

CITY OF NORMAN, OK
FLOODPLAIN PERMIT COMMITTEE MEETING
Development Center, Room B, 225 N. Webster Ave., Norman, OK 73069
Monday, July 21, 2025 at 3:30 PM

AGENDA

It is the policy of the City of Norman that no person or groups of persons shall on the grounds of race, color, religion, ancestry, national origin, age, place of birth, sex, sexual orientation, gender identity or expression, familial status, marital status, including marriage to a person of the same sex, disability, relation, or genetic information, be excluded from participation in, be denied the benefits of, or otherwise subjected to discrimination in employment activities or in all programs, services, or activities administered by the City, its recipients, sub-recipients, and contractors. In the event of any comments, complaints, modifications, accommodations, alternative formats, and auxiliary aids and services regarding accessibility or inclusion, please call 405-366-5424, Relay Service: 711. To better serve you, five (5) business days' advance notice is preferred.

ROLL CALL

MINUTES

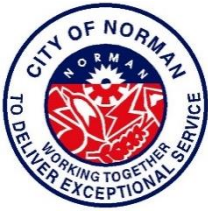
1. Approval of minutes from the July 7, 2025 meeting

ACTION ITEMS

2. **Floodplain Permit Application No. 727** - This floodplain permit application is for the proposed bridge replacement for the bridge over a tributary to Jim Blue Creek on East Post Oak Road between 96th Ave. SE and 104th Ave. SE

MISCELLANEOUS COMMENTS

ADJOURNMENT



CITY OF NORMAN, OK

FLOODPLAIN PERMIT COMMITTEE MEETING

Development Center, Conference Room B, 225 N. Webster Avenue,
Norman, OK 73069

Monday July 7, 2025 at 3:30 PM

MINUTES

The Floodplain Permit Committee of the City of Norman, Cleveland County, State of Oklahoma, met in Regular Session in Conference Room B at the Development Center, on the 7th day of July, 2025, at 3:30 p.m., and notice of the agenda of the meeting was posted at the Norman Municipal Building at 201 West Gray, Development Center at 225 N. Webster and on the City website at least 24 hours prior to the beginning of the meeting.

ROLL CALL

The meeting was called to order by Mr. Sturtz at 3:30 p.m. Roll was taken. Committee members in attendance included Bill Scanlon, Resident Member; Sherri Stansel, Resident Member; Scott Sturtz, Floodplain Administrator; Tim Miles, City Engineer; Lora Hoggatt, Public Services Manager; and Ken Danner, Subdivision Development Manager. Committee members absent included Jane Hudson, Director of Planning. Also in attendance were Jason Murphy, Stormwater Program Manager; and Roxsie Stephens, Staff. Citizens in attendance included Gary Keen, P.E.; Braden Shaffer, P.E.; Ken Giannone, P.E.; Joseph Hill; Brandon Brooks, P.E.; and Ethan Childers.

MINUTES

1. Approval of minutes from the June 2nd 2025 meeting
 - a. Minutes were approved with a vote of 5 to 0, with a minor edit made to wording.

ACTION ITEMS

2. Floodplain Permit No. 718

Mr. Sturtz stated that the floodplain permit application is for the emergency repairs to the sanitary sewer line that crosses Bishop Creek near 730 Stinson.

Mr. Murphy stated the applicant is the City of Norman Utilities Authority. The contractor is TBD and the engineer is Ken Giannone, P.E..

Mr. Murphy provided a staff report, detailing the request with respect to the floodplain permit requirements and potential impacts.

Mr. Murphy stated staff recommends permit app #718 be approved.

Mr. Sturtz asked the committee if they had any questions. There were not any questions from the committee.

Mr. Sturtz asked for any comments from the public. There were not any questions from the public.

Mr. Scanlon motioned to approve the permit. Mrs. Hoggatt seconded the motion. **The permit application was approved with a vote of 6-0.**

3. Floodplain Permit No. 719

Mr. Sturtz stated that the floodplain permit application is for bridge maintenance on Main Street located over Merkle Creek between Merkle Drive and Hal Muldrow Drive.

Mr. Sturtz said the applicant is City of Norman, Streets Division. The contractor is TBD and the engineer is Brandon Brooks, P.E., CFM.

Mr. Murphy presented the staff report, providing details for the bridge maintenance, with respect to the Floodplain permit requirements.

Mr. Murphy stated staff recommends Floodplain Permit Application #719 be approved.

Mr. Sturtz asked the committee if they have any questions. Mr. Scanlon stated that he was very impressed with the details provided with this permit. There were no questions from the committee.

Mr. Sturtz asked for any comments from the public. Mr. Childers asked if the bridge maintenance would create any lane closures. It was confirmed that there would be one lane closed on the road in both directions for the duration of the project.

Mr. Danner motioned to approve. Mr. Scanlon seconded the motion. **The permit application was approved with a vote of 6-0.**

4. Floodplain Permit No. 720

Mr. Sturtz stated that the floodplain permit application is for bridge maintenance for the bridge over Bishop Creek near the intersection of Lindsey Street and Classen Boulevard.

Mr. Sturtz said the applicant is City of Norman, Streets Division. The contractor is TBD and the engineer is Brandon Brooks, P.E., CFM.

Mr. Murphy presented the staff report, providing details for the bridge maintenance, with respect to the Floodplain permit requirements.

Mr. Murphy stated staff recommends Floodplain Permit Application #720 be approved.

Mr. Sturtz asked the committee if they have any questions. There were not any questions from the committee.

Mr. Sturtz asked for any comments from the public. There were not any questions from the public.

Mr. Danner motioned to approve. Mr. Scanlon seconded the motion. The permit application was approved with a vote of 6-0.

5. Floodplain Permit No. 721

Mr. Sturtz stated that the floodplain permit application is for the proposed connection of a water line located in the Bishop Creek floodplain for the proposed development outside of the floodplain at 310 Boyd Street.

Mr. Sturtz said the applicant is OK-OU Holdings, LLC (Frank Rocchio). The contractor is Cowen Construction and the engineer is Braden Shaffer, P.E., CFM (Crafton Tull).

Mr. Murphy presented the staff report, providing details for the proposed development with respect to the Floodplain permit requirements.

Mr. Murphy stated staff recommends Floodplain Permit Application #721 be approved.

Mr. Sturtz asked the committee if they have any questions. There were none.

Mr. Sturtz asked for any comments from the public. There were none.

Mr. Danner motioned to approve. Mr. Scanlon seconded the motion. **The permit application was approved with a vote of 6-0.**

6. Floodplain Permit No. 722

Mr. Sturtz stated that the floodplain permit application is for the proposed construction of a single family residence at 2601 60th Avenue NW in the Ten Mile Flat Creek floodplain.

Mr. Sturtz said the applicant is Jared and Kaylee Gray. The builder is Stonewall Homes and the engineer is Gary Keen, P.E..

Mr. Murphy presented the staff report, providing details for the construction project, with respect to the Floodplain permit requirements.

Mr. Murphy stated staff recommends Floodplain Permit Application #722 be approved with the following conditions:

- Elevation certificate is provided for residential structure prior to final acceptance
- As-built survey should be provided for the drive compensatory storage area prior to final acceptance.

Mr. Sturtz asked the committee if they have any questions. Mr. Scanlon asked why the conditions for approval do not include the various permits that were mentioned in staff reports. Mr. Sturtz explained that the applicant will need to address those permits individually and they do not directly impact the floodplain permit determination.

Mr. Sturtz asked why in the second condition it is worded the way it is and suggested that it be changed to "all fill areas and compensatory storages". Mr. Sturtz also asked if we know what the elevation of the driveway is. Mr. Murphy referred to a survey with elevation contours and asked if Mr. Keen could elaborate any further. Mr. Keen stated that they are planning on building the subgrade up to 1128.5 and will put 6 inches of concrete on top of that. This will make the elevation 1129 and it will slope upwards going towards the structure.

Mr. Scanlon asked if there is any plan for fencing to be built. Mr. Keen stated that he had spoken to the contractor and expressed the difference in submitting the plans for a fence with this permit versus waiting until a later date. He stated he has not heard any request from the owners or contractor for a fence.

Mr. Sturtz asked for any comments from the public. There were not any questions from the public.

Mr. Scanlon motioned to approve with the following amendments to the conditions recommended by staff as proposed by Mr. Sturtz.

- Elevation certificate is provided for residential structure prior to final acceptance
- As-built survey should be provided of all fill areas and compensatory storage area (pond) prior to final acceptance

Mr. Danner seconded the motion. **The permit application was approved with a vote of 6-0.**

7. Floodplain Permit No. 723

Mr. Sturtz stated that the floodplain permit application is for road repairs at two locations in the Ten Mile Flat Creek floodplain. The two locations are over Ten Mile Flat Creek on Robinson Street and on Rock Creek Road, both between 48th Ave. NW and 60th Ave. NW.

Mr. Sturtz said the applicant is City of Norman, Streets Division. The contractor is TBD and the engineer is Brandon Brooks, P.E., CFM.

Mr. Murphy presented the staff report, providing details for the road repairs, with respect to the Floodplain permit requirements.

Mr. Murphy stated staff recommends Floodplain Permit Application #723 be approved.

Mr. Sturtz asked the committee if they have any questions. There were not any questions from the committee.

Mr. Sturtz asked for any comments from the public. There were not any questions from the public.

Mr. Danner motioned to approve. Mrs. Hoggatt seconded the motion. **The permit application was approved with a vote of 6-0.**

MISCELLANEOUS COMMENTS

ADJOURNMENT

Mrs. Stansel motioned to adjourn. Mr. Danner seconded the motion. Mr. Sturtz adjourned the meeting at 4:12 p.m.

Passed and approved this _____ day of _____, 2025

City of Norman Floodplain Administrator, Scott Sturtz

STAFF REPORT

07/21/2025

PERMIT #727

ITEM: This Floodplain Permit Application is for the replacement of a bridge over a tributary to Jim Blue Creek on East Post Oak Road between 96th Ave. SE and 104th Ave. SE.

BACKGROUND:

APPLICANT: City of Norman Streets Department

CONTRACTOR: K&R

ENGINEER: Darryl J. Gary, P.E.

This project involves the replacement of the bridge located on East Post Oak over a tributary of Jim Blue Creek in the Lake Thunderbird watershed and is one of the programmed bridge replacements in the City of Norman Bridge Maintenance Bond. This construction project will consist of removing the existing bridge, excavating to accommodate the new structure, regrading roadway drainage channels, minimal channel restoration and stabilization measures in the immediate vicinity of the bridge.

The existing bridge is a 32' long steel beam structure with a 22-foot wide, clear roadway and has a load rating of 12 tons. The proposed bridge replacement consists of 3 12'x7'x40'-2" at grade reinforced concrete boxes (RCB). Plans indicate a slight change in road grade and the addition of a shoulder for safety. According to the engineering report, for the existing bridge, the water surface elevation upstream of the structure for the 100-year flood event is 1126.11 ft. with 3.85 ft. of backwater compared to the natural condition with no freeboard. For the proposed bridge, the water surface elevation upstream of the structure for the 100-year flood event is 1122.89 ft. with 0.63 ft. of backwater compared to natural conditions with 1.41 ft. of free board.

Site located in Little River Basin or its Tributaries? yes ☐ no ☒

STAFF ANALYSIS:

The project is located in the Jim Blue Creek floodplain (Zone A). Base flood elevation is approximately 1123.0'.

Applicable Ordinance Sections:

36-533 (e)(2)(a).....

(e)(2)(e).....

(f)(3)(8).....

Subject Area:

Fill restrictions in the floodplain

Compensatory storage

No rise considerations

(e)(2)(a) and (e)(2)(e) Fill Restrictions in the Floodplain and Compensatory Storage – The use of fill is restricted in the floodplain unless compensatory storage is provided.

Plans indicate approximately 1400 cubic yards of cut and 900 cubic yards of fill, for an approximate increase in storage of 500 cubic yards meeting ordinance requirements.

(f)(3)(8) No Rise Considerations – For proposed development within any flood hazard area (except for those designated as regulatory floodways), certification that a rise of no more than 0.05 feet will occur in the BFE on any adjacent property as a result of the proposed work must be provided.

The engineer has certified that the project will not cause a rise in the BFE which meets this ordinance requirement.

RECOMMENDATION: Staff recommends that Floodplain Permit Application #727 be approved.

ACTION TAKEN: _____



City of Norman

Floodplain Permit Application

Floodplain Permit No. 727

Building Permit No. _____

Date 7/21/2025

FLOODPLAIN PERMIT APPLICATION (\$100.00 Application Fee Required)

SECTION 1: GENERAL PROVISIONS (APPLICANT to read and sign):

1. No work may start until a permit is issued.
2. The permit may be revoked if any false statements are made herein.
3. If revoked, all work must cease until permit is re-issued.
4. Development shall not be used or occupied until a Certificate of Occupancy is issued.
5. The permit will expire if no work is commenced within 2 years of issuance.
6. Applicant is hereby informed that other permits may be required to fulfill local, state and federal regulatory requirements and must be included with this floodplain permit application.
7. Applicant hereby gives consent to the City of Norman or his/her representative to access the property to make reasonable inspections required to verify compliance.
8. The following floodplain modifications require approval by the City Council:
 - (a) A modification of the floodplain that results in a change of ten percent (10%) or more in the width of the floodplain.
 - (b) The construction of a pond with a water surface area of 5 acres or more.
 - (c) Any modifications of the stream banks or flow line within the area that would be regulatory floodway whether or not that channel has a regulatory floodplain, unless the work is being done by the City of Norman staff as part of a routine maintenance activity.
9. All supporting documentation required by this application is required along with the permit fee by the submittal deadline. Late or incomplete applications will not be accepted.
10. I, THE APPLICANT, CERTIFY THAT ALL STATEMENTS HEREIN AND IN ATTACHMENTS TO THIS APPLICATION ARE, TO THE BEST OF MY KNOWLEDGE, TRUE AND ACCURATE.

SECTION 2: PROPOSED DEVELOPMENT (To be completed by APPLICANT.)

APPLICANT: City of Norman ADDRESS: 225 N. Webster Ave., Norman, Ok, 73069

TELEPHONE: 405-366-5459 SIGNATURE: _____

BUILDER: _____ ADDRESS: _____

TELEPHONE: _____ SIGNATURE: _____

ENGINEER: _____ ADDRESS: _____

TELEPHONE: _____ SIGNATURE: _____

PROJECT LOCATION

To avoid delay in processing the application, please provide enough information to easily identify the project location. Provide the street address, subdivision addition, lot number or legal description (attach) and, outside urban areas, the distance to the nearest intersecting road or well known landmark. A sketch attached to this application showing the project location would be helpful.

A bridge located between 96th Ave SE and 104th Ave SE over a tributary of Jim Blue Creek.

DESCRIPTION OF WORK (Check all applicable boxes):

A. STRUCTURAL DEVELOPMENT

ACTIVITY

STRUCTURE TYPE

- | | |
|--|---|
| ☐ New Structure | ☐ Residential (1-4 Family) |
| ☐ Addition | ☐ Residential (More than 4 Family) |
| ☐ Alteration | ☐ Non-Residential (Flood proofing? ☐ Yes) |
| ☐ Relocation | ☐ Combined Use (Residential & Commercial) |
| ☐ Demolition | ☐ Manufactured (Mobile) Home |
| ☐ Replacement | ☐ In Manufactured Home Park? ☐ Yes |

ESTIMATED COST OF PROJECT \$ 888,289.60 Work that involves substantial damage/substantial improvement requires detailed cost estimates and an appraisal of the structure that is being improved.

B. OTHER DEVELOPMENT ACTIVITIES:

- ☐ Fill ☐ Mining ☐ Drilling ☐ Grading
- ☐ Excavation (Beyond the minimum for Structural Development)
- ☐ Watercourse Alteration (Including Dredging and Channel Modifications)
- ☐ Drainage Improvements (Including Culvert Work) ☒ Road, Street or Bridge Construction
- ☐ Subdivision (New or Expansion) ☐ Individual Water or Sewer System

In addition to items A. and B. provide a complete and detailed description of proposed work (failure to provide this item will be cause for the application to be rejected by staff). Attach additional sheets if necessary.

This project is to replace the load rated bridge located between 96th Ave SE and 108th Ave SE over a tributary of Jim Blue Creek. It will involve removing the existing structure, raising the road profile slightly, and improving the grass drainage channels on the north and south side of the road.

C. ATTACHMENTS WHICH ARE REQUIRED WITH EVERY APPLICATION:

The applicant must submit the documents listed below before the application can be processed. If the requested document is not relevant to the project scope, please check the Not Applicable box and provide explanation.

- A. Plans drawn to scale showing the nature, location, dimensions, and elevation of the lot, existing or proposed structures, fill, storage of materials, flood proofing measures, and the relationship of the above to the location of the channel, floodway, and the regulatory flood-protection elevation.

- B. A typical valley cross-section showing the channel of the stream, elevation of land areas adjoining each side of the channel, cross-sectional areas to be occupied by the proposed development, and high-water information.

☒ Not Applicable:

- C. Subdivision or other development plans (If the subdivision or other developments exceeds 50 lots or 5 acres, whichever is the lesser, the applicant **must** provide 100-year flood elevations if they are not otherwise available).

☒ Not Applicable:

- D. Plans (surface view) showing elevations or contours of the ground; pertinent structure, fill, or storage elevations; size, location, and spatial arrangement of all proposed and existing structures on the site; location and elevations of streets, water supply, sanitary facilities; photographs showing existing land uses and vegetation upstream and downstream, soil types and other pertinent information.

☐ Not Applicable:

- E. A profile showing the slope of the bottom of the channel or flow line of the stream.

☒ Not Applicable:

- F. Elevation (in relation to mean sea level) of the lowest floor (including basement) of all new and substantially improved structures.

☒ Not Applicable:

- G. Description of the extent to which any watercourse or natural drainage will be altered or relocated as a result of proposed development.

☒ Not Applicable:

- H. For proposed development within any flood hazard area (except for those areas designated as regulatory floodways), certification that a rise of no more than five hundredths of a foot (0.05') will occur on any adjacent property in the base flood elevation as a result of the proposed work. For proposed development within a designated regulatory floodway, certification of no increase in flood levels within the community during the occurrence of the base flood discharge as a result of the proposed work. All certifications shall be signed and sealed by a Registered Professional Engineer licensed to practice in the State of Oklahoma.
- I. A certified list of names and addresses of all record property owners within a three hundred fifty (350) foot radius of the exterior boundary of the subject property not to exceed 100 feet laterally from the Special Flood Hazard Area. The radius to be extended by increments of one hundred (100) linear feet until the list of property owners includes not less than fifteen (15) individual property owners of separate parcels or until a maximum radius of one thousand (1,000) feet has been reached.
- J. A copy of all other applicable local, state, and federal permits (i.e. U.S. Army Corps of Engineers 404 permit, etc).

After completing SECTION 2, APPLICANT should submit form to Permit Staff for review.

SECTION 3: FLOODPLAIN DETERMINATION (To be completed by Permit Staff.)

The proposed development is located on FIRM Panel No.: 0320H, Dated: 9/26/2008

The Proposed Development:

☐ Is NOT located in a Special Flood Hazard Area

(Notify the applicant that the application review is complete and NO FLOODPLAIN PERMIT IS REQUIRED).

☒ Is located in a Special Flood Hazard Area.

☐ The proposed development is located in a floodway.

☒ 100-Year flood elevation at the site is ~1123.0' Ft. NGVD (MSL) ☐ Unavailable

See Section 4 for additional instructions.

SIGNED: 

DATE: 7/16/2025

SECTION 4: ADDITIONAL INFORMATION REQUIRED (To be completed by Permit Staff.)

The applicant must also submit the documents checked below before the application can be processed.

- ☐ Flood proofing protection level (non-residential only) _____ Ft. NGVD (MSL). For flood proofed structures applicant must attach certification from registered engineer.
- ☐ Certification from a registered engineer that the proposed activity in a regulatory floodway will not result in any increase in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.
- ☐ Certification from a registered engineer that the proposed activity in a regulatory flood plain will result in an increase of no more than 0.05 feet in the height of the 100-year flood (Base Flood Elevation). A copy of all data and calculations supporting this finding must also be submitted.
- ☐ All other applicable federal, state, and local permits have been obtained.

Other: _____

SECTION 5: PERMIT DETERMINATION (To be completed by Floodplain Chairman.)

The proposed activity: (A) ☐ **Is**; (B) ☐ **Is Not** in conformance with provisions of Norman's City Code Chapter 36, Section 533. The permit is issued subject to the conditions attached to and made part of this permit.

SIGNED: _____ DATE: _____

If **BOX A** is checked, the Floodplain committee chairman may issue a Floodplain Permit.

If **BOX B** is checked, the Floodplain committee chairman will provide a written summary of deficiencies. Applicant may revise and resubmit an application to the Floodplain committee or may request a hearing from the Board of Adjustment.

APPEALS: Appealed to Board of Adjustment: ☐ Yes ☐ No
Hearing date: _____

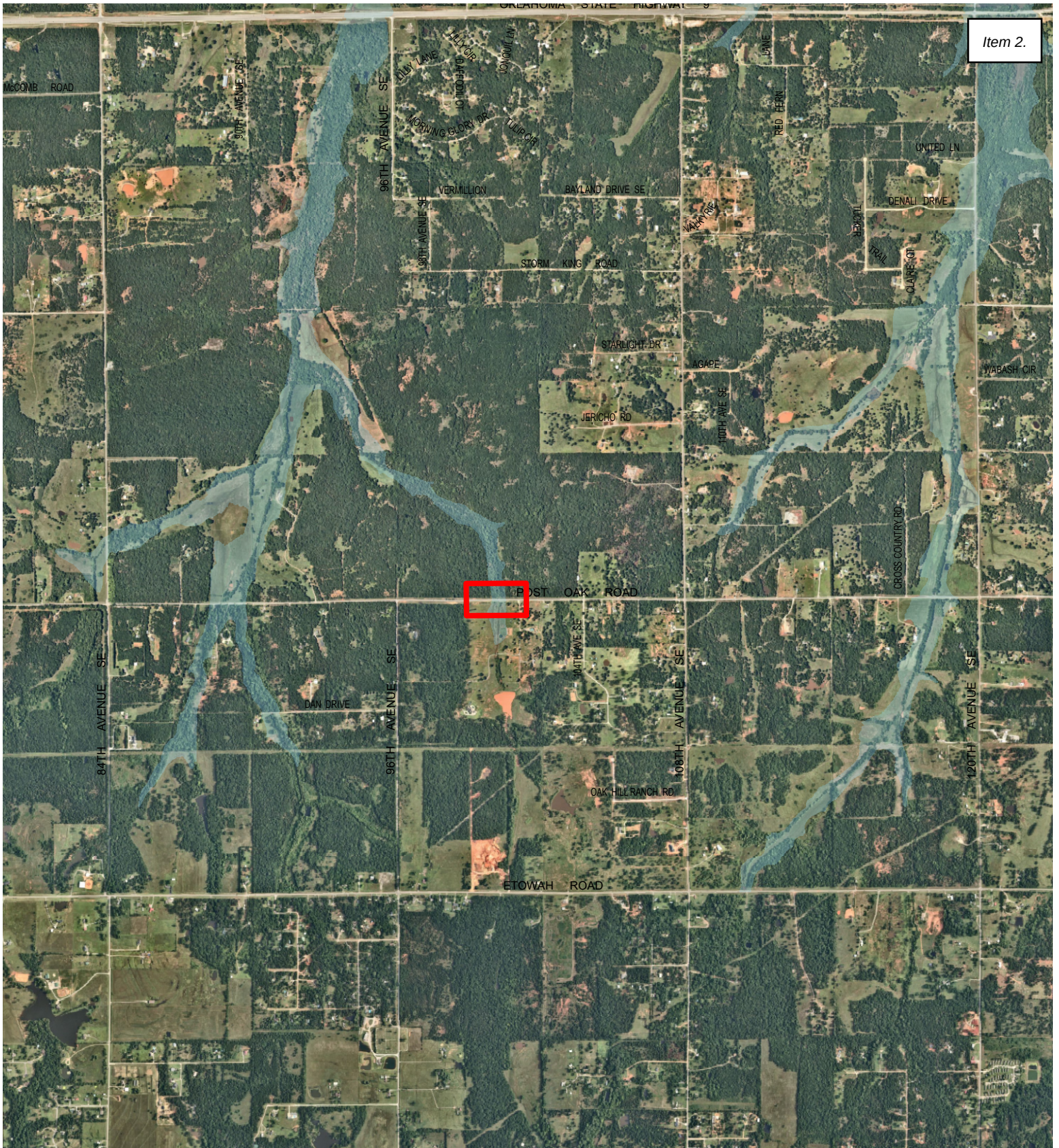
Board of Adjustment Decision - Approved: ☐ Yes ☐ No

Conditions:

SECTION 6: AS-BUILT ELEVATIONS (To be submitted by APPLICANT before Certificate of Occupancy is issued.)

1. FEMA Elevation Certificate
and/or
2. FEMA Floodproofing Certificate

NOTE: The completed certificate will be reviewed by staff for completeness and accuracy. If any deficiencies are found it will be returned to the applicant for revision. A Certificate of Occupancy for the structure will not be issued until an Elevation and /or Floodproofing Certificate has been accepted by the City.



East Post Oak Bridge Replacement

Legend

- BFE 2021
- 1% Chance Floodplain
- Floodway

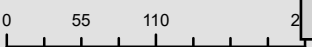
0 900 1,800 3,600



East Post Oak Bridge Replacement

Legend

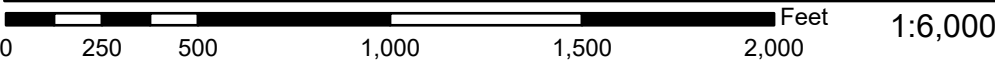
-  BFE 2021
-  1% Chance Floodplain
-  Floodway



National Flood Hazard Layer FIRMMette



97°17'57"W 35°9'52"N



97°17'20"W 35°9'23"N

Basemap Imagery Source: USGS National Map 2023

Legend

Item 2.

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual Chance Water Surface Elevation
OTHER FEATURES		Coastal Transect
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
OTHER FEATURES		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
MAP PANELS		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/16/2025 at 4:17 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

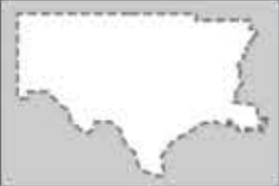
This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifier, FIRM panel number, and FIRM effective date. Map in unmapped and unmodernized areas cannot be used for regulatory purposes.

Report

Legend

5

FEMA Region 6



FEMA Region 6

Comments:

FEMA Region 6 includes Arkansas, Louisiana, New Mexico, Oklahoma, and Texas. [More info](#)

Click [here](#) to select a different area.

Flood Depth (1%)



≤ 1 foot	> 3 to 4 feet
> 1 to 2 feet	> 4 to 5 feet
> 2 to 3 feet	> 5 feet

Comments:

Depicts estimated water depths above land surface during a 1% annual chance storm event (a storm that has a 1/100 chance of occurring in any calendar year). [Glossary of terms...](#)

Coastal Influence



Areas of coastal influence

Comments:

Coastal Influence features are represented from the National Flood Hazard Layer and include coastal A, AE, V, and VE.

Quick Start

Change Area

Glossary

About

Notifications

Hover tips

Dark mode

Map Layers

3

+

Home

Full Screen

Layers

Print

Share

Scale 4,514 Lat 35.1605 Lon -97.2916

100 m

500 ft

18



The City of NORMAN

225 N Webster Ave • P.O. Box 370
Norman, Oklahoma 73069 • 73070

PUBLIC WORKS DEPARTMENT

Phone: 405-366-5452
Fax: 405-366-5418

Item 2.

June 3, 2025

Mr. Scott Sturtz, P.E., CFM
Floodplain Administrator
City of Norman

Re: No Rise Certification
E. Post Oak Rd Bridge Replacement
Norman, OK

Dear Mr. Sturtz:

This project involves the replacement of the bridge located on E. Post Oak Road over a tributary to Jim Blue Creek within the City of Norman. Replacement activities include removing the existing bridge, excavating to accommodate the new structure, regrading roadway drainage channels, minimal channel restoration and articulated concrete block placement (limited to the immediate vicinity of the bridge).

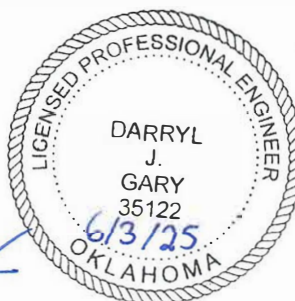
The existing bridge is a 32' long steel beam structure with a 22-foot clear roadway and is load posted with a weight limit of 12 tons. The proposed bridge replacement is a 3-12'x7'x40'-2" at-grade RCB. For the existing bridge, the water surface elevation upstream of the structure for the 100-year flood event is 1126.11 ft. with 3.85 ft. of backwater compared to the natural condition with no freeboard. For the proposed bridge, the water surface elevation upstream of the structure for the 100-year flood event is 1122.89 ft. with 0.63 ft. of backwater compared to natural conditions with 1.41 ft. of freeboard. There will not be any increase in the Base Flood Elevation as a result of this project.

Please contact me at if you have any questions or need further information.

Sincerely,

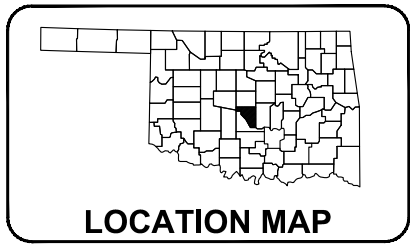
Darryl J. Gary, P.E.
Project Engineer

x Darryl J. Gary



SURVEY CONTROL DATA

- 1) THE PROJECT HORIZONTAL DATUM IS BASED ON THE NAD88, OKLAHOMA STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, (US SURVEY FEET DEFINITION), WITH NO COMBINED ADJUSTMENT FACTOR (CAF). ALL COORDINATE AND DIMENSIONS SHOWN ON THESE PLANS ARE ON STATE PLANE.
- 2) THE VERTICAL DATUM USED IS NAVD88.



DESIGN DATA	
ADT 2025	- 220
ADT 2045	- 327
V	40 MPH
FLEX ESALS.	0.24 M

CITY OF NORMAN

PLAN OF PROPOSED

BRIDGE AND APPROACHES

PROJECT NO. K-2324-151

EXISTING NBI NO. 26914 NEW NBI NO. 33435

E. POST OAK ROAD OVER TRIB. TO JIM BLUE CREEK

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
0001	TITLE SHEET
0002	TYPICAL SECTION
AB01	SUMMARY OF PAY QUANTITIES AND NOTES (BRIDGE)
AE01	ENVIRONMENTAL NOTES
AR01	SUMMARY OF PAY QUANTITIES AND NOTES (ROADWAY)
AR02	SUMMARY SHEETS (ROADWAY)
AT01	SUMMARY OF PAY QUANTITIES AND NOTES (TRAFFIC)
B001	GENERAL PLAN AND ELEVATION
B002	BRIDGE PAY QUANTITIES SUMMARY
B003-B004	FOUNDATION REPORTS
B005-B006	BARREL DETAILS
B007-B008	END SECTION DETAILS
B009	APPROACH SLAB DETAILS
B010	EXCAVATION DETAILS
R001	STORM WATER MANAGEMENT PLAN
R002	GEOMETRIC DATA
R003	EROSION CONTROL PLAN
R004	PLAN AND PROFILE SHEET
S001-S006	SURVEY DATA SHEETS
T001	DETOUR PLAN
T002	COUNTY ROAD CLOSURE DETAIL
U001-U002	FLEXAMAT STANDARD DETAIL
X001-X004	CROSS SECTION SHEETS

THE FOLLOWING ODOT STANDARDS ARE REQUIRED FOR THIS PROJECT:

2019 ROADWAY	2009 BRIDGE	2009 TRAFFIC
BMPR-0	TR4-2-00E	TCS1-1-01
TESCA-0	LECS-5-2	TCS9-1-01
RSF-0	SBI-5-2	TCS10-1-00
TSD-0		TCS14-1-00
SSS-2-1		THR1-1-02
PSE-2-1		SKT-1-00
SBI-5-2		

SCALES	
PLAN	1:100
PROFILE HOR.	1:100
VER.	1:10
LAYOUT MAP	1"=2 MILES

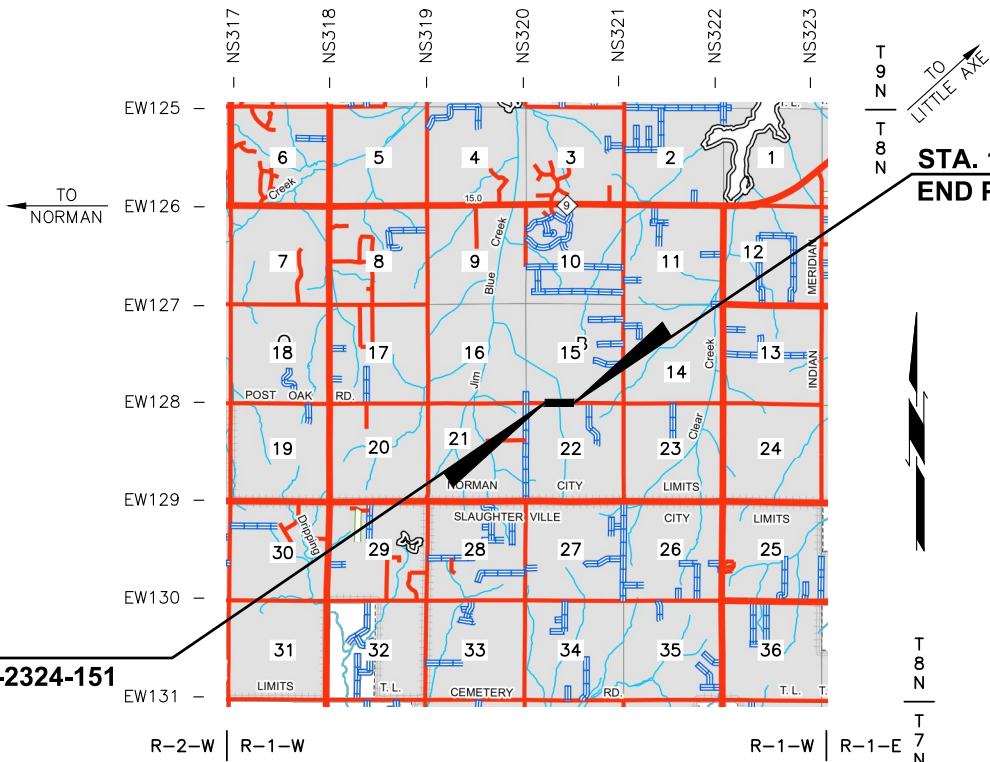
CONVENTIONAL SYMBOLS

- PROPOSED ROADS
- SECTION LINES
- QUARTER SECTION LINES
- FENCES
- EXISTING GRADE
- EXISTING ROADS
- BASE LINE
- PROPOSED GRADE
- OHT OVERHEAD TELEPHONE LINES (EXISTING)
- TUG COMMUNICATION LINES (EXISTING)
- OHE OVERHEAD POWER LINES (EXISTING)
- PUG POWER UNDER GROUND LINES (EXISTING)
- G GAS LINE (EXISTING)
- SS SANITARY SEWER LINES (EXISTING)
- W WATER LINES (EXISTING)
- TUG COMMUNICATION LINES (PROPOSED)
- OHE POWER LINES (PROPOSED)
- PUG POWER LINES (PROPOSED)
- G GAS LINE (PROPOSED)
- SS SANITARY SEWER LINES (PROPOSED)
- W WATER LINES (PROPOSED)
- BUILDINGS
- DRAINAGE STRUCTURES (EXISTING)
- DRAINAGE STRUCTURES (PROPOSED)
- RIGHT-OF-WAY LINES (EXISTING)
- RIGHT-OF-WAY LINES (PROPOSED)
- RIGHT-OF-WAY FENCE
- FLOWLINE (EXISTING)
- FLOWLINE (PROPOSED)
- TOE OF SLOPE (EXISTING)
- TOP OF CUT (EXISTING)
- TOE OF SLOPE/TOP OF CUT (PROPOSED)
- LANDSCAPE
- RAILROAD

BRIDGE 'A'

LOCATION NO. 14E1280N3200002
NBI NO. 33435
BEGIN BRIDGE STA. 112+80.00
BRIDGE LENGTH = 40.00
END BRIDGE STA. 113+20.00

STA. 111+10.00
BEGIN PROJ. NO. K-2324-151



STA. 114+87.00
END PROJ. NO. K-2324-151

PREPARED FOR:
THE CITY OF NORMAN



ROADWAY LENGTH_____ 337.00 FT___ 0.063 MI

BRIDGE LENGTH_____ 40.00 FT___ 0.007 MI

TOTAL PROJECT LENGTH_____ 377.00 FT___ 0.071 MI

EXCEPTIONS_____NONE

EQUATIONS_____NONE

PREPARED BY:
MKEC ENGINEERING, INC.
CA#2958 06/30/25
OKLAHOMA CITY, OKLAHOMA

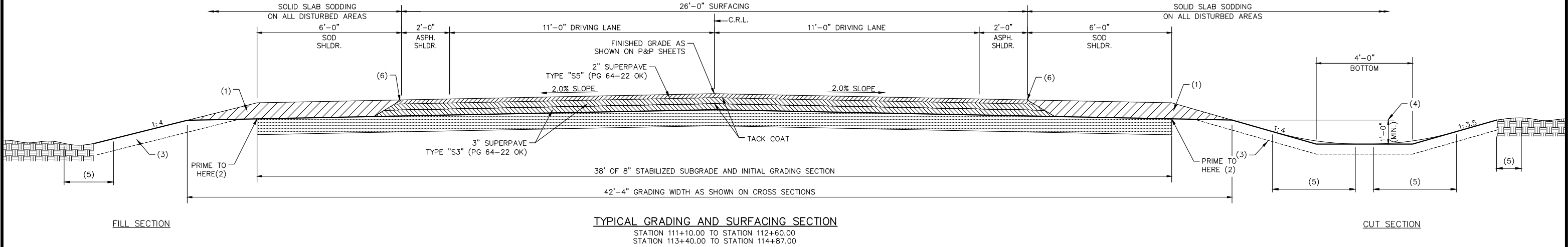
JONATHAN T. HISEY, P.E. S.E.
OKLA. REG. NO. 23127
(SHEETS AB01, B001-B010)

DATE
4/11/2025

PREPARED BY:
MKEC ENGINEERING, INC.
CA#2958 06/30/25
OKLAHOMA CITY, OKLAHOMA

CHASE R. COLE, P.E.
OKLA. REG. NO. 32407
(SHEETS 002, AR01-AT01, R001-R004, T001-X004)

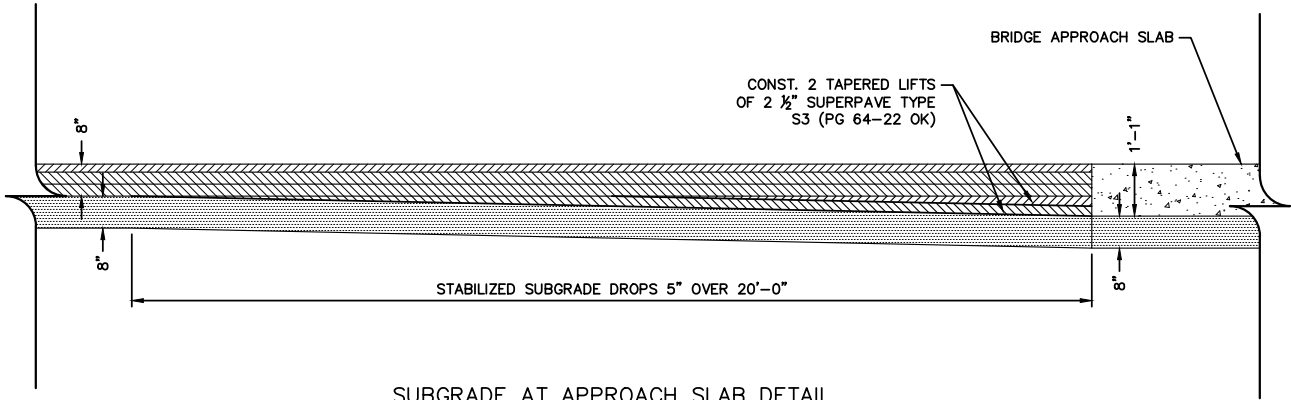
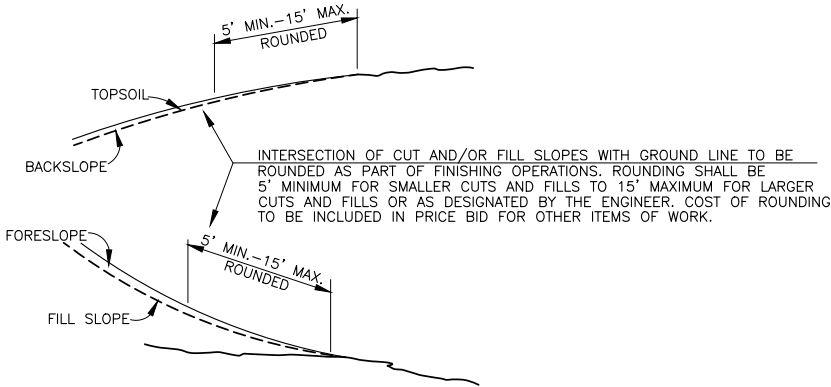
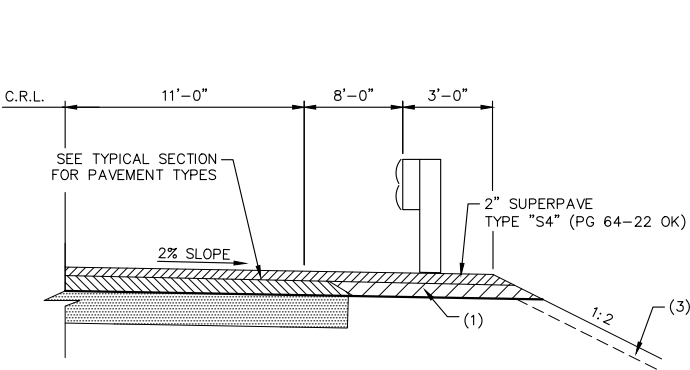
DATE
4-11-25



- NOTES:**
- (1) SHOULDERS TO BE SHAPED OR FILLED AND COMPACTED AS PART OF FINISHING OPERATIONS. COST TO BE INCLUDED IN PRICE BID FOR UNCLASSIFIED BORROW.
 - (2) PRIME COAT IS TO BE APPLIED IMMEDIATELY AFTER SUBGRADE MODIFICATION.
 - (3) TOPSOIL NOTE:
THE CONTRACTOR SHOULD STRIP ALL AVAILABLE TOPSOIL, STOCK PILE IT, AND PLACE IT BACK ON THE SECTION IN ACCORDANCE WITH SECTION 205 OF THE STANDARD SPECIFICATION. RESERVED TOPSOIL SHALL BE SPREAD FIRST ON THE COMPLETED SLOPES OF THE CUT SECTIONS AND THE REMAINDER ON COMPLETED FILL SLOPES OR OTHER PRIORITY AREAS LOCATED BY THE ENGINEER. ALL ADDITIONAL COSTS ASSOCIATED WITH OPERATION SHALL BE INCLUDED IN THE PAY ITEM FOR SALVAGE TOPSOIL, LUMP SUM.

