	R4-2		24 x 30				10BWG	1	SA	P	
6	1	R4-2		24 x 30				10BWG	1	SA	P	
6	2	R4-1		24 x 30				10BWG	1	SA	P	

SQUARE FEET	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:  
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  - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

		Traffic Operations Division Standard	
<h2>SUMMARY OF SMALL SIGNS</h2>			
<h3>SOSS</h3>			
SHEET 3 OF 8			
FILE: slms16.dgn	DN: IxDOT	CK: IxDOT	DW: IxDOT
© TxDOT May 1987	CONT: 0848	SECT: 04	JOB: 052
REVISIONS			HIGHWAY: FM 462
4-16	DIST: SAT	COUNTY: MEDINA	SHEET NO.: 210
8-16			

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DATE: 1/31/2024 3:31:39 PM  
 FILE: c:\pwworking\dot285597\FM462\_TEXT\_SOSS.dgn

# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)			BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)			
							Post Type	Anchor Type	Mounting Designation				
							FRP = Fiberglass TWT = Thin-wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plastic	P = Prefab. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S	
6	3	W17-15T		36 x 36				10BWG	1	SA	P		
7	1	R4-1		24 x 30				10BWG	1	SA	P		
7	2	W1-4R		30 x 30				10BWG	1	SA	P		
		W13-1P		18 x 18									
7	3	R4-2		24 x 30				10BWG	1	SA	P		
7	4	D7-6aTL		48 x 48				10BWG	1	SA	T		
7	5	M3-3		24 x 12				10BWG	1	SA	P		
		M1-6F		24 x 24									
8	1	W1-2L		30 x 30				10BWG	1	SA	P		
		W13-1P		18 x 18									
8	2	W1-4R		30 x 30				10BWG	1	SA	P		
		W13-1P		18 x 18									
8	3	W17-15T		36 x 36				10BWG	1	SA	P		

SQUARE FEET	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:  
<http://www.txdot.gov/>



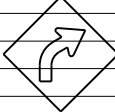

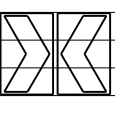
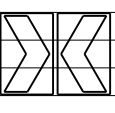
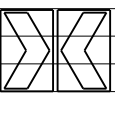
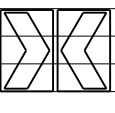
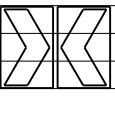
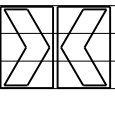
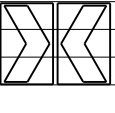
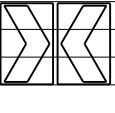
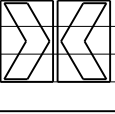
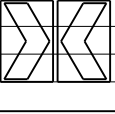
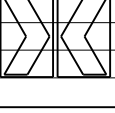
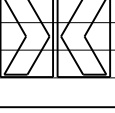
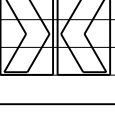
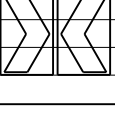

- NOTE:**
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  - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

				Traffic Operations Division Standard	
<h2>SUMMARY OF SMALL SIGNS</h2>					
<h3>SOSS</h3>					
SHEET 4 OF 8					
FILE: slums16.dgn	DN: IxDOT	CK: IxDOT	DW: IxDOT	CR: IxDOT	
© TxDOT May 1987	CONT: 0848	SECT: 04	JOB: 052	HIGHWAY: FM 462	
4-16	DIST: SAT	COUNTY: MEDINA	SHEET NO.: 211		
8-16					

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 FILE: c:\pwworking\dot285597\FM462\_TEXT\_SOSS.dgn


# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)			BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)		
							Post Type	Anchor Type	Mounting Designation			
							FRP = Fiberglass TWT = Thin-wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plastic	P = Prefab. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
8	4	W1-2R		30 x 30				10BWG	1	SA	P	
		W13-1P		18 x 18								
8	5	W1-2R		30 x 30				10BWG	1	SA	P	
		W13-1P		18 x 18								
8	6	W1-8R		18 x 24				10BWG	1	SA	P	
		W1-8L		18 x 24								
8	7	W1-8R		18 x 24				10BWG	1	SA	P	
		W1-8L		18 x 24								
8	8	W1-8R		18 x 24				10BWG	1	SA	P	
		W1-8L		18 x 24								
9	1	W1-8R		18 x 24				10BWG	1	SA	P	
		W1-8L		18 x 24								
9	2	W1-8R		18 x 24				10BWG	1	SA	P	
		W1-8L		18 x 24								
9	3	W1-8R		18 x 24				10BWG	1	SA	P	
		W1-8L		18 x 24								
9	4	W1-8R		18 x 24				10BWG	1	SA	P	
		W1-8L		18 x 24								
9	5	R4-2		24 x 30				10BWG	1	SA	P	

ALUMINUM SIGN BLANKS THICKNESS	
SQUARE FEET	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:  
<http://www.txdot.gov/>

- NOTE:**
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  - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

		Traffic Operations Division Standard	
<b>SUMMARY OF SMALL SIGNS</b>			
<b>SOSS</b>			
SHEET 5 OF 8			
FILE: slms16.dgn	DN: IxDOT	CK: IxDOT	DW: IxDOT
© TxDOT May 1987	CONT: 0848	SECT: 04	JOB: 052
REVISIONS	DIST: COUNTY		HIGHWAY: FM 462
4-16	SAT		SHEET NO. 212
8-16	MEDINA		

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 FILE: c:\pwworking\dot285597\FM462\_TEXT\_SOSS.dgn

# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)			BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)	
							Post Type	Anchor Type	Mounting Designation		
9	6	R4-1		24 x 30			10BWG	1	SA	P	
9	7	W1-2L		30 x 30			10BWG	1	SA	P	
		W13-1P		18 x 18							
9	8	R4-1		24 x 30			10BWG	1	SA	P	
9	9	W1-2L		30 x 30			10BWG	1	SA	P	
		W13-1P		18 x 18							
9	10	D7-7aTL D7-7aTR		48 x 48			10BWG	1	SA	T	
10	1	W1-8R W1-8L		18 x 24 18 x 24			10BWG	1	SA	P	
10	2	R4-2		24 x 30			10BWG	1	SA	P	
10	3	W1-8R W1-8L		18 x 24 18 x 24			10BWG	1	SA	P	
10	4	W1-8R W1-8L		18 x 24 18 x 24			10BWG	1	SA	P	
10	5	W1-8R W1-8L		18 x 24 18 x 24			10BWG	1	SA	P	

FRP = Fiberglass  
 TWT = Thin-wall  
 10BWG = 10 BWG  
 S80 = Sched 80

UA = Univer-Conc  
 UB = Univer-Bolt  
 SA = Slip-Conc  
 SB = Slip-Bolt  
 WS = Wedge Steel  
 WP = Wedge Plastic

P = Prefab. "Plain"  
 T = Prefab. "T"  
 U = Prefab. "U"

1EXT or 2EXT = # of Ext.  
 BM = Extruded Beam  
 WC = 1.12 #/ft Wing Chan.  
 EXAL = Extruded Alum. Signs

SQUARE FEET	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:  
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  - For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Traffic Operations Division Standard

**SUMMARY OF SMALL SIGNS**

**SOSS** SHEET 6 OF 8

FILE: slums16.dgn	DN: I:\DOT	CK: I:\DOT	DW: I:\DOT	CR: I:\DOT
© TxDOT May 1987	CONT: 0848	SECT: 04	JOB: 052	HIGHWAY: FM 462
4-16 8-16	DIST: SAT	COUNTY: MEDINA	SHEET NO.: 213	



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 FILE: c:\pwworking\dot285597\FM462\_TEXT\_SOSS.dgn

# SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)			BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)		
							Post Type	Anchor Type	Mounting Designation			
							FRP = Fiberglass TWT = Thin-wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plastic	P = Prefab. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
10	6	W1-8R		18 x 24				10BWG	1	SA	P	
		W1-8L		18 x 24								
10	7	W1-2R		30 x 30				10BWG	1	SA	P	
		W13-1P		18 x 18								
10	8	W1-2R		30 x 30				10BWG	1	SA	P	
		W13-1P		18 x 18								
11	1	D2-2		72 x 30				10BWG	1	SA	T	
11	2	R4-2		24 x 30				10BWG	1	SA	P	
11	3	W1-2L		30 x 30				10BWG	1	SA	P	
		W13-1P		18 x 18								
11	4	R4-1		24 x 30				10BWG	1	SA	P	
11	5	R4-1		24 x 30				10BWG	1	SA	P	

SQUARE FEET	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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		Traffic Operations Division Standard	
<h2>SUMMARY OF SMALL SIGNS</h2>			
<h3>SOSS</h3>			
SHEET 7 OF 8			
FILE: slms16.dgn	DN: IxDOT	CK: IxDOT	DW: IxDOT
© TxDOT May 1987	CONT: 0848	SECT: 04	JOB: 052
4-16	DIST: SAT	COUNTY: MEDINA	HIGHWAY: FM 462
8-16			SHEET NO.: 214

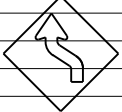

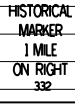





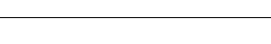


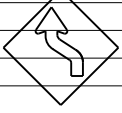


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 FILE: c:\pwworking\dot285597\FM462\_TEXT\_SOSS.dgn

# SUMMARY OF SMALL SIGNS

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


BRIDGE MOUNT CLEARANCE SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)			BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)		
							Post Type	Anchor Type	Mounting Designation			
							FRP = Fiberglass TWT = Thin-wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel WP = Wedge Plastic	P = Prefab. "Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
12	1	W1-4L		30 x 30				10BWG	1	SA	P	
		W13-1P		18 x 18								
12	2	D7-6aTR		48 x 48				10BWG	1	SA	T	
12	3	R4-2		24 x 30				10BWG	1	SA	P	
12	4	M3-1		24 x 12				10BWG	1	SA	P	
		M1-6F		24 x 24								
12	5	R4-2		24 x 30				10BWG	1	SA	P	
		W14-1aL		36 x 8								
		W14-1aR		36 x 8								
12	6	D3-3T		30 x 8				10BWG	1	SA	P	
		R1-1		30 x 30								
13	1	W1-4L		30 x 30				10BWG	1	SA	P	
		W13-1P		18 x 18								
13	2	R4-1		24 x 30				10BWG	1	SA	P	

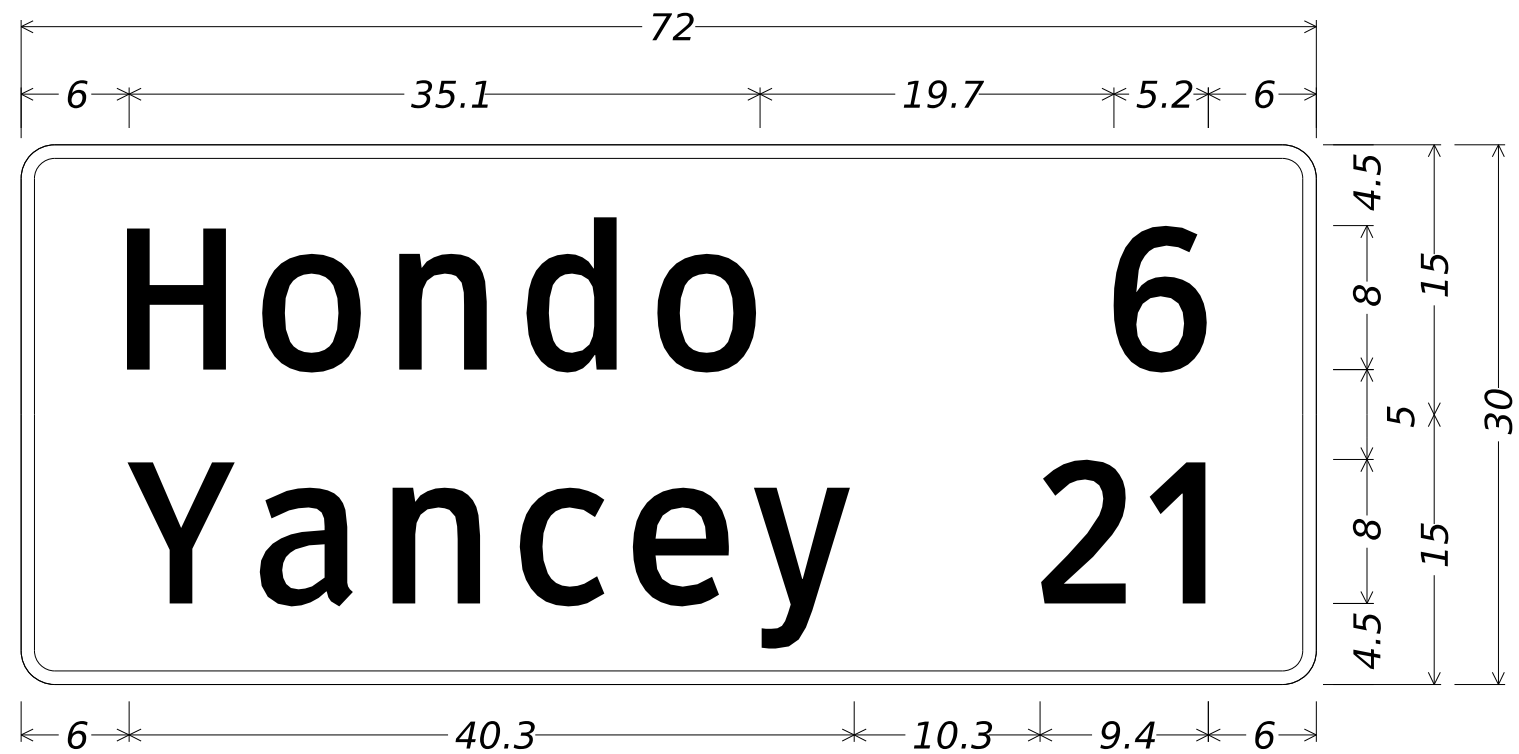
SQUARE FEET	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:  
<http://www.txdot.gov/>

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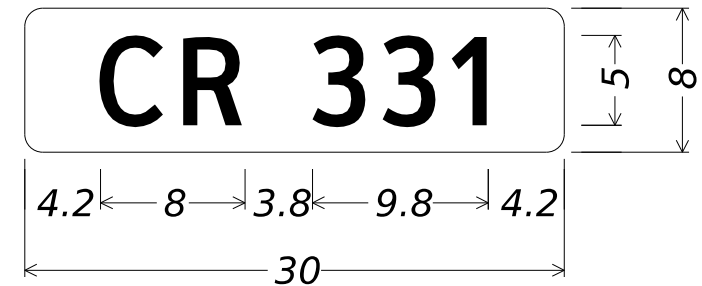
 Texas Department of Transportation		Traffic Operations Division Standard	
<h2>SUMMARY OF SMALL SIGNS</h2>			
<h3>SOSS</h3>			
SHEET 8 OF 8			
FILE: slms16.dgn	DN: IxDOT	CK: IxDOT	DW: IxDOT
© TxDOT May 1987	CONT: 0848	SECT: 04	JOB: 052
4-16	DIST: SAT	COUNTY: MEDINA	HIGHWAY: FM 462
8-16			SHEET NO.: 215

CK: DW: CK: DW: CK:



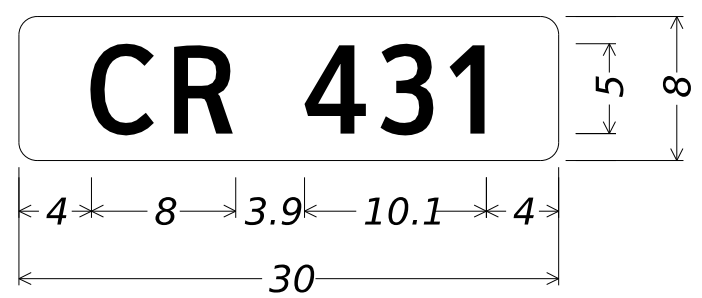
D2-2 8in;  
 1.875" Radius, 0.75" Border, White on Green;  
 "Hondo", ClearviewHwy-3-W; "6", ClearviewHwy-3-W;  
 1.875" Radius, 0.75" Border, White on Green;  
 "Yancey", ClearviewHwy-3-W; "21", ClearviewHwy-3-W;

11-1



D3-3T;  
 1.0" Radius, No border, Green;  
 "CR 331" White, ClearviewHwy-3-W specified length;

4-3



D3-3T;  
 1.0" Radius, No border, Green;  
 "CR 431" White, ClearviewHwy-3-W specified length;

12-6

Matthew Gaal  
 1/30/2024  


**Kimley»Horn** F-928  
 © 2023  
 Texas Department of Transportation  
 FM 462  
 SIGN DETAILS  
 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	216	

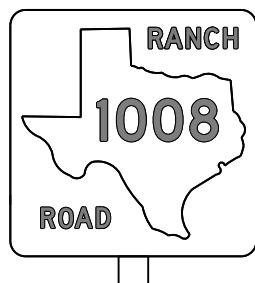
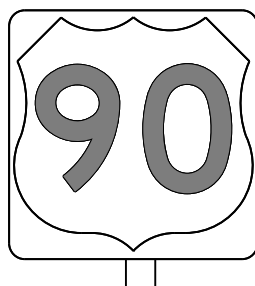
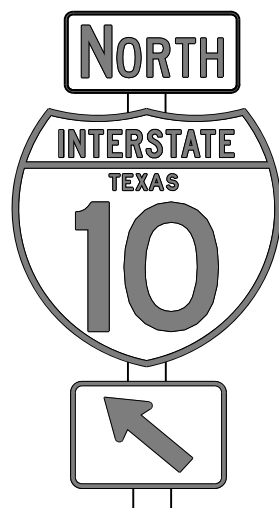
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 FILE: c:\pwworkh\0285621\tsr3-13.dgn

## REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

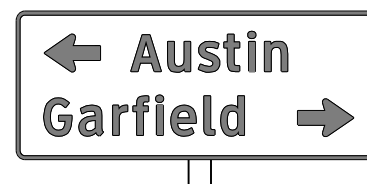
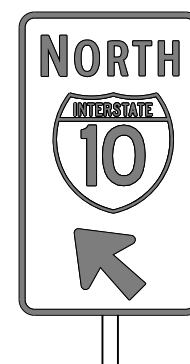
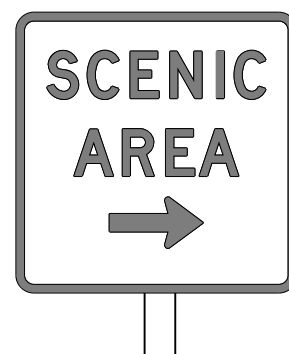
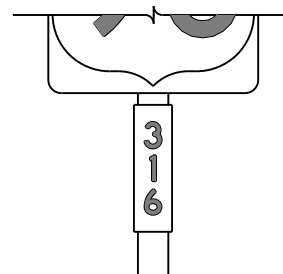
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

## REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

## GENERAL NOTES

- Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
- White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

- Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).
- Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
- Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.
- Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

### DEPARTMENTAL MATERIAL SPECIFICATIONS

ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

### ALUMINUM SIGN BLANKS THICKNESS

Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

<http://www.txdot.gov/>



## TYPICAL SIGN REQUIREMENTS

### TSR(3) - 13

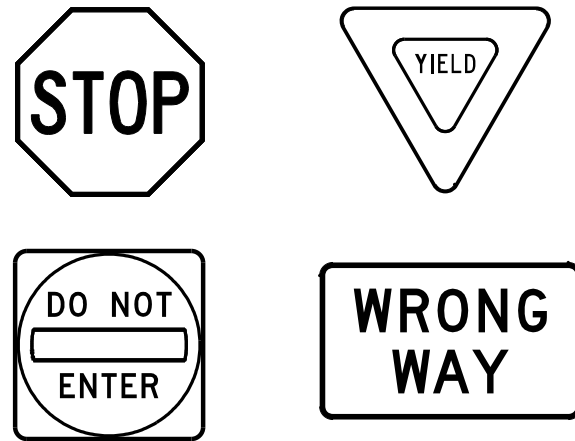
FILE:	tsr3-13.dgn	DN:	TxDOT	CK:	TxDOT	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0848	04	052	FM 462				
12-03	7-13	DIST	COUNTY	SHEET NO.					
9-08		SAT	MEDINA	217					

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DATE: 1/31/2024 3:33:11 PM  
 FILE: c:\pwworking\dot285621\tsr4-13.dgn

### REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

### REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

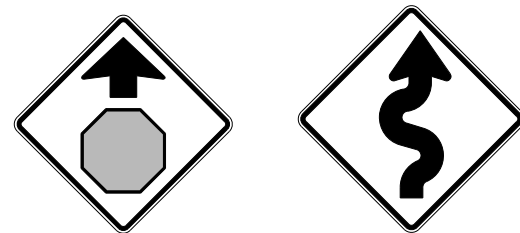
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

### REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B <sub>FL</sub> OR C <sub>FL</sub> SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

### REQUIREMENTS FOR SCHOOL SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B <sub>FL</sub> OR C <sub>FL</sub> SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

### GENERAL NOTES

- Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
- Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
- Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
- Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
- White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
- Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

#### ALUMINUM SIGN BLANKS THICKNESS

Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

#### DEPARTMENTAL MATERIAL SPECIFICATIONS

ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

<http://www.txdot.gov/>



## TYPICAL SIGN REQUIREMENTS

TSR(4) - 13

FILE:	tsr4-13.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0848	04	052	FM 462				
12-03	7-13	DIST	COUNTY	SHEET NO.					
9-08		SAT	MEDINA	218					

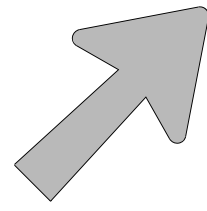


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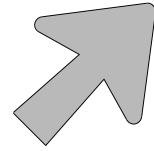
DATE: 1/31/2024 3:33:37 PM  
 FILE: c:\pwworking\dot285621\tsr5-13.dgn

### ARROW DETAILS

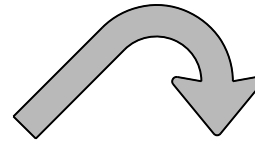
for Large Ground-Mounted and Overhead Guide Signs



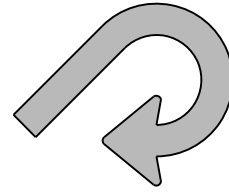
Type A



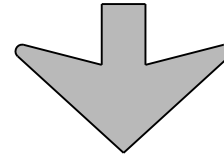
Type B



E-3



E-4



Down Arrow

TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

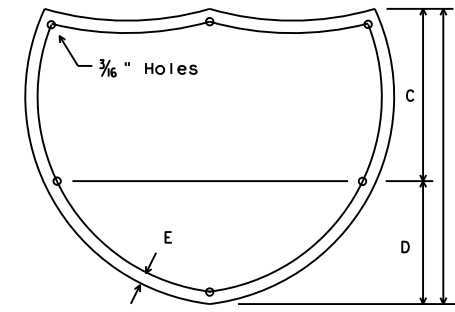
**NOTE**

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

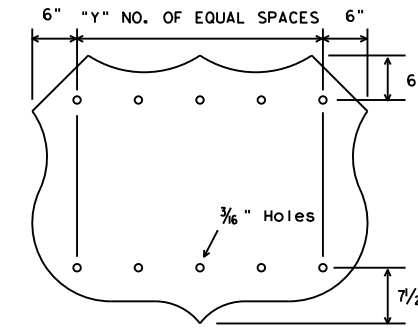
<http://www.txdot.gov/>

### SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)



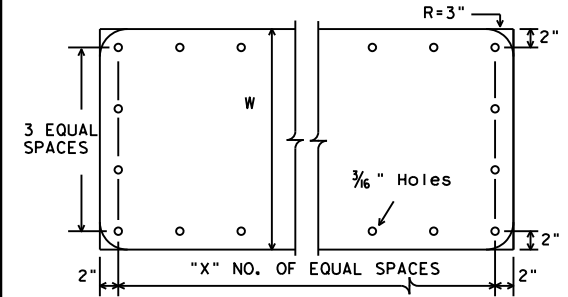
INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4



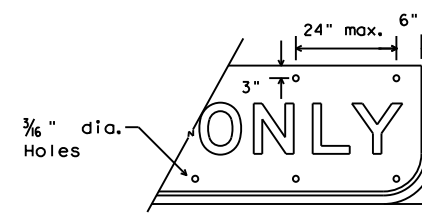
U.S. ROUTE MARKERS

Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



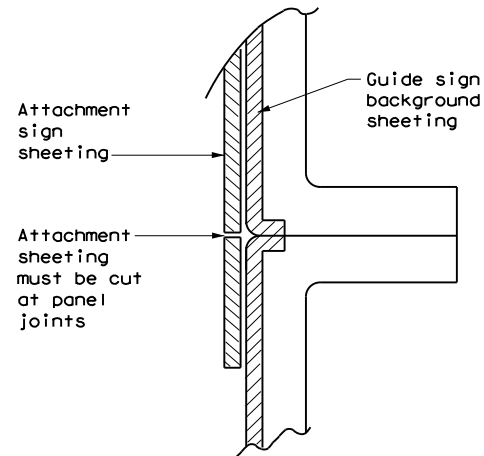
STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5



EXIT ONLY PANEL

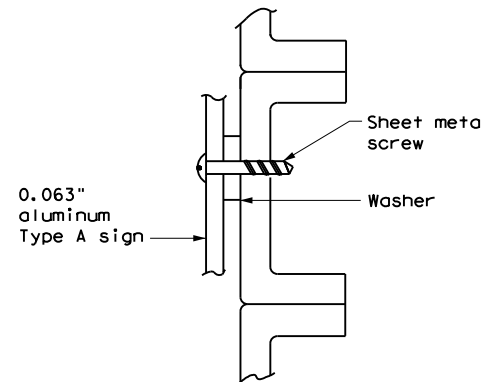
### MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



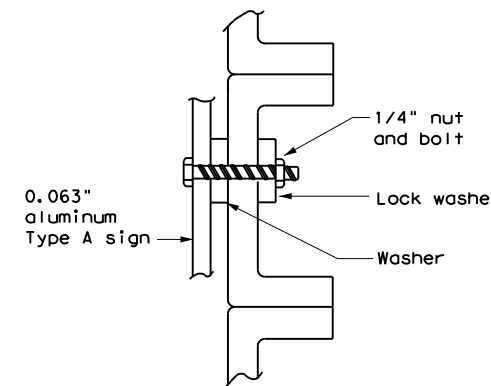
DIRECT APPLIED ATTACHMENT

**NOTE:**

- Sheeting for legend, symbols, and borders must be cut at panel joints.
- Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



SCREW ATTACHMENT

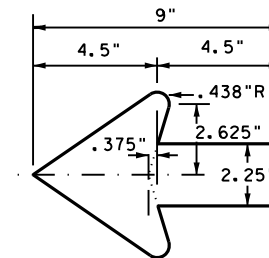


NUT/BOLT ATTACHMENT

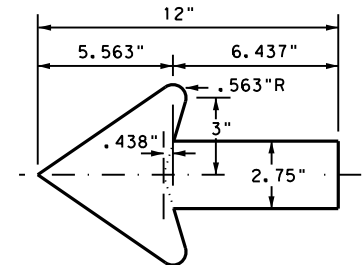
**NOTE:**

Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

### ARROW DETAILS for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.



### TYPICAL SIGN REQUIREMENTS

#### TSR(5) - 13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
12-03 7-13	DIST	COUNTY	SHEET NO.	
9-08	SAT	MEDINA	219	

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DATE: 1/31/2024 3:34:06 PM  
 FILE: c:\pwworking\kh1\d0285621\dom1-20.dgn

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS				DELINEATORS				D & OM DESCRIPTIVE CODES	
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SINGLE		DOUBLE		INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX) NUMBER OF REFLECTORS S = Single D = Double COLOR OF REFLECTORS W = White Y = Yellow R = Red REFLECTOR UNIT SIZE 1 or 2 TYPE OF POST OR DELINEATOR WC = Wing Channel Post YFLX = Yellow Flexible Post WFLX = White Flexible Post BRF = Barrier Reflector TYPE OF MOUNT GND = Embedded (drivable or set in concrete) CTB = Concrete Barrier Mount GF1 or GF2 = Guard Fence Attachment SRF = Surface Mount DIRECTION If Required BI = Bi-Directional BR = Bi-Directional with red on back
						Yellow, White or Red Type B or C reflective sheeting		Yellow, White or Red Type B or C Reflective Sheeting	
SHEETING	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (fix). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX	
NOTE				MOUNT TYPE	GND	GND, SRF	GND	GND, SRF	

OBJECT MARKERS								D & OM DESCRIPTIVE CODES	
DEVICE	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)	INSTL OM ASSM (OM-XX) (XXXX)XXX(XX) TYPE OF OBJECT MARKER 1, 2, 3, or 4 NUMBER OF REFLECTORS OR DIRECTION X = 3-Size 2 reflector units (Type 2 only) Y = 1-Size 3 reflector unit (Type 2 only) Z = 3-Size 1 or 1-Size 4 reflector units (Type 2 only) L = Left Side (Type 3 Object Marker only) R = Right Side (Type 3 Object Marker only) C = Center (Type 3 Object Marker only) TYPE OF POST WC = Wing Channel Post WFLX = White Flexible Post TWT = Thin Walled Tubing TYPE OF MOUNT GND = Embedded (drivable) SRF = Surface Mount WAS = Wedge Anchor Steel WAP = Wedge Anchor Plastic DIRECTION If Required BI = Bi-Directional
		OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	
SHEETING	Yellow-Type B <sub>FL</sub> or C <sub>FL</sub> Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroreflective yellow - Type B <sub>FL</sub> or C <sub>FL</sub> Sheeting			Red -Type B <sub>FL</sub> or C <sub>FL</sub> Sheeting	
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT	
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP	

DEPARTMENTAL MATERIAL SPECIFICATIONS	
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)			CHEVRONS				ONE DIRECTION LARGE ARROW		NOTE: Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.		
DEVICE	GF1	GF2	CTB	 W1-8				 W1-6			
SHEETING	Yellow, White, Red			SIZE (W x L)	18" x 24" (Conventional)	24" x 30" (Conventional Oversize)	30" x 36" (Expressway)	36" x 48" (Freeway)	SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
NOTE	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.			MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	MOUNTING HEIGHT	7'-0"		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.			NOTE	1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).						

Texas Department of Transportation  
 Traffic Safety Division Standard

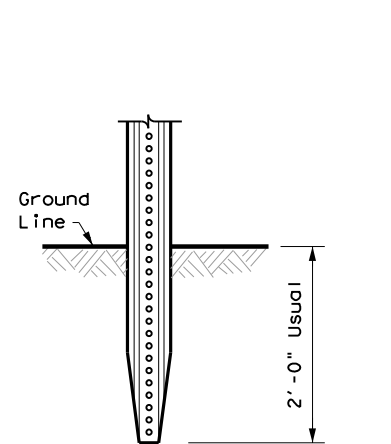
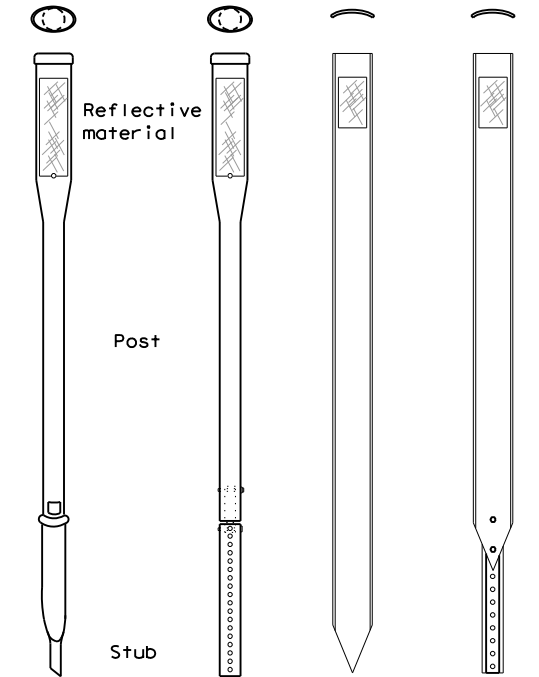
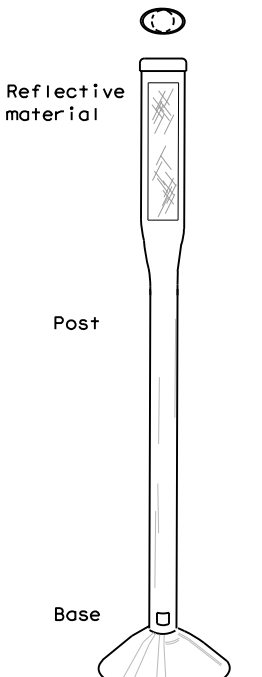
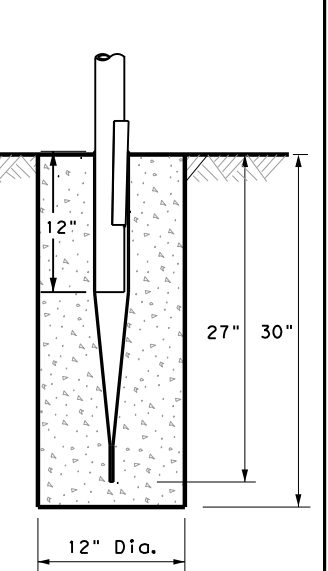
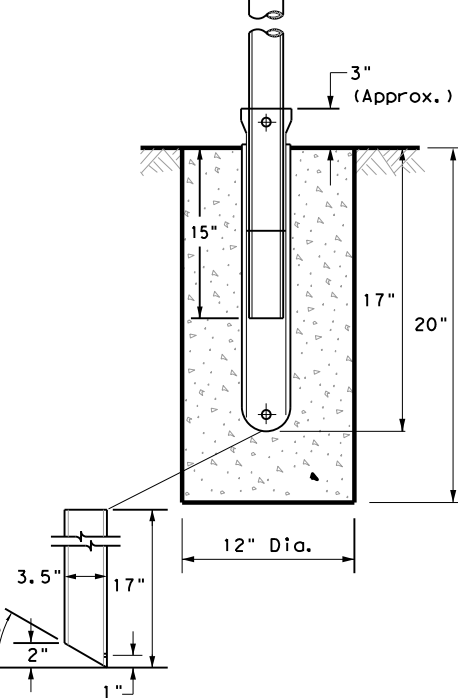
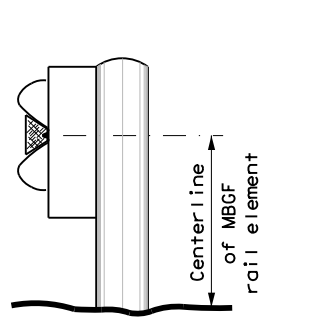
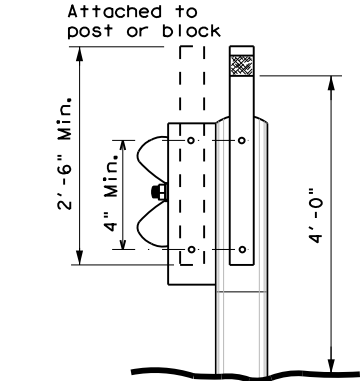
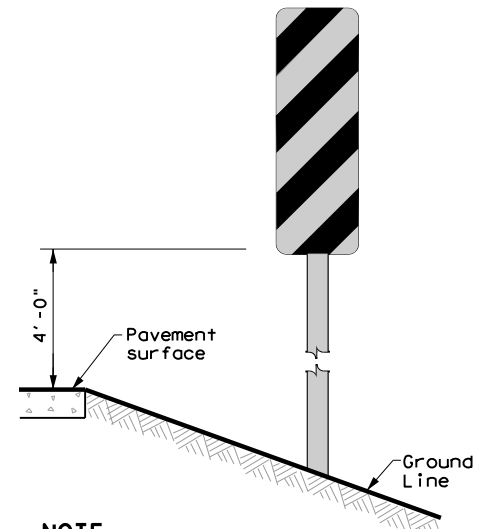
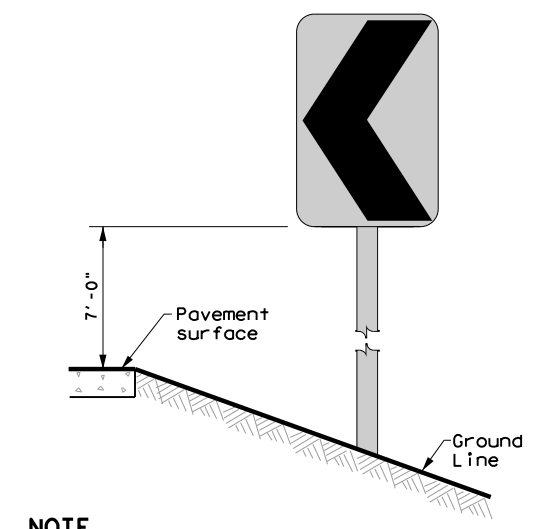
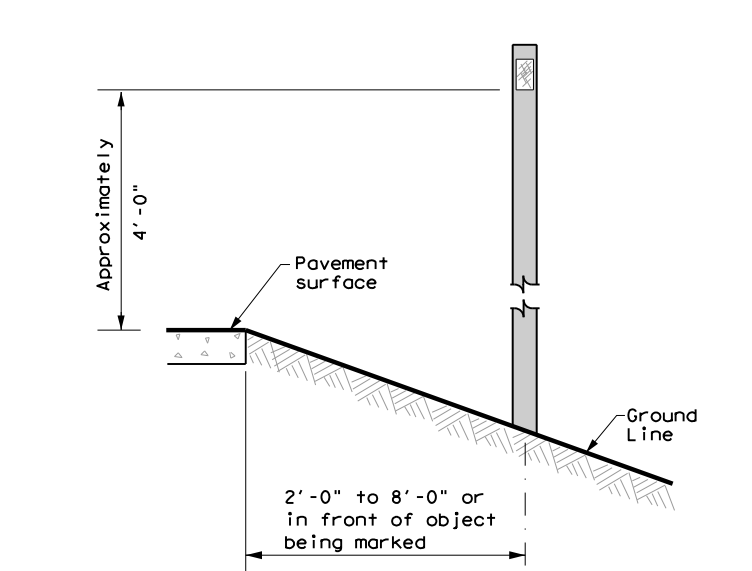
### DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION


#### D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DN: TXDOT	CK: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	SAT	MEDINA	220	

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DATE: 1/31/2024 3:34:38 PM  
 FILE: c:\pwworking\dot285621\dom2-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS				TYPE OF BARRIER MOUNTS		
WING CHANNEL (WC)	FLEXIBLE POSTS (YFLX, WFLX)		WEDGE ANCHOR SYSTEMS		GUARD FENCE ATTACHMENT	
GND	GND	SRF	WAS	WAP	GF 1	
						
	EMBEDDED	SURFACE MOUNT	STEEL	PLASTIC	CONCRETE TRAFFIC BARRIER (CTB)	
<b>NOTES</b> 1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only. 2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.			<b>NOTE</b> 1. Install per manufacturer's recommendations.		<b>GENERAL NOTES</b> 1. Place delineators on a section of roadway at a consistent distance from the edge of pavement. 2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction. 3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible. 4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation. 5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface. 6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.	
<b>NOTES</b> 1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices. 2. Install per manufacturer's recommendations. 3. Post length may vary to meet field conditions. 4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.						
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS		CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN		DELINEATORS AND TYPE 2 OBJECT MARKERS		
						
<b>NOTE</b> Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)		<b>NOTE</b> Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.		See general notes 1, 2 and 3.		



Traffic Safety Division Standard

## DELINEATOR & OBJECT MARKER INSTALLATION

### D & OM(2)-20

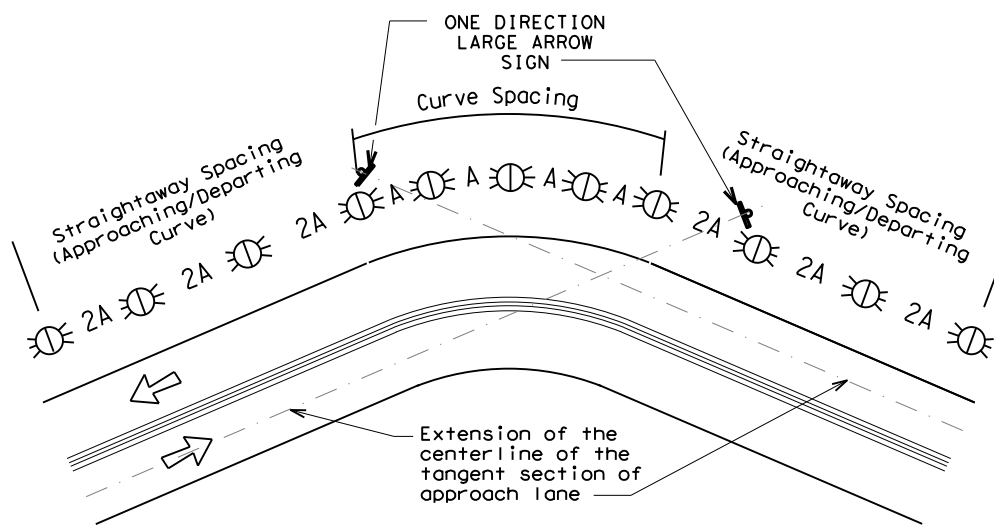
FILE: dom2-20.dgn	DW: TxDOT	CK: TxDOT	DN: TxDOT	CR: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	SAT	MEDINA	221	

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### MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

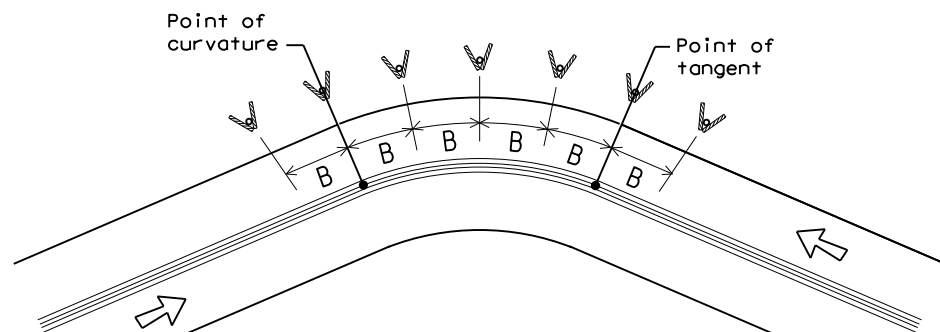
### SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



**NOTE**

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

### SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



**NOTE**

At least one chevron pair is installed beyond the point of tangent in tangent section.

### DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN				
Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

### DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN			
Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

### DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp. Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete) and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100' max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100' max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

**NOTES**

- Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
- Barrier reflectors may be used to replace required delineators.
- Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

**LEGEND**

	Bi-directional Delineator
	Delineator
	Sign



## DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

### D & OM(3) -20

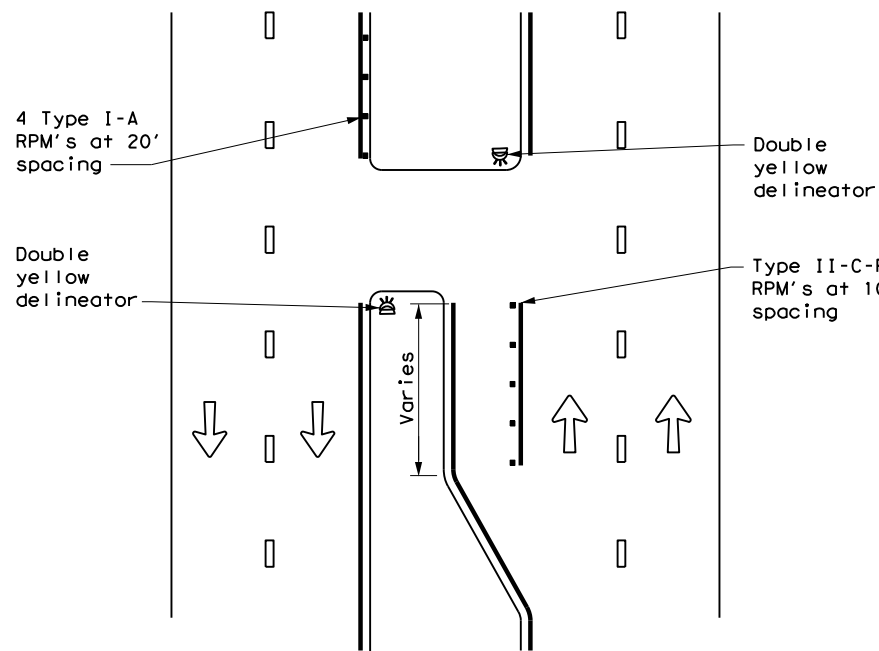
FILE: dom3-20.dgn	DW: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
3-15 8-15	DIST	COUNTY	SHEET NO.	
8-15 7-20	SAT	MEDINA	222	

DATE: 1/31/2024 3:35:13 PM  
 FILE: c:\pwworking\dot285621\dom3-20.dgn

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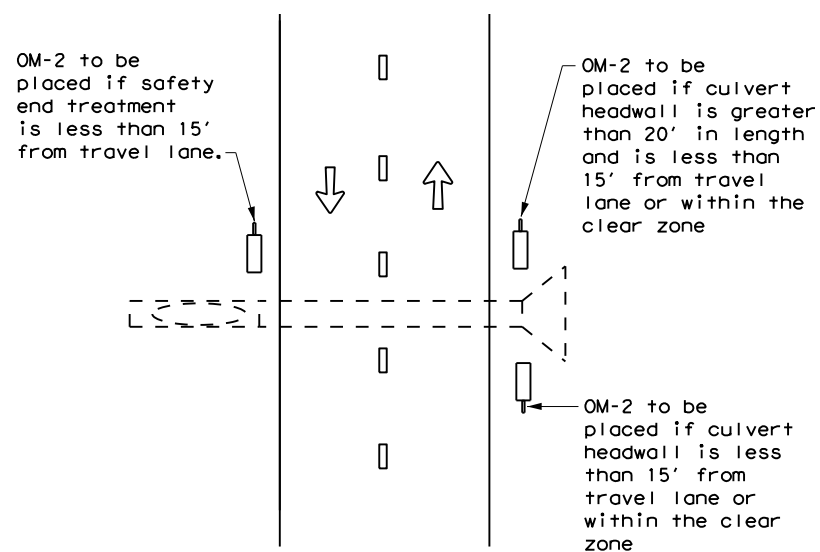
DATE: 1/31/2024 3:35:45 PM  
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**CROSSOVERS**



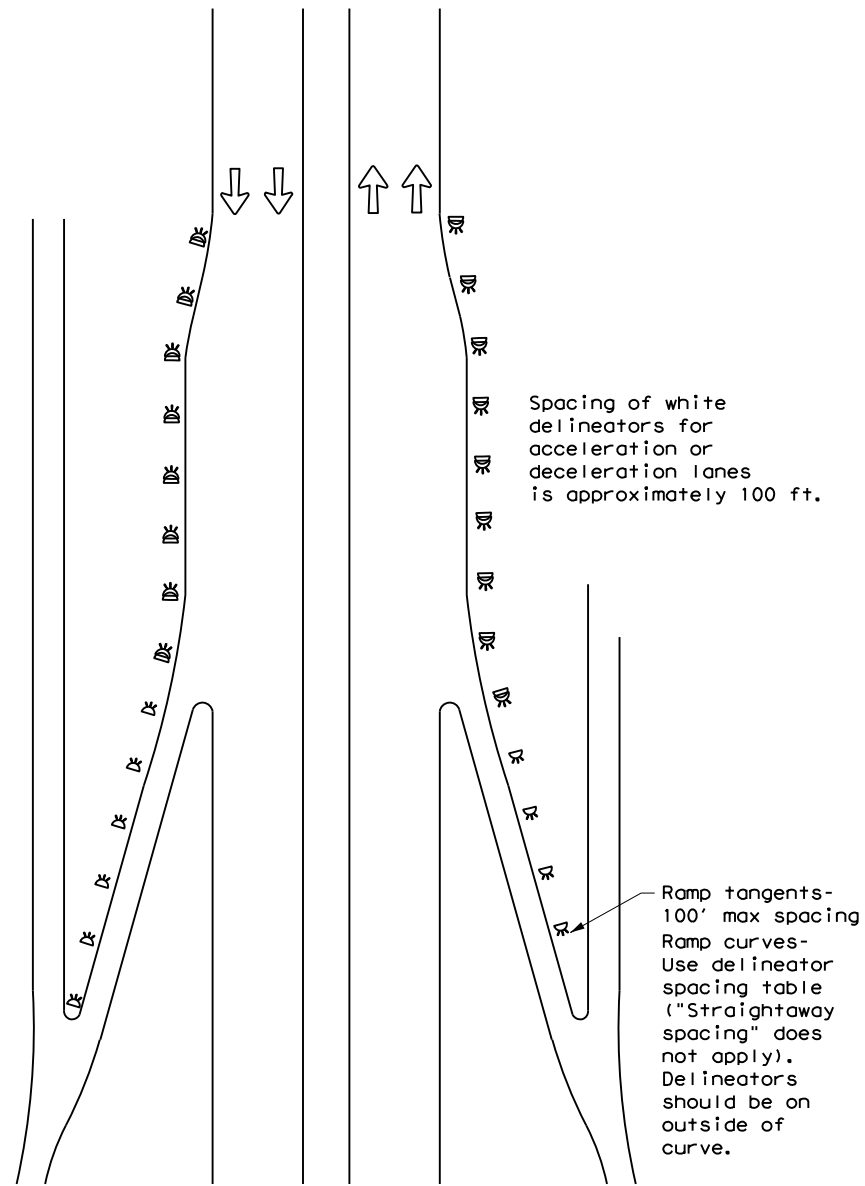
**DETAIL 1**

**FOR CULVERTS WITHOUT MBGF**



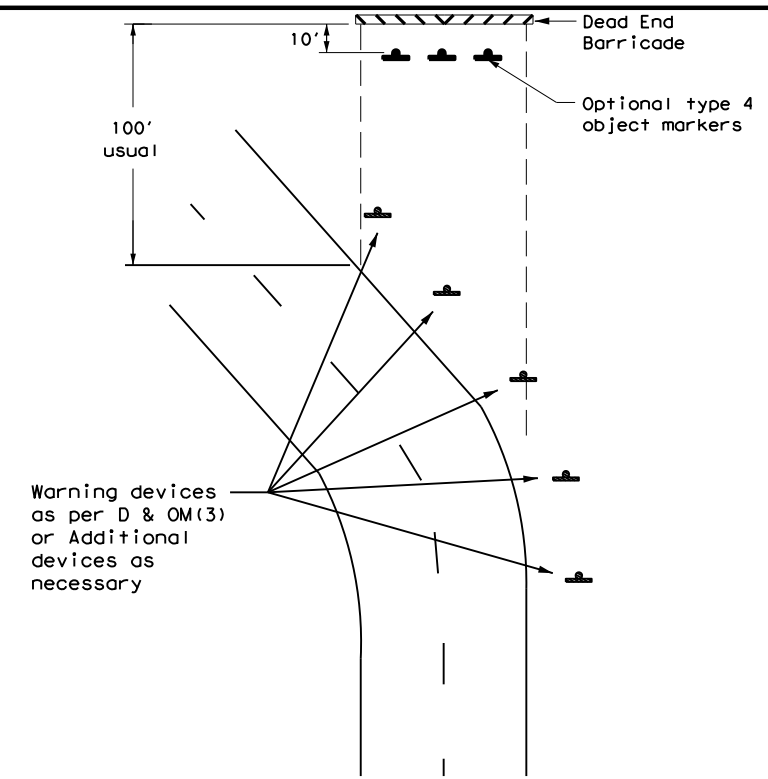
**DETAIL 2**

**FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES**



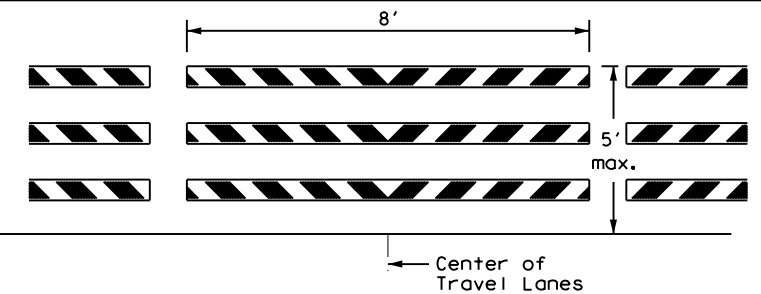
**DETAIL 3**

**TYPICAL APPLICATION OF DEAD END BARRICADE**



**DETAIL 4**

**TYPICAL DEAD END BARRICADE INSTALLATION**



**NOTES**

- Barricade striping shall be red and white reflective sheeting for all permanent road closures.
- Barricade striping is red and white sloping toward the center of the roadway.
- Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

**DETAIL 5**

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator



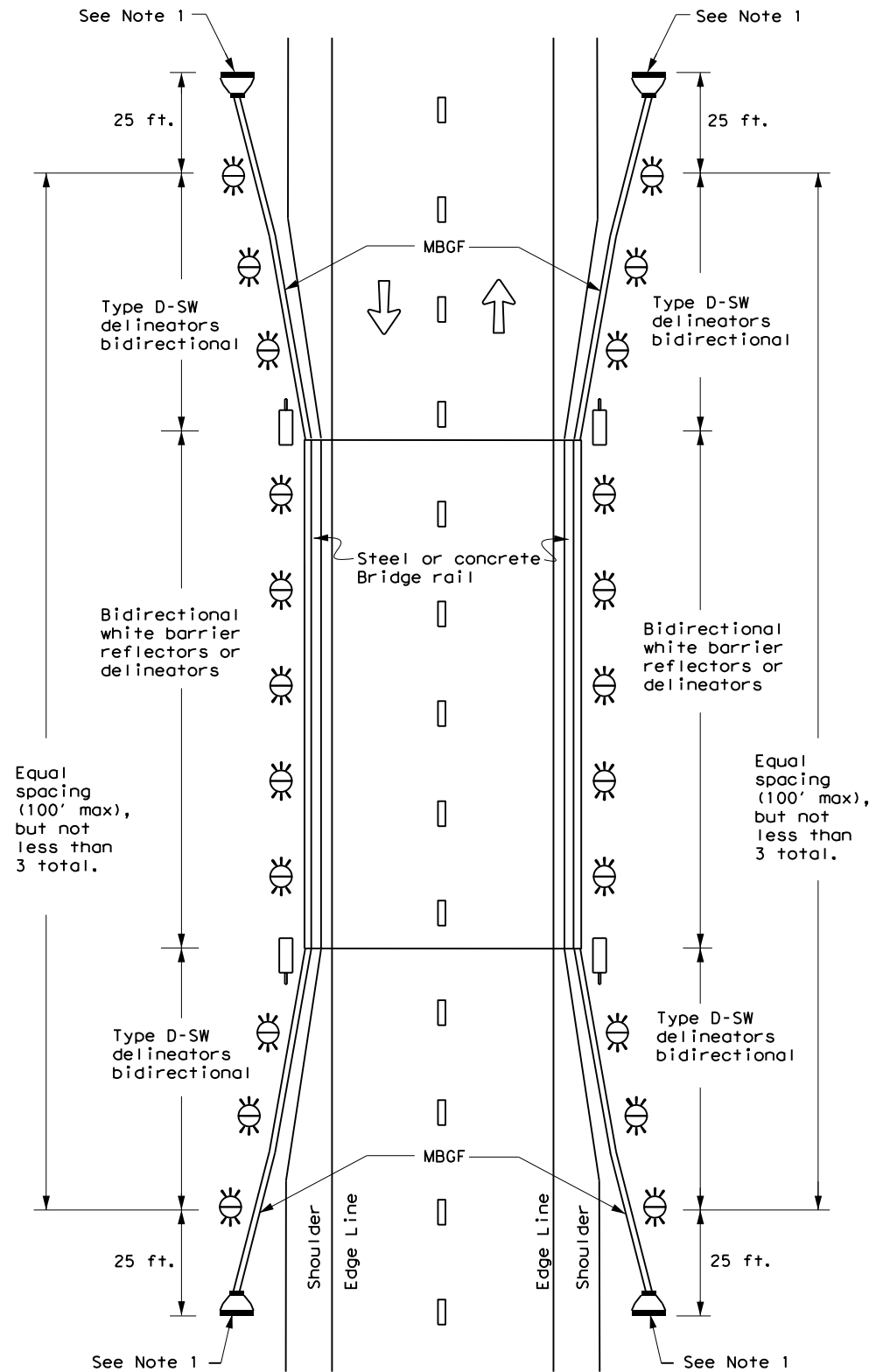
**DELINEATOR & OBJECT MARKER PLACEMENT DETAILS**

**D & OM(4) -20**

FILE: dom4-20.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
3-15	DIST	COUNTY	SHEET NO.	
7-20	SAT	MEDINA	223	



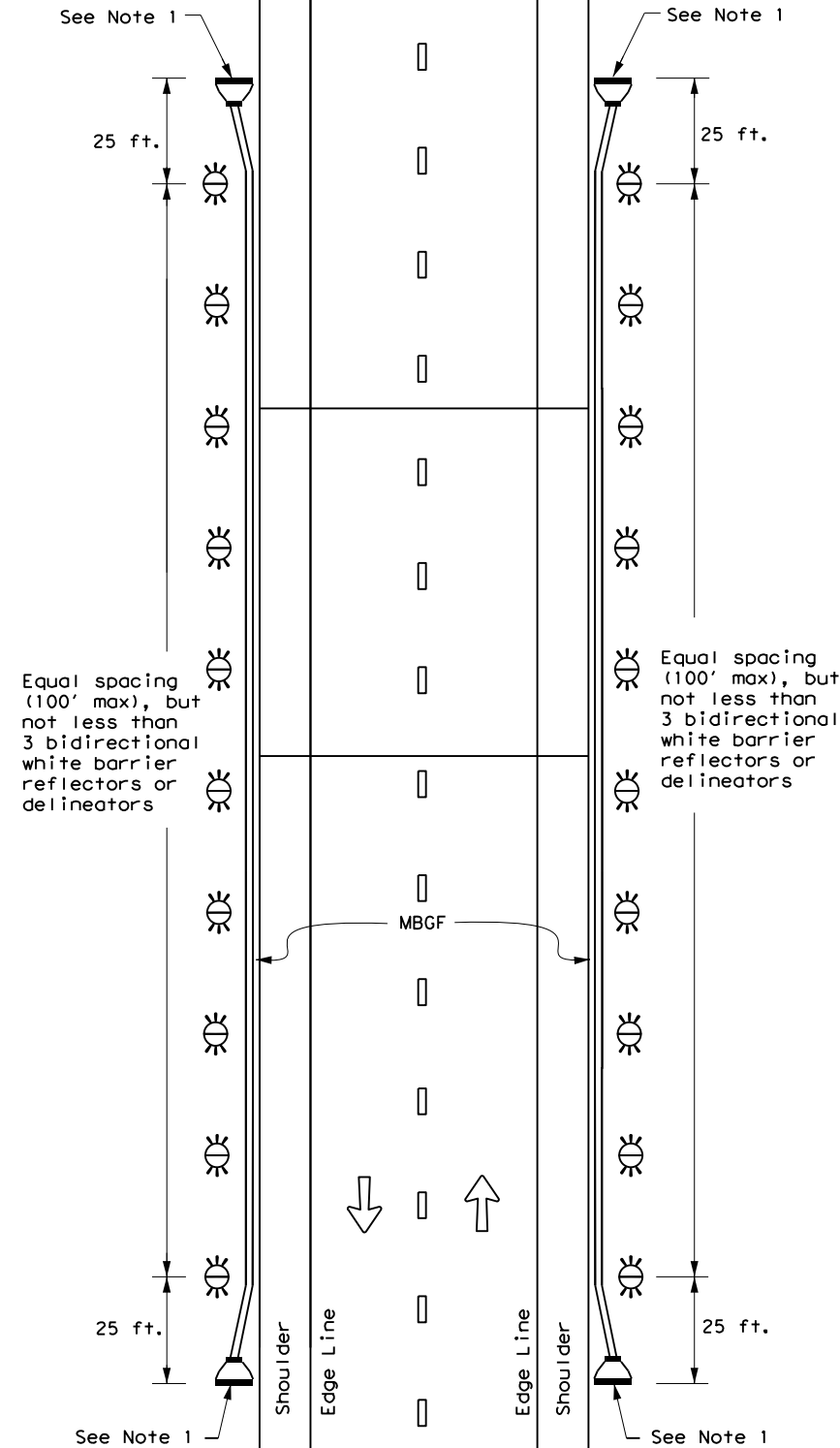
**TWO-WAY, TWO LANE ROADWAY  
WITH REDUCED WIDTH APPROACH RAIL**



**NOTE:**

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

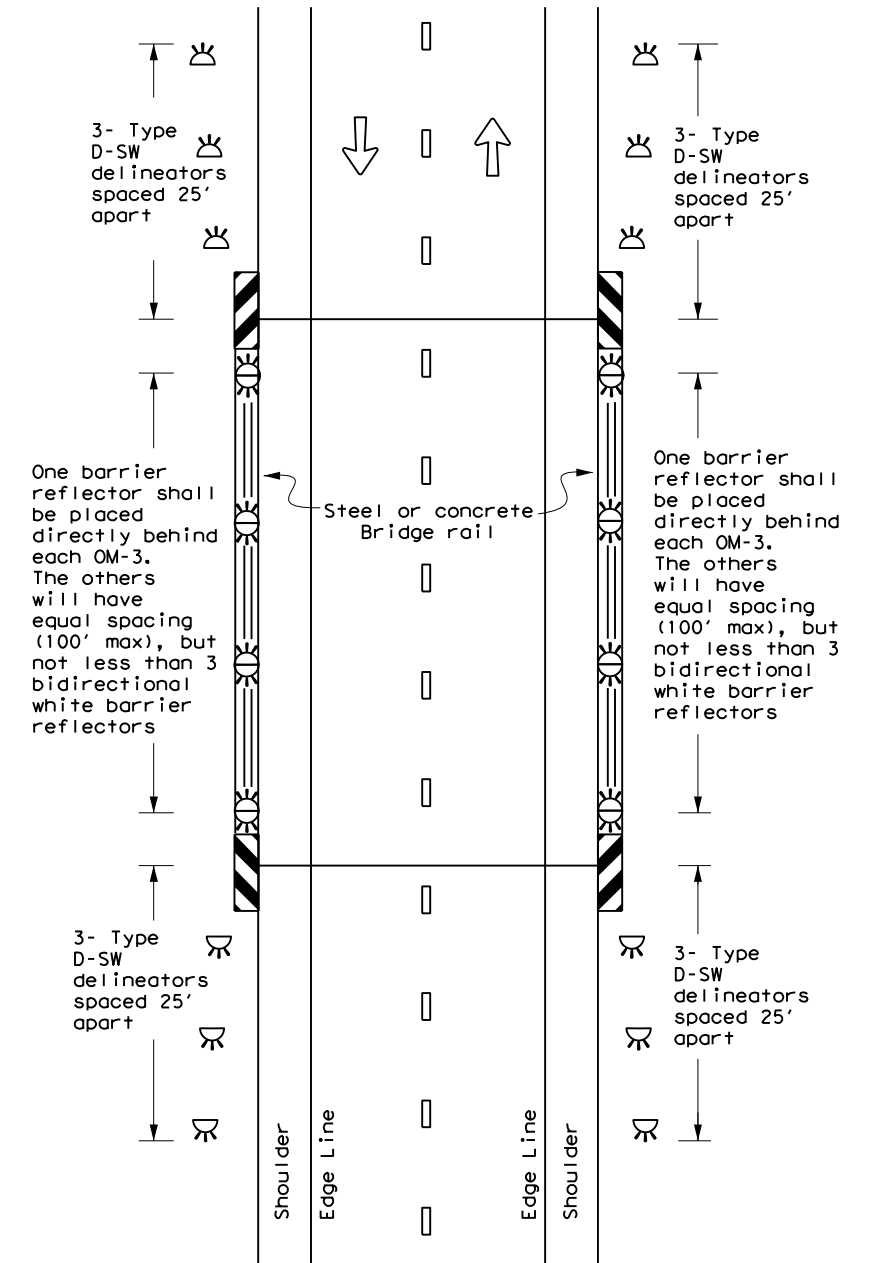
**TWO-WAY, TWO LANE ROADWAY  
WITH METAL BEAM GUARD FENCE (MBGF)**



**NOTE:**

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

**TWO-WAY, TWO LANE ROADWAY  
BRIDGE WITH NO APPROACH RAIL**



**LEGEND**

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow



Traffic Safety Division Standard

**DELINEATOR &  
OBJECT MARKER  
PLACEMENT DETAILS**

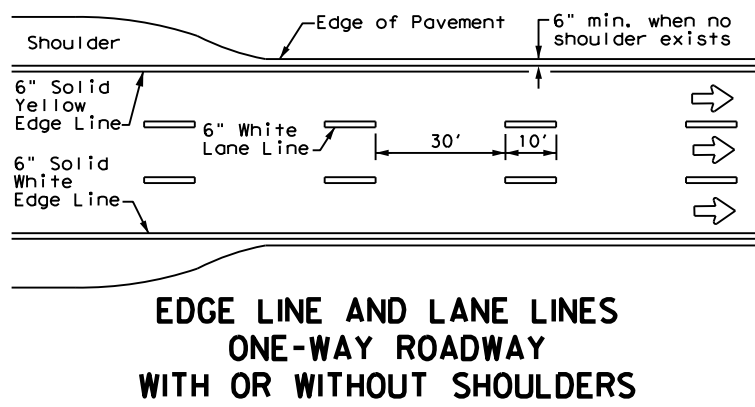
**D & OM(5) - 20**

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
7-20	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	224	

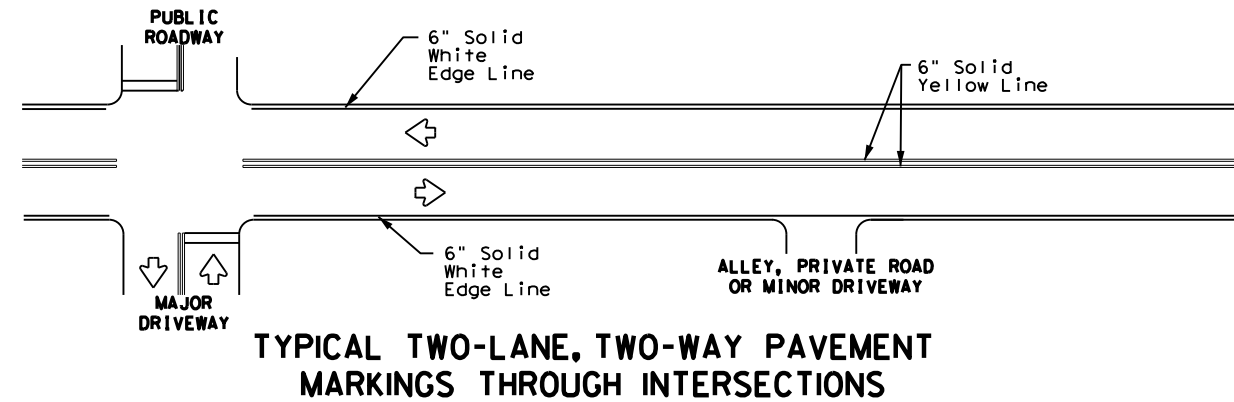
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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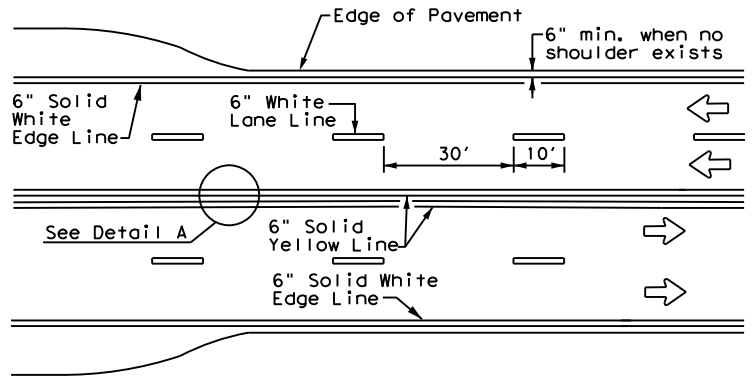
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



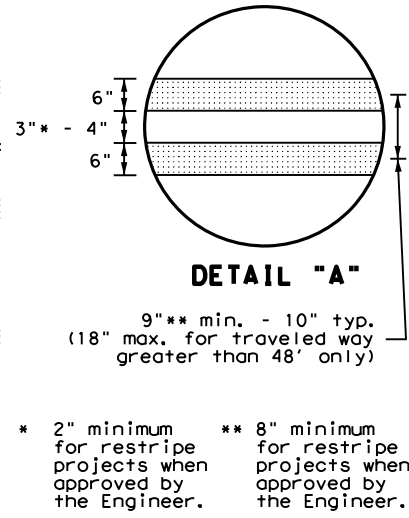
**EDGE LINE AND LANE LINES  
ONE-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



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



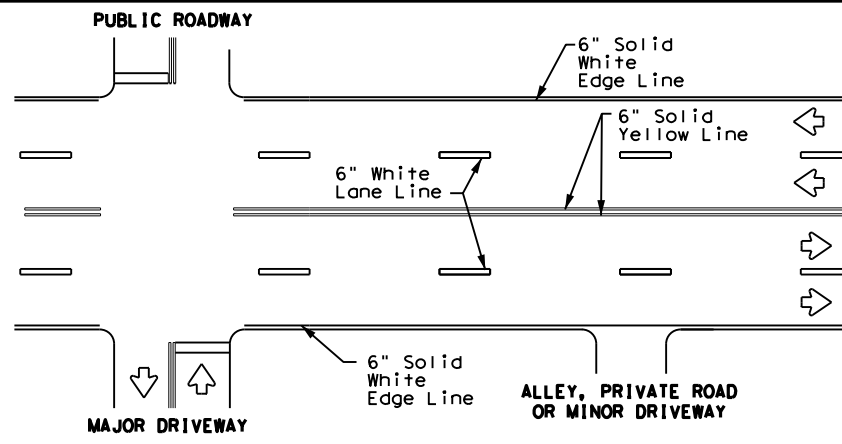
**CENTERLINE AND LANE LINES  
FOUR LANE TWO-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



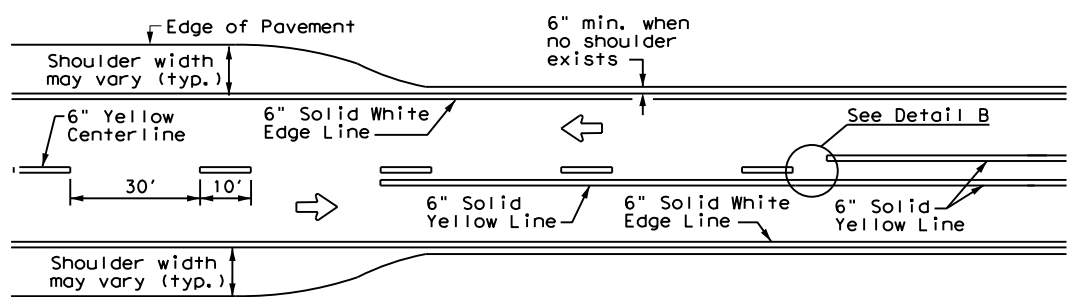
**DETAIL "A"**

9" min. - 10" typ.  
(18" max. for traveled way greater than 48' only)

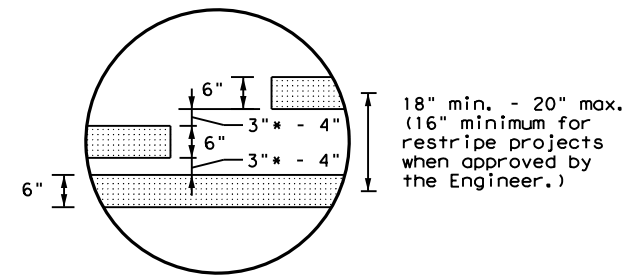
\* 2" minimum for restripe projects when approved by the Engineer.  
\*\* 8" minimum for restripe projects when approved by the Engineer.



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

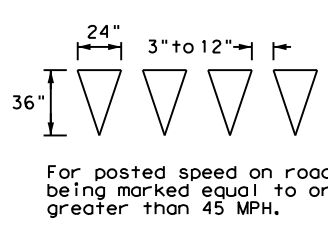


**TWO LANE TWO-WAY ROADWAY  
WITH OR WITHOUT SHOULDERS**



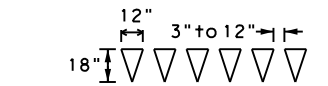
**DETAIL "B"**

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



**YIELD LINES**

For posted speed on road being marked equal to or greater than 45 MPH.



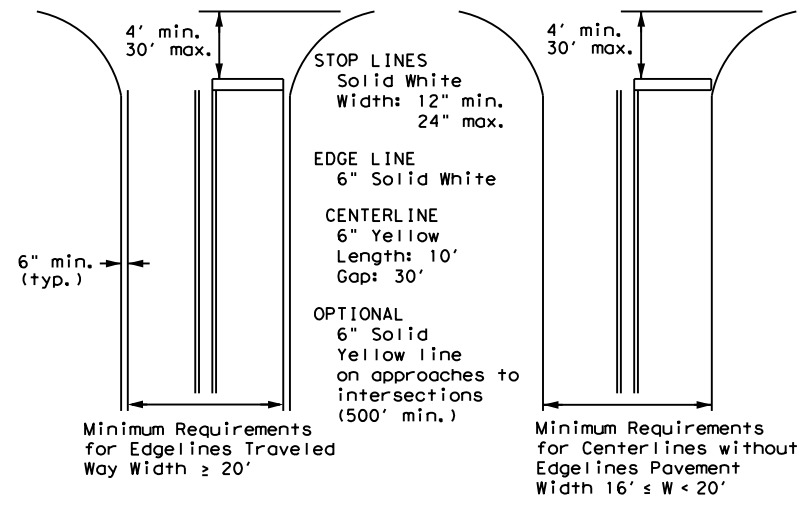
For posted speed on road being marked equal to or less than 40 MPH.

**GENERAL NOTES**

- 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.
- 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.

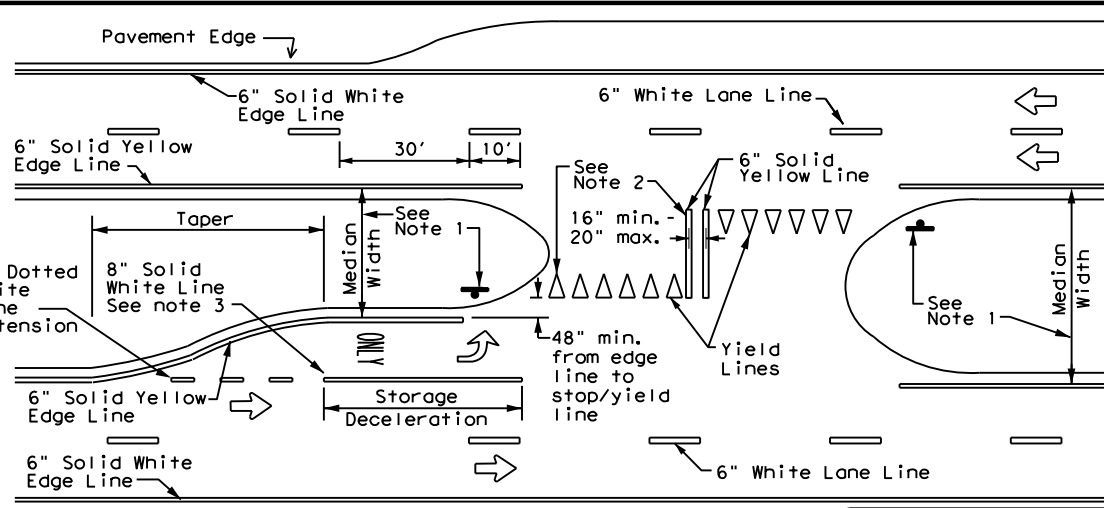


NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

**GUIDE FOR PLACEMENT OF STOP LINES,  
EDGE LINE & CENTERLINE**  
Based on Traveled Way and Pavement Widths for Undivided Roadways

**NOTES**

- 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.
- 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.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.



**FOUR LANE DIVIDED ROADWAY CROSSOVERS**



**TYPICAL STANDARD  
PAVEMENT MARKINGS**

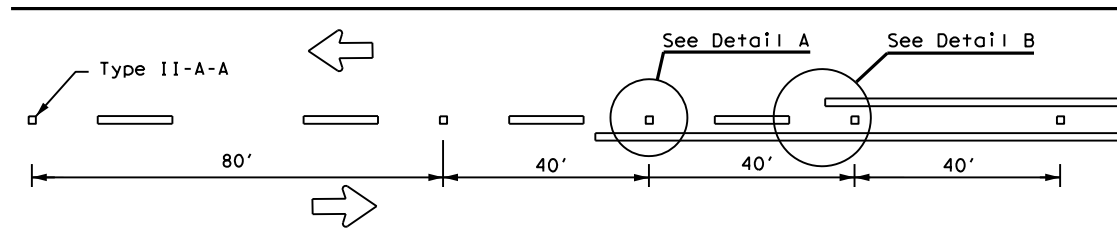
**PM(1)-22**

FILE: pml-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
11-78 8-00 6-20	DIST	COUNTY	SHEET NO.	
8-95 3-03 12-22	SAT	MEDINA	225	
5-00 2-12				

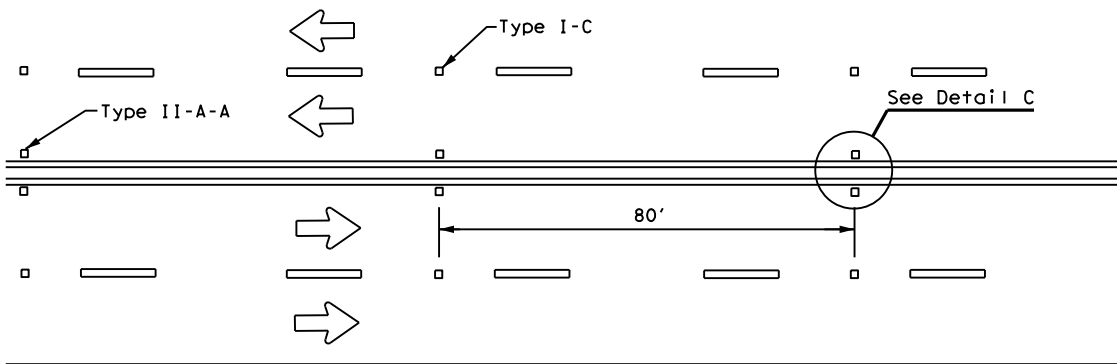
DATE: 1/31/2024 3:36:36 PM  
 FILE: c:\pwworking\dot285621\pml-22.dgn

# REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

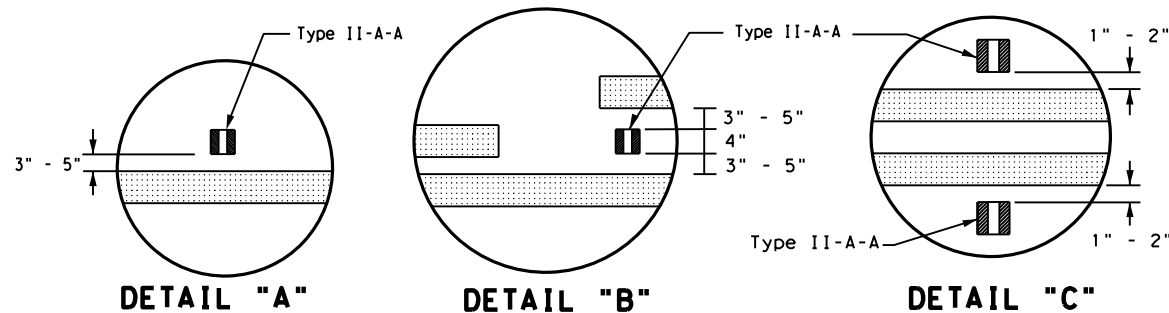
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**CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS**



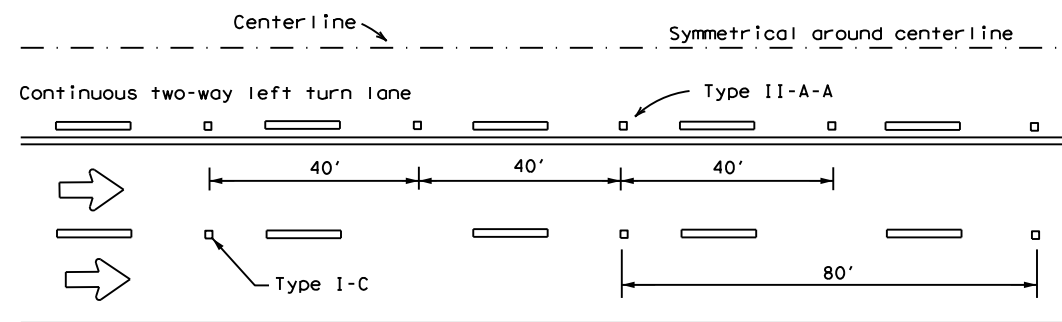
**CENTERLINE & LANE LINES  
FOR FOUR LANE TWO-WAY ROADWAYS**



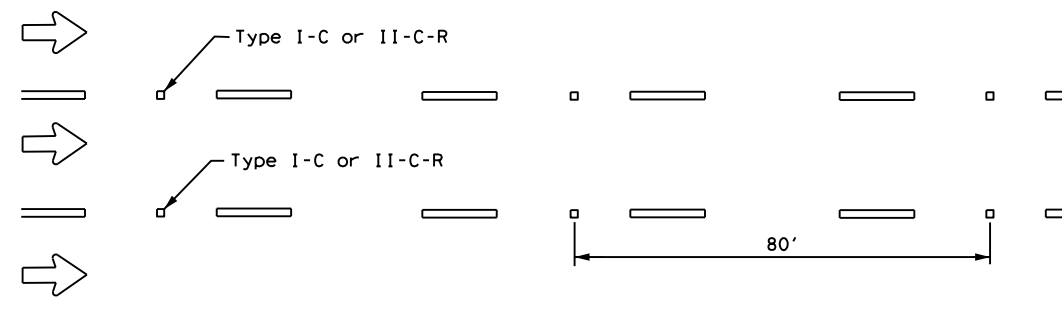
**DETAIL "A"**

**DETAIL "B"**

**DETAIL "C"**

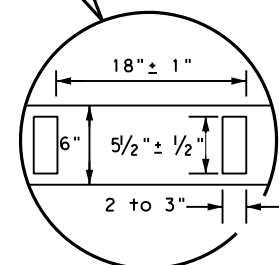
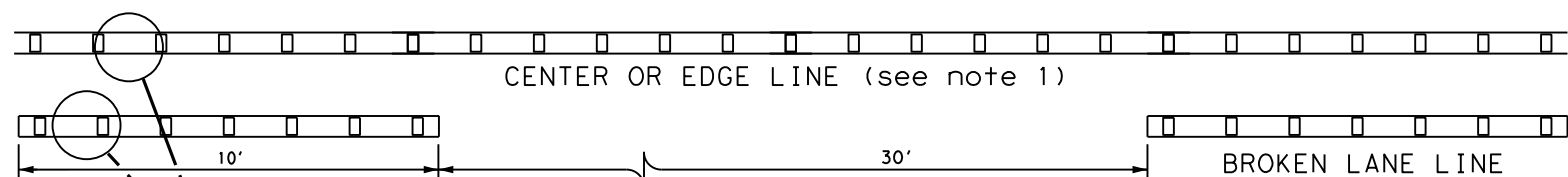


**CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE**



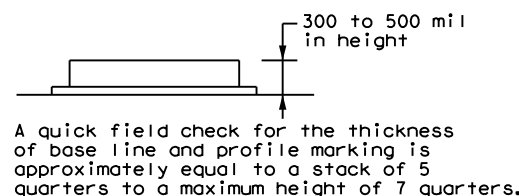
**LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)**

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



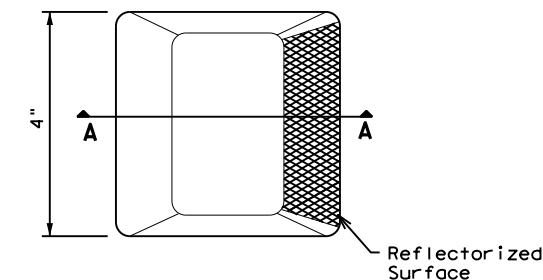
A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

**NOTES**

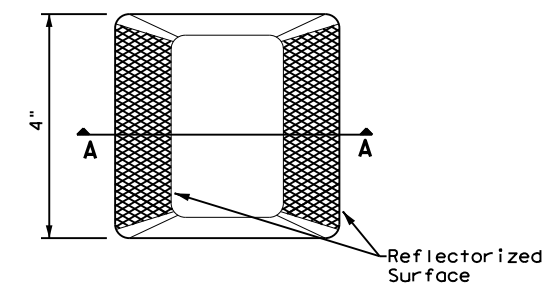
- Edge lines should typically be 6" wide and the materials shall be specified in the plans.
- Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

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

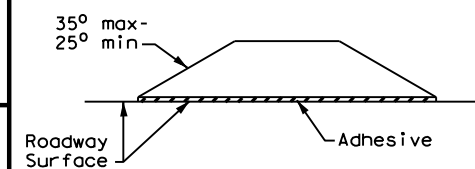
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



**Type I (Top View)**



**Type II (Top View)**



**SECTION A**

**RAISED PAVEMENT MARKERS**



**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	0848	04	052	FM 462
4-77 8-00 6-20	DIST	COUNTY	SHEET NO.	
4-92 2-10 12-22	SAT	MEDINA	226	
5-00 2-12				

DATE: 1/31/2024 3:37:04 PM  
 FILE: c:\pwworking\dot285621\pm2-22.dgn

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### SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

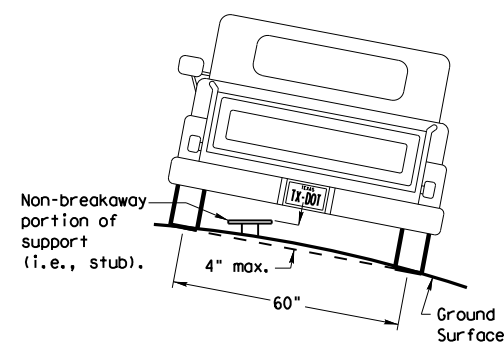
**Post Type**  
 FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))  
 TWT = Thin-Walled Tubing (see SMD(TWT))  
 10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))  
 S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

**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  
 1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))  
 BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))  
 WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))  
 EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

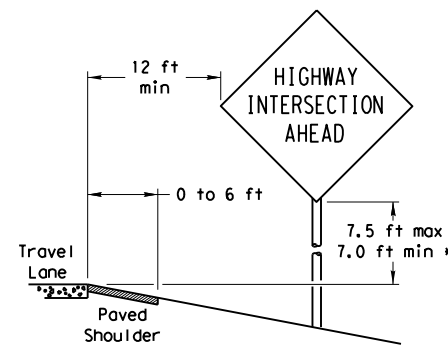
### REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

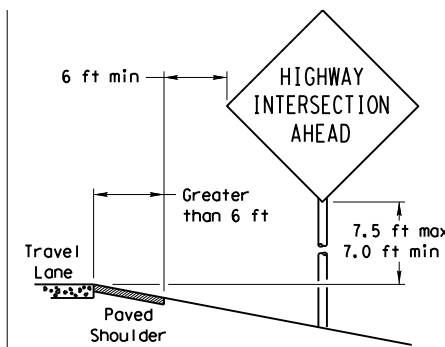
### SIGN LOCATION

#### PAVED SHOULDERS



#### LESS THAN 6 FT. WIDE

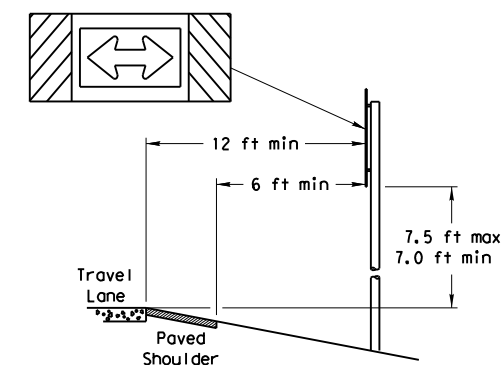
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



#### GREATER THAN 6 FT. WIDE

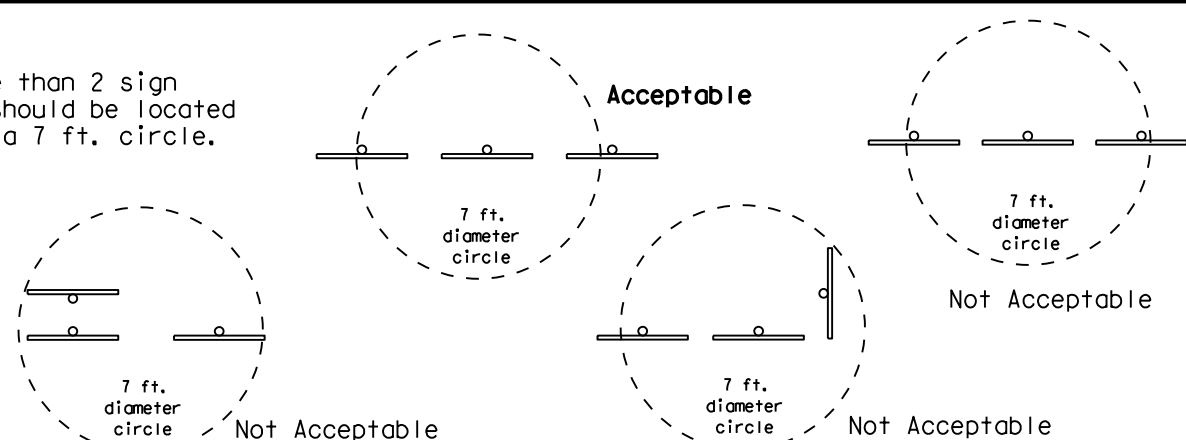
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

#### T-INTERSECTION

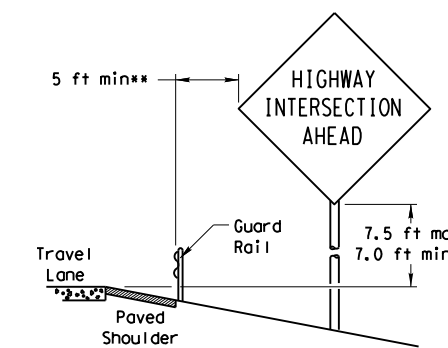


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

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

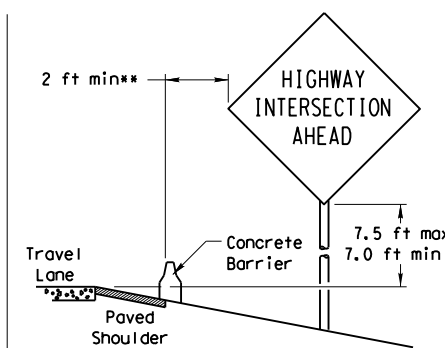


#### BEHIND BARRIER

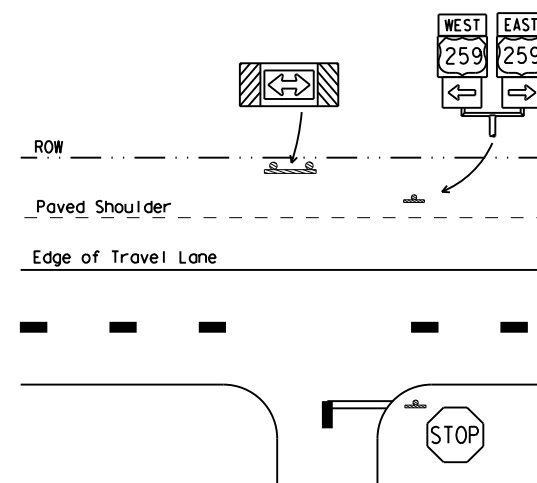


#### BEHIND GUARDRAIL

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



#### BEHIND CONCRETE BARRIER



\* Signs shall be mounted using the following condition that results in the greatest sign elevation:

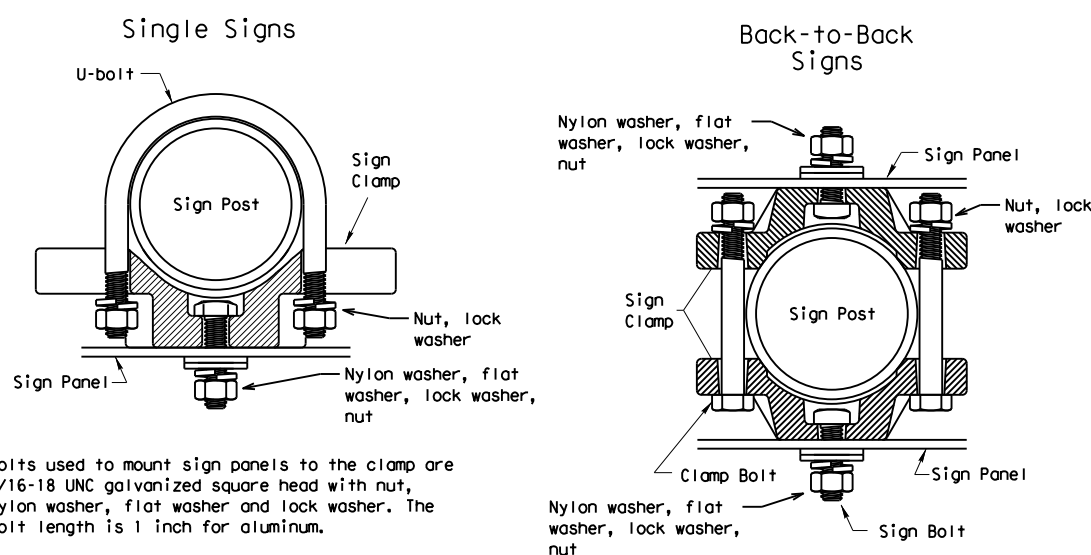
- (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
- (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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>

### TYPICAL SIGN ATTACHMENT DETAIL



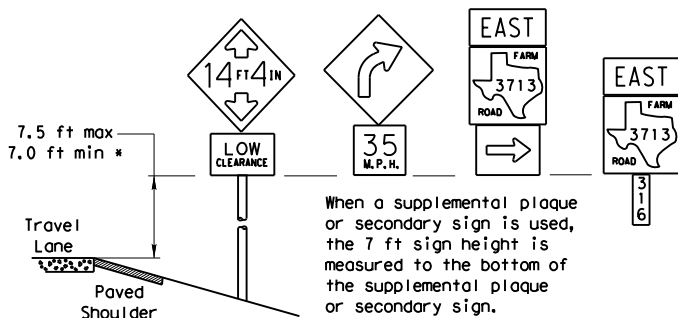
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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.

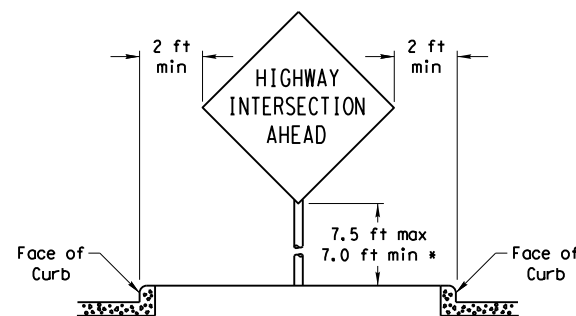
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

### SIGNS WITH PLAQUES

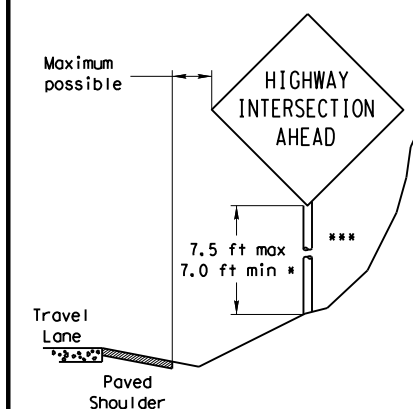


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

### 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.



## SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN) - 08

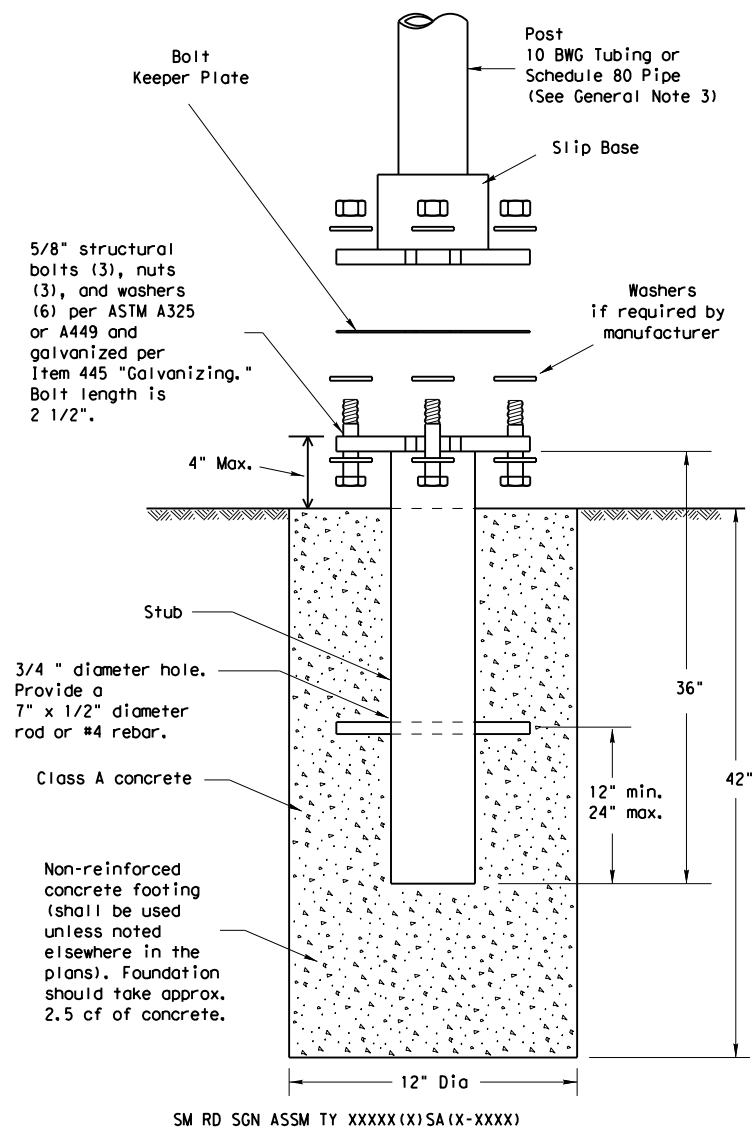
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# TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXX(X)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](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:

- 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.
- 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 precoated 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
- 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>
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

## ASSEMBLY PROCEDURE

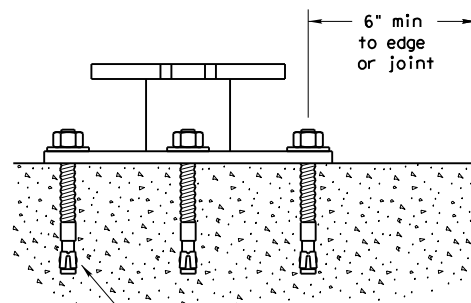
### Foundation

- 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.
- 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.
- 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.
- Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
- The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

### Support

- Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (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 travelway. The cut shall be plumb and straight.
- 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



5/8" diameter Concrete Anchor - 8 places (embed a minimum of 5 1/2" and torque to min. of 50 ft-lbs). Anchor may be expansion or adhesive type.

SM RD SGN ASSM TY XXXX(X)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 type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxyes and Adhesives." 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.



## SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

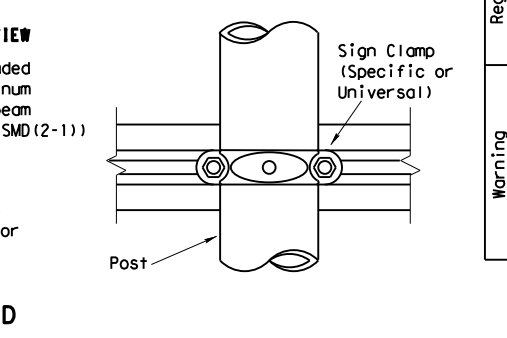
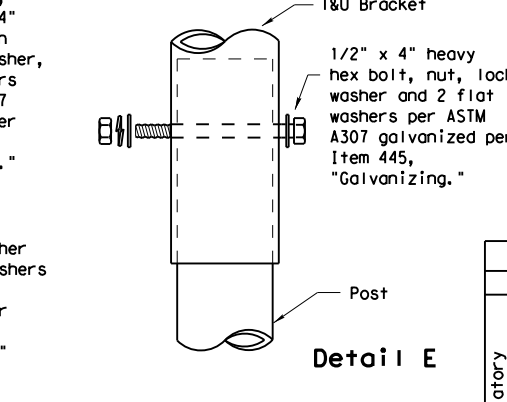
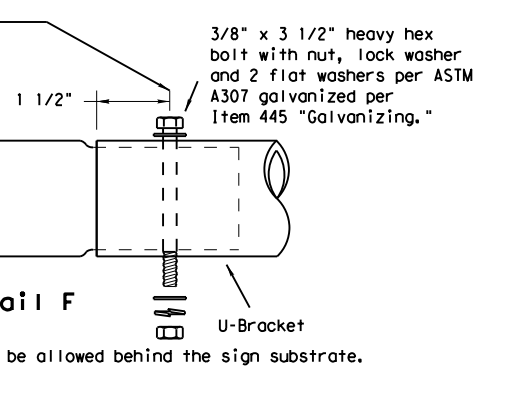
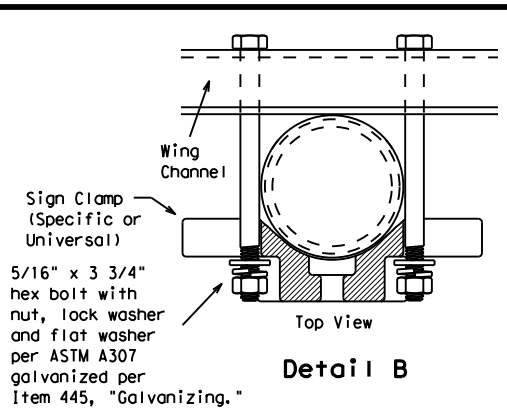
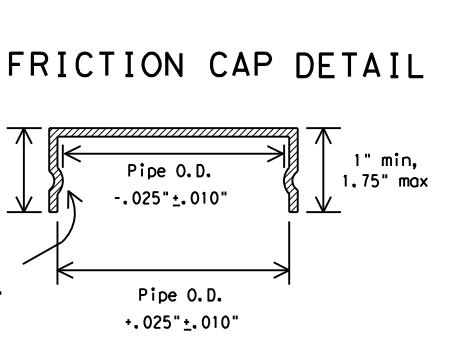
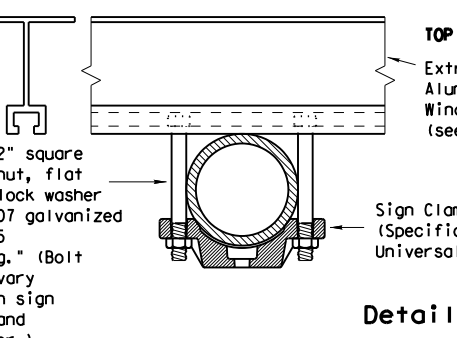
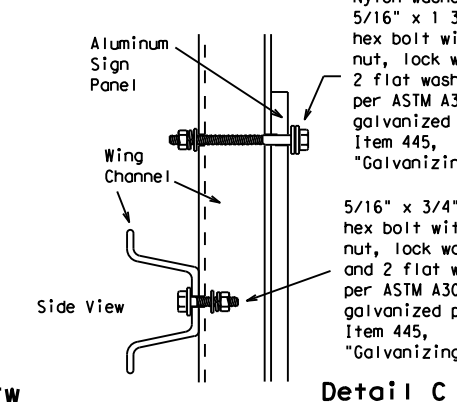
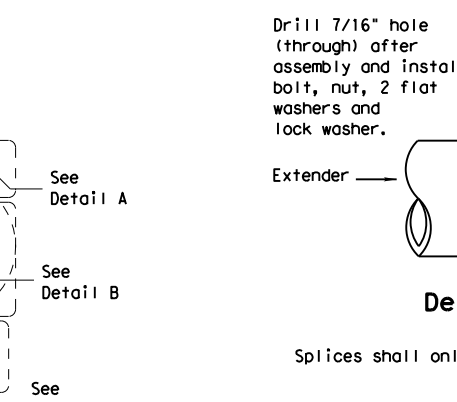
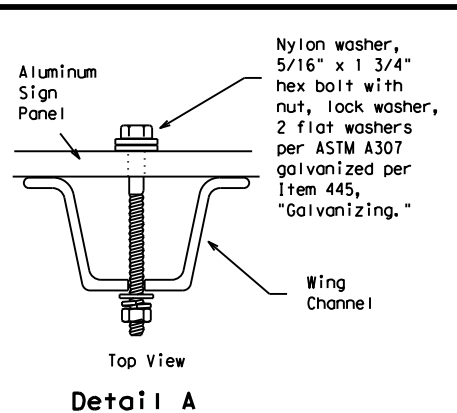
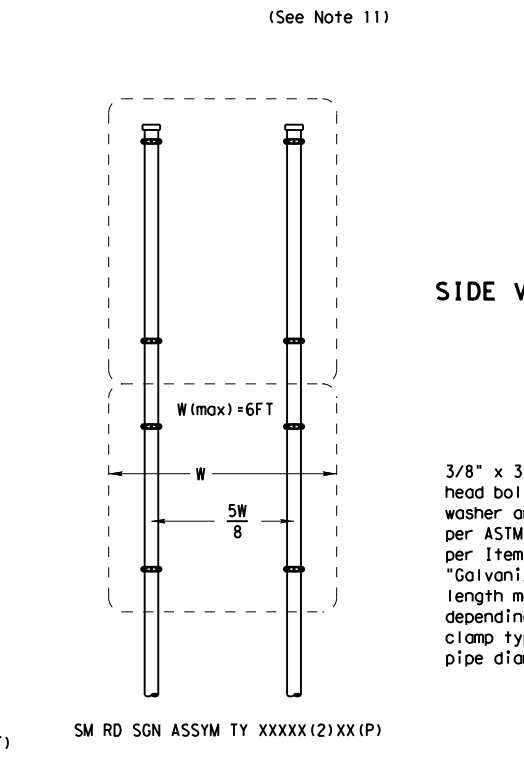
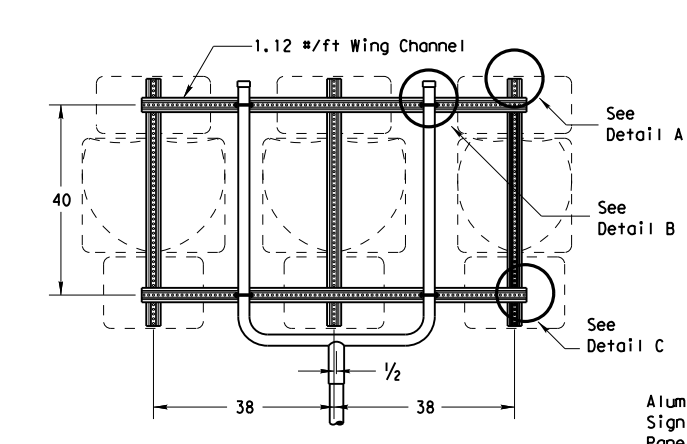
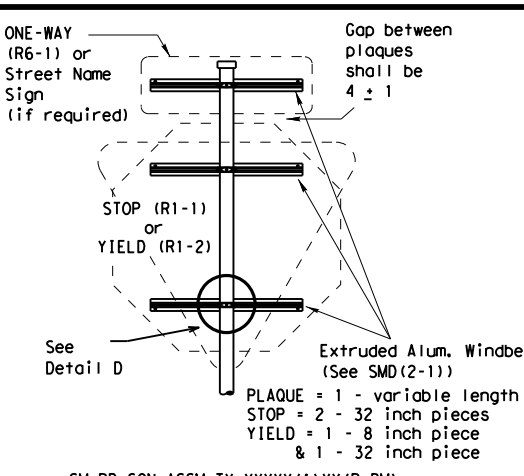
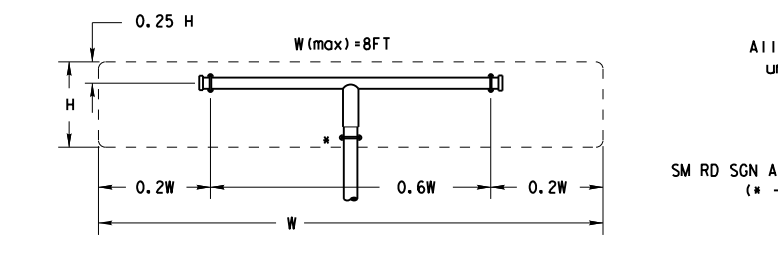
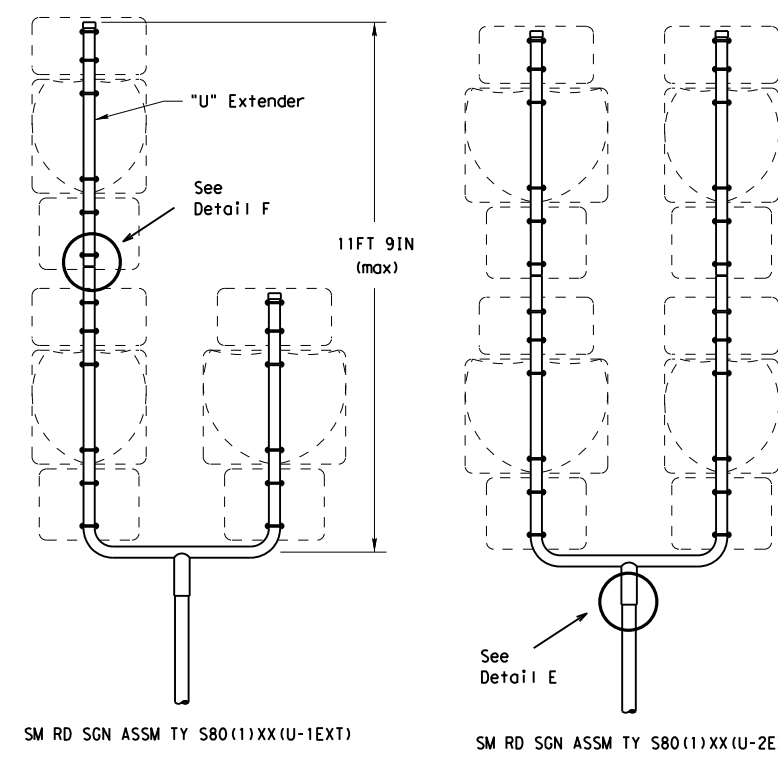
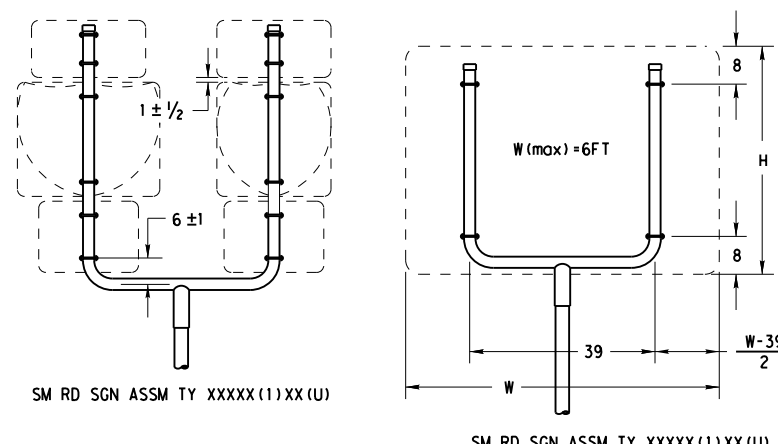
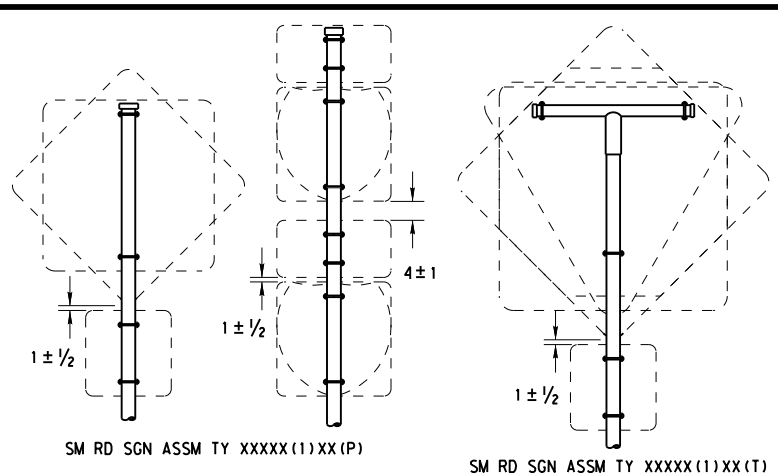
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Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes. The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner 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.