THE GRADING LINE AS SHOWN ON THE TYPICAL AND CROSS SECTIONS IS TO THE TOP OF THE TOPSOIL. EARTHWORK QUANTITIES WERE NOT ADJUSTED FOR SALVAGE AND THE TOPSOIL QUANTITY IS INCLUDED IN THE GRADING SUMMARY.
 - (4) VARIES AT SPECIAL DITCH LOCATIONS.
 - (5) SEE ROUNDING DETAIL, THIS SHEET
 - (6) SAFETY EDGE NOTE: CONSTRUCT ASPHALT SAFETY EDGE AS SHOWN IN SPECIAL PROVISION 411-14

PAVEMENT REQUIREMENTS -TYPICAL SECTION			
PAVEMENT STRUCTURE	DRIVING LANES	PAVED SHOULDER	SOD SHOULDER
SURFACE	2" SUPERPAVE TYPE S5 (PG 64-22 OK)	2" SUPERPAVE TYPE S5 (PG 64-22 OK)	SOD
BASE	3" SUPERPAVE TYPE S3 (PG 64-22 OK)	3" SUPERPAVE TYPE S3 (PG 64-22 OK)	
	3" SUPERPAVE TYPE S3 (PG 64-22 OK)	3" SUPERPAVE TYPE S3 (PG 64-22 OK)	
	8" STABILIZED SUBGRADE	8" STABILIZED SUBGRADE	8" STABILIZED SUBGRADE



GENERAL NOTES

SPECIFICATIONS –
COMPLY WITH THE REQUIREMENTS OF THE 2019 OKLAHOMA STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EXCEPT AS MODIFIED BY THE PLANS AND SPECIAL PROVISIONS.

CONCRETE –
ALL EXPOSED CONCRETE EDGES SHALL HAVE A 1½” CHAMFER UNLESS OTHERWISE SHOWN OR NOTED. ALL CHAMFER STRIPS SHALL BE SIZED LUMBER.

REINFORCING STEEL –
ALL REINFORCING STEEL 2” MINIMUM CLEAR COVER UNLESS OTHERWISE SHOWN.

PAY ITEM NOTES

- B1 PAYMENT TO THE CONTRACTOR WILL BE BASED ON PLAN QUANTITIES
- B2 THE APPROACH SLABS CONTAIN AN ESTIMATED TOTAL OF 65.70 C.Y. OF CLASS AA CONCRETE AND 12,550.00 LB. OF REINFORCING STEEL. INCLUDE ALL COSTS FOR CONSTRUCTING THE APPROACH SLABS, INCLUDING CONCRETE, REINFORCING STEEL (INCLUDING SLAB TO BRIDGE RAILING BARS), BACKER ROD, RAPID CURE JOINT SEALANT, POLYSTYRENE, LABOR, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK, IN THE CONTRACT UNIT PRICE OF "APPROACH SLAB".
- B3 ITEM "REMOVAL OF EXISTING BRIDGE STRUCTURE" INCLUDES REMOVAL AND DISPOSAL OF SUPERSTRUCTURE AND SUBSTRUCTURE OF 32’ LONG STEEL BEAM BRIDGE. ALL WORK SHALL BE DONE IN ACCORDANCE WITH SUBSECTION 619.04B(2) OF THE SPECIFICATIONS AND IN A MANNER APPROVED BY THE ENGINEER. ALL REMOVED MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR. INCLUDE ALL COSTS FOR LABOR, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN THE CONTRACT UNIT PRICE OF "REMOVAL OF EXISTING STRUCTURE".

MKEC // TRANSPORTATION		Item 2.
DESCRIPTION	REVISIONS	

0200 BRIDGE				
NBI NO. 33435				
PAY QUANTITIES				
3 – 12’x7’x40’–2” AT GRADE RCB 0’ SKEW W/ TR4 CONCRETE TRAFFIC RAILS, @ STA. 113+00.00				
ITEM NO.		ITEM	UNIT	TOTAL
202 (A)	2210	UNCLASSIFIED EXCAVATION	B1 C.Y.	1,010.00
501 (A)	1210	STRUCTURAL EXCAVATION UNCLASSIFIED	B1 C.Y.	305.00
504 (A)	5200	APPROACH SLAB	B1,B2 S.Y.	178.60
504 (B)	5300	SAW–CUT GROOVING	B1 S.Y.	286.80
504 (D)	5420	CONCRETE RAIL (TR4)	B1 L.F.	160.00
509 (A)	0210	CLASS AA CONCRETE	B1 C.Y.	282.40
511 (A)	2210	REINFORCING STEEL	B1 LB.	50,380.00
619 (D)	6700	REMOVAL OF EXISTING BRIDGE STRUCTURE	B3 LSUM	1.00

PLOTTED: Friday, April 11, 2025 @ 08:49AM

MKEC PROJECT NUMBER: 2403010281



DESIGN	J.T.H.
DRAWN	P.W.D.
CHECKED	J.T.H.

E. POST OAK RD. OVER TRIB. CITY OF NORMAN
TO JIM BLUE CRK.

SUMMARY OF PAY QUANTITIES AND
NOTES (BRIDGE)



PROJECT NO. K-2324-151 SHEET NO. 22

	DESIGN	DJG	E. POST OAK ROAD	CLEVELAND COUNTY
	DRAWN	KMH	ENVIRONMENTAL NOTES	
	CHECKED	---		
			PROJECT NO. <u>K-2324-151</u>	SHEET NO. <u>23</u>

C:\projects\2024\2403010281_City of Norman_Post Oak Bridge\00_CAD\SPITS Pay\K-2324-151-SUMMARY SHEETS (ROADWAY).dwg
PLOTED: Thursday, April 10, 2025 @ 04:27PM

SPECIFICATIONS:

COMPLY WITH THE REQUIREMENTS OF THE 2019 OKLAHOMA STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EXCEPT AS MODIFIED BY THE PLANS AND SPECIAL PROVISIONS.

GENERAL CONSTRUCTION NOTES:

IN ACCORDANCE WITH THE OKLAHOMA UNDERGROUND FACILITIES DAMAGE PREVENTION ACT THE CONTRACTOR SHALL NOTIFY THE OKLAHOMA ONE-CALL SYSTEM, INC. 48 HOURS PRIOR TO BEGINNING EXCAVATION. OKLAHOMA ONE-CALL SYSTEM, INC. CALL OKIE 1-800-522-6543 OR 811.

FOR PROJECTS THAT INCLUDE WIDENING AND/OR RESURFACING, THE CONTRACTOR SHALL SCHEDULE OPERATIONS TO MINIMIZE POTENTIAL DROPOFF HAZARDS AND SHALL SUBMIT A SEQUENCE OF CONSTRUCTION OPERATIONS TO THE RESIDENT ENGINEER FOR APPROVAL BEFORE OPERATIONS BEGIN. ANY PORTION OF THE CONSTRUCTION OPERATIONS, SUCH AS SUPERPAVE LAYING OPERATIONS, EXCAVATION FOR PAVEMENT WIDENING, OR EXTENSION OF ROADWAY STRUCTURES, SHALL BE LIMITED TO ONE SIDE AT A TIME, AND THE PROCEDURES OUTLINED IN THE PAVEMENT DROP-OFF TREATMENT STANDARD PDT-1 (LATEST REVISION) SHALL BE IMPLEMENTED. ONLY THAT AMOUNT OF OPEN TRENCH WILL BE ALLOWED THAT CAN BE SURFACED IN 1 (ONE) DAY'S TIME WITHOUT APPROVAL BY THE ENGINEER. LIGHTS, SIGNS AND BARRICADES SHALL BE MOVED AS WORK PROGRESSES.

ALL TREES, BRUSH, AND OTHER DEBRIS THAT MIGHT INTERFERE WITH THE FLOW OF WATER SHALL BE CLEANED OUT TO THE RIGHT-OF-WAY LINE, AT EACH STRUCTURE AND BRIDGE, IN A MANNER APPROVED BY THE ENGINEER. ALL COST TO BE INCLUDED IN OTHER ITEMS OF WORK.

ALL FLOWLINES THAT ARE TO BE FILLED SHALL BE THOROUGHLY TAMPED BEFORE CONSTRUCTION OR EXTENSION OF DRAINAGE STRUCTURES. ALL COST TO BE INCLUDED IN OTHER ITEMS OF WORK.

IN ORDER TO ALLEVIATE DUST CONDITIONS DURING GRADING OPERATIONS AND BEFORE PAVEMENT WORK IS COMPLETED, THE CONTRACTOR SHALL SPRINKLE GRADING AT INTERVALS APPROVED BY THE ENGINEER. ALL COST TO BE INCLUDED IN OTHER ITEMS OF WORK.

THE CONTRACTOR SHALL NOT WASTE ANY EXCESS EXCAVATION UNTIL ALL PLANNED EMBANKMENTS AND BACKFILLS ARE COMPLETED. EXCESS UNCLASSIFIED EXCAVATION MATERIAL DETERMINED BY THE ENGINEER TO BE SUITABLE FOR BACKFILL SHALL BE USED TO REDUCE ANY UNCLASSIFIED BORROW NEEDED. COST OF SECOND HANDLING SHALL BE INCLUDED IN OTHER ITEMS OF WORK. ANY REMAINING EXCESS EXCAVATION SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND BE DISPOSED OF IN A MANNER APPROVED BY THE ENGINEER.

PRIME COAT SHALL BE APPLIED TO THE SUBGRADE IMMEDIATELY AFTER FINAL COMPACTION AND SHAPING TO RETAIN MOISTURE FOR PROPER CHEMICAL REACTION OF THE SOIL ADDITIVE.

THE CONTRACTOR SHALL KEEP THE OPEN TRENCH DRAINED. COST TO BE INCLUDED IN OTHER ITEMS OF WORK.

VEGETATIVE MULCHING: THE VEGETATIVE MULCH SHALL BE ANCHORED IN ACCORDANCE WITH THE "MULCHING-TILLER METHOD", AS SPECIFIED IN 233.04B(2) OF THE STANDARD SPECIFICATIONS.

AREAS ON WHICH SALVAGED TOPSOIL IS TO BE REPLACED SHALL HAVE 18-46-0 FERTILIZER APPLIED, AT THE RATE OF 150 POUNDS PER ACRE, JUST PRIOR TO THE REPLACEMENT OF SALVAGED TOPSOIL.

AT THE BEGINNING OF TURFING OPERATIONS, ANY AREAS INCLUDED IN PLANNED QUANTITIES THAT HAVE GROWN A SATISFACTORY VOLUNTEER TURF OF PERENNIAL GRASS, AS DETERMINED BY THE ENGINEER, SHALL BE FERTILIZED AND WATERED AS CALLED FOR ON THE PLANS, BUT SHALL NOT BE SEEDED, SODDED, OR SPRIGGED.

EXCESS ASPHALT AT JOINTS AND CRACKS IN EXISTING PAVEMENT SHALL BE REMOVED FLUSH TO TOP OF PAVING IN A MANNER APPROVED BY THE ENGINEER.

THE BRIDGE SITE WILL BE CLOSED TO ALL PUBLIC TRAFFIC DURING CONSTRUCTION. CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC DURING CONSTRUCTION.

ANY DAMAGE CAUSED BY THE CONTRACTOR TO ANY STRUCTURES, ROADWAY SURFACES, STRIPING, RAISED PAVEMENT MARKERS, GUARDRAIL, SLOPES, AND SIGNS SHALL BE REPLACED AT THE CONTRACTORS EXPENSE TO THE SATISFACTION OF THE RESIDENT ENGINEER.

THE CITY OF NORMAN WILL BE RESPONSIBLE FOR:

- RELOCATION OF UTILITIES

CONTRACTOR SHALL GIVE NOTICE TO CITY OF NORMAN IN WRITING 14 DAYS BEFORE WORK BEGINS ON THE PROJECT.

ROADWAY PAY QUANTITY NOTES:

(R-1) PAYMENT FOR THIS ITEM WILL BE BASED ON PLAN QUANTITY ONLY. SEE SECTION 109.01B OF THE STANDARD SPECIFICATIONS.

(R-4) AN ESTIMATED QUANTITY OF 123 C.Y. TOPSOIL TO BE RESERVED FOR REPLACEMENT OF APPROXIMATELY 5" ON COMPLETED FORESLOPES, DITCHES, AND BACKSLOPES. THIS QUANTITY IS INCLUDED IN THE EARTHWORK BALANCE. ANY ADDITIONAL EXCAVATION REQUIRED IN CUT SECTIONS TO ALLOW FOR PLACEMENT OF TOPSOIL TO FINAL GRADE, SHALL BE INCLUDED IN THE PRICE BID.

(R-6) FOR SOLID SLAB SODDING PRICE BID TO INCLUDE COST OF 10-20-10 FERTILIZER, ESTIMATED AT 200 POUNDS PER 1000 S.Y.

(R-7) FOR SOLID SLAB SODDING PRICE BID TO INCLUDE COST OF WATERING, ESTIMATED AT 40 GALLONS PER S.Y.

(R-8) PRICE BID TO INCLUDE COST OF ALL NECESSARY MAINTENANCE, MAINTAINING DEVICE IN PROPER UPRIGHT POSITION, REMOVAL OF DEVICE, AND REMOVAL OF SEDIMENT WHEN IT REACHES HALF THE HEIGHT OF THE DEVICE.

(R-11) THE QUANTITIES ESTIMATED FOR TEMPORARY EROSION AND SEDIMENT CONTROL IS 0.18 ACRES.

(R-15) QUANTITY BASED ON TWO APPLICATIONS.

(R-19) PRICE BID TO INCLUDE THE CHEMICAL ADDITIVE(S) TO ACHIEVE THE RATE SPECIFIED FOR THE APPROPRIATE SOIL CLASSIFICATION AS SPECIFIED IN THE MOST CURRENT ODOT MATERIALS DIVISION OHD L-50. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CLASSIFY THE SOIL AND DETERMINE THE APPROPRIATE ADDITIVE(S).

(R-23) PRIME COAT SHALL BE APPLIED AT AN ESTIMATED RATE OF 0.35 GAL. PER SQ. YD. WHEN APPLIED TO SUBGRADE, AND 0.25 GAL. PER SQ. YD. WHEN APPLIED TO AGGREGATE BASE. THE ACTUAL CUTBACK PRIME COAT REQUIRED FOR PLACEMENT OPERATIONS WILL BE DETERMINED BY THE CONTRACTOR, AND SHALL CONSIDER THE RESIDUE FROM DISTILLATION PERCENTAGE SHOWN IN SECTION 708.03 OF THE STANDARD SPECIFICATIONS.

(R-25) ESTIMATED AT 0.075 GALLONS PER SQUARE YARD OF ORIGINAL EMULSION OF TACK COAT (BEFORE DILUTION FOR APPLICATION) IN ACCORDANCE WITH SECTION 407 OF THE STANDARD SPECIFICATIONS.

(R-26) ESTIMATED AT 112 LBS. PER SQ. YD. PER 1" THICK.

(R-33) QUANTITY INCLUDES AN ESTIMATED 5 C.Y. TO BE USED AS DIRECTED BY THE ENGINEER.

(R-39) INCLUDES REMOVAL OF ALL EXISTING ROADWAY DRAINAGE STRUCTURES, HEADWALLS (UNLESS OTHERWISE SPECIFIED), INLETS, FENCES, AND OTHER STRUCTURES WITHIN THE RIGHT OF WAY.

(R-40) TO BECOME THE PROPERTY OF AND BE DISPOSED OF BY THE CONTRACTOR IN A MANNER APPROVED BY THE ENGINEER.

(R-41) MATERIALS REMOVED SHALL NOT BE MEASURED FOR PAYMENT UNDER SECTION 202.06 UNCLASSIFIED EXCAVATION.

- SEE SUMMARY OF EARTHWORK (SHEET NO. A02)
- ESTIMATED QUANTITY ONLY TO BE USED FOR EROSION AND SEDIMENT CONTROL IN A MANNER APPROVED BY THE ENGINEER. (SEE STDS. RSF-0 AND TSD-0)
- IN ADDITION TO THE RESPONSIBILITIES SHOWN IN THE SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND/OR RE-ESTABLISHING THE SURVEY CONTROL POINTS SHOWN ON THE PLANS, STAKING THE CENTERLINE OF CONSTRUCTION AND RE-ESTABLISHING RIGHT-OF-WAY STAKES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING AND VERIFYING BENCH MARKS SHOWN ON THE PLANS AND FOR ESTABLISHING NEW BENCH MARKS AS NEEDED TO CONSTRUCT THE PROJECT. THE CONTRACTOR SHALL PLACE STAKES AND HUBS EVERY 100' AND AT DRAINAGE STRUCTURES.
- INCLUDES 31 C.Y. OF EXCAVATION FOR DRAINAGE GRADING AT STA. 114+65.00 LT. ESTIMATED QUANTITY BASED ON 4' DITCH BOTTOM WITH 3.5:1 BACKSLOPE.
- PRICE BID TO INCLUDE COST OF PORTLAND CEMENT, FLEXAMAT UNDERLAYMENT MATERIALS, AND #3 REBAR U-ANCHORS (18") NECESSARY TO INSTALL ARTICULATING CONCRETE BLOCK (FLEXAMAT) AS SHOWN ON SHEET U001-U002 ANY EXCAVATION FOR ANCHOR TRENCHES SHALL ALSO BE INCLUDED IN THE PRICE BID. FLEXAMAT SHALL BE INSTALLED IN ACCORDANCE WITH THE PRODUCT TECHNICAL SPECIFICATIONS AND DETAILS DRAWINGS.

(6) DEBRIS FROM BRIDGE REMOVAL TO BE REMOVED FROM CHANNEL AT THE END OF EACH DAY.

(7) QUANTITY IS FOR BEDDING AND BACKFILL AT BRIDGE 'A'. SEE SHEET NO. B010 FOR MORE DETAIL.

(8) FLARED GUARDRAIL END TREATMENT TO BE INSTALLED AS DIRECTED BY THE FIELD ENGINEER, EACH LEG.

(9) QUANTITY INCLUDES 25 TONS OF SUPERPAVE TYPE S3 (PG 64-22 OK) TO BE USED AT THE TRANSITION FROM THE ASPHALT TO THE APPROACH SLAB EACH SIDE OF BRIDGE 'A'. SEE SHEET NO. 0002, SUBGRADE AT APPROACH SLAB DETAIL FOR MORE INFORMATION.

Item 2.

K-2324-151				
PAY QUANTITIES				
0100 ROADWAY				
ITEM		DESCRIPTION	UNIT	QUANTITY
201(A)	1200	CLEARING AND GRUBBING	L.SUM	1.00
202(A)	2200	UNCLASSIFIED EXCAVATION (1)(4)(R-1)	C.Y.	82.00
202(D)	2500	UNCLASSIFIED BORROW (1)	C.Y.	270.00
205(A)	6200	TYPE A-SALVAGED TOPSOIL (R-4)	L.SUM	1.00
221(B)	2300	TEMPORARY SILT FENCE (2)(R-8)	L.F.	574.00
221(E)	2600	TEMPORARY SILT DIKE (2)(R-8)	L.F.	21.00
230(A)	7200	SOLID SLAB SODDING (R-6)(R-7)	S.Y.	882.00
233(A)	0200	VEGETATIVE MULCHING (R-11)	AC.	0.18
241	3100	MOWING (R-15)	AC.	0.36
303(A)	1200	AGGREGATE BASE TYPE A (7)	C.Y.	300.00
307(K)	4200	STABILIZED SUBGRADE (R-19)	S.Y.	1,255.00
407(B)	7300	TACK COAT (R-25)	GAL.	135.00
408	8100	PRIME COAT (R-23)	GAL.	440.00
411(B)	1330	SUPERPAVE, TYPE S3 (PG 64-22 OK) (R-26)	TON	330.00
411(D)	1530	SUPERPAVE, TYPE S5 (PG 64-22 OK) (R-26)	TON	147.00
509(D)	0500	CLASS C CONCRETE (R-33)	C.Y.	5.00
602(B)	2300	ARTICULATING CONCRETE BLOCK (5)	S.F.	483.00
619(A)	6200	REMOVAL OF STRUCTURES & OBSTRUCTIONS (6)(R-39)(R-40)	L.SUM	1.00
619(B)	6364	REMOVAL OF ASPHALT PAVEMENT (R-40)(R-41)	S.Y.	938.00
619(B)	6396	REMOVAL OF GUARDRAIL (R-40)	L.F.	144.00
619(C)	6600	SAWING PAVEMENT	L.F.	48.00
623(A)	1200	BEAM GUARDRAIL W-BEAM SINGLE	L.F.	50.00
623(G)	1820	GUARDRAIL END TREATMENT (31") (8)	EA.	4.00
623(I)	2050	GUARDRAIL BRIDGE CONN-THRIE BEAM (31")	EA.	4.00

K-2324-151				
PAY QUANTITIES				
0600 STAKING				
ITEM		DESCRIPTION	UNIT	QUANTITY
642(B)	3300	CONSTRUCTION STAKING LEVEL II (3)	L.SUM	1.00

K-2324-151				
PAY QUANTITIES				
0640 CONSTRUCTION				
ITEM		DESCRIPTION	UNIT	QUANTITY
220	1100	SWPPP DOCUMENTATION AND MANAGEMENT	L.SUM	1.00
641	2100	MOBILIZATION	L.SUM	1.00



DESIGN	DJG
DRAWN	KMH
CHECKED	---



E. POST OAK ROAD CLEVELAND COUNTY

SUMMARY OF PAY
QUANTITIES AND NOTES
(ROADWAY)

PROJECT NO. K-2324-151 SHEET NO. 24

SCHEDULE OF EARTHWORK				
SHEET NO.	STATION TO STATION	UNCLASSIFIED EXCAVATION	EMBANKMENT +15%	UNCLASSIFIED BORROW
		202(A)		202(D)
		C.Y.	C.Y.	C.Y.
R004	111+10.00 TO 114+87.00	51.00	352.00	301.00
R004	DRAINAGE GRADING	31.00	-	(31.00)
TOTAL		82.00	352.00	270.00

SUMMARY OF SURFACING						
SHEET NO.	STATION TO STATION	8" STABILIZED SUBGRADE	TACK COAT	PRIME COAT	SUPERPAVE, TYPE S3 (PG 64-22 OK)	SUPERPAVE, TYPE S5 (PG 64-22 OK)
		307(K)	407(B)	408	411(B)	411(D)
		S.Y.	GAL.	GAL.	TON	TON
R004	111+10.00 TO 112+60.00	634.00	68.00	222.00	154.00	50.00
R004	113+40.00 TO 114+87.00	621.00	67.00	218.00	151.00	49.00
TOTAL		1,255.00	135.00	440.00	305.00	99.00

SUMMARY OF REMOVALS				
SHEET NO.	STATION TO STATION	REMOVAL OF GUARDRAIL	REMOVAL OF ASPH. PVMT.	SAWING PAVEMENT
		619(B)	619(B)	619(C)
		L.F.	S.Y.	L.F.
R004	111+10.00 TO 114+87.00	144.00	938.00	48.00
TOTAL		144.00	938.00	48.00

SUMMARY OF GUARDRAIL & WIDENING							
SHEET NO.	STATION TO STATION	LANE		SUPERPAVE TYPE S5 (PG 64-22 OK)	BEAM GUARDRAIL (W-BEAM) SINGLE	GUARDRAIL CONNECTIONS	
						THRIE BEAM (31")	GUARDRAIL END TREATMENT (31")
		LT.	RT.	411(D) TON	623(A) L.F.	623(I) EA.	623(G) EA.
R004	111+50.75 TO 112+80.00	X	X	24.00	25.00	2.00	2.00
R004	113+20.00 TO 114+49.25	X	X	24.00	25.00	2.00	2.00
TOTAL				48.00	50.00	4.00	4.00

SUMMARY OF DITCH TREATMENT					
SHEET NO.	STATION TO STATION	LOCATION	LENGTH	BOTTOM WIDTH	ARTICULATING CONC. BLOCK
					602(B)
			FT.	FT.	S.F.
R004	114+07.25 TO 114+87.00	LT.	79.75	2.00	163.00
R004	114+07.25 TO 114+87.00	RT.	79.75	4.00	320.00
TOTAL					483.00

SUMMARY OF EROSION CONTROL					
SHEET NO.	STATION TO STATION	TEMPORARY SILT FENCE	TEMPORARY SILT DIKE	SOLID SLAB SODDING	VEGETATIVE MULCHING
		221(B)	221(E)	230(A)	233(A)
		L.F.	L.F.	S.Y.	AC.
R003	111+10.00 TO 114+87.00	574.00	21.00	882.00	0.18
TOTAL		574.00	21.00	882.00	0.18

GENERAL TRAFFIC NOTES:

CONTRACTOR SHALL MAINTAIN ACCESS TO LOCAL TRAFFIC DURING CONSTRUCTION.

CONTRACTOR SHALL GIVE NOTICE TO CITY OF NORMAN IN WRITING 14 DAYS BEFORE WORK BEGINS ON THE PROJECT.

TRAFFIC OPERATIONS GENERAL CONSTRUCTION NOTES

ANY DAMAGE CAUSED BY THE CONTRACTOR TO ANY STRUCTURES, ROADWAY SURFACES, STRIPING, RAISED PAVEMENT MARKERS, GUARDRAIL, SLOPES, AND SIGNS SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE ENGINEER.

TRAFFIC SIGNING GENERAL CONSTRUCTION NOTES

ALL REGULATORY SIGNS SHALL HAVE HIGH INTENSITY SHEETING. THE HIGH INTENSITY SHEETING SHALL MEET THE REQUIREMENTS OF ASTM D4956—(LATEST REVISION) FOR TYPE III SHEETING.

ALL WARNING SIGNS SHALL HAVE FLUORESCENT YELLOW SHEETING. THE FLUORESCENT YELLOW SHEETING SHALL MEET THE REQUIREMENTS OF ASTM D4956-(LATEST REVISION) REQUIREMENTS FOR TYPE VIII SHEETING.

THE STATIONS AND LOCATIONS OF THE SIGN PLACEMENT, AS SHOWN ON THE PLAN SHEETS, ARE APPROXIMATE. EXACT STATIONS AND LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR SO THAT THE SIGN IS INSTALLED IN ACCORDANCE WITH DEPARTMENT STANDARDS AND THE MUTCD IN ORDER TO PROVIDE OPTIMUM VISIBILITY TO THE ONCOMING/APPROACHING MOTORIST. IF A PROPOSED LOCATION CONFLICTS WITH OTHER SIGNS, UTILITIES OR OTHER ROADWAY FEATURES, THE ENGINEER SHALL BE NOTIFIED.

TRAFFIC CONSTRUCTION PAY QUANTITY NOTES:

(TC-26) ALL CONSTRUCTION TRAFFIC CONTROL WILL BE IMPLEMENTED ACCORDING TO CONSTRUCTION PLANS, AND INSTALLED IN A MANNER APPROVED BY THE ENGINEER, IN ACCORDANCE WITH CHAPTER VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (CURRENT EDITION), AND COMPLIANT WITH APPLICABLE O.D.O.T. STANDARD DRAWINGS. PRICE BID FOR THIS ITEM SHALL BE PAYMENT IN FULL FOR THE INSTALLATION, MAINTENANCE AND SUBSEQUENT REMOVAL OF ALL NECESSARY CONSTRUCTION TRAFFIC CONTROL DEVICES AND PAVEMENT MARKINGS REQUIRED FOR COMPLETION OF THE PROJECT.

ALL SIGNS AND BARRICADES, WHICH ARE SHOWN WITH TYPE 'A' LIGHTS IN THE STANDARD DRAWINGS SHALL HAVE THE CORRESPONDING LIGHT ATTACHED DURING NON-DAYLIGHT HOURS.

(TC-33) ALL CONSTRUCTION WORK ZONE SIGNS SHALL HAVE FLUORESCENT SHEETING. THE FLUORESCENT SHEETING SHALL MEET THE REQUIREMENTS OF ASTM D4956 (LATEST REVISION).

THE MANUFACTURER SHALL FURNISH A TYPE 'D' CERTIFICATION IN ACCORDANCE WITH O.D.O.T. STANDARD SPECIFICATIONS (CURRENT EDITION) SUBSECTION 106.04. THE CERTIFICATION SHALL INCLUDE TEST RESULTS ON MATERIAL SUBMITTED FOR APPROVAL.

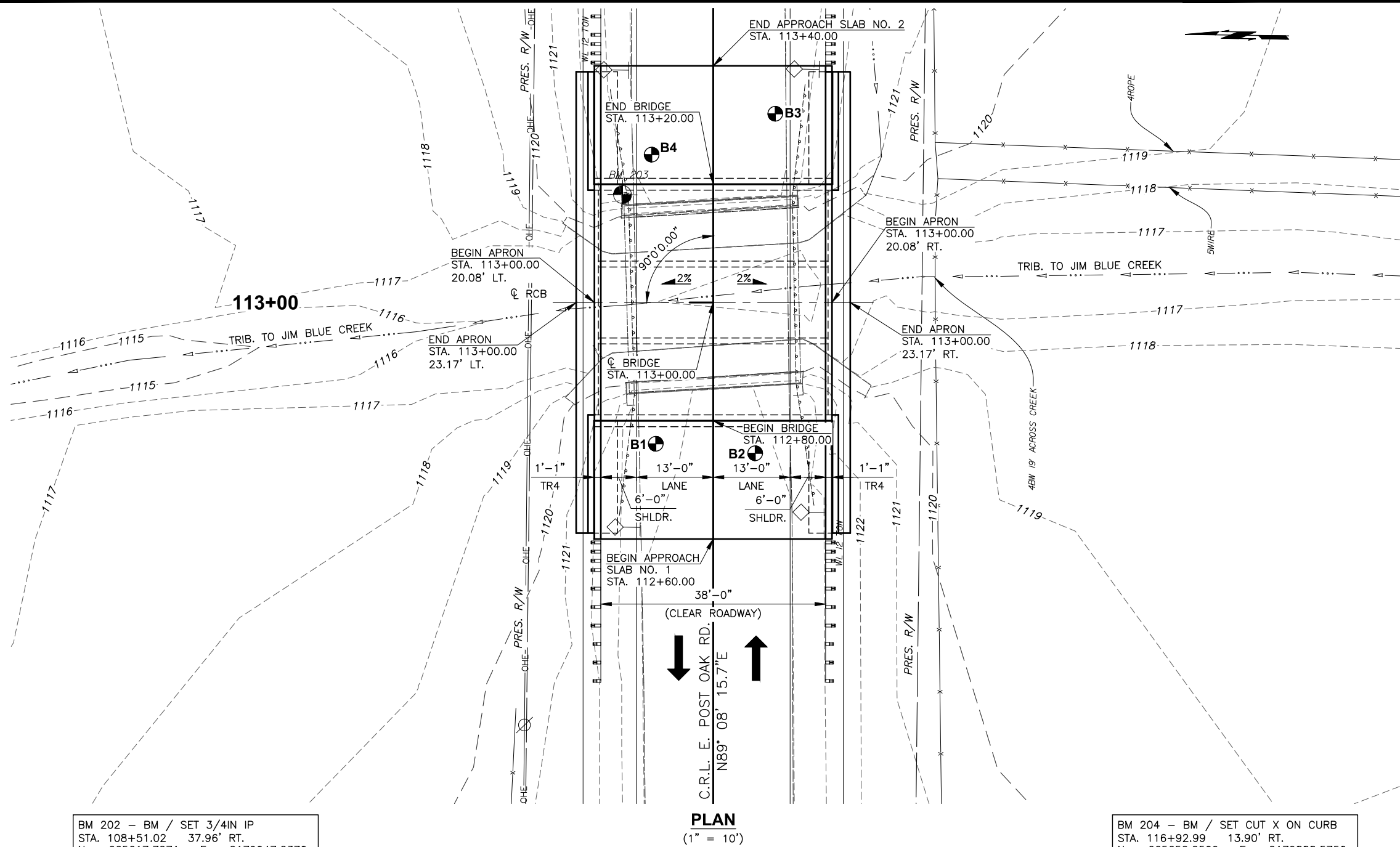
(TC-84) 90 CONSTRUCTION CALENDAR DAYS WERE USED TO COMPUTE THE SIGN DAY PAY THE AMOUNT OF CALENDAR DAYS USED TO COMPUTE THE SIGN DAY PAY ITEMS IS AN ESTIMATED QUANTITY ONLY, BASED ON THE CURRENT O.D.O.T. STANDARDS AND SUGGESTED CONSTRUCTION SEQUENCE FOR THIS PROJECT THESE ESTIMATED SIGN DAY QUANTITIES MAY CHANGE AS THE PROJECTS CONSTRUCTION TRAFFIC CONTROL IS MODIFIED DURING CONSTRUCTION.

REV. NO.		DESCRIPTION	REVISIONS

Item 2.

K-2324-151				
PAY QUANTITIES				
0300 TRAFFIC TEMPORARY				
ITEM	DESCRIPTION			UNIT QUANTITY
880(B) 6300	CONSTRUCTION SIGNS 0 TO 6.25 SF (TC-26)(TC-33)(TC-84)			S.D. 900.00
880(B) 6310	CONSTRUCTION SIGNS 6.26 SF TO 15.99 SF (TC-26)(TC-33)(TC-84)			S.D. 360.00
880(B) 6320	CONSTRUCTION SIGNS 16.0 SF TO 32.99 SF (TC-26)(TC-33)(TC-84)			S.D. 360.00
880(C) 6410	CONSTRUCTION BARRICADES (TYPE III) (TC-26)(TC-84)			S.D. 1,620.00
880(E) 6600	WARNING LIGHTS (TYPE A) (TC-26)(TC-84)			S.D. 360.00

CONSTRUCTION SIGN SUMMARY											
SHEET NO.	CONSTRUCTION SIGN										
	CONST. SIGNS 0 - 6.25 S.F.		CONST. SIGNS 6.26 - 15.99 S.F.		CONST. SIGNS 16.00 - 32.99 S.F.		CONSTRUCTION BARRICADES (TYPE III)		WARNING LIGHTS (TYPE A)		
	880(B)		880(B)		880(B)		880(C)		880(E)		
	EA.	S.D.	EA.	S.D.	EA.	S.D.	EA.	S.D.	EA.	S.D.	
M4-9	8.00	90.00						8.00	90.00		
M4-10	2.00	90.00						2.00	90.00		
R11-2			2.00	90.00				2.00	90.00		
R11-3A			2.00	90.00				2.00	90.00		
W20-2					2.00	90.00	2.00	90.00	2.00	90.00	
W20-3					2.00	90.00	2.00	90.00	2.00	90.00	
PHASE TOTAL	10.00	90.00	4.00	90.00	4.00	90.00	18.00	90.00	4.00	90.00	
TOTAL	900.00		360.00		360.00		1,620.00		360.00		
SIGN DAY= 90 DAYS											



DESIGN DATA

CLASS AA CONCRETE $f'_c = 4$ K.S.I.
REINFORCING STEEL, AASHTO M 31 (GRADE 60) $F_y = 60$ K.S.I.