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 abnormally high due to a fill slope.
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 allowable amount per Note 1.
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)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Warning	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)	
Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)	

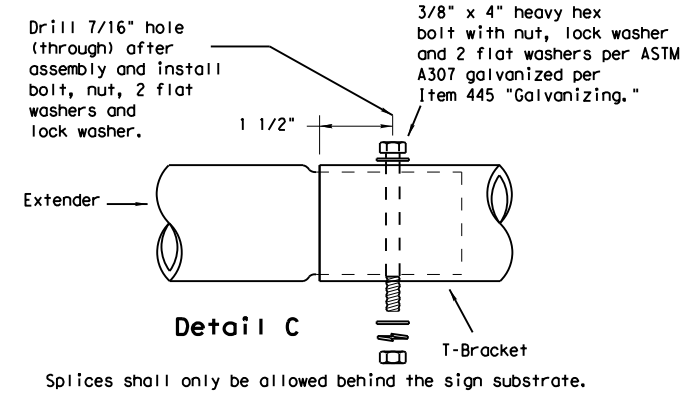
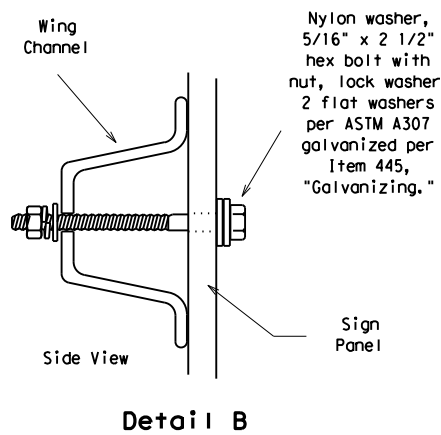
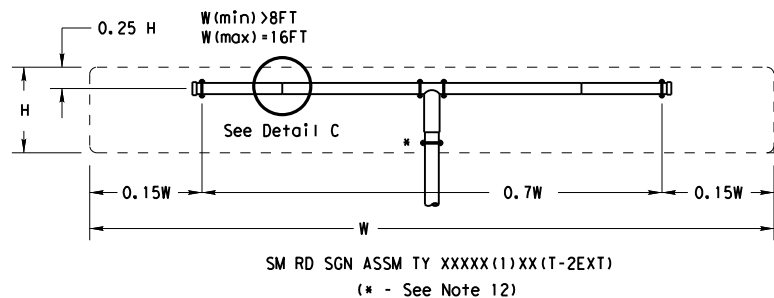


SIGN MOUNTING DETAILS  
 SMALL ROADSIDE SIGNS  
 TRIANGULAR SLIPBASE SYSTEM  
 SMD(SLIP-2)-08

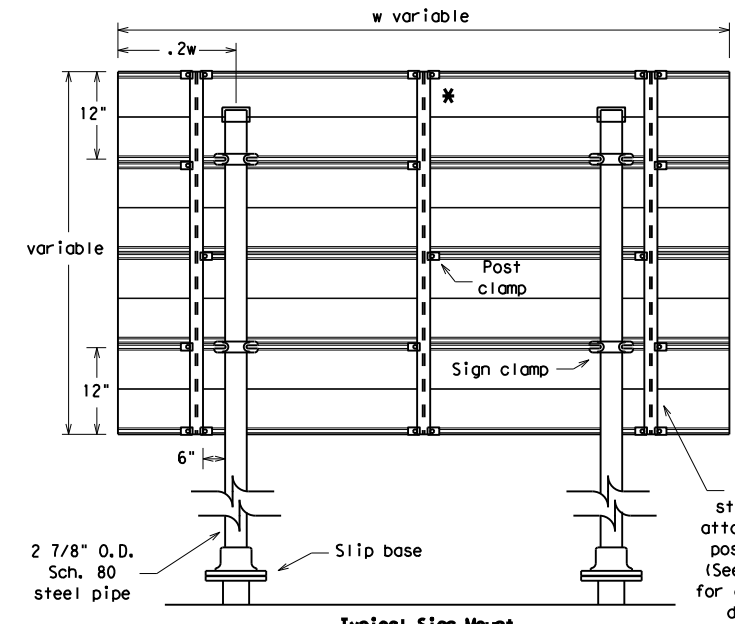
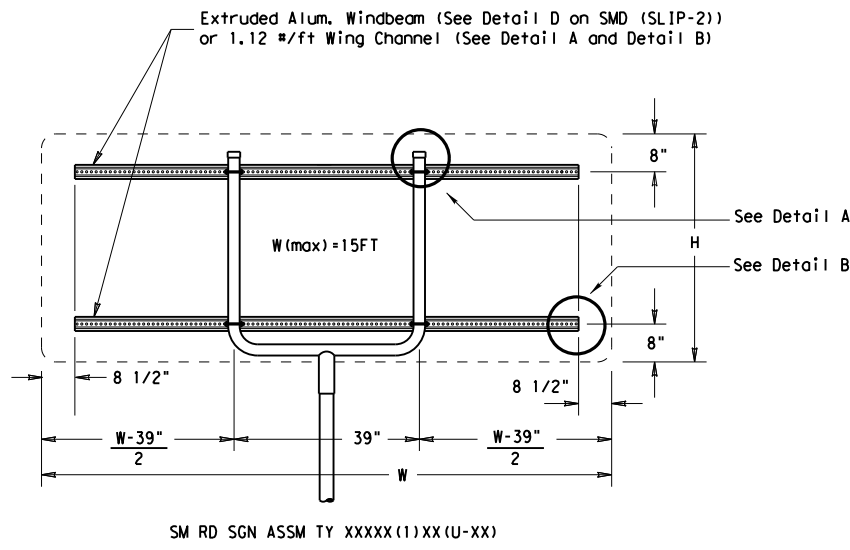
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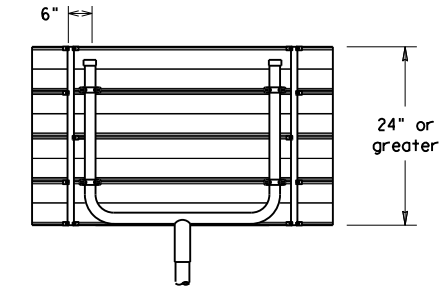
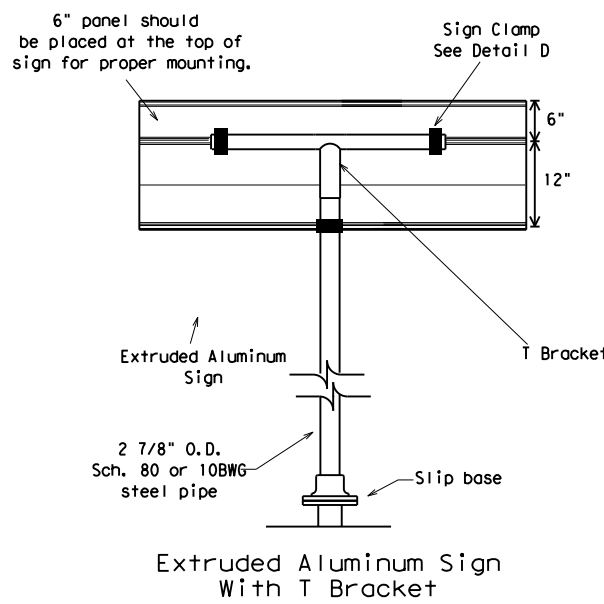
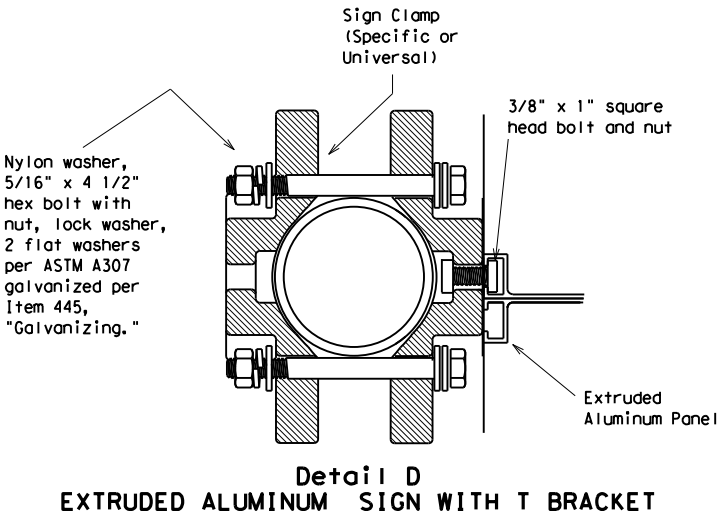
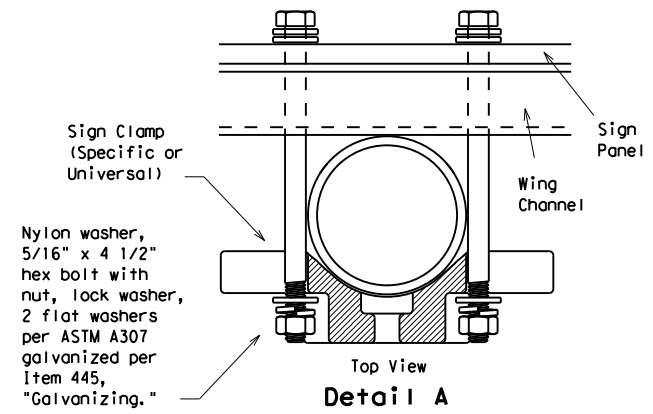
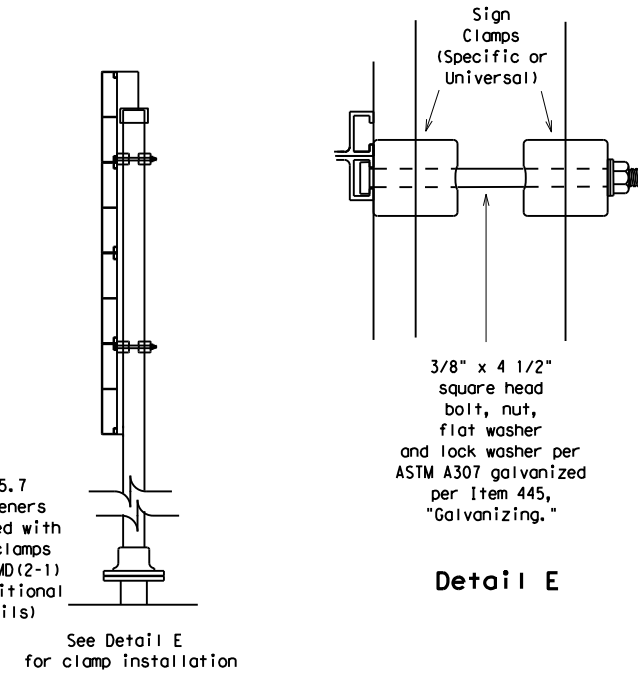
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Splices shall only be allowed behind the sign substrate.



\* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



Use Extruded Alum. Windbeam as stiffeners See SMD (2-1) for additional details  
 See Detail E for clamp installation

GENERAL NOTES:

- | 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          |
- The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- 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.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- 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.
- 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.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- 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."
- Sign blanks shall be the sizes and shapes shown on the plans.
- Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
- Post open ends shall be fitted with Friction Caps.

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

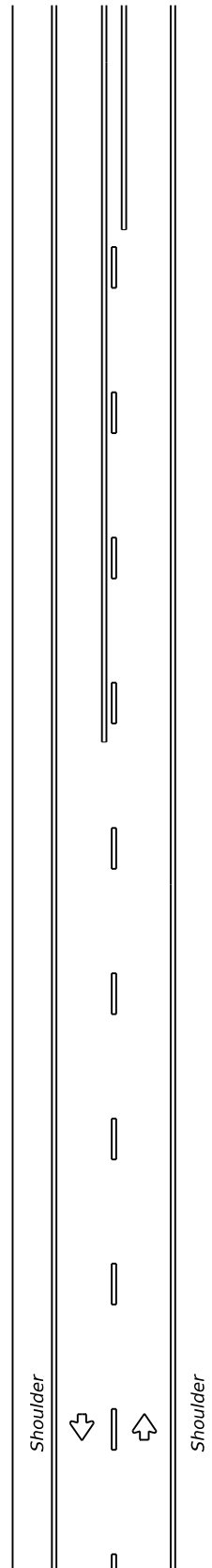
Texas Department of Transportation  
 Traffic Operations Division  
**SIGN MOUNTING DETAILS**  
**SMALL ROADSIDE SIGNS**  
**TRIANGULAR SLIPBASE SYSTEM**  
**SMD (SLIP-3) -08**

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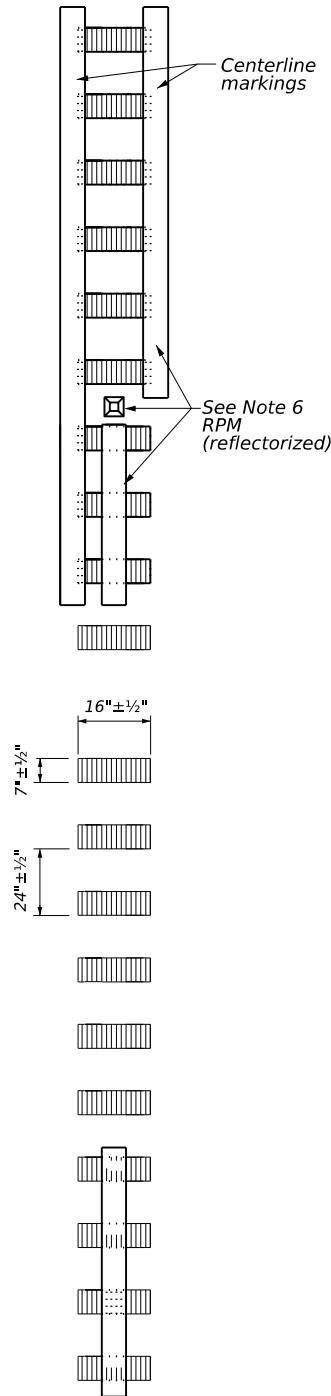
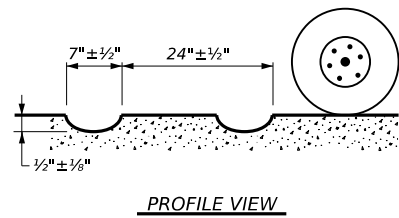
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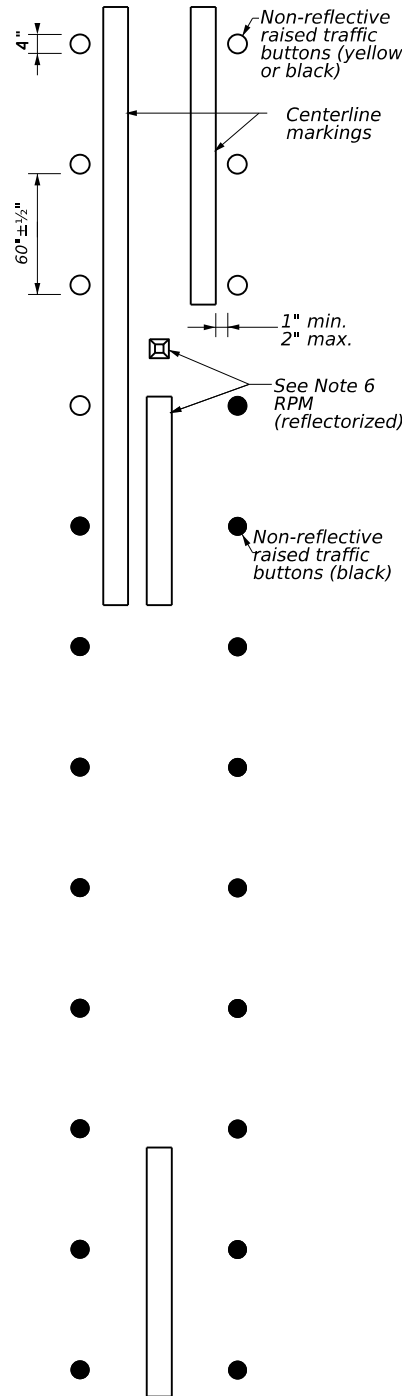
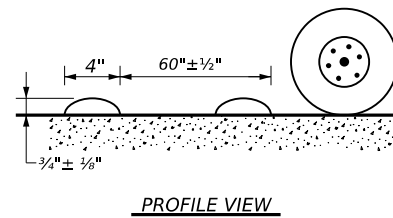
**TWO LANE TWO-WAY HIGHWAYS**



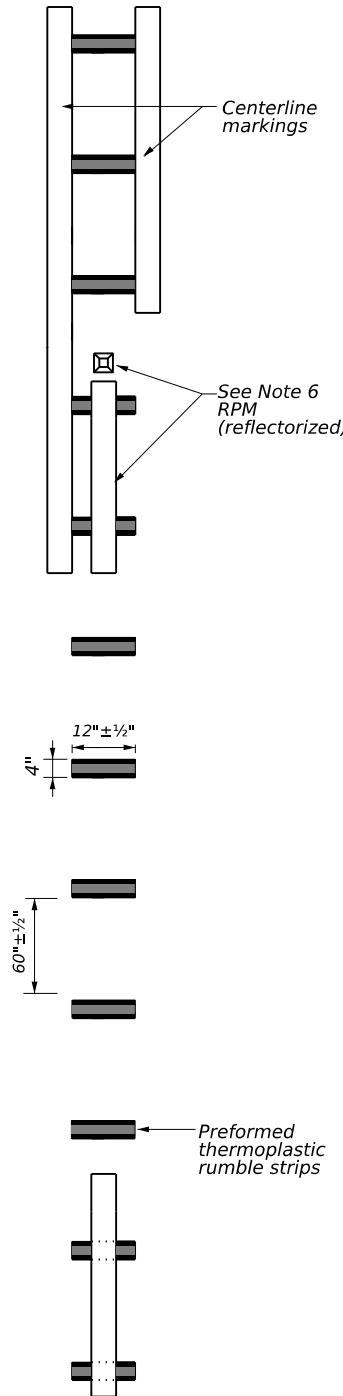
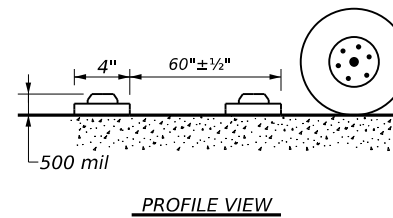
**CENTERLINE RUMBLE STRIPS**



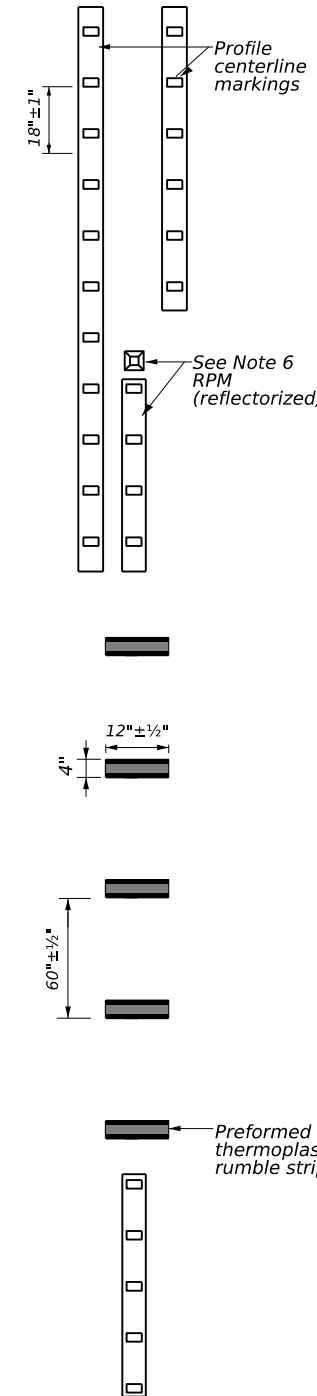
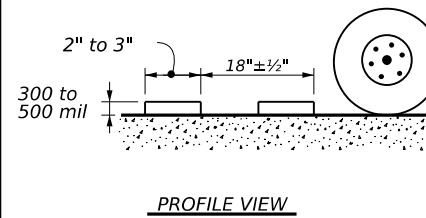
**MILLED CENTERLINE RUMBLE STRIPS**



**RAISED CENTERLINE RUMBLE STRIPS**



**PREFORMED THERMOPLASTIC RUMBLE STRIPS**



**PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS**

**GENERAL NOTES**

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edge line rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections or driveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

**WHEN INSTALLING CENTERLINE RUMBLE STRIPS:**

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.
12. Consideration shall be given to bicyclists. See RS(6).

**WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:**

13. See standard sheet RS(2).

<p><b>CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS RS(4)-23</b></p>			
FILE: rs(4)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT	January 2023	CONT SECT	JOB HIGHWAY
REVISIONS	0848	04	052 FM 462
10-13	DIST	COUNTY	SHEET NO.
1-23	SAT	MEDINA	231

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with soil disturbing activity and for projects that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

**1.0 SITE/PROJECT DESCRIPTION**

**1.1 PROJECT CONTROL SECTION JOB (CSJ):**  
\_0848-04-052\_

**1.2 PROJECT LIMITS:**

From: 1.5 mi North of CR 331

To: CR 433

**1.3 PROJECT COORDINATES:**

BEGIN: (Lat) W99°12'03.9", (Long) N29°28'18.7"

END: (Lat) W99°10'22" , (Long) N29°23'49.1"

**1.4 TOTAL PROJECT AREA (Acres): 55.55 Acres**

**1.5 TOTAL AREA TO BE DISTURBED (Acres): 38.61 Acres**

**1.6 NATURE OF CONSTRUCTION ACTIVITY:**

WORK CONSISTING OF GRADING, BASE, AND SURFACE TREATMENT FOR PAVEMENT REHABILITATION AND WIDENING

**1.7 MAJOR SOIL TYPES:**

Soil Type	Description
Atco loam, 0 to 1 percent slopes	90% Atco, well drained, no runoff
Knippa clay, 0 to 1 percent slopes	92% Knippa, well drained, low runoff
Sabenyo clay loam, 1 to 5 percent slopes	85% Sabenyo, well drained, low runoff
Orif soils, 0 to 3 percent slopes, frequently flooded	70% Orif, well drained, very low runoff
Castroville clay loam, 0 to 1 percent slopes	85% Castroville, well drained, no runoff
Knippa clay 1 to 3 percent slopes	95% Knippa, well drained, medium runoff
Castroville clay loam, 1 to 3 percent slopes	85% Castroville, well drained, low runoff

**1.8 PROJECT SPECIFIC LOCATIONS (PSLs):**

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

- PSLs determined during preconstruction meeting
- PSLs determined during construction
- No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

**1.9 CONSTRUCTION ACTIVITIES:**

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

- Mobilization
- Install sediment and erosion controls
- Blade existing topsoil into windrows, prep ROW, clear and grub
- Remove existing pavement
- Grading operations, excavation, and embankment
- Excavate and prepare subgrade for proposed pavement widening
- Remove existing culverts, safety end treatments (SETs)
- Remove existing metal beam guard fence (MBGF), bridge rail
- Install proposed pavement per plans
- Install culverts, culvert extensions, SETs
- Install mow strip, MBGF, bridge rail
- Place flex base
- Rework slopes, grade ditches
- Blade windrowed material back across slopes
- Revegetation of unpaved areas
- Achieve site stabilization and remove sediment and erosion control measures

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.10 POTENTIAL POLLUTANTS AND SOURCES:**

- Sediment laden stormwater from stormwater conveyance over disturbed area
- Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- Solvents, paints, adhesives, etc. from various construction activities
- Transported soils from offsite vehicle tracking
- Construction debris and waste from various construction activities
- Contaminated water from excavation or dewatering pump-out water
- Sanitary waste from onsite restroom facilities
- Trash from various construction activities/receptacles
- Long-term stockpiles of material and waste
- Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities.

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.11 RECEIVING WATERS:**

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody

\* Add (\*) for impaired waterbodies with pollutant in ( ).

**1.12 ROLES AND RESPONSIBILITIES: TxDOT**

- Development of plans and specifications
- Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- Post Construction Site Notice
- Submit NOI/CSN to local MS4
- Perform SWP3 inspections
- Maintain SWP3 records and update to reflect daily operations
- Complete and submit Notice of Termination to TCEQ
- Maintain SWP3 records for 3 years

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR**

- Day To Day Operational Control
- Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- Post Construction Site Notice
- Submit NOI/CSN to local MS4
- Maintain schedule of major construction activities
- Install, maintain and modify BMPs
- Complete and submit Notice of Termination to TCEQ
- Maintain SWP3 records for 3 years

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:**

MS4 Entity
NO MS4s RECIEVE STROMWATER DISCHARGE FROM THE SITE

**STORMWATER POLLUTION PREVENTION PLAN (SWP3)**

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
				232
STATE	STATE DIST.	COUNTY		
TEXAS	SAT	MEDINA		
CONT.	SECT.	JOB	HIGHWAY NO.	
0848	04	052	FM 462	

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

**2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE**

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

**2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:**

**T / P**

- Protection of Existing Vegetation
- Vegetated Buffer Zones
- Soil Retention Blankets
- Geotextiles
- Mulching/ Hydromulching
- Soil Surface Treatments
- Temporary Seeding
- Permanent Planting, Sodding or Seeding
- Biodegradable Erosion Control Logs
- Rock Filter Dams/ Rock Check Dams
- Vertical Tracking
- Interceptor Swale
- Riprap
- Diversion Dike
- Temporary Pipe Slope Drain
- Embankment for Erosion Control
- Paved Flumes
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.2 SEDIMENT CONTROL BMPs:**

**T / P**

- Biodegradable Erosion Control Logs
- Dewatering Controls
- Inlet Protection
- Rock Filter Dams/ Rock Check Dams
- Sandbag Berms
- Sediment Control Fence
- Stabilized Construction Exit
- Floating Turbidity Barrier
- Vegetated Buffer Zones
- Vegetated Filter Strips
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

**T / P**

- Sediment Trap
  - Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - 3,600 cubic feet of storage per acre drained
- Sedimentation Basin
  - Not required (<10 acres disturbed)
  - Required (>10 acres) and implemented.
    - Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - 3,600 cubic feet of storage per acre drained
  - Required (>10 acres), but not feasible due to:
    - Available area/Site geometry
    - Site slope/Drainage patterns
    - Site soils/Geotechnical factors
    - Public safety
    - Other: \_\_\_\_\_

**2.3 PERMANENT CONTROLS:**

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.4 OFFSITE VEHICLE TRACKING CONTROLS:**

- Excess dirt/mud on road removed daily
- Haul roads dampened for dust control
- Loaded haul trucks to be covered with tarpaulin
- Stabilized construction exit
- Daily street sweeping
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.5 POLLUTION PREVENTION MEASURES:**

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.6 VEGETATED BUFFER ZONES:**

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.7 ALLOWABLE NON-STORMWATER DISCHARGES:**

- Fire hydrant flushings
- Irrigation drainage
- Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- Potable water sources
- Springs
- Uncontaminated groundwater
- Water used to wash vehicles or control dust
- Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

**2.8 DEWATERING:**

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

**2.9 INSPECTIONS:**

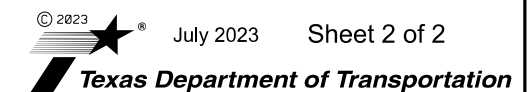
All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

When dewatering activities are present, a daily inspection will be conducted once per day during those activities and documented in accordance with CGP and TxDOT requirements.

**2.10 MAINTENANCE:**

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

**STORMWATER POLLUTION PREVENTION PLAN (SWP3)**



FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
				233
STATE	STATE DIST.	COUNTY		
TEXAS	SAT	MEDINA		
CONT.	SECT.	JOB	HIGHWAY NO.	
0848	04	052	FM 462	



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**I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402**

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

No Action Required     Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
2. Comply with the Storm Water Pollution Prevention Plan (SW3P) and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and Texas Commission on Environmental Quality (TCEQ), Environmental Protection Agency (EPA) or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, Contractor shall submit Notice of Intent (NOI) to TCEQ and the Engineer.
5. NOI required:  Yes  No

Note: If amount of soil disturbance changes, permit requirements may change.

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

US Army Corps of Engineers (USACE) Permit required for filling, dredging, excavating or other work in any potential USACE jurisdictional water, such as, rivers, creeks, streams, or wetlands.

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

- No Permit Required
- Nationwide Permit (NWP) 14 - Pre-construction Notice (PCN) not Required
- Nationwide Permit 14 - PCN Required
- Individual 404 Permit Required
- Other Nationwide Permit Required: NWP# \_\_\_\_\_

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

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

401 Best Management Practices: (Not applicable if no USACE permit)

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

**III. CULTURAL RESOURCES**

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

No Action Required     Required Action

Action No.

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

**IV. VEGETATION RESOURCES**

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

No Action Required     Required Action

Action No.

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

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

No Action Required     Required Action

Action No.

1. MIGRATORY BIRD NESTS: Schedule construction activities as needed to meet the following requirements:

- A. Do not remove or destroy any active migratory bird nests (nests containing eggs and/or flightless birds) at any time of year. If there are any active nests, they shall not be removed until the nests become inactive.
- B. On/in structures, if there are any active nests, they shall not be removed until all nests become inactive. After inactive nests are removed and/or before nest activity begins, deterrent materials may be applied to the structures to prevent future nest building.

2. See Item 5 in General Notes.

- 3.
- 4.

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

**VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES**

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:

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

Hazardous Materials or Contamination Issues Specific to this Project:

No Action Required     Required Action

Action No.

- 1.
- 2.
- 3.

Does the project involve the demolition of a span bridge?

Yes     No (No further action required)

If "Yes", a pre-demolition notification must be submitted to the Texas Department of State Health Services. The contractor shall contact TxDOT's Project Engineer 25 calendar days prior to the demolition of the bridges(s) on the project to assist with the notification.

**VII. OTHER ENVIRONMENTAL ISSUES**

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

No Action Required     Required Action

Action No.

- 1.
- 2.
- 3.

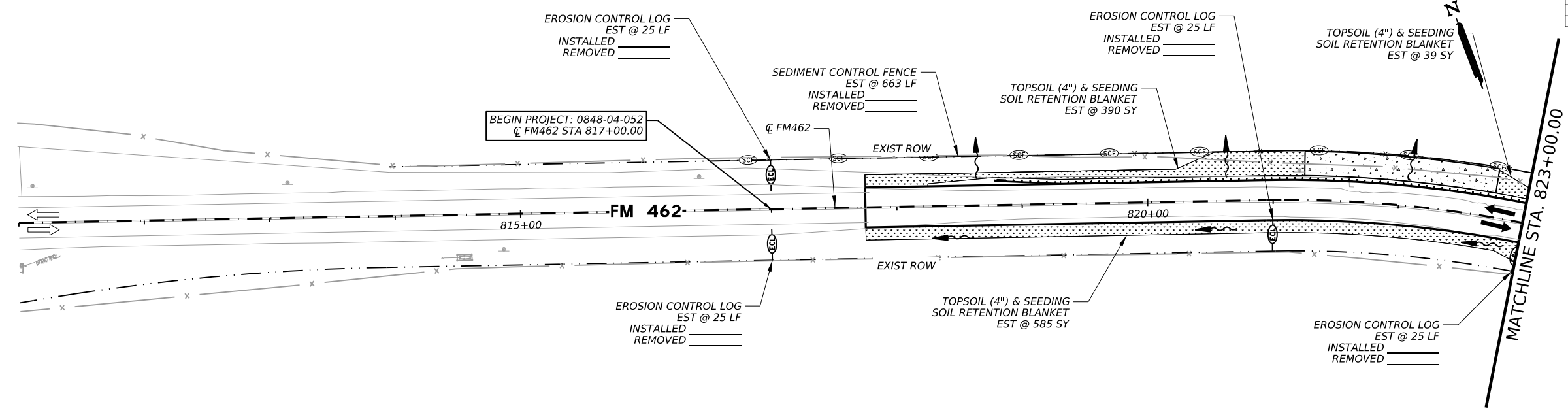


**ENVIRONMENTAL PERMITS,  
ISSUES AND COMMITMENTS  
EPIC**

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK: TxDOT	DW: BW	CK: GAG
© TxDOT OCTOBER 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	052	FM 462
	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	234	

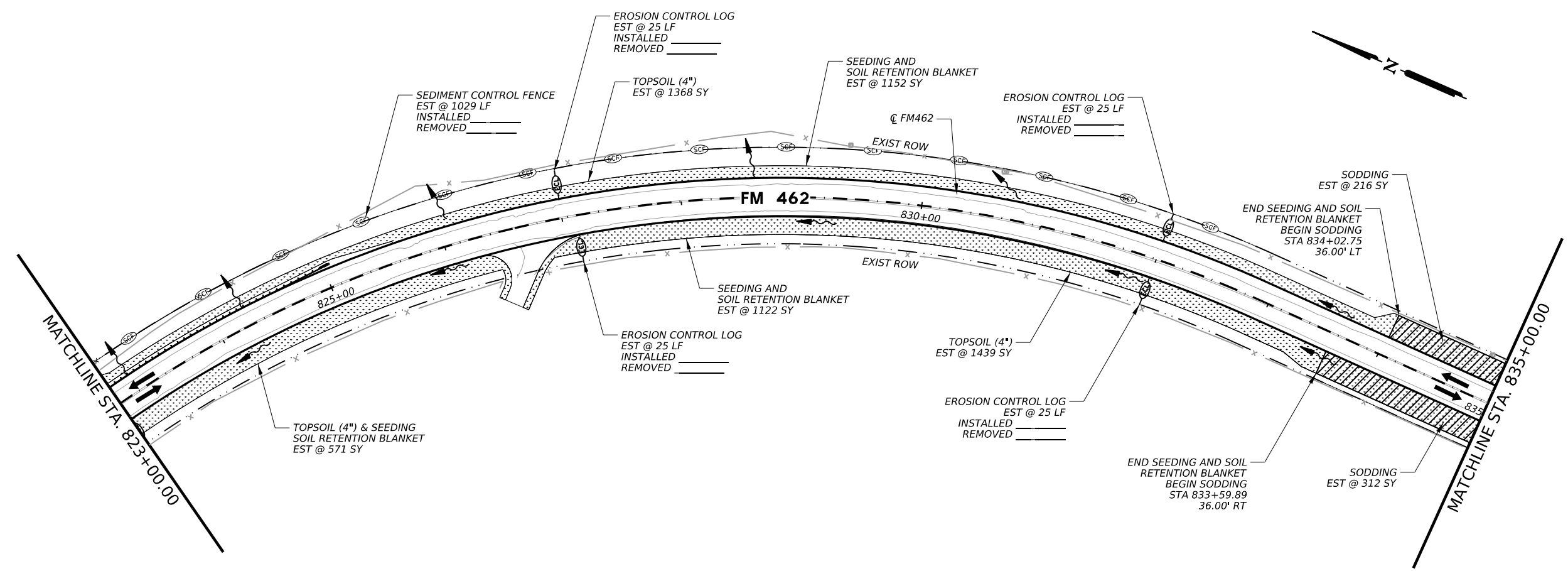
CK: DW: CK: DN:

SHEET #	ITEM	DESCRIPTION	UNIT	QTY
0160	6003	FURNISHING AND PLACING TOPSOIL (4")	SY	4387
0162	6008	ROLL SODDING	SY	528
0164	6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	3859
0164	6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	3859
0168	6001	VEGETATIVE WATERING	MG	128.7
0169	6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	3859
0506	6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1692
0506	6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1692
0506	6041	BIODEG EROSN CONT LOGS (INSLT) (12")	LF	200
0506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	200



**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- [Hatched Box] SEEDING
- [Dotted Box] SODDING
- (SCF) SILT FENCE
- (ECL) EROSION CONTROL LOG
- (RFD) ROCK FILTER DAM
- > FLOW ARROW



1/31/2024

DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

0' 50' 100'

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

SHEET 1 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	235	

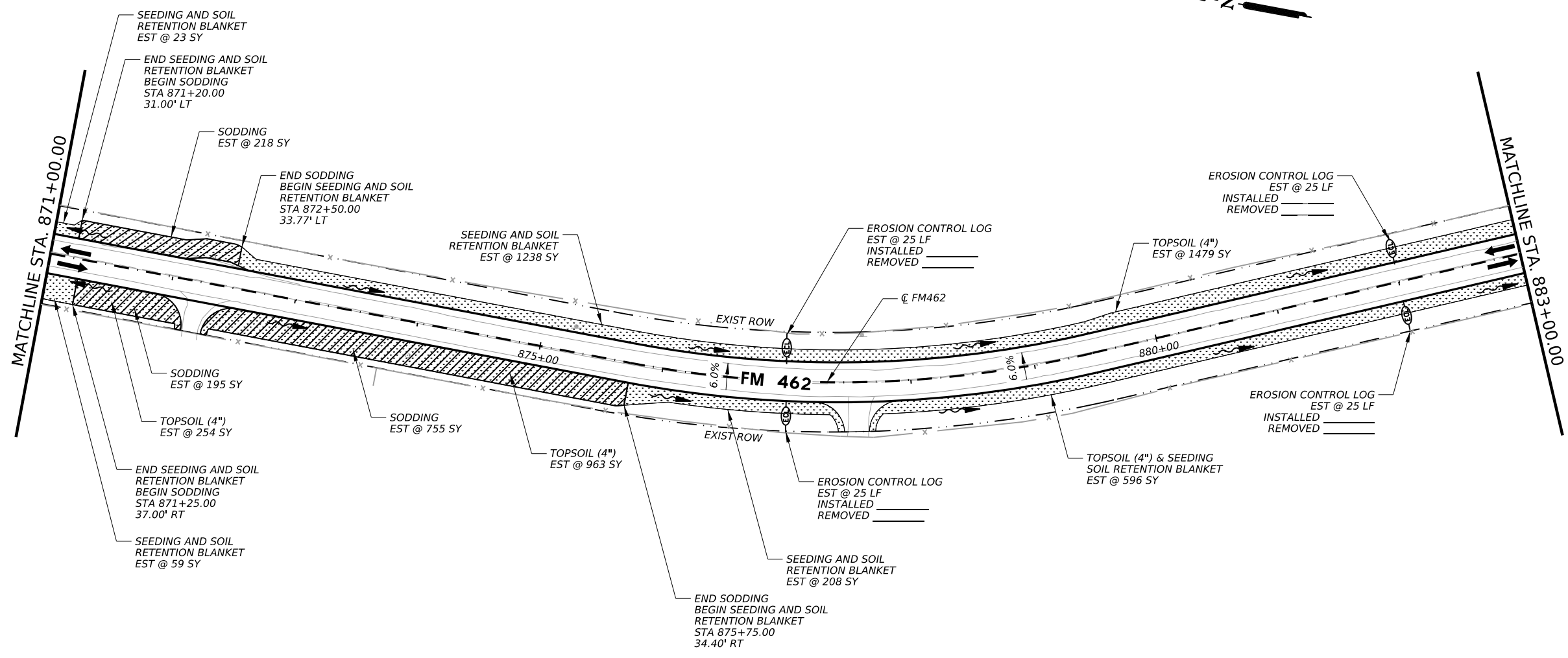
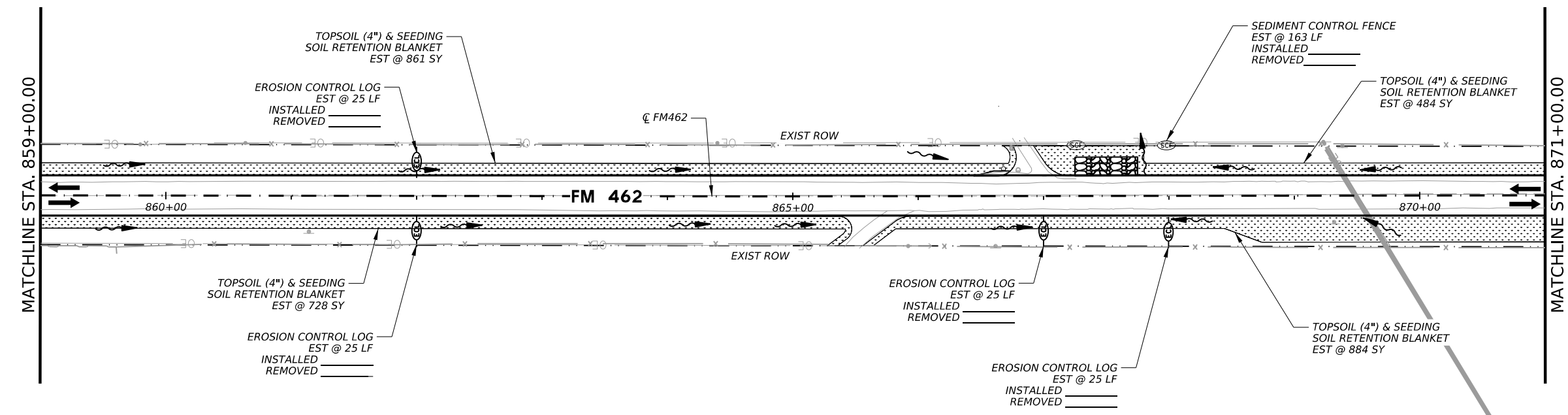
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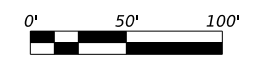
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	0162 6008	ROLL SODDING	SY	1168
	0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5081
	0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5081
	0168 6001	VEGETATIVE WATERING	MG	176.8
	0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5081
	0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	163
	0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	163
	0506 6041	BIODEG EROSN CONT LOGS (INSL) (12")	LF	200
	0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	200

**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- [Hatched Box] SEEDING
- [Diagonal Lines Box] SODDING
- [Circle with X] SILT FENCE
- [Circle with Dashed] EROSION CONTROL LOG
- [Circle with Dotted] ROCK FILTER DAM
- [Arrow] FLOW ARROW



1/31/2024



**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**  
**SW3P LAYOUT**

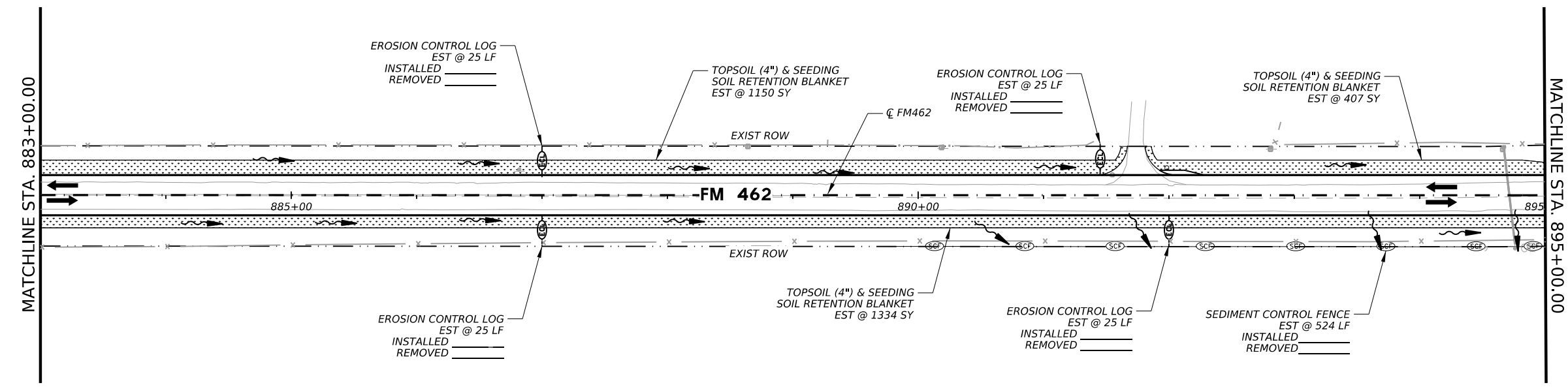
SHEET 3 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
SAT		COUNTY	SHEET NO.
		MEDINA	237

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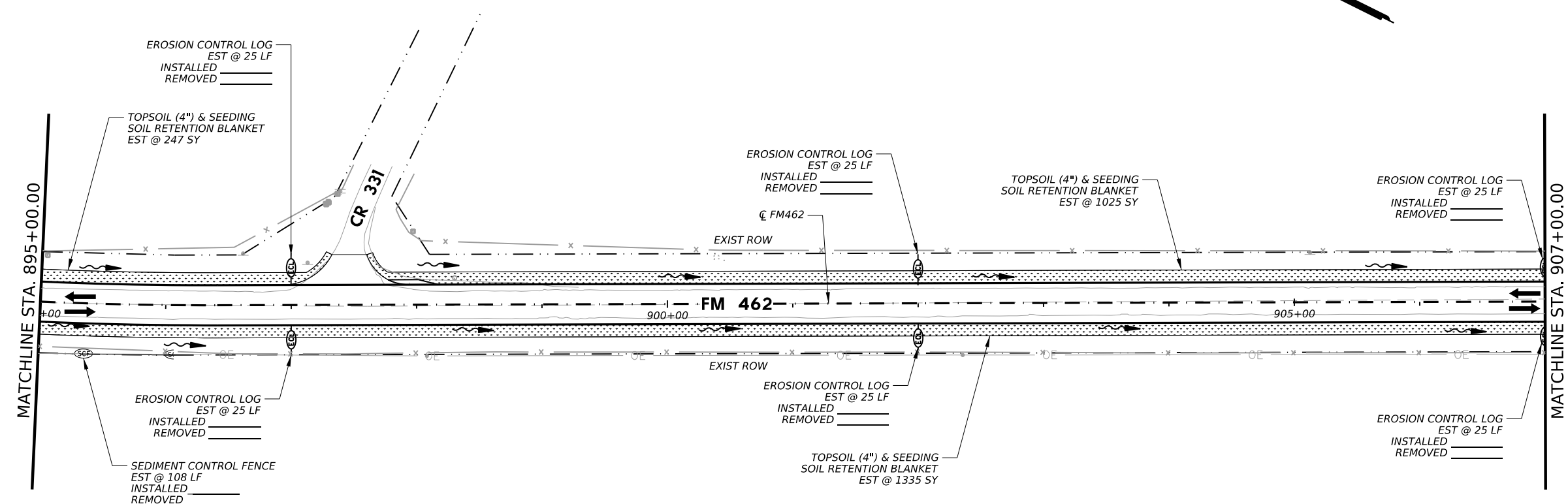
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SHEET #	ITEM	DESCRIPTION	UNIT	QTY
	0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	5498
	0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5498
	0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5498
	0168 6001	VEGETATIVE WATERING	MG	171.6
	0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5498
	0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	632
	0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	632
	0506 6041	BIODEG EROSN CONT LOGS (INSTR) (12")	LF	250
	0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	250



**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- SEEDING
- SODDING
- SCF --- SILT FENCE
- ECL --- EROSION CONTROL LOG
- RFD --- ROCK FILTER DAM
- >--- FLOW ARROW



1/31/2024

0' 50' 100'

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

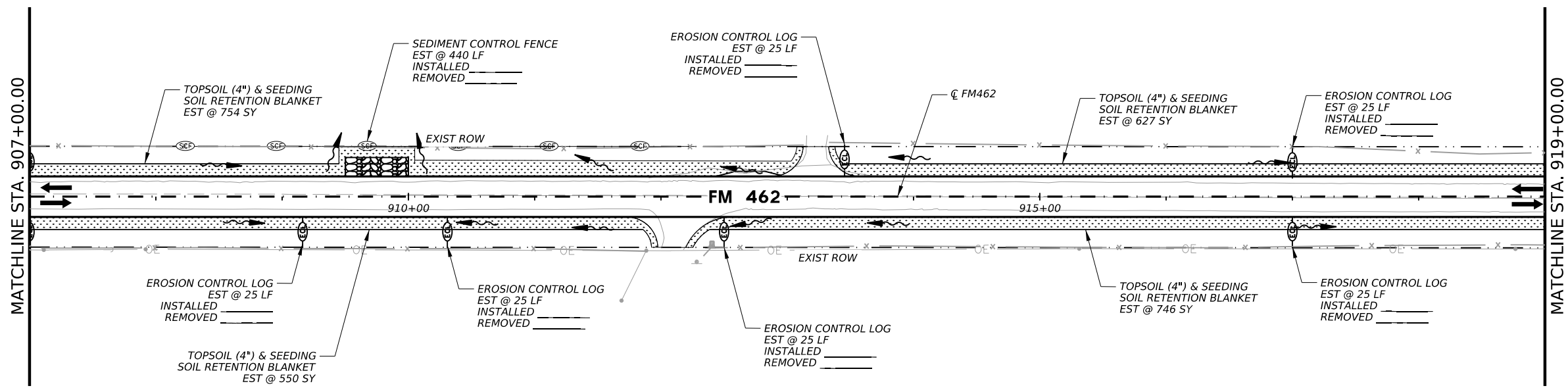
SHEET 4 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	238	

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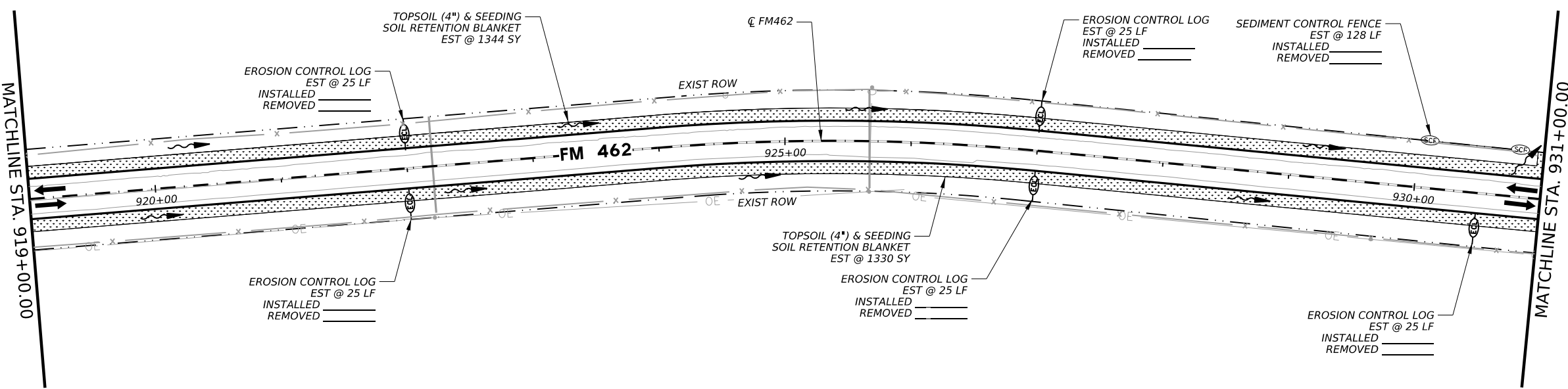


SHEET #	DESCRIPTION	UNIT	QTY
0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	5351
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5351
0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	5351
0168 6001	VEGETATIVE WATERING	MG	167.0
0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5351
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	568
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	568
0506 6041	BIODEG EROSN CONT LOGS (INSTR) (12")	LF	275
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	275



**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- SEEDING
- SODDING
- SCP --- SILT FENCE
- ECL --- EROSION CONTROL LOG
- RFD --- ROCK FILTER DAM
- FLOW ARROW



1/31/2024

DAVID H. GUTIERREZ  
143301  
LICENSED PROFESSIONAL ENGINEER

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Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

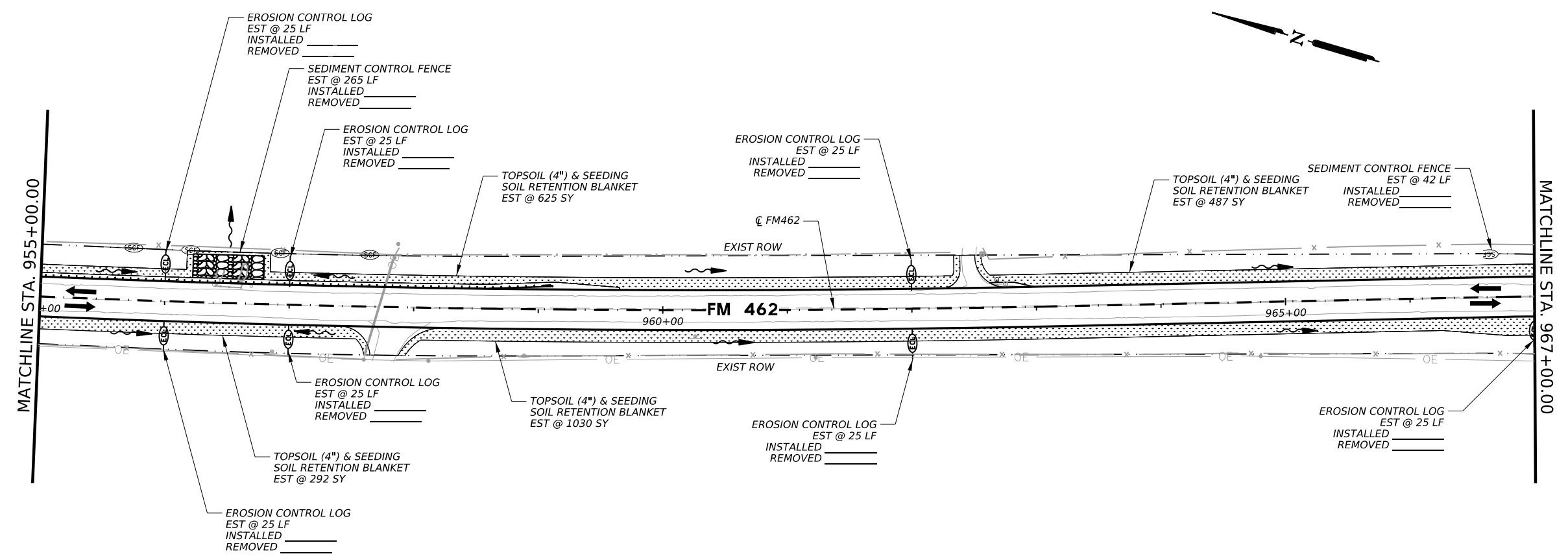
SHEET 5 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04		FM 462
SAT		COUNTY	SHEET NO.
		MEDINA	239

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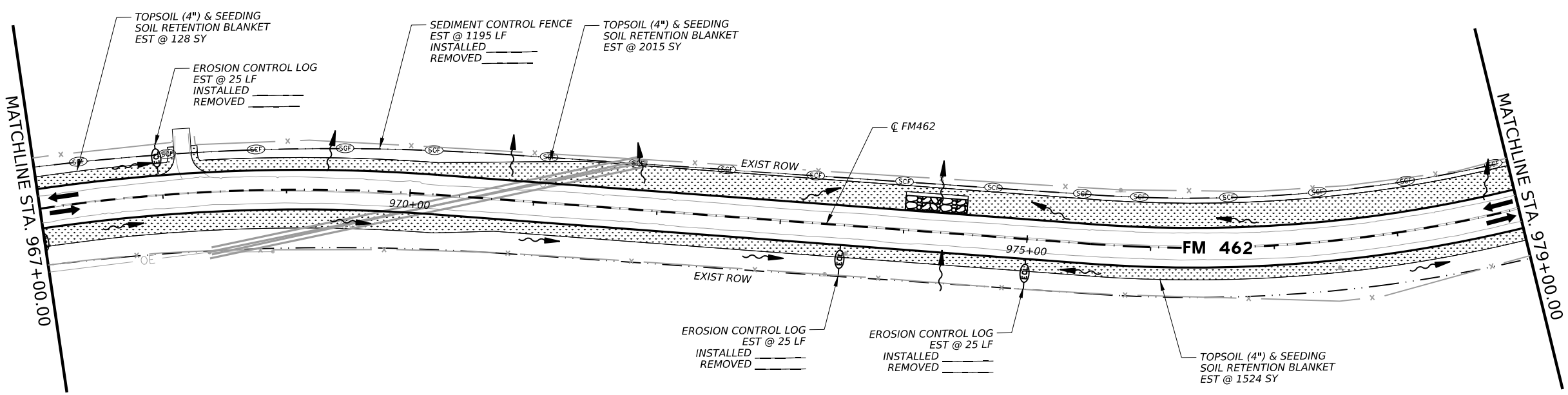


SHEET #	ITEM	DESCRIPTION	UNIT	QTY
0160	6003	FURNISHING AND PLACING TOPSOIL (4")	SY	6101
0164	6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6101
0164	6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	6101
0168	6001	VEGETATIVE WATERING	MG	190.4
0169	6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6101
0506	6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1501
0506	6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1501
0506	6041	BIODEG EROSN CONT LOGS (INSTR) (12")	LF	250
0506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	250



**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- [Pattern] SEEDING
- [Pattern] SODDING
- [Symbol] SILT FENCE
- [Symbol] EROSION CONTROL LOG
- [Symbol] ROCK FILTER DAM
- [Symbol] FLOW ARROW



1/31/2024

DAVID H. GUTIERREZ  
143301  
LICENSED PROFESSIONAL ENGINEER

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**FM 462**

**SW3P LAYOUT**

SHEET 7 OF 13

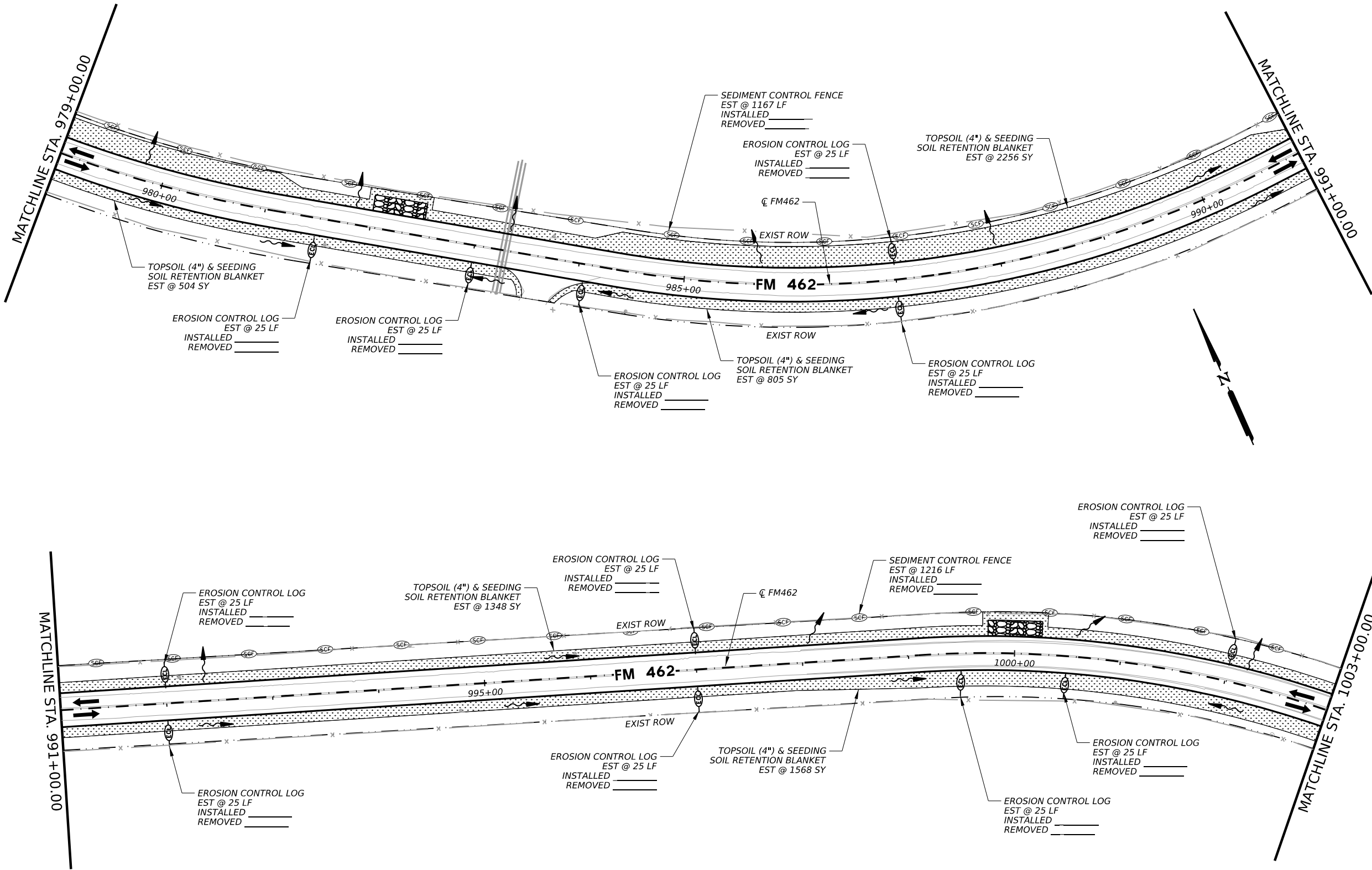
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	241	

DATE: 1/31/2024 6:02:00 PM  
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SHEET #	ITEM	DESCRIPTION	UNIT	QTY
8	0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	6481
	0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6481
	0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	6481
	0168 6001	VEGETATIVE WATERING	MG	202.3
	0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6481
	0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	2383
	0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	2383
	0506 6041	BIODEG EROSN CONT LOGS (INSTR) (12")	LF	300
	0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	300

**LEGEND**

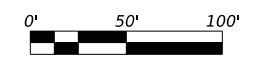
- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- [Pattern] SEEDING
- [Pattern] SODDING
- [Symbol] SILT FENCE
- [Symbol] EROSION CONTROL LOG
- [Symbol] ROCK FILTER DAM
- [Symbol] FLOW ARROW



1/31/2024

*David Gutierrez*

STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
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FM 462			
SW3P LAYOUT			
SHEET 8 OF 13			
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	242	

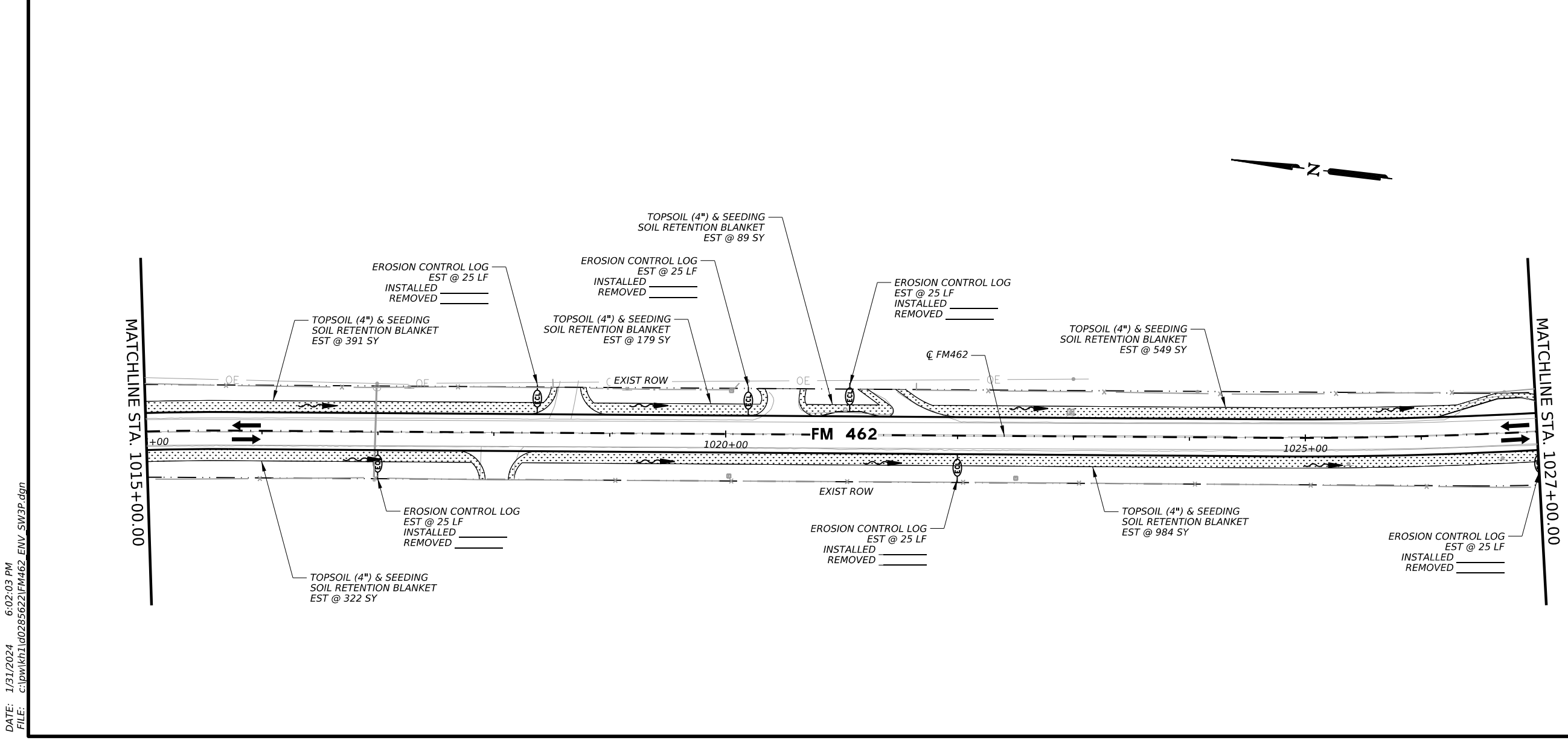
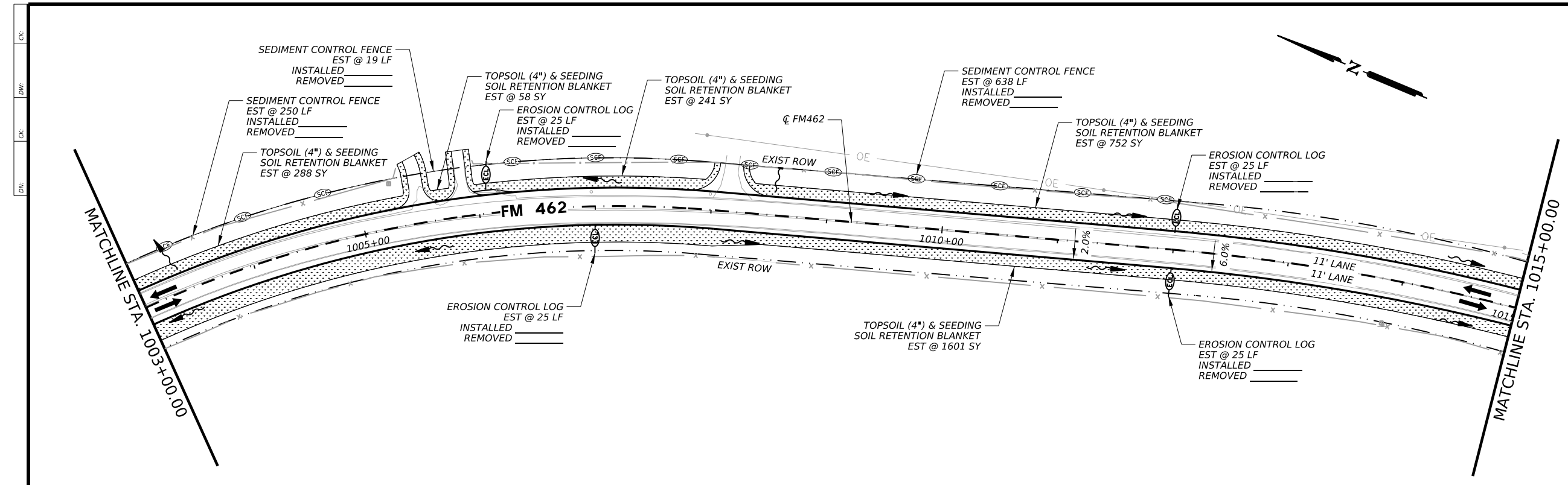
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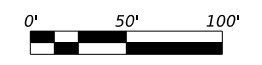
SHEET #	DESCRIPTION	UNIT	QTY
0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	5454
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5454
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5454
0168 6001	VEGETATIVE WATERING	MG	170.2
0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5454
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	907
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	907
0506 6041	BIODEG EROSN CONT LOGS (INSTR) (12")	LF	250
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	250

**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- [Pattern] SEEDING
- [Pattern] SODDING
- SCP --- SILT FENCE
- ECL --- EROSION CONTROL LOG
- RFD --- ROCK FILTER DAM
- > FLOW ARROW



1/31/2024



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Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

SHEET 9 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	243	

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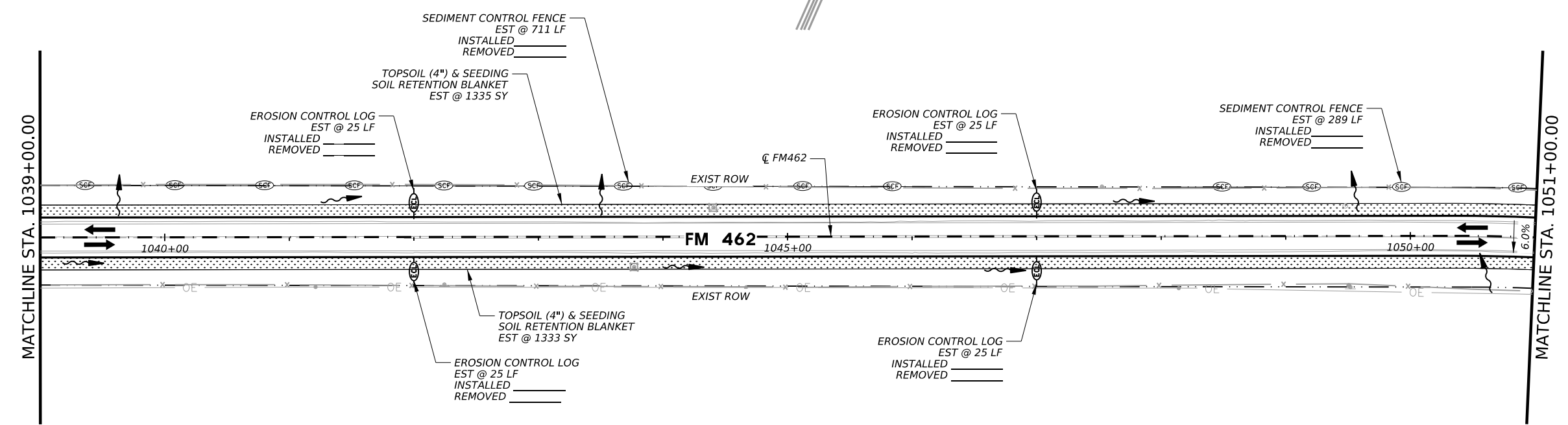
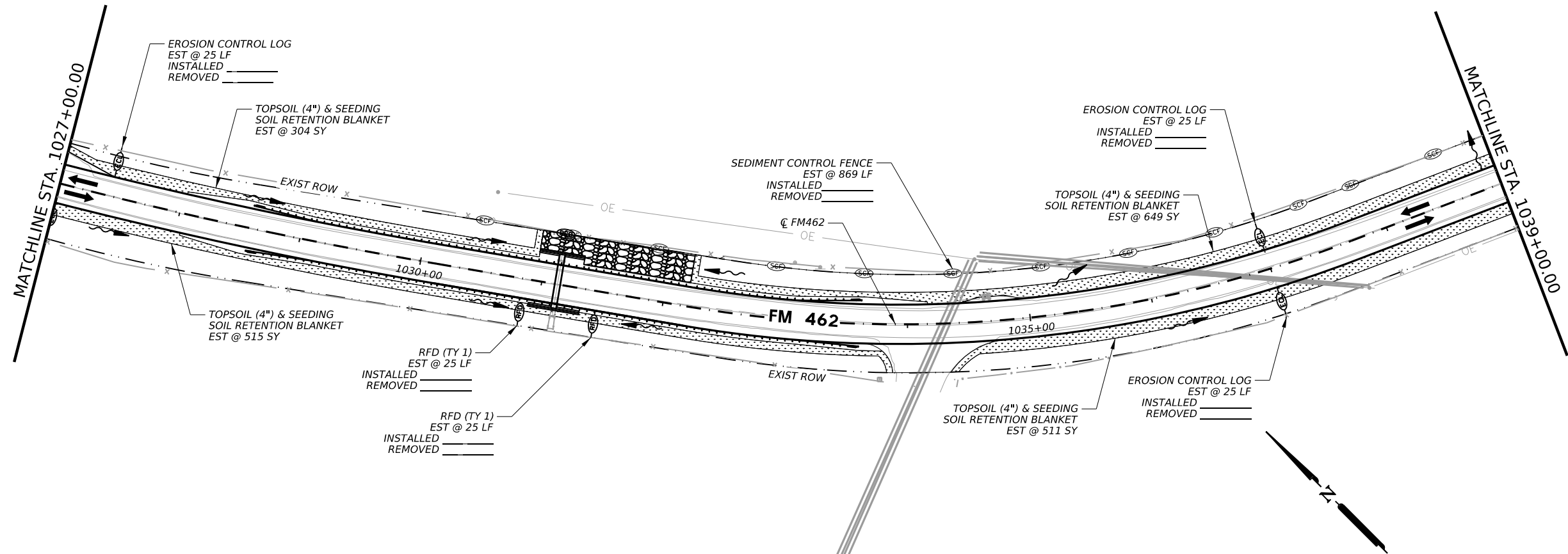


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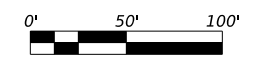
SHEET #	DESCRIPTION	UNIT	QTY
0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	4647
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	4647
0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	4647
0168 6001	VEGETATIVE WATERING	MG	145.0
0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	4647
0506 6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF	50
0506 6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	60
0506 6011	ROCK FILTER DAMS (REMOVE)	LF	110
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1868
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1868
0506 6041	BIODEG EROSN CONT LOGS (INSL) (12")	LF	175
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	175

**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- SEEDING
- SODDING
- SCP SILT FENCE
- ECL EROSION CONTROL LOG
- RFD ROCK FILTER DAM
- Flow Arrow



1/31/2024



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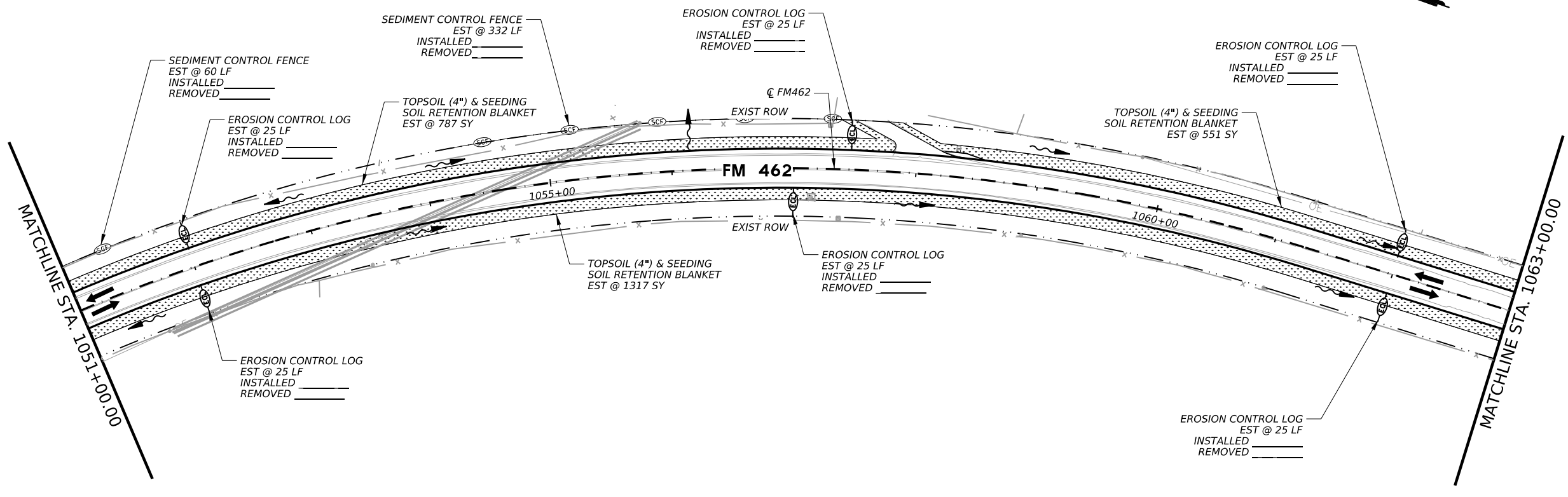
**FM 462**  
**SW3P LAYOUT**

SHEET 10 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	244

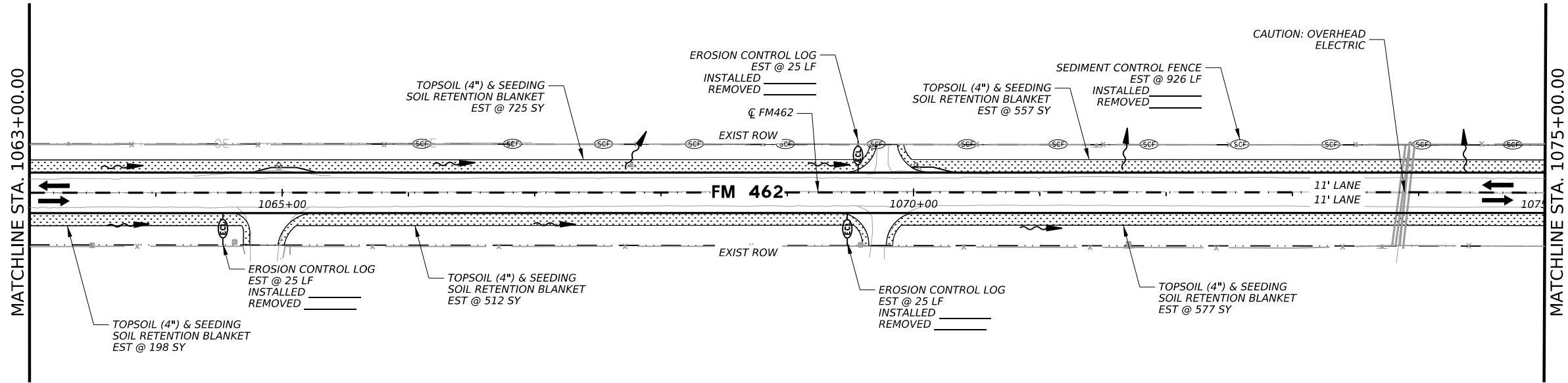
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SHEET #	ITEM	DESCRIPTION	UNIT	QTY
11	0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	5224
	0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5224
	0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	5224
	0168 6001	VEGETATIVE WATERING	MG	163.0
	0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5224
	0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1318
	0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1318
	0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	225
	0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	225



**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- [Pattern] SEEDING
- [Pattern] SODDING
- [Symbol] SILT FENCE
- [Symbol] EROSION CONTROL LOG
- [Symbol] ROCK FILTER DAM
- [Symbol] FLOW ARROW



1/31/2024

0' 50' 100'

CAUTION: OVERHEAD ELECTRIC

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 DAVID H. GUTIERREZ  
 143301  
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Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

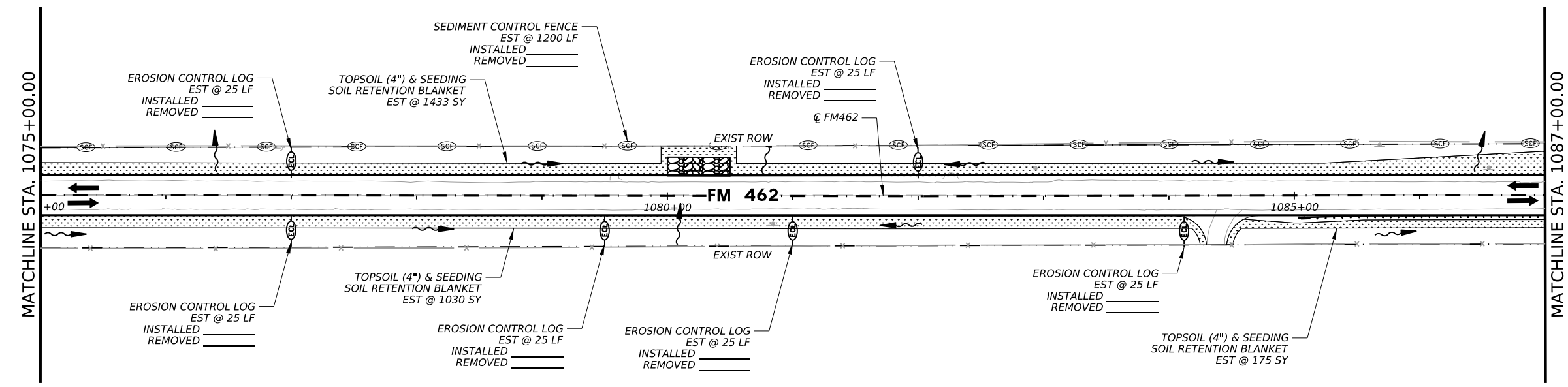
SHEET 11 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	245	

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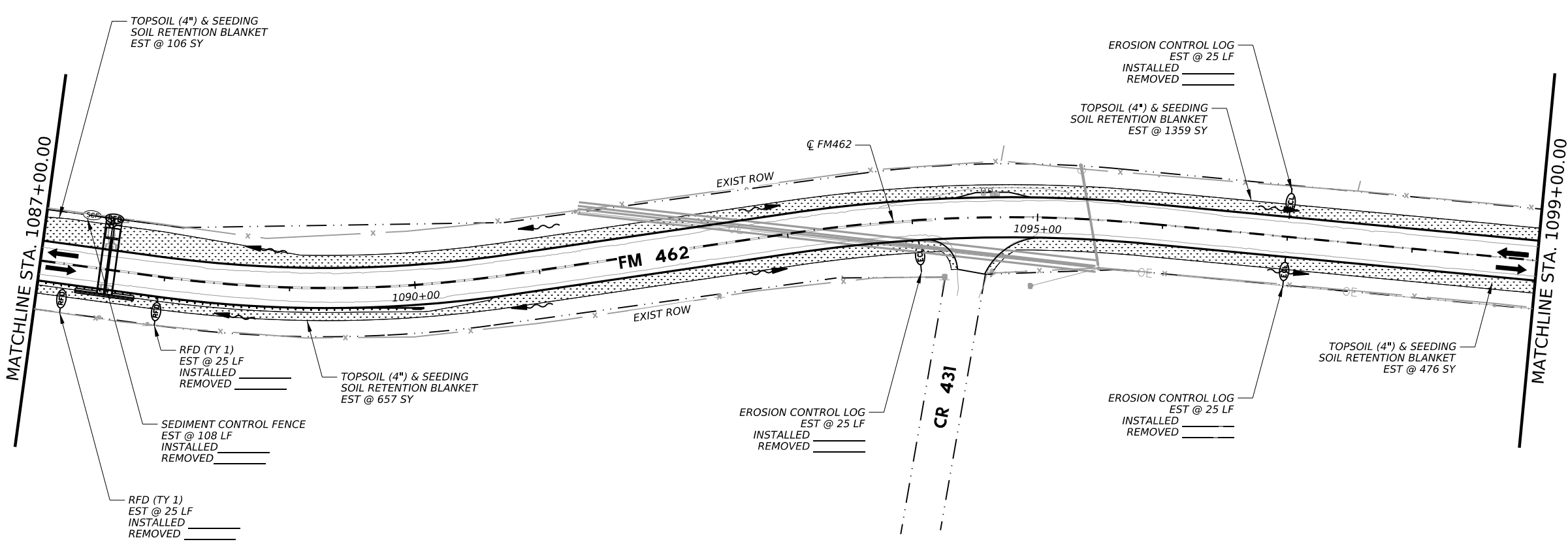
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SHEET #	ITEM	DESCRIPTION	UNIT	QTY
12	0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	5236
	0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5236
	0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	5236
	0168 6001	VEGETATIVE WATERING	MG	163.4
	0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5236
	0506 6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF	50
	0506 6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	60
	0506 6011	ROCK FILTER DAMS (REMOVE)	LF	110
	0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1308
	0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1308
	0506 6041	BIODEG EROSN CONT LOGS (INSL) (12")	LF	225
	0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	225



**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- - - EXIST RIGHT OF WAY
- [Pattern] SEEDING
- [Pattern] SODDING
- SCF SILT FENCE
- ECL EROSION CONTROL LOG
- RFD ROCK FILTER DAM
- FLOW ARROW



1/31/2024

0' 50' 100'

STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

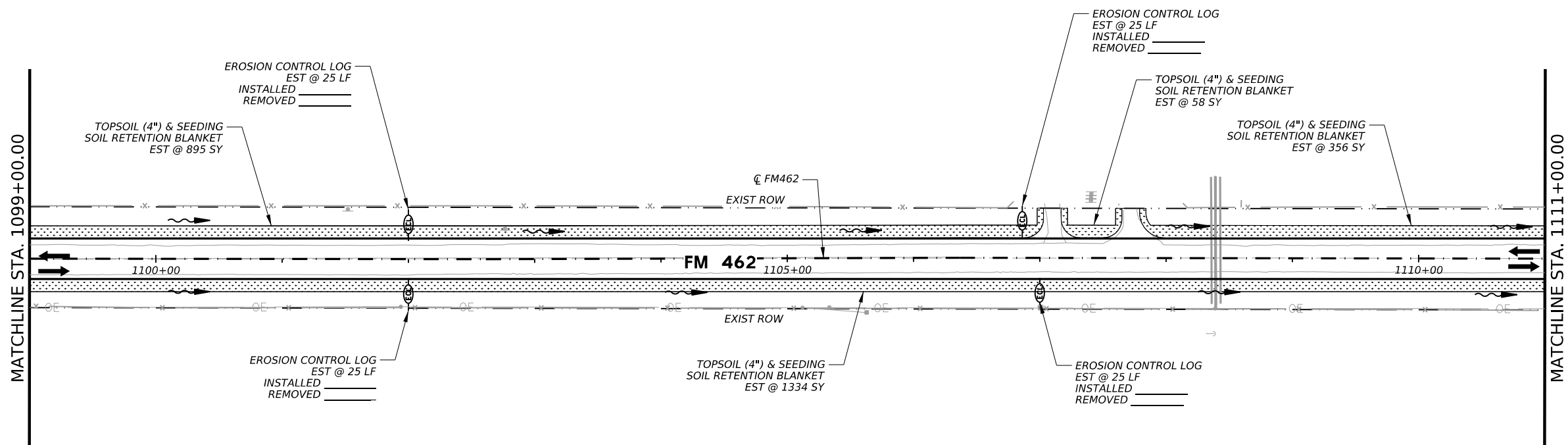
**SW3P LAYOUT**

SHEET 12 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	246	

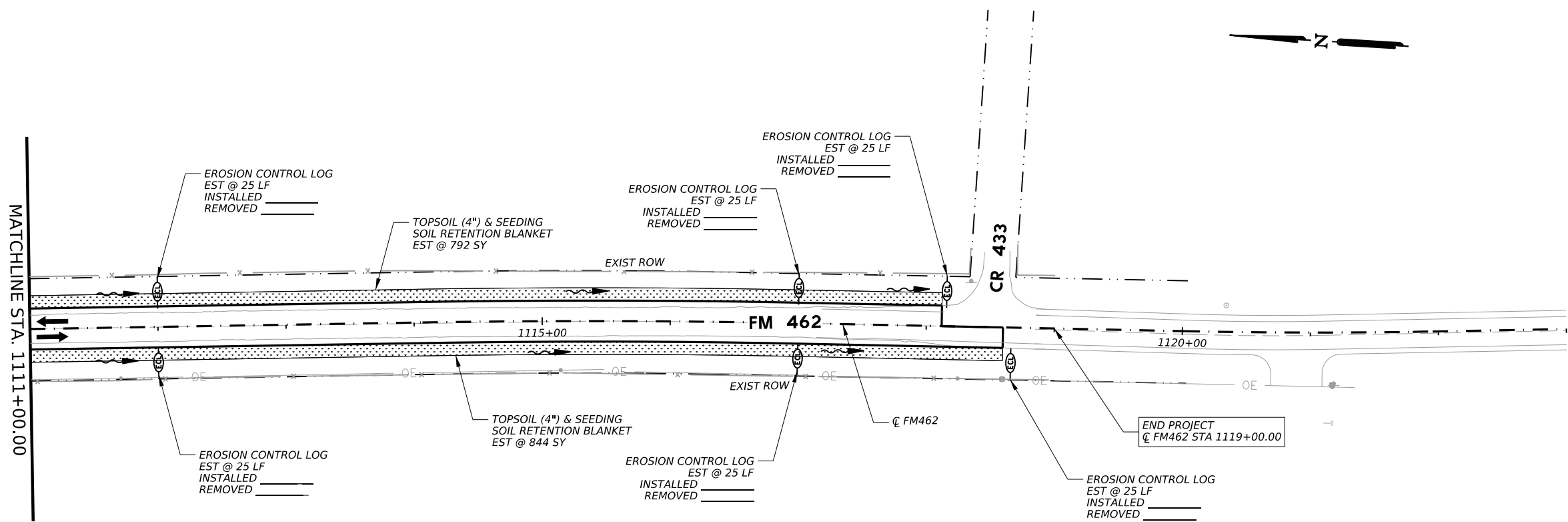
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SHEET #	DESCRIPTION	UNIT	QTY
0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	4279
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	4279
0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	4279
0168 6001	VEGETATIVE WATERING	MG	133.6
0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	4279
0506 6041	BIODEG EROSN CONT LOGS (INSLT) (12")	LF	250
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	250



**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- [Symbol] SEEDING
- [Symbol] SODDING
- [Symbol] SILT FENCE
- [Symbol] EROSION CONTROL LOG
- [Symbol] ROCK FILTER DAM
- [Symbol] FLOW ARROW



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David Gutierrez

143301

DAVID H. GUTIERREZ  
PROFESSIONAL ENGINEER

0' 50' 100'

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**FM 462**

**SW3P LAYOUT**

SHEET 13 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	247

DATE: 1/31/2024 6:02:09 PM  
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DATE: 1/31/2024 6:02:32 PM  
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## Texas Commission on Environmental Quality Water Pollution Abatement Plan General Construction Notes

1. A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES.  
THIS NOTICE MUST INCLUDE:
  - THE NAME OF THE APPROVED PROJECT;
  - THE ACTIVITY START DATE; AND
  - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.
2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN (WPAP) AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS ARE REQUIRED TO KEEP ON-SITE COPIES OF THE APPROVED PLAN AND APPROVAL LETTER.
3. IF ANY SENSITIVE FEATURE(S) (CAVES, SOLUTION CAVITY, SINK HOLE, ETC.) IS DISCOVERED DURING CONSTRUCTION, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPROPRIATE TCEQ REGIONAL OFFICE MUST BE IMMEDIATELY NOTIFIED OF ANY SENSITIVE FEATURES ENCOUNTERED DURING CONSTRUCTION. CONSTRUCTION ACTIVITIES MAY NOT BE RESUMED UNTIL THE TCEQ HAS REVIEWED AND APPROVED THE APPROPRIATE PROTECTIVE MEASURES IN ORDER TO PROTECT ANY SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY.
4. NO TEMPORARY OR PERMANENT HAZARDOUS SUBSTANCE STORAGE TANK SHALL BE INSTALLED WITHIN 150 FEET OF A WATER SUPPLY SOURCE, DISTRIBUTION SYSTEM, WELL, OR SENSITIVE FEATURE.
5. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND MANUFACTURERS SPECIFICATIONS. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
6. ANY SEDIMENT THAT ESCAPES THE CONSTRUCTION SITE MUST BE COLLECTED AND PROPERLY DISPOSED OF BEFORE THE NEXT RAIN EVENT TO ENSURE IT IS NOT WASHED INTO SURFACE STREAMS, SENSITIVE FEATURES, ETC.
7. SEDIMENT MUST BE REMOVED FROM THE SEDIMENT TRAPS OR SEDIMENTATION BASINS NOT LATER THAN TCEQ-0592 (REV. JULY 15, 2015) PAGE 2 OF 2 WHEN IT OCCUPIES 50% OF THE BASIN'S DESIGN CAPACITY.
8. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER SHALL BE PREVENTED FROM BEING DISCHARGED OFFSITE.
9. ALL SPOILS (EXCAVATED MATERIAL) GENERATED FROM THE PROJECT SITE MUST BE STORED ON-SITE WITH PROPER E&S CONTROLS. FOR STORAGE OR DISPOSAL OF SPOILS AT ANOTHER SITE ON THE EDWARDS AQUIFER RECHARGE ZONE, THE OWNER OF THE SITE MUST RECEIVE APPROVAL OF A WATER POLLUTION ABATEMENT PLAN FOR THE PLACEMENT OF FILL MATERIAL OR MASS GRADING PRIOR TO THE PLACEMENT OF SPOILS AT THE OTHER SITE.
10. IF PORTIONS OF THE SITE WILL HAVE A TEMPORARY OR PERMANENT CEASE IN CONSTRUCTION ACTIVITY LASTING LONGER THAN 14 DAYS, SOIL STABILIZATION IN THOSE AREAS SHALL BE INITIATED AS SOON AS POSSIBLE PRIOR TO THE 14TH DAY OF INACTIVITY. IF ACTIVITY WILL RESUME PRIOR TO THE 21ST DAY, STABILIZATION MEASURES ARE NOT REQUIRED. IF DROUGHT CONDITIONS OR INCLEMENT WEATHER PREVENT ACTION BY THE 14TH DAY, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS POSSIBLE.
11. THE FOLLOWING RECORDS SHALL BE MAINTAINED AND MADE AVAILABLE TO THE TCEQ UPON REQUEST:
  - THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR;
  - THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE; AND
  - THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.
12. THE HOLDER OF ANY APPROVED EDWARD AQUIFER PROTECTION PLAN MUST NOTIFY THE APPROPRIATE REGIONAL OFFICE IN WRITING AND OBTAIN APPROVAL FROM THE EXECUTIVE DIRECTOR PRIOR TO INITIATING ANY OF THE FOLLOWING:
  - A. ANY PHYSICAL OR OPERATIONAL MODIFICATION OF ANY WATER POLLUTION ABATEMENT STRUCTURE(S), INCLUDING BUT NOT LIMITED TO PONDS, DAMS, BERMS, SEWAGE TREATMENT PLANTS, AND DIVERSIONARY STRUCTURES;
  - B. ANY CHANGE IN THE NATURE OR CHARACTER OF THE REGULATED ACTIVITY FROM THAT WHICH WAS ORIGINALLY APPROVED OR A CHANGE WHICH WOULD SIGNIFICANTLY IMPACT THE ABILITY OF THE PLAN TO PREVENT POLLUTION OF THE EDWARDS AQUIFER;
  - C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

TOTAL PROJECT SUMMARY				
SITE AREA	EXISTING IMPERVIOUS AREA	PROPOSED IMPERVIOUS AREA	REQUIRED ANNUAL TSS LOAD REMOVAL	PROVIDED ANNUAL TSS LOAD REMOVAL
AC	AC	AC	LBS	LBS
8.23	3.13	4.49	1036	1103

PROVIDED LOAD REMOVAL / VEGETATIVE FILTER STRIP SUMMARY						
VFS ID	DRAINAGE AREA	BEGIN STA	END STA	OFFSET	REMOVAL EFFICIENCY	PROVIDED TSS REMOVAL
	AC			RT/LT		LBS
NB-1	0.11	834+17.57	836+63.8	LT	85	90
NB-2	0.24	836+63.83	843+54.3	LT	85	198
NB-3	0.26	844+20.28	851+20.0	LT	85	214
NB-4	0.05	871+20.00	872+50.0	LT	85	42
NORTHBOUND LOAD REMOVAL =						544
SB-1	0.11	833+59.89	836+74.6	RT	85	90
SB-2	0.42	837+44.69	848+50.0	RT	85	346
SB-3	0.03	871+25.00	871+88.8	RT	85	24
SB-4	0.12	872+55.00	875+75.0	RT	85	99
SOUTHBOUND LOAD REMOVAL =						559
TOTAL PROVIDED LOAD REMOVAL =						1103

**NOTES:**

1. SEE FM 462 WATER QUALITY REPORT (STANTEC) FOR DETAILED DISCUSSION ON WATER QUALITY CALCULATION METHODOLOGY.
2. TOTAL REQUIRED LOAD REMOVALS ONLY COMPUTED WITHIN THE LIMITS OF THE ROADWAY WIDENING AS FOLLOWS:  
 NORTHBOUND: BEGIN STA 817+00.00 END STA 875+96.08  
 SOUTHBOUND: BEGIN STA 817+00.00 END STA 875+96.08

*David Gutierrez*

1/31/2024



**Kimley»Horn** F-928

**Texas Department of Transportation**

FM 462

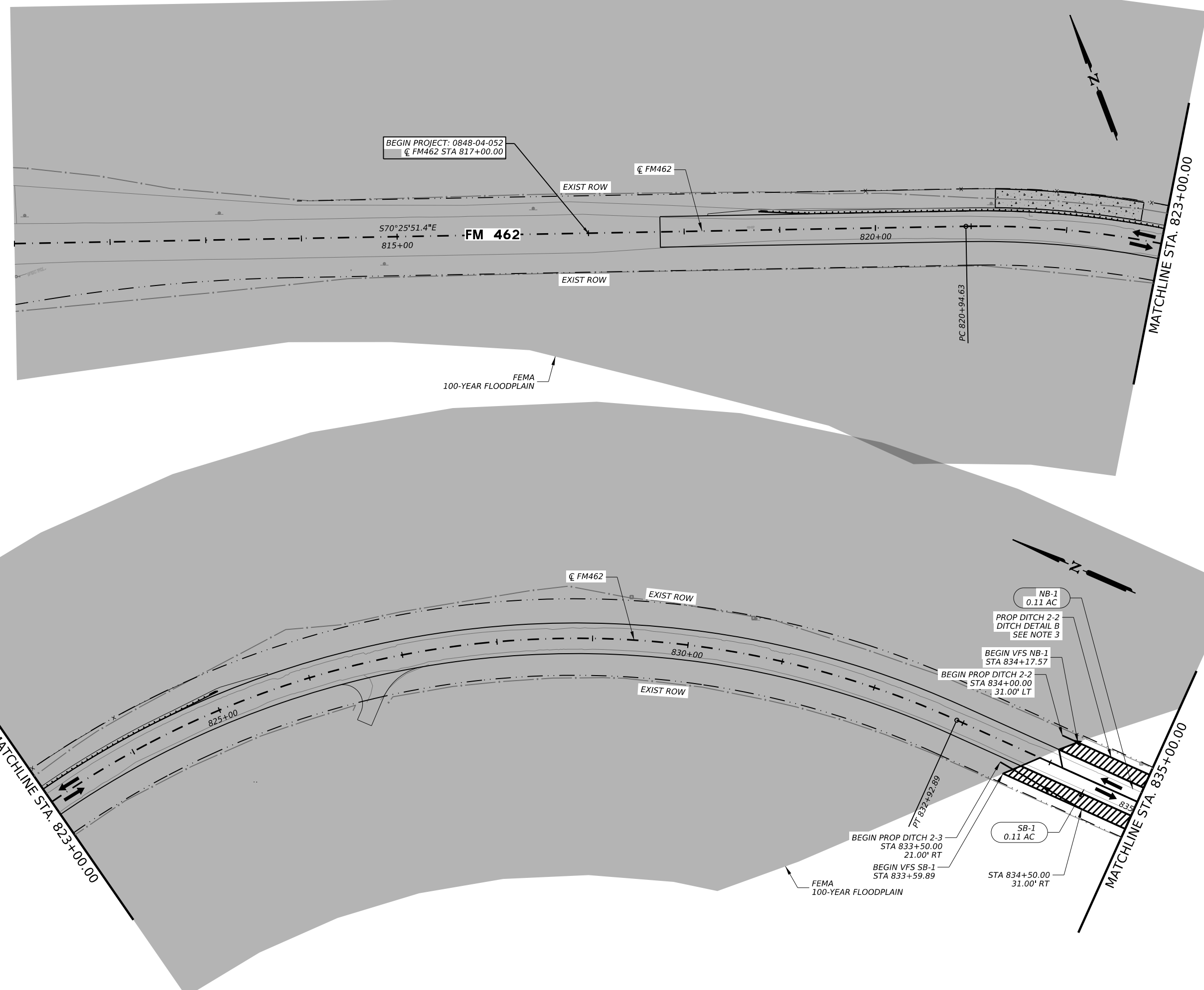
WATER QUALITY  
 CALCULATIONS AND  
 TCEQ GENERAL NOTES

SHEET 1 OF 1

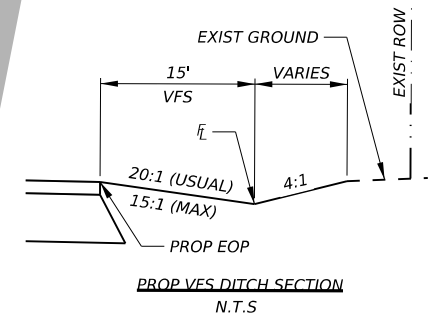
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	248	



CK: DW: CK: DN:



BEGIN PROJECT: 0848-04-052  
 C FM462 STA 817+00.00



- LEGEND**
- EXIST FENCE
  - ..... EXIST FEATURES
  - - - - EXIST RIGHT OF WAY
  - - - - LIMITS OF EDWARDS AQUIFER RECHARGE ZONE
  - DIRECTION OF TRAVEL
  - ▨ VEGETATIVE FILTER STRIPS
  - FEMA 100-YEAR FLOODPLAIN

*David Gutierrez*  
 STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

1/31/2024  
 0' 50' 100'

**Kimley»Horn** F-928  
 Texas Department of Transportation

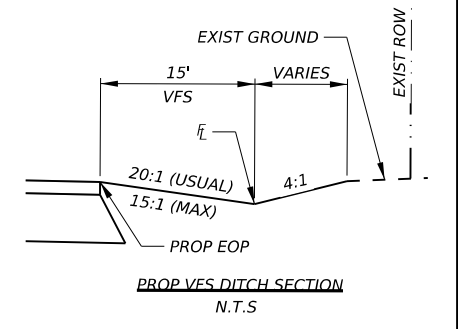
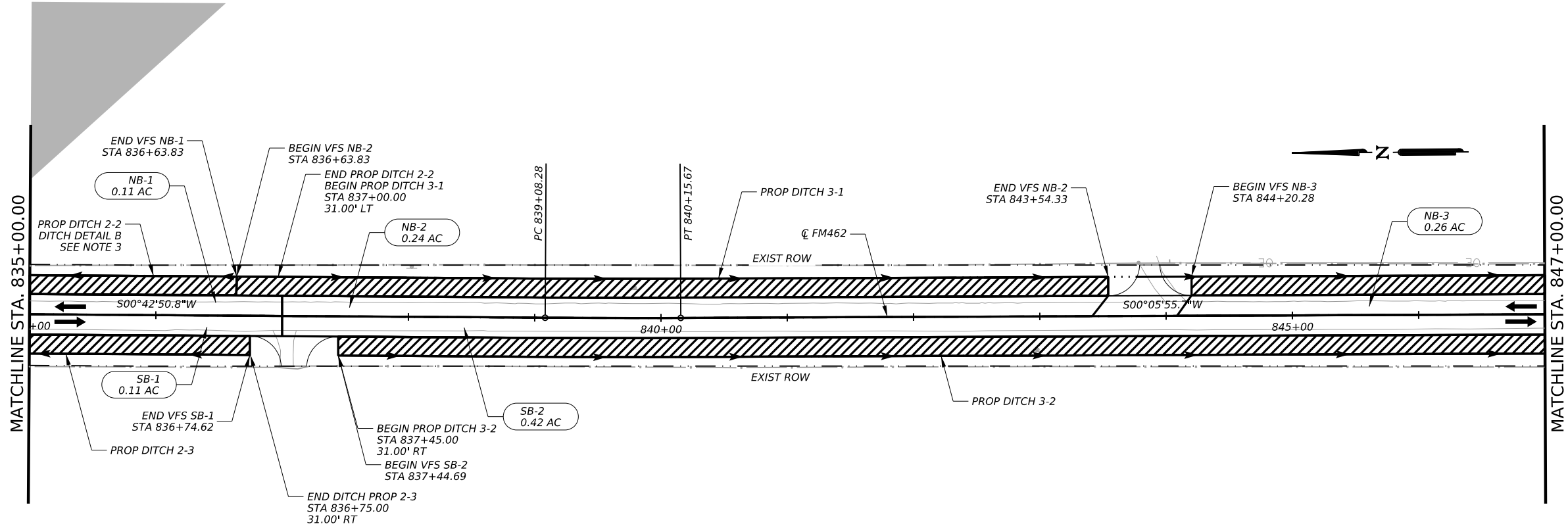
**FM 462**  
**WATER POLLUTION ABATEMENT PLAN**

SHEET 1 OF 3

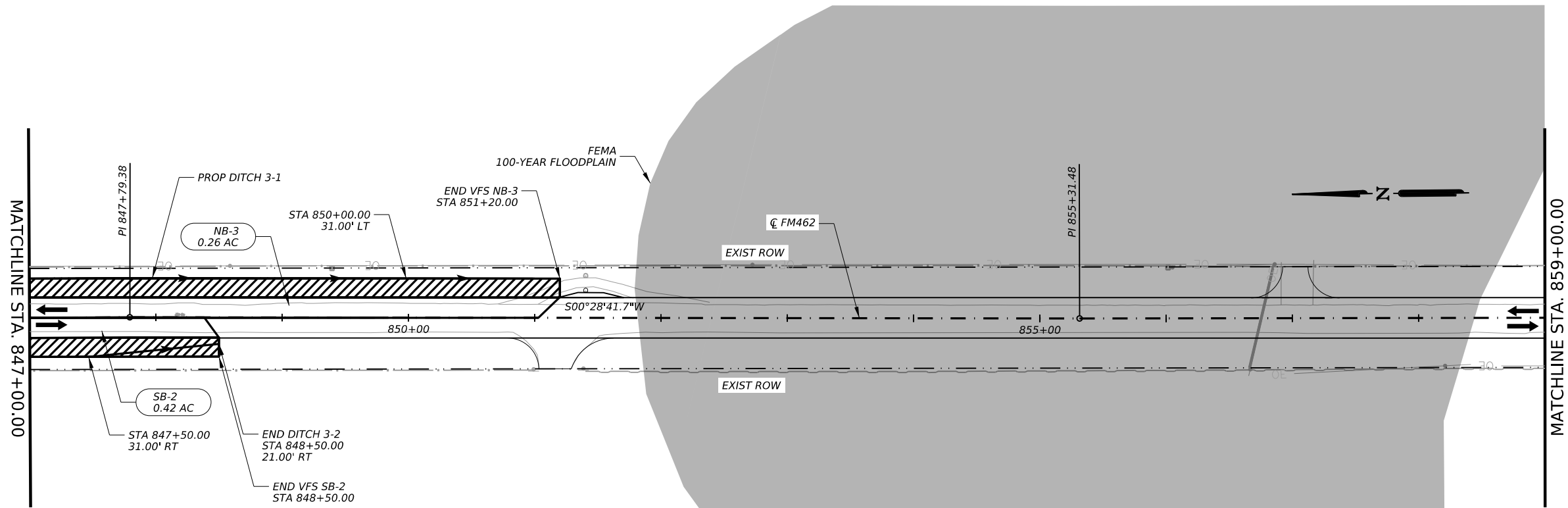
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0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	249	

DATE: 1/31/2024 6:02:59 PM  
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CK: DW: CK: DW: CK: DW:



- LEGEND**
- EXIST FENCE
  - ..... EXIST FEATURES
  - - - - EXIST RIGHT OF WAY
  - - - - LIMITS OF EDWARDS AQUIFER RECHARGE ZONE
  - DIRECTION OF TRAVEL
  - ▨ VEGETATIVE FILTER STRIPS
  - FEMA 100-YEAR FLOODPLAIN



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0' 50' 100'

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**FM 462**

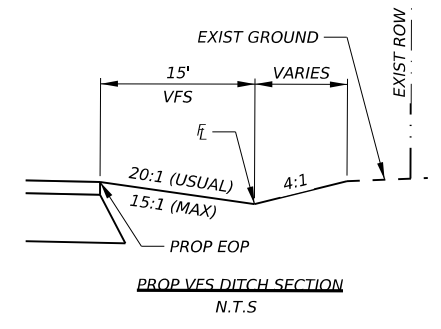
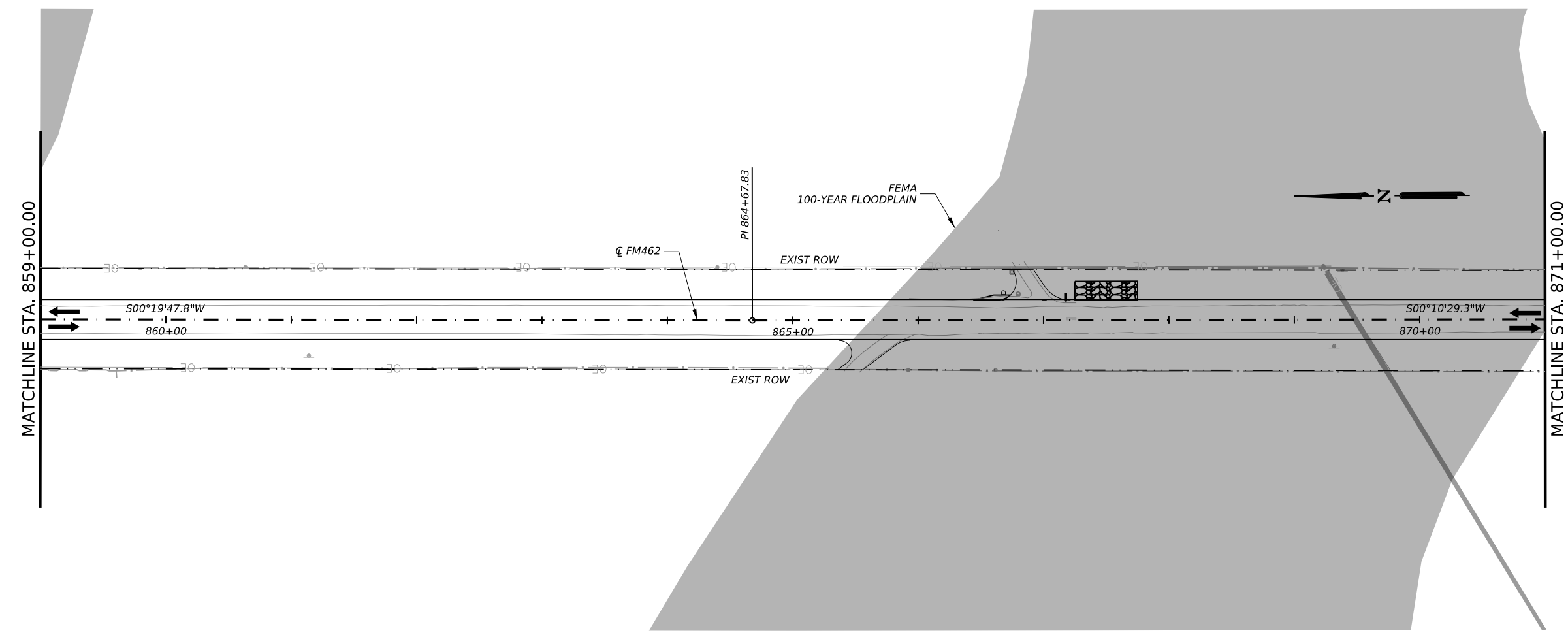
**WATER POLLUTION ABATEMENT PLAN**

SHEET 2 OF 3

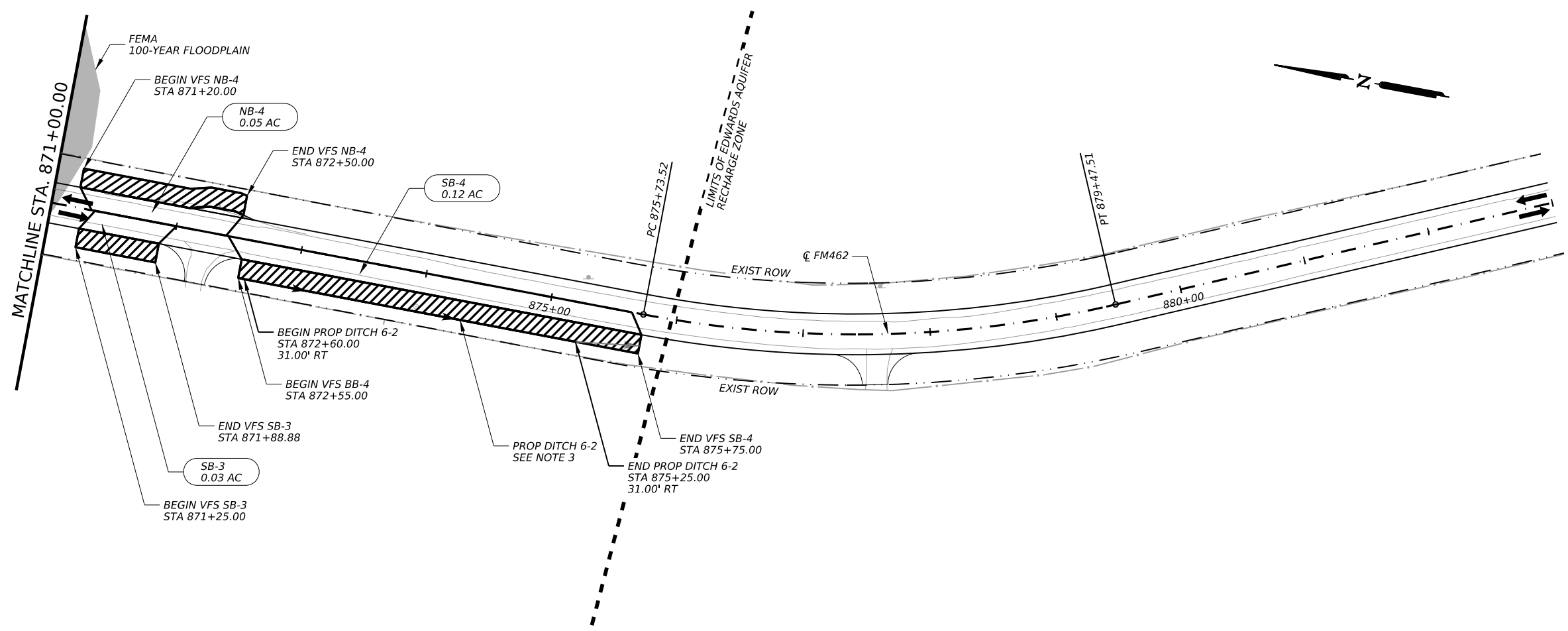
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	250	

DATE: 1/31/2024 6:03:00 PM  
FILE: c:\pwworkh1\0285622\FM462\_ENV\_WPAP.dgn

CK: DW: CK: DN:



- LEGEND**
- EXIST FENCE
  - ..... EXIST FEATURES
  - - - - EXIST RIGHT OF WAY
  - - - - LIMITS OF EDWARDS AQUIFER RECHARGE ZONE
  - DIRECTION OF TRAVEL
  - ▨ VEGETATIVE FILTER STRIPS
  - FEMA 100-YEAR FLOODPLAIN



1/31/2024

0' 50' 100'

**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**WATER POLLUTION ABATEMENT PLAN**

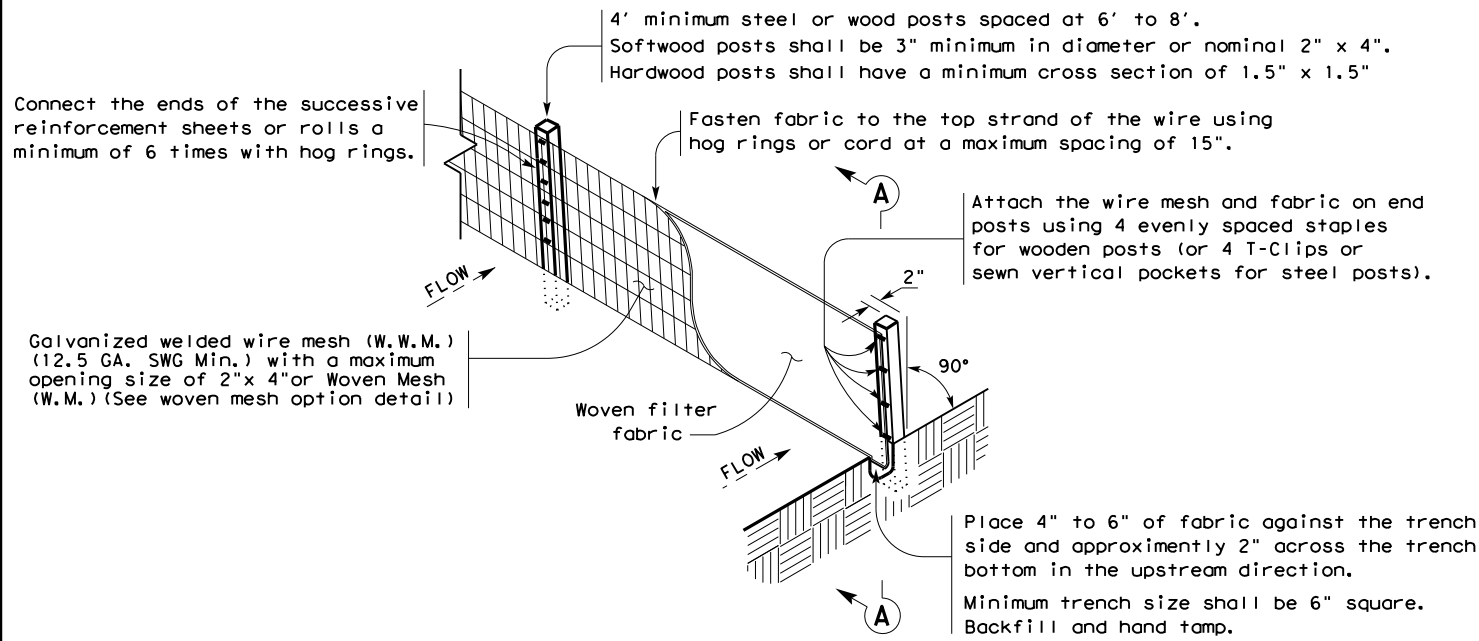
SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	251

DATE: 1/31/2024 6:03:00 PM  
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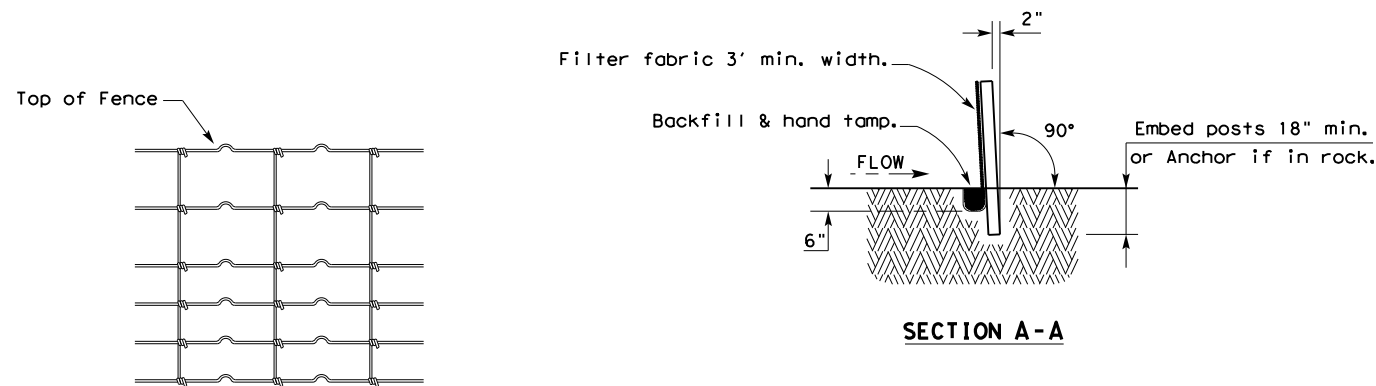
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10/13/2024  
 c:\pbe\khl\d0285622\ec116.dgn



**TEMPORARY SEDIMENT CONTROL FENCE**

SCF



**HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL**

Galvanized hinge joint knot woven mesh (12.5 GA. SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

**SEDIMENT CONTROL FENCE USAGE GUIDELINES**

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT<sup>2</sup>. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

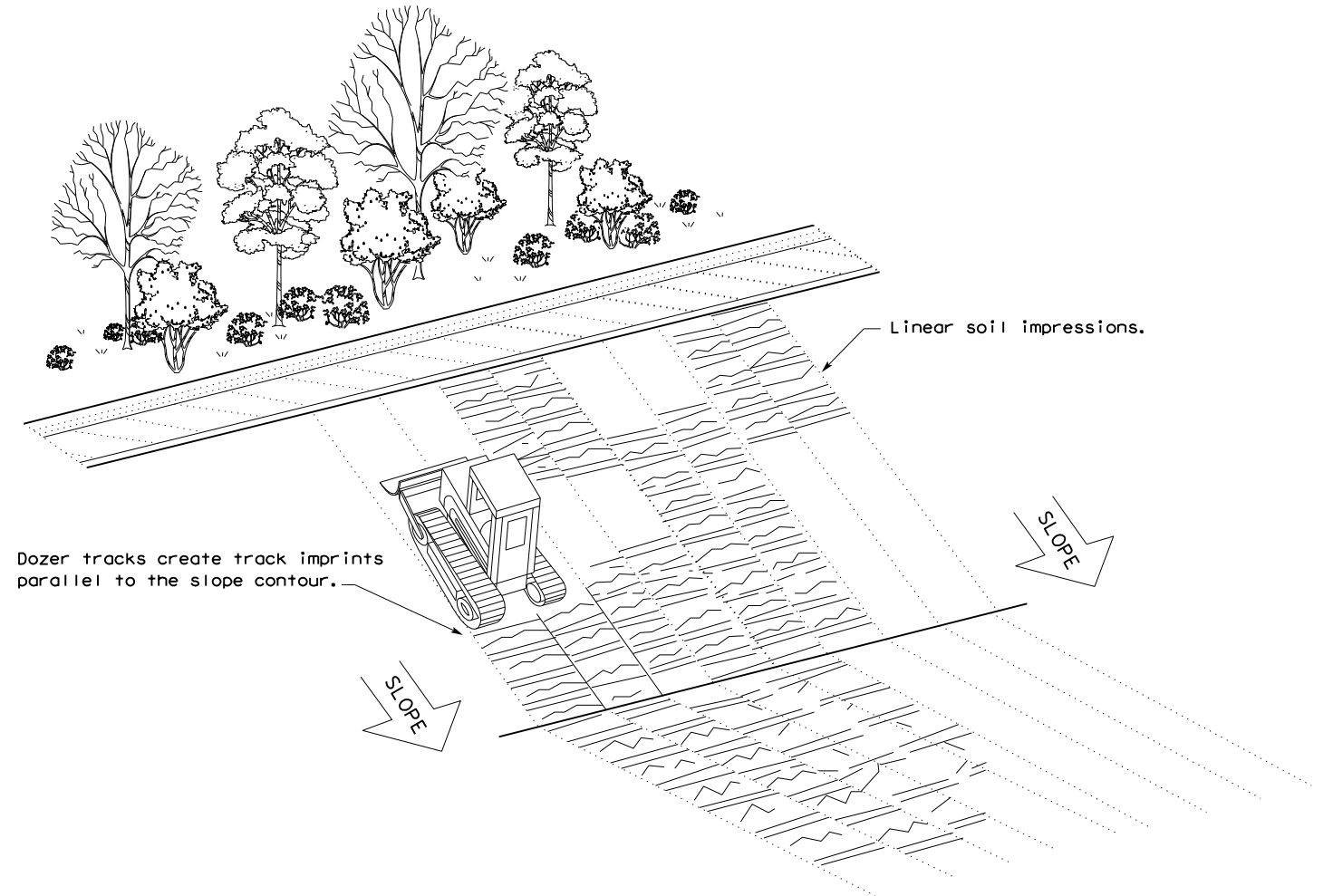
**LEGEND**

Sediment Control Fence

SCF

**GENERAL NOTES**

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.