LOADING:
HL-93

DESIGN:
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION.

LRFR INVENTORY RATING FACTOR:	1.34
LRFR OPERATING RATING FACTOR:	1.74
EV3 LEGAL LOAD RATING FACTOR:	1.81
NRL LEGAL LOAD RATING FACTOR:	3.46

HYDRAULIC DATA

TOTAL DRAINAGE AREA = 0.63 SQ. MI.
CONTROLLED DRAINAGE AREA = 0.00 SQ. MI.
EFFECTIVE DRAINAGE AREA = 0.63 SQ. MI.

Q2 =	261 CFS	Q25 =	993 CFS
CHW =	1119.59	CHW =	1121.73
V2 =	2.74 FPS	V25 =	6.01 FPS

Q5 =	490 CFS	Q50 =	1330 CFS
CHW =	1120.46	CHW =	1122.39
V5 =	3.92 FPS	V50 =	7.19 FPS

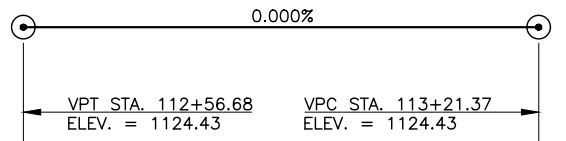
Q10 =	688 CFS	Q100 =	1560 CFS
CHW =	1121.02	CHW =	1122.89
V10 =	4.81 FPS	V100 =	7.94 FPS

RDW OT > 412 YR	QOT =	2260 CFS
CHW OT = 1124.45	VOT =	10.05 FPS

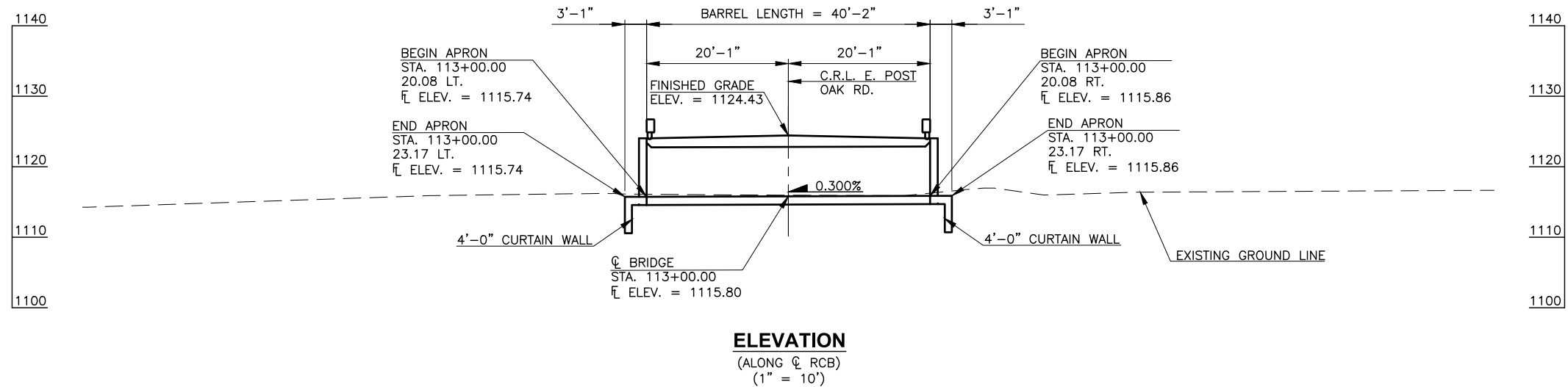
ODOT STANDARDS

TR4-2-00E
LECS-5-2
SBI-5-2

NOTE:
FOR SHEET INDEX, SUMMARY OF BRIDGE PAY QUANTITIES, SEE SHEET B002.



PROFILE GRADE LINE DATA



PLOTTED: Friday, April 11, 2025 @ 08:50AM
 MKEC PROJECT NUMBER: 2403010281

SHEET INDEX

SUMMARY OF PAY QUANTITIES AND NOTES (BRIDGE)	AB01
GENERAL PLAN AND ELEVATION	B001
BRIDGE PAY QUANTITIES SUMMARY	B002
FOUNDATION REPORTS (SHEET 1 OF 2)	B003
FOUNDATION REPORTS (SHEET 2 OF 2)	B004
BARREL DETAILS (SHEET 1 OF 2)	B005
BARREL DETAILS (SHEET 2 OF 2)	B006
END SECTION DETAILS (SHEET 1 OF 2)	B007
END SECTION DETAILS (SHEET 2 OF 2)	B008
APPROACH SLAB DETAILS	B009
EXCAVATION DETAILS	B010

SUMMARY OF BRIDGE QUANTITIES					
ITEM	UNIT	APPROACH SLABS	RCB BARREL	RCB END SECTIONS	TOTAL
UNCLASSIFIED EXCAVATION	C.Y.		100.00	910.00	1,010.00
STRUCTURAL EXCAVATION UNCLASSIFIED	C.Y.		190.00	115.00	305.00
APPROACH SLAB	S.Y.	178.60			178.60
SAW-CUT GROOVING	S.Y.	139.40	147.40		286.80
CONCRETE RAIL (TR4)	L.F.	80.00	80.00		160.00
CLASS AA CONCRETE	C.Y.		201.00	81.40	282.40
REINFORCING STEEL	LB.		40,000.00	10,380.00	50,380.00
REMOVAL OF EXISTING BRIDGE STRUCTURE	L.SUM				1.00

MKEC // TRANSPORTATION

Item 2.

DESCRIPTION	REVISIONS



DESIGN	J.T.H.	E. POST OAK RD. OVER TRIB. CITY OF NORMAN TO JIM BLUE CRK.
DRAWN	P.W.D.	
CHECKED	J.T.H.	



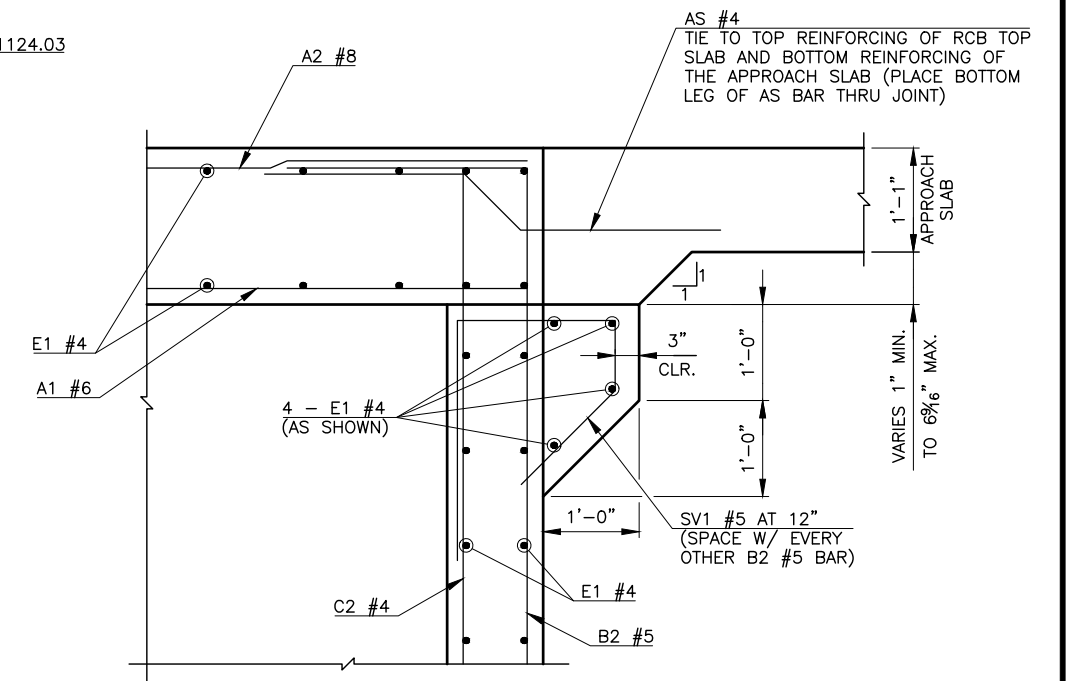
BRIDGE PAY QUANTITIES SUMMARY

PROJECT NO. K-2324-151 SHEET NO. 28

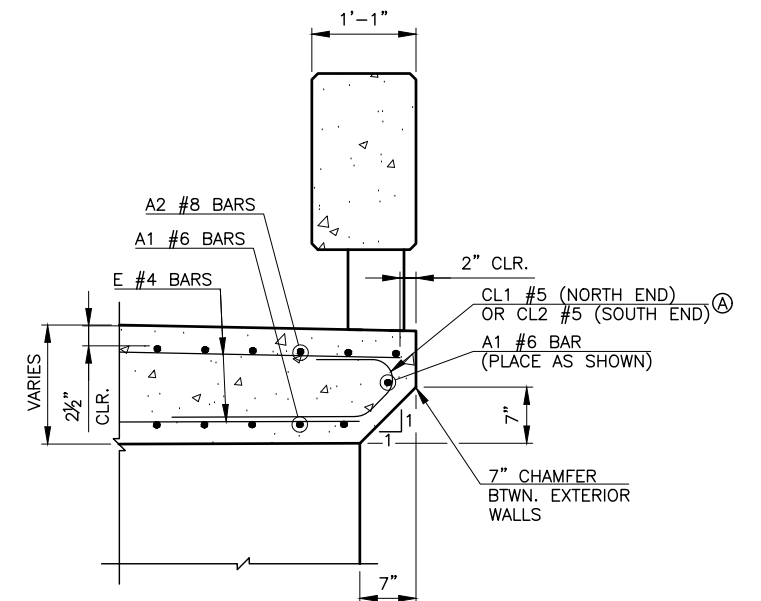
	DESIGN	J.T.H.	E. POST OAK RD. OVER TRIB.	CITY OF NORMAN
	DRAWN	P.W.D.	TO JIM BLUE CRK.	
	CHECKED	J.T.H.	FOUNDATION REPORTS (SHEET 1 OF 2)	
	 MKEC			
PROJECT NO.			<u>K-2324-151</u>	SHEET NO.
				29

C:\USERS\BRYCE\HAN\ARROWHEAD ENG. CO. DROPBOX\AEC JOBS-2024\1 PROJECTS 2024\1941 MKEC EPOSTOAKOVTRIBJ\JMBLUECREEK CLEVELANDCO RCBBRIDGEREPLACEMENT7 GINT FILE\1941 GINT.GPJ FIRE

C:\USERS\BRYCE\HANI\ONARROWHEAD ENG. CO. DROPBOX\AEC JOBS-2024\1 PROJECTS 2024\1941 MKEC EPOSTOAKOVTRIBJ\IMBLUECREEK CLEVELANDCO RCBBRDIGEREPLACEMENT\7 GINT FILE\1941 GINT.GPJ FIRE



TYPICAL ELEVATION ALONG C RCB BARREL

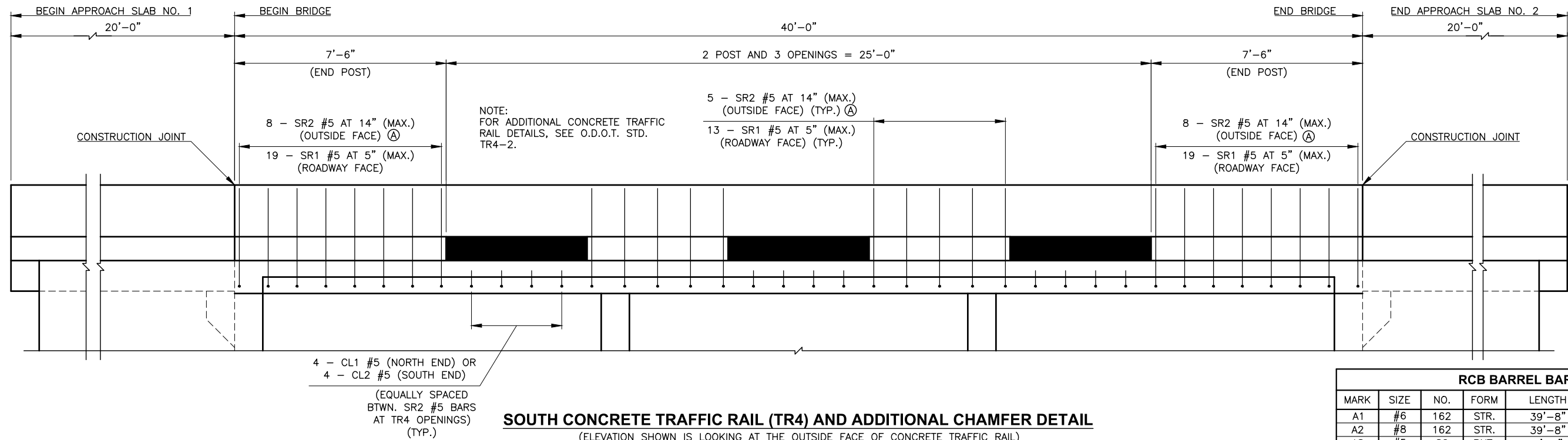


TYPICAL SECTION THRU BARREL

FOR WING WALL DETAILS AND WING
WALL QUANTITIES, SEE SHEET B007
AND B008.

	DESIGN	J.T.H.	E. POST OAK RD. OVER TRIB.	CITY OF NORMAN
	DRAWN	J.D.H.	TO JIM BLUE CRK.	
	CHECKED	J.T.H.	BARREL DETAILS (SHEET 1 OF 2)	
 MKEC	PROJECT NO.		<u>K-2324-151</u>	SHEET NO. 31

MKEC PROJECT NUMBER: 2403010281
PLOTTED: Friday, April 11, 2025 @ 08:50AM

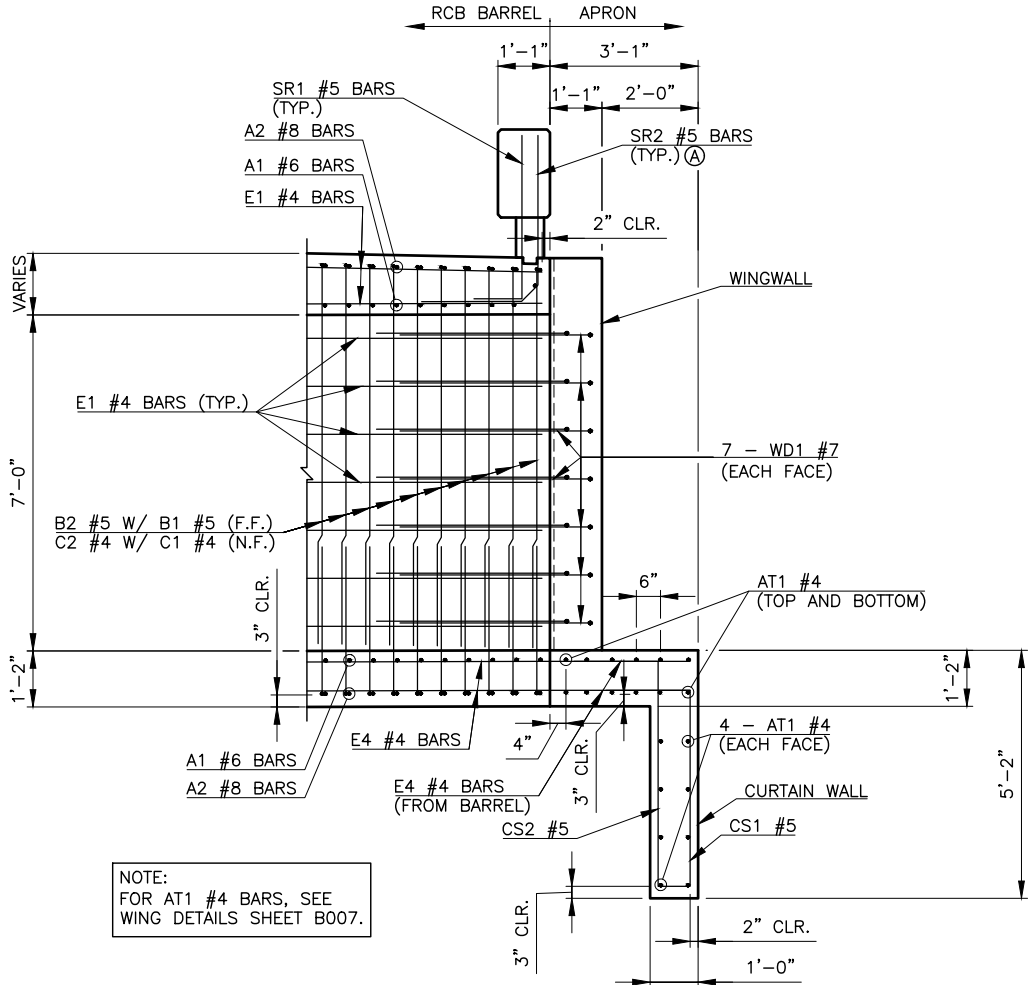


SOUTH CONCRETE TRAFFIC RAIL (TR4) AND ADDITIONAL CHAMFER DETAIL
(ELEVATION SHOWN IS LOOKING AT THE OUTSIDE FACE OF CONCRETE TRAFFIC RAIL)

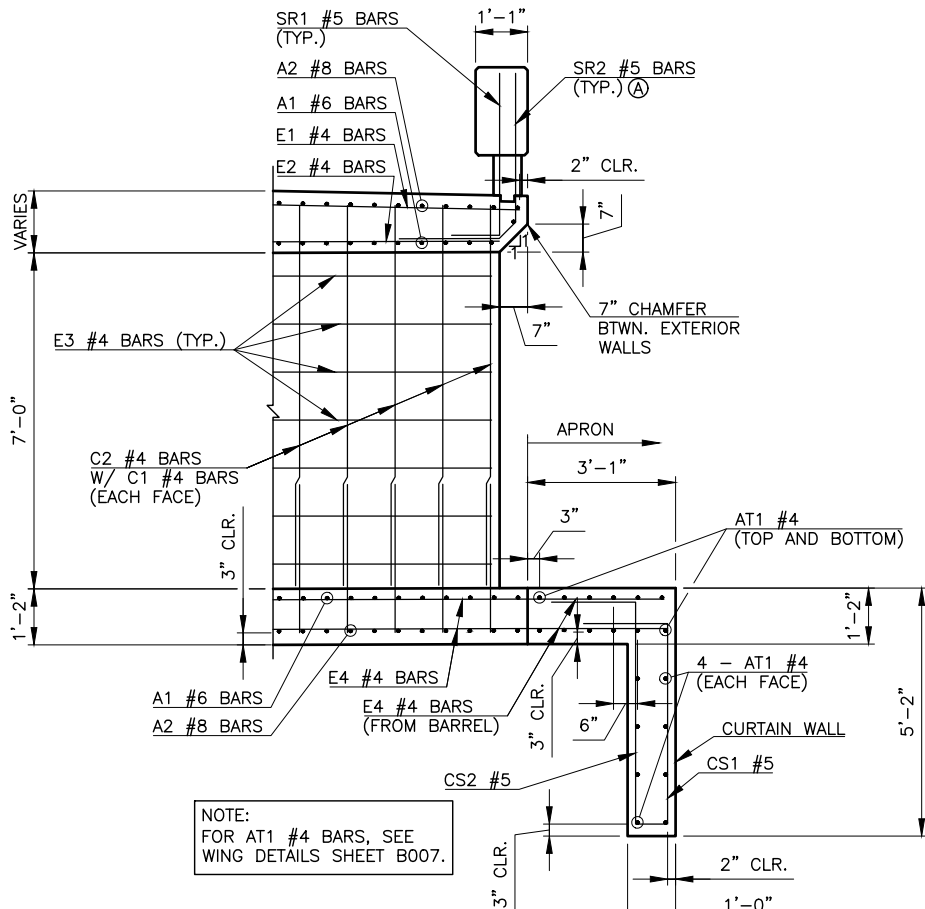
NOTES:
FOR RCB BARREL QUANTITIES, SEE SHEET B005.
FOR WING WALL DETAILS, SEE SHEET B007 AND B008.

Ⓐ USE SR2 #5 AT OUTSIDE FACE OF CONCRETE TRAFFIC RAIL ONLY ON TOP OF BARREL IN LIEU OF SR1 #5 BAR.

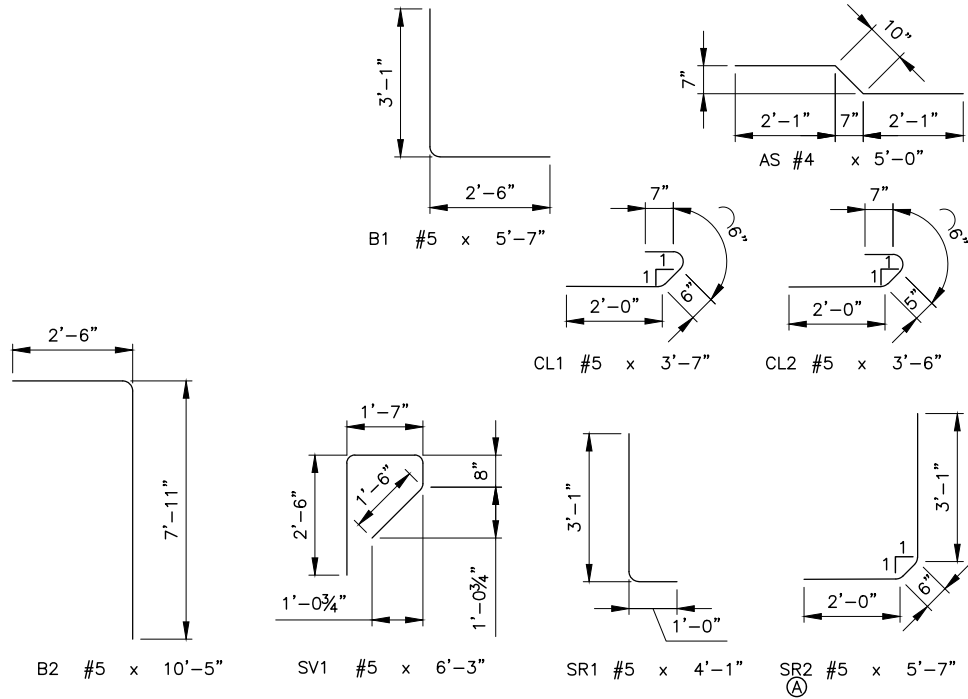
RCB BARREL BAR LIST					
MARK	SIZE	NO.	FORM	LENGTH	LENGTH VARIATION
A1	#6	162	STR.	39'-8"	
A2	#8	162	STR.	39'-8"	
AS	#5	82	BNT.	5'-0"	
B1	#5	162	BNT.	5'-7"	
B2	#5	162	BNT.	10'-5"	
C1	#4	242	STR.	3'-1"	
C2	#4	242	STR.	7'-11"	
CL1	#5	12	BNT.	3'-7"	
CL2	#5	12	BNT.	3'-6"	
E1	#4	88	STR.	39'-10"	
E2	#4	40	STR.	38'-8"	
E3	#4	28	STR.	38'-8"	
E4	#4	88	STR.	46'-0"	
SR1	#5	128	BNT.	4'-1"	
Ⓐ SR2	#5	52	BNT.	5'-7"	
SV1	#5	82	BNT.	6'-3"	

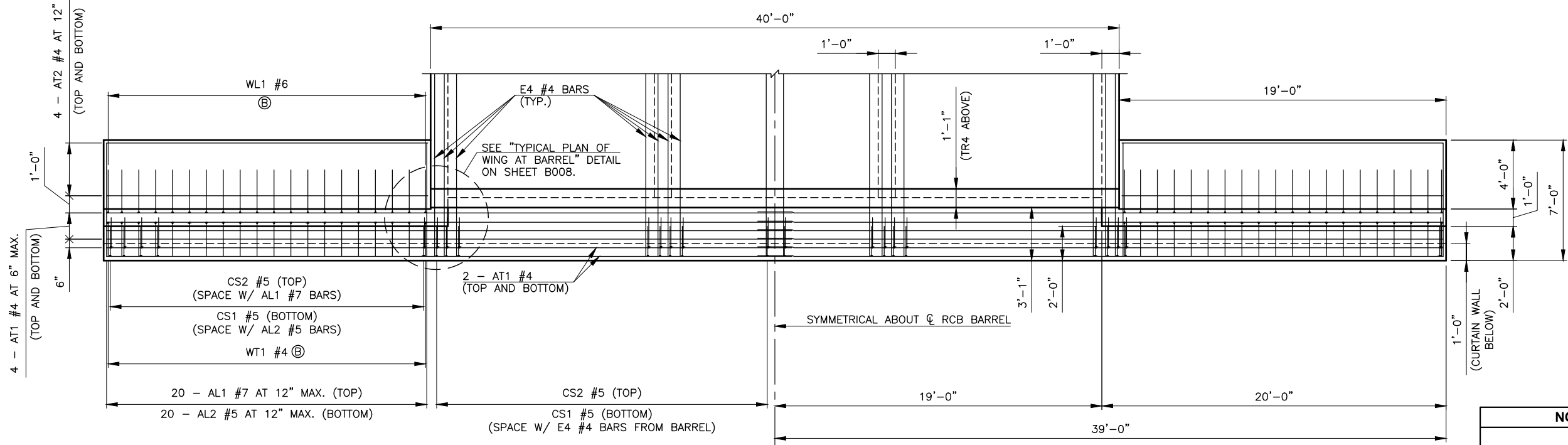


TYPICAL END OF BARREL DETAIL AT EXTERIOR WALL



TYPICAL END OF BARREL DETAIL AT INTERIOR WALL





HALF REINFORCING PLAN

HALF PLAN

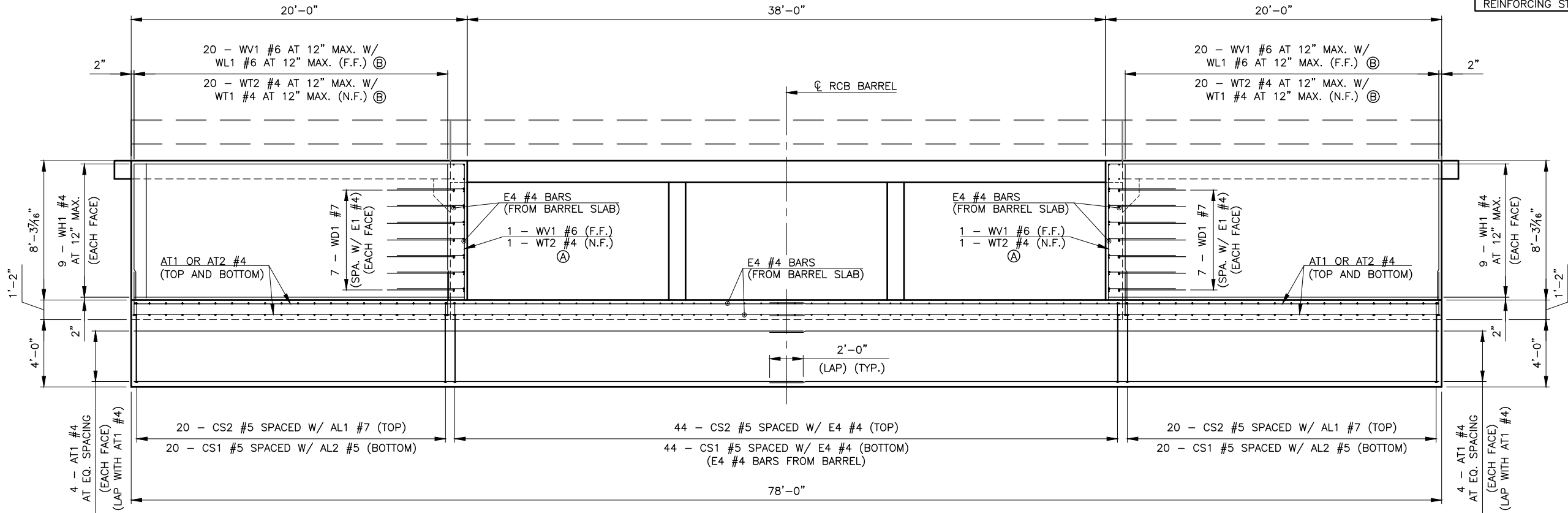
WINGWALL AND APRON PLAN
(NORTH END SECTION SHOWN, SOUTH END SECTION SIMILAR)

NORTH RCB END SECTION QUANTITIES		
ITEM	UNIT	TOTAL
CONCRETE CLASS AA	C.Y.	40.80
REINFORCING STEEL	LB.	5,190.00

SOUTH RCB END SECTION QUANTITIES		
ITEM	UNIT	TOTAL
CONCRETE CLASS AA	C.Y.	40.60
REINFORCING STEEL	LB.	5,190.00

F.F. = FAR FACE / ROADWAY FACE
N.F. = NEAR FACE / OUTSIDE FACE

- Ⓐ TIE WV1 #6 (F.F.) TO WD1 #7 BARS AND WT2 #4 (N.F.) TO WH1 #4 BARS.
- Ⓑ TIE BOTTOM LEGS OF WL1 #6 (F.F.) AND WT1 #4 (N.F.) TO AL2 #5 BARS.



WINGWALL AND APRON ELEVATION
(NORTH END SECTION SHOWN, SOUTH END SECTION SIMILAR)

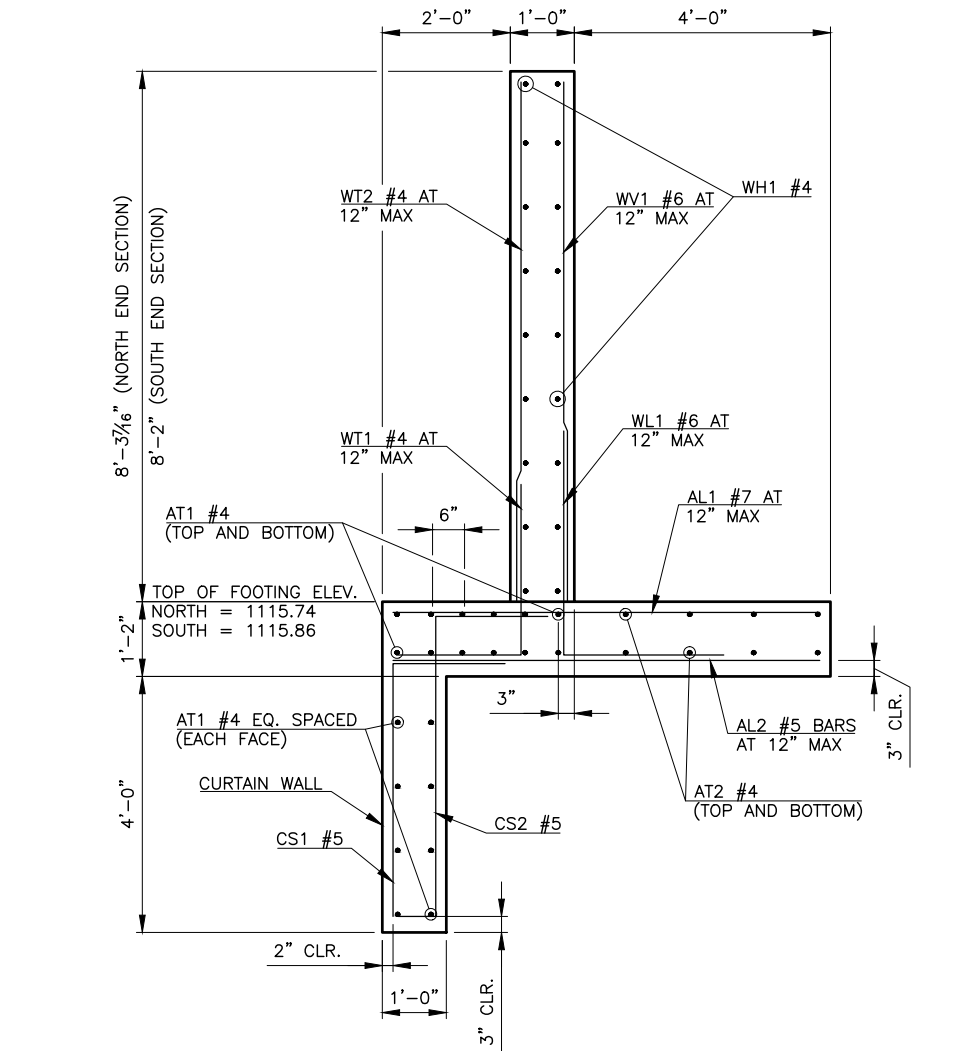
NOTES:

FOR TYPICAL WINGWALL AND APRON SECTION, SEE SHEET B008.

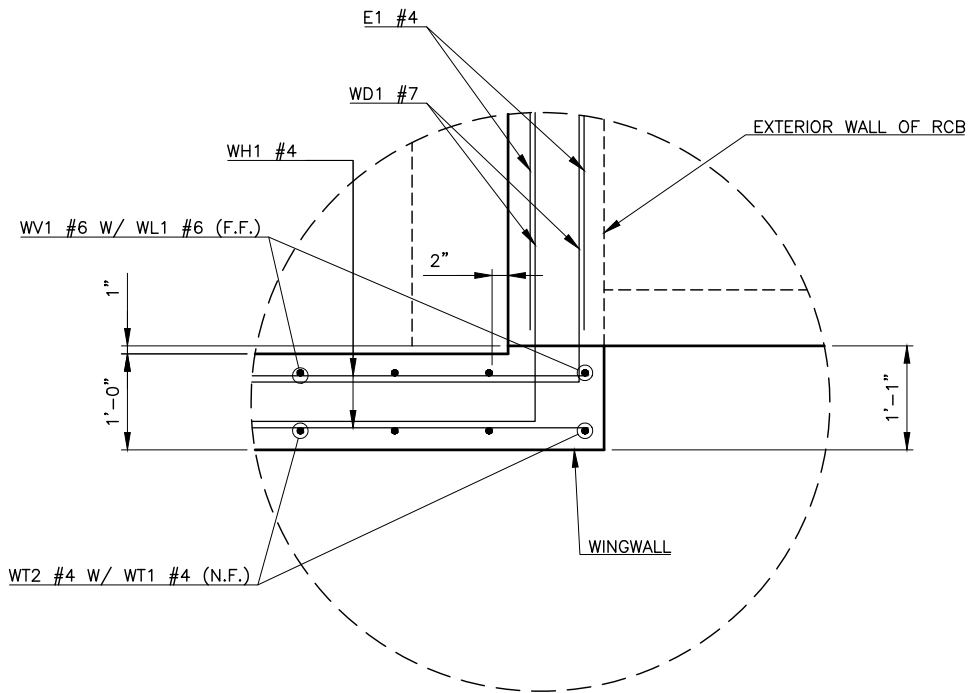
FOR BARREL DETAILS, SEE SHEETS B005 - B006.