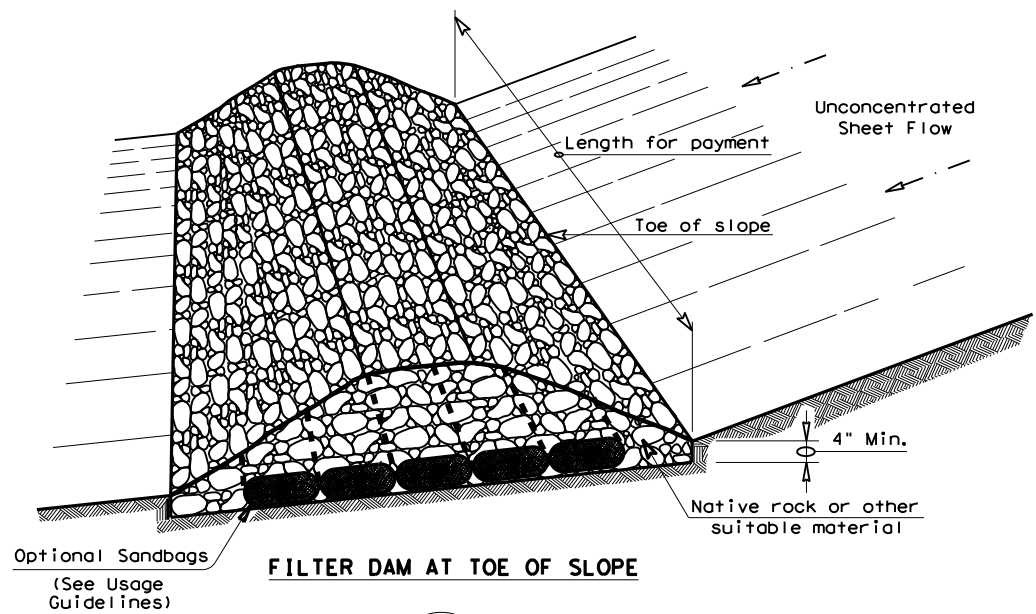


**VERTICAL TRACKING**

				Design Division Standard	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE &amp; VERTICAL TRACKING</b> <b>EC(1) - 16</b>					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0848	04	052	FM 462	
	DIST	COUNTY		SHEET NO.	
	SAT	MEDINA		252	

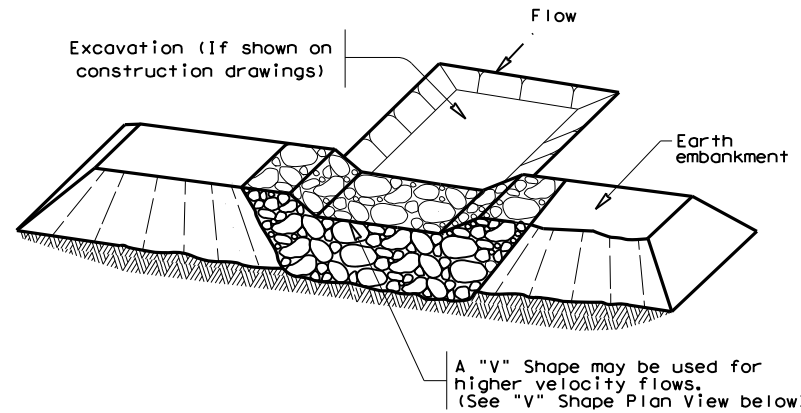
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 FILE: c:\pw\khi\d0285622.ec216.dgn



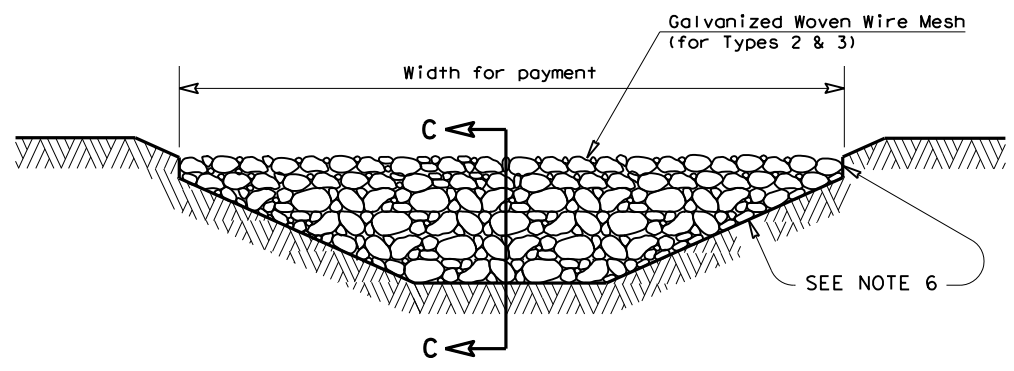
**FILTER DAM AT TOE OF SLOPE**

RFD1



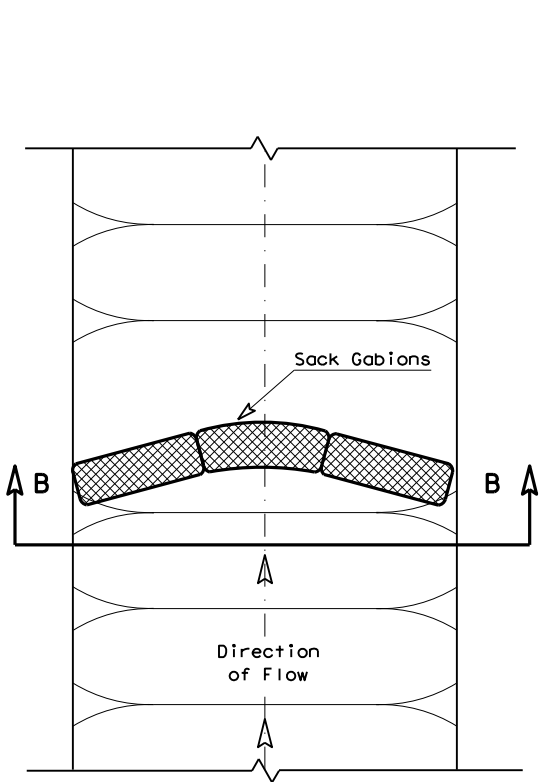
**FILTER DAM AT SEDIMENT TRAP**

RFD1 OR RFD2

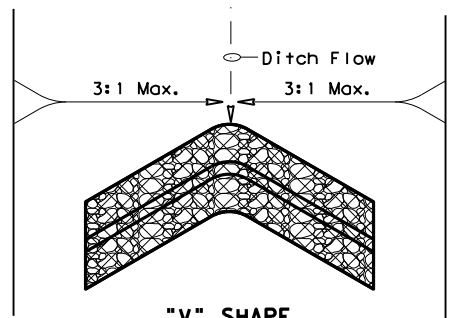


**FILTER DAM AT CHANNEL SECTIONS**

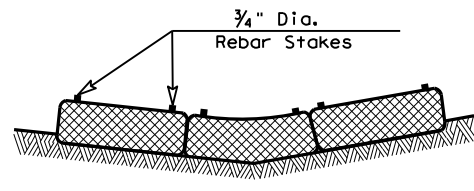
RFD1 OR RFD2 OR RFD3



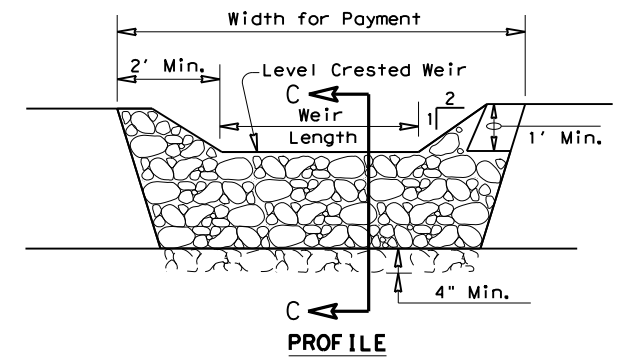
**PLAN VIEW**



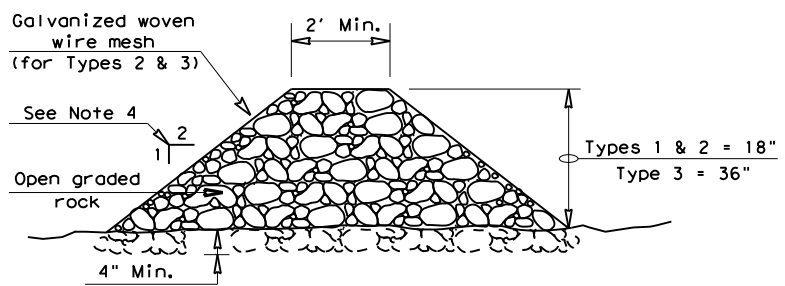
**"V" SHAPE PLAN VIEW**



**SECTION B-B**



**PROFILE**



**SECTION C-C**

**ROCK FILTER DAM USAGE GUIDELINES**

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT<sup>2</sup> of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

**Type 1 (18" high with no wire mesh) (3" to 6" aggregate):** Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximately 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

**Type 2 (18" high with wire mesh) (3" to 6" aggregate):** Type 2 may be used in ditches and at dike or swale outlets.

**Type 3 (36" high with wire mesh) (4" to 8" aggregate):** Type 3 may be used in stream flow and should be secured to the stream bed.

**Type 4 (Sack gabions) (3" to 6" aggregate):** Type 4 May be used in ditches and smaller channels to form an erosion control dam.

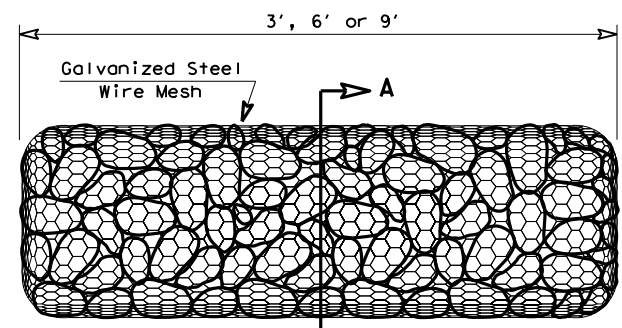
**Type 5:** Provide rock filter dams as shown on plans.

**GENERAL NOTES**

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4".
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

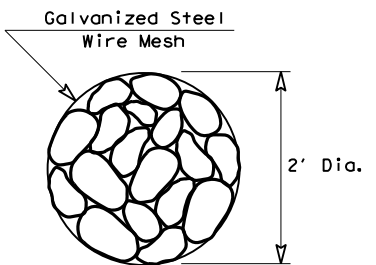
**PLAN SHEET LEGEND**

- Type 1 Rock Filter Dam — RFD1 —
- Type 2 Rock Filter Dam — RFD2 —
- Type 3 Rock Filter Dam — RFD3 —
- Type 4 Rock Filter Dam — RFD4 —



**TYPE 4 (SACK GABIONS)**

RFD4



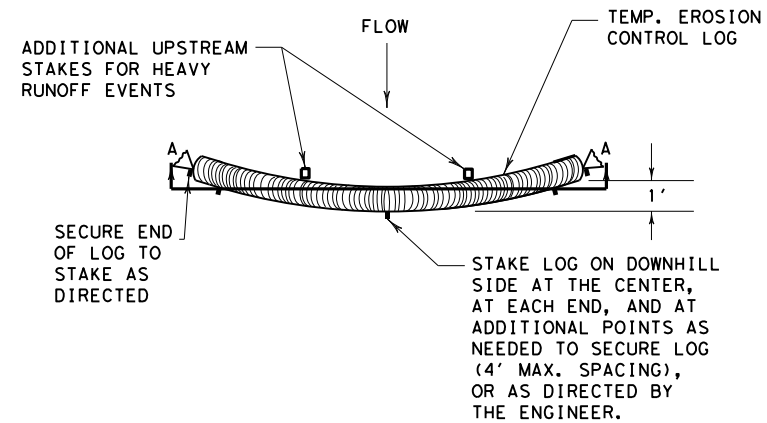
**SECTION A-A**

		<b>Design Division Standard</b>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>ROCK FILTER DAMS</b> <b>EC(2) - 16</b>			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0848 04	052	FM 462
	DIST	COUNTY	SHEET NO.
	SAT	MEDINA	253

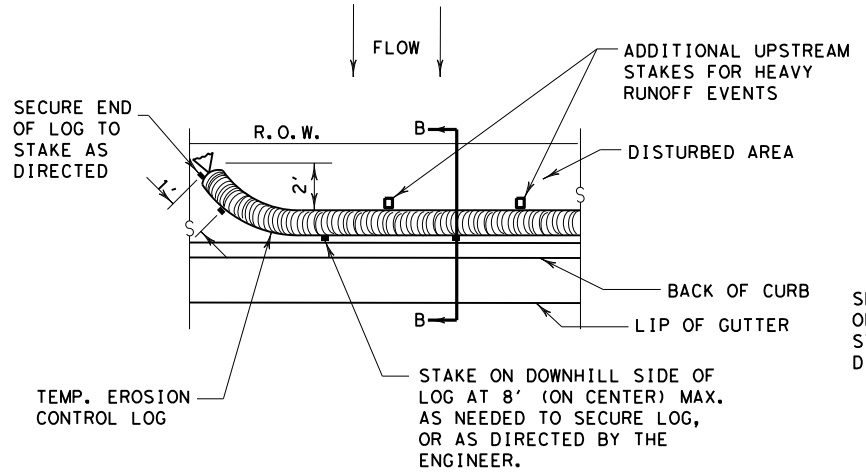


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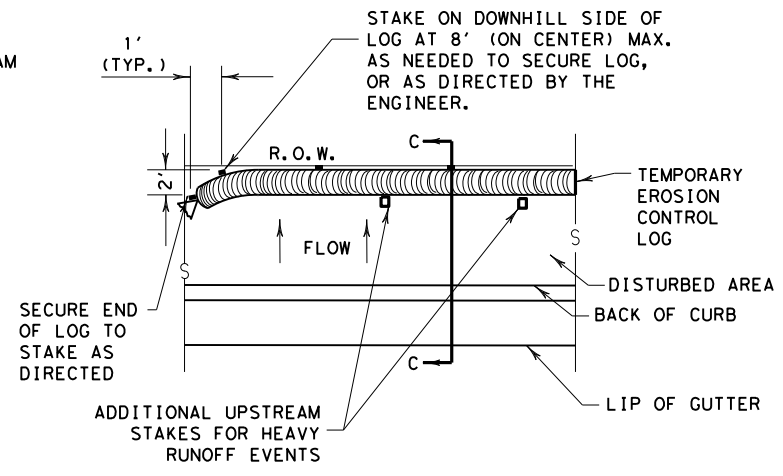
DATE: 1/31/2024  
 FILE: c:\pwworkh1\d0285622\ec916.dgn



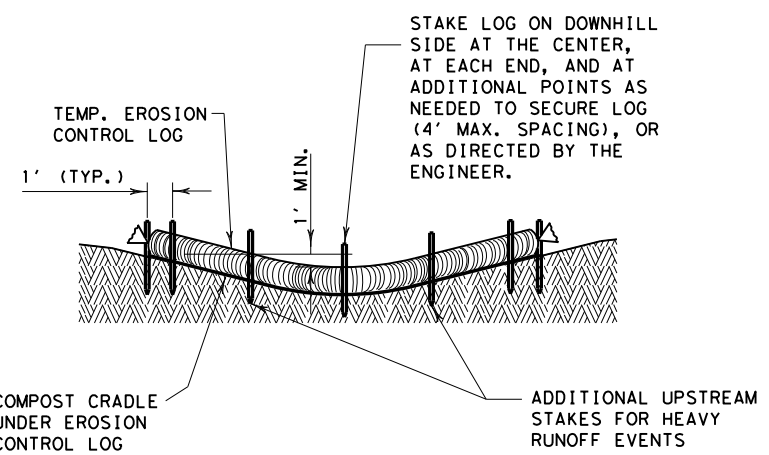
PLAN VIEW



PLAN VIEW



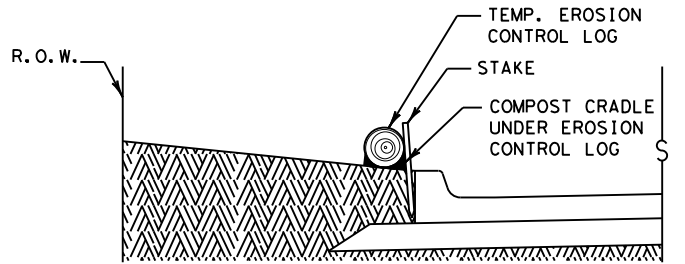
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

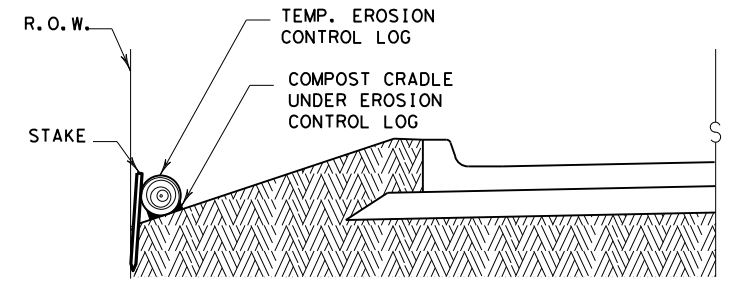
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

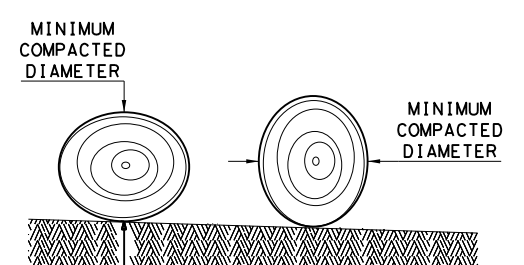
CL-BOC



SECTION C-C

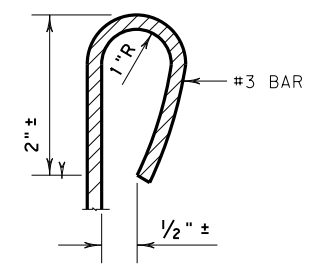
EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

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



REBAR STAKE DETAIL

**SEDIMENT BASIN & TRAP USAGE GUIDELINES**

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

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

Control logs should be placed in the following locations:

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

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

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

**GENERAL NOTES:**

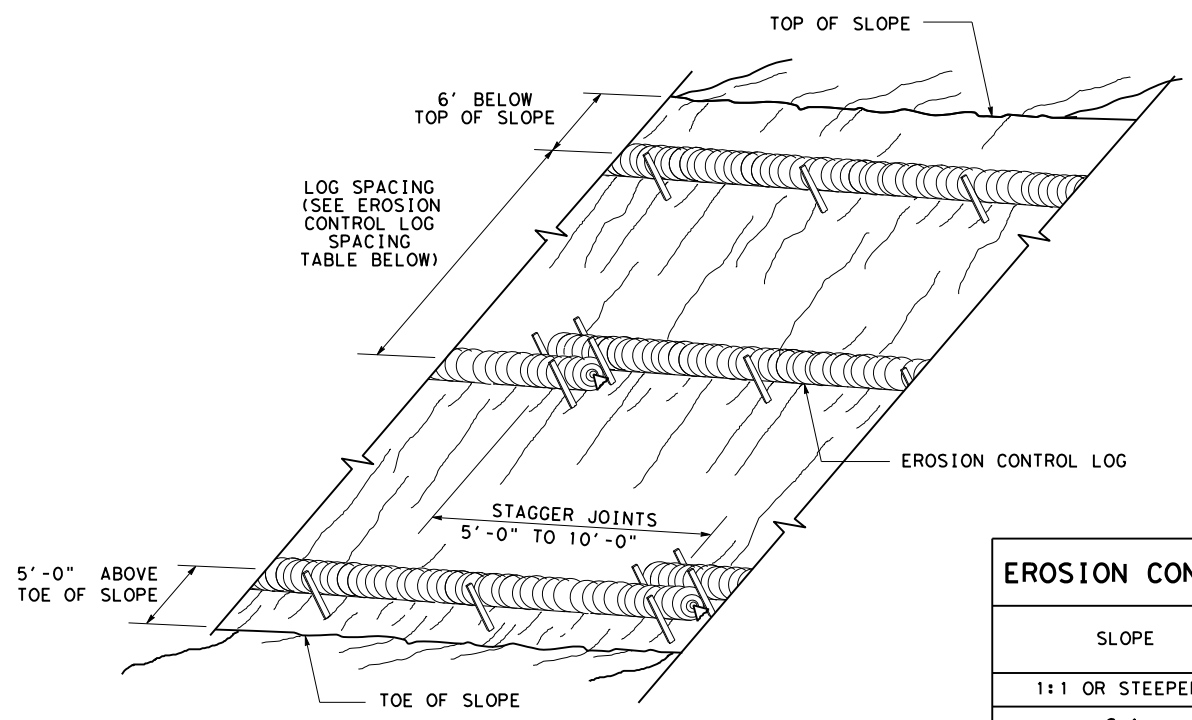
1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE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

SHEET 1 OF 3

		<b>Design Division Standard</b>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b>			
<b>EROSION CONTROL LOG</b>			
<b>EC (9) - 16</b>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0848 04	052	FM 462
	DIST	COUNTY	SHEET NO.
	SAT	MEDINA	254

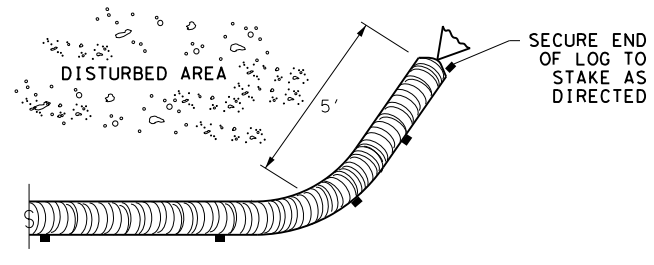
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**EROSION CONTROL LOGS ON SLOPES  
 STAKE AND TRENCHING ANCHORING**

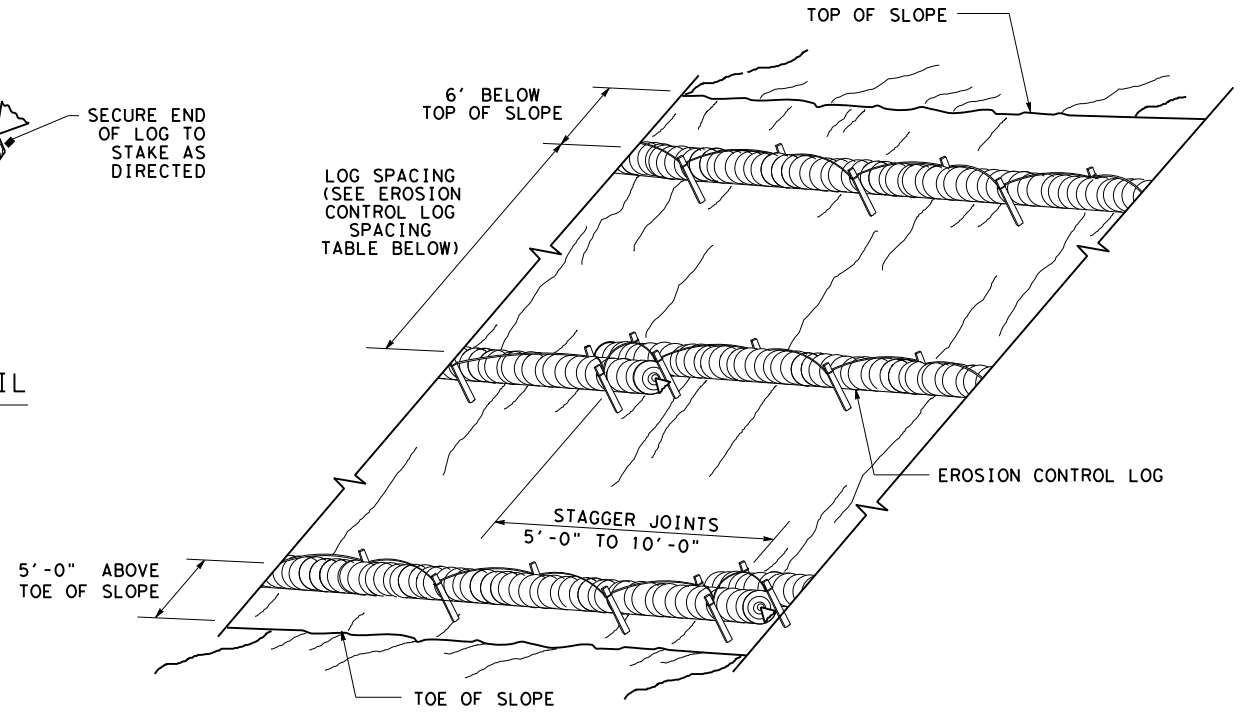
CL-SST



**END SECTION RAP DETAIL**

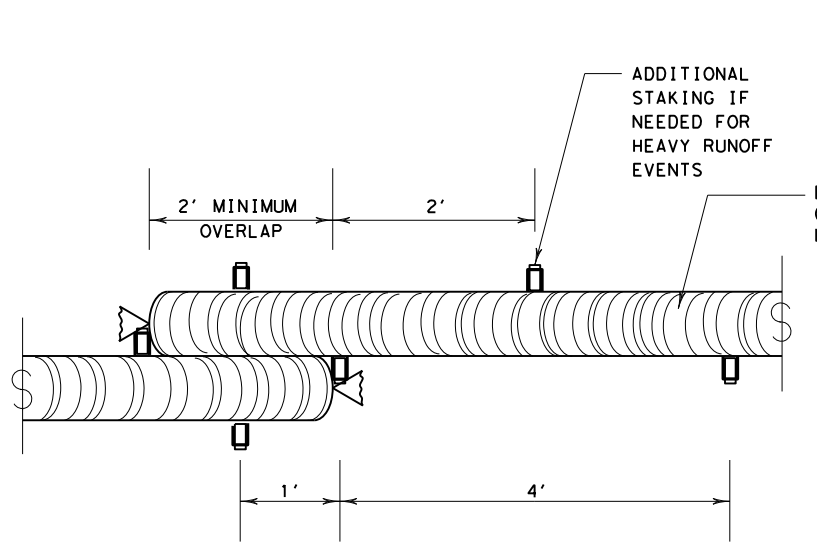
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

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



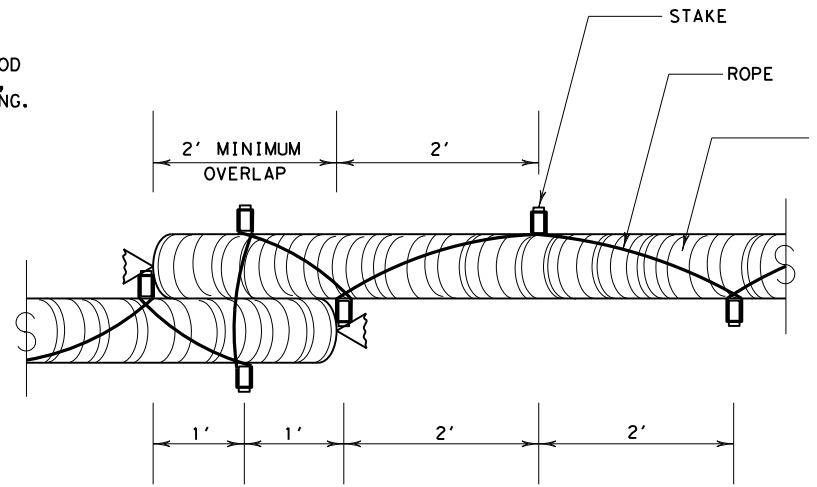
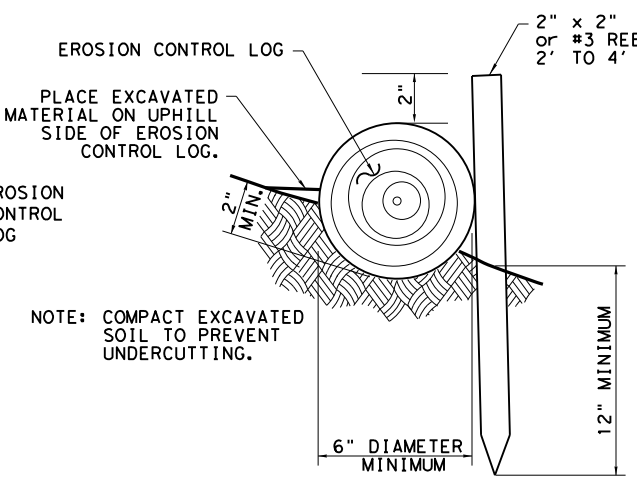
**EROSION CONTROL LOGS ON SLOPES  
 STAKE AND LASHING ANCHORING**

CL-SSL



**STAKE AND TRENCHING ANCHORING DETAIL**

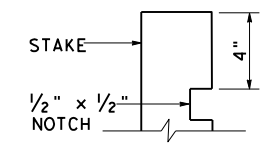
CL-SST



**STAKE AND LASHING ANCHORING DETAIL**

CL-SSL

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



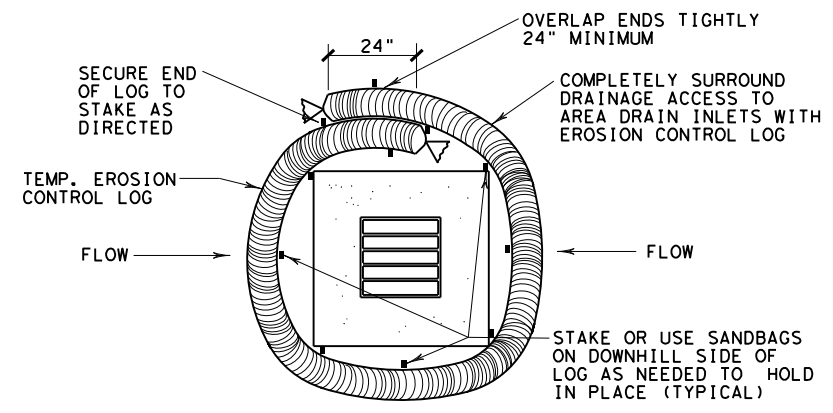
**STAKE NOTCH DETAIL**

SHEET 2 OF 3

		Design Division Standard	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>			
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0848 04	052	FM 462
	DIST	COUNTY	SHEET NO.
	SAT	MEDINA	255

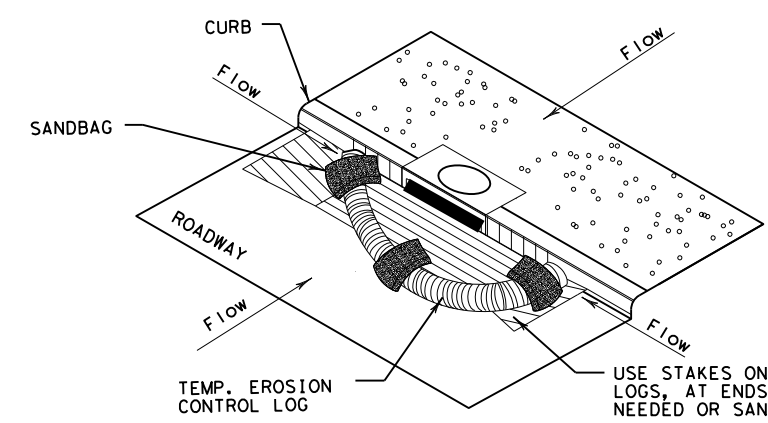
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 1/31/2024  
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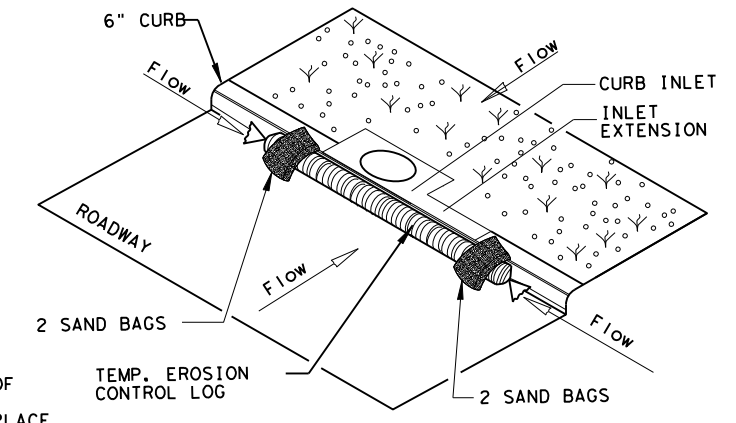
**EROSION CONTROL LOG AT DROP INLET**

CL-DI



**EROSION CONTROL LOG AT CURB INLET**

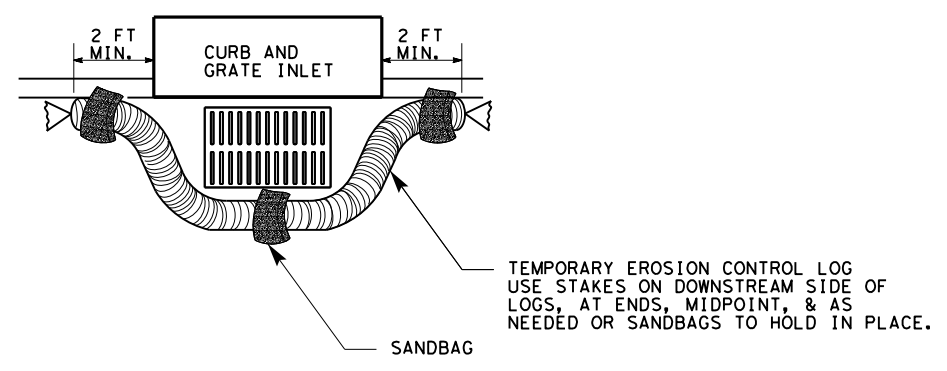
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**EROSION CONTROL LOG AT CURB INLET**

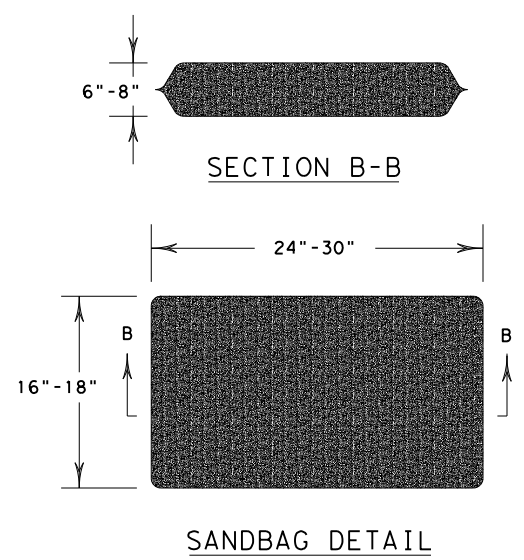
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NOTE:  
 EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



**EROSION CONTROL LOG AT CURB & GRADE INLET**

CL-GI



SHEET 3 OF 3

		<i>Design Division Standard</i>	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0848 04	052	FM 462
	DIST	COUNTY	SHEET NO.
	SAT	MEDINA	256

**Attachment H – Inspection, Maintenance, Repair, and Retrofit  
Plan**

ATTACHMENT H  
INSPECTION, MAINTENANCE, REPAIR AND RETROFIT PLAN  
FM 462 at Hondo Creek  
Medina County, TX  
0848-04-049

These maintenance guidelines were prepared at the request of the Texas Commission on Environmental Quality (TCEQ) with regard to their approval of an Edwards Aquifer Protection Plan for the above referenced project. These guidelines apply to the permanent storm water controls constructed for this project.

**Pest management:** Any vegetated areas that have noxious vegetation, insects, or other pests will be remedied with the minimum amount of selective pesticide necessary to control the pest. All chemicals are EPA labeled, registered, and approved. Personnel licensed and/or trained according to Texas Department of Agriculture (TDA) laws and regulations will apply pesticides. Records are kept for each application in accordance with TDA regulations.

**Inspection cycles:** Maintenance forces will review roadways and roadsides at least twice per year. Any problem areas are duly noted particularly if there is an absence of vegetation, any accumulation of brush, debris or litter, and/or any areas of significant erosion. These items will then be scheduled for repair on priority basis.

**Debris and litter removal:** Litter, debris and brush accumulation is assessed not only for aesthetic reasons but also for the tendency to clog drainage paths or impede the intended flow of a structure's hydraulic design. Areas are cleaned periodically by state forces or by outside contractor. Areas documented as trouble spots are scheduled on a priority basis.

**Sediment removal:** During inspections if sediment has accumulated to a depth that hinders original design characteristics it will be removed. Excessive sedimentation, or a significant load of silt, does not normally occur in filter strip areas or in permanent pond structures after project completion, but it may occur from other drainage areas or construction underway beyond State right-of-way.

**Stormwater Treatment Unit (**Jelly fish**):**

1. Post-construction inspection is required prior to putting the unit into service.
2. It is recommended that stormwater treatment units be inspected on a quarterly basis for the first year of operation. The rate at which each system collects pollutants will often depend more on-site activities than the size or type of unit. For example, watershed construction activities, or heavy winter sanding will cause sediments to accumulate at a more rapid rate.
3. After the first year, maintenance personnel will have a better understanding of the operational characteristics of the unit and subsequent inspections can be reduced if warranted. At a minimum, maintenance should be performed twice annually during detailed inspections. Inspections and maintenance should be concurrent with other project BMP inspections when feasible. At least one of the inspections should occur following a rainfall event to observe system operations.



4. In the event of an oil, fuel, or other chemical spill, an inspection is required.
5. All exposed site areas should be stabilized to minimize sediment loads in unit and runoff from non-stabilized construction areas should be routed around the unit and treated separately.
6. With each inspection, any damage to the structural elements of the system (pipes, concrete drainage structures, filters, cartridges, etc.) must be identified and repaired immediately. Cracks, voids and undermining should be patched/filled to prevent growth in cracks and joints that can cause structural damage. Repair or replace any components that are inoperative.
7. Maintenance should be conducted by professional vacuum cleaning service providers with experience in confined space entry procedures and the maintenance of underground tanks, sewers, or catch basins.
  - a. Every 12 months, filter cartridges should be tested for adequate flow rate and cleaned, recommissioned, or replaced as necessary.
  - b. A manual backflush must be performed on one of the draindown cartridges using the unit's backflush pipe. If time required to drain 14 gallons exceeds 15 seconds, it is recommended to perform a manual backflush on each cartridge. If draindown time exceeds 15 seconds after manual backflush, then cartridge must be replaced.
8. Filters/Cartridges should be replaced once every three years. If inspection of the removed filters/cartridges indicates that their life expectancy exceeds three years, a modified maintenance plan should be provided to TCEQ specifying the new replacement schedule. Filters/Cartridges may initially require annual replacement due to sediment load from construction activities. Cartridge replacement also may be required in the event of a chemical or hazardous material spill or due to excessive sediment loading from site erosion or extreme storms.
9. Check and verify that the BMP facility site(s) are secure at least once per month. Any site found to be insecure should be made secure immediately.
10. Standing water within vaults may become a location of mosquito breeding. The facility should be evaluated at least twice a year to determine if mosquito control is needed.

Maintenance Contact: The Maintenance Supervisor may be contacted for questions or concerns pertaining to maintenance of the facility.

Mr. Henry J. Fojtik  
TxDOT Department of Transportation  
Transportation Engineer Supervisor  
4615 NW Loop 410  
San Antonio, Texas 78229  
(210) 615-5935



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Signature

**Attachment J – Measures for Minimizing Surface Stream  
Contamination**

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**I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402**

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

- No Action Required     Required Action

Action No.

- Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
- Comply with the Storm Water Pollution Prevention Plan (SW3P) and revise when necessary to control pollution or required by the Engineer.
- Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and Texas Commission on Environmental Quality (TCEQ), Environmental Protection Agency (EPA) or other inspectors.
- When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, Contractor shall submit Notice of Intent (NOI) to TCEQ and the Engineer.
- NOI required:  Yes  No

Note: If amount of soil disturbance changes, permit requirements may change.

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

US Army Corps of Engineers (USACE) Permit required for filling, dredging, excavating or other work in any potential USACE jurisdictional water, such as, rivers, creeks, streams, or wetlands.

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

- No Permit Required
- Nationwide Permit (NWP) 14 - Pre-construction Notice (PCN) not Required
- Nationwide Permit 14 - PCN Required
- Individual 404 Permit Required
- Other Nationwide Permit Required: NWP# \_\_\_\_\_

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

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401 Best Management Practices: (Not applicable if no USACE permit)

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

**III. CULTURAL RESOURCES**

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

- No Action Required     Required Action

Action No.

- 
- 
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- 

**IV. VEGETATION RESOURCES**

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

- No Action Required     Required Action

Action No.

- 
- 
- 
- 

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

- No Action Required     Required Action

Action No.

1. MIGRATORY BIRD NESTS: Schedule construction activities as needed to meet the following requirements:

- A. Do not remove or destroy any active migratory bird nests (nests containing eggs and/or flightless birds) at any time of year. If there are any active nests, they shall not be removed until the nests become inactive.
- B. On/in structures, if there are any active nests, they shall not be removed until all nests become inactive. After inactive nests are removed and/or before nest activity begins, deterrent materials may be applied to the structures to prevent future nest building.

2. See Item 5 in General Notes.

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

**VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES**

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:

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

Hazardous Materials or Contamination Issues Specific to this Project:

- No Action Required     Required Action

Action No.

- 

Does the project involve the demolition of a span bridge?

- Yes     No (No further action required)

If "Yes", a pre-demolition notification must be submitted to the Texas Department of State Health Services. The contractor shall contact TxDOT's Project Engineer 25 calendar days prior to the demolition of the bridge(s) on the project to assist with the notification.

**VII. OTHER ENVIRONMENTAL ISSUES**

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

- No Action Required     Required Action

Action No.

1. Project is located in the TCEQ Edwards Aquifer Recharge Zone and the EPA Sole Source Aquifer Recharge Zone. The Contractor shall comply with the Texas Commission on Environmental Quality (TCEQ) approved Water Pollution Abatement Plan (WPAP) and conditions in the TCEQ and EPA approval letters for this project. A copy of the project WPAP, TCEQ and EPA approval letters shall be maintained on site. No regulated activities shall begin until approval of the WPAP has been received from the TCEQ and EPA.

2. The Contractor must immediately report spills (including sanitary sewer discharge) of reportable quantities to TxDOT and to the following:

- \* State Emergency Response Center 800-832-8224
- \* TCEQ Regional Office 210-490-3096
- \* National Response Center 800-424-8802
- \* Edwards Aquifer Authority 210-222-2204

3. Hazardous substances (e.g., fuel, oil, asphalt emulsion, concrete curing compounds) shall not be stored on the state ROW or easements.

4. Intentional discharges of sediment laden storm water during construction are not allowed.

5. If any sensitive feature (e.g., cave, sinkhole, well) is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately and notify the Engineer. Construction near the sensitive feature may not proceed until the feature has been evaluated and approval to continue construction has been received.



**ENVIRONMENTAL PERMITS,  
ISSUES AND COMMITMENTS  
EPIC**

FILE: epic_2015-10-09_SAT.dgn	DN: TxDOT	CK: TxDOT	DW: BW	CK: GAG
© TxDOT	OCTOBER 2015	CONT	SECT	JOB
REVISIONS		0848	04	052
		DIST	COUNTY	SHEET NO.
		SAT	MEDINA	234

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

For all projects with soil disturbing activity and for projects that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

**1.0 SITE/PROJECT DESCRIPTION**

**1.1 PROJECT CONTROL SECTION JOB (CSJ):**  
\_0848-04-052\_

**1.2 PROJECT LIMITS:**

From: 1.5 mi North of CR 331

To: CR 433

**1.3 PROJECT COORDINATES:**

BEGIN: (Lat) W99°12'03.9", (Long) N29°28'18.7"

END: (Lat) W99°10'22" , (Long) N29°23'49.1"

**1.4 TOTAL PROJECT AREA (Acres): 55.55 Acres**

**1.5 TOTAL AREA TO BE DISTURBED (Acres): 38.61 Acres**

**1.6 NATURE OF CONSTRUCTION ACTIVITY:**

WORK CONSISTING OF GRADING, BASE, AND SURFACE TREATMENT FOR PAVEMENT REHABILITATION AND WIDENING

**1.7 MAJOR SOIL TYPES:**

Soil Type	Description
Atco loam, 0 to 1 percent slopes	90% Atco, well drained, no runoff
Knippa clay, 0 to 1 percent slopes	92% Knippa, well drained, low runoff
Sabenyo clay loam, 1 to 5 percent slopes	85% Sabenyo, well drained, low runoff
Orif soils, 0 to 3 percent slopes, frequently flooded	70% Orif, well drained, very low runoff
Castroville clay loam, 0 to 1 percent slopes	85% Castroville, well drained, no runoff
Knippa clay 1 to 3 percent slopes	95% Knippa, well drained, medium runoff
Castroville clay loam, 1 to 3 percent slopes	85% Castroville, well drained, low runoff

**1.8 PROJECT SPECIFIC LOCATIONS (PSLs):**

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

- PSLs determined during preconstruction meeting
- PSLs determined during construction
- No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

**1.9 CONSTRUCTION ACTIVITIES:**

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.5.)

- Mobilization
- Install sediment and erosion controls
- Blade existing topsoil into windrows, prep ROW, clear and grub
- Remove existing pavement
- Grading operations, excavation, and embankment
- Excavate and prepare subgrade for proposed pavement widening
- Remove existing culverts, safety end treatments (SETs)
- Remove existing metal beam guard fence (MBGF), bridge rail
- Install proposed pavement per plans
- Install culverts, culvert extensions, SETs
- Install mow strip, MBGF, bridge rail
- Place flex base
- Rework slopes, grade ditches
- Blade windrowed material back across slopes
- Revegetation of unpaved areas
- Achieve site stabilization and remove sediment and erosion control measures

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.10 POTENTIAL POLLUTANTS AND SOURCES:**

- Sediment laden stormwater from stormwater conveyance over disturbed area
- Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- Solvents, paints, adhesives, etc. from various construction activities
- Transported soils from offsite vehicle tracking
- Construction debris and waste from various construction activities
- Contaminated water from excavation or dewatering pump-out water
- Sanitary waste from onsite restroom facilities
- Trash from various construction activities/receptacles
- Long-term stockpiles of material and waste
- Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities.

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.11 RECEIVING WATERS:**

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody

\* Add (\*) for impaired waterbodies with pollutant in ( ).

**1.12 ROLES AND RESPONSIBILITIES: TxDOT**

- Development of plans and specifications
- Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- Post Construction Site Notice
- Submit NOI/CSN to local MS4
- Perform SWP3 inspections
- Maintain SWP3 records and update to reflect daily operations
- Complete and submit Notice of Termination to TCEQ
- Maintain SWP3 records for 3 years

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR**

- Day To Day Operational Control
- Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- Post Construction Site Notice
- Submit NOI/CSN to local MS4
- Maintain schedule of major construction activities
- Install, maintain and modify BMPs
- Complete and submit Notice of Termination to TCEQ
- Maintain SWP3 records for 3 years

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:**

MS4 Entity
NO MS4s RECIEVE STROMWATER DISCHARGE FROM THE SITE

**STORMWATER POLLUTION PREVENTION PLAN (SWP3)**

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
				232
STATE	STATE DIST.	COUNTY		
TEXAS	SAT	MEDINA		
CONT.	SECT.	JOB	HIGHWAY NO.	
0848	04	052	FM 462	

**STORMWATER POLLUTION PREVENTION PLAN (SWP3):**

**2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE**

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

**2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:**

**T / P**

- Protection of Existing Vegetation
- Vegetated Buffer Zones
- Soil Retention Blankets
- Geotextiles
- Mulching/ Hydromulching
- Soil Surface Treatments
- Temporary Seeding
- Permanent Planting, Sodding or Seeding
- Biodegradable Erosion Control Logs
- Rock Filter Dams/ Rock Check Dams

- Vertical Tracking
- Interceptor Swale
- Riprap
- Diversion Dike
- Temporary Pipe Slope Drain
- Embankment for Erosion Control
- Paved Flumes
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.2 SEDIMENT CONTROL BMPs:**

**T / P**

- Biodegradable Erosion Control Logs
- Dewatering Controls
- Inlet Protection
- Rock Filter Dams/ Rock Check Dams
- Sandbag Berms
- Sediment Control Fence
- Stabilized Construction Exit
- Floating Turbidity Barrier
- Vegetated Buffer Zones
- Vegetated Filter Strips

- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

**T / P**

- Sediment Trap
  - Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - 3,600 cubic feet of storage per acre drained
- Sedimentation Basin
  - Not required (<10 acres disturbed)
  - Required (>10 acres) and implemented.
    - Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - 3,600 cubic feet of storage per acre drained
  - Required (>10 acres), but not feasible due to:
    - Available area/Site geometry
    - Site slope/Drainage patterns
    - Site soils/Geotechnical factors
    - Public safety
    - Other: \_\_\_\_\_

**2.3 PERMANENT CONTROLS:**

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.4 OFFSITE VEHICLE TRACKING CONTROLS:**

- Excess dirt/mud on road removed daily
- Haul roads dampened for dust control
- Loaded haul trucks to be covered with tarpaulin
- Stabilized construction exit
- Daily street sweeping
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.5 POLLUTION PREVENTION MEASURES:**

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_
- Other: \_\_\_\_\_

**2.6 VEGETATED BUFFER ZONES:**

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

**2.7 ALLOWABLE NON-STORMWATER DISCHARGES:**

- Fire hydrant flushings
- Irrigation drainage
- Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- Potable water sources
- Springs
- Uncontaminated groundwater
- Water used to wash vehicles or control dust
- Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

**2.8 DEWATERING:**

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

**2.9 INSPECTIONS:**

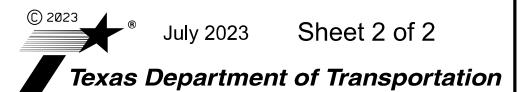
All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

When dewatering activities are present, a daily inspection will be conducted once per day during those activities and documented in accordance with CGP and TxDOT requirements.

**2.10 MAINTENANCE:**

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.5 of this SWP3.