PLOTTED: Friday, April 11, 2025 @ 08:50AM
 MKEC PROJECT NUMBER: 2403010281

MKEC // TRANSPORTATION		Item 2.
DESCRIPTION	REVISIONS	



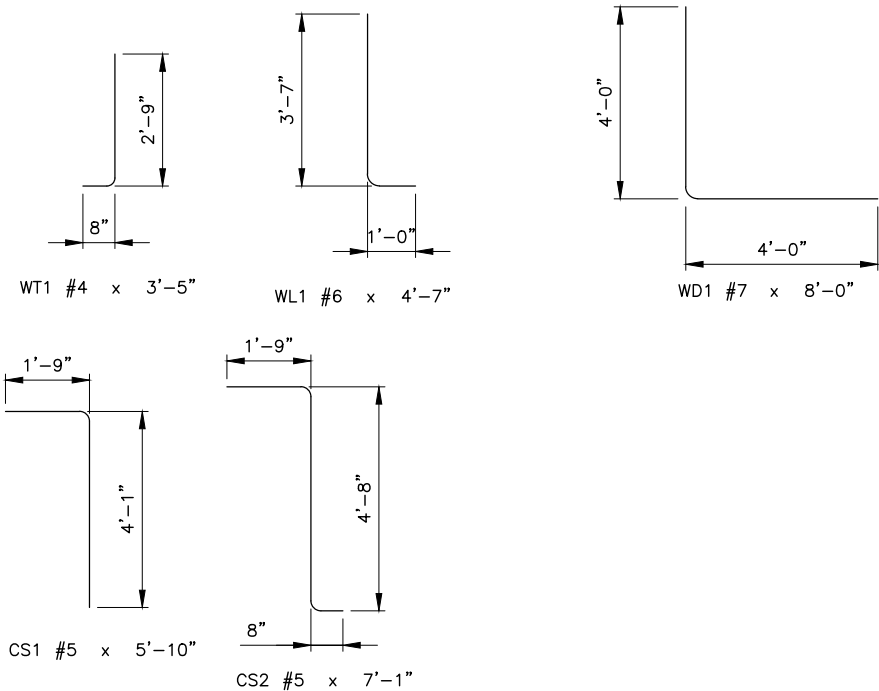
TYPICAL WINGWALL SECTION



TYPICAL PLAN OF WING AT BARREL

WINGWALL BAR LIST					
(ONE SHOWN, TWO REQUIRED)					
MARK	SIZE	NO.	FORM	LENGTH	LENGTH VARIATION
AL1	#7	40	STR.	6'-8"	
AL2	#5	40	STR.	6'-8"	
AT1	#4	24	STR.	39'-10"	
AT2	#4	16	STR.	18'-8"	
WD1	#7	28	BNT.	8'-0"	
WH1	#4	36	STR.	18'-8"	
WL1	#6	40	BNT.	4'-7"	
WT1	#4	40	BNT.	3'-5"	
WT2	#4	40	STR.	8'-0"	
WV1	#6	40	STR.	8'-0"	

CURTAIN WALL BAR LIST					
(ONE SHOWN, TWO REQUIRED)					
MARK	SIZE	NO.	FORM	LENGTH	LENGTH VARIATION
AT1	#4	16	STR.	39'-10"	
CS1	#5	84	BNT.	5'-10"	
CS2	#5	84	BNT.	7'-1"	

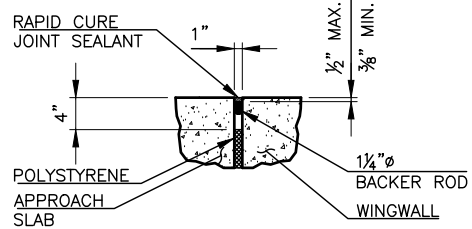
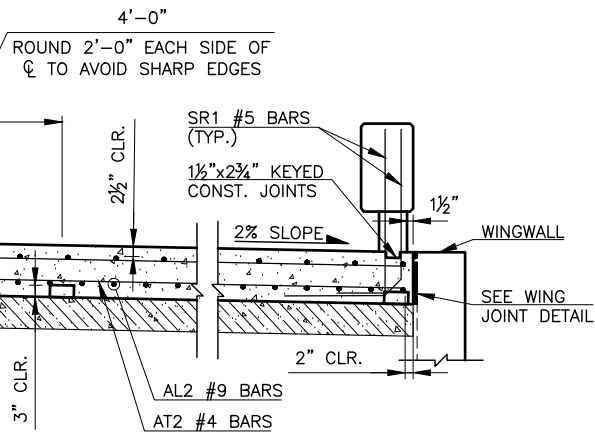
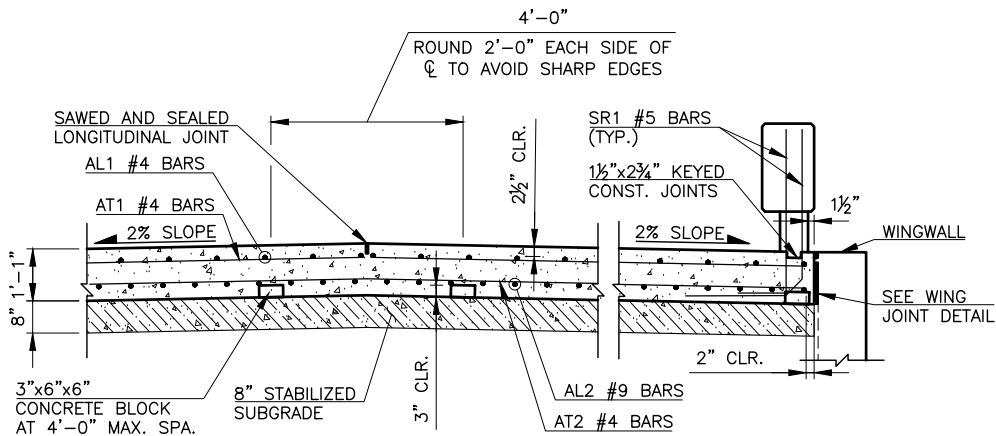
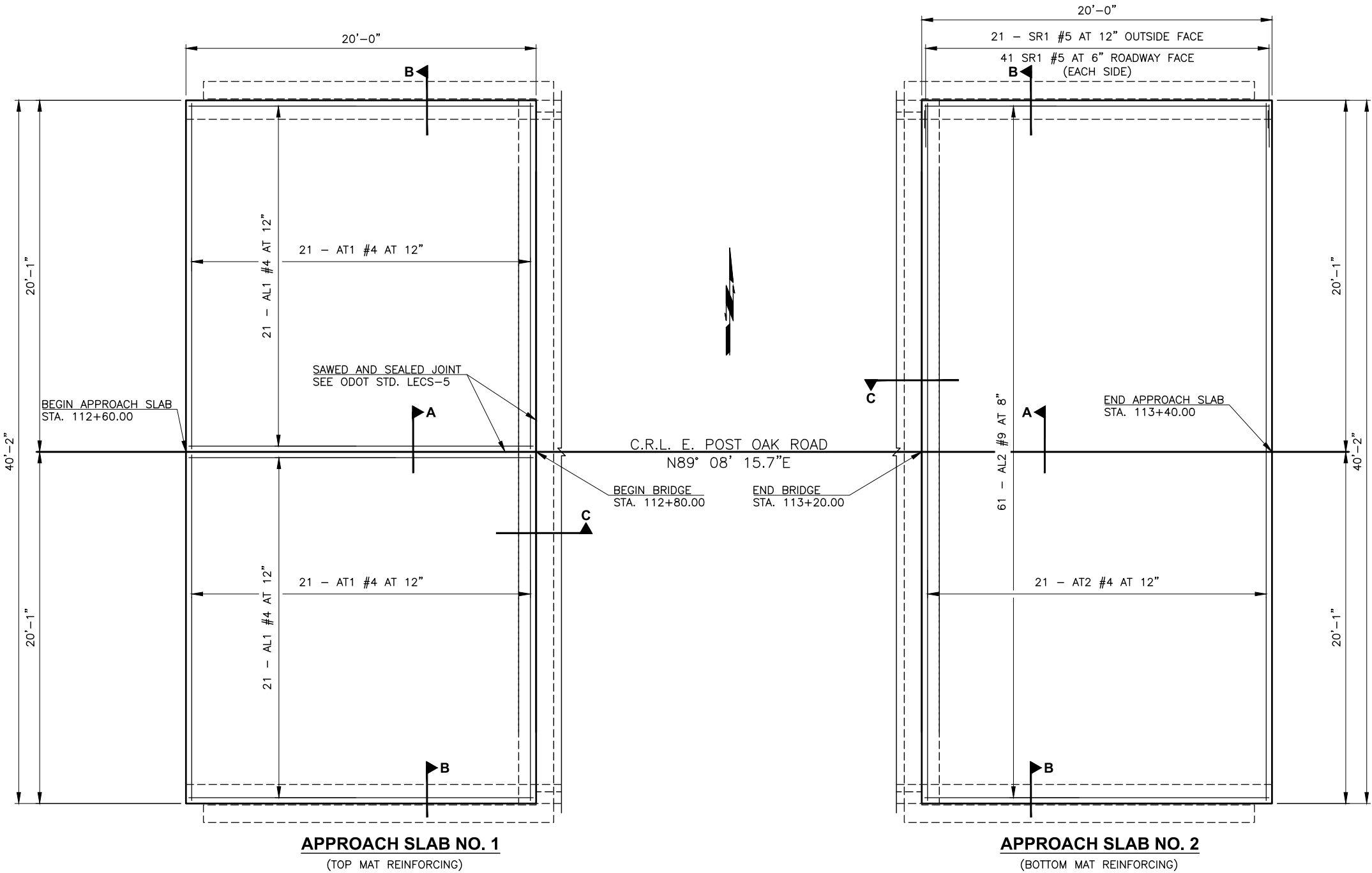


	DESIGN	P.W.D.	E. POST OAK RD. OVER TRIB.	CITY OF NORMAN
	DRAWN	J.D.H.	TO JIM BLUE CRK.	
	CHECKED	J.T.H.	END SECTION DETAILS (SHEET 2 OF 2)	
	PROJECT NO. K-2324-151		SHEET NO. 34	

MKEC PROJECT NUMBER: 2403010281
 PLOTTED: Friday, April 11, 2025 @ 08:50AM

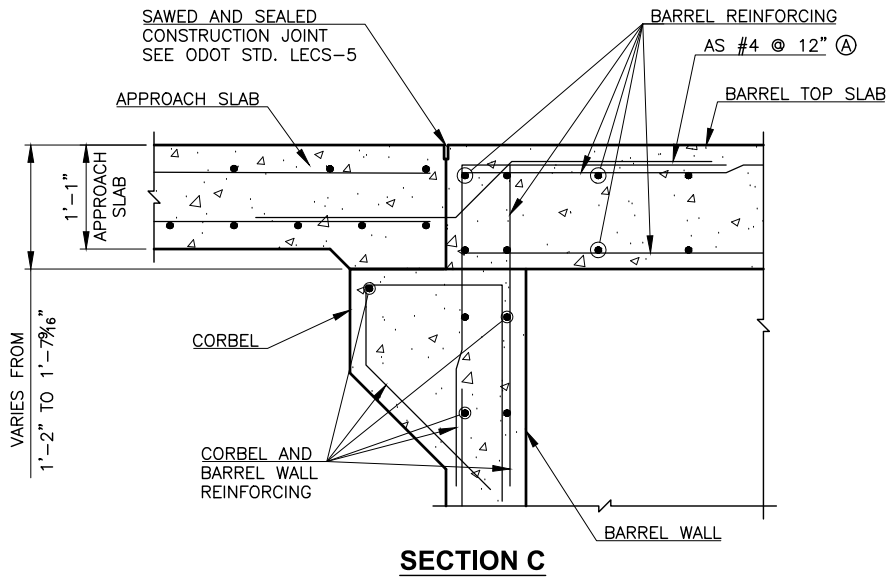
MKEC // TRANSPORTATION	
DESCRIPTION	REVISIONS
	Item 2.

- NOTES:
- PLACE REINFORCING IN THE TOP OF THE APPROACH SLAB 2" FROM EITHER OF THE SAWED AND SEALED LONGITUDINAL JOINTS.
- FOR ADDITIONAL DETAILS OF LONGITUDINAL JOINT, SEE O.D.O.T. STD. LECS-5.
- Ⓐ AS BARS SHALL BE TIED TO THE TOP LAYER OF REINFORCING STEEL IN THE RCB AND TO THE BOTTOM LAYER OF REINFORCING STEEL IN THE APPROACH SLAB. AS BARS SHALL BE INSTALLED BEFORE PLACING THE RCB CONCRETE.



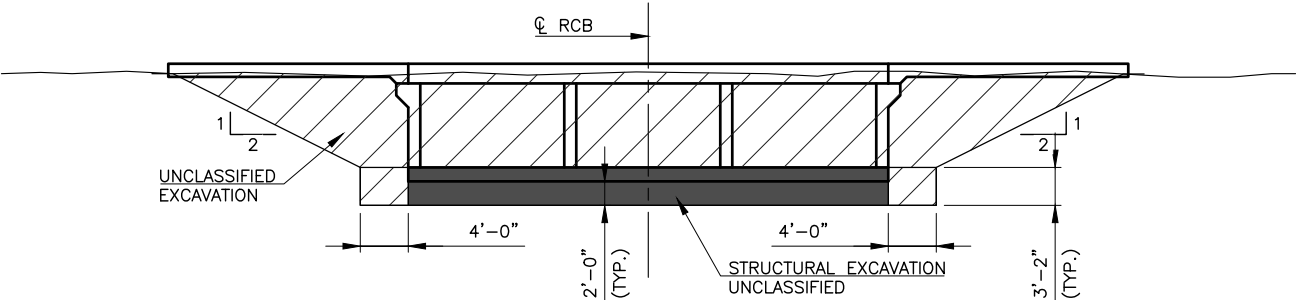
APPROACH SLAB QUANTITIES				
ITEM	UNIT	APPROACH SLAB NO. 1	APPROACH SLAB NO. 2	TOTAL
APPROACH SLAB	S.Y.	89.30	89.30	178.60
SAW-CUT GROOVING	S.Y.	69.70	69.70	139.40
CONCRETE RAIL (TR4)	LF.	40.00	40.00	80.00

APPROACH SLAB BAR LIST					
(ONE SHOWN, TWO REQUIRED)					
MARK	SIZE	NO.	FORM	LENGTH	LENGTH VARIATION
AL1	#4	42	STR.	19'-8"	
AL2	#9	61	STR.	19'-8"	
AT1	#4	42	STR.	19'-9"	
AT2	#4	21	STR.	39'-10"	
SR1	#5	124	BNT.	4'-1"	

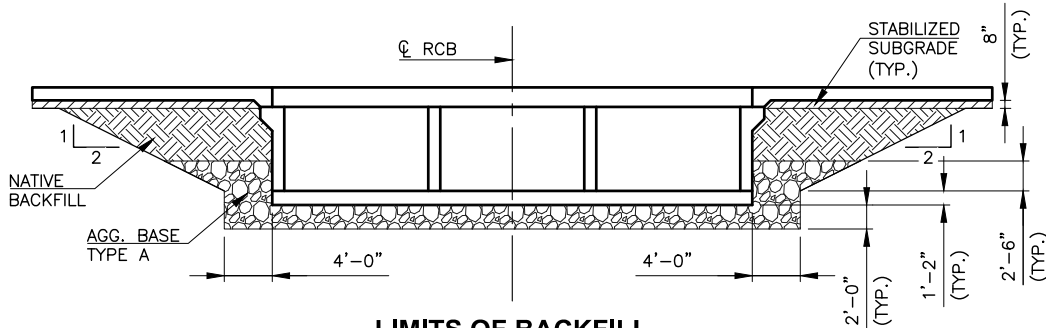


	DESIGN	J.T.H.	E. POST OAK RD. OVER TRIB. CITY OF NORMAN		
	DRAWN	P.W.D.	TO JIM BLUE CRK.		
	CHECKED	J.T.H.			
	APPROACH SLAB DETAILS				
		PROJECT NO.	K-2324-151	SHEET NO.	35

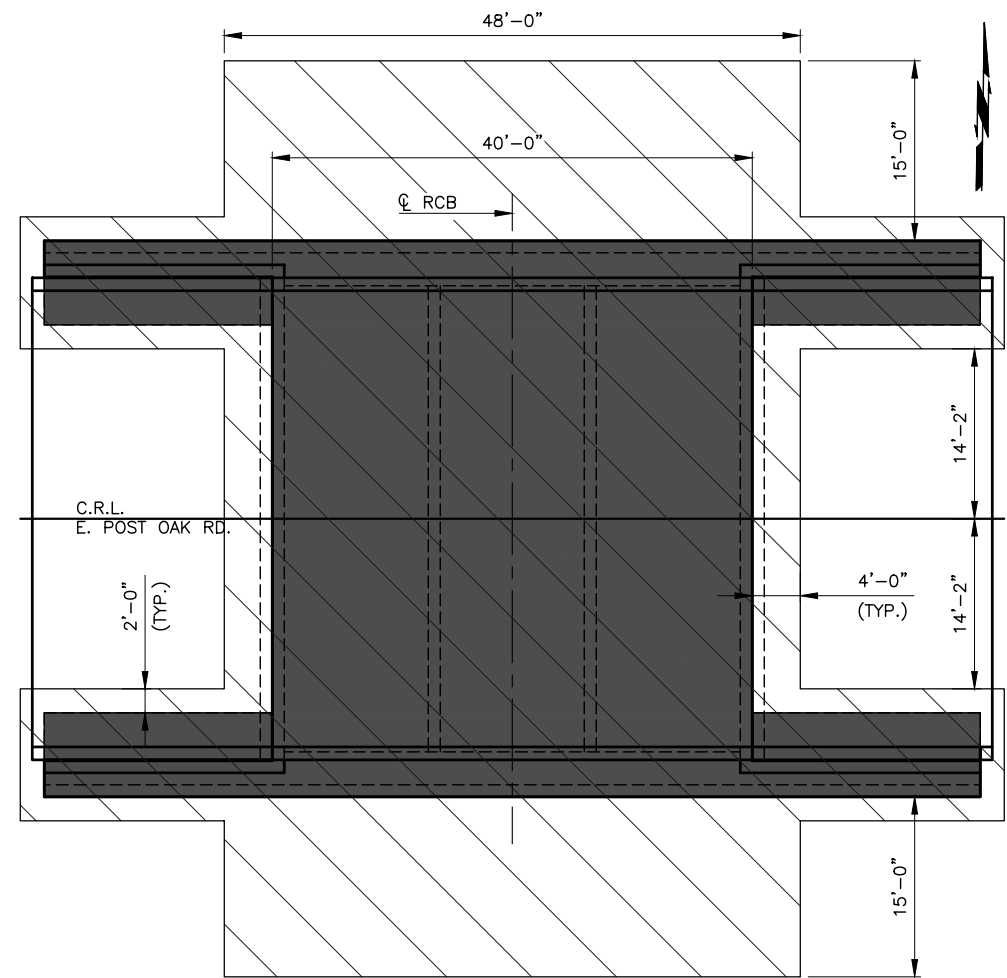
PLOTTED: Friday, April 11, 2025 @ 08:50AM
 MKEC PROJECT NUMBER: 2403010281



LIMITS OF UNCLASSIFIED AND STRUCTURAL EXCAVATION
 TYPICAL SECTION



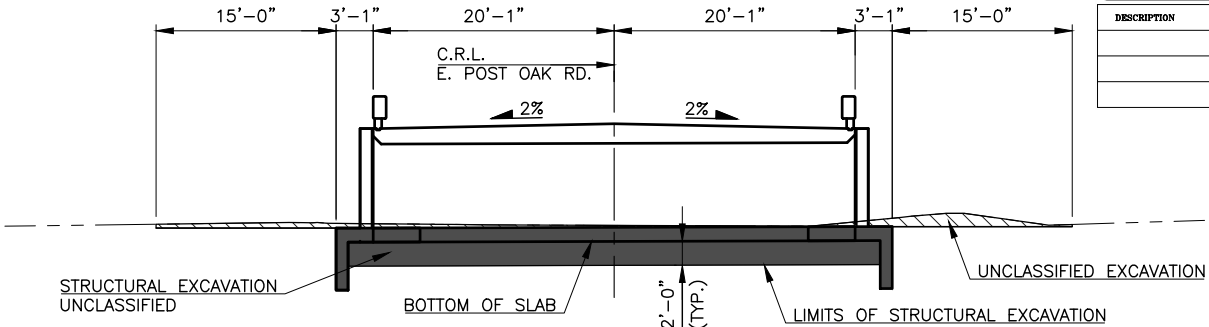
LIMITS OF BACKFILL
 TYPICAL SECTION



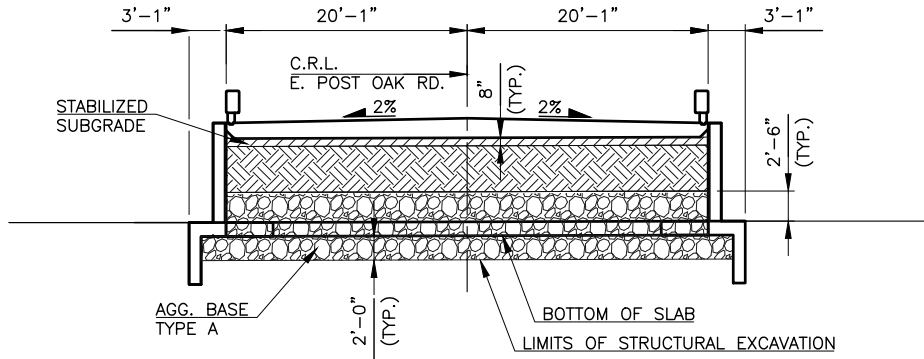
PLAN OF LIMITS OF UNCLASSIFIED AND STRUCTURAL EXCAVATION

- UNCLASSIFIED EXCAVATION
- STRUCTURAL EXCAVATION UNCLASSIFIED
- AGGREGATE BASE TYPE A
- NATIVE BACKFILL
- STABILIZED SUBGRADE

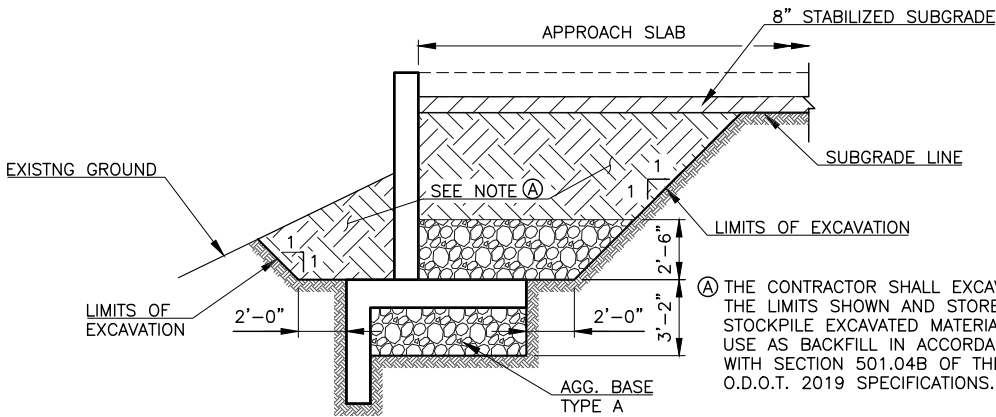
LEGEND



LIMITS OF UNCLASSIFIED AND STRUCTURAL EXCAVATION
 ELEVATION



LIMITS OF BACKFILL
 ELEVATION



TYPICAL WING WALL EXCAVATION AND BACKFILL DETAIL

SUMMARY OF EXCAVATION QUANTITIES				
ITEM	UNIT	BARREL	END SECTION	TOTAL
UNCLASSIFIED EXCAVATION	C.Y.	100.00	910.00	1,010.00
AGGREGATE BASE TYPE A	C.Y.	170.00	130.00	300.00
STRUCTURAL EXCAVATION UNCLASSIFIED	C.Y.	190.00	115.00	305.00

NOTE:
 AGGREGATE BASE TYPE A BACKFILL TO BE PAID AS ROADWAY PAY ITEM.

(A) THE CONTRACTOR SHALL EXCAVATE TO THE LIMITS SHOWN AND STORE IN A STOCKPILE EXCAVATED MATERIAL TO USE AS BACKFILL IN ACCORDANCE WITH SECTION 501.04B OF THE O.D.O.T. 2019 SPECIFICATIONS.

DESIGN

J.T.H.

DRAWN

P.W.D.

CHECKED

J.T.H.

E. POST OAK RD. OVER TRIB. TO JIM BLUE CRK.

CITY OF NORMAN

EXCAVATION DETAILS

PROJECT NO. K-2324-151 SHEET NO. 36

STORM WATER MANAGEMENT PLAN

DESCRIPTION REVISIONS

Item 2.

SITE DESCRIPTION

EROSION AND SEDIMENT CONTROLS

PROJECT LIMITS: 200 FEET EAST AND 200 FEET WEST OF BRIDGE ON E. POST OAK RD.

PROJECT DESCRIPTION: BRIDGE AND APPROACHES ON E POST OAK RD. OVER TRIBUTARY TO JIM BLUE CREEK

SUGGESTED SEQUENCE OF EROSION CONTROL ACTIVITIES:

PRIOR TO INITIATING SOIL DISTURBING ACTIVITIES, THE CONTRACTOR WILL INSTALL ALL PERIMETER TEMPORARY SEDIMENT CONTROLS SPECIFIED. STRIP, STOCKPILE AND STABILIZE TOPSOIL. CLEAR AND GRUB ONLY IN NECESSARY AREAS, PRESERVING AS MUCH NATIVE VEGETATION AS POSSIBLE. INSTALL, MAINTAIN AND/OR MOVE TEMPORARY SEDIMENT ITEMS WITH CONSTRUCTION OPERATIONS AS PRACTICAL. IF DIRECTED BY THE ENGINEER, PLANT TEMPORARY SEEDING. REPLACE SALVAGED TOPSOIL. REMOVE TEMPORARY SEDIMENT CONTROL DEVICES WHEN AN ACCEPTABLE VEGETATIVE COVER (AT LEAST 70%) HAS BEEN ATTAINED. AS SITE CONDITIONS WARRANT, THE CONTRACTOR MAY CHOOSE TO MODIFY THE TYPE OR ARRANGEMENT OF SPECIFIED PRACTICES TO IMPROVE THEIR EFFECTIVENESS AS APPROVED BY THE ENGINEER. THE CONTRACTOR WILL MAINTAIN A LOG OF THE DATES OF MAJOR SOIL DISTURBANCE ACTIVITIES, AND ALSO THE DATES OF INSTALLATION OF EROSION.

SOIL TYPE: FINE SANDY LOAM

TOTAL AREA OF THE CONSTRUCTION SITE: 0.61 AC.

ESTIMATED AREA TO BE DISTURBED: 0.58 AC.

OFFSITE AREA TO BE DISTURBED: 0.00 AC. (FOR CONTRACTOR USE)

TOTAL IMPERVIOUS AREA PRE-CONSTRUCTION: 0.21 AC.

TOTAL IMPERVIOUS AREA POST-CONSTRUCTION: 0.34 AC.

POST-CONSTRUCTION RUNOFF COEFFICIENT OF THE SITE: 0.35

LATITUDE & LONGITUDE OF CENTER OF PROJECT: N= 35° 9'37.37"N E= 97°17'38.87"W

PROJECT WILL DISCHARGE TO:

NAME OF RECEIVING WATERS: JIM BLUE CREEK

SENSITIVE WATERS OR WATERSHEDS: YES X NO

303 (d) IMPAIRED WATERS: YES NO X

IF YES, LIST IMPAIRMENT:

LOCATED IN A TMDL: YES X NO

LAKE THUNDERBIRD TMDL: YES X NO

MS4 ENTITY YES NO X

IF YES, LOCATION:

NOTE: THIS SHEET SHOULD BE USED IN CONJUNCTION WITH A DRAINAGE MAP THAT ILLUSTRATES THE DRAINAGE PATTERNS/PATHWAYS AND RECEIVING WATERS FOR THIS PROJECT. THIS SHEET SHOULD ALSO BE USED WITH THE EROSION CONTROL SUMMARIES, PAY ITEMS, & NOTES.

SOIL STABILIZATION PRACTICES:

- TEMPORARY SEEDING
- X PERMANENT SODDING, SPRIGGING OR SEEDING
- X VEGETATIVE MULCHING
- SOIL RETENTION BLANKET
- X PRESERVATION OF EXISTING VEGETATION

NOTE: TEMPORARY EROSION CONTROL METHODS MUST BE USED ON ALL DISTURBED AREAS WHERE CONSTRUCTION ACTIVITIES HAVE CEASED FOR OVER 14 DAYS. METHODS USED WILL BE AS SHOWN ON PLANS, OR AS DIRECTED BY THE ENGINEER.

STRUCTURAL PRACTICES:

- STABILIZED CONSTRUCTION EXIT
- X TEMPORARY SILT FENCE
- X TEMPORARY SILT DIKES
- TEMPORARY FIBER LOG
- DIVERSION, INTERCEPTOR OR PERIMETER DIKES
- DIVERSION, INTERCEPTOR OR PERIMETER SWALES
- ROCK FILTER DAMS
- TEMPORARY SLOPE DRAIN
- PAVED DITCH W/ DITCH LINER PROTECTION
- TEMPORARY DIVERSION CHANNELS
- TEMPORARY SEDIMENT BASINS
- TEMPORARY SEDIMENT TRAPS
- TEMPORARY SEDIMENT FILTERS
- X TEMPORARY SEDIMENT REMOVAL
- X RIP RAP
- INLET SEDIMENT FILTER
- TEMPORARY BRUSH SEDIMENT BARRIERS
- SANDBAG BERMS
- TEMPORARY STREAM CROSSINGS
- X FLEXAMAT / ARTICULATED CONCRETE BLOCK
- COMPOST FILTER SOCKS
- EROSION CONTROL MATS AND BLANKETS

OFFSITE VEHICLE TRACKING:

- X HAUL ROADS DAMPENED FOR DUST CONTROL
- X LOADED HAUL TRUCKS TO BE COVERED WITH TARPULIN
- X EXCESS DIRT ON ROAD REMOVED DAILY

NOTES:

THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE FOLLOWING:

MAINTENANCE AND INSPECTION:

ALL EROSION AND SEDIMENT CONTROLS WILL BE MAINTAINED IN GOOD WORKING ORDER FROM THE BEGINNING OF CONSTRUCTION UNTIL AN ACCEPTABLE VEGETATIVE COVER IS ESTABLISHED. INSPECTION BY THE CONTRACTOR AND ANY NECESSARY REPAIRS SHALL BE PERFORMED ONCE EVERY 7 CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCH AS RECORDED BY A NON-FREEZING RAIN GAUGE TO BE LOCATED ON SITE. POTENTIALLY ERODIBLE AREAS, DRAINAGEWAYS, MATERIAL STORAGE, STRUCTURAL DEVICES, CONSTRUCTION ENTRANCES AND EXITS ALONG WITH EROSION AND SEDIMENT CONTROL LOCATIONS ARE EXAMPLES OF SITES THAT NEED TO BE INSPECTED.

WASTE MATERIALS:

PROPER MANAGEMENT AND DISPOSAL OF CONSTRUCTION WASTE MATERIAL IS REQUIRED BY THE CONTRACTOR. MATERIALS INCLUDE STOCKPILES, SURPLUS, DEBRIS AND ALL OTHER BY-PRODUCTS FROM THE CONSTRUCTION PROCESS. PRACTICES INCLUDE DISPOSAL, PROPER MATERIALS HANDLING, SPILL PREVENTION AND CLEANUP MEASURES. CONTROLS AND PRACTICES SHALL MEET THE REQUIREMENTS OF ALL FEDERAL, STATE AND LOCAL AGENCIES.

HAZARDOUS MATERIALS:

PROPER MANAGEMENT AND DISPOSAL OF HAZARDOUS WASTE MATERIALS IS REQUIRED. THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING MANUFACTURER'S RECOMMENDATIONS, STATE AND FEDERAL REGULATIONS TO ENSURE CORRECT HANDLING, DISPOSAL, SPILL PREVENTION AND CLEANUP MEASURES. EXAMPLES INCLUDE BUT ARE NOT LIMITED TO: PAINTS, ACIDS, CLEANING SOLVENTS, CHEMICAL ADDITIVES, CONCRETE CURING COMPOUNDS AND CONTAMINATED SOILS.

GENERAL NOTES:

A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IS REQUIRED TO COMPLY WITH THE OKLAHOMA POLLUTION DISCHARGE ELIMINATION SYSTEM (OPDES) REGULATIONS. THIS PLAN IS INITIATED DURING THE DESIGN PHASE, CONFIRMED IN THE PRE-WORK MEETINGS AND AVAILABLE ON THE JOB SITE ALONG WITH COPIES OF THE NOTICE OF INTENT (NOI) FORM AND PERMIT CERTIFICATE THAT HAVE BEEN FILED WITH THE OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY (ODEQ). THE PLAN MUST BE KEPT CURRENT WITH UP-TO-DATE AMENDMENTS DURING THE PROGRESSION OF THE PROJECT. ALL CONTRACTOR OFF-SITE OPERATIONS ASSOCIATED WITH THE PROJECT MUST BE DOCUMENTED IN THE SWPPP, I.E., BORROW PITS, WORK ROADS, DISPOSAL SITES, ASPHALT/CONCRETE PLANTS, ETC. THE BASIC GOAL OF STORM WATER MANAGEMENT IS TO IMPROVE WATER QUALITY BY REDUCING POLLUTANTS IN STORM WATER DISCHARGES. RUNOFF FROM CONSTRUCTION SITES HAS A POTENTIAL FOR POLLUTION DUE TO EXPOSED SOILS AND THE PRESENCE OF HAZARDOUS MATERIALS USED IN THE CONSTRUCTION PROCESS. THE PREVENTION OF SOIL EROSION, CONTAINMENT OF HAZARDOUS MATERIALS AND/OR THE INTERCEPTION OF THESE POLLUTANTS BEFORE LEAVING THE CONSTRUCTION SITE ARE THE BEST PRACTICES FOR CONTROLLING STORM WATER POLLUTION.

THE FOLLOWING SECTIONS OF THE 2019 ODOT STANDARD SPECIFICATIONS SHOULD BE NOTED:

- 103.05 BONDING REQUIREMENTS
- 104.10 FINAL CLEANING UP
- 104.12 CONTRACTOR'S RESPONSIBILITY FOR WORK
- 104.13 ENVIRONMENTAL PROTECTION
- 106.08 STORAGE AND HANDLING OF MATERIAL
- 107.01 LAWS, RULES AND REGULATIONS TO BE OBSERVED
- 107.20 STORM WATER MANAGEMENT
 - 220 MANAGEMENT OF EROSION, SEDIMENTATION AND STORM WATER POLLUTION PREVENTION AND CONTROL
 - 221 TEMPORARY SEDIMENT CONTROL

IN ADDITION:

"ODEQ GENERAL PERMIT (OKR10) FOR STORM WATER DISCHARGES FROM CONSTRUCTION ACTIVITIES WITHIN THE STATE OF OKLAHOMA." ODEQ, WATER QUALITY DIVISION, OCTOBER 18, 2022.

ADDITIONAL PERMITS REQUIRED FROM OKLAHOMA WATER RESOURCES BOARD



DESIGN DJG
DRAWN KMH
CHECKED ---



E. POST OAK ROAD CLEVELAND COUNTY

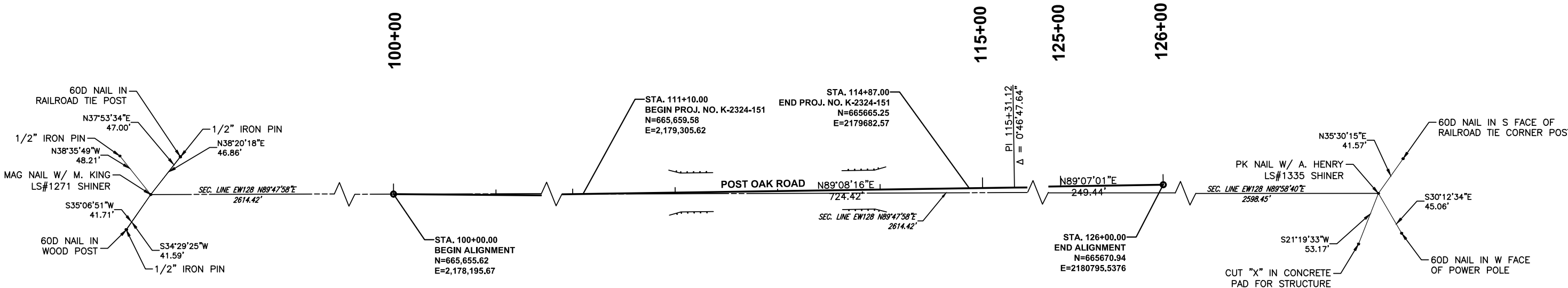
STORM WATER MANAGEMENT PLAN

PROJECT NO. K-2324-151 SHEET NO.

SEC. 16, T8N, R1W

SEC. 15, T8N, R1W

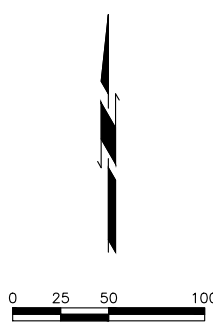
SEC. 14, T8N, R1W



SEC. 21, T8N, R1W

SEC. 22, T8N, R1W

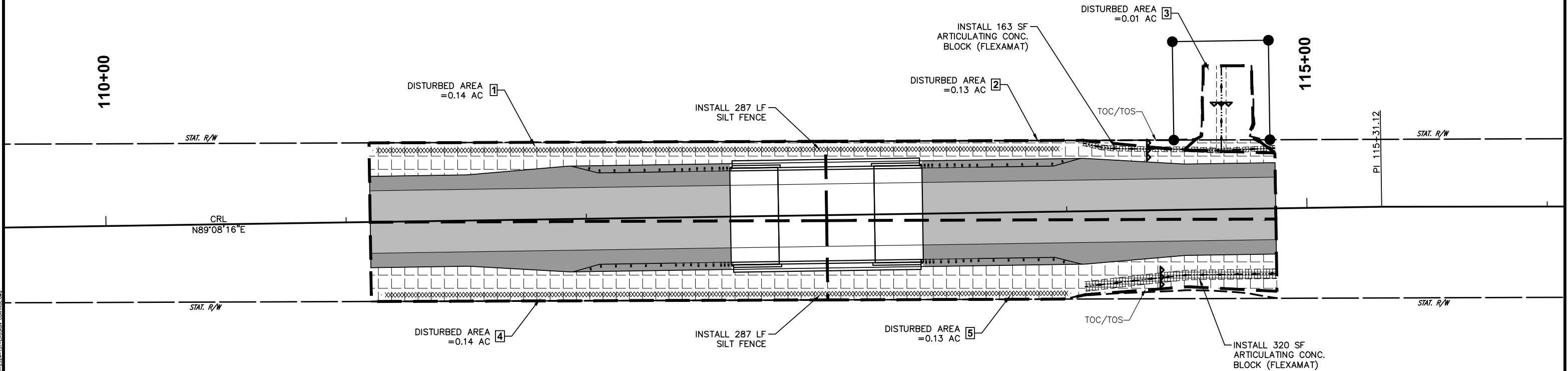
SEC. 23, T8N, R1W



DESIGN	---	E. POST OAK ROAD	CLEVELAND COUNTY
DRAWN	---	GEOMETRIC DATA	
CHECKED	---		
MKEC		JOB PIECE NO. <u>K-2324-151</u>	SHEET NO. <u>38</u>

DRAINAGE AREAS			
DA	DISTURBED AREA	TO	E.C. METHOD
1	0.14 AC.	BRIDGE A	SILT FENCE
2	0.13 AC.	BRIDGE A	SILT FENCE SILT DIKE
3	0.01 AC.	OFFSITE	SILT DIKE
4	0.14 AC.	BRIDGE A	SILT FENCE
5	0.13 AC.	BRIDGE A	SILT FENCE SILT DIKE

SEC. 15, T8N, R1W



LEGEND

TEMPORARY SILT DIKE

XXXXXXX

SOLID SLAB SODDING

ARTICULATING CONC. BLOCK

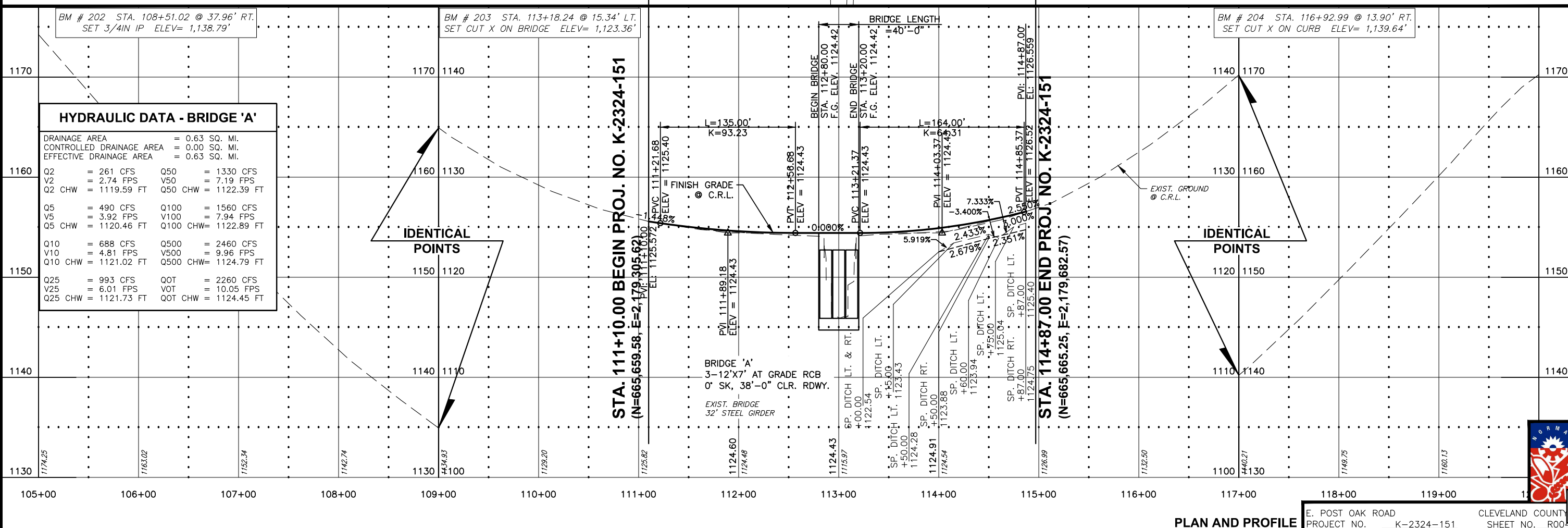
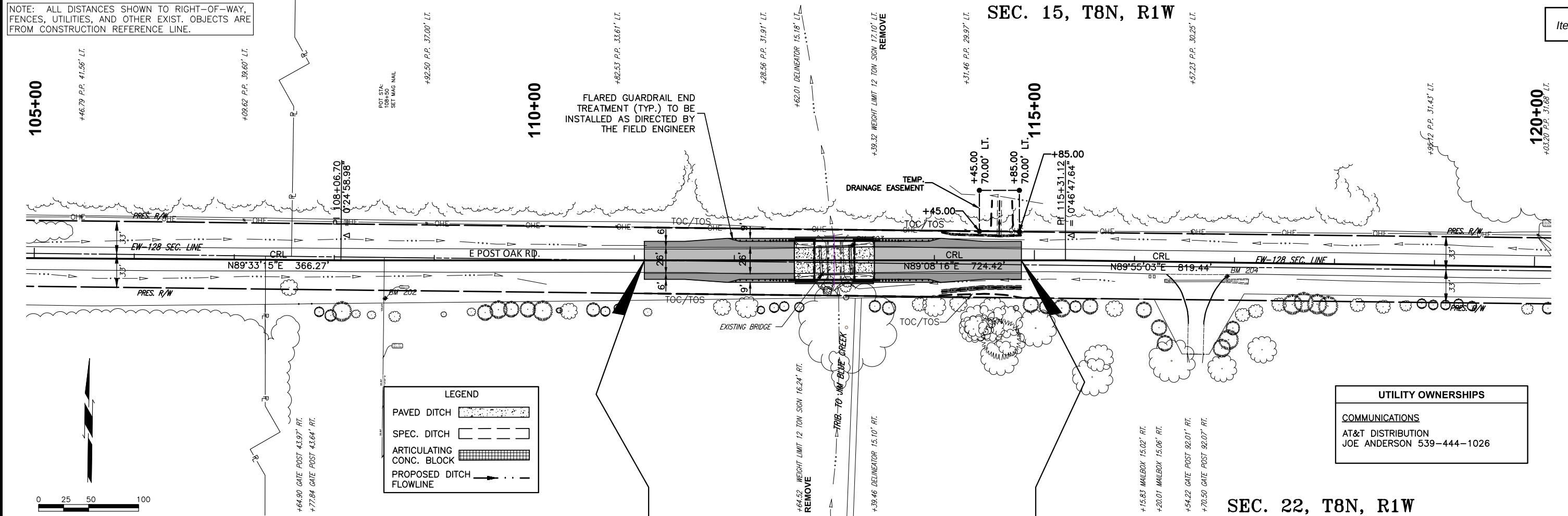
SOLID SLAB SODDING
THIS SHEET = 882 SY

NOTE: ALL DISTANCES SHOWN TO RIGHT-OF-WAY, FENCES, UTILITIES, AND OTHER EXIST. OBJECTS ARE FROM CONSTRUCTION REFERENCE LINE.

Item 2.

SEC. 15, T8N, R1W

SEC. 22, T8N, R1W



PLAN AND PROFILE

E. POST OAK ROAD
PROJECT NO. K-2324-151

CLEVELAND COUNTY
SHEET NO. R004

40

SURVEY CONTROL DATA

1. POSITIONAL CONTROL:
- A. POSITIONAL CONTROL FOR THIS SURVEY IS THE NGS OKLAHOMA STATE PLANE COORDINATE SYSTEM, NAD88 (1993), LAMBERT PROJECTION (SOUTH ZONE).

B. ACCURACY – THE POSITIONAL CONTROLS FOR THIS SURVEY MEETS OR EXCEEDS THE FOLLOWING ACCURACY CRITERIA:

1. NETWORK ACCURACY: 0.10 FOOT

2. LOCAL ACCURACY: 0.05 FOOT
2. BEARINGS:

THE BEARINGS SHOWN HEREIN OR HEREON ARE GRID BEARINGS DERIVED FROM THE NGS OKLAHOMA STATE PLANE COORDINATE SYSTEM AND ARE NOT ASTRONOMICAL.

3. VERTICAL CONTROLS:
- A. LEVEL DATUM IS NAVD 88 FROM Differential Leveling

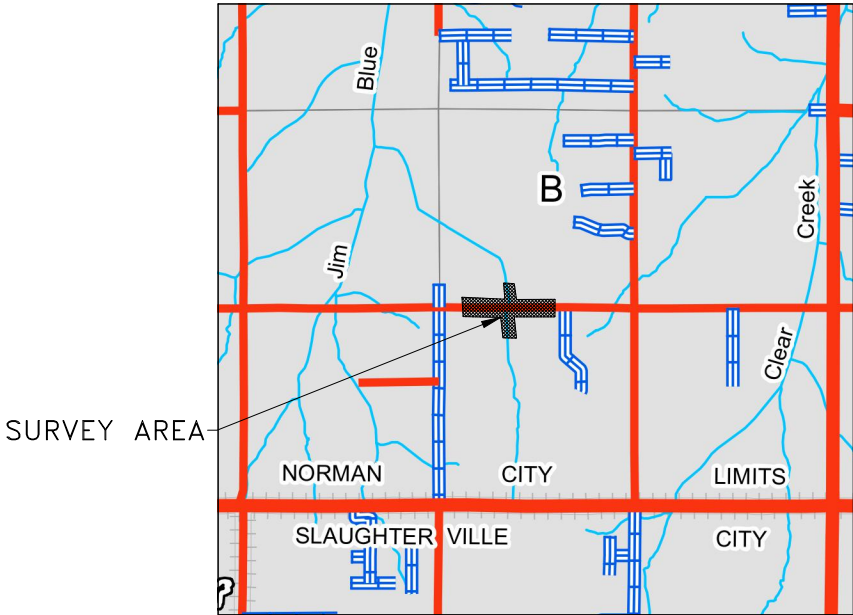
B. ACCURACY – VERTICAL CONTROL FOR THIS SURVEY MEETS OR EXCEEDS THE FOLLOWING ACCURACY CRITERIA:

1. NETWORK ACCURACY (FROM GPS OR LEVELING): 0.10 FOOT

2. LOCAL ACCURACY (CONFIRMED BY LEVELING): 0.02 FOOT

Point Table				
Point #	Description	Northing	Easting	Elevation
1	CP / SET 1/2IN IP W/ CP CAP	665,613.5710	2,178,204.4740	1,181.37
2	CP / SET 1/2IN IP W/ CP CAP	665,694.3894	2,180,928.6440	1,196.72
201	BM / SET 3/4IN IP	665,606.2776	2,178,592.7251	1,189.40
202	BM / SET 3/4IN IP	665,617.7271	2,179,047.2370	1,138.79
203	BM / SET CUT X ON BRIDGE	665,678.0427	2,179,513.5970	1,123.36
204	BM / SET CUT X ON CURB	665,652.2509	2,179,888.5750	1,139.64
205	BM / SET 3/4IN IP	665,640.1612	2,180,362.3020	1,175.98

POST OAK BRIDGE
NORMAN, OKLAHOMA



UTILITY OWNER INFORMATION

CITY OF NORMAN

JARED MATTERN 405-329-0703
JARED.MATTERN@NORMANOK.GOV

AT&T DISTRIBUTION

JOE ANDERSON 539-444-1026
JA492C@ATT.COM

OEC FIBER

MORGAN EDERER 405-217-6615
MORGAN.EDERER@OKCOOP.ORG

OG&E

MATT HILL
HLLMC@OGE.COM

LEGEND					
	BENCHMARK		GAS VALVE		SIGN
	BOLLARD		GAS VENT PIPE		SPIGOT
	BUSH		GATE POST		SPRINKLER
	CONTROL POINT		GROUND ROD		SPRINKLER CONTROL VALVE
	DOWNSPOUT		GUY WIRE		TANK FILLER
	ELECTRIC MARKER		LIGHT		TELEPHONE MARKER
	ELECTRIC METER		LIGHT POLE		TELEPHONE PEDESTAL
	ELECTRIC PEDESTAL		MAILBOX		TELEPHONE VAULT
	ELECTRIC VAULT		MISC. MANHOLE		TIE-DOWN
	FIBER OPTIC MARKER		MONITORING WELL		TRANSFORMER
	FIBER OPTIC PEDESTAL		PIPELINE MARKER		TREE CONIFEROUS
	FIBER OPTIC VAULT		POWER POLE		TREE DECIDUOUS
	FIRE HYDRANT		PULL BOX		WATER METER
	GAS MARKER		SEWER CLEANOUT		WATER VALVE
	GAS METER		SEWER MANHOLE		WATER VAULT

DEPICTED PROPERTY LINE

TOPOGRAPHY CERTIFICATION –
I, J. WYATT BISHOP, CERTIFY THAT THIS PROJECT WAS COMPLETED UNDER MY DIRECT AND RESPONSIBLE CHARGE FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; THAT THIS GROUND TOPOGRAPHIC SURVEY WAS PERFORMED AT THE 95 PERCENT CONFIDENCE LEVEL TO MEET FEDERAL GEOGRAPHIC DATA COMMITTEE STANDARDS; THAT THIS SURVEY WAS PERFORMED TO MEET THE REQUIREMENTS FOR A TOPOGRAPHIC PLANIMETRIC SURVEY, ACCORDING TO THE OKLAHOMA MINIMUM TECHNICAL STANDARDS FOR THE PRACTICE OF LAND SURVEYING AS ADOPTED BY THE OKLAHOMA STATE BOARD OF LICENSURE FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS. THE ORIGINAL DATA WAS OBTAINED ON 2 MAY 2024 – 31 MAY 2024; THE SURVEY WAS COMPLETED ON 3 JUNE 2024; ALL COORDINATES ARE BASED ON NAD83 OKLAHOMA STATE PLANE, SOUTH ZONE AND ALL ELEVATIONS ARE BASED ON NAVD88.

**THIS IS A TOPOGRAPHIC SURVEY AND IS NOT A BOUNDARY SURVEY. ANY PROPERTY LINE OR RIGHT-OF-WAY INFORMATION SHOWN HEREON IS FOR REFERENCE IN DESIGNING IMPROVEMENTS AND WAS PLOTTED USING METHODS OF RELATING PROPERTY DESCRIPTIONS TO SECTION BOUNDARY LINES AND PHYSICAL EVIDENCE, HOWEVER, THIS DOES NOT CONSTITUTE A BOUNDARY SURVEY PER OKPELS MINIMUM STANDARDS OF THE PROPERTY LINES OR RIGHT-OF-WAY BEING DEPICTED.

J. WYATT BISHOP P.L.S. #1649



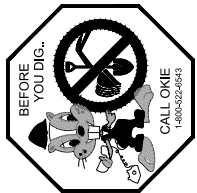
PERSONNEL:

KELLY FARMER
JOE FARMER
ADAM HINDS
WYATT BISHOP
JESSICA BISHOP
ALLYSON BRUEGGEN
STEPHANIE VILLANELLA
CHASE KILE
JAMIL EHTISHAM
ALBERT SMITH
ALEC CENICEROS
MATT DAFFERN
LEVI WOOD
DREW KNIGHT
JJ VALENTINE
COOPER VAUGHN
DAWSON HUDDLESTON
KADEN VANBUSKIRK
COOPER SMITH
BRADEN DAVENPORT

TITLE:

PRESIDENT
PROFESSIONAL LAND SURVEYOR
PROFESSIONAL LAND SURVEYOR
PROFESSIONAL LAND SURVEYOR
SENIOR CAD TECHNICIAN
SENIOR CAD TECHNICIAN
CAD TECHNICIAN
CAD TECHNICIAN
LIDAR SPECIALIST
SENIOR PARTY CHIEF
SURVEY PARTY CHIEF
SURVEY PARTY CHIEF
SURVEY PARTY CHIEF
SURVEY CREW MEMBER
SURVEY CREW MEMBER
SURVEY CREW MEMBER
SURVEY CREW MEMBER
SURVEY CREW MEMBER
SURVEY CREW MEMBER
SURVEY CREW MEMBER

SURVEY NOTES:
1) UTILITY LINES ARE SHOWN BY MAPPING THE MARKINGS IN THE FIELD PRODUCED FROM THE OKIE 811 UTILITY LOCATE TICKET #'S 24041907580417, 24041908020435, 24041908080461, 24041908130487, 24041908150511.



REV		DATE	DESCRIPTION	BY	APP'D
1	INT	06/03/24	TOPOGRAPHIC SURVEY - COMPLETE	ABB	JFB
2	INT	06/03/24	ADDED TREES & TREE LINES	ABB	JFB

P.O. BOX 7197
Edmond, OK 73083
405.285.0433

frontier
LAND SURVEYING

CA #7232

POST OAK BRIDGE OVER JIM BLUE CREEK	TOPOGRAPHIC SURVEY
DRAWN BY ABB	DATE 06/03/2024
SCALE 1"=50'	JOB NO. 24-
SHEET S001	

POB STA: 100+00
POST OAK ROAD
SET MAG NAIL

SE/4, SW/4, SW/4
Bk2378, Pg881

Bk6225, Pg1179

SECTION 22
T-8-N, R-1-W
NW/4

SHEET 2

SHEET 3

POST OAK BRIDGE
OVER JIM BLUE
CREEK

TOPOGRAPHIC
SURVEY

DRAWN BY ABB	DATE 06/03/2024
SCALE 1"=50'	JOB NO. 24- [REDACTED]

SHEET S002

42

REVISIONS

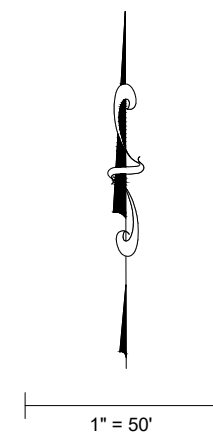
[illegible]

P.O. BOX 7197
Edmond, OK 73083

405.285.0433

frontier
LAND SURVEYING

CA #7232



SW/4 - Bk6349, Pg918

POT STA: 108+50
SET MAG NAIL

[illegible]

frontier
LAND SURVEYING

CA #7232

TOPOGRAPHIC
SURVEY

DRAWN BY ABB	DATE 06/03/2024
SCALE 1"=50'	JOB NO. 24-[REDACTED]

SHEET S003

43

SET 1/2"
IRON PIN

S 0°12'02" E

50.00'

SET 1/2"
IRON PIN

SECTION 22
T-8-N, R-1-W
NW/4

Bk5406, Pg1079

TITLE RESEARCH PROVIDES THAT AREA WAS
SUBJECT TO "CONSTRUCTION AND
IMPOUNDMENT" EASEMENT PER BK431 PG 466,
FILED IN 1965, SINCE HAS BEEN PARTIALLY
RELEASED PER BK 578 PG326 FILED IN 1974

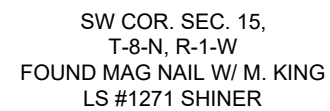
1" = 50'

SHEET 3

SHEET 4

SHEET 2

SHEET 3



- S. 1/4 COR. SEC. 15,
T-8-N, R-1-W
FOUND RAILROAD SPIKE
6" BELOW SURFACE

- SE COR. SEC. 15,
T-8-N, R-1-W
PK NAIL W/ A. HENRY LS
#1335 SHINER

- [illegible]

frontier
LAND SURVEYING

CA #7232

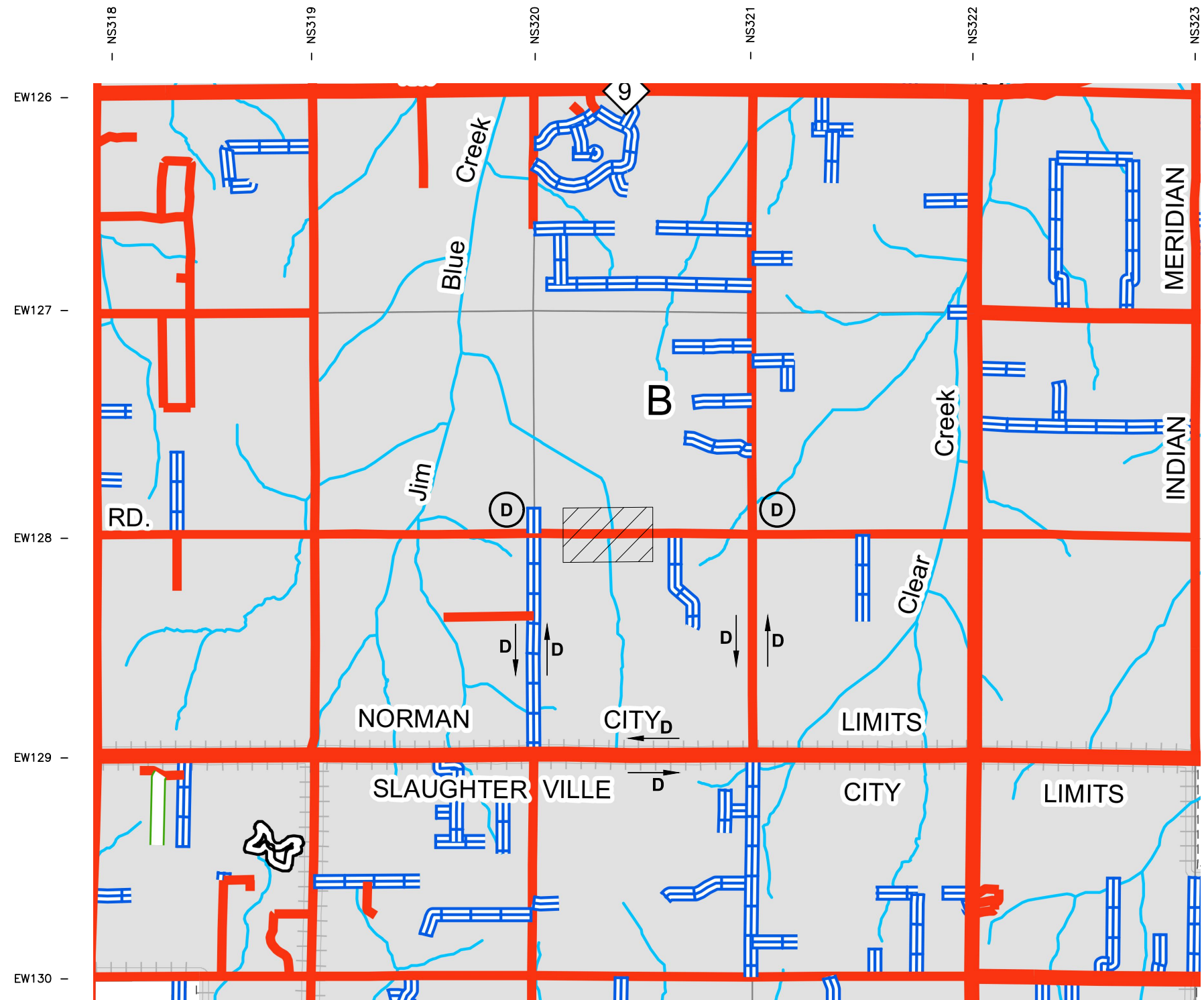
POST OAK BRIDGE
OVER JIM BLUE
CREEK

TOPOGRAPHIC
SURVEY

DRAWN BY ABB
SCALE 1"=50'

DATE
06/03/2024

JOB NO.
24-



LEGEND

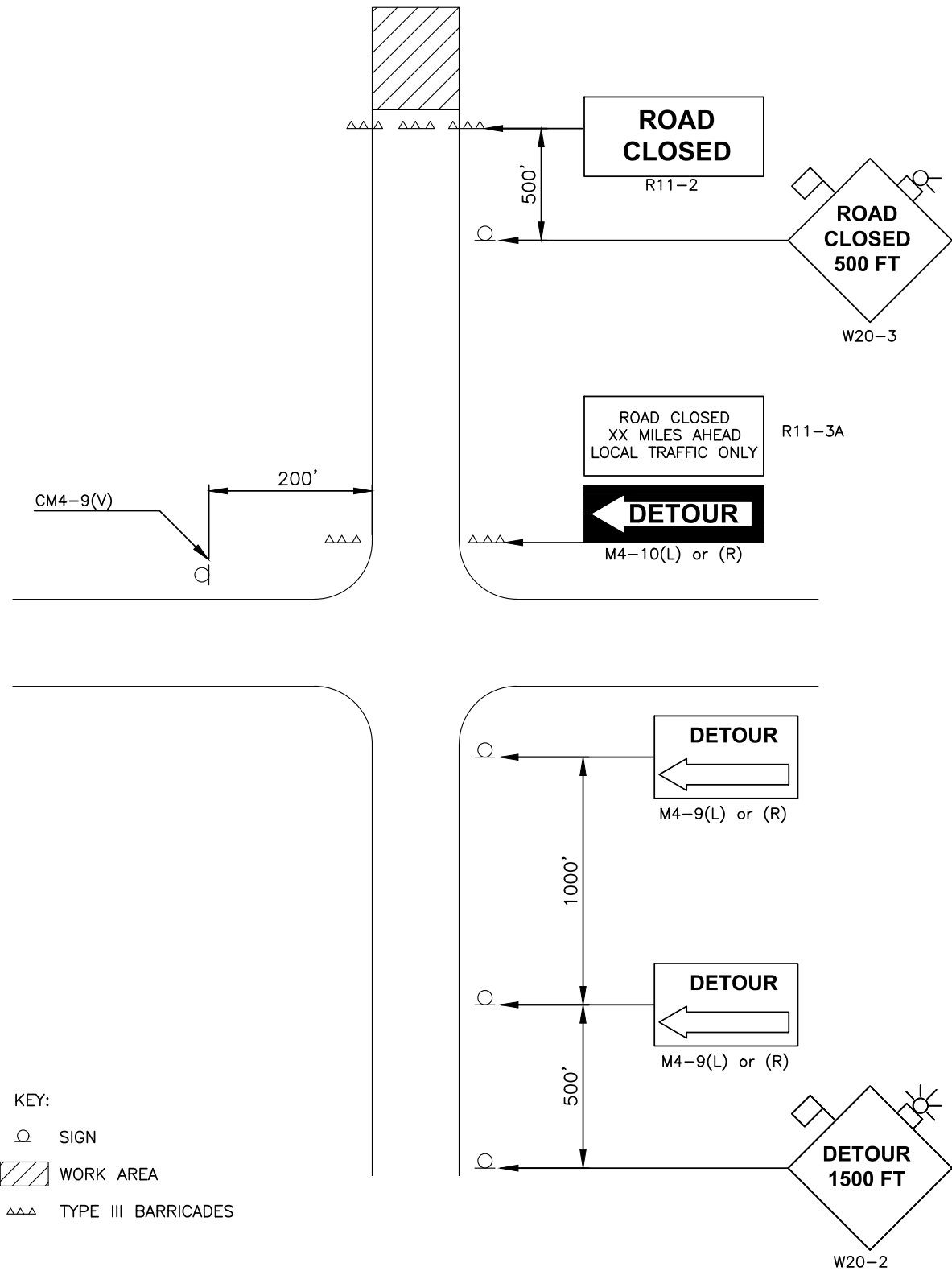
 DETOUR AHEAD

 DETOUR DIRECTION SIGN

 WORK AREA

NOTE:
SEE COUNTY ROAD CLOSURE DETAIL FOR
SIGN DETAILS AND PLACEMENT, SHEET T002

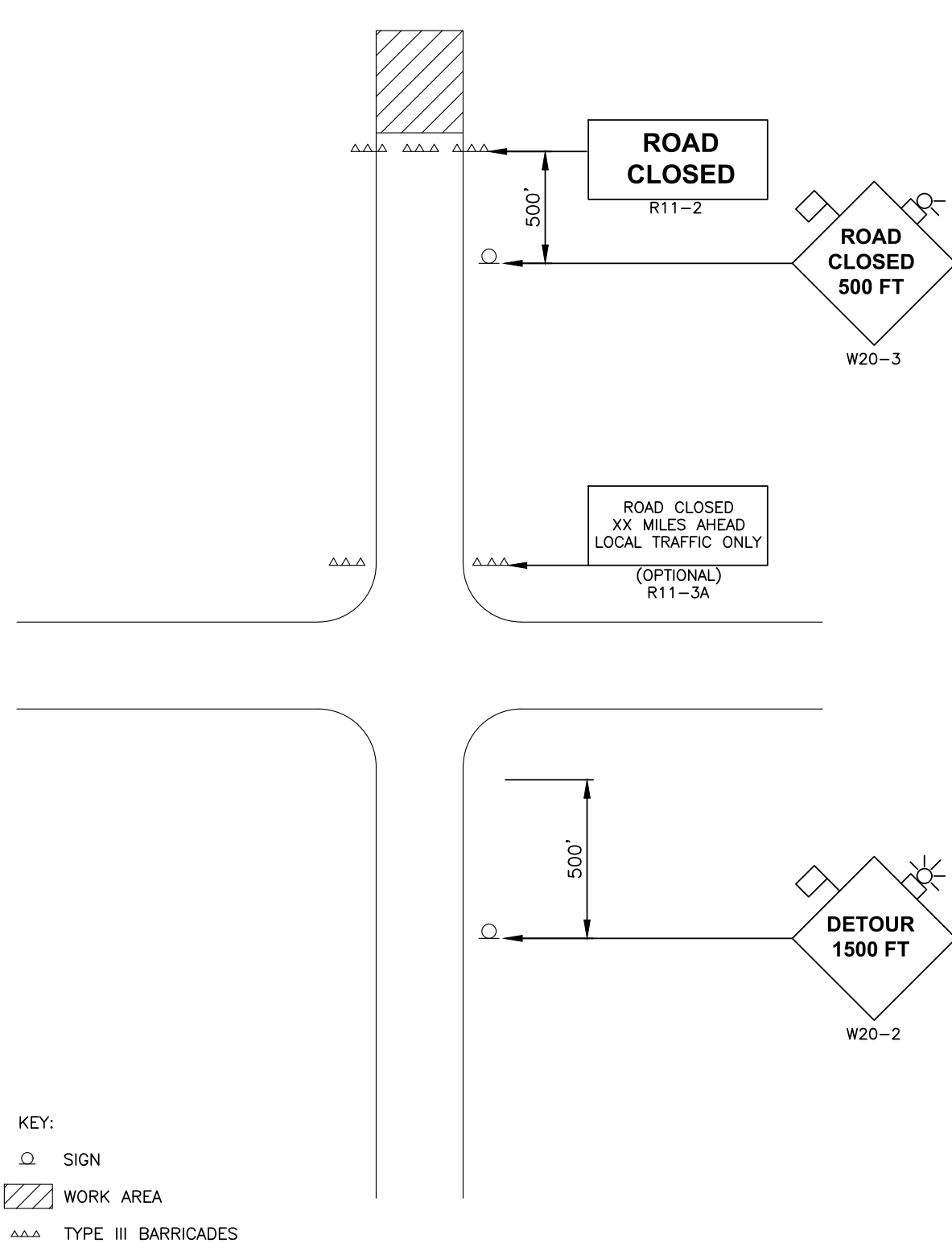
	DESIGN	DJG	E. POST OAK ROAD CLEVELAND COUNTY
	DRAWN	KMH	
	CHECKED	---	
			
DETOUR PLAN			PROJECT NO. K-2324-151 SHEET NO. 47



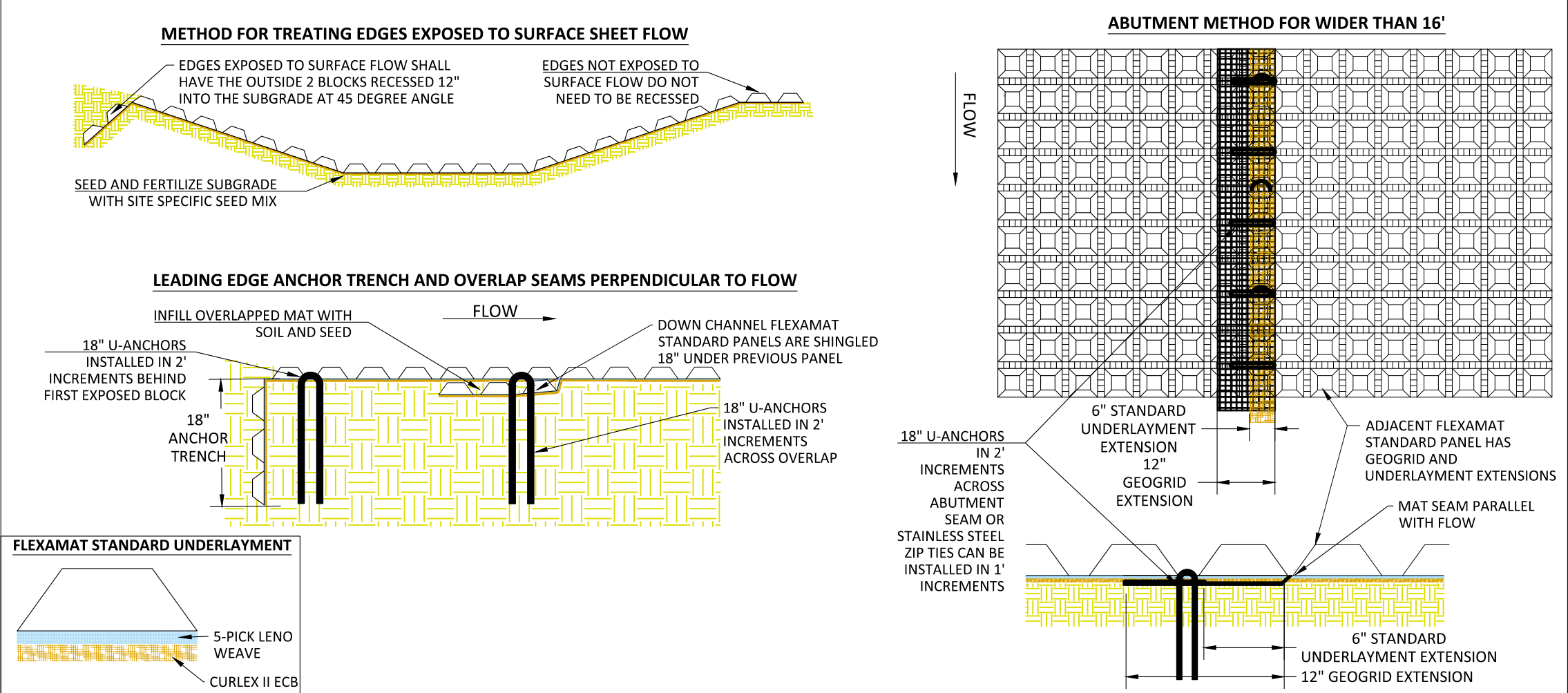
**TYPICAL APPLICATION
COUNTY ROAD (DETOUR IS ESTABLISHED)**

NOTES:
WHEN A DETOUR ROUTE IS ESTABLISHED IN CONJUNCTION WITH THE CONSTRUCTION THE DETOUR ROUTE SHALL BE SHOWN IN THE PLANS. EITHER THE CONTRACTOR OR THE COUNTY WILL BE RESPONSIBLE FOR THE DETOUR SIGNING AND THIS RESPONSIBILITY SHALL BE STATED IN THE PLANS.

THE CONSTRUCTION SIGNING SHOWN ON THIS PLAN SHEET AND FROM THE OPPOSITE DIRECTION (NOT SHOWN) SHALL ALWAYS BE THE RESPONSIBILITY OF THE CONTRACTOR.



**TYPICAL APPLICATION
COUNTY ROAD (NO DETOUR ESTABLISHED)**



FLEXAMAT STANDARD CHANNEL - LAYOUT PARALLEL TO FLOW

CONSTRUCTION NOTES:

1. AN ENGINEER OR MANUFACTURES REPRESENTATIVE SHALL BE ONSITE FOR THE START OF THE INSTALLATION.
2. GRADE CHANNEL SO THAT WATER WILL FLOW DOWN CENTER OF THE CHANNEL AND BE CONTAINED TO THE CHANNEL. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND.
3. PRIOR TO FLEXAMAT STANDARD INSTALLATION SEED AND FERTILIZE THE PREPARED SUBGRADE WITH SITE SPECIFIC SEED MIX AND IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
4. INSTALL FLEXAMAT STANDARD ROLLS, USING THE WIDEST ROLLS POSSIBLE TO AVOID SEAMS.

4.1. FOR CHANNELS THAT ARE WIDER THAN 16', INSTALL 15.5' WIDE FLEXAMAT STANDARD ROLLS THAT INCLUDE 12" GEOGRID EXTENSIONS WITH A 6" STANDARD UNDERLAYMENT EXTENSIONS. THESE SEAMS ARE PARALLEL WITH FLOW, THE ADJACENT MAT INSTALLED OVER THE EXTENSIONS. ENSURE GEOGRID AND STANDARD UNDERLAYMENT EXTENSIONS ARE LAYING FLAT ON SUBGRADE PRIOR TO INSTALLING ADJACENT MAT.

4.2. SECURE THE ABUTMENT PARALLEL WITH FLOW BY INSTALLING 18" U-ANCHORS IN 2' INCREMENTS OR 20" STAINLESS STEEL ZIP TIES IN 1' INCREMENTS THROUGH THE EXTENSION OVERLAP. U ANCHORS OR ZIP TIES TO BE INSTALLED PERPENDICULAR TO FLOW. ZIP TIES SHALL ENCOMPASS 3 CORDS OF GEOGRID FROM EACH MAT.
5. FOR ADDITIONAL SECTIONS OF MAT, SECURE SEAM PERPENDICULAR WITH FLOW BY OVERLAPPING THE DOWNSTREAM SECTION 18" WITH UPSTREAM SECTION OF MAT. PRIOR TO INSTALLING OVERLAP, FLIP UPSTREAM MAT BACK 24". EXCAVATE 2.25" OF SOIL 18" FROM END OF UPSTREAM MAT. DOWNSTREAM SECTION IS LAID IN THE SHALLOW TRENCH. RETURN AND TAMP SOIL OVER INITIAL EDGE AND SEED.

5.1. SECURE OVERLAPS PERPENDICULAR TO FLOW BY INSTALLING 18" U-ANCHORS IN 2' INCREMENTS OR 20" STAINLESS STEEL ZIP TIES IN 1' INCREMENTS THROUGH THE OVERLAP. ZIP TIES SHALL ENCOMPASS 3 CORDS OF GEOGRID FROM EACH MAT.
6. AT THE INITIAL LEADING EDGE OF THE FLEXAMAT STANDARD ARMORED CHANNEL, EMBED THE MAT 18" IN A VERTICAL ANCHOR TRENCH. FILL AND COMPACT ANCHOR TRENCH WITH SUITABLE FILL. AT ENDING EDGE OF PROTECTION, EMBED THE MAT 18" IN A TERMINATION TRENCH. THE TRENCH SHALL BE FILLED AND COMPACTED WITH SUITABLE FILL, AS DETERMINED BY THE ENGINEER OF RECORD.

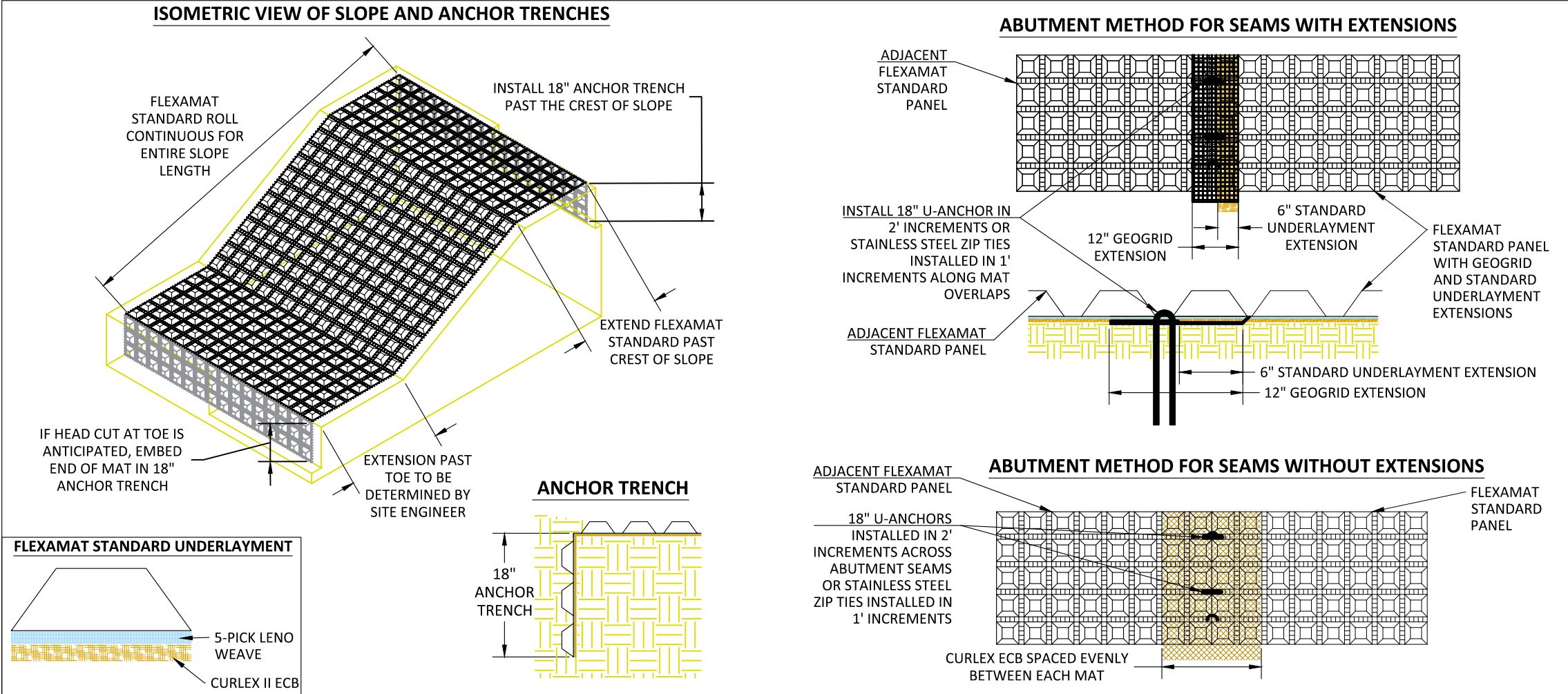
MOTZ
ENTERPRISES, INC.