**STORMWATER POLLUTION PREVENTION PLAN (SWP3)**

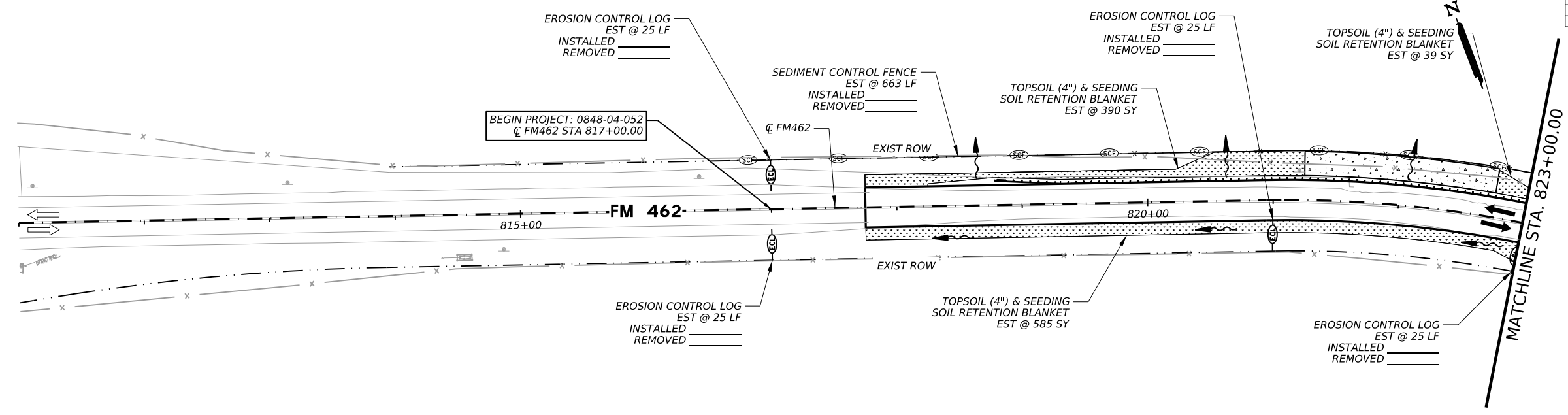


FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
				233
STATE	STATE DIST.	COUNTY		
TEXAS	SAT	MEDINA		
CONT.	SECT.	JOB	HIGHWAY NO.	
0848	04	052	FM 462	



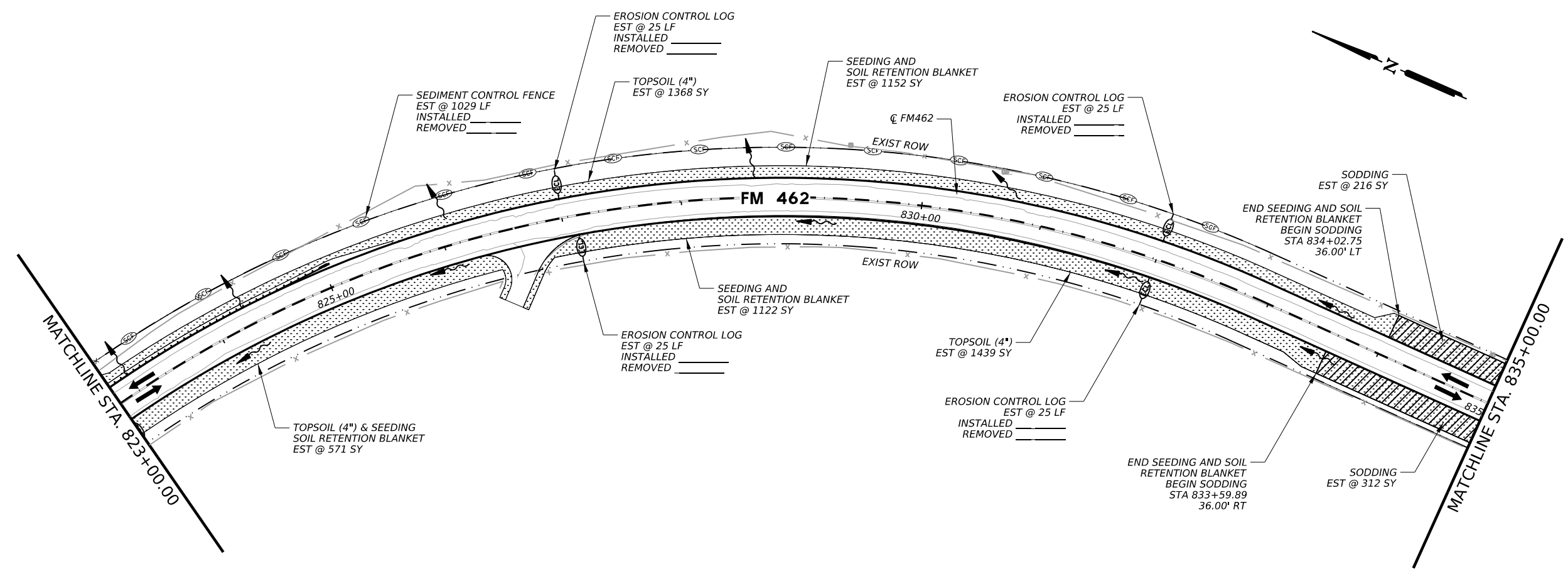
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SHEET #	ITEM	DESCRIPTION	UNIT	QTY
0160	6003	FURNISHING AND PLACING TOPSOIL (4")	SY	4387
0162	6008	ROLL SODDING	SY	528
0164	6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	3859
0164	6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	3859
0168	6001	VEGETATIVE WATERING	MG	128.7
0169	6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	3859
0506	6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1692
0506	6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1692
0506	6041	BIODEG EROSN CONT LOGS (INSLT) (12")	LF	200
0506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	200



**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- [Hatched Box] SEEDING
- [Dotted Box] SODDING
- (SCF) SILT FENCE
- (ECL) EROSION CONTROL LOG
- (RFD) ROCK FILTER DAM
- > FLOW ARROW



2/5/2024

DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

0' 50' 100'

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

SHEET 1 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	235	

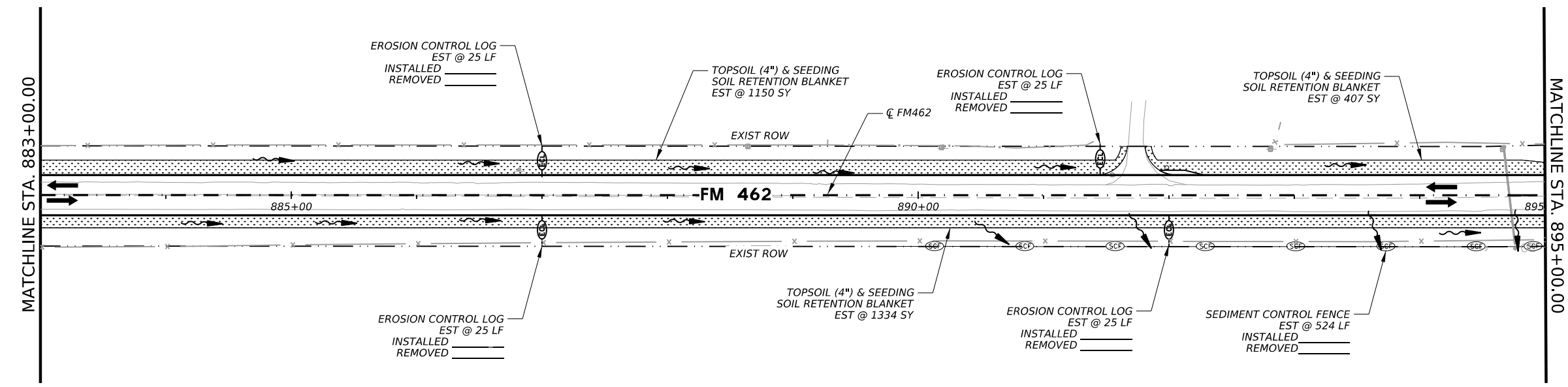
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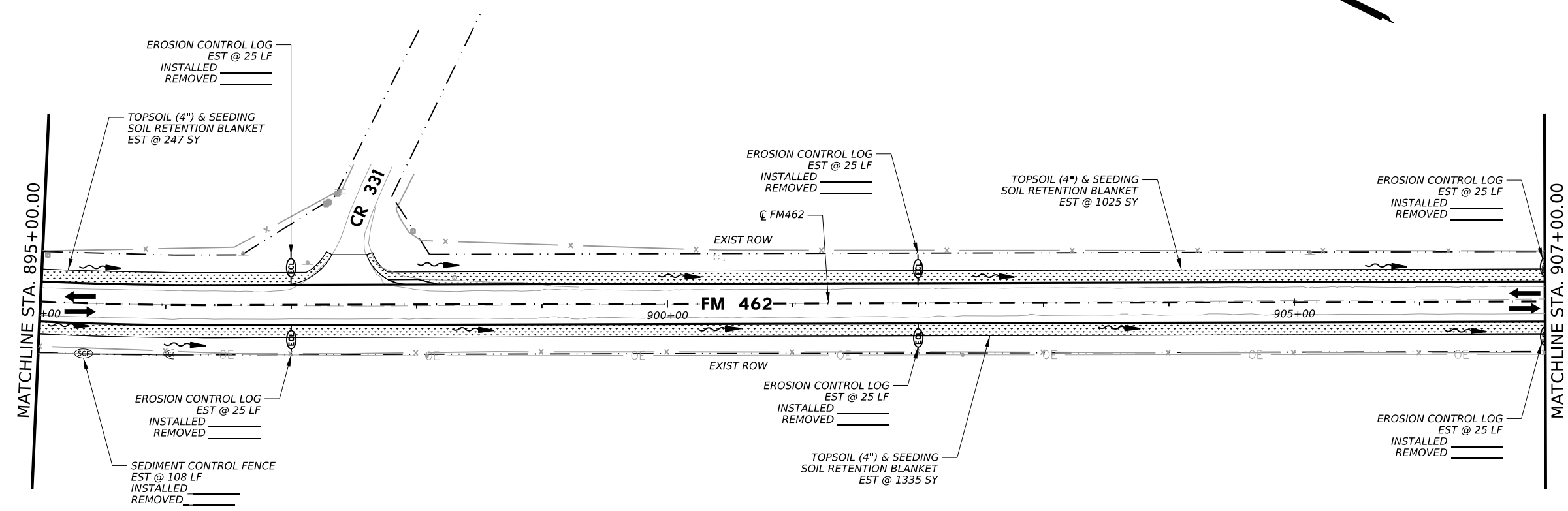
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SHEET #	ITEM	DESCRIPTION	UNIT	QTY
	0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	5498
	0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5498
	0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5498
	0168 6001	VEGETATIVE WATERING	MG	171.6
	0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5498
	0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	632
	0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	632
	0506 6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	250
	0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	250



**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- SEEDING
- SODDING
- SCF SILT FENCE
- ECL EROSION CONTROL LOG
- RFD ROCK FILTER DAM
- > FLOW ARROW



2/5/2024

0' 50' 100'

DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

**Kimley Horn** F-928

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 Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

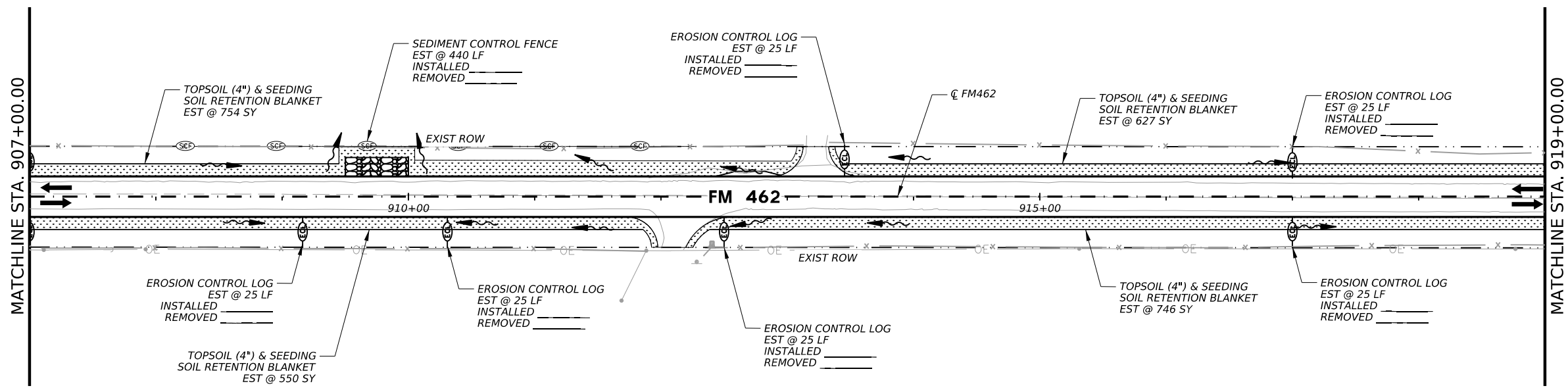
SHEET 4 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	238	

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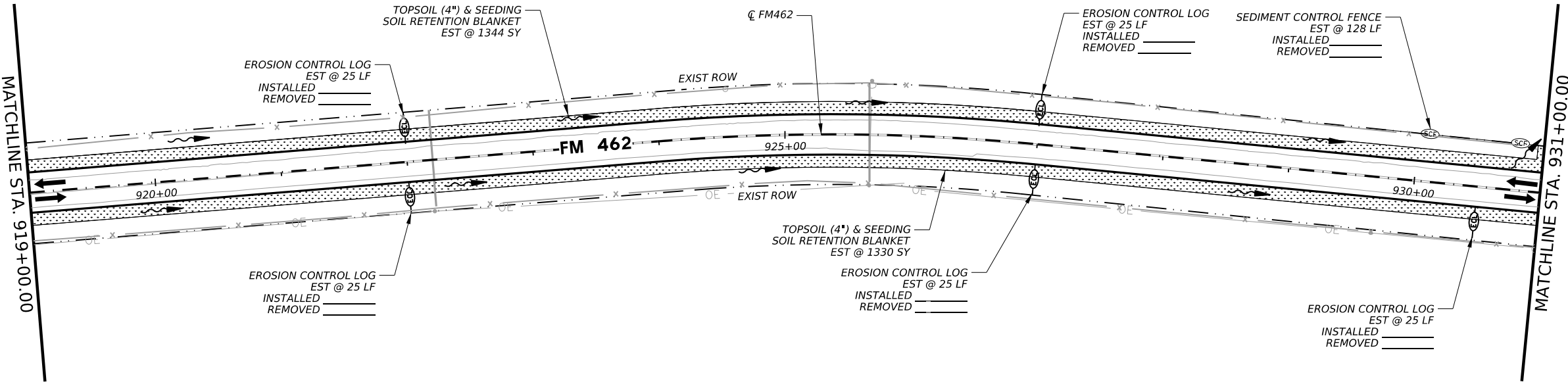


SHEET #	DESCRIPTION	UNIT	QTY
0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	5351
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5351
0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	5351
0168 6001	VEGETATIVE WATERING	MG	167.0
0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5351
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	568
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	568
0506 6041	BIODEG EROSN CONT LOGS (INSTR) (12")	LF	275
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	275



**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- SEEDING
- SODDING
- SCP SILT FENCE
- ECL EROSION CONTROL LOG
- RFD ROCK FILTER DAM
- > FLOW ARROW



2/5/2024

DAVID H. GUTIERREZ  
143301  
LICENSED PROFESSIONAL ENGINEER

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

SHEET 5 OF 13

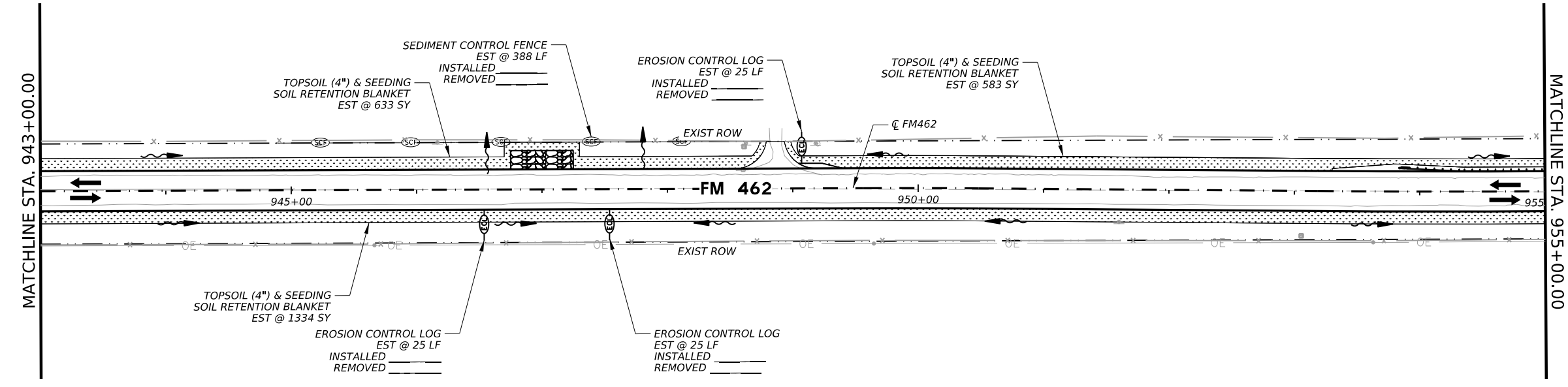
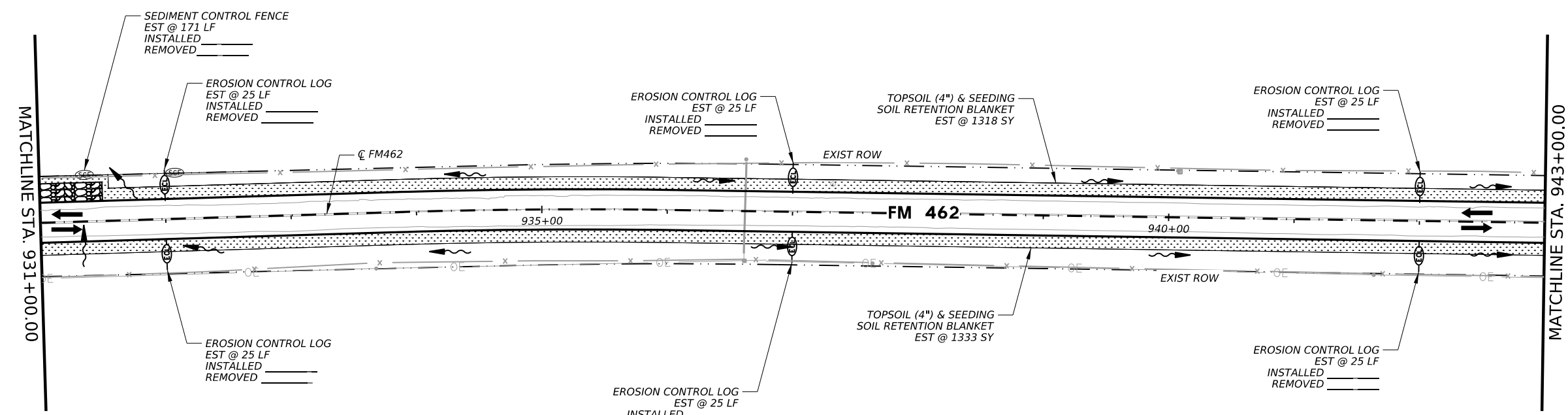
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0848	04		FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	239	

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CK: \_\_\_\_\_  
 DW: \_\_\_\_\_  
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 DW: \_\_\_\_\_

SHEET #	ITEM	DESCRIPTION	UNIT	QTY
0160	6003	FURNISHING AND PLACING TOPSOIL (4")	SY	5201
0164	6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5201
0164	6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	5201
0168	6001	VEGETATIVE WATERING	MG	162.3
0169	6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5201
0506	6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	559
0506	6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	559
0506	6041	BIODEG EROSN CONT LOGS (INSTR) (12")	LF	225
0506	6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	225



**LEGEND**

- X --- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- SEEDING
- SODDING
- SCF SILT FENCE
- ECL EROSION CONTROL LOG
- RFD ROCK FILTER DAM
- > FLOW ARROW

2/5/2024

DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

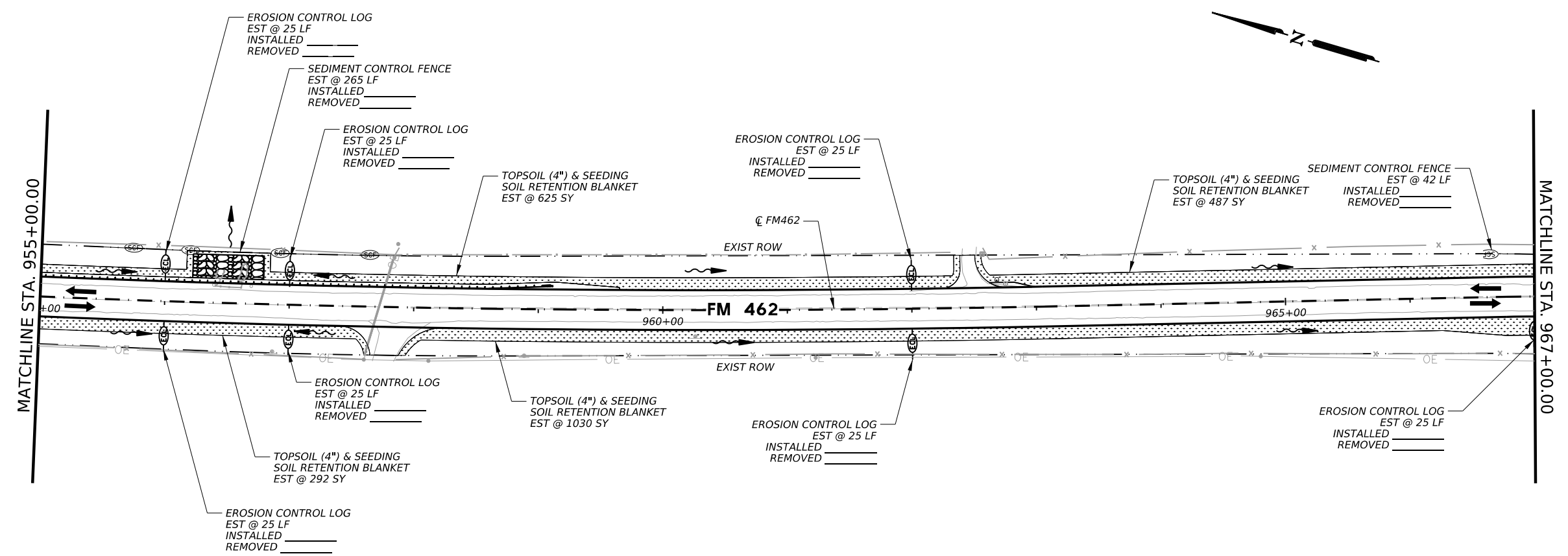
SHEET 6 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
SAT	COUNTY	SHEET NO.	
	MEDINA	240	

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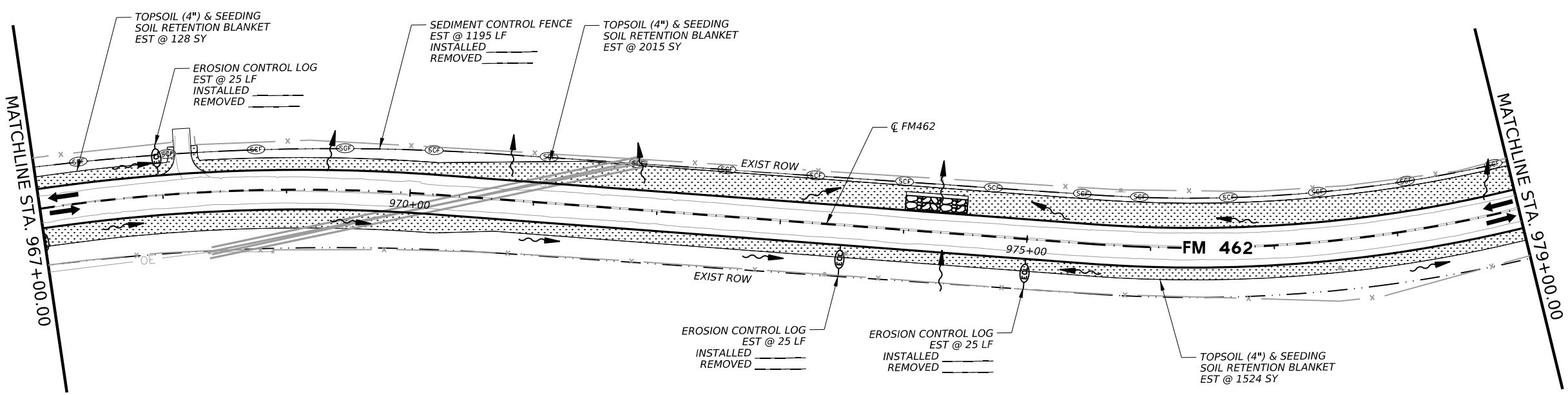
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 DW: \_\_\_\_\_

SHEET #	ITEM	DESCRIPTION	UNIT	QTY
	0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	6101
	0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6101
	0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	6101
	0168 6001	VEGETATIVE WATERING	MG	190.4
	0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6101
	0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1501
	0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1501
	0506 6041	BIODEG EROSN CONT LOGS (INSTR) (12")	LF	250
	0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	250



**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- [Pattern] SEEDING
- [Pattern] SODDING
- [Symbol] SILT FENCE
- [Symbol] EROSION CONTROL LOG
- [Symbol] ROCK FILTER DAM
- [Symbol] FLOW ARROW



2/5/2024

David Gutierrez

0' 50' 100'

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

SHEET 7 OF 13

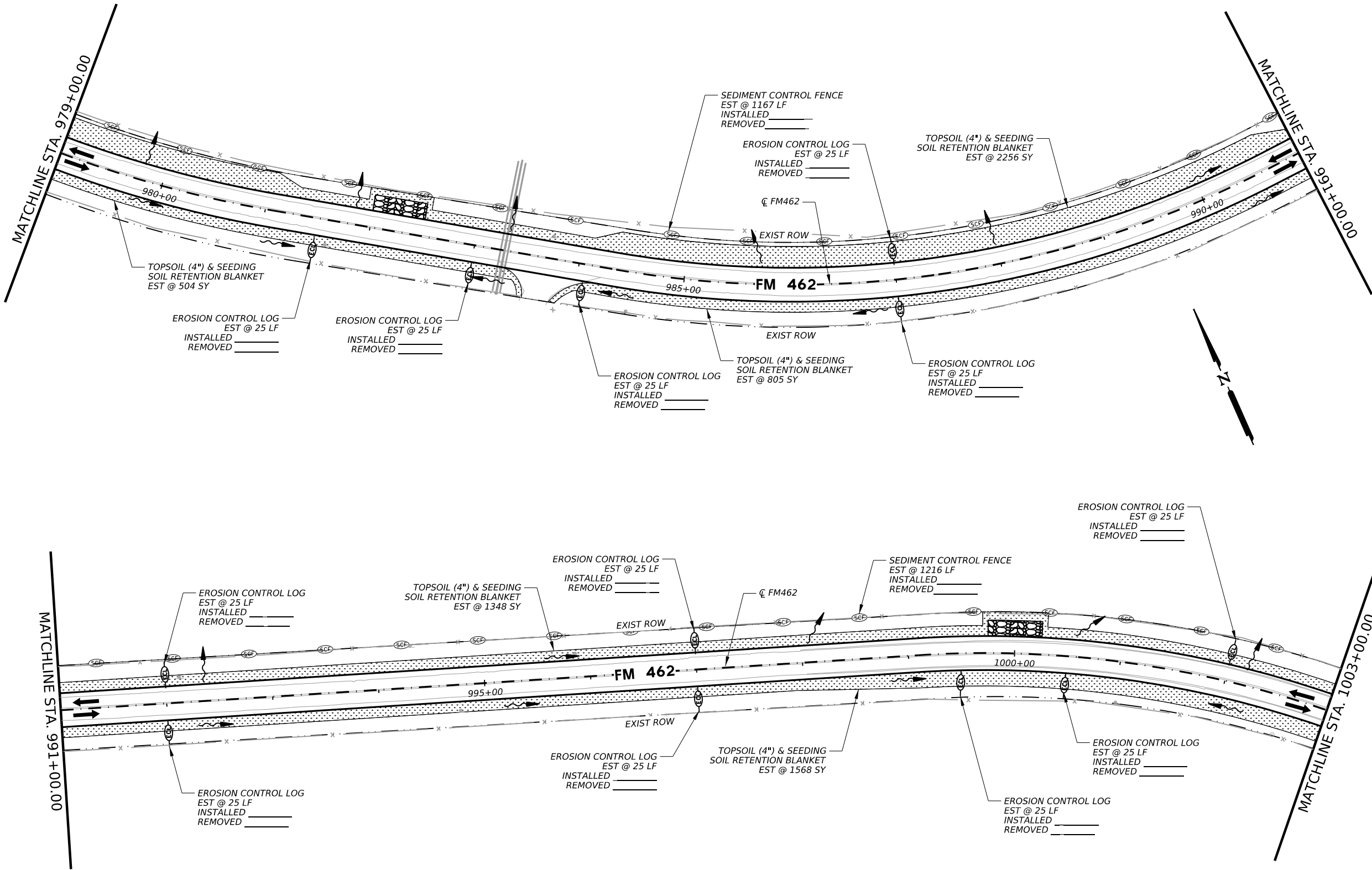
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	241	

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SHEET #	ITEM	DESCRIPTION	UNIT	QTY
8	0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	6481
	0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	6481
	0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	6481
	0168 6001	VEGETATIVE WATERING	MG	202.3
	0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	6481
	0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	2383
	0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	2383
	0506 6041	BIODEG EROSN CONT LOGS (INSTR) (12")	LF	300
	0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	300

**LEGEND**

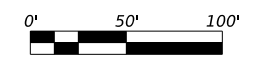
- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- [Pattern] SEEDING
- [Pattern] SODDING
- [Symbol] SILT FENCE
- [Symbol] EROSION CONTROL LOG
- [Symbol] ROCK FILTER DAM
- [Symbol] FLOW ARROW



2/5/2024

*David Gutierrez*

DAVID H. GUTIERREZ  
143301  
LICENSED PROFESSIONAL ENGINEER



**Kimley Horn** F-928

Texas Department of Transportation

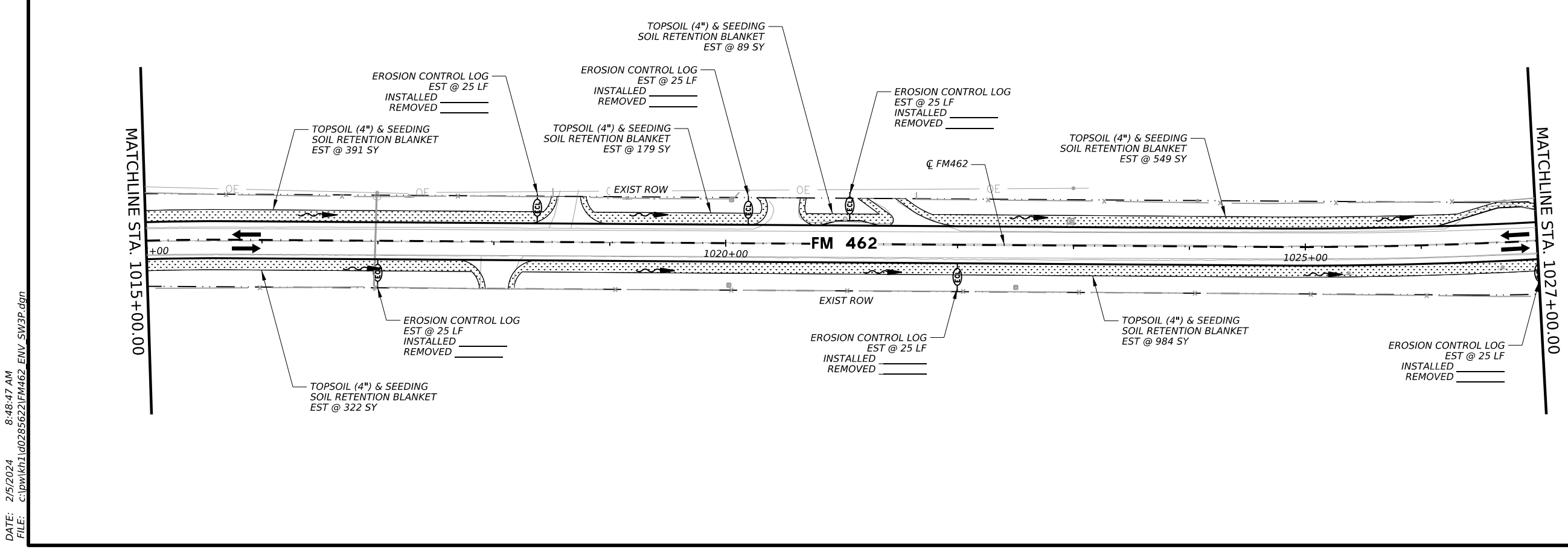
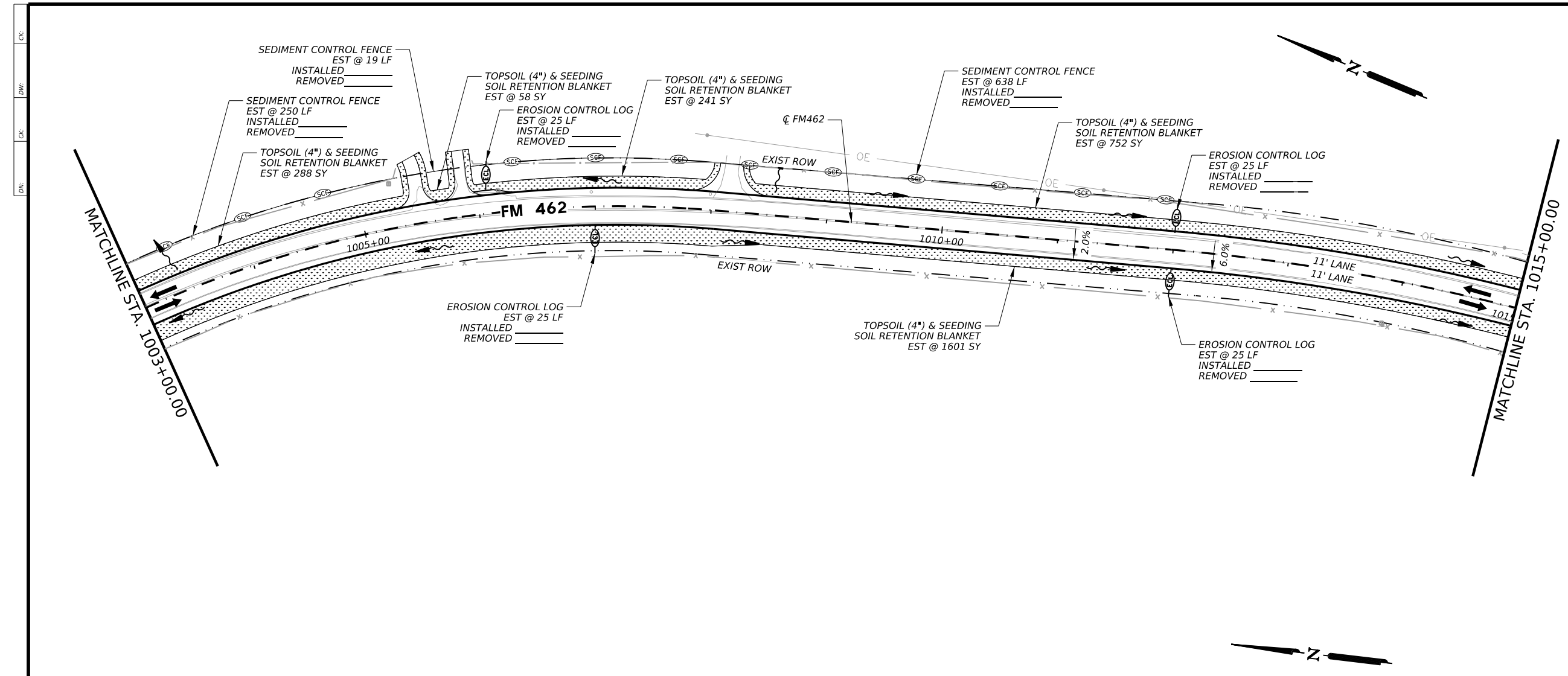
FM 462			
SW3P LAYOUT			
SHEET 8 OF 13			
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	242	

DATE: 2/5/2024 8:48:46 AM  
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SHEET #	DESCRIPTION	UNIT	QTY
0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	5454
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5454
0164 6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	5454
0168 6001	VEGETATIVE WATERING	MG	170.2
0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5454
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	907
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	907
0506 6041	BIODEG EROSN CONT LOGS (INSTR) (12")	LF	250
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	250

**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- SEEDING
- SODDING
- SCF SILT FENCE
- ECL EROSION CONTROL LOG
- RFD ROCK FILTER DAM
- Flow Arrow



2/5/2024

0' 50' 100'

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

SHEET 9 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	243	

DATE: 2/5/2024 8:48:47 AM  
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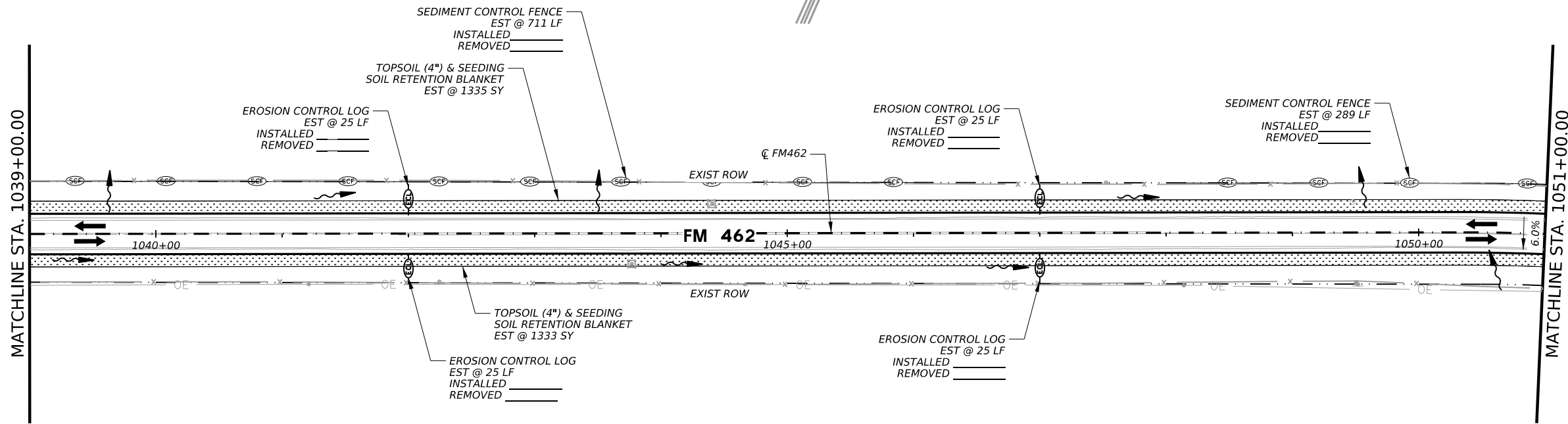
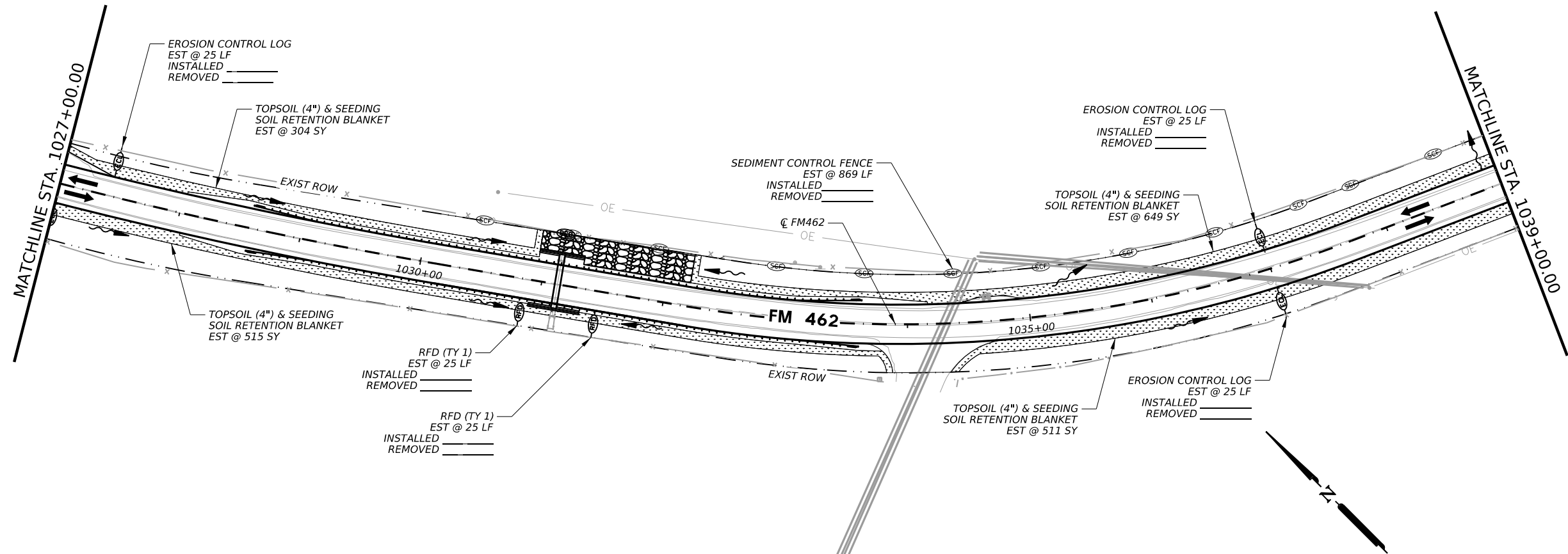




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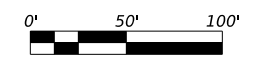
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0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	4647
0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	4647
0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	4647
0168 6001	VEGETATIVE WATERING	MG	145.0
0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	4647
0506 6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF	50
0506 6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	60
0506 6011	ROCK FILTER DAMS (REMOVE)	LF	110
0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1868
0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1868
0506 6041	BIODEG EROSN CONT LOGS (INSL) (12")	LF	175
0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	175

**LEGEND**

- X --- EXIST FENCE
- EXIST FEATURES
- EXIST RIGHT OF WAY
- [Pattern] SEEDING
- [Pattern] SODDING
- [Symbol] SILT FENCE
- [Symbol] EROSION CONTROL LOG
- [Symbol] ROCK FILTER DAM
- [Symbol] FLOW ARROW



  
 2/5/2024  




**Kimley Horn** F-928

Texas Department of Transportation

FM 462  
SW3P LAYOUT

SHEET 10 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	244

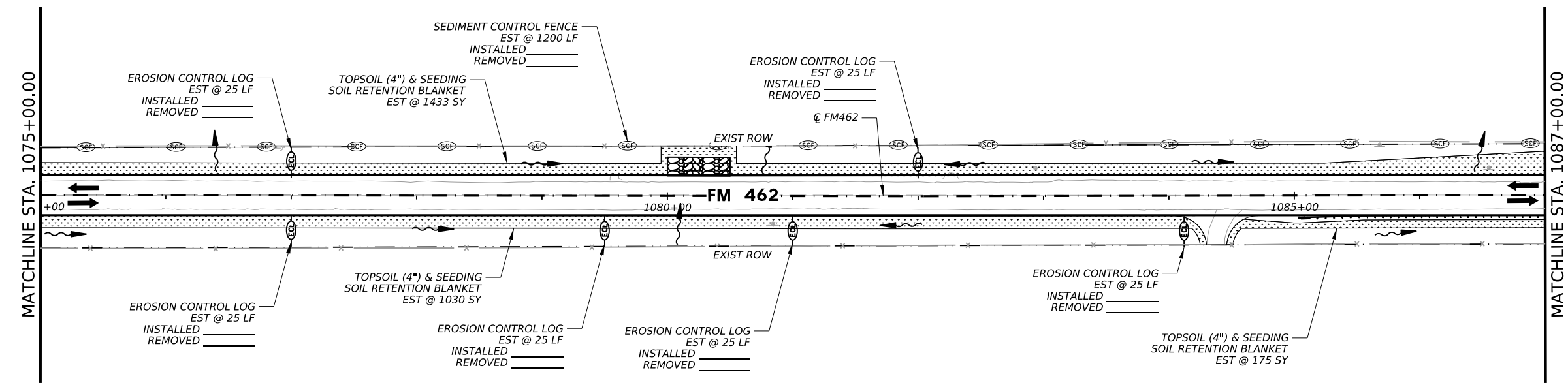
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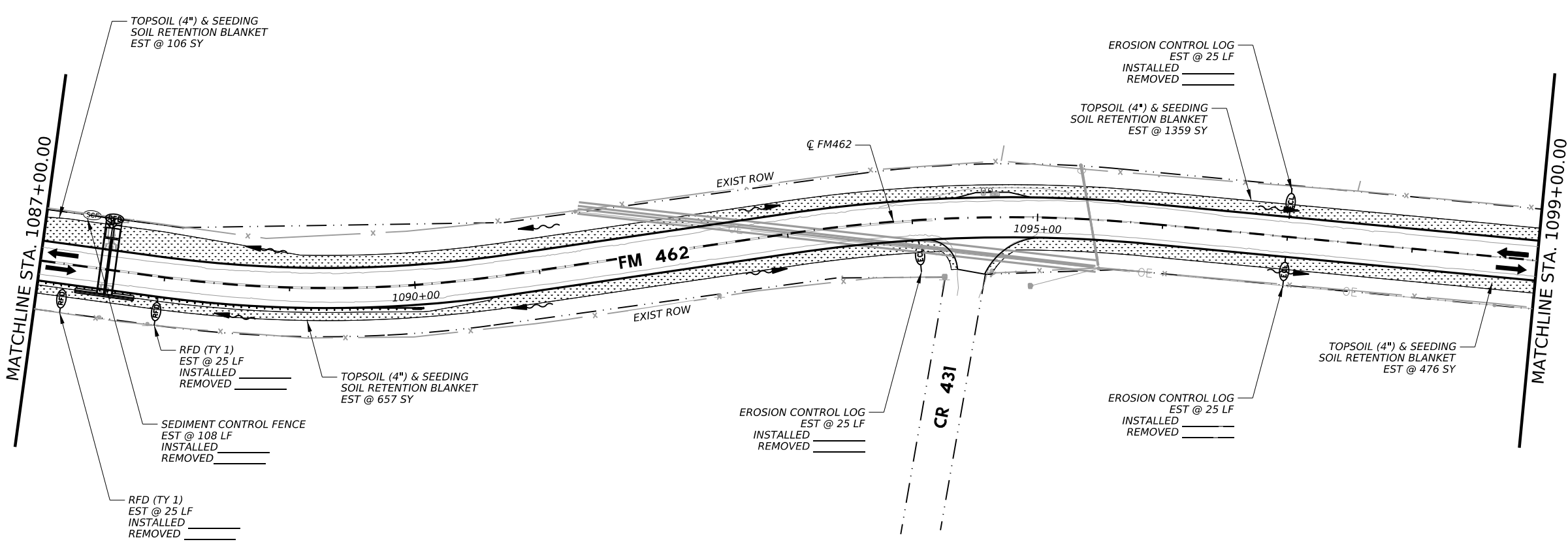
CK: DW: CK: DW: CK: DW:

SHEET #	ITEM	DESCRIPTION	UNIT	QTY
12	0160 6003	FURNISHING AND PLACING TOPSOIL (4")	SY	5236
	0164 6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	5236
	0164 6051	DRILL SEED (TEMP) (WARM OR COOL)	SY	5236
	0168 6001	VEGETATIVE WATERING	MG	163.4
	0169 6001	SOIL RETENTION BLANKETS (CL 1) (TY A)	SY	5236
	0506 6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF	50
	0506 6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	60
	0506 6011	ROCK FILTER DAMS (REMOVE)	LF	110
	0506 6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1308
	0506 6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1308
	0506 6041	BIODEG EROSN CONT LOGS (INSL) (12")	LF	225
	0506 6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	225



**LEGEND**

- EXIST FENCE
- EXIST FEATURES
- - - EXIST RIGHT OF WAY
- [Pattern] SEEDING
- [Pattern] SODDING
- SCF SILT FENCE
- ECL EROSION CONTROL LOG
- RFD ROCK FILTER DAM
- FLOW ARROW



2/5/2024

0' 50' 100'

STATE OF TEXAS  
 DAVID H. GUTIERREZ  
 143301  
 LICENSED PROFESSIONAL ENGINEER

**Kimley Horn** F-928

Texas Department of Transportation

**FM 462**

**SW3P LAYOUT**

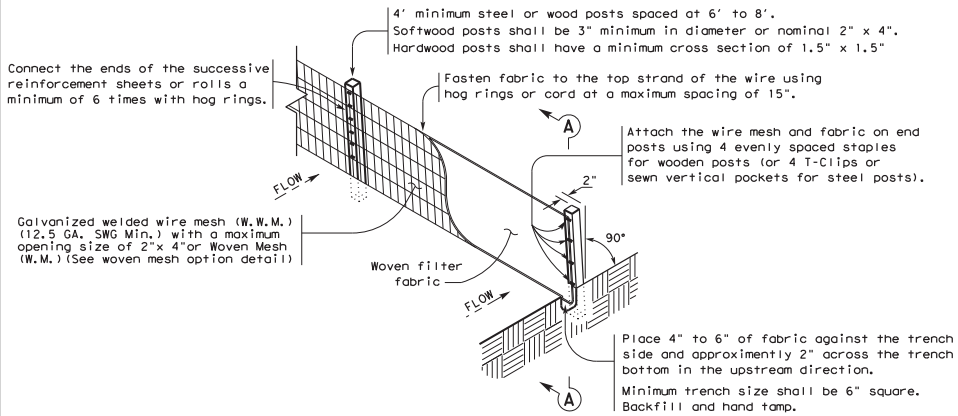
SHEET 12 OF 13

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	246	

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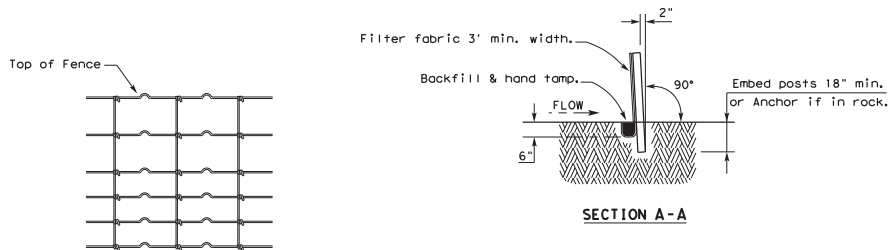


6/30/2020  
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 DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



**TEMPORARY SEDIMENT CONTROL FENCE**

SCF



**HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL**

Galvanized hinge joint knot woven mesh (12.5 GA, SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

**SEDIMENT CONTROL FENCE USAGE GUIDELINES**

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT<sup>2</sup>. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

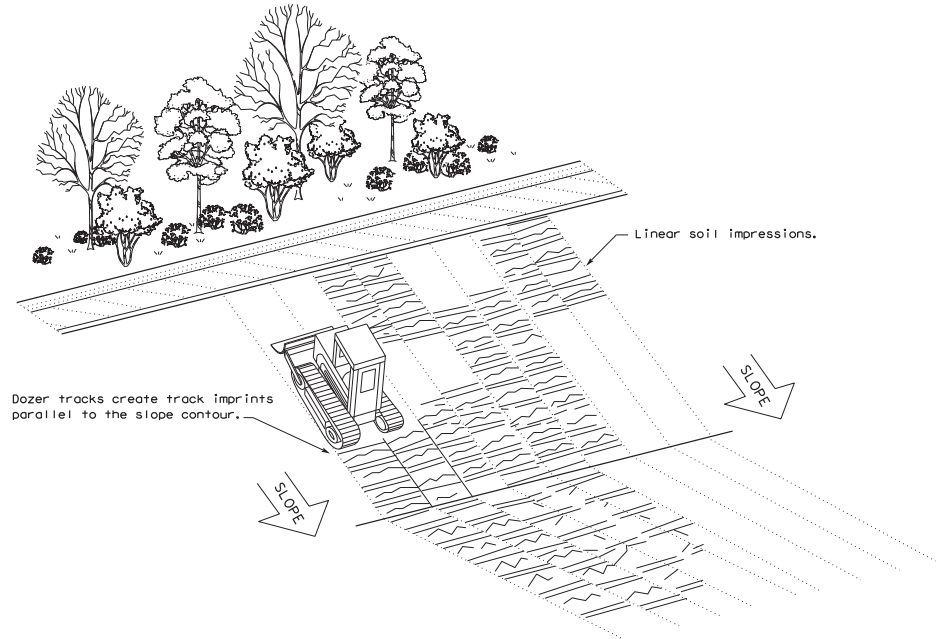
**LEGEND**

Sediment Control Fence

SCF

**GENERAL NOTES**

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



**VERTICAL TRACKING**



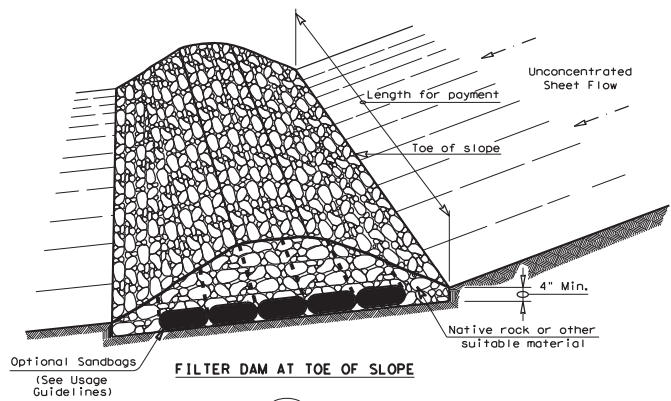
**TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING EC(1)-16**

FILE: ec116	DN: TxDOT	CR: KM	DN: VP	DN/CR: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0848	04	048	FM 462
	DIST	COUNTY	SHEET NO.	
	SAT	MEDINA	214	



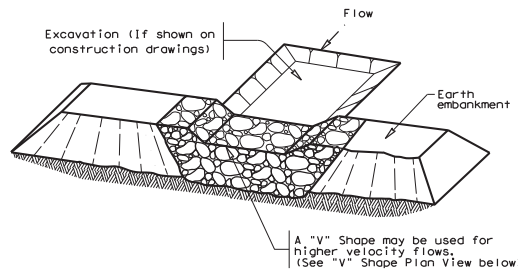
DISCLAIMER: This is standard is covered by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 6/30/2020  
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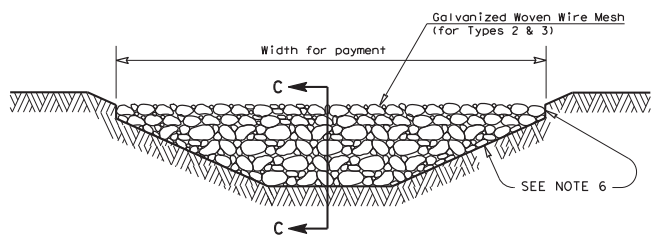
**FILTER DAM AT TOE OF SLOPE**

(RFD1)



**FILTER DAM AT SEDIMENT TRAP**

(RFD1) OR (RFD2)

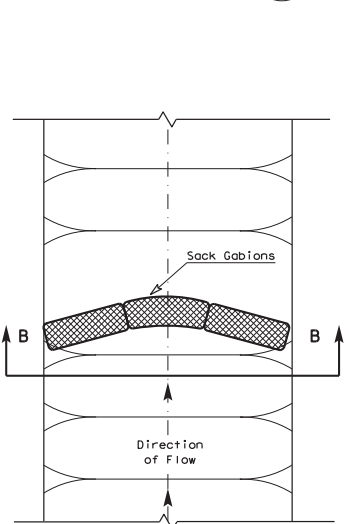


**FILTER DAM AT CHANNEL SECTIONS**

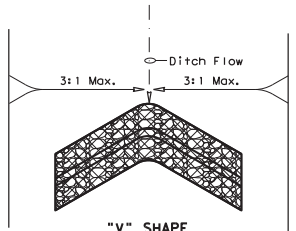
(RFD1) OR (RFD2) OR (RFD3)

**GENERAL NOTES**

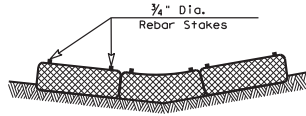
1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream of drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.



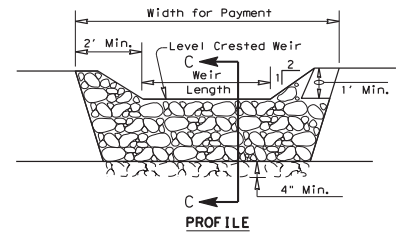
**PLAN VIEW**



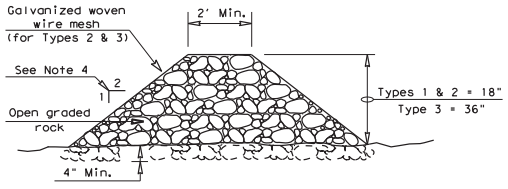
**"V" SHAPE PLAN VIEW**



**SECTION B-B**



**PROFILE**



**SECTION C-C**

**ROCK FILTER DAM USAGE GUIDELINES**

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT<sup>2</sup> of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

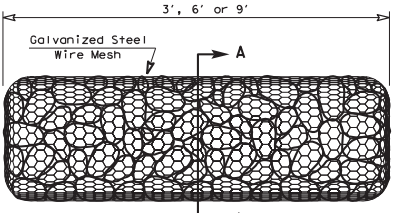
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximately 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

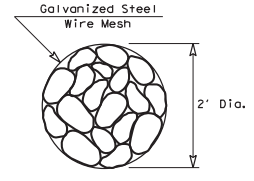
Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.