Flexamat
(513)772-6689
Info@Flexamat.com
Flexamat.com

Flexamat®

PERMANENT EROSION CONTROL

REV - 2



FLEXAMAT STANDARD - SLOPE ARMORING

CONSTRUCTION NOTES:

1. AN ENGINEER OR MANUFACTURERS REPRESENTATIVE SHALL BE ONSITE FOR THE START OF THE INSTALLATION.
2. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND.
3. PRIOR TO FLEXAMAT STANDARD INSTALLATION SEED AND FERTILIZE SUBGRADE WITH SITE SPECIFIC SEED MIX IN ACCORDANCE WITH THE PROJECT PLANS AND SPECIFICATIONS.
4. INSTALL FLEXAMAT STANDARD ROLLS THAT ARE CONTINUOUS FOR ENTIRE SLOPE LENGTH. FOR SLOPES LONGER THAN 16', USE MATS WITH EXTENSIONS CUT TO THE LENGTH OF THE SLOPE. INSTALL MATS TO THAT THE MATTING EXTENDS PAST THE CREST OF SLOPE AND INTO AN 18" ANCHOR TRENCH.
 - 4.1. FOR ARMORED SLOPE LENGTHS 16' OR LESS, INSTALL CURLEX ECB EQUALLY UNDER ADJACENT MATS. SECURE SEAM WITH #3 REBAR 18" U-ANCHORS IN 2' INCREMENTS THE LENGTH OF THE ABUTMENT.
 - 4.2. ARMORED SLOPE LENGTHS LONGER THAN 16', INSTALL NEXT MAT OVER EXTENSIONS.
5. INSTALL SUBSEQUENT MATS OVER THE GEOGRID EXTENSION AND STANDARD UNDERLAYMENT EXTENSION OF THE PREVIOUSLY INSTALLED MAT. ENSURE THE GEOGRID AND STANDARD UNDERLAYMENT EXTENSIONS ARE LAYING FLAT ON THE SUBGRADE BEFORE INSTALLING ADJACENT MAT OVER THE EXTENSIONS.
6. INSTALL #3 REBAR 18" U-ANCHORS IN 2' INCREMENTS ACROSS THE GEOGRID AND STANDARD EXTENSION ABUTMENT. INSTALL ANCHORS PERPENDICULAR TO THE SLOPE DIRECTLY BEHIND FIRST ROW OF BLOCKS ON THE ADJACENT MAT.
7. AT THE END OF THE ARMORED SLOPE, IF HEAD CUT IS ANTICIPATED, EMBED THE MAT 18" IN A TERMINATION TRENCH. FILL AND COMPACT TERMINATION TRENCH WITH SUITABLE FILL.

MOTZ ENTERPRISES, INC.

Flexamat

(513)772-6689

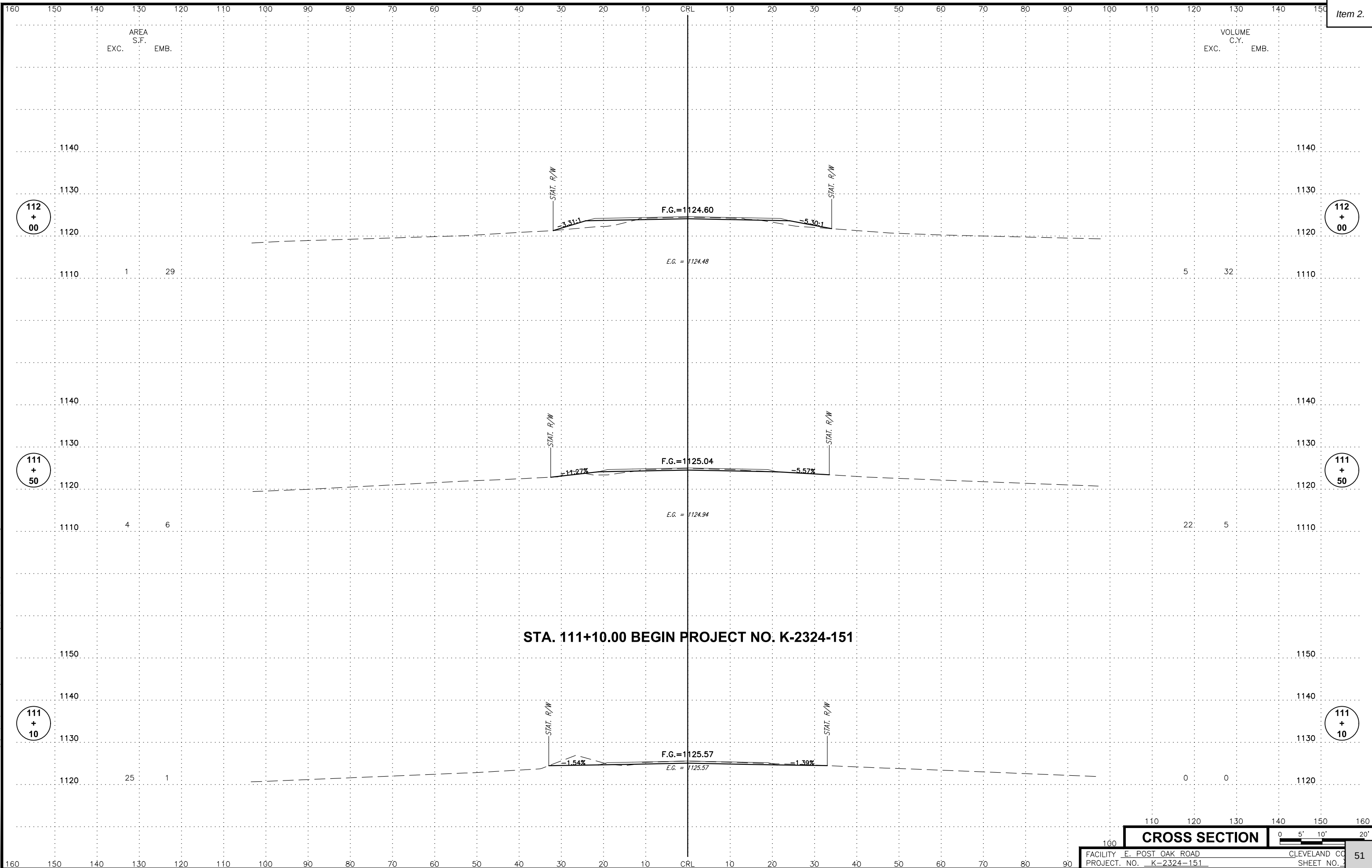
Info@Flexamat.com

Flexamat.com

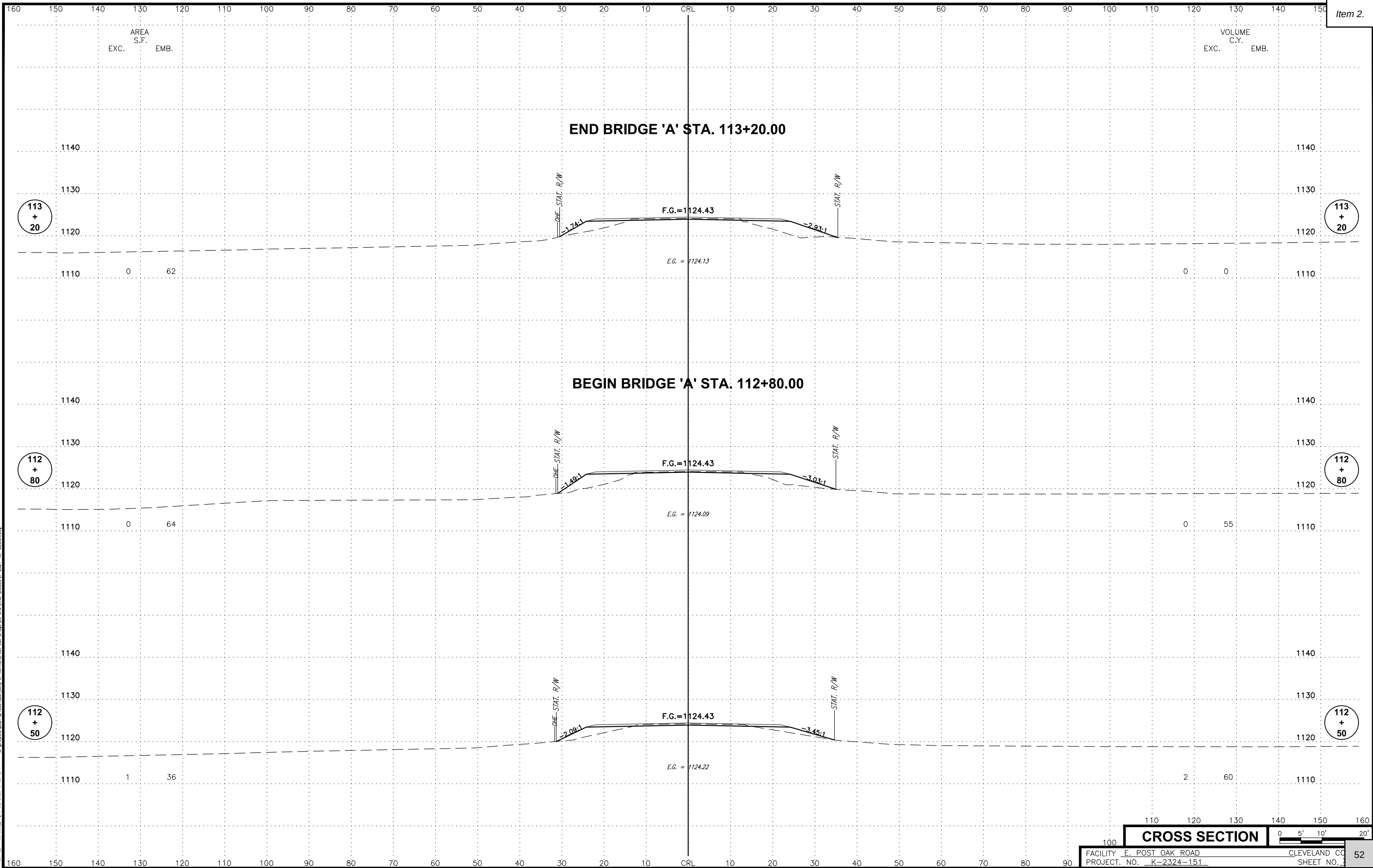
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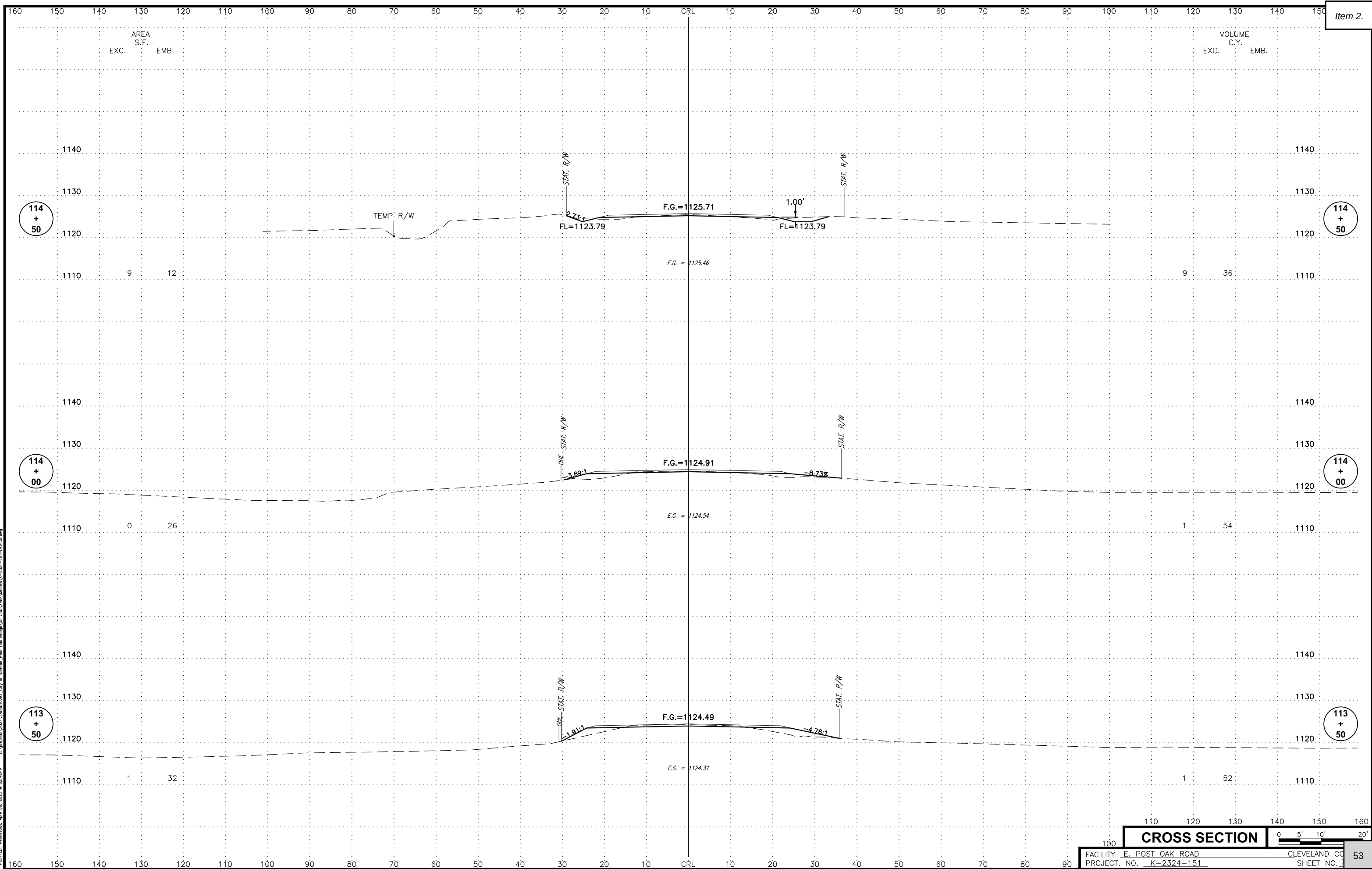
PERMANENT EROSION CONTROL

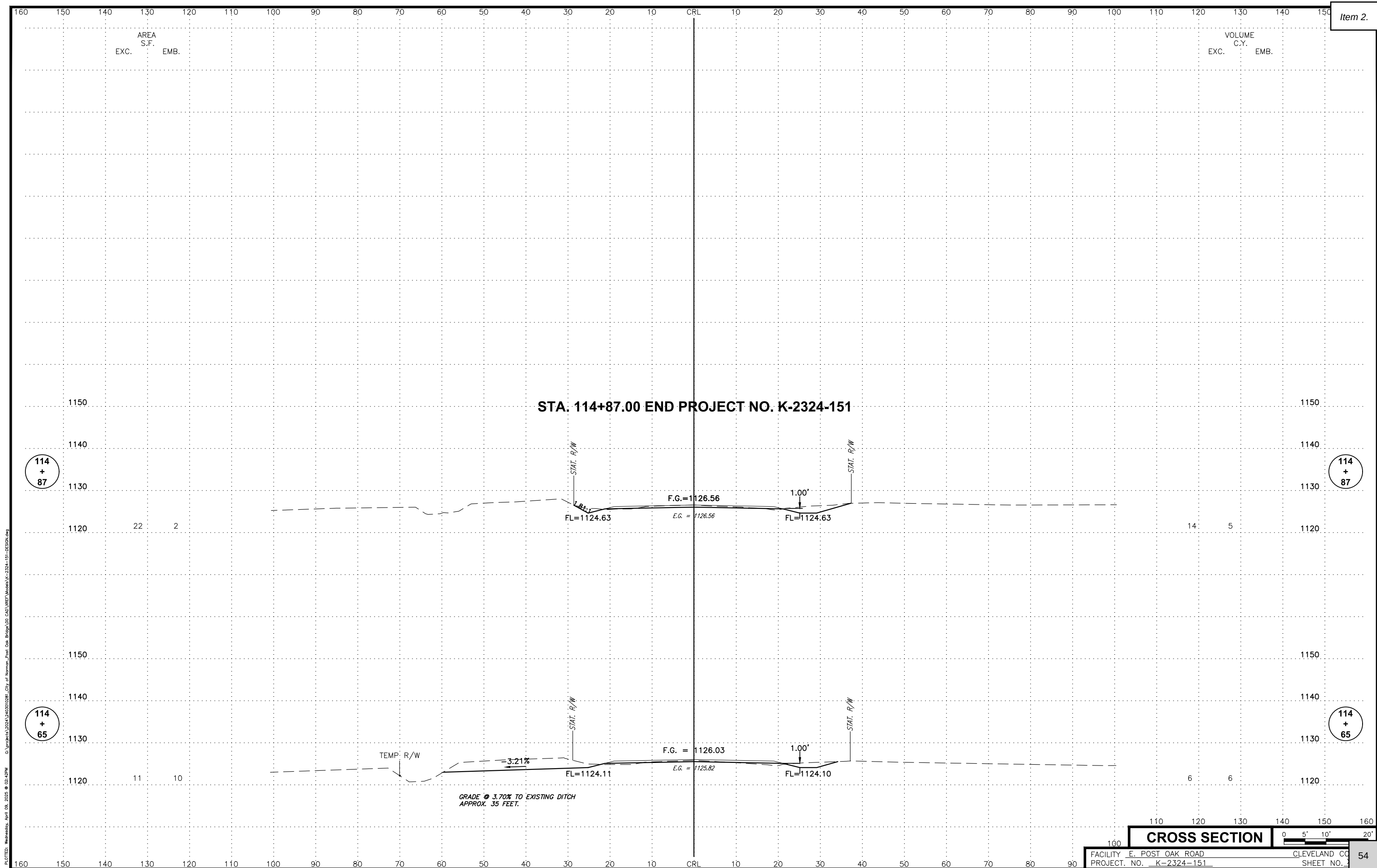
REV - 2



Plotted: Wednesday, April 09, 2025 @ 02:49PM C:\projects\2024\2324\01281_City of Numa_Post Oak Bridge\00_CAD\REV Models\K-2324-151_DESIGN.dwg







ENGINEERING SUCCESS

PRELIMINARY HYDRAULIC REPORT FOR

**EW-128 (E. Post Oak Road)
Bridge and Approaches over Tributary to
Jim Blue Creek
4.25 miles south and 8.25 miles east of
Downtown Norman**



205 NW 63rd Street, Suite 240
Oklahoma City, OK 73116
405.842.8558

EXISTING NBI#: 26914
PROJECT NUMBER: K-2324-151
DATE: July 25th, 2024



Title Page

REPORT INFORMATION: Hydraulic Report
EW-128 (E. Post Oak Road)
Bridge and Approaches over Tributary to Jim Blue Creek
4.25 miles south and 8.25 miles east of Downtown Norman
Cleveland County, OK

EXISTING NBI#: 26914

PREPARED BY: MKEC Engineering, Inc.
Chase Cole, PE
205 NW 63rd Street, Suite 240
Oklahoma City, OK 73116
T. 405.842.8558
F. 405.842.8553
ccole@mkec.com

MKEC PROJECT #: 2403010281

RISK STATEMENT: Hydraulic Design is in compliance with "Federal-Aid Policy Guide 23 CFR
650, Subpart A"

REPORT DATE: July 25th, 2024

Seal on Final Report

Chase R. Cole, PE

Initials	Date
DJG	7/25/2024

Project No. **Cleveland** County
K-2324-151

E. Post Oak Rd. over Trib. Of Jim Blue Creek
NBIS # 26914

Hydraulic Summary

Total Drainage Area = 0.63 sq. mi
Controlled Drainage Area = 0.00 sq. mi
Effective Drainage Area = 0.63 sq. mi

Existing Structure: C/L Station	32' Steel Girder	L = 32 ft $Q_{OT} \approx Y_{r_{freq}}$ 58	Low Bm Elev = 1121.76 ft Low Bm Sta = 112+97.05 Rdwy _{OT} Elev = 1124.00 ft Rdwy _{OT} Sta = 112+97.05
	113+00.03		
Proposed Structure: C/L Station	3-12'x7' RCB	Slope = 0.003 ft/ft $Q_{OT} \approx Y_{r_{freq}}$ 412	Flowline In = 1115.86 ft Rdwy _{OT} Elev = 1124.43 ft Rdwy _{OT} Sta = 112+97.02
	113+00.00		
Detour Structure: C/L Station		Slope = ft/ft $Q_{OT} \approx Y_{r_{freq}}$	Inlet Elev = ft Detour _{OT} Elev = ft Detour _{OT} Sta =

Freq.	Q (cfs)	CHW (ft)	V (fps)	Contraction Scour (ft)	Pier Scour (ft)	Total Scour (ft)
2	261	1119.59	2.74			
5	490	1120.46	3.92			
10	688	1121.02	4.81			
25	993	1121.73	6.01			
50	1330	1122.39	7.19			
100	1560	1122.89	7.94			
OT or 500 = $Y_{r_{freq}}$	2260	1124.45	10.05			
Detour OT = $Y_{r_{freq}}$						

Notes:

1. Curtain wall depth upstream = 4' downstream 4'

*Hydraulic Design is in compliance with
"Federal-Aid Policy Guide 23 CFR 650, Subpart A"*

Initials:	Date:
DJG	7/25/2024

County	Cleveland
Project #	K-2324-151
Highway	E. Post Oak Rd.
Crossing	Trib. To Jim Blue Creek

		NBIS #	26914		Computed Water Surface Elev. (FT)								Velocity (FPS)			
Discharges (CFS)		Open Channel	Existing 32' Steel Girder		Backwater	Proposed: 3-12'x7' RCB		Backwater	Proposed Alternative: 45' Concrete Slab Span		Backwater	Open Channel	Existing 32' Steel Girder	Proposed: 3-12'x7' RCB	Proposed Alternative: 45' Concrete Slab Span	
			Low Beam (ft)	1121.76		Flowline In (ft)	1115.86		Low Beam (ft)	1122.43						
Q2 =	261	1119.63	1119.60		-0.03	1119.59		-0.04	1119.59		-0.04	6.43	6.12	2.74	4.72	
Q5 =	490	1120.44	1120.81		0.37	1120.46		0.02	1120.45		0.01	7.50	9.81	3.92	5.83	
Q10 =	688	1120.89	1121.62		0.73	1121.02		0.13	1120.97		0.08	7.95	9.22	4.81	6.48	
Q25 =	993	1121.43	1122.72		1.29	1121.73		0.30	1121.70		0.27	8.44	10.40	6.01	7.40	
Q50 =	1330	1121.94	1123.84		1.90	1122.39		0.45	1122.50		0.56	9.08	11.49	7.19	8.32	
Q100 =	1560	1122.26	1126.11		3.85	1122.89		0.63	1123.00		0.74	9.51	4.29	7.94	8.68	
Q500 =	2460	1123.32	1126.77		3.45	1124.79		1.47	1125.20		1.88	11.04	4.15	9.96	11.40	
		Overtopping Elev (ft) =		1125.47	Overtopping Elev (ft) =		1124.45	Overtopping Elev (ft) =		1126.56						
		Overtopping Q (cfs) ≈		1365	Overtopping Q (cfs) ≈		2260	Overtopping Q (cfs) ≈		3130						
		Overtopping Freq (yr) ≈		58	Overtopping Freq (yr) ≈		412	Overtopping Freq (yr) ≈		>500						

Table of Contents

Introduction 1

General 2

Design Flows/Hydrology 2

Hydraulic Analysis 2

Existing Bridge 3

Proposed Bridge 3

Risk Statement..... 4

Appendix A - Scope, Photos

Appendix B - Hydrology - Drainage Maps

Appendix C - Hydraulic Model - Natural Stream

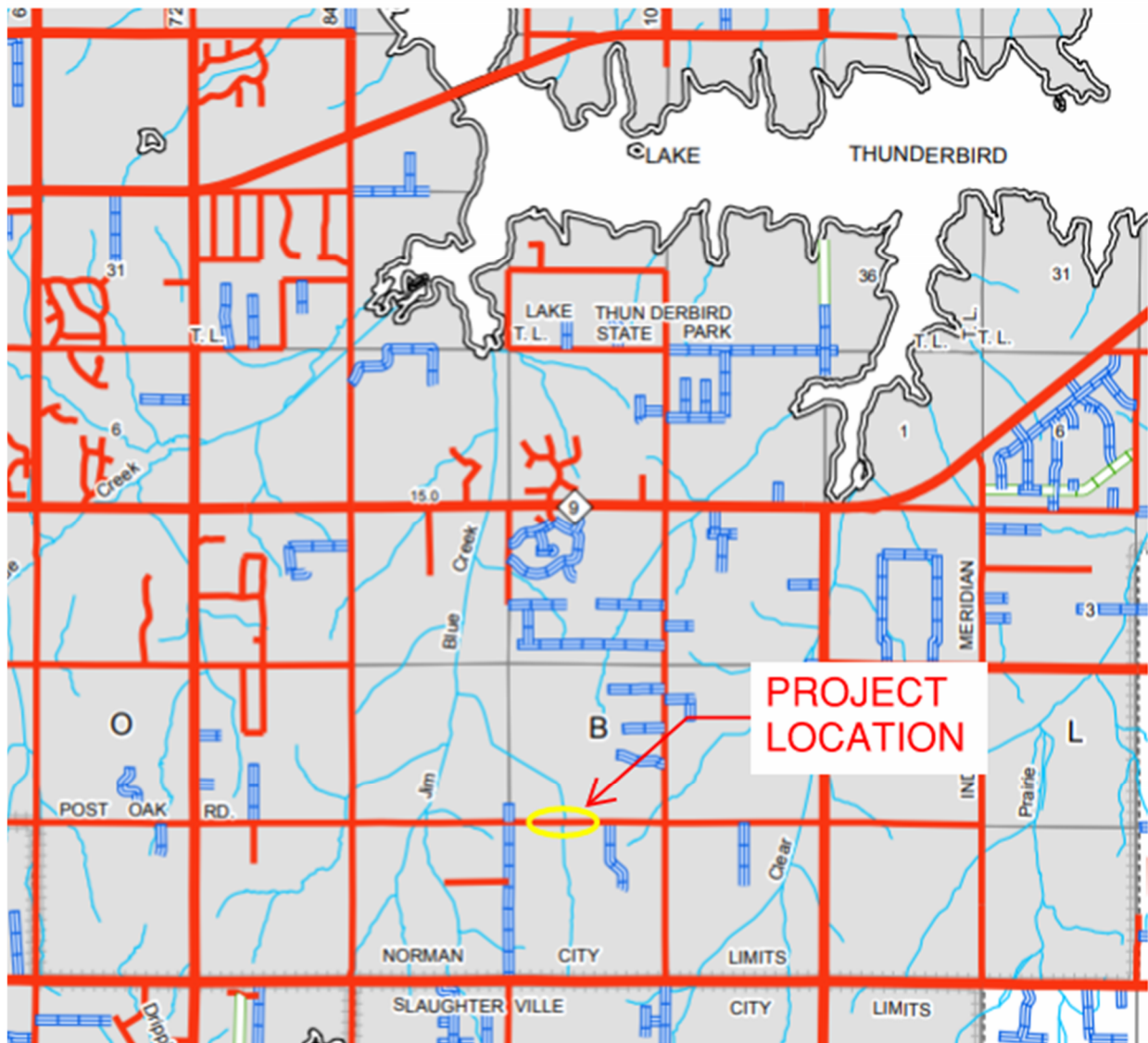
Appendix D - Hydraulic Model - Existing Bridge

Appendix E - Hydraulic Model - Proposed Bridge

Appendix H - Hydraulic P&P - Creek Flowline Profile

Introduction

The scope for this report includes a hydrologic study to obtain the peak flow discharges for the conditions of the bridge structure carrying EW-128 (E. Post Oak Road) over Tributary to Jim Blue Creek, in Cleveland County, Oklahoma. The purpose is to determine the size, type, and location of the new bridge and to replace the existing structure. (Refer to Attachment A - Vicinity Map). The structure to be replaced is located in between Section 15 T-8-N, R-1-W and Section 22 T-8-N, R-1-W. The bridge is in a FEMA Flood Zone A. (Refer to Firmette Map in Appendix B).



**Project Vicinity Map
Cleveland County, OK**

Attachment A

General

This section discusses the characteristics of Tributary to Jim Blue Creek and the hydrologic data used for the peak flow discharges for the model. The creek flows in a south to north direction at the structure. The creek meanders approximately 1.40 miles from the approximate starting point to the location of the project on Post Oak Road. The bridge is located in a FEMA Zone A (40027C0320H; effective September 26th, 2008) (Refer to Appendix B). Streamstats shows that the drainage area consists of 0.63 sq. miles of unregulated area and 0.00 sq. miles of regulated area, making the total drainage area 0.63 sq. miles (Refer to Appendix B). The average channel slope is 1.65%. The mean annual precipitation is 38.63 inches. The existing channel shape is mostly trapezoidal shaped with 3:1 or steeper bank slopes. The channel is well defined and has a clear meandering flow line. Appendix A includes photos showing both the upstream and downstream of the creek.

Design Flows/Hydrology

E. Post Oak Road is classified as a rural collector with a 10-year storm design event requirement. The total drainage area is taken from Streamstats to be 0.63 square miles (Refer to Appendix B).

Based on the size of the catchment area, basin characteristics, and the peak-stream flow frequency estimates were obtained from Streamstats. Table 1 shows the flowrates found.

Table 1. Streamstats Flowrates.

Design Storm	Flowrate (cfs)
2-yr	261
5-yr	490
10-yr	688
25-yr	993
50-yr	1,330
100-yr	1,560
500-yr	2,460

Hydraulic Analysis

Hydraulic Models were created to investigate and size the new bridge for this location. HEC-RAS 6.3.1 version was used for hydraulic analysis.

The following hydraulic models have been developed for the:

1. Natural: "Natural" flow model of the original channel not constricted by any bridge structure.
2. Existing: "Existing" flow model with the existing 32' steel girder bridge.
3. Proposed: "Proposed 3-12'x7' RCB" flow model consists of a custom 3-12'x7' RCB and proposed roadway conditions.
4. Alternative: "Proposed Slab Span" flow model consists of a 45' concrete slab span bridge and proposed roadway conditions.

The existing and proposed roadway profiles are modeled respectively to include the existing and new roadway conditions. A D/S and U/S channel slope of 0.01659 ft/ft is used for boundary conditions. The Manning's "n" values used for the main channel are 0.030 and 0.033 upstream, and 0.033 downstream. This was decided based on "Table 5009.1" (Pg. 86) in the "City of Norman Engineering Design Criteria"; C. Natural Streams; (0.025-0.050). The upstream channel appears to be clear of debris unlike the downstream channel. The Manning's value used for the banks in this model are 0.035 upstream and 0.100 downstream.

This is based on C. Overbank Areas; (0.030-0.200). The Manning's value used for the downstream banks, accounts for the trees and brush present compared to the upstream banks.

A comparison table including the natural, existing, proposed, and alternative models as well as a rating curve up stream of the bridge are included in the report.

Natural

Based on the creek alignment and geometry, natural cross sections were defined along the existing alignment, perpendicular to the flow (Refer to Appendix C). The cross sections 1000, 1048, and 1112 on the downstream side and 1199, 1262, and 1295 on the upstream side are added to model the channel flow. The cross sections reflect existing topography width up to approximately 2,533 ft to include the flood plain. The peak flow data from the Streamstats report is defined for the 2, 5, 10, 25, 50, 100, and 500-year flood events. A steady flow analysis was performed using the mixed flow method. The upstream water surface elevation during the 100-year storm event is 1122.26 ft. and velocity of 9.51 fps downstream of the bridge station.

Existing Bridge

The existing structure is a bridge with 32 ft. steel girder bridge. The structure was located along the existing centerline and an approximate proposed alignment Sta. 113+00.03. The proposed alignment is similar to existing. The roadway has two 11' - lanes with a current ADT of 220. A steady flow analysis was performed using the mixed flow method for the 2, 5, 10, 25, 50, 100, and 500-year flood events.

The existing 22-foot-wide roadway and structure are added to the natural cross sections (Refer to Appendix D). The structure is modeled at creek Sta. 1154.25. The local low point of the roadway is at the bridge structure at an elevation of 1124.00 ft. at an equivalent proposed alignment station of 112+97.05. The roadway is found to overtop at a 58-year event and equivalent flowrate of 1,365 cfs. resulting in a U/S channel water surface elevation of 1125.47 ft. with a velocity near the bridge of 16.32 fps. The existing bridge structure does meet the 10-year storm design requirement. The water surface elevation upstream of the structure for the 100-year flood event is 1126.11 ft. with 3.85 ft. of backwater compared to the natural condition. There is no available freeboard during the 100-storm year for the existing condition. The velocity during the design storm event near the bridge is 9.22 fps.

Proposed Bridge

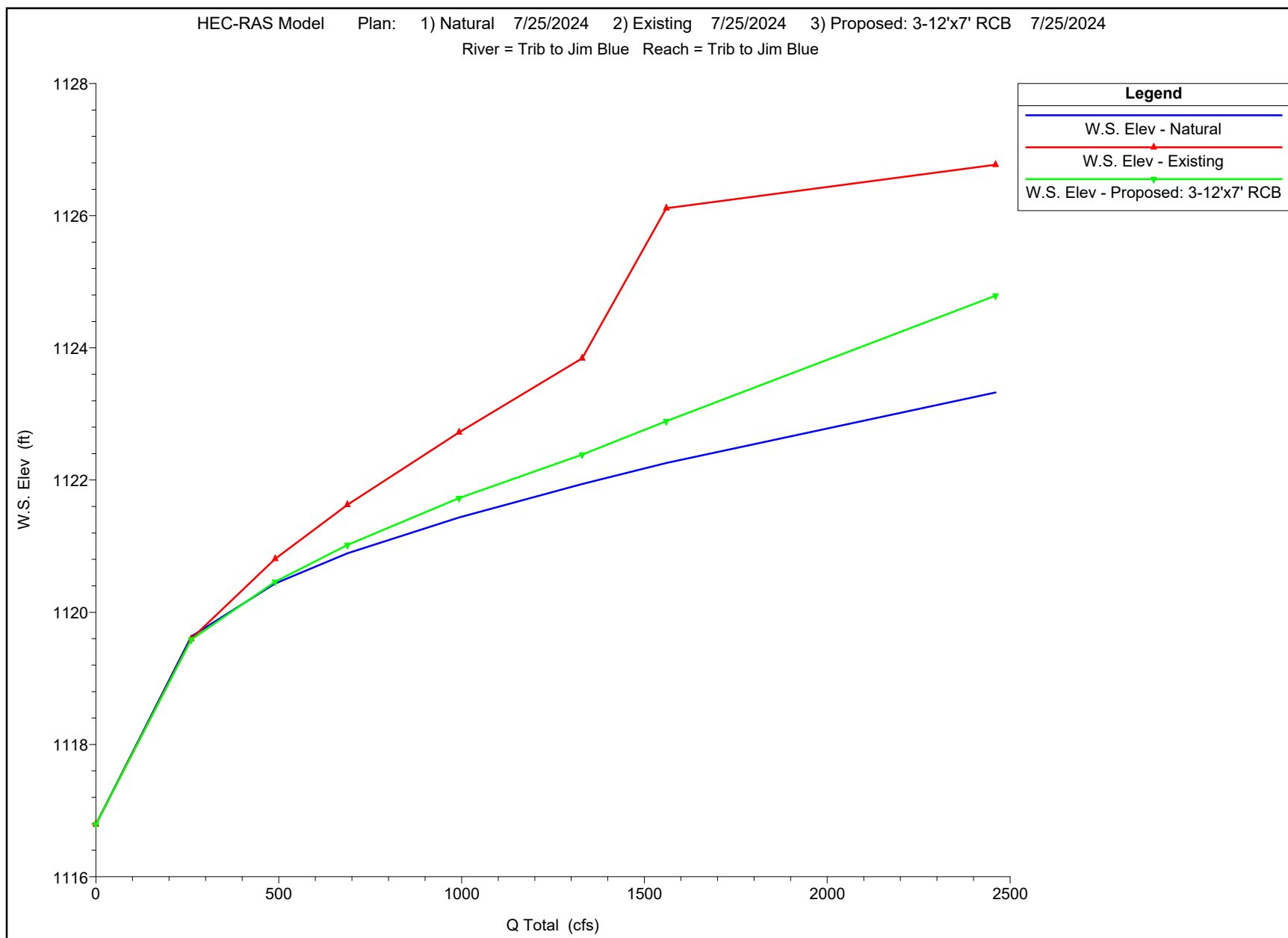
Based on the geometrics of the proposed roadway and hydraulic model, the proposed structure is a custom 3-12'x7' RCB centered at Sta. 113+00.00. The structure meets the 10-year design requirement. The upstream water surface elevation at the 10-year storm event is 1121.02 ft. with a velocity of 4.81 fps, a decrease of 4.41 fps. A mixed flow-steady flow analysis of the proposed bridge indicates that a 412-year peak flow discharge overflows the roadway at an elevation of 1124.43 ft. and flowrate of 2,260 cfs, with an upstream water surface elevation of 1124.45 ft. The water surface elevation upstream of the structure for the 100-year flood event is 1122.89 ft. with 0.63 ft. of backwater compared to natural conditions, meeting FEMA's Zone A backwater requirement. The freeboard during the 100-storm year is 1.41 ft; this compared to no available freeboard during the existing condition.

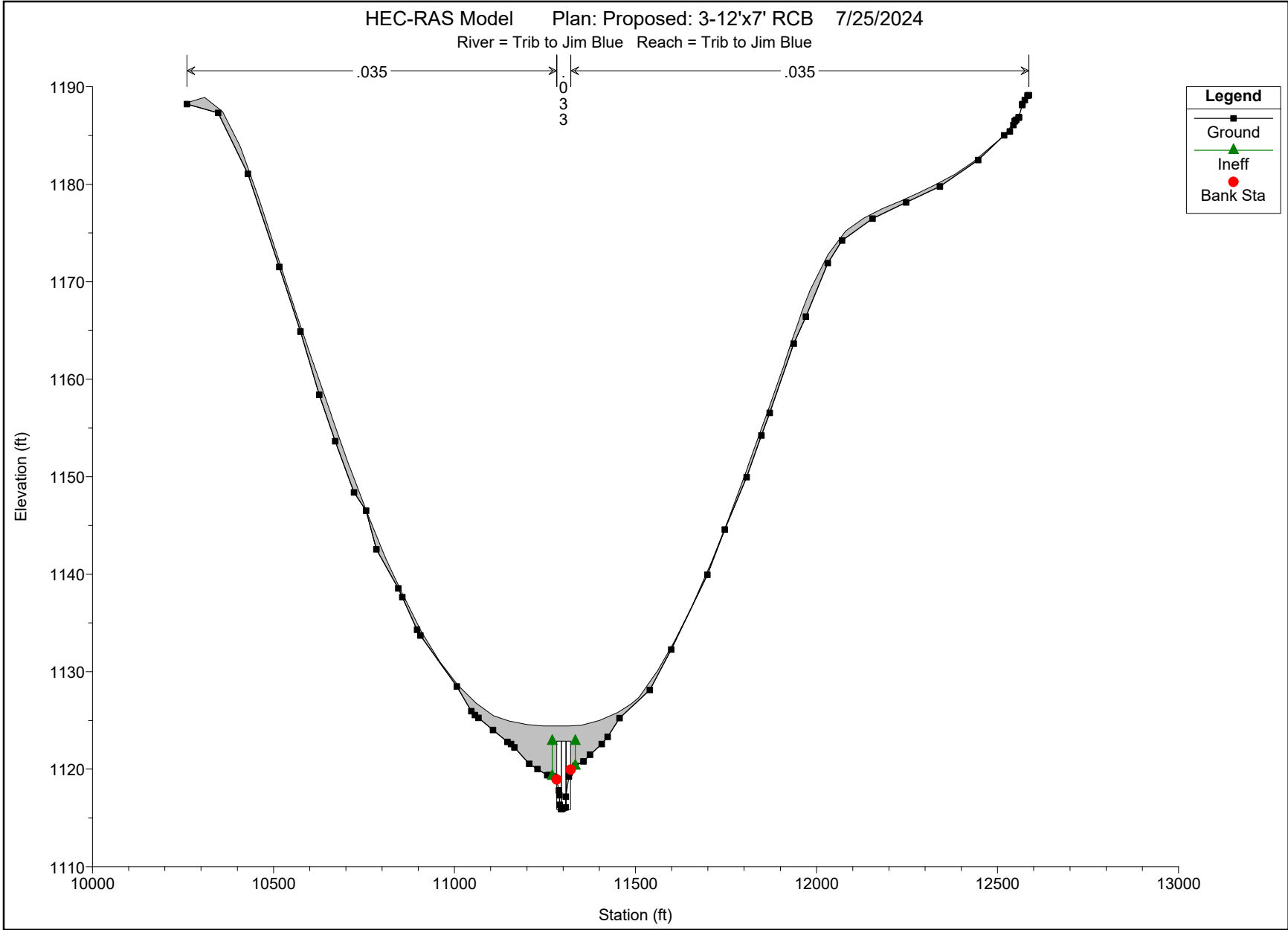
An alternative structure was modeled of a 45' concrete slab span bridge. Results from this model are shown in the accompanying comparison table. This bridge model meets many of the hydraulic bridge requirements. While the model does improve the overtopping frequency, this model does not meet the City of Norman 100-year freeboard requirement (0.80 ft.). MKEC also modeled a smaller box (3-10'x6'-10" RCB). This RCB likewise also meets many of the hydraulic bridge requirements. It does not, however, meet the FEMA Zone A backwater requirement (1.19 ft of backwater). Given all considerations, the proposed 3-12'x7' RCB is chosen as an economical and efficient solution for this project location.

Risk Statement

The 10-year flood stays within the main channel and minimal backwater is created by the proposed bridge compared to existing and natural conditions. Therefore, a potential risk to human life is not anticipated because of the proposed bridge at this location.

Hydraulic Design is in compliance with “Federal-Aid Policy Guide 23 CFR 650, Subpart A”.





Appendix A - Scope - Photos

Photos



Photo 1. Looking West from Existing Bridge



Photo 2. Looking East from Existing Bridge



Photo 3. Looking North from Existing Bridge (Downstream)



Photo 4. Looking South from Existing Bridge (Upstream)



SCOPE OF SERVICE
City of Norman
Contract No. K-2324-151
Post Oak Road over Tributary to Jim Blue Creek (NBI 26914)
Bridge Replacement
0.2 miles east of 96th Avenue SE
February 13th, 2024

DESCRIPTION OF PROJECT

This project is located on Post Oak Road approximately 0.2 miles east of 96th Avenue SE. The purpose of this project is to replace the existing load posted bridge carrying Post Oak Road over an unnamed tributary to Jim Blue Creek.

1. ROADWAY/STREET

The project length is approximately 0.42 miles. Post Oak Road is classified as a rural collector. The existing roadway is asphalt and is approximately 22' wide. The new roadway section will be 26' wide with unpaved 6' sod shoulders. There will be a paved shoulder taper leading to the bridge deck. The New guardrail systems will be required at the approaches to the bridge. Additional R/W is anticipated for permanent construction. The roadway will be closed to through traffic, but local access will be maintained throughout construction.

Roadway design will follow the City of Norman Engineering Design Criteria as well as the 2018 AASHTO Policy of Geometric Design of Highways and Streets, the 2011 AASHTO Roadside Design Guide, and the 2009 Manual on Uniform Traffic Control Devices (MUTCD). Detailed construction plans shall meet the City of Norman standards for submittal.

2. TRAFFIC

a. Traffic Control

Post Oak Road will be closed to thru traffic during construction of the new bridge. Traffic Control Plans will be prepared with a signed detour.

b. Signing and Striping

Signing and striping plans will be prepared in accordance with the latest City of Norman and ODOT standards.

3. BRIDGE/STRUCTURAL

The existing bridge over the tributary to Jim Blue Creek will be replaced. The clear roadway between the railing will match the required width (pavement plus shoulders) for a rural collector. W-beam guardrail will be used to protect the ends of the bridge railing.

a. Hydraulic Design

The size of the bridge will be determined by a hydrology & hydraulic study in accordance with City of Norman Engineering Design Criteria and the ODOT Drainage Manual. The bridge is located in a FEMA Flood Zone A.

b. Structural Design

The structural design of the bridge will be in accordance with the AASHTO LRFD Bridge Design Specifications, 9th Edition and ODOT Bridge Division policies. ODOT standard bridge railing will be used. The foundation will be designed in accordance with recommendations of the geotechnical report that will be prepared for this site.

4. SURVEY

The survey limits will extend 1,200' west of the existing bridge and 1,200' east of the existing bridge along Post Oak Road. The survey will extend 80' north of the center of the road and 110' south of the center of the road. The survey of the creek will extend 300' upstream and 300' downstream of the existing bridge.

Within the limits of the survey the following information will be collected:

- Set a minimum of 2 control points/benchmarks for vertical and horizontal purposes derived from GPS static observation, OPUS solution, VRS Network, or existing control if provided.
- Topographical survey will include all the following existing surface features: roads, curbs, drives, sidewalks, buildings, finished floor at thresholds, signs, fences, walls, tree lines, flowerbeds, all visible drainage structures and flow lines, and visible or marked utilities.
- Tree cover will be annotated by coverage being dense or sparse within those areas.
- Trees located on the south side of the road, south of the white fence, within the survey footprint will be individually located.
- All utility companies servicing the project area will be contacted thru "CALL OKIE- 811" 14 days prior to field survey.
- All utility information field collected will be placed in the CAD drawing.
- Storm sewer manholes, sanitary sewer manholes, water valve rims and inverts will be measured for depth (to the connection outside of survey limits).
- Cross-sections at interval grid to produce contours at 1.0' minimum density.
- Right-of-way, property lines and ownerships will be established using a title company.

Staking for the new right-of-way or easements is included in Section 7: Right-of-Way.

5. GEOTECHNICAL

The scope of the geotechnical services is as follows:

- a.** Advance two (2) abutment borings to a minimum depth of 20 feet into bedrock. The borings will be sampled using the Standard Penetration Test at a maximum of 5 feet intervals beginning at ground level. The borings will be located as close as possible to the proposed abutments.
- b.** Once bedrock is encountered, the rock hardness will be tested using the Texas Cone

Penetrometer (TCP) on a maximum of 5 feet intervals.

- c. Advance four (4) in-place borings in the approaches to the new bridge and obtain soil samples from 0-6 and 6-36 inches below the ground. A composite bulk sample will be obtained to determine the Proctor and Resilient Modulus.
- d. About 50% of the bridge soil samples and 100 % of the roadway samples recovered will be tested to determine the soil classification (Atterberg Limits and gradation) and moisture content. Soluble sulfate will be tested on the roadway samples. Proctor and Resilient modulus will be tested on the bulk samples..
- e. Groundwater levels will be measured during and 24 hours after completion of the drilling. The borings will be plugged per Oklahoma Water Resources Board (OWRB) requirements.
- f. The borings will be located in the field by an Engineer using the plans provided. Vertical control established in the project plans will be used to obtain surface elevations of the borings.
- g. The geotechnical services will provide a foundation report containing recommendations for driven piles and, if appropriate, drilled pier foundations. The report will include recommendations for the approach roadway pavement design for HMA and essentially will be performed to verify the City of Norman paving standard is adequate. The report will be prepared under the supervision of and signed by a registered Professional Engineer in the State of Oklahoma.

6. ENVIRONMENTAL CLEARANCE

MKEC will provide environmental mitigation measures as required in the plans and provide any support documentation for CC Environmental to obtain all environmental permits or requirements, including 404 permit and OWRB permit as applicable.

7. RIGHT-OF-WAY

It is expected that right-of-way (R/W) will be acquired for this project. The CONSULTANT will prepare right-of-way plans, exhibits and legal descriptions for the acquisition of right-of-way. CONSULTANT will provide R/W staking for the parcels during the acquisition process. The cost for staking R/W will be a unit price per request/mobilization. Right-of-way acquisition services are not included in this contract.

8. UTILITIES

a. Utility Map (color-coded)

CONSULTANT will provide a color-coded set of plan and profile sheets to OWNER for each affected utility company to coordinate the necessary utility relocations.

b. Utility Relocation Coordination

OWNER will coordinate the relocation of utilities as required for the project and will request written approval from all utility companies as to the accuracy of all facilities on the plans.

c. Utility Meetings

CONSULTANT will attend utility relocation meetings with each utility. The meeting will be coordinated by the City of Norman. The OWNER will prepare the meeting minutes.

d. Utility Relocation Plan Review

CONSULTANT will ensure any utility relocation plans meet the requirements of the project.

e. Utility Relocation Design

The design of OWNER owned utility relocations is not anticipated for this project. If the design or relocation of OWNER-owned utilities is necessary, services will be added to the agreement by written amendment.

9. CONSTRUCTION

a. Bidding

The OWNER will assume primary responsibility for the bidding/award process for the project. The CONSULTANT will serve the OWNER in a support role during the bidding/award process. Additionally, the CONSULTANT shall answer questions from possible contractors, including the development of written responses to questions received.

b. Construction Support

CONSULTANT shall attend any scheduled Pre-Construction Meeting and will be available throughout construction to answer questions, including formal Requests for Information (RFIs) and assist the OWNER as necessary, helping to resolve any complications or conflicts that may arise. If shop drawings are to be produced during construction, CONSULTANT will be available to assist the OWNER in review. CONSULTANT shall attend regularly scheduled progress meetings, as required.

c. Construction Management/Testing

Construction Management and Testing are not included in this contract.

d. Record Drawings

Record Drawings will be prepared and submitted to the OWNER based upon field documents provided by the construction administrator.

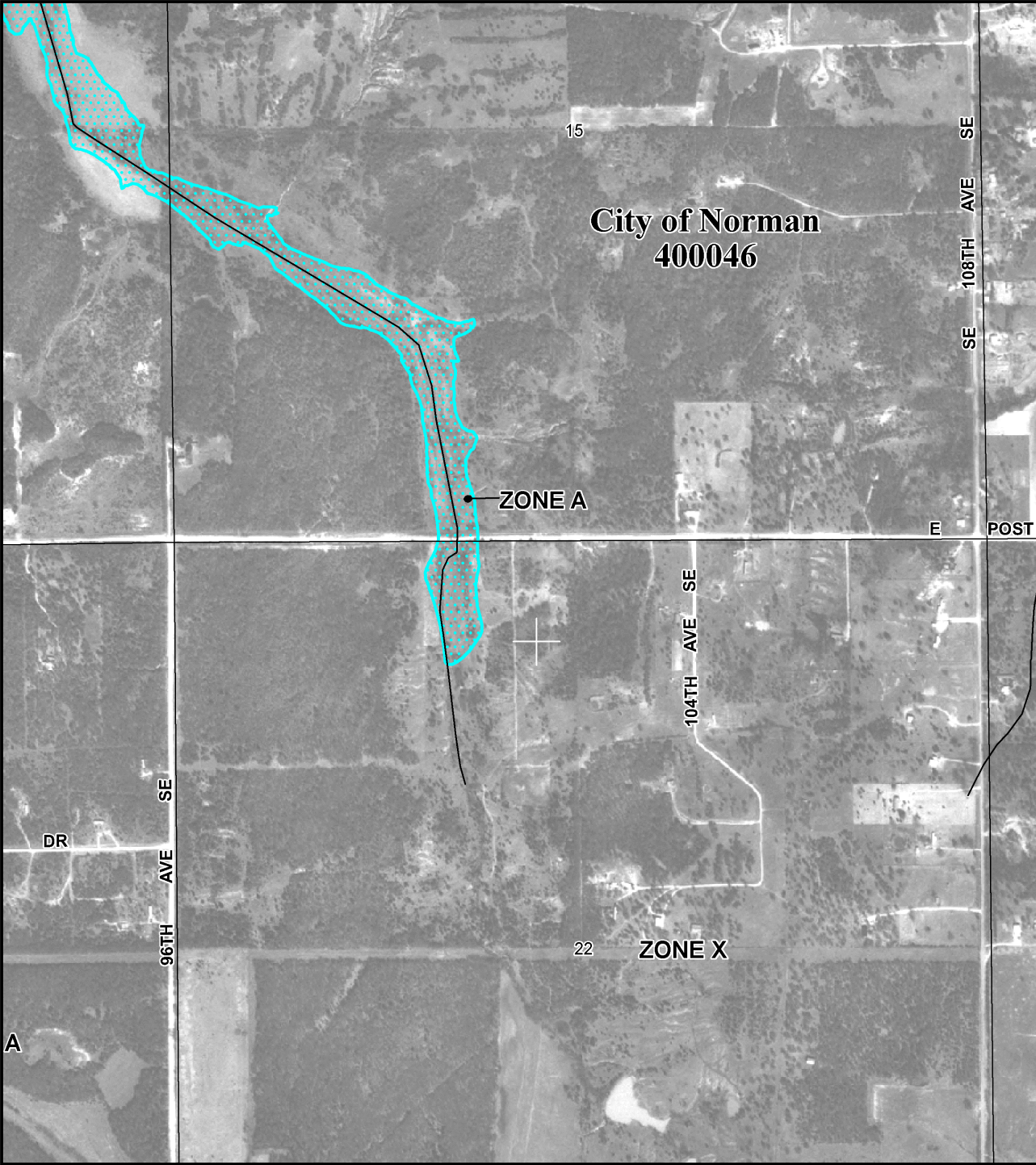
MEETINGS

The consultant shall schedule monthly design progress meetings or conference calls with the OWNER to discuss current project status, upcoming milestones, and any issues arising on the project.

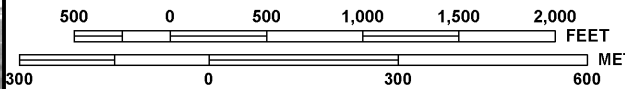
DESIGN CRITERIA

The design and plans shall conform to current (at the time of bidding) Federal, State of Oklahoma, City of Norman, and American Association of State Highway and Transportation Officials (AASHTO) policies and standards unless modified in writing at the direction of the OWNER. It is expected that this project will be bid and awarded by the City of Norman.

Appendix B - Hydrology - Drainage Maps



MAP SCALE 1" = 1000'



NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0320H

FIRM
FLOOD INSURANCE RATE MAP
CLEVELAND COUNTY
OKLAHOMA
AND INCORPORATED AREAS

PANEL 320 OF 475
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
CLEVELAND COUNTY UNINCORPORATED AREAS	400475	0320	H
NORMAN, CITY OF	400046	0320	H
SLAUGHTERVILLE, TOWN OF	400539	0320	H

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



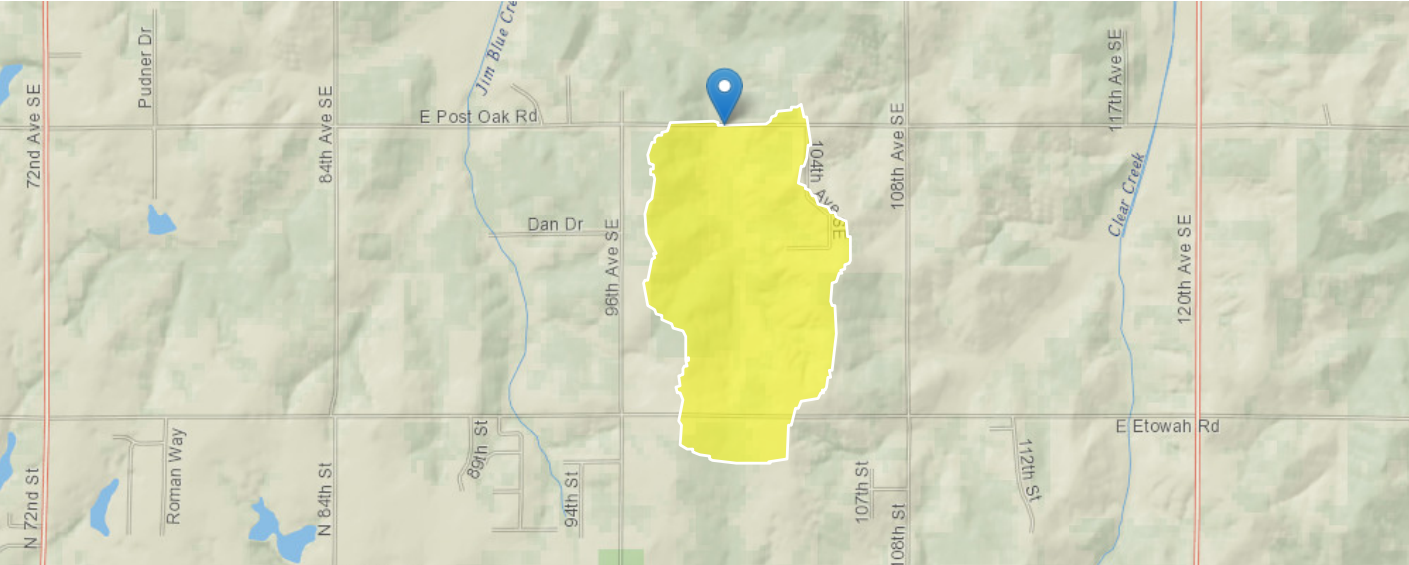
MAP NUMBER
40027C0320H
MAP REVISED
SEPTEMBER 26, 2008

Federal Emergency Management Agency

This is an official FIRMette showing a portion of the above-referenced flood map created from the MSC FIRMette Web tool. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For additional information about how to make sure the map is current, please see the Flood Hazard Mapping Updates Overview Fact Sheet available on the FEMA Flood Map Service Center home page at <https://msc.fema.gov>.

Post Oak Road over Trib to Jim Blue Creek

Region ID: OK
Workspace ID: OK20240122200255886000
Clicked Point (Latitude, Longitude): 35.16035, -97.29404
Time: 2024-01-22 14:03:24 -0600



Collapse All

➤ Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CANOPY_PCT	Percentage of drainage area covered by canopy as described in OK SIR 2009_5267	46.25	percent
CONTDA	Area that contributes flow to a point on a stream	0.63	square miles
CSL10_85fm	Change in elevation between points 10 and 85 percent of length along main channel to basin divide divided by length between points ft per mi	87.6	feet per mi
DAUNREG	Unregulated drainage area used in OK regulated equations	0.63	square miles
ELEV	Mean Basin Elevation	1180	feet
PRECIPOUT	Mean annual precip at the stream outlet (based on annual PRISM precip data in inches from 1971-2000)	38.63	inches

➤ Peak-Flow Statistics

Peak-Flow Statistics Parameters [Peak Region 2 Unregulated 2019 5143]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CONTDA	Contributing Drainage Area	0.63	square miles	0.1	2510
CSL10_85fm	Stream Slope 10 and 85 Method ft per mi	87.6	feet per mi	1.98	342

Peak-Flow Statistics Parameters [Peak Region 2 NRCS Regulated 2019 5143]

Item 2.

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DAUNREG	Unregulated Drainage Area	0.63	square miles	0.1	2510
CSL10_85fm	Stream Slope 10 and 85 Method ft per mi	87.6	feet per mi	1.98	342

Peak-Flow Statistics Flow Report [Peak Region 2 Unregulated 2019 5143]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	ASEp	Equiv. Yrs.
50-percent AEP flood	261	ft ³ /s	46.9	2
20-percent AEP flood	490	ft ³ /s	36.2	5
10-percent AEP flood	688	ft ³ /s	35	8
4-percent AEP flood	993	ft ³ /s	39.9	9
2-percent AEP flood	1330	ft ³ /s	37.1	11
1-percent AEP flood	1560	ft ³ /s	39.9	12
0.2-percent AEP flood	2460	ft ³ /s	50.7	12

Peak-Flow Statistics Flow Report [Peak Region 2 NRCS Regulated 2019 5143]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	ASEp	Equiv. Yrs.
Regulated 50-percent AEP flood	261	ft ³ /s	46.9	2
Regulated 20-percent AEP flood	490	ft ³ /s	36.2	5
Regulated 10-percent AEP flood	688	ft ³ /s	35	8
Regulated 4-percent AEP flood	993	ft ³ /s	39.9	9
Regulated 2-percent AEP flood	1330	ft ³ /s	37.1	11
Regulated 1-percent AEP flood	1560	ft ³ /s	39.9	12
Regulated 0.2-percent AEP flood	2460	ft ³ /s	50.7	12

Peak-Flow Statistics Flow Report [Area-Averaged]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	ASEp	Equiv. Yrs.
50-percent AEP flood	261	ft ³ /s	46.9	2
20-percent AEP flood	490	ft ³ /s	36.2	5
10-percent AEP flood	688	ft ³ /s	35	8
4-percent AEP flood	993	ft ³ /s	39.9	9
2-percent AEP flood	1330	ft ³ /s	37.1	11
1-percent AEP flood	1560	ft ³ /s	39.9	12
0.2-percent AEP flood	2460	ft ³ /s	50.7	12
Regulated 50-percent AEP flood	261	ft ³ /s	46.9	2
Regulated 20-percent AEP flood	490	ft ³ /s	36.2	5
Regulated 10-percent AEP flood	688	ft ³ /s	35	8
Regulated 4-percent AEP flood	993	ft ³ /s	39.9	9
Regulated 2-percent AEP flood	1330	ft ³ /s	37.1	11
Regulated 1-percent AEP flood	1560	ft ³ /s	39.9	12

Statistic	Value	Unit	ASEp	Equiv. Yrs.	Item 2.
Regulated 0.2-percent AEP flood	2460	ft^3/s	50.7	12	
<i>Peak-Flow Statistics Citations</i>					
Lewis, J.M., Hunter, S.L., and Labriola, L.G.,2019, Methods for estimating the magnitude and frequency of peak streamflows for unregulated streams in Oklahoma developed by using streamflow data through 2017: U.S. Geological Survey Scientific Investigations Report 2019–5143, 39 p. (https://doi.org/10.3133/sir20195143)					

➤ Flow-Duration Statistics

Flow-Duration Statistics Parameters [Duration Region 3 2009 5267]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CONTDA	Contributing Drainage Area	0.63	square miles	8	2296
ELEV	Mean Basin Elevation	1180	feet	625	1527
CANOPY_PCT	Percent Area Under Canopy	46.25	percent	8.41	83.5
PRECIPOUT	Mean Annual Precip at Gage	38.63	inches	38	58

Flow-Duration Statistics Disclaimers [Duration Region 3 2009 5267]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [Duration Region 3 2009 5267]

Statistic	Value	Unit
20 Percent Duration	0.106	ft^3/s
50 Percent Duration	0.014	ft^3/s
80 Percent Duration	0	ft^3/s
90 Percent Duration	0	ft^3/s
95 Percent Duration	0	ft^3/s

Flow-Duration Statistics Citations

Esralew, R.A., Smith, S.J.,2009, Methods for estimating flow-duration and annual mean-flow statistics for ungaged streams in Oklahoma: U.S. Geological Survey Scientific Investigations Report 2009-5267, 131 p. (<http://pubs.usgs.gov/sir/2009/5267/>)

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Application Version: 4.19.3
 StreamStats Services Version: 1.2.22
 NSS Services Version: 2.2.1

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and plasticity index (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk "*" denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(<http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba>). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties—Cleveland County, Oklahoma														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
37—Harrah fine sandy loam, 5 to 8 percent slopes, moderately eroded														
Harrah, moderately eroded	75	B	0-5	Fine sandy loam	SC, CL, SC-SM	A-4, A-6, A-2-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	83-93-1 00	33-43- 55	22-27 -33	6-9 -12
			5-10	Fine sandy loam, loamy fine sand	SC-SM, SC, SM	A-2-4, A-6	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	84-96-1 00	21-28- 44	17-25 -33	2-7 -12
			10-60	Sandy clay loam, fine sandy loam	CL, SC	A-6, A-7-6	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	79-87- 99	41-51- 63	28-38 -46	12-19-2 5
			60-71	Sandy clay loam, fine sandy loam	SC, CL	A-6, A-7-6, A-2-6	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	85-94-1 00	34-42- 56	28-30 -46	12-13-2 5
			71-80	Fine sandy loam, sandy clay loam	CL, SC	A-6, A-7-6	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	79-87- 99	41-51- 63	28-38 -46	12-19-2 5

Engineering Properties—Cleveland County, Oklahoma														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
92—Port fine sandy loam, 0 to 1 percent slopes, occasionally flooded														
Port, occasionally flooded	93	B	0-9	Fine sandy loam	SC-SM, SC	A-6, A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	87-95-100	44-49-60	25-30-37	7-9 -13
			9-27	Silt loam	CL, CL-ML	A-6, A-7-6, A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	94-100-100	85-94-100	25-33-42	7-12-18
			27-42	Silty clay loam, clay loam, loam	CL	A-6, A-7	0- 0- 0	0- 0- 0	100-100-100	100-100-100	92-100-100	84-96-100	30-38-47	13-19-25
			42-72	Silty clay loam, clay loam, loam, silt loam	CL	A-7-6, A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	92-100-100	84-96-100	28-36-47	12-17-25

Engineering Properties—Cleveland County, Oklahoma														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
SEND—Stephenville-Darnell-Newalla complex, 3 to 8 percent slopes														
Stephenville	45	C	0-5	Loamy fine sand	SC-SM, SM	A-2-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	86-94-99	24-30-38	19-23-31	3-4 -9
			5-15	Fine sandy loam, loamy fine sand	SM, SC-SM	A-4, A-2-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	89-97-100	31-39-47	16-22-28	1-6 -10
			15-33	Fine sandy loam, sandy clay loam	SC, CL	A-6, A-7-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	93-99-100	40-47-54	28-38-43	12-19-24
			33-51	Bedrock	—	—	—	—	—	—	—	—	—	—
Darnell	30	D	0-8	Fine sandy loam	CL-ML, CL, SC-SM	A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	82-93-100	45-51-55	22-26-31	6-7 -9
			8-10	Fine sandy loam	CL-ML, SM, CL	A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	81-93-100	43-51-56	16-21-26	2-6 -10
			10-16	Fine sandy loam	SM, SC-SM, SC	A-2-4, A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	81-93-100	33-41-50	18-23-26	3-7 -10
			16-26	Bedrock	—	—	—	—	—	—	—	—	—	—
Newalla	15	D	0-2	Fine sandy loam	SC, SC-SM, SM	A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	87-99-100	31-39-43	22-35-41	6-11-13
			2-5	Loamy fine sand, fine sandy loam	SM	A-2-4, A-4	0- 0- 0	0- 0- 0	100-100-100	100-100-100	86-99-100	26-33-38	0-22 -28	NP-3 -6
			5-11	Clay loam, sandy clay loam	CL	A-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	90-99-100	47-54-60	30-38-49	13-18-24
			11-16	Silty clay, clay	CH	A-7-6, A-7	0- 0- 0	0- 0- 0	100-100-100	100-100-100	93-99-100	70-76-90	48-59-69	28-35-43
			16-30	Clay, silty clay	CH	A-7-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	93-99-100	72-79-92	49-61-71	29-36-44
			30-51	Clay, silty clay	CH	A-7-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	93-99-100	75-84-95	49-67-71	29-42-44

Engineering Properties—Cleveland County, Oklahoma														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
			51-58	Very parachannery clay, parachannery clay, very parachannery silty clay, parachannery silty clay	CH	A-7-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	92-100-100	82-93-100	48-58-70	28-36-44
			58-80	Silty clay, clay	CH	A-7-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	91-99-100	75-84-98	49-55-70	29-33-44

Engineering Properties—Cleveland County, Oklahoma														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
SEND4— Stephenville- Darnell-Newalla complex, 3 to 8 percent slopes, gullied														
Stephenville, gullied	55	C	0-3	Fine sandy loam	SC-SM, SM	A-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	90-97-1 00	32-39- 46	19-25 -31	3-6 -9
			3-8	Loamy fine sand, fine sandy loam	SC-SM, SM	A-4, A-2-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	89-97-1 00	31-39- 47	16-22 -28	1-6 -10
			8-19	Fine sandy loam, sandy clay loam	SC, CL	A-6	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	93-99-1 00	40-47- 54	29-37 -39	12-20-2 4
			19-26	Fine sandy loam, sandy clay loam	SC, CL	A-6	0- 0- 0	0- 0- 0	87-93-1 00	86-93-1 00	76-92-1 00	31-43- 53	28-38 -39	12-20-2 4
			26-36	Bedrock	—	—	—	—	—	—	—	—	—	—
Darnell, gullied	15	D	0-4	Fine sandy loam	SC-SM, CL, CL- ML	A-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	82-93-1 00	45-51- 55	22-26 -31	6-7 -9
			4-12	Fine sandy loam	SM, SC- SM, SC	A-2-4, A-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	81-93-1 00	33-41- 50	18-23 -26	3-7 -10
			12-22	Bedrock	—	—	—	—	—	—	—	—	—	—
Newalla, gullied	14	D	0-3	Fine sandy loam	SC-SM, SM, SC	A-6, A-7-6, A-2-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	87-99-1 00	31-39- 43	22-35 -41	6-11-13
			3-6	Loamy fine sand, fine sandy loam	SC-SM	A-4, A-2-4	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	86-99-1 00	26-33- 38	0-22 -28	NP-5 -6
			6-11	Sandy clay loam, clay loam	CL	A-6	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	90-99-1 00	47-54- 60	30-39 -50	13-18-2 5
			11-16	Silty clay, clay	CH	A-7-6, A-7	0- 0- 0	0- 0- 0	100-100 -100	100-100 -100	93-99-1 00	70-76- 90	48-60 -71	29-37-4 4

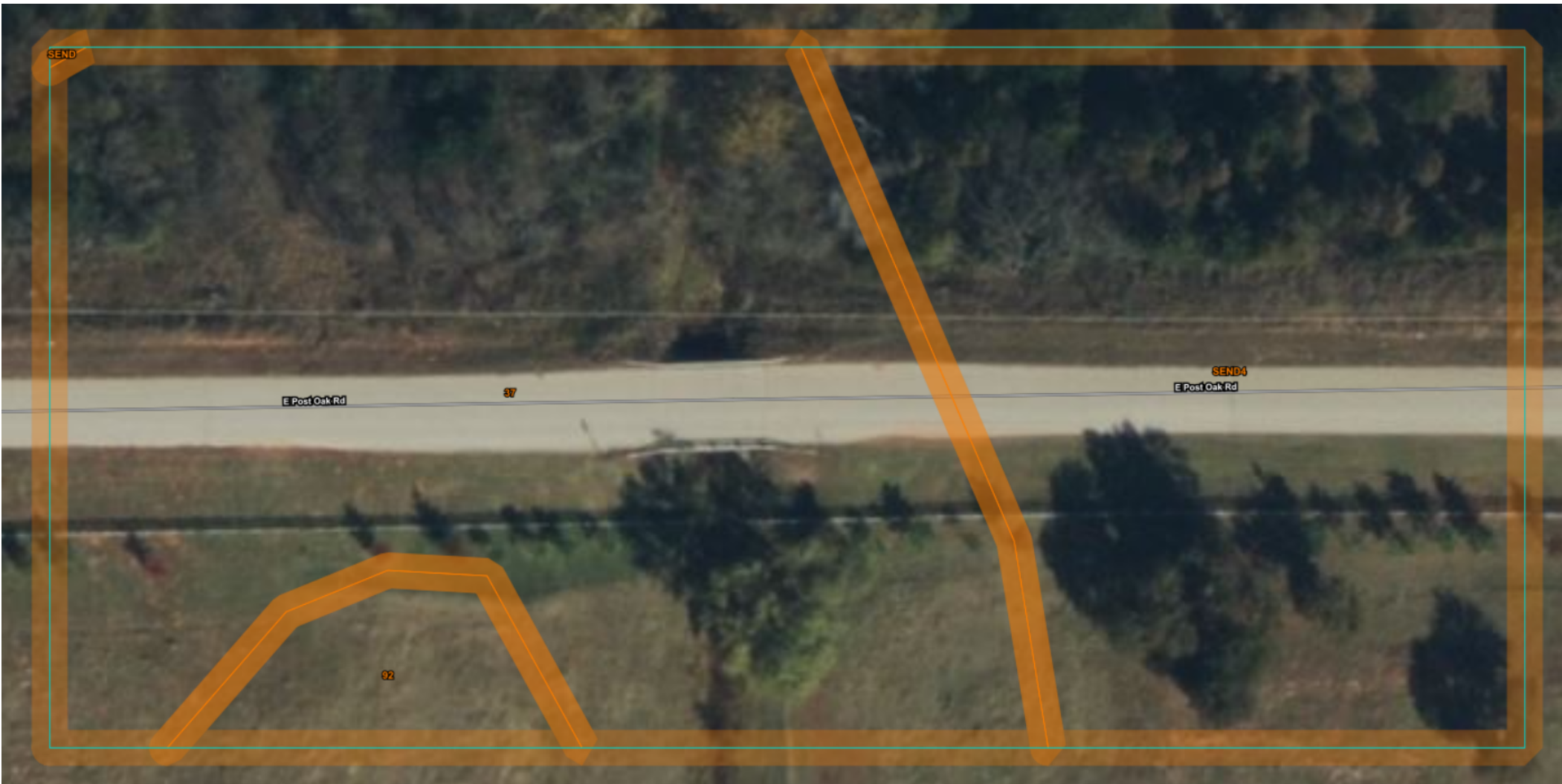
Engineering Properties—Cleveland County, Oklahoma														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			<i>In</i>				<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>	<i>L-R-H</i>
			16-30	Silty clay, clay	CH	A-7-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	93-99-100	72-79-92	50-61-72	29-36-44
			30-51	Clay, silty clay	CH	A-7-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	93-99-100	75-84-95	50-68-72	29-41-44
			51-58	Very parachannery silty clay, parachannery clay, parachannery silty clay, very parachannery clay	CH	A-7-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	90-100-100	84-93-100	48-58-71	28-35-44
			58-80	Silty clay, clay	CH	A-7-6	0- 0- 0	0- 0- 0	100-100-100	100-100-100	91-99-100	75-84-98	50-55-71	29-33-44