**TYPE 4 (SACK GABIONS)**

(RFD4)



**SECTION A-A**

**PLAN SHEET LEGEND**

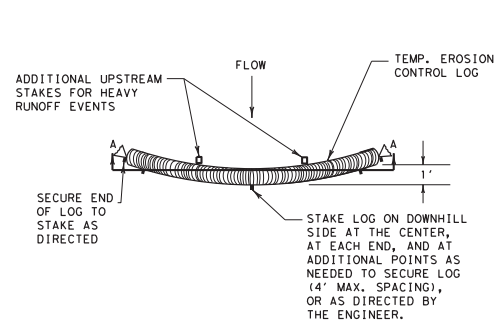
- Type 1 Rock Filter Dam (RFD1)
- Type 2 Rock Filter Dam (RFD2)
- Type 3 Rock Filter Dam (RFD3)
- Type 4 Rock Filter Dam (RFD4)

		Design Division Standard	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>ROCK FILTER DAMS</b> <b>EC(2) - 16</b>			
FILE: ec216	DN: TxDOT	CR: KM	DN: VP
REVISIONS	CONT	SECT	JOB
0848	04	048	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	215	

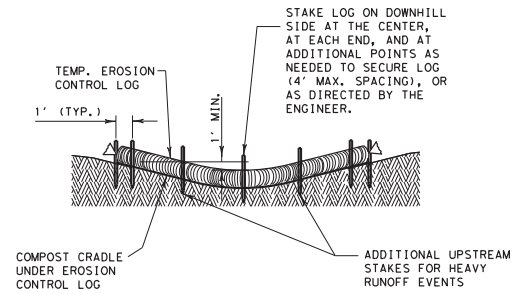


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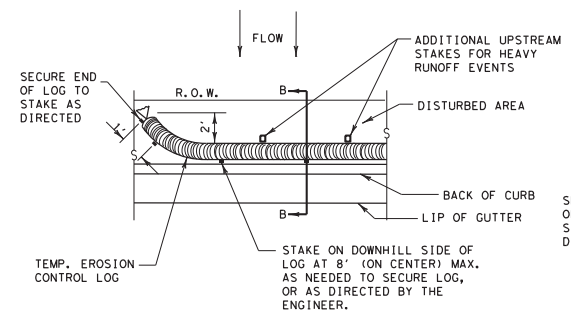
DATE: 6/30/2020  
 FILE: P:\garver-pw\01\Documents\2016\16187038 - FM 462 of Honda Creek Drawings\STANDARDS\Environmental\ec916.dgn



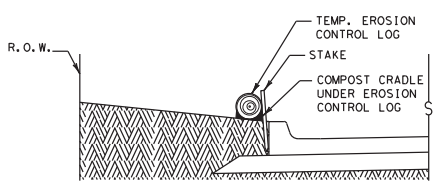
PLAN VIEW



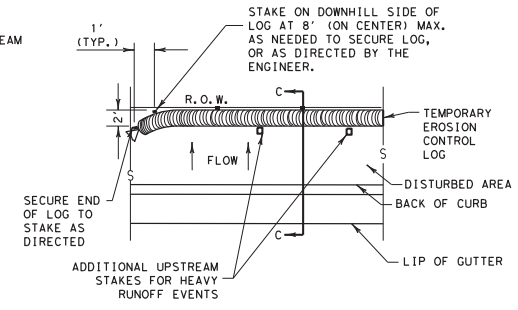
SECTION A-A  
 EROSION CONTROL LOG DAM



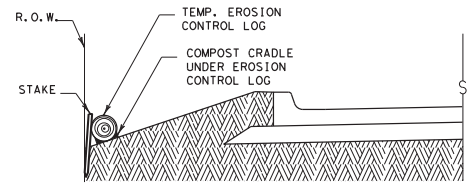
PLAN VIEW



SECTION B-B  
 EROSION CONTROL LOG AT BACK OF CURB



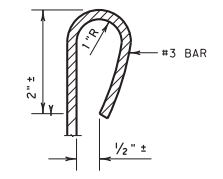
PLAN VIEW



SECTION C-C  
 EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

LEGEND

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



REBAR STAKE DETAIL

SEDIMENT BASIN & TRAP USAGE GUIDELINES

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

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

Control logs should be placed in the following locations:

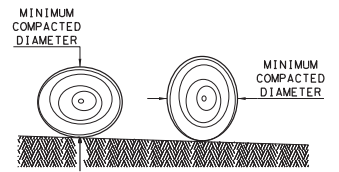
1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows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

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

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

GENERAL NOTES:

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

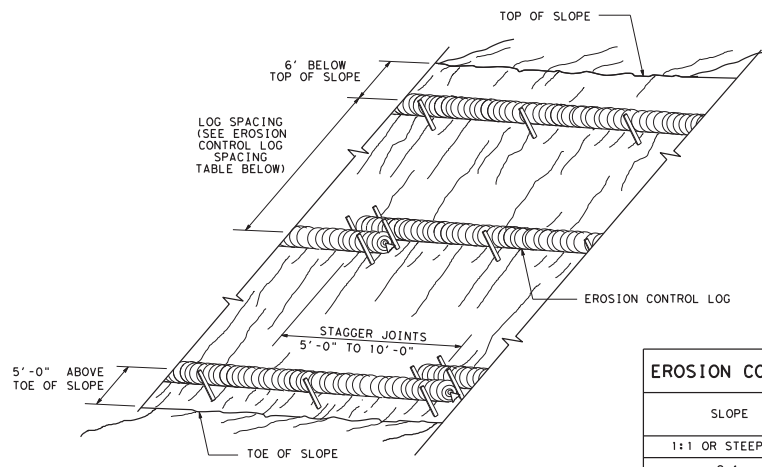


DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SHEET 1 OF 3

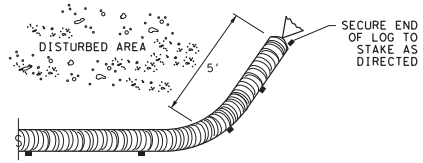
		Design Division Standard	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>			
FILE: ec916	DATE: TxDOT	CHK: KM	DATE: LS/PT
© TxDOT: JULY 2016	CONT: 0848	SECT: 04	JOB: 048
REVISIONS		HIGHWAY	
DIST: SAT	COUNTY: MEDINA	SHEET NO. 217	

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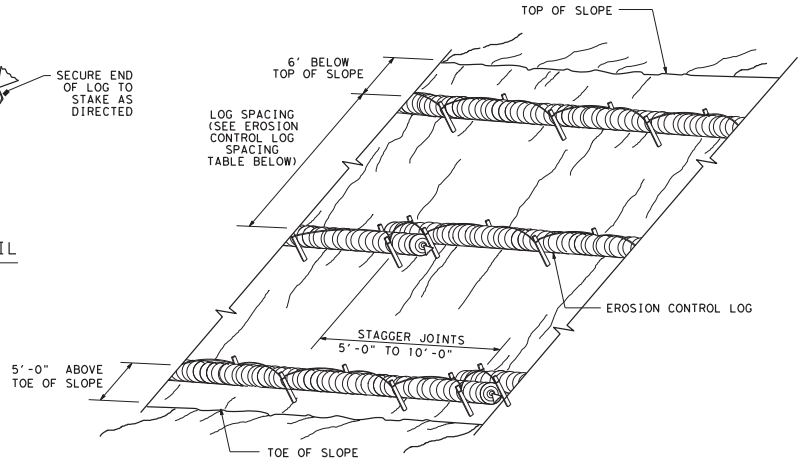


**EROSION CONTROL LOGS ON SLOPES  
STAKE AND TRENCHING ANCHORING**

CL-SST



**END SECTION RAP DETAIL**

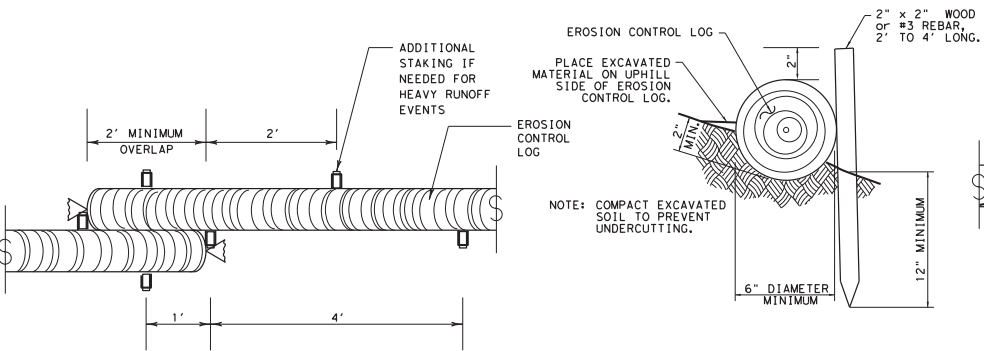


**EROSION CONTROL LOGS ON SLOPES  
STAKE AND LASHING ANCHORING**

CL-SSL

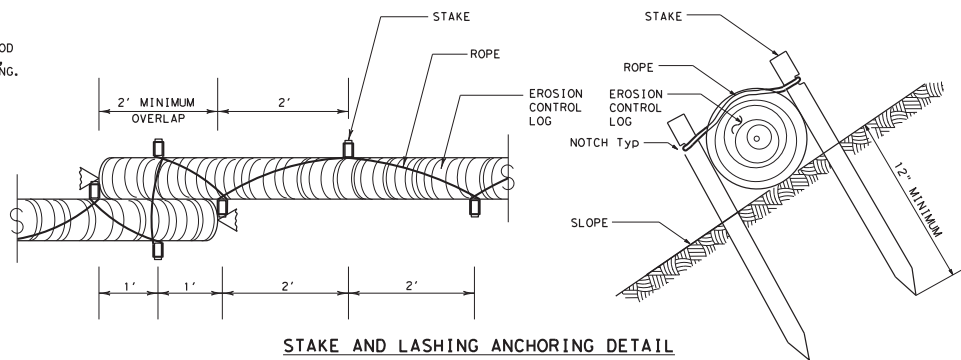
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

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



**STAKE AND TRENCHING ANCHORING DETAIL**

CL-SST

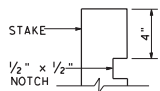


**STAKE AND LASHING ANCHORING DETAIL**

CL-SSL

LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

**TRENCH DEPTH TABLE**



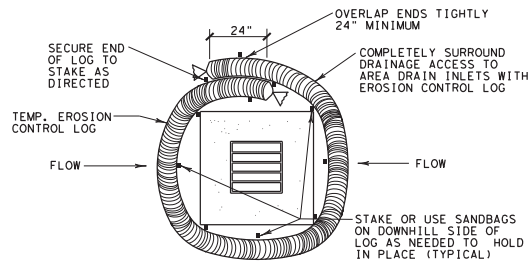
**STAKE NOTCH DETAIL**

SHEET 2 OF 3

		Design Division Standard	
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG</b>			
<b>EC(9) - 16</b>			
FILE: ec116	DN: TxDOT	CR: KM	DN: LS/PT
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0848 04	048	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	218	

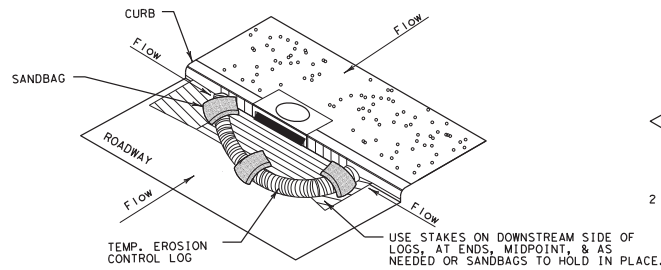
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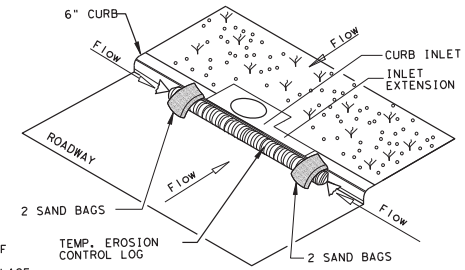
**EROSION CONTROL LOG AT DROP INLET**

CL-DI



**EROSION CONTROL LOG AT CURB INLET**

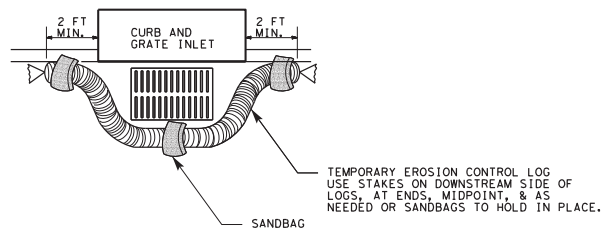
CL-CI



**EROSION CONTROL LOG AT CURB INLET**

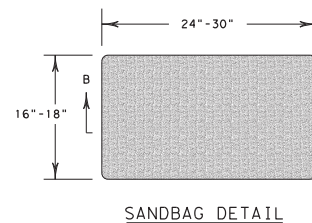
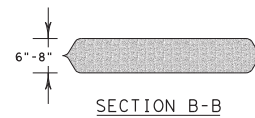
CL-CI

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



**EROSION CONTROL LOG AT CURB & GRADE INLET**

CL-GI



SHEET 3 OF 3

		Design Division Standard		
<b>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</b> <b>EROSION CONTROL LOG</b> <b>EC (9) - 16</b>				
FILE: ec916	DN: TxDOT	CR: KM	DN: LS/PT	CR: LS
© TxDOT: JULY 2016	CONT: 0848	SECT: 04	JOB: 048	HIGHWAY: FM 462
REVISIONS		DIST: SAT	COUNTY: MEDINA	SHEET NO.: 219

**Instructions on how to complete Form 2118** - Form 2118 is designed to meet the requirements of the Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit (CGP) as administered by the Texas Commission on Environmental Quality (TCEQ). All appropriate sections must be completed fully for each project inspection. Contact the Engineer for the project or the District Environmental Quality Coordinator (DEQC) if you have questions on completing on inspection form.

**Project Information Section** – The project information section documents all the necessary basic project details that need to be recorded.

- Inspection Cycle – Select only one of the three possible blocks. The selected box must be the same as outlined in the Stormwater Pollution Prevention Plan (SWP3). The inspection cycle can be modified on a project with the approval of the Engineer and a change to the SWP3. When selecting “Other”, use the space given to document the alternative inspection cycle.
- Inspection Date – Complete this section by providing the date of the inspection.
- CSJ – Complete this section by entering the controlling CSJ for the project in the blank, with no dashes.
- RN – Provide the TCEQ Regulated Entity (RN) number provided on the Notice of Intent (NOI). If there is no NOI required for the project, write “N/A”.
- Project – Complete this section by providing the project number.
- Highway – Complete this section by providing the highway for the project.
- County – Complete this section by providing the county for the project.
- TxDOT Authorization No. – On large projects (equal to or larger than 5 acres of earth disturbance) this is the number provided on TxDOT’s NOI from TCEQ. The Authorization No. must be made available prior to commencing construction. On small projects (equal to or greater than 1 acre and less than 5 acres of earth disturbance) use the general permit number, TXR150000 as the TCEQ Authorization No. For projects with less than 1 acres of earth disturbance, write “N/A”.
- Contractor Authorization No. – On large projects (equal to or larger than 5 acres of earth disturbance) this is the number provided on the Contractor’s NOI from TCEQ. The Authorization No. must be made available prior to commencing construction. On small projects (equal to or greater than 1 acre and less than 5 acres of earth disturbance) use the general permit number, TXR150000 as the TCEQ Authorization No. For projects with less than 1 acres of earth disturbance, write “N/A”.
- Date of Last Rainfall – Provide the last date of rainfall at the project.
- Amount of Last Rainfall – Provide the amount of rainfall in inches. It is recommended that a rain gauge be kept on the project site for record keeping.
  - Guidance – If the seven (7) day inspection cycle is selected the date or amount of last rainfall is not required to be recorded according to the CGP. However, the District may still require this on their inspections, especially with in Districts with frequent rainfall events.

**Inspected Best Management Practices (BMPs)/Areas Section** - Mark all BMPs present on the project right-of-way and all areas inspected. The inspection should ensure that these BMPs are functioning properly and are being maintained in compliance with the permit. This list captures the most BMP types and areas to inspect. If a BMP type or area to inspect exists on the project but is not included in the list, use the “Other” line to document these BMP(s) and/or area(s).

**Corrective Actions, Maintenance, Upgrading or Additional Controls Section** - Except the items listed in this section, all areas/BMPs indicated in the previous section have been inspected and do not require maintenance, upgrading or additional controls. If multiple highways or project locations are involved, identify the highway or project location of the BMP/area requiring maintenance or improvement. Document all changes to the SWP3. Use additional sheets if needed.

- BMP No. – List the BMP’s identifying number or label from the plan set.
- New or Existing – Note if this issue is new to this inspection, or an existing carryover from the previous week.
- Station(s) of Location – Provide the station of the area/BMP needing corrective action. This information is typically available on the plan sheets.
- Left or Right of Centerline – Select Left or Right of Centerline.
- Notes – Use this box to document any comments, notes, or observations that are helpful in communicating the issue or corrective action.
- BMP/Area – List the BMP or area being inspected for corrective action. Use a new line for each BMP/Area by clicking on the “+”.
- Issue – List the issue identified during the inspection.
- Cause – Document the specific cause of the potential non-compliance issue.
- Corrective Action - Document the activity required to bring the BMP/Area into compliance and resolve the issue.
- Potential Non-Compliance – Check this box if the listed issue is a potential non-compliance.
- Priority – Document how soon this issue/BMP must be corrected.

Low	Requires attention by the next inspection; Low priority items are those that are not causing immediate endangerment to human health or the environment but need to be addressed to avoid becoming an issue. If not addressed by the next inspection, but the issue is still not causing immediate or imminent harm to the environment or safety, it may remain at low priority for one more inspection period. Low priority items that have not been addressed in two consecutive inspections should be escalated to medium priority items. Low priority items should be immediately escalated to high priority if conditions change that cause immediate endangerment to human health or the environment.
Medium	Requires attention from contractor within 3 working days (and a follow-up by inspector at 3 business days); Medium priority items are those that may endanger human health or the environment if left unchecked but are not yet a direct threat or a low priority item from the previous inspection that has not been addressed within the required time frame. If a medium priority item is not addressed after one weekly inspection, it will be moved to a high priority and will be considered non-compliant.
High	High – Requires immediate attention; High priority items are those that are causing immediate endangerment to human health or the environment or a medium priority item that appeared on the prior week’s inspection that was not addressed during the required timeframe. High priority items need to be brought to the attention of the Area Engineer or Project Manager immediately. For high priority items, work must immediately be stopped in the vicinity of the issue, and the issue must be immediately addressed. If the issues are widespread, work can be stopped on the entire project until issues are addressed. Vicinity will be defined as the immediate drainage area to the BMP(s) in question, or the area of work causing impact to the BMP(s) in question, as determined by the engineer. If work is stopped in the vicinity of a high priority issue, the area must comply with stabilization requirements.

- Date of Corrective Action Completed – Provide the date when the potential non-compliance issue was corrected.
- TxDOT Rep. Initials of Verification – Type in initials after completing “Date of Corrective Action Completed” field.

In accordance with Item 506.4.4 when corrections are not made within the established time frame, the TxDOT Engineer can order the Contractor to cease work on the project and time charges will continue while the control measures are brought into compliance.

**Temporary and Permanent Stabilization Section** - When construction activities permanently cease, or temporarily cease and are not expected to resume for 14 or more days, on a disturbed portion of the site, erosion control and stabilization measures must be initiated immediately, unless excluded by Part III.F.2(b)(iii) of the CGP.

- Area No. – The identified area for the stabilization practices, taken from the plan sheet (ex. Area A1, Area B3).
- Sheet No. – Corresponding SWP3 layout sheet where stabilization practice is documented.



- Phase – Project phase in which stabilization is occurring.
- Station – Provide the station information of the location of the disturbed area. This information is typically available on the plan sheets
- Left or Right of Centerline – Select Left or Right of Centerline.
- Date Soil Disturbance Initiated – Document the date when the contractor started working to stabilize the area.
- Ongoing? – Check the box if activities dependent on the soil disturbance are ongoing. This will collapse the non-applicable sections. When activity has ceased, uncheck this box and fill in “Date Activity Ceased”.
- Date Activity Ceased – Date activities dependent on the soil disturbance have temporarily or permanently ceased.
- Days Idle – This will calculate the number of days the area has been idle based on the inspection date and the date activities ceased.
- Stabilization Required – Check whether temporary or permanent stabilization measures are required.
- 70% Permanent Cover Achieved – If permanent stabilization measures are required, check if 70% permanent cover has been achieved.
- Correct Seed Mix/Sod Used? – Determine if the correct seed mix or sod was used in accordance with the plans.
- Stabilization Measure – Document the stabilization measure that has been used for the noted area.
- Notes – Document notes concerning the stabilization efforts such as if the stabilization measures are installed correctly and are being maintained appropriately. If there are concerns (example - the installed sod is not receiving enough watering) about the stabilization measures it should be noted. Additionally, if the contractor is using a stabilization measure that is not listed in the form, describe the selected stabilization measure taken.
- Corrective Action – Document the activity required to bring the BMP/Area into compliance and resolve the issue.
- Potential Non-Compliance – Check this box if the listed issue is a potential non-compliance.
- Priority – Document how soon this issue/BMP must be corrected.
- Date of Corrective Action Completed – Provide the date when the potential non-compliance issue was corrected.
- TxDOT Rep. Initials of Verification – Type in initials after completing “Date of Corrective Action Completed” field.

**Observations Section** – Observations are not identified as potential non-compliance items but are items to monitor so they do not progress to the point of becoming a potential non-compliance. Observations should be thought of as notes, comments, reminders or warnings to the Contractor. If additional observations remain unchecked they could be re-classified and prioritized using the escalation ladder priority levels (low, medium, high). The observation category is not the appropriate category for items that are an issue, such as BMPs that require maintenance, sediment discharges, housekeeping issues, or other potential non-compliant items. Inspector should follow up on any “additional observations” during the next inspection to ensure those items have not progressed to potential non-compliant items.

- BMP No. – List the BMP’s identifying number or label from the plan set.
- Station(s) of Location – Provide the station of the area/BMP needing corrective action. This information is typically available on the plan sheets.
- Left or Right of Centerline – Select Left or Right of Centerline.
- Comments – Include any relevant comments regarding the observation.
- Observation – State the note, comment, reminder, or warning and what was noted regarding that issue.
- Note/Reminder – State the take-away point from the observation.

**Compliance Certification Section** – Check one of the two boxes. Print the TxDOT Representative's name and title. Provide the date and signature. If the box indicating potential noncompliance is marked, complete the section entitled Potential Non-Compliance Issues. Immediately notify Engineer of the potential non-compliance. The inspection report must be completed upon completion of inspection but no later than 24 hours, Part III.F.7(f) of the TPDES CGP.

**Contractor Notification Section** – Furnish a copy of this inspection report to the Contractor within one calendar day of the inspection. The Contractor must sign and return this form within one calendar day of receiving it. Corrective actions must be taken as soon as possible and before the next anticipated rain event, but no later than 7 calendar days after being able to access the site. If corrective actions are not made within this timeframe and become potential non-compliance issues, other work on the project may be suspended by the Engineer. Time charges will continue until the project is brought into compliance and documentation of corrective action is provided. Obtain the Contractor's representatives name, title, date and signature.

**Inspection Certification Section** – This section includes a certification statement confirming that the TxDOT Certifying Representative is providing true and accurate information and that there are significant penalties for submitting false information. See Delegation of Signature Authority memo for authorized Certifying Representative delegation. Complete this section by providing the TxDOT Representative's name, title, date and signature.

**Post Signature Updates Section** – Use this section to document any items, notes, or corrections after the form was signed. This might include changes to corrective action based on additional information or changing site conditions, changes to

- Date of Update – Provide the date the update was made.
- TxDOT Rep Initials – Initial by the TxDOT representative approving the update.
- Contractor Rep Initials – Initial by the Contractor representative acknowledging the update.
- Update Notes – Describe the specifics of the update, including impacted items.
- Additional Required Actions – Note any additional actions required by TxDOT or the Contractor.

#### **Definitions:**

**Discharge** – The drainage, release, or disposal of pollutants in stormwater and certain non-stormwater from areas where soil disturbing activities (e.g., clearing, grading, excavation, stockpiling of fill material, and demolition), construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck wash out, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants) are located.

**Pollutant** – Sediment, dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into any surface water in the state.



# CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN FIELD INSPECTION AND MAINTENANCE REPORT

## Project Information

**Inspection Cycle (select only one):**

- At least once every 7 calendar days.
- At least once every 14 calendar days and within 24 hours after 0.5 inches or more of rainfall.
- \*Other:  
\_\_\_\_\_

Inspection Date: \_\_\_\_\_  
 CSJ: \_\_\_\_\_  
 RN: \_\_\_\_\_  
 Highway: \_\_\_\_\_  
 County: \_\_\_\_\_

TxDOT Authorization No.: \_\_\_\_\_  
 Contractor Authorization No.: \_\_\_\_\_  
 Date of Last Rainfall: \_\_\_\_\_  
 Amount of Last Rainfall: \_\_\_\_\_ (inches)

## Inspected Best Management Practice (BMP)/Areas

All of these BMPs/areas must be inspected when present on the right-of-way

- |  |  |  |  |
|--|--|--|--|
| <input type="checkbox"/> Disturbed areas       | <input type="checkbox"/> Concrete truck washout areas            | <input type="checkbox"/> Material stockpiles                   | <input type="checkbox"/> Construction material storage areas |
| <input type="checkbox"/> Discharge locations   | <input type="checkbox"/> Areas where litter/debris/trash collect | <input type="checkbox"/> Areas where vehicles enter/leave site | <input type="checkbox"/> Parking/equipment storage areas     |
| <input type="checkbox"/> Erosion control BMPs  | <input type="checkbox"/> Areas that generate dust                | <input type="checkbox"/> Portable sanitary facilities          | <input type="checkbox"/> Chemical/fuel storage areas         |
| <input type="checkbox"/> Sediment control BMPs | <input type="checkbox"/> Postings                                | <input type="checkbox"/> Dewatering activities                 | <input type="checkbox"/> Soil stabilization areas            |

Other: \_\_\_\_\_

## Corrective Actions, Maintenance, Upgrading or Additional Controls

Except the items listed below, all areas/BMPs indicated above have been inspected and do not require maintenance, upgrading or additional controls. Document all changes to the SWP3.

Low	Requires attention by the next inspection; Low priority items are those that are not causing immediate endangerment to human health or the environment but need to be addressed to avoid becoming an issue. If not addressed by the next inspection, but the issue is still not causing immediate or imminent harm to the environment or safety, it may remain at low priority for one more inspection period. Low priority items that have not been addressed in two consecutive inspections should be escalated to medium priority items. Low priority items should be immediately escalated to high priority if conditions change that cause immediate endangerment to human health or the environment.
Medium	Requires attention from contractor within 3 working days (and a follow-up by inspector at 3 business days); Medium priority items are those that may endanger human health or the environment if left unchecked but are not yet a direct threat or a low priority item from the previous inspection that has not been addressed within the required time frame. If a medium priority item is not addressed after one weekly inspection, it will be moved to a high priority and will be considered non-compliant.
High	High – Requires immediate attention; High priority items are those that are causing immediate endangerment to human health or the environment or a medium priority item that appeared on the prior week's inspection that was not addressed during the required timeframe. High priority items need to be brought to the attention of the Area Engineer or Project Manager immediately. For high priority items, work must immediately be stopped in the vicinity of the issue, and the issue must be immediately addressed. If the issues are widespread, work can be stopped on the entire project until issues are addressed. Vicinity will be defined as the immediate drainage area to the BMP(s) in question, or the area of work causing impact to the BMP(s) in question, as determined by the engineer. If work is stopped in the vicinity of a high priority issue, the area must comply with stabilization requirements.

**Corrective Actions, Maintenance, Upgrading or Additional Controls**

BMP No.:	New or Existing Issue:	Station(s) or Location: to	Left or Right of Centerline:	Notes:	Potential Non-Compliance <input type="checkbox"/>		
BMP/Area:		Issue:					
Cause:					Priority:	Date Corrective Action Completed	TxDOT Rep. Initials of Verification
Corrective Action:							

**Temporary and Permanent Stabilization**

When construction activities permanently cease, or temporarily cease and are not expected to resume for 14 or more days, on a disturbed portion of the site, erosion control and stabilization measures must be initiated immediately, unless excluded by Part III.F.2(b)(iii) of the CGP. Indicate the stabilization measures that have been initiated under these circumstances.

Area No.	Sheet No.	Phase	Station(s) or Location: to	Left or Right of Centerline:	Date Soil Disturbance Initiated	Ongoing? <input type="checkbox"/>	Date Activity Ceased	Days Idle
Stabilization Required:		Temporary <input type="checkbox"/>	Permanent <input type="checkbox"/>	70% Permanent Cover Achieved? Yes <input type="checkbox"/> No <input type="checkbox"/>	Correct Seed Mix/Sod Used? Yes <input type="checkbox"/> No <input type="checkbox"/>	N/A <input type="checkbox"/>		
Stabilization Measure:							Date Stabilization Initiated	
Notes:						Priority:	Date Corrective Action Completed	TxDOT Rep. Initials of Verification
Corrective Action:								

### Observations

Observations can be used to document any items noted in the inspection that do not fall into the "Corrective Actions, Maintenance, Upgrading, or Additional Controls" or the "Temporary and Permanent Stabilization" sections. Observations are notes, warnings, comments, and reminders to the Contractor.

BMP No. or Area:	Station(s) or Location: to	Left or Right of Centerline:	Comments:
Observation:			
Note/Reminder:			

### Compliance Certification

Check One and Complete Signature.

- With the corrective actions noted (if any), the site is in compliance with the CGP regulations and the SWP3.
- The site is in potential non-compliance with the CGP and/or the SWP3 and are noted with a check box in the above-listed items. Notify engineer of potential non-compliance.

TxDOT Assigned Inspector's Name (Print clearly):	Title:	Date:
TxDOT Assigned Inspector's Signature:		

### Contractor Notification

Furnish a copy of this inspection report to the Contractor within one calendar day of the inspection. Corrective actions must be taken as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. If corrective actions are not made within this timeframe and become potential noncompliance issues, other work on the project may be suspended by the Engineer. Time charges will continue until the project is brought into compliance and documentation of corrective action is provided. This in no way releases the contractor of liability for noncompliance.

Contractor's Representative's Name (Print clearly):	Title:	Date:
Contractor's Representative's Signature:		

### Inspection Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

TxDOT's Certifying Representative's Name (Print clearly):	Title:	Date:
TxDOT's Certifying Representative's Signature:		



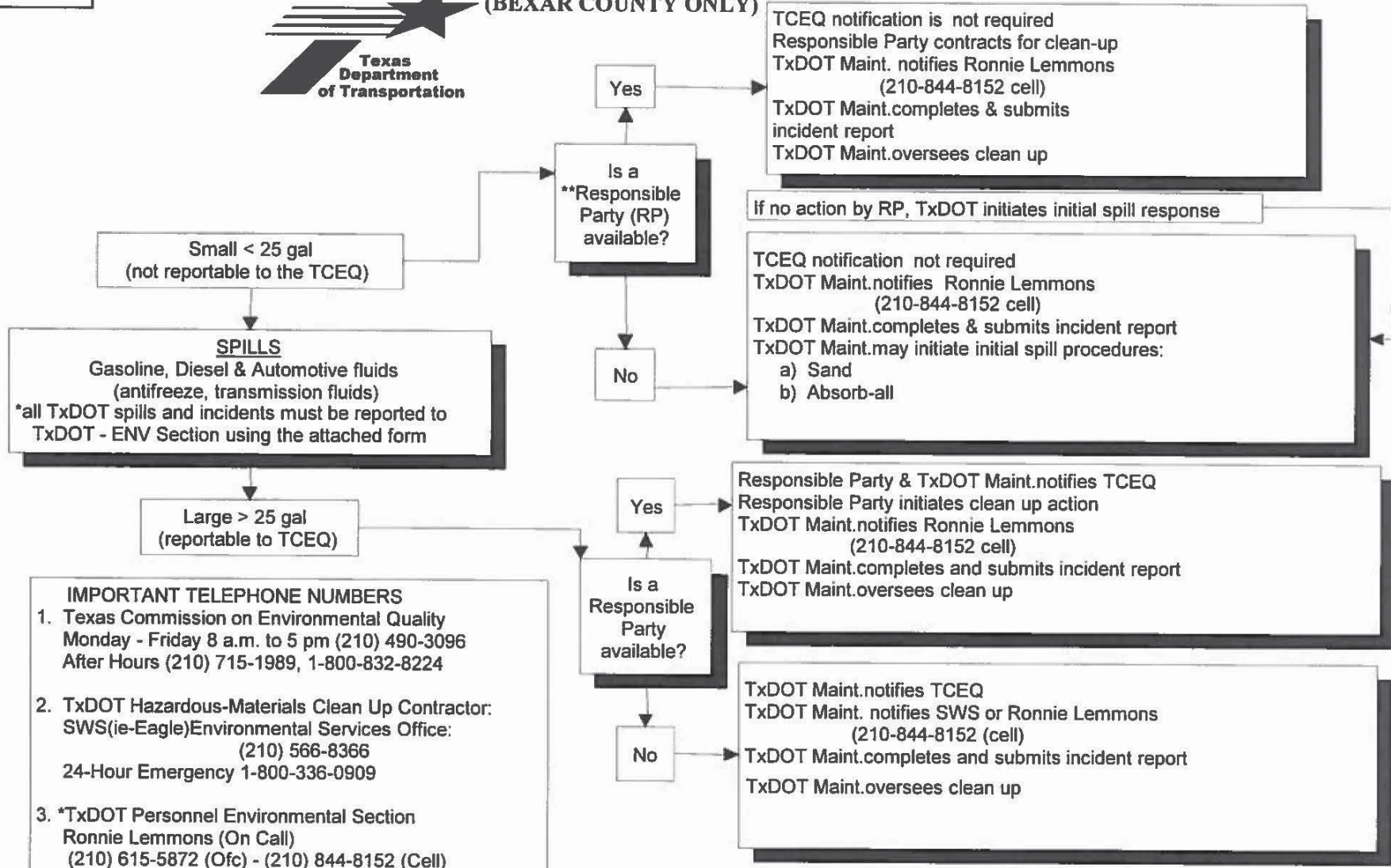
### Post Signature Updates

Document any items, notes, or corrections that occurred after the form was signed. If no post signature updates are documented, this section can be hidden using the "Hide Post Signature Updates" button.

Date of Update	TxDOT Rep Initials	Contractor Rep Initials	
Update Notes:			
Additional Required Actions:			



## SAN ANTONIO DISTRICT SPILL RESPONSE PROCEDURES (BEXAR COUNTY ONLY)



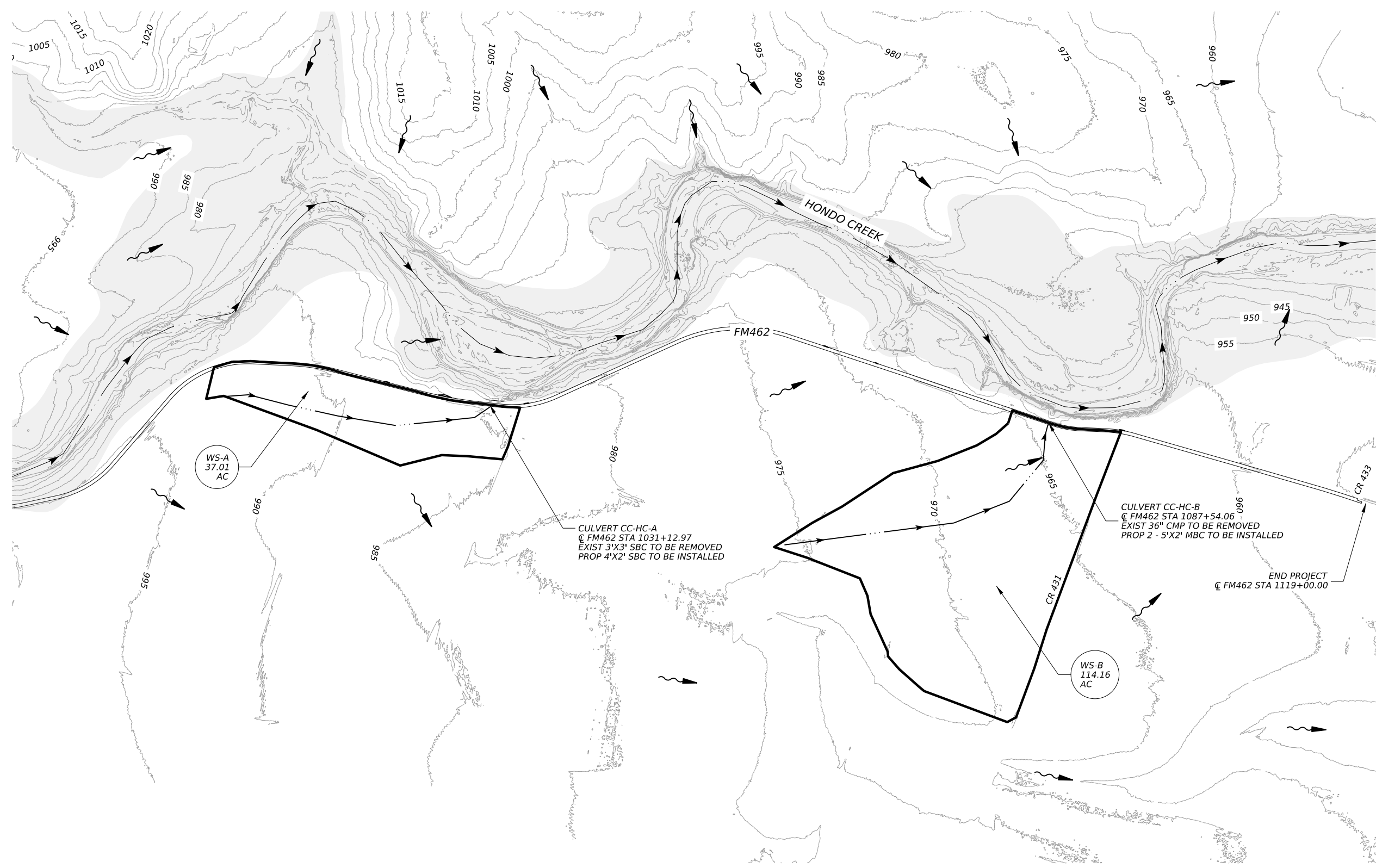
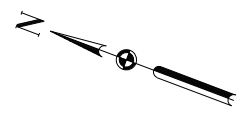
Large > 25 gal  
(reportable to TCEQ)

- IMPORTANT TELEPHONE NUMBERS**
1. Texas Commission on Environmental Quality  
Monday - Friday 8 a.m. to 5 pm (210) 490-3096  
After Hours (210) 715-1989, 1-800-832-8224
  2. TxDOT Hazardous-Materials Clean Up Contractor:  
SWS(ie-Eagle)Environmental Services Office:  
(210) 566-8366  
24-Hour Emergency 1-800-336-0909
  3. \*TxDOT Personnel Environmental Section  
Ronnie Lemmons (On Call)  
(210) 615-5872 (Ofc) - (210) 844-8152 (Cell)

\* For non-emergency spills, TxDOT personnel should be notified between 8 a.m. and 5 p.m., Monday - Friday, or the next working day. For emergency spills after normal working hours, please contact Ronnie Lemmons at 210-844-8152  
 \*\*Responsible Party is the person or company creating the incident or spill.

## **Attachment K – Volume and Character of Stormwater**

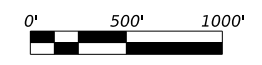
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- LEGEND**
- DRAINAGE AREA
  - STREAM CENTERLINE
  - 950 EXIST 5' CONTOURS
  - FEMA 100 YR FLOODPLAIN
  - xx-x  
xx.xx  
AC DRAINAGE AREA LABEL
  - DRAINAGE FLOW ARROWS

- NOTES:**
1. PREFIXES  
HC = HONDO CREEK
  2. FEMA FLOODPLAIN DATA BASED ON THE MEDINA COUNTY FEMA FIRM PANEL 48325C0325C, EFFECTIVE DATE 04/03/2012
  3. H&H FILES WERE SENT TO THE LOCAL FLOODPLAIN ADMINISTRATOR PAT BRAUNER ON 1/10/2024
  4. DRAINAGE AREAS DELINEATED ON TNRIS 2018 LIDAR 5 FT CONTOURS
  5. RAINFALL DATA OBTAINED FROM TXDOT EBD LOOK UP FOR MEDINA COUNTY ZONE 3 AMS
  6. TIME OF CONCENTRATION CALCULATED USING NRCS METHOD N ACCORDANCE WITH TXDOT 2019-1 HDM CHAPTER 4 SECTION 11
  7. RUNOFF VALUES CALCULATED USING RATIONAL METHOD IN ACCORDANCE WITH TXDOT 2019-1 HDM CHAPTER 4 SECTION 12

David Gutierrez  
 1/31/2024



Name	AREA (AC)	C	TC (MIN)	Rational Flows, Q (cfs)													
				12-YR (IN/HR)	15-YR (IN/HR)	110-YR* (IN/HR)	125-YR (IN/HR)	150-YR (IN/HR)	1100-YR (IN/HR)	1500-YR (IN/HR)	2-YR	5-YR	10-YR*	25-YR	50-YR	100-YR	500-YR
WS-A	37.01	0.37	56	1.90	2.58	3.12	3.87	4.48	5.13	6.73	26	35	43	53	61	70	92
WS-B	114.16	0.37	52	2.00	2.71	3.27	4.06	4.69	5.36	7.02	84	114	138	171	198	226	297

\* DESIGN YEAR USED FOR PROPOSED CULVERTS

Name	TOC Calc Method	Time of Concentration	
		Sheet Flow Time t (min)	Shallow Concentrated Flow Time t (min)
CULV-A-EXIST	NRCS Method	16	40
CULV-B-EXIST	NRCS Method	9	43

NOTE: DUE TO FLAT TERRAIN, NO CHANNEL FLOW OBSERVED OR CALCULATED

**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**DRAINAGE AREA MAP**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	163

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**REQUIRED TSS REMOVAL:**

Texas Commission on Environmental Quality

**TSS Removal Calculations 04-20-2009**

Project Name: **FM 462**  
 Date Prepared: **2/27/2024**

**1. The Required Load Reduction for the total project:** Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3:  $L_{TOTAL PROJECT} = 27.2(A_i \times P)$

where:  
 $L_{TOTAL PROJECT}$  = Required TSS removal resulting from the proposed development = 80% of increased load  
 $A_i$  = Net increase in impervious area for the project  
 P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	<b>Medina</b>	
Total project area included in plan * =	<b>8.23</b>	acres
Predevelopment impervious area within the limits of the plan * =	<b>3.13</b>	acres
Total post-development impervious area within the limits of the plan* =	<b>4.49</b>	acres
Total post-development impervious cover fraction * =	<b>0.55</b>	
P =	<b>28</b>	inches


$L_{TOTAL PROJECT} = 1036$  lbs.

Number of drainage basins / outfalls areas leaving the plan area = **2**

*David Gutierrez*  
 2/27/2024



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<b>Kimley»Horn</b> F-928			
 <b>Texas Department of Transportation</b>			
<b>FM 462</b>			
<b>WATER POLLUTION ABATEMENT PLAN CALCULATIONS</b>			
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY		SHEET NO.
SAT	MEDINA		



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**NORTH BOUND VEGETATIVE FILTER STRIPS:**

**2. Drainage Basin Parameters (This information should be provided for each basin):**

Drainage Basin/Outfall Area No. = **NB**  
 Total drainage basin/outfall area = **0.66** acres  
 Predevelopment impervious area within drainage basin/outfall area = **0.00** acres  
 Post-development impervious area within drainage basin/outfall area = **0.66** acres  
 Post-development impervious fraction within drainage basin/outfall area = **1.00**  
 $L_{TSS\ Basin}$  = **503** lbs.

**3. Indicate the proposed BMP Code for this basin.**

Proposed BMP = **Vegetated Filter Strips**  
 Removal efficiency = **85** percent

**4. Calculate Maximum TSS Load Removed ( $L_r$ ) for this Drainage Basin by the selected BMP Type.**

RG-348 Page 3-33 Equation 3.7:  $L_r = (BMP\ efficiency) \times P \times (A_t \times 34.6 + A_p \times 0.54)$

where:

$A_t$  = Total On-Site drainage area in the BMP catchment area  
 $A_p$  = Impervious area proposed in the BMP catchment area  
 $A_r$  = Pervious area remaining in the BMP catchment area  
 $L_r$  = TSS Load removed from this catchment area by the proposed BMP

$A_t$  = **0.66** acres  
 $A_p$  = **0.66** acres  
 $A_r$  = **0.00** acres  
 $L_r$  = **544** lbs

**SOUTH BOUND VEGETATIVE FILTER STRIPS:**

**2. Drainage Basin Parameters (This information should be provided for each basin):**

Drainage Basin/Outfall Area No. = **SB**  
 Total drainage basin/outfall area = **0.68** acres  
 Predevelopment impervious area within drainage basin/outfall area = **0.00** acres  
 Post-development impervious area within drainage basin/outfall area = **0.68** acres  
 Post-development impervious fraction within drainage basin/outfall area = **1.00**  
 $L_{TSS\ Basin}$  = **518** lbs.

**3. Indicate the proposed BMP Code for this basin.**

Proposed BMP = **Vegetated Filter Strips**  
 Removal efficiency = **85** percent



**4. Calculate Maximum TSS Load Removed ( $L_r$ ) for this Drainage Basin by the selected BMP Type.**

RG-348 Page 3-33 Equation 3.7:  $L_r = (BMP\ efficiency) \times P \times (A_t \times 34.6 + A_p \times 0.54)$

where:


$A_t$  = Total On-Site drainage area in the BMP catchment area  
 $A_p$  = Impervious area proposed in the BMP catchment area  
 $A_r$  = Pervious area remaining in the BMP catchment area  
 $L_r$  = TSS Load removed from this catchment area by the proposed BMP

$A_t$  = **0.68** acres  
 $A_p$  = **0.68** acres  
 $A_r$  = **0.00** acres  
 $L_r$  = **559** lbs

  
  
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**Kimley»Horn** F-928

  
**Texas Department of Transportation**

FM 462

WATER POLLUTION  
ABATEMENT PLAN  
CALCULATIONS

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA		

CK: DW: CK: DN:

# Texas Commission on Environmental Quality Water Pollution Abatement Plan General Construction Notes

1. A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES.  
THIS NOTICE MUST INCLUDE:  
- THE NAME OF THE APPROVED PROJECT;  
- THE ACTIVITY START DATE; AND  
- THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.
2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN (WPAP) AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS ARE REQUIRED TO KEEP ON-SITE COPIES OF THE APPROVED PLAN AND APPROVAL LETTER.
3. IF ANY SENSITIVE FEATURE(S) (CAVES, SOLUTION CAVITY, SINK HOLE, ETC.) IS DISCOVERED DURING CONSTRUCTION, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPROPRIATE TCEQ REGIONAL OFFICE MUST BE IMMEDIATELY NOTIFIED OF ANY SENSITIVE FEATURES ENCOUNTERED DURING CONSTRUCTION. CONSTRUCTION ACTIVITIES MAY NOT BE RESUMED UNTIL THE TCEQ HAS REVIEWED AND APPROVED THE APPROPRIATE PROTECTIVE MEASURES IN ORDER TO PROTECT ANY SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY.
4. NO TEMPORARY OR PERMANENT HAZARDOUS SUBSTANCE STORAGE TANK SHALL BE INSTALLED WITHIN 150 FEET OF A WATER SUPPLY SOURCE, DISTRIBUTION SYSTEM, WELL, OR SENSITIVE FEATURE.
5. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND MANUFACTURERS SPECIFICATIONS. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
6. ANY SEDIMENT THAT ESCAPES THE CONSTRUCTION SITE MUST BE COLLECTED AND PROPERLY DISPOSED OF BEFORE THE NEXT RAIN EVENT TO ENSURE IT IS NOT WASHED INTO SURFACE STREAMS, SENSITIVE FEATURES, ETC.
7. SEDIMENT MUST BE REMOVED FROM THE SEDIMENT TRAPS OR SEDIMENTATION BASINS NOT LATER THAN TCEQ-0592 (REV. JULY 15, 2015) PAGE 2 OF 2 WHEN IT OCCUPIES 50% OF THE BASIN'S DESIGN CAPACITY.
8. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER SHALL BE PREVENTED FROM BEING DISCHARGED OFFSITE.
9. ALL SPOILS (EXCAVATED MATERIAL) GENERATED FROM THE PROJECT SITE MUST BE STORED ON-SITE WITH PROPER E&S CONTROLS. FOR STORAGE OR DISPOSAL OF SPOILS AT ANOTHER SITE ON THE EDWARDS AQUIFER RECHARGE ZONE, THE OWNER OF THE SITE MUST RECEIVE APPROVAL OF A WATER POLLUTION ABATEMENT PLAN FOR THE PLACEMENT OF FILL MATERIAL OR MASS GRADING PRIOR TO THE PLACEMENT OF SPOILS AT THE OTHER SITE.
10. IF PORTIONS OF THE SITE WILL HAVE A TEMPORARY OR PERMANENT CEASE IN CONSTRUCTION ACTIVITY LASTING LONGER THAN 14 DAYS, SOIL STABILIZATION IN THOSE AREAS SHALL BE INITIATED AS SOON AS POSSIBLE PRIOR TO THE 14TH DAY OF INACTIVITY. IF ACTIVITY WILL RESUME PRIOR TO THE 21ST DAY, STABILIZATION MEASURES ARE NOT REQUIRED. IF DROUGHT CONDITIONS OR INCLEMENT WEATHER PREVENT ACTION BY THE 14TH DAY, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS POSSIBLE.
11. THE FOLLOWING RECORDS SHALL BE MAINTAINED AND MADE AVAILABLE TO THE TCEQ UPON REQUEST:  
- THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR;  
- THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE; AND  
- THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.
12. THE HOLDER OF ANY APPROVED EDWARD AQUIFER PROTECTION PLAN MUST NOTIFY THE APPROPRIATE REGIONAL OFFICE IN WRITING AND OBTAIN APPROVAL FROM THE EXECUTIVE DIRECTOR PRIOR TO INITIATING ANY OF THE FOLLOWING:  
A. ANY PHYSICAL OR OPERATIONAL MODIFICATION OF ANY WATER POLLUTION ABATEMENT STRUCTURE(S), INCLUDING BUT NOT LIMITED TO PONDS, DAMS, BERMS, SEWAGE TREATMENT PLANTS, AND DIVERSIONARY STRUCTURES;  
B. ANY CHANGE IN THE NATURE OR CHARACTER OF THE REGULATED ACTIVITY FROM THAT WHICH WAS ORIGINALLY APPROVED OR A CHANGE WHICH WOULD SIGNIFICANTLY IMPACT THE ABILITY OF THE PLAN TO PREVENT POLLUTION OF THE EDWARDS AQUIFER;  
C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

TOTAL PROJECT SUMMARY				
SITE AREA	EXISTING IMPERVIOUS AREA	PROPOSED IMPERVIOUS AREA	REQUIRED ANNUAL TSS LOAD REMOVAL	PROVIDED ANNUAL TSS LOAD REMOVAL
AC	AC	AC	LBS	LBS
8.23	3.13	4.49	1036	1103

PROVIDED LOAD REMOVAL / VEGETATIVE FILTER STRIP SUMMARY						
VFS ID	DRAINAGE AREA	BEGIN STA	END STA	OFFSET	REMOVAL EFFICIENCY	PROVIDED TSS REMOVAL
	AC			RT/LT		LBS
NB-1	0.11	834+17.57	836+63.8	LT	85	90
NB-2	0.24	836+63.83	843+54.3	LT	85	198
NB-3	0.26	844+20.28	851+20.0	LT	85	214
NB-4	0.05	871+20.00	872+50.0	LT	85	42
NORTHBOUND LOAD REMOVAL =						544
SB-1	0.11	833+59.89	836+74.6	RT	85	90
SB-2	0.42	837+44.69	848+50.0	RT	85	346
SB-3	0.03	871+25.00	871+88.8	RT	85	24
SB-4	0.12	872+55.00	875+75.0	RT	85	99
SOUTHBOUND LOAD REMOVAL =						559
TOTAL PROVIDED LOAD REMOVAL =						1103

**NOTES:**

1. SEE FM 462 WATER QUALITY REPORT (STANTEC) FOR DETAILED DISCUSSION ON WATER QUALITY CALCULATION METHODOLOGY.
2. TOTAL REQUIRED LOAD REMOVALS ONLY COMPUTED WITHIN THE LIMITS OF THE ROADWAY WIDENING AS FOLLOWS:  
NORTHBOUND: BEGIN STA 817+00.00 END STA 875+96.08  
SOUTHBOUND: BEGIN STA 817+00.00 END STA 875+96.08

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*David Gutierrez*  
2/5/2024



**Kimley»Horn** F-928

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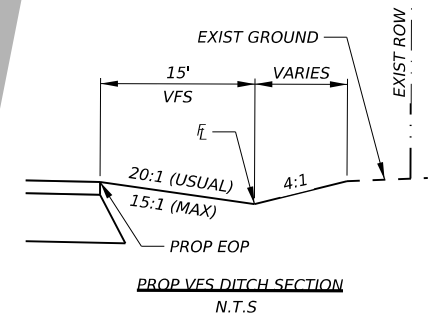
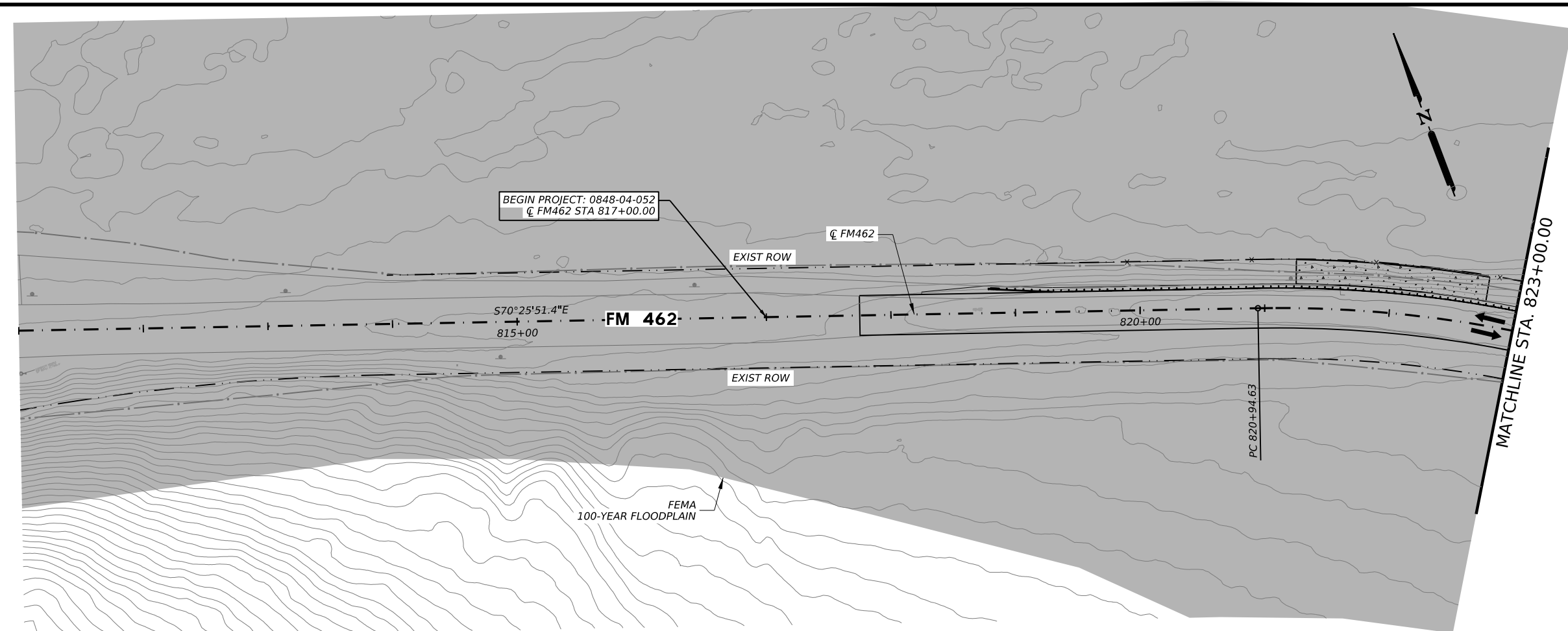
**FM 462**

WATER QUALITY  
CALCULATIONS AND  
TCEQ GENERAL NOTES

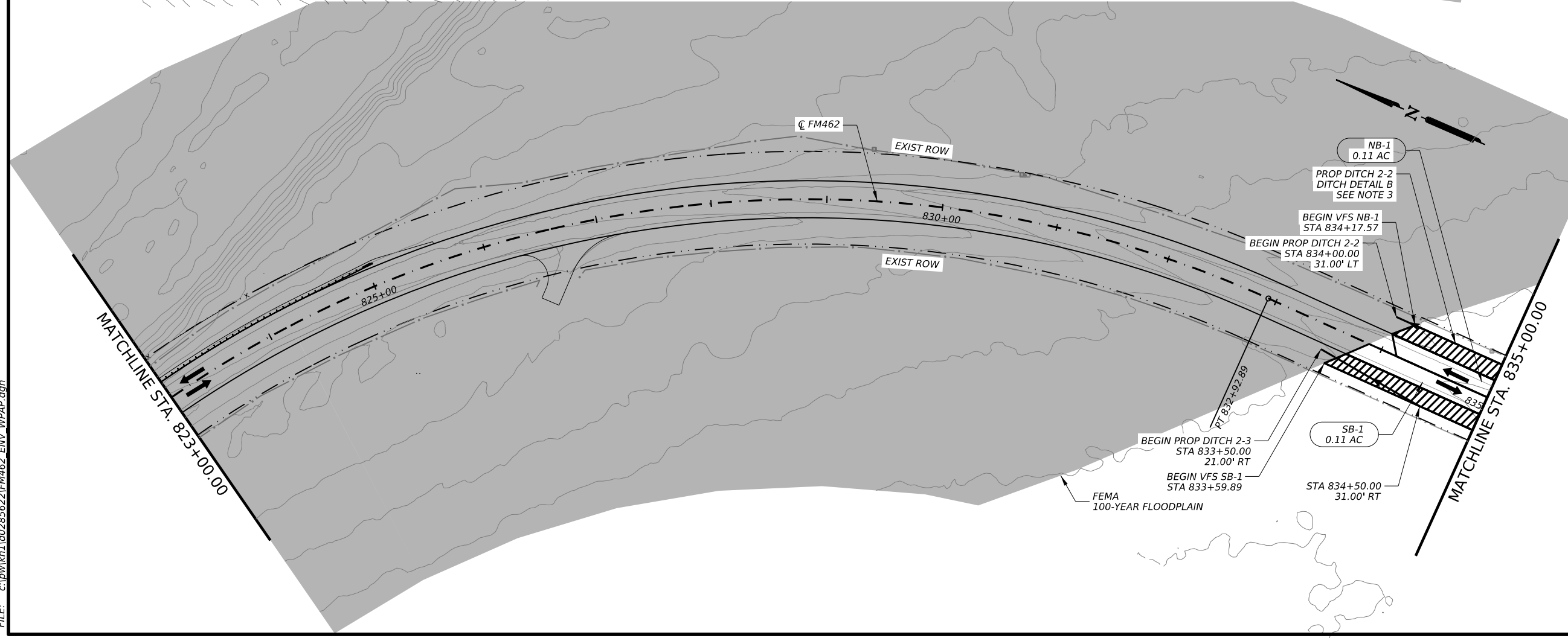
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	248	

CK: DW: CK: DN:



- LEGEND**
- EXIST FENCE
  - EXIST CONTOURS
  - - - EXIST RIGHT OF WAY
  - - - LIMITS OF EDWARDS AQUIFER RECHARGE ZONE
  - ➔ DIRECTION OF TRAVEL
  - ▨ VEGETATIVE FILTER STRIPS
  - FEMA 100-YEAR FLOODPLAIN



*David Gutierrez*

2/5/2024

0' 50' 100'

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**FM 462**

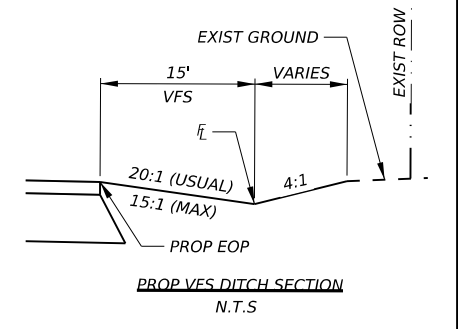
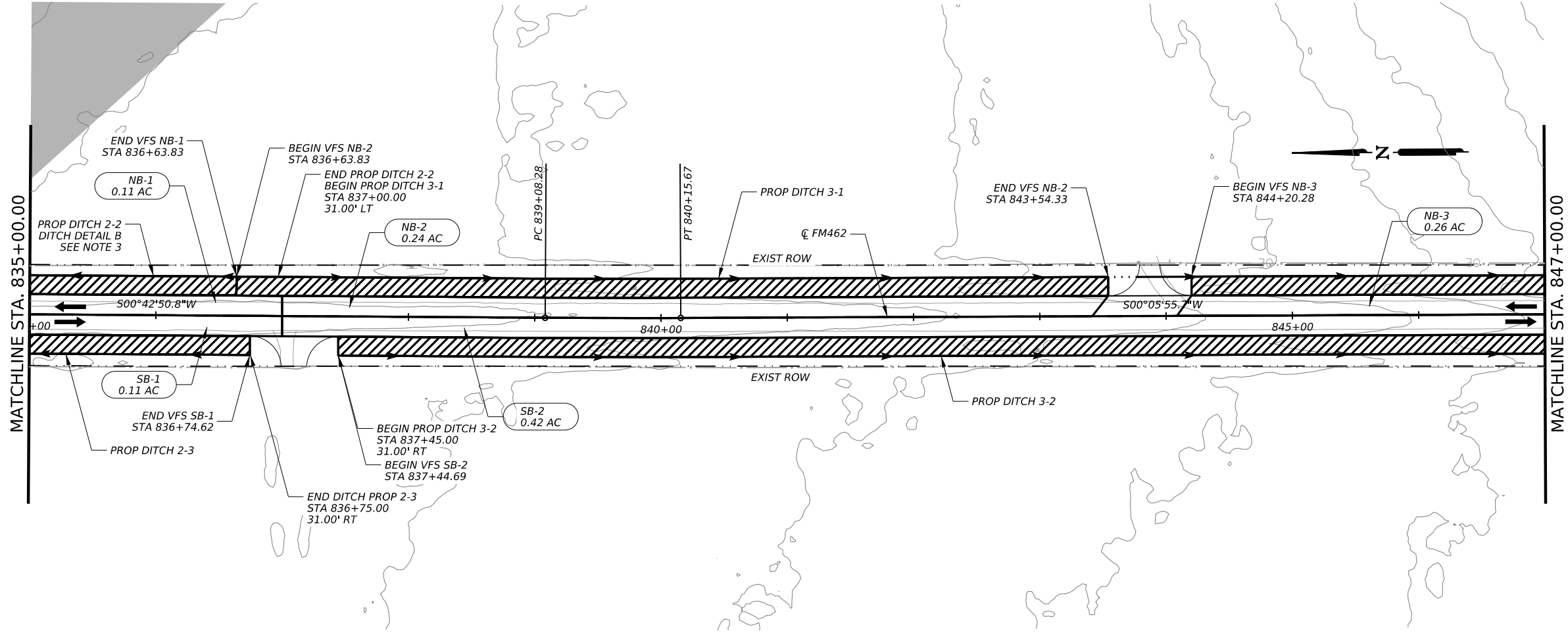
**WATER POLLUTION ABATEMENT PLAN**

SHEET 1 OF 3

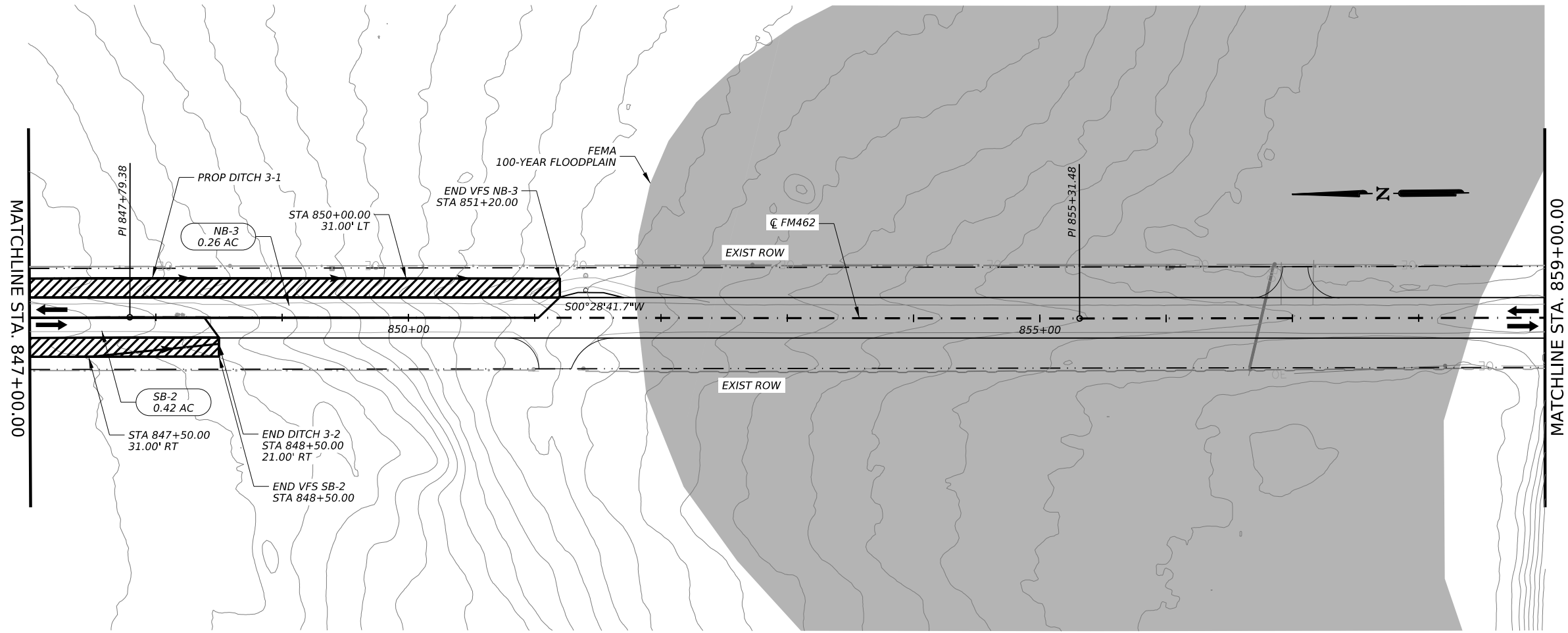
CONT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST	COUNTY	SHEET NO.	
SAT	MEDINA	249	

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- LEGEND**
- EXIST FENCE
  - EXIST CONTOURS
  - - - EXIST RIGHT OF WAY
  - - - LIMITS OF EDWARDS AQUIFER RECHARGE ZONE
  - DIRECTION OF TRAVEL
  - ▨ VEGETATIVE FILTER STRIPS
  - FEMA 100-YEAR FLOODPLAIN



2/5/2024

0' 50' 100'

**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**  
**WATER POLLUTION ABATEMENT PLAN**

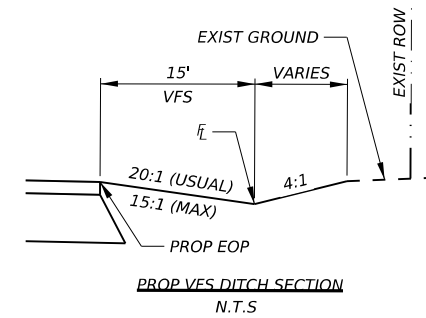
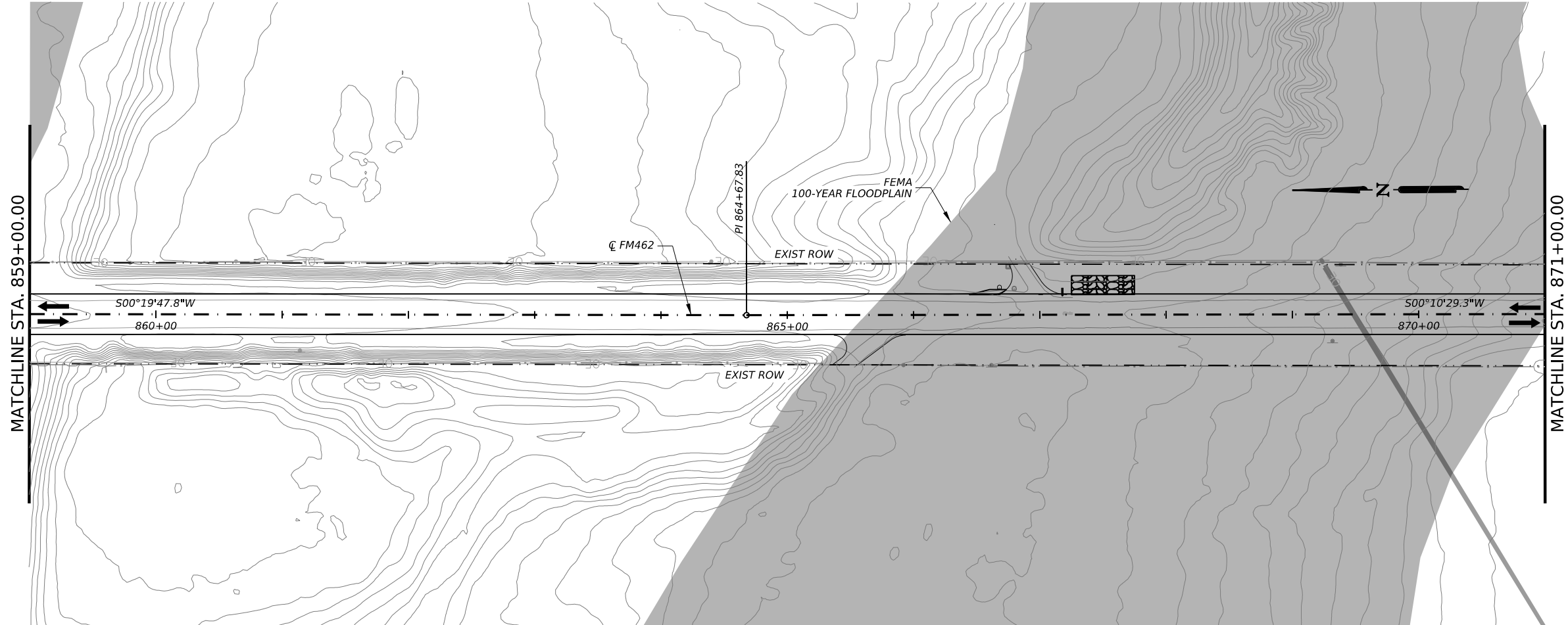
SHEET 2 OF 3

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0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	250

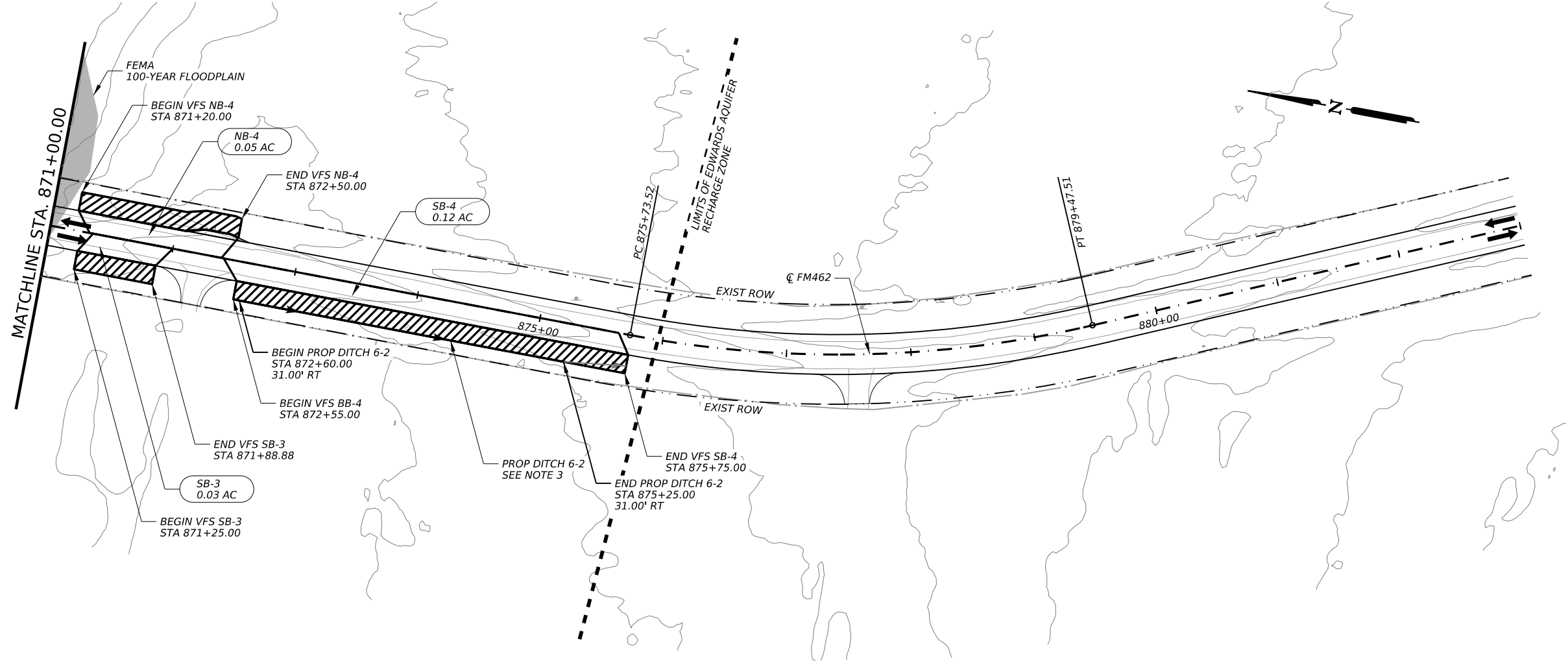
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- LEGEND**
- EXIST FENCE
  - EXIST CONTOURS
  - - - EXIST RIGHT OF WAY
  - - - LIMITS OF EDWARDS AQUIFER RECHARGE ZONE
  - DIRECTION OF TRAVEL
  - ▨ VEGETATIVE FILTER STRIPS
  - FEMA 100-YEAR FLOODPLAIN



2/5/2024

0' 50' 100'

David Gutierrez  
STATE OF TEXAS  
DAVID H. GUTIERREZ  
143301  
LICENSED PROFESSIONAL ENGINEER

**Kimley»Horn** F-928

Texas Department of Transportation

**FM 462**

**WATER POLLUTION ABATEMENT PLAN**

SHEET 3 OF 3

COUNT	SECT	JOB	HIGHWAY
0848	04	052	FM 462
DIST		COUNTY	SHEET NO.
SAT		MEDINA	251

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# Geologic Assessment

## FM 462 from 1.7 miles north of CR 331 to CR 433

CSJ Number: 0848-04-052

December 2023

Prepared for Texas Department of Transportation

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated 12-9-2019, and executed by FHWA and TxDOT.

## Attachment B

### Geologist Certification

*Geologic Assessment FM 462 from 1.7 Mi north of CR 331 to CR 433, WA 57202SB013*

Prepared for: Texas Department of Transportation

Prepared by: Stantec Consulting, Inc.

Date: 25 December 2023

In accordance with the Texas Board of Professional Geologists rules at 22 Texas Administrative Code, Part 39, Chapter 851, Subchapter C, §851.156, this report is signed and sealed on the title page to assure the user that the work has been performed by or directly supervised by the following professional geoscientists who take full responsibility for this work.

The computer-generated seals appearing on this document were authorized by Brian Cowan, P.G. 11180.



*Brian Cowan*

---

Brian D. Cowan, Texas Professional Geoscientist No. 11180  
Stantec Consulting Services, Inc., Geoscience Firm No. 50120

# Geologic Assessment

## Texas Commission on Environmental Quality

For Regulated Activities on The Edwards Aquifer Recharge/transition Zones and Relating to 30 TAC §213.5(b)(3), Effective June 1, 1999

**To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.**

**Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.**

## Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Print Name of Geologist: Brain Davis Cowan,  
P.G.

Telephone: 512-632-8409

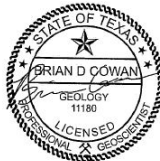
Fax: \_\_\_\_\_

Date: 12/25/2023

Representing: Stantec Consulting Services, Inc. (#50120) (Name of Company and TBPG or TBPE registration number)

Signature of Geologist:

Brian Cowan



Regulated Entity Name: FM 462 from 1.7 MI north of CR 331 to CR 433 TxDOT CSJ 0848-04-052

## Project Information

1. Date(s) Geologic Assessment was performed: 11/03/2023

2. Type of Project:

WPAP  
 SCS

AST  
 UST

3. Location of Project:

Recharge Zone  
 Transition Zone  
 Contributing Zone within the Transition Zone

4.  **Attachment A - Geologic Assessment Table.** Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.
5.  Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups\* (Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

**Table 1 - Soil Units, Infiltration Characteristics and Thickness**

Soil Name	Group*	Thickness(feet)
See report body		

\* Soil Group Definitions (Abbreviated)

- A. Soils having a high infiltration rate when thoroughly wetted.
- B. Soils having a moderate infiltration rate when thoroughly wetted.
- C. Soils having a slow infiltration rate when thoroughly wetted.
- D. Soils having a very slow infiltration rate when thoroughly wetted.

6.  **Attachment B – Stratigraphic Column.** A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.
7.  **Attachment C – Site Geology.** A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.
8.  **Attachment D – Site Geologic Map(s).** The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1": 400'  
 Applicant's Site Plan Scale: 1" = 400'  
 Site Geologic Map Scale: 1" = 400'  
 Site Soils Map Scale (if more than 1 soil type): 1" = 400'
9. Method of collecting positional data:
  - Global Positioning System (GPS) technology.
  - Other method(s). Please describe method of data collection: Via ESRI ArcGIS software for mapped features
10.  The project site and boundaries are clearly shown and labeled on the Site Geologic Map.

- 11.  Surface geologic units are shown and labeled on the Site Geologic Map.
- 12.  Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.
  - Geologic or manmade features were not discovered on the project site during the field investigation.
- 13.  The Recharge Zone boundary is shown and labeled, if appropriate.
- 14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.
  - There are 0 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
    - The wells are not in use and have been properly abandoned.
    - The wells are not in use and will be properly abandoned.
    - The wells are in use and comply with 16 TAC Chapter 76.
  - There are no wells or test holes of any kind known to exist on the project site.

***Administrative Information***

- 15.  Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.



## Attachment A

GEOLOGIC ASSESSMENT TABLE						PROJECT NAME:		FM 462 from 1.7 MI north of CR 331 to CR 433 TxDOT CSJ 0848-04-052											
LOCATION			FEATURE CHARACTERISTICS										EVALUATION		PHYSICAL SETTING				
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10	11	12	
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DIP (DEGREES)	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY	CATCHMENT AREA (ACRES)	TOPOGRAPHY	
						X	Y	Z		10						<40	≥40	<1.6	≥1.6
462-01	29.47146	-99.19987	F	20	Kdvr	110	-	-	40	-	-	-	F	5	25	X		X	Hillside
462-02	29.45938	-99.19795	F	20	Kdvr	110	-	-	70	10	-	-	F	5	35	X		X	Hillside

\* DATUM: WGS 1984

2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12 TOPOGRAPHY
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed



I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

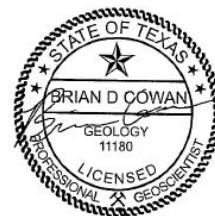
*Brian Cowan*

Date: \_\_\_\_\_

Sheet   1   of   1

## Attachment B

Stratigraphic Units			Hydrogeologic Units		
<i>Quaternary</i>	Quaternary Alluvium & Leona Formation		Outcrop in Survey Area		
	Buda Limestone			<i>Upper Confining Units</i>	
	Del Rio Formation				
<i>Lower Cretaceous</i>	Devils River Formation		Outcrop in Survey Area	<i>Edwards Aquifer</i>	
	Basal Transgressive Unit				
	<b>Trinity Group</b>	<b>Glen Rose Formation</b>	Cavernous member	> 35 m	<i>Upper Trinity Aquifer</i>
			Camp Bullis member	37-46 m	
			Upper evaporite member	5-7.6 m	
			Fossiliferous member	40-53 m	
			Lower evaporite member	2-3 m	
			Lower member	120 m	
			Hensell Formation	20 m	
	Cow Creek Formation	20 m	<i>Middle Trinity Aquifer</i>		
Hamett Formation	9 m				



This stratigraphic column shows the regional geologic units and indicates the zones of rocks that outcrop in the project area. Adapted from Lindgren et al. (2004).

## Attachment C

### Table of Contents

Introduction .....	1
Methodology.....	1
Results .....	1
Regional Hydrostratigraphy .....	1
Project Area Geology.....	2
Soils .....	3
FEMA Flood Zones .....	5
Water Well Records.....	5
Feature Descriptions .....	5
Discussion and Recommendations .....	6

# Attachment C

## Introduction

The proposed project will rehabilitate the existing Ranch to Market (RM) 462 roadway from 1.7 miles north of County Road (CR) 331 to CR 433. The project will also add five-foot-wide shoulders onto both existing roadways. The northern approximately 1.45 miles of the project is located within the TCEQ Edwards Aquifer Recharge Zone (EARZ). TxDOT conducted a Geologic Assessment (GA) on the portion of the project within the EARZ.

## Methodology

Before fieldwork, pertinent data was reviewed, including local and regional geology (Blome et al., 2005), soils (National Resource Conservation Service [NRCS] 2023), flood insurance rate maps (Federal Emergency Management Agency [FEMA] 2012), and well records (Texas Water Development Board [TWDB] 2023). One previous GA, completed in 2019 was reviewed.

Pedestrian surveys were conducted on 3 November 2023 by walking in transects spaced no more than 25 feet apart within the unpaved portions of the ROW within the EARZ while visually surveying for indications of karst features or other features reported in a GA. A reconnaissance investigation was performed on all potential features by a licensed Professional Geoscientist to evaluate the subsurface extent and infiltration potential. The sensitivity of each feature was ranked using the point system as defined in TCEQ 2004. All work was supervised by Brian D Cowan, a licensed Professional Geoscientist in the State of Texas (#11180).

## Results

### *Regional Hydrostratigraphy*

The site is in the Devil's River Trend Depositional Province. Except where covered by Quaternary and modern river deposits, the geology consists of Cretaceous age Devil's River Limestone. There are mapped outcrops of the Del Rio Clay and Buda Limestone, but none were observed within the survey area. A stratigraphic column showing the regional geology is included as Attachment B.

Quaternary alluvium river terrace deposits 10 to 26 feet thick are present over modern channels. Most of these deposits are planar bedded, calcite-cemented, rounded limestone cobbles and gravel (GAT 2010). Beds are light gray to white and weather to gray.

The Leona formation consists of terraced deposits of silt, sand, and gravel paralleling the principal streams in Medina County. Sediments are grayish-brown calcareous, clayey, silty, and sandy unconsolidated alluvium containing limestone granules and pebbles, and caliche fragments, which are abundant in the lower part of the unit (GAT 2010). Soft masses of

## Attachment C

calcium carbonate are present in the uppermost one to two feet. The maximum mapped thickness is 15 feet.

Each stream terrace represents a separate aquifer confined to a stream valley. As a rule, the greatest thickness of saturated material is found near the present or previous drainage channels. The formation generally thins transverse to the stream channel, although there may be a sufficient thickness of saturated material in the interstream area for partial connection of parallel aquifers (Holt 1959).

The Buda Limestone is a hard, dense, fine-grained, buff, or light gray limestone with small, calcite-filled fractures. The Buda is distinctly nodular with a conchoidal fracture pattern and has been described as porcelaneous with little primary porosity or permeability.

The Del Rio Formation is a blue, sticky clay in the subsurface, which weathers in outcrop to greenish-yellow brown clay with pyrite and gypsum. The Del Rio Clay ranges from about 40 to 50 feet thick and often has large accumulations of rams-horn index fossil (*Ilymatogyra arietina*).

In the Devils River Trend, the Edwards Aquifer consists of the Devils River Limestone and is typically about 790 feet thick in Medina County (Maclay 1995). It consists of marine to supratidal deposits in the lower part and complex reef and inter-reefal deposits in the upper part. Rocks grade upward from about 108 feet of poorly permeable, nodular, dense, shaley limestone above the contact with the Glen Rose Limestone, to about 220 feet of tidal and marine wackestone and mudstone containing burrowed or honeycombed beds, some of which are highly permeable. Above these rocks is about 59 feet of mudstone and permeable collapse breccia. The upper 180 feet represent shallow marine deposits consisting of biohermal rudist mounds, talus grainstone, and inter-reefal wackestone. Outcrops are dense, microcrystalline limestone (lime mudstone), grainstone, and packstone that weathers light gray to gray. Outcrops on hillslopes in the northern part of Medina County are commonly pocked, pitted, show fluted dissolution features, and are topped by scattered chert nodules (GAT 2010).

### *Narrative Description of Project Area Geology*

The project area is underlain by the Devils River Formation (Lower Cretaceous) and the Leona Formation (Quaternary) (Blome et al 2005; Attachment D, Figure 2). The project area is mostly covered by paved roadway and the unpaved portions consisted of thick sediments that are likely Quaternary in age. No bedrock outcrops occurred within the project area. Some bedrock outcrops occurred on properties adjacent to the project area but right of entry to these properties was not obtained and these outcrops were not examined.



## Attachment C

The following descriptions are summarized from Blome et al. (2005) Geologic Map of the Edwards Aquifer Recharge Zone, South-Central Texas:

- **Devils River Formation (Lower Cretaceous):** Upper 250 ft consists of miliolid, shell-fragment wackestones and grainstones containing rudists and chert. Middle of formation consists of recrystallized and brecciated mudstones that grade downward into alternating beds of vuggy spar and chert-bearing wackestone and grainstone. Lower 120–250 ft contains sparry limestone and nodular, burrowed mudstone to wackestone, with gastropods, miliolids, and *Exogyra texana*. Upper part of formation has extensive cavern development and abundant caprinids, monopleurids, and requieniids. Highly dissolutioned and brecciated, the middle part has vuggy porosity and abundant chert, with numerous sinkholes and some cavern development. Solution-enlarged fractures are present in the relatively massive, nodular, burrowed mudstone near base of formation. Formal subdivision of the Devils River Formation has been lacking to date.
- **Leona Formation (Quaternary):** Lenticular beds of sand, gravel, silt, and clay. Pebbles and cobbles in the Leona are predominantly limestone with some chert. Coarser gravels are present near base of formation; silt increases up-section. The Leona is locally a prolific ground-water source and has rare cavern development and variable (low to high) porosity due to the poorly sorted gravels. Locally, silty and clayey cement significantly reduces the permeability. In general, formation is thickest near stream channels or older abandoned meander channels. Thickness ranges from a few feet to 80 feet.

### Soils

A review of the NRCS United States Department of Agriculture (USDA) Web Soil Survey (NRCS 2023) indicated that eight soil types occur within the project area (Attachment D, Figure 3).

Map Unit Symbol	Map Unit Name	Acres in Project Area	Percent of Project Area	Thickness (ft)	Hydrologic Group	Description
Or	Orif soils, 0 to 3 percent slopes, frequently flooded	0.57	4.0%	>6.7	A	Very deep, well drained, high Ksat, formed in calcareous sandy and gravelly alluvium

## Attachment C

Map Unit Symbol	Map Unit Name	Acres in Project Area	Percent of Project Area	Thickness (ft)	Hydrologic Group	Description
RED	Real association, undulating	2.2	15.6%	1.7	D	Very shallow or shallow, well drained, moderately high to high Ksat, formed in residuum weathered from limestone
CsB	Castroville clay loam, 1 to 3 percent slopes	3.0	21.4%	>6.7	B	Very deep, well drained, moderately high to high Ksat, formed in calcareous silty alluvium
KnB	Knippa clay, 1 to 3 percent slopes	1.1	8.1%	>6.7	C	Very deep, well drained, moderately high Ksat, formed in calcareous clayey alluvium
KnA	Knippa clay, 0 to 1 percent slopes	2.0	14.4%	>6.7	C	Very deep, well drained, moderately high Ksat, formed in calcareous silty alluvium
Do	Divot clay loam, occasionally flooded	2.3	16.5%	>6.7	C	Very deep, well drained, moderately high Ksat, formed in clayey alluvium
SaC	Sabenyo clay loam, 1 to 5 percent slopes	1.3	9.1%	>6.7	B	Very deep, well drained, moderately high to high Ksat, formed in alluvium derived from limestone
AtA	Atco loam, 0 to 1 percent slopes	0.9	6.3%	6.25	B	Very deep, well drained, high to moderately high Ksat, formed in calcareous loamy alluvium

## Attachment C

Map Unit Symbol	Map Unit Name	Acres in Project Area	Percent of Project Area	Thickness (ft)	Hydrologic Group	Description
SaC	Atco loam, 0 to 1 percent slopes	0.7	4.7%	6.25	B	Very deep, well drained, high to moderately high Ksat, formed in loamy alluvium derived from limestone

### *FEMA Flood Zones*

The project area is shown on the FEMA flood map 48325C0325C effective 3 April 2012. Significant portions of the project area are within Zone A, the 100-Yr floodplain, which is the area where there is a one percent or greater annual chance of flooding. Some parts of the project area are outside the FEMA flood zones (Attachment D, Figure 2).

### *Water Well Records*

According to the Texas Water Development Board (TWDB) Groundwater Database, Brackish Resources Aquifer Characterization System Database, and Submitted Drillers Reports Database, the following wells occur near the project area:

Well #6939504: Is a test hole also known as “TWDB - Tarpley Well EAA monitoring well.” This well was completed in April 1973 to a depth of 652 feet below ground surface (ft bgs) in the Edwards and Associated Limestones and is cased with steel to 85 ft bgs. This well was used for pumping tests, groundwater monitoring, and geochemical sampling. The well is listed by TWDB as “unused” but water level data collected via pressure transducer is available through 1 May 2023. This well was not observed during the field reconnaissance, and it may be located just off the project ROW and obscured by vegetation.

### *Feature Descriptions*

Two features were identified within the project area. The features are described in the Geologic Assessment Table (Attachment A) and below. The location of each feature is mapped on the Site Geologic Map (Attachment D, Figure 2). Feature photographs can be found in Appendix A.

Feature 462-01                      Fault                      29.47146, -99.19987

This feature is a fault mapped by Blome et al. 2005 with no visible expression within the project area. It is oriented approximately 40 degrees (NE-SW) which is consistent with the dominant trend of major faults in the area. There is no expression of this fault within the project area, and because there is no indication of rapid infiltration of water into the

## Attachment C

subsurface near this feature, it is not considered sensitive according to the Edwards Aquifer Rules (30 TAC §213.5(b)(3)).

Feature 462-02                      Fault                      29.45938, -99.19795

This feature is a fault mapped by Blome et al. 2005 with no visible expression within the project area. It is oriented approximately 70 degrees (ENE-WSW) which is not consistent with the dominant trend of major faults in the area. There is no expression of this fault within the project area, and because there is no indication of rapid infiltration of water into the subsurface near this feature, it is not considered sensitive according to the Edwards Aquifer Rules (30 TAC §213.5(b)(3)).

### Discussion and Recommendations

The potential for rapid recharge to the Edwards Aquifer within much of the project area is low due to the lack of features with downward trending voids that may act as a conduit for flow into the Edwards Aquifer. The features that were identified included mapped faults with no surface expression in the project area. Neither feature showed evidence of rapid infiltration of water into the subsurface or of a significant void in the subsurface below the project area (i.e., clean washed rocks, stranded debris, collapse of overburden into the subsurface). It is important to note that visual observations alone cannot identify all karst features as they are often obscured by sediment, pavement, or dense vegetation.

Care should be taken during subsurface excavation within the EARZ as there is a potential to intersect a karst feature with no previous surface expression. A qualified Professional Geoscientist should inspect excavations for karst features. If a void is encountered during excavation within the EARZ, all work around it should cease immediately, and a qualified Professional Geoscientist should inspect the void and prepare a TCEQ Void Discovery Notification Form, if applicable.

## Attachment C

### References

Blome, C.D., Faith, J.R., Pedraza, D.E., Ozuna, G.B., Cole, J.C., Clark, A.K., Small, T.A., and Morris, R.R., 2005, Geologic map of the Edwards aquifer recharge zone, south-central Texas, U.S. Geological Survey, Scientific Investigations Map SIM-2873, 1:200,000.

Federal Emergency Management Agency (FEMA). 2012. National Flood Insurance Program, Flood Insurance Rate Map (FIRM) panel: 48209C0370F - Effective 09/02/2005. Available Online at <https://msc.fema.gov/portal/home>. Accessed on November 29, 2023.

Lindgren, R.J., Dutton, A.R., Hovorka, S.D., Worthington, S.R.H., and S. Painter. 2004. Conceptualization and Simulation of the Edwards Aquifer, San Antonio Region, Texas. US Geological Survey Scientific Investigations Report 2004-5277.

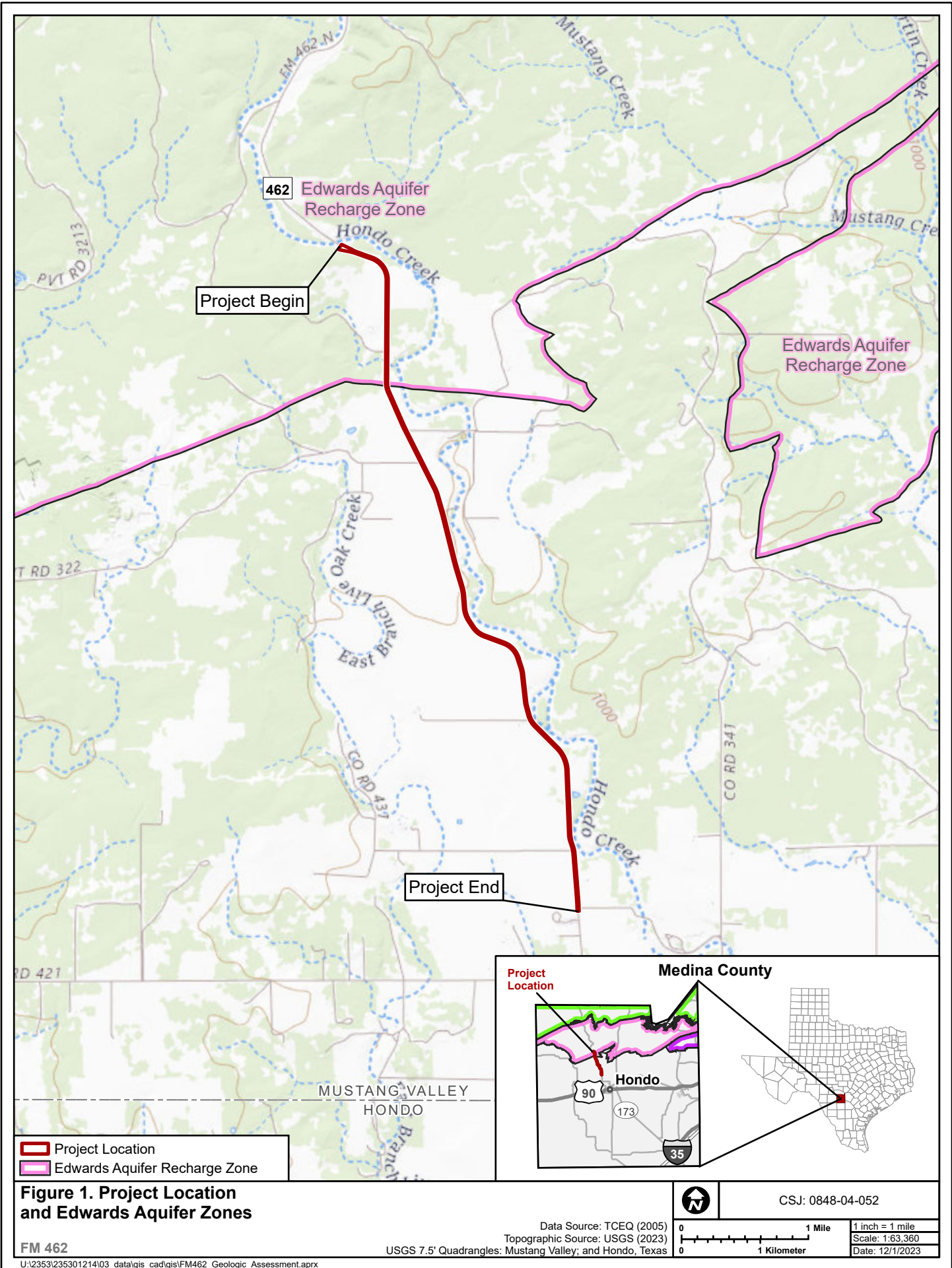
Texas Commission on Environmental Quality (TCEQ). 2004. Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zone. TCEQ RG-0508, 34 p., revised October 1, 2004.

Texas Water Development Board (TWDB). 2023. Groundwater Data Viewer. Available online at <https://www3.twdb.texas.gov/apps/waterdatainteractive/groundwaterdataviewer>. Accessed on November 29, 2023.

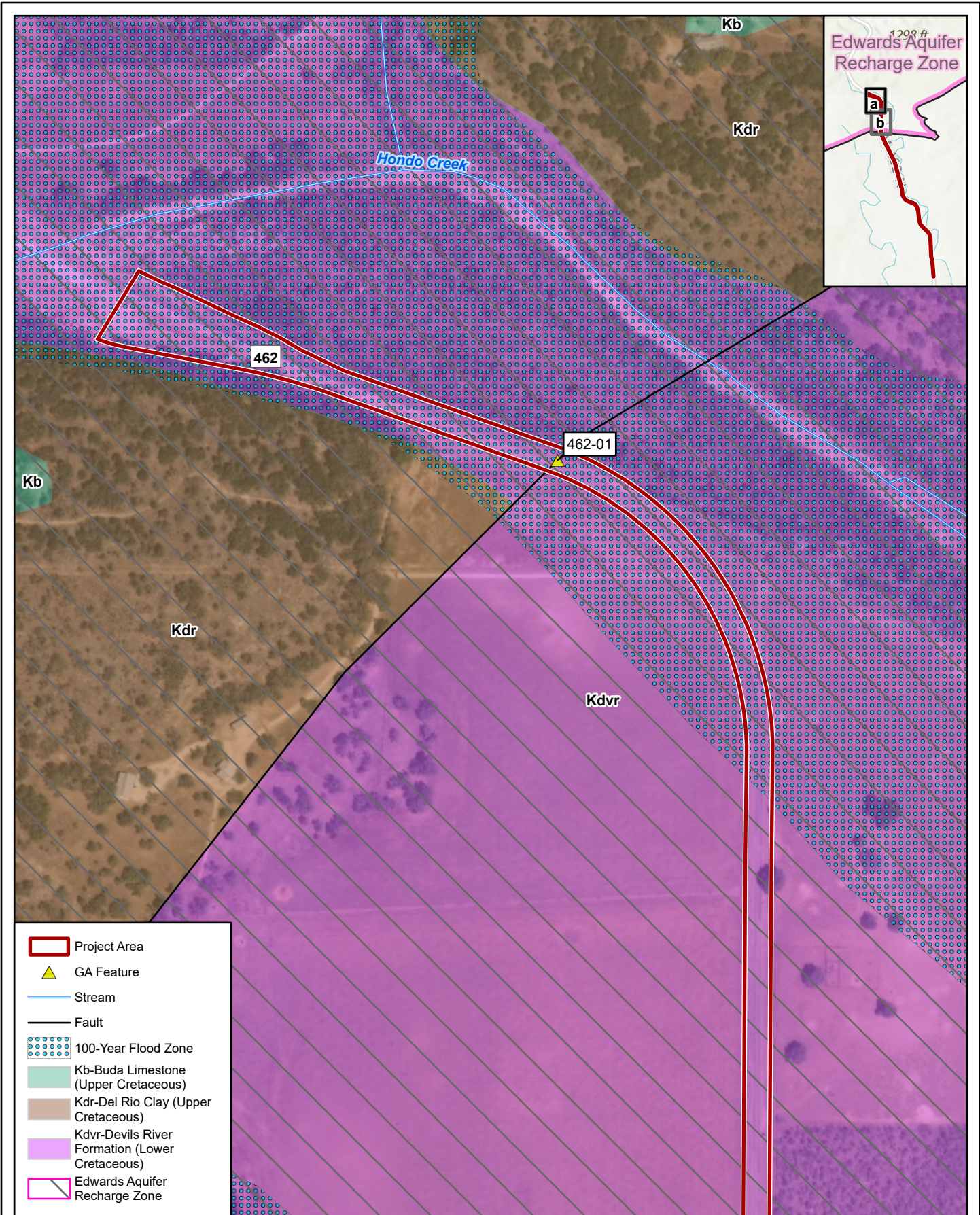
United States Department of Agriculture (USDA), Natural Resources Conservation Service, Soil Survey. 2019. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed November 29, 2023.



## **Attachment D: Project Location, Site Geology & Site Soils Maps**







- Project Area
- ▲ GA Feature
- Stream
- Fault
- 100-Year Flood Zone
- Kb-Buda Limestone (Upper Cretaceous)
- Kdr-Del Rio Clay (Upper Cretaceous)
- Kdvr-Devils River Formation (Lower Cretaceous)
- Edwards Aquifer Recharge Zone

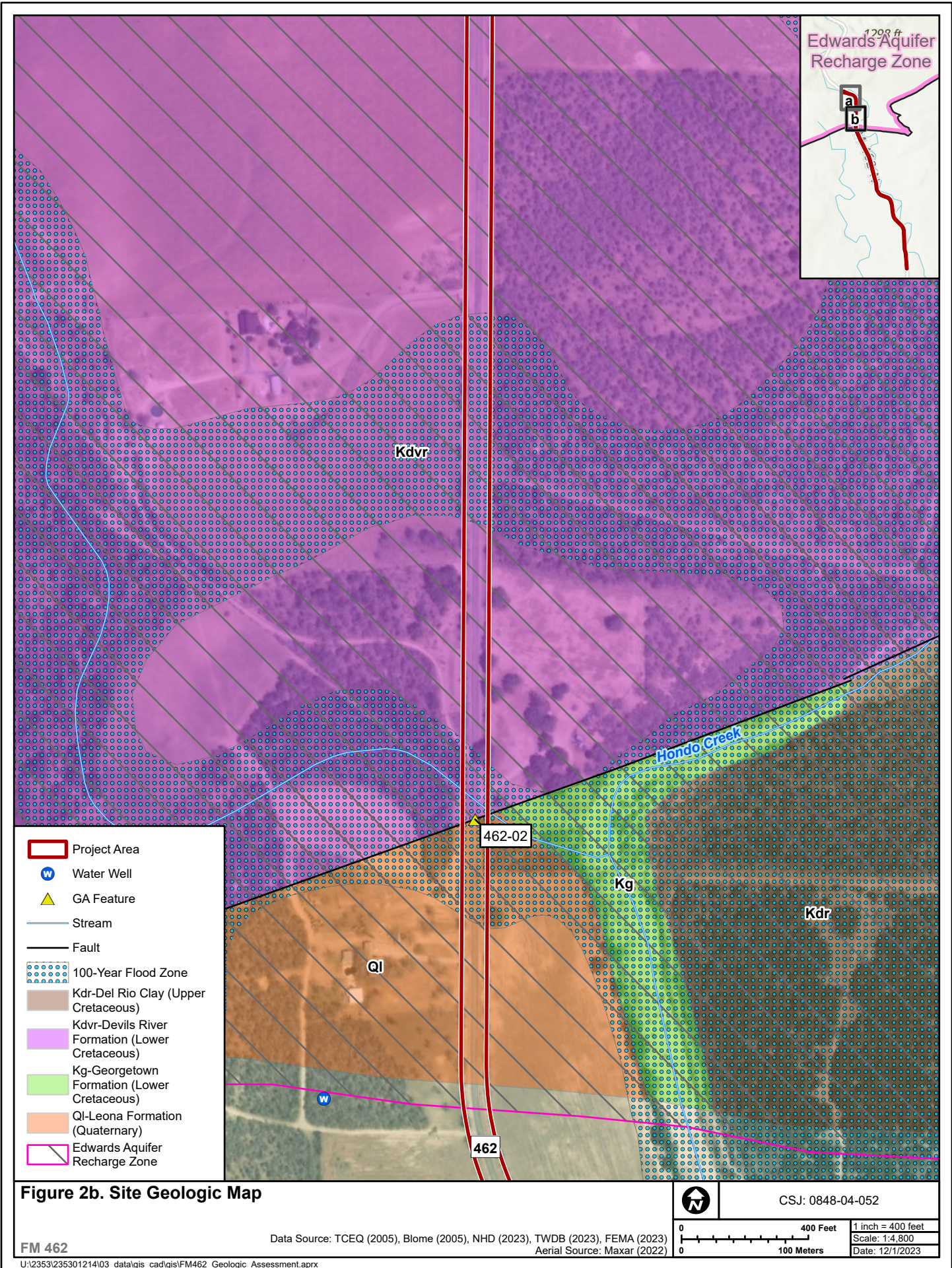
**Figure 2a. Site Geologic Map**

	CSJ: 0848-04-052
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0	100 Meters
	1 inch = 400 feet Scale: 1:4,800 Date: 12/1/2023

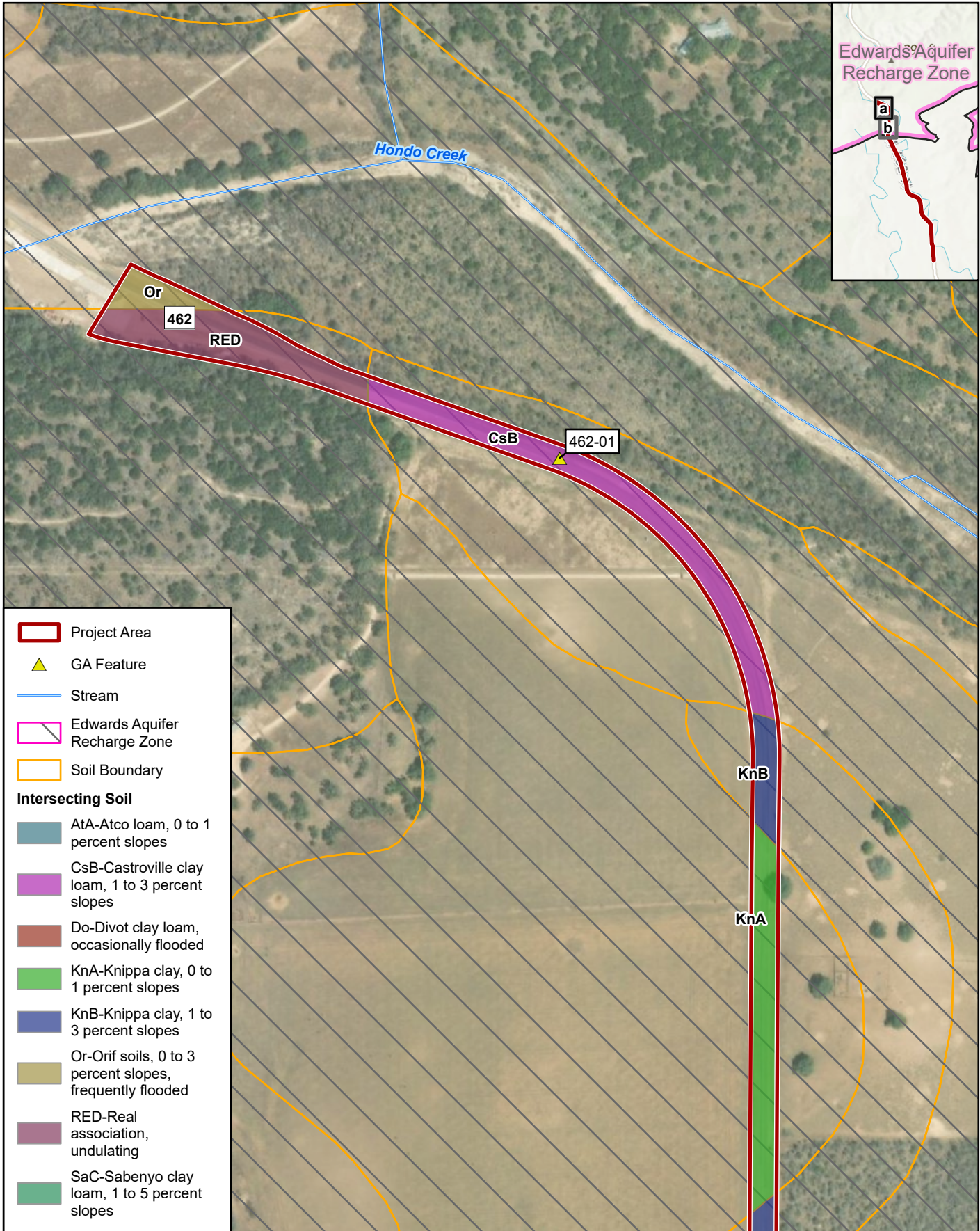
FM 462

Data Source: TCEQ (2005), Blome (2005), NHD (2023), TWDB (2023), FEMA (2023)  
Aerial Source: Maxar (2022)









**Figure 3a. Site Soils Map**

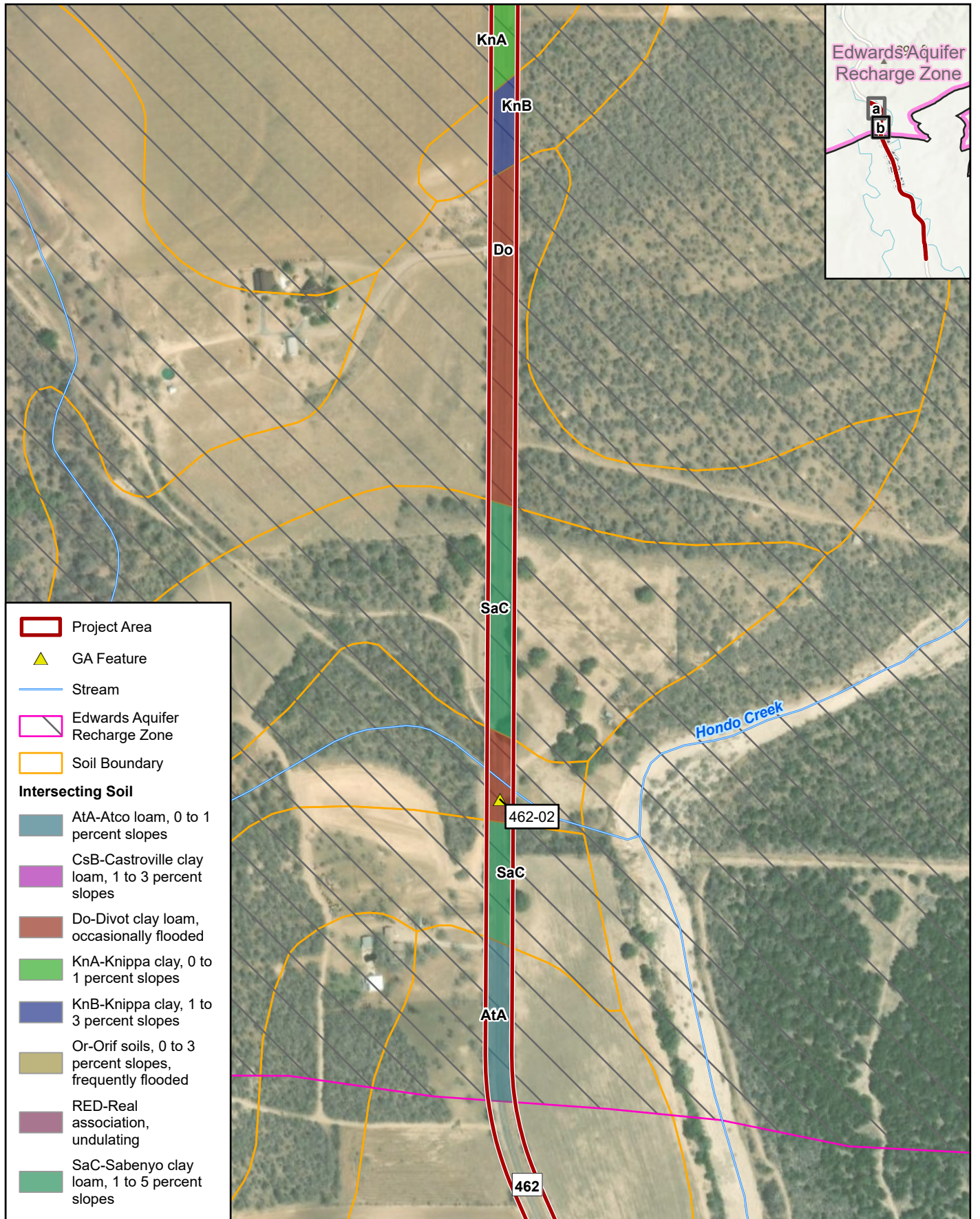
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 Date: 12/1/2023

FM 462

Data Source: TCEQ (2005), NHD (2023), NRCS (2023)  
 Aerial Source: Maxar (2022)





**Figure 3b. Site Soils Map**

CSJ: 0848-04-052

0 400 Feet 1 inch = 400 feet  
 0 100 Meters Scale: 1:4,800  
 Date: 12/1/2023

FM 462

Data Source: TCEQ (2005), NHD (2023), NRCS (2023)  
 Aerial Source: Maxar (2022)

## Appendix A: Field Photographs





**Photo 1.** Representative photo of the southern portion of the project area. Facing north.



**Photo 2.** Photo of mapped location of Feature 462-01, a mapped fault. Neither mapped fault had a visible surface expression in the project area. Facing north.





**Photo 3.** View of northern project area from Hondo Creek bridge. Facing south.



**Photo 4.** Roadway is not curbed or guttered, and water is conveyed via grassy swales or sheetflow off the project area. Facing south.