Data Source Information

Soil Survey Area: Cleveland County, Oklahoma

Survey Area Data: Version 21, Sep 7, 2023

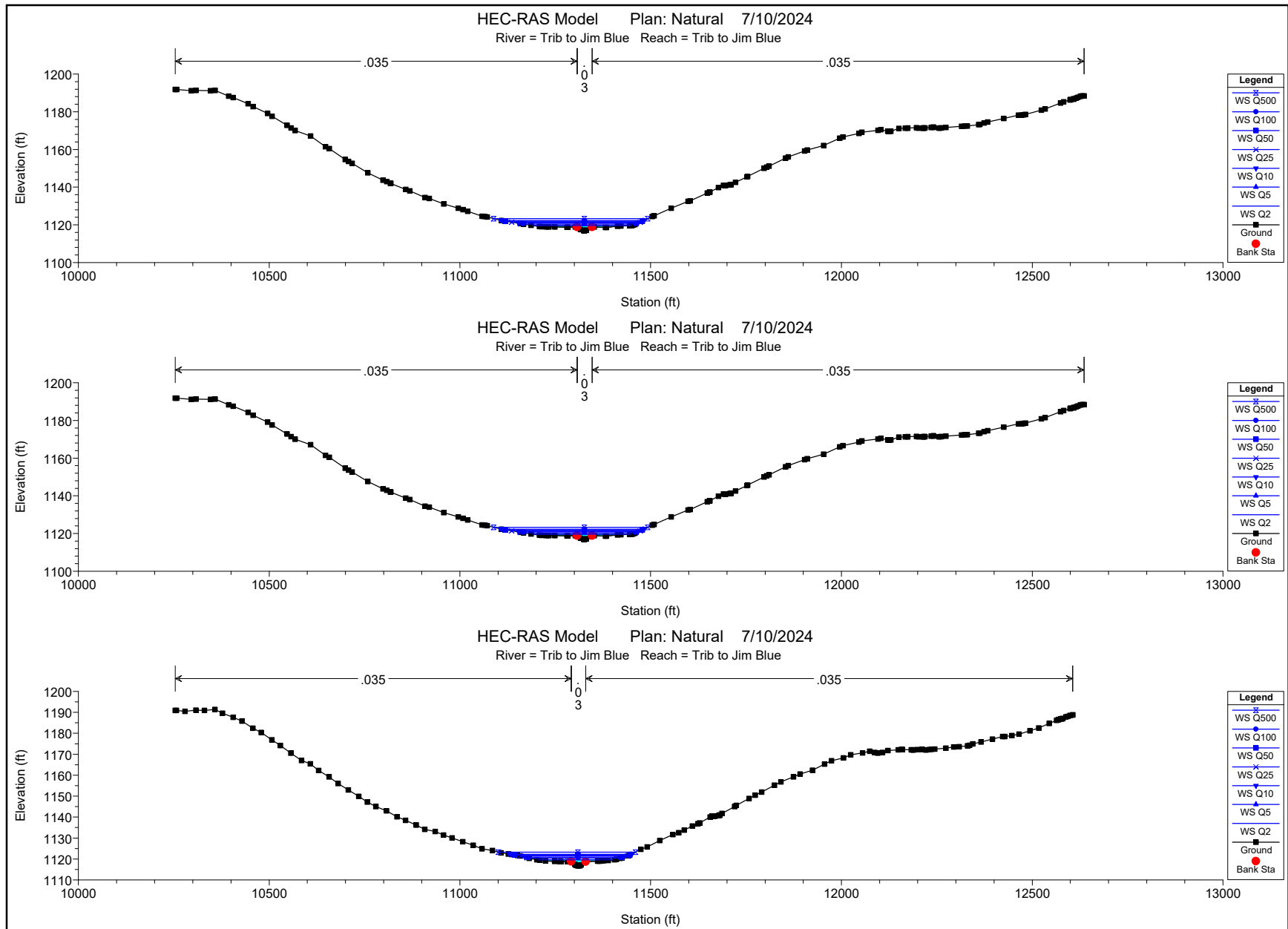


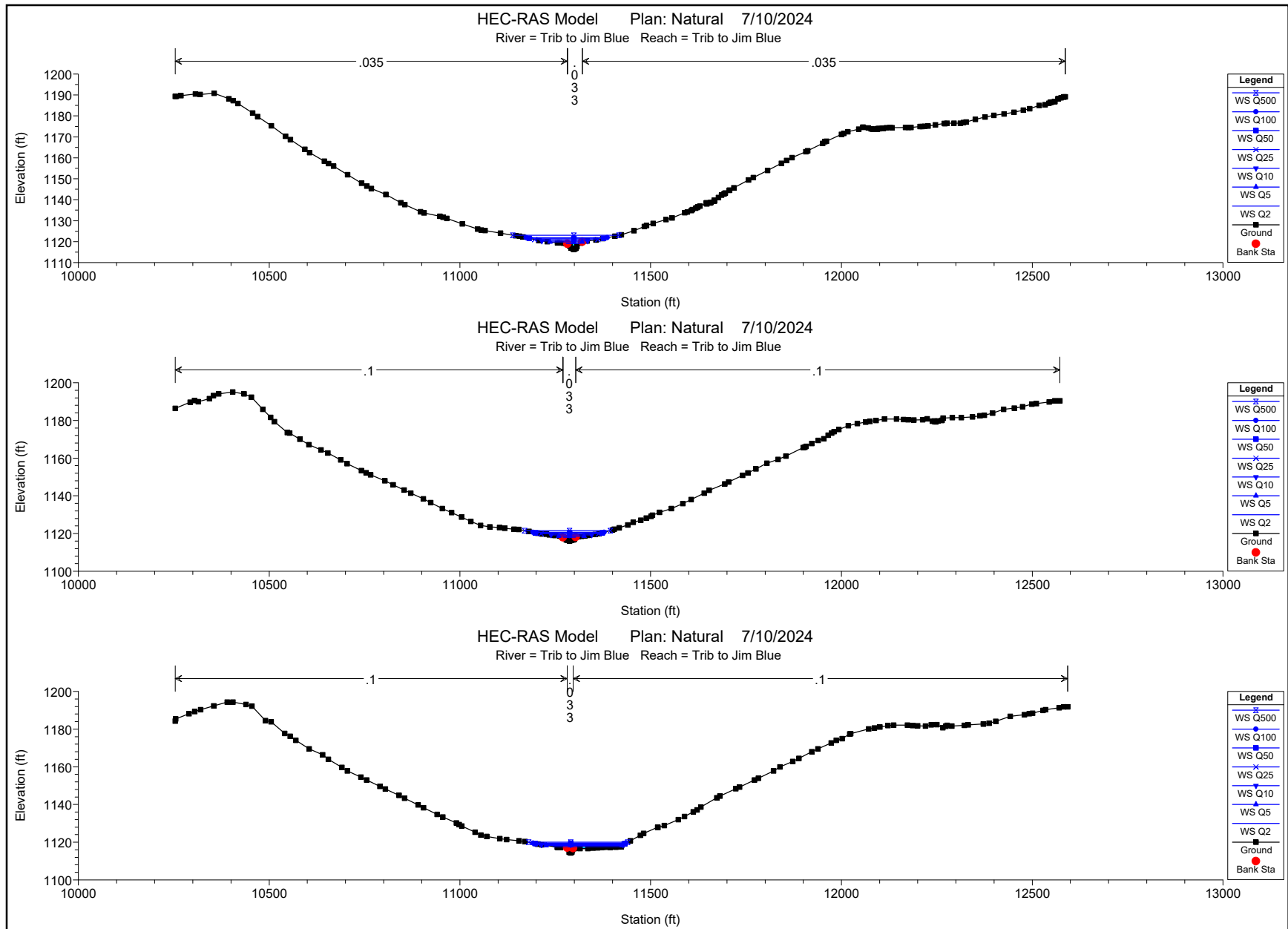


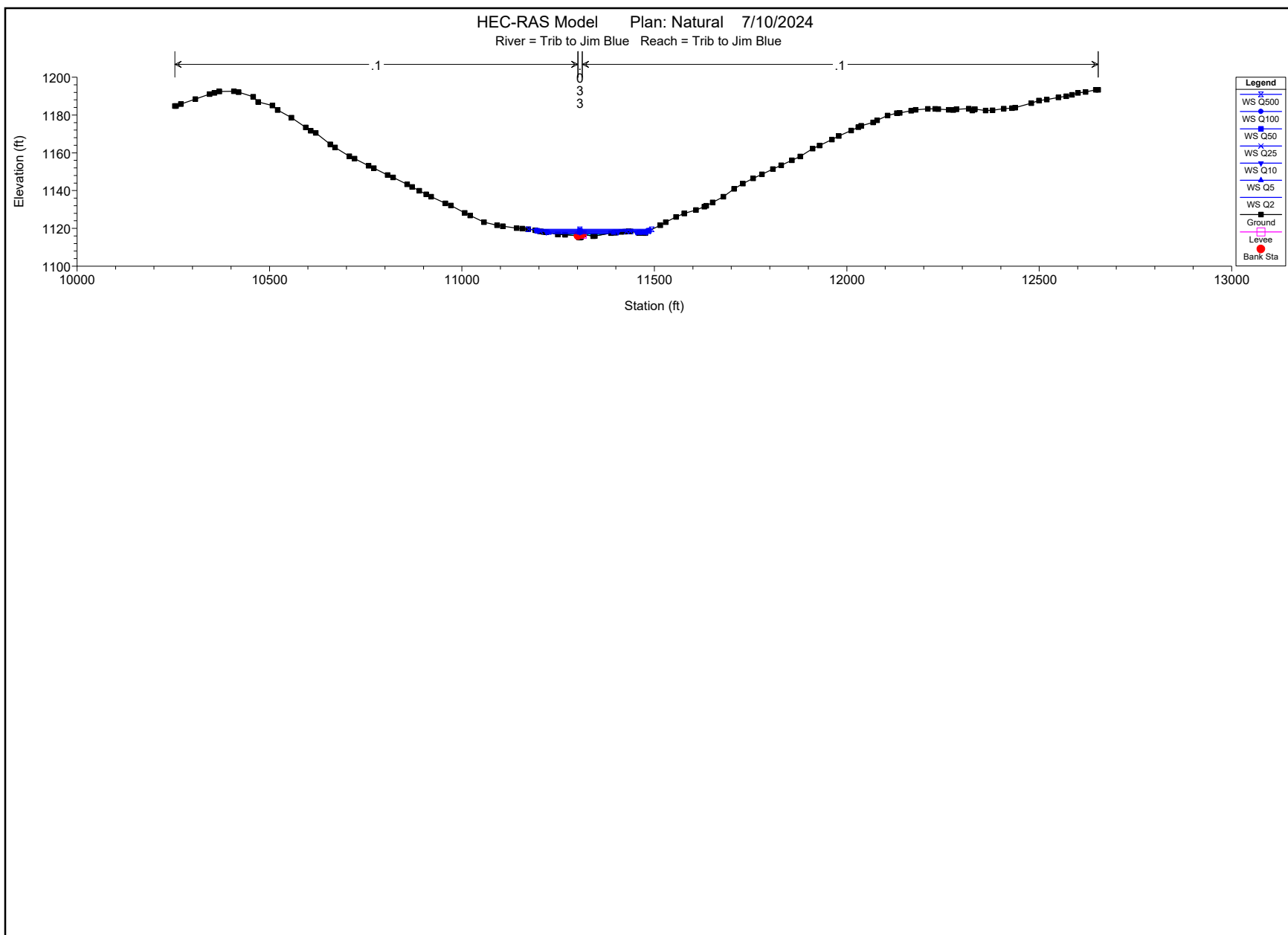
Appendix C - Hydraulic Model - Natural Stream

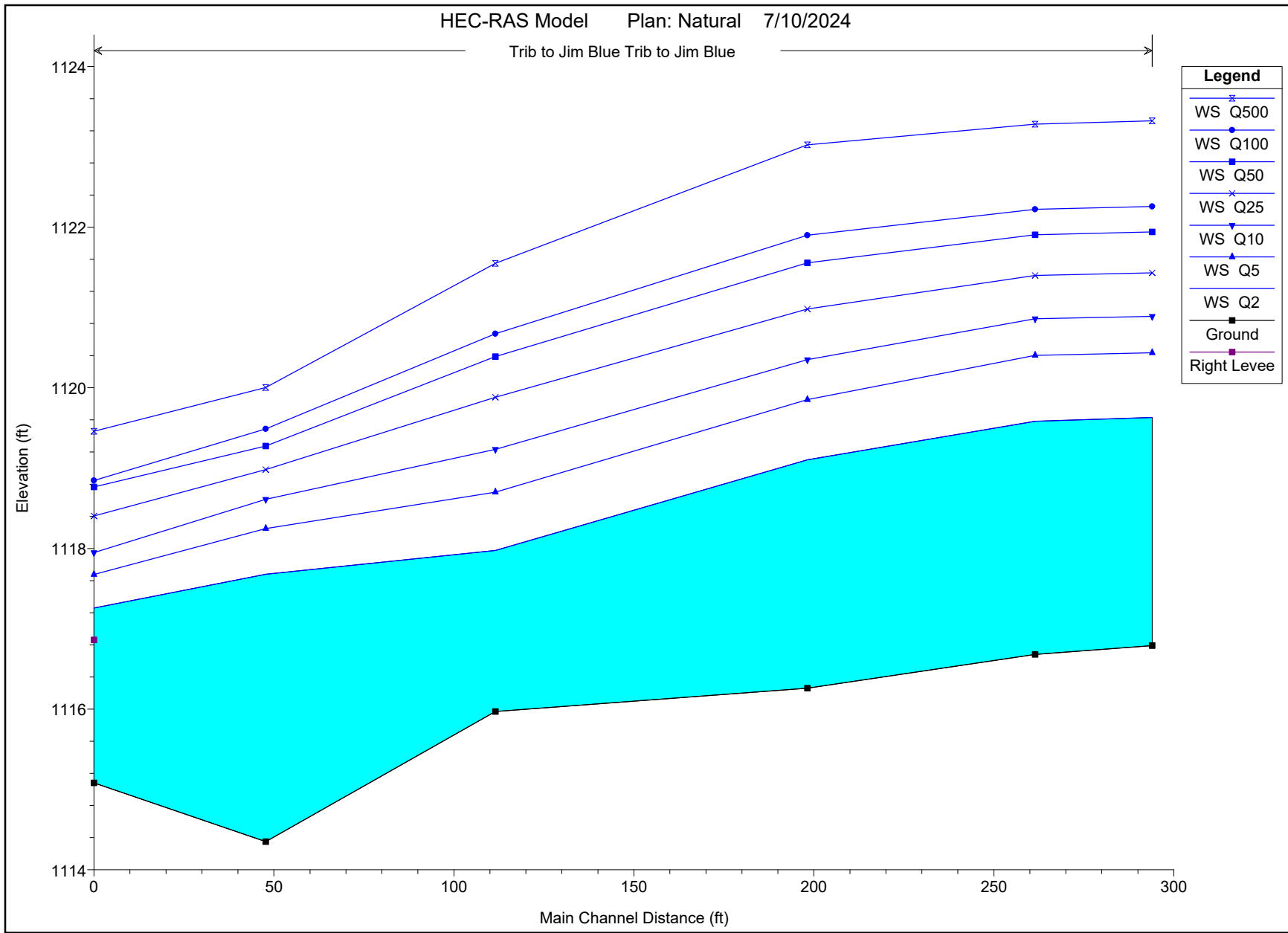
HEC-RAS Plan: Natural River: Trib to Jim Blue Reach: Trib to Jim Blue

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Trib to Jim Blue	1295 U/S FAR	Q2	261.00	1116.79	1119.63	1119.02	1119.67	0.000670	1.98	212.33	255.90	0.25
Trib to Jim Blue	1295 U/S FAR	Q5	490.00	1116.79	1120.44	1119.33	1120.46	0.000336	1.77	435.51	296.24	0.19
Trib to Jim Blue	1295 U/S FAR	Q10	688.00	1116.79	1120.89	1119.55	1120.92	0.000299	1.85	573.78	313.02	0.18
Trib to Jim Blue	1295 U/S FAR	Q25	993.00	1116.79	1121.43	1119.76	1121.47	0.000289	2.02	749.97	336.70	0.18
Trib to Jim Blue	1295 U/S FAR	Q50	1330.00	1116.79	1121.94	1119.95	1121.98	0.000283	2.18	927.02	358.90	0.19
Trib to Jim Blue	1295 U/S FAR	Q100	1560.00	1116.79	1122.26	1120.06	1122.30	0.000278	2.26	1042.75	372.04	0.19
Trib to Jim Blue	1295 U/S FAR	Q500	2460.00	1116.79	1123.32	1120.45	1123.37	0.000260	2.51	1456.32	404.36	0.19
Trib to Jim Blue	1262 U/S	Q2	261.00	1116.68	1119.59		1119.65	0.000834	2.29	172.22	196.95	0.28
Trib to Jim Blue	1262 U/S	Q5	490.00	1116.68	1120.40		1120.45	0.000471	2.16	353.48	241.55	0.22
Trib to Jim Blue	1262 U/S	Q10	688.00	1116.68	1120.86		1120.91	0.000429	2.27	467.54	259.39	0.22
Trib to Jim Blue	1262 U/S	Q25	993.00	1116.68	1121.40		1121.45	0.000419	2.48	613.25	279.97	0.22
Trib to Jim Blue	1262 U/S	Q50	1330.00	1116.68	1121.91		1121.97	0.000416	2.69	760.73	302.75	0.23
Trib to Jim Blue	1262 U/S	Q100	1560.00	1116.68	1122.22		1122.29	0.000411	2.80	858.48	316.94	0.23
Trib to Jim Blue	1262 U/S	Q500	2460.00	1116.68	1123.28		1123.36	0.000385	3.10	1219.52	359.43	0.23
Trib to Jim Blue	1199 U/S BRIDGE	Q2	261.00	1116.26	1119.10	1118.71	1119.50	0.006948	5.02	52.23	36.69	0.71
Trib to Jim Blue	1199 U/S BRIDGE	Q5	490.00	1116.26	1119.85	1119.64	1120.33	0.006343	5.75	98.68	84.50	0.71
Trib to Jim Blue	1199 U/S BRIDGE	Q10	688.00	1116.26	1120.35	1120.05	1120.80	0.004997	5.82	148.93	119.95	0.65
Trib to Jim Blue	1199 U/S BRIDGE	Q25	993.00	1116.26	1120.98	1120.56	1121.36	0.003510	5.66	240.72	165.49	0.56
Trib to Jim Blue	1199 U/S BRIDGE	Q50	1330.00	1116.26	1121.56	1120.92	1121.89	0.002666	5.52	343.87	194.53	0.51
Trib to Jim Blue	1199 U/S BRIDGE	Q100	1560.00	1116.26	1121.90		1122.21	0.002323	5.47	414.03	212.91	0.48
Trib to Jim Blue	1199 U/S BRIDGE	Q500	2460.00	1116.26	1123.03		1123.30	0.001646	5.42	689.62	278.04	0.42
Trib to Jim Blue	1112 D/S BRIDGE	Q2	261.00	1115.97	1117.98	1117.98	1118.62	0.015060	6.43	40.58	31.98	1.01
Trib to Jim Blue	1112 D/S BRIDGE	Q5	490.00	1115.97	1118.70	1118.70	1119.57	0.011626	7.50	73.05	66.54	0.95
Trib to Jim Blue	1112 D/S BRIDGE	Q10	688.00	1115.97	1119.23	1119.23	1120.17	0.009454	7.95	118.65	106.17	0.89
Trib to Jim Blue	1112 D/S BRIDGE	Q25	993.00	1115.97	1119.88	1119.88	1120.87	0.007815	8.44	202.20	151.01	0.84
Trib to Jim Blue	1112 D/S BRIDGE	Q50	1330.00	1115.97	1120.39	1120.39	1121.45	0.007392	9.08	285.05	174.63	0.84
Trib to Jim Blue	1112 D/S BRIDGE	Q100	1560.00	1115.97	1120.67	1120.67	1121.80	0.007341	9.51	336.30	186.50	0.85
Trib to Jim Blue	1112 D/S BRIDGE	Q500	2460.00	1115.97	1121.55	1121.55	1122.92	0.007546	11.04	516.28	224.33	0.89
Trib to Jim Blue	1048 D/S	Q2	261.00	1114.35	1117.68	1117.45	1117.99	0.004789	5.25	131.74	177.78	0.61
Trib to Jim Blue	1048 D/S	Q5	490.00	1114.35	1118.25	1118.02	1118.59	0.004880	6.12	238.78	198.99	0.63
Trib to Jim Blue	1048 D/S	Q10	688.00	1114.35	1118.61	1118.32	1118.98	0.005064	6.75	313.85	213.48	0.66
Trib to Jim Blue	1048 D/S	Q25	993.00	1114.35	1118.98	1118.68	1119.44	0.005953	7.86	395.60	225.74	0.73
Trib to Jim Blue	1048 D/S	Q50	1330.00	1114.35	1119.28	1119.01	1119.85	0.007160	9.08	463.09	235.10	0.81
Trib to Jim Blue	1048 D/S	Q100	1560.00	1114.35	1119.49	1119.19	1120.11	0.007541	9.65	514.09	242.15	0.84
Trib to Jim Blue	1048 D/S	Q500	2460.00	1114.35	1120.01	1119.86	1120.94	0.010510	12.32	643.36	259.38	1.01
Trib to Jim Blue	1000 D/S FAR	Q2	261.00	1115.08	1117.26	1117.26	1117.63	0.013139	6.92	115.30	143.77	0.96
Trib to Jim Blue	1000 D/S FAR	Q5	490.00	1115.08	1117.68	1117.68	1118.19	0.015294	8.70	180.77	178.77	1.08
Trib to Jim Blue	1000 D/S FAR	Q10	688.00	1115.08	1117.95	1117.93	1118.55	0.016594	9.86	234.73	213.43	1.15
Trib to Jim Blue	1000 D/S FAR	Q25	993.00	1115.08	1118.41	1118.41	1119.00	0.014488	10.40	345.98	269.84	1.10
Trib to Jim Blue	1000 D/S FAR	Q50	1330.00	1115.08	1118.77	1118.77	1119.38	0.013872	11.04	447.99	290.14	1.10
Trib to Jim Blue	1000 D/S FAR	Q100	1560.00	1115.08	1118.85	1118.55	1119.59	0.016618	12.29	470.96	292.56	1.21
Trib to Jim Blue	1000 D/S FAR	Q500	2460.00	1115.08	1119.46	1119.43	1120.29	0.016594	13.81	658.64	320.27	1.25









HEC-RAS HEC-RAS 6.3.1 September 2022
 U.S. Army Corps of Engineers
 Hydrologic Engineering Center
 609 Second Street
 Davis, California

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X      X  XXXXXX   XXXX      XXXX      XX      XXXX
X      X  X        X      X      X      X      X
X      X  X        X        X      X      X      X
XXXXXXXX XXXX      X        XXX XXXX      XXXXXX   XXXX
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X      X  XXXXXX   XXXX      X      X      X      XXXXX

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PROJECT DATA

Project Title: HEC-RAS Model
 Project File : Post Oak Rd.prj
 Run Date and Time: 7/10/2024 2:39:05 PM

Project in English units

Project Description:

CRS Info=<SpatialReference> <CoordinateSystem Code="2268"
 Unit="US_survey_Foot" AcadCode="OK83-SF" /></SpatialReference>

PLAN DATA

Plan Title: Natural

Plan File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
 Civil\Docs\Drainage\Models\Post Oak Rd.p01

Geometry Title: Natural Geometry

Geometry File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
 Civil\Docs\Drainage\Models\Post Oak Rd.g01

Flow Title : Steady Flow

Flow File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
 Civil\Docs\Drainage\Models\Post Oak Rd.f01

Plan Description:

Natural scenario w/o road and bridge

Plan Summary Information:

Number of: Cross Sections	=	6	Multiple Openings	=	0
Culverts	=	0	Inline Structures	=	0
Bridges	=	0	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 20
 Maximum difference tolerance = 0.33
 Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
 Conveyance Calculation Method: At breaks in n values only
 Friction Slope Method: Average Conveyance
 Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Steady Flow

Flow File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
 Civil\Docs\Drainage\Models\Post Oak Rd.f01

Flow Data (cfs)

River	Reach	RS	Q2	Q5	Q10	Q25	Q50	Q100	Q500
Trib to Jim Blue	Trib to Jim Blue	1295	261	490	688	993	1330	1560	2460

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
Trib to Jim Blue	Trib to Jim Blue	Q2	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q5	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q10	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q25	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q50	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q100	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q500	Normal S = 0.01659
S = 0.01659			Normal

GEOMETRY DATA

Geometry Title: Natural Geometry

Geometry File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
Civil\Docs\Drainage\Models\Post Oak Rd.g01

CROSS SECTION

RIVER: Trib to Jim Blue

REACH: Trib to Jim Blue RS: 1295

INPUT

Description:

Station Elevation Data				num=	157
Sta	Elev	Sta	Elev	Sta	Elev
10254	1191.82	10257.4	1191.82	10295.92	1191.14
10358.46	1191.36	10393.7	1188.31	10405.63	1187.48
10496	1179.05	10507.8	1177.59	10547.09	1172.75
10608.82	1167.18	10647.78	1161.49	10657.59	1160.44
10717.63	1152.59	10758.32	1147.64	10798.43	1143.71
10818.64	1141.95	10858.11	1138.84	10868.56	1137.98
10957.95	1131.11	10995.66	1128.82	11007.82	1128.03
11064.49	1124.41	11071.59	1124.17	11108.76	1122.27
11166.56	1120.39	11186.81	1119.79	11208.74	1119.14
11233.37	1118.89	11248.86	1118.84	11280.92	1118.73
11307.56	1118.89	11309.64	1118.58	11316.42	1117.51
11330.06	1117.11	11330.26	1117.13	11331.11	1117.14
11351.95	1118.91	11381.21	1118.71	11383.78	1118.68
11445.02	1119.54	11449.64	1119.68	11450.78	1119.73
11458.59	1120.14	11503.77	1124.38	11508.87	1124.75
11603.37	1132.78	11648.12	1136.92	11653.77	1137.34
11690.88	1140.91	11694.89	1140.91	11695.44	1140.83
11707	1141.22	11710.58	1141.35	11710.65	1141.35
11752.38	1145.49	11754.05	1145.71	11797.44	1149.95
11854.06	1155.47	11860.72	1156.11	11903.79	1159.22
11995.94	1165.97	12003.62	1166.66	12045.95	1168.48
12103.47	1170.54	12121.17	1169.67	12124.51	1169.56
12167.55	1171.33	12173.33	1171.34	12173.63	1171.35
12214.13	1171.42	12215.29	1171.29	12215.36	1171.31
12235.12	1171.7	12240	1171.74	12241.4	1171.73
12259.39	1171.39	12261.97	1171.44	12273.75	1171.64
12329.7	1172.48	12359.95	1173.16	12362.54	1173.28
12425.54	1176.49	12463.94	1178.19	12472.07	1178.27
12523.98	1180.85	12534.21	1181.48	12574.09	1184.61
12599.94	1186.36	12600.55	1186.36	12600.76	1186.37
12609.52	1186.81	12615.59	1187.32	12619.61	1187.67
12631.81	1188.43	12635.85	1188.43		

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
10254	.035	11307.56	.031
		11346.43	.035

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	11307.56	11346.43		32.57	32.57	32.57		.1	.3

CROSS SECTION

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1262

INPUT

Description:

Station	Elevation	Data	num=	154
Sta	Elev	Sta	Elev	Sta
10254	1190.92	10257.2	1190.92	10279.71
10357.67	1191.37	10378.01	1189.61	10405.87
10479.24	1180.37	10507.43	1176.89	10529.58
10607.91	1165.39	10629.62	1162.21	10657.25
10735.06	1149.94	10757.58	1147.21	10779.56
10857.44	1138.42	10885.28	1136.13	10907.62
10979.69	1130.04	11007.33	1128.24	11034.93
11107.86	1122.94	11126.71	1122.38	11136.06
11181.65	1120.32	11201.38	1119.68	11209.09
11262.39	1118.77	11263.22	1118.75	11265.14
11301	1117.45	11302.63	1117.21	11304.55
11313.86	1116.81	11314.64	1116.81	11317.34
11366.24	1118.96	11372.95	1119.11	11377.13
11410.33	1119.82	11420.09	1120.34	11424.33
11490.92	1125.79	11523.98	1128.84	11558.29
11608.99	1135.78	11624.28	1136.91	11628.45
11665.47	1140.44	11665.5	1140.42	11665.64
11681.35	1140.89	11681.4	1140.93	11681.47
11724.47	1145.57	11757.98	1148.85	11774.38
11841.45	1156.86	11874.16	1159.23	11891.74
11974.1	1166.91	12005.63	1168.26	12024.04
12086.88	1170.83	12095.32	1170.56	12107.49
12156.94	1172.18	12157.75	1172.21	12159.32
12186.39	1172.14	12188.39	1172.04	12199.1
12211.83	1172.34	12221.41	1172.05	12229.72
12273.86	1172.94	12294.16	1173.53	12308.83
12344.34	1174.91	12365.84	1175.86	12395.5
12446.49	1178.91	12465.51	1179.55	12494.34
12563.63	1186.22	12568.79	1186.54	12568.97
12577.59	1186.93	12577.75	1186.97	12578.55
12593.47	1188.15	12599.46	1188.52	12605.99
			1188.78	12606.04

Manning's n	Values	num=	3
Sta	n Val	Sta	n Val
10254	.035	11291.95	.035
		11330.11	.035

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	11291.95	11330.11		63.23	63.23	63.23		.1	.3

CROSS SECTION

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1199

INPUT

Description:

Station Elevation Data		num= 174	
Sta	Elev	Sta	Elev
10254	1189.3310256.27	1189.3310269.03	1189.7210306.68
10355.97	1190.810394.32	1188.2110405.69	1187.3110418.07
10469.66	1179.7510506.22	1175.2410543.46	1170.3110555.81
10606.07	1162.5110644.43	1158.410656.12	1157.2810669.06
10742.12	1147.8910755.96	1146.5210767.69	1145.3110805.95
10855.94	1137.65 10896.8	1134.3 10906	1133.7210947.96
10965.73	1131.1211006.13	1128.4911046.49	1125.9411056.15
11106.15	1124.0211146.34	1122.7911156.05	1122.5811165.65
11229.03	1120.0111255.93	1119.3811261.59	1119.3911271.38
11282.15	1118.9311288.08	1117.8211291.93	1116.9711296.51
11300.15	1116.5511303.08	1116.7711303.82	1116.8211306.58
11318.25	1119.6511321.11	1119.9511333.63	1120.3311356.37
11406.41	1122.5811423.24	1123.31 11456.2	1125.2411483.65
11506.42	1128.6611540.17	1130.5711556.27	1131.2811589.54
11606.61	1134.811609.29	1135.2411618.09	1135.9111621.79
11629.24	1136.9311646.07	1138.3611646.08	1138.3711646.21
11646.64	1138.4711646.67	1138.4211646.87	1138.0411654.98
11657.7	1138.6711666.62	1139.2711666.65	1139.3311666.84
11667.28	1139.68 11667.3	1139.6811667.41	1139.6611677.83
11691.81	1142.7911693.98	1142.9911695.74	1143.2111705.97
11718.18	1145.74 11756.7	1149.46 11769.1	1150.6111806.18
11856.19	1158.7411870.35	1160.0811906.57	1162.8811911.83
11956.4	1167.6511960.72	1167.9312000.15	1171.1812006.49
12045.2	1173.7112056.12	1174.6112057.25	1174.66 12070.6
12082.53	1173.6612087.45	1173.7112093.15	1173.7512093.97
12097.05	1173.9412097.65	1173.9112100.36	1173.9512106.19
12108.6	1174.0512109.91	1174.1212118.42	1174.3312127.82
12168.24	1174.5412175.44	1174.4912182.57	1174.512206.02
12218.68	1175.0512226.89	1175.1912246.65	1175.7212269.52
12276.78	1176.4912295.18	1176.5312311.96	1176.5312319.91
12351.24	1178.3312376.39	1179.4412399.46	1180.3112426.39
12476.45	1182.7312493.62	1183.4712518.48	1185.0312534.19
12547.64	1186.4512548.07	1186.4712548.36	1186.4912551.86
12558.75	1186.8512559.21	1186.8712567.82	1188.1112568.28
12575.38	1188.6412582.34	1189.0612583.59	1189.1112586.77

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
10254	.03511282.15	.03311321.11	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11282.15	11321.11		86.7	86.7	.1	.3

CROSS SECTION

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1112

INPUT

Description:

Station Elevation Data		num= 133							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10254	1186.4	10293.3	1189.71	110304.06	1190.57	110314.07	1189.91	110343.23	1191.56
10354.06	1193.24	10367.48	1194.03	110404.24	1195.07	110434.28	1194.02	110453.72	1192.31
10483.73	1185.86	10504.18	1181.55	10513.91	1179.36	10547.9	1173.54	10554.11	1173.28
10580.53	1170.08	10604.14	1167.08	10635.7	1164.32	10654.04	1162.66	10687.54	1159.11
10704.17	1157.11	10741.93	1153.36	10753.93	1152.27	10765.89	1151.11	10803.56	1147.95
10825.45	1145.87	10853.97	1143.12	10871.03	1141.42	10903.92	1138.42	10923.69	1136.41
10953.85	1133.25	10978.52	1131.11	11004.25	1128.76	111028.34	1126.46	111054.16	1124.29
11078.26	1123.53	11103.89	1123.2	11117.6	1122.77	111141.98	1122.3	11154.1	1122.16
11181.07	1121.13	11203.9	1120.16	11215.65	1119.79	11226.87	1119.65	11234.81	1119.33
11247.16	1119.05	11249.87	1118.97	11261.71	1118.62	11270.34	1118.06	11272.61	1117.76
11278.49	1116.58	11282.33	1116.33	11287.75	1115.97	11292.33	1116.31	11296.07	1116.6
11298.15	1116.74	11299.7	1117.08	11303.62	1118.16	11306.53	1118.25	11310.36	1118.44
11318.41	1118.52	11327.46	1118.75	11335.04	1118.97	11339.86	1119.11	11354.87	1119.46
11364.69	1119.93	11400.38	1121.88	11404.27	1122.32	11417.63	1123.04	11439.92	1124.55
11454.44	1125.98	11474.18	1127.12	11488.37	1128.17	11501.07	1129.11	11504.55	1129.7
11523.57	1131.19	11554.6	1133.29	11584.23	1135.87	11605.89	1138.08	11640.3	1141.45
11653.25	1142.98	11694.22	1146.35	11704.71	1147.34	11741.2	1150.86	11754.63	1152.15
11775.67	1154.23	11804.67	1157.29	11833.86	1159.29	11854.29	1161.08	11899.94	1165.56
11904.12	1165.75	11907.31	1166.28	11922.02	1167.81	11938.84	1169.39	11954.19	1170.23
11965.16	1172.22	11974.72	1173.25	11980.98	1174	11993	1175.15	12017.9	1177.19
12041.41	1178.38	12063.17	1179.06	12074.52	1179.42	12090.94	1180.03	12112.78	1180.76
12144.43	1180.74	12162.79	1180.51	12174.74	1180.35	12189.59	1180.24	12212.58	1180.39
12224.42	1180.89	12238.05	1179.65	12243.33	1179.75	12244.4	1179.38	12247.54	1179.17
12252.55	1179.73	12262.77	1180.01	12263.59	1180.15	12266.03	1181.19	12290.36	1181.48
12314.45	1181.51	12343.27	1181.83	12363.2	1182.52	12374.43	1182.8	12396.3	1183.87
12424.98	1185.86	12453.2	1186.57	12474.54	1187.26	12499	1188.64	12511.18	1188.94
12544.3	1189.83	12559.2	1190.49	12572.76	1190.49				

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
10254	.11	1270.34	.03	11303.62	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11270.34	11303.62		63.77	63.77	.1	.3

CROSS SECTION

RIVER: Trib to Jim Blue

REACH: Trib to Jim Blue RS: 1048

INPUT

Description:

Station Elevation Data		num= 132							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10254	1184.23	10254.97	1185.41	10289.95	1188.21	110305.08	1189.26	110320.18	1190.31
10355	1192.28	10390.09	1194.35	10405.29	1194.37	10439.5	1193.12	10454.76	1192.15
10490.52	1184.57	10505.22	1183.83	10540.71	1177.75	10555.1	1176.14	10569.74	1174.07
10605.01	1169.57	10640.57	1166.35	10655.36	1163.94	10690.77	1159.68	10705.29	1157.83
10740.75	1154.59	10755.34	1153.07	10790	1149.68	110804.33	1148.25	110840.48	1144.8

10855.03 1143.3610890.57 1139.8210905.04 1138.2710940.13 1134.7110954.98 1133.32
 10990.37 1130.2310998.44 1129.3611005.12 1128.6411039.64 1125.3511054.97 1123.81
 11070.53 1123.04 11104.6 1121.93 11122.5 1121.3811154.86 1120.7311170.21 1120.44
 11202.72 1119.0411205.16 1118.9611214.51 1118.59 11255 1117.36 11255.5 1117.35
 11257.24 1117.2911264.04 1117.2511281.01 1117.0811286.77 1114.7911286.99 1114.72
 11287.13 1114.7111290.47 1114.3511290.81 1114.411293.48 1114.8811295.03 1115.91
 11296.15 1116.6511296.57 1116.8211300.27 1116.6811314.72 1116.5911335.17 1116.66
 11348.69 1116.8311360.75 1116.9611371.53 1117.2711375.41 1117.3511379.77 1117.44
 11384.64 1117.5111393.32 1117.2411404.03 1117.45 11409.1 1117.3711415.95 1117.54
 11419.95 1117.6311422.26 1117.6711424.07 1118.1511432.58 1119.3111447.07 1120.73
 11472.85 1123.7411481.55 1124.65 11518.3 1127.9811518.97 1127.8711535.54 1128.82
 11572.37 1131.9311588.76 1133.6611611.94 1136.0911621.95 1137.19 11631.8 1138.66
 11673.5 1143.5811681.53 1144.4111722.84 1148.3 11733.2 1149.311772.39 1153.04
 11782.07 1153.9611821.94 1157.7811838.75 1159.9511872.17 1162.8411888.69 1164.45
 11922.22 1167.9511938.52 1169.4711972.98 1172.7111986.09 1174.1112001.77 1174.93
 12022.02 1177.4 12024.5 1177.6212071.81 1180.1112086.22 1180.5612100.54 1181.1
 12121.96 1181.8712136.62 1182.1 12172.7 1182.1 12186.8 1181.9112199.52 1181.74
 12220.17 1181.58 12235.2 1182.212249.93 1182.3412265.85 1180.712273.51 1181.54
 12276.84 1182.0312289.33 1181.6712322.53 1181.9612332.55 1182.2512372.28 1182.76
 12372.36 1182.7712387.03 1183.1512404.76 1184.15 12442.6 1186.7712479.95 1187.69
 12492.26 1188.1312500.73 1188.39 12528.2 1189.9512534.93 1190.3512570.93 1191.29
 12582.28 1191.79 12592.8 1191.79

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 10254 .111281.01 .03311296.57 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 11281.0111296.57 47.73 47.73 47.73 .1 .3

CROSS SECTION

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1000

INPUT

Description:

Station Elevation Data num= 131
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 10254 1184.7910257.13 1184.7910269.88 1185.8210307.23 1188.410344.43 1191.01
 10356.9 1191.7110369.48 1192.4610407.33 1192.5110420.04 1192.0510457.33 1189.66
 10470.6 1186.8510507.51 1184.9710520.96 1182.6710557.18 1178.6210593.98 1173.4
 10607.1 1171.7210620.35 1170.52 10657.8 1164.4310670.51 1162.9 10707.3 1158.22
 10720.85 1156.9810757.48 1153.1710770.94 1151.8510806.96 1148.2510820.92 1146.92
 10857.3 1143.310870.86 1141.9510889.38 1139.97 10907.1 1138.0810920.33 1136.74
 10957.17 1133.2910971.19 1132.0711007.32 1128.211021.49 1126.8611057.13 1123.3
 11091.27 1121.6411106.18 1121.1811141.79 1120.1311156.75 1119.8511171.96 1119.48
 11190.81 1119.0111202.33 1118.4511205.57 1118.3411212.18 1118.1811215.28 1118.08
 11218.99 1117.9611248.78 1116.7911268.19 1116.61 11301.2 1116.1611301.53 1116.16
 11301.61 1116.1311304.56 1115.2611306.41 1115.0811308.26 1115.3311309.43 1115.49
 11309.5 1115.5211310.97 1116.1111312.84 1116.8611316.78 1116.7111341.27 1115.84
 11345.26 1115.9611387.51 1117.5111396.27 1117.7311398.25 1117.81 11400.1 1117.87
 11413.68 1118.0811423.38 1118.2311432.67 1118.5611438.39 1118.3911460.76 1117.67
 11468.48 1117.6911473.17 1117.6211476.64 1117.5411484.87 1118.6611515.34 1121.65

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11529.92 1123.3411556.19 1126.0711577.83 1128.0211578.21 1127.9711608.15 1129.68
11629.71 1131.4811634.91 1132.0311651.44 1133.7611679.33 1136.8111707.08 1140.93
11729.97 1143.6411756.88 1146.4211779.69 1148.57 11808.2 1151.3311829.33 1153.34
11857.26 115611879.13 1158.111911.08 1162.2311929.31 1163.82 11961.3 1166.94
11979.47 1168.8412011.22 1171.8212030.01 1173.5912037.12 1174.3512068.42 1176.01
12078.64 1177.2512106.22 1179.67 12130.1 1180.9412137.31 1181.1612167.02 1182.29
12179.1 1182.7312210.16 1183.2112229.88 1183.2212237.54 1183.1112265.09 1182.77
12276.31 1182.6812284.43 1183.0212316.93 1183.3512326.25 1182.412330.73 1182.89
12332.67 1183.1712360.85 1182.3812378.58 1182.53 12407.5 1183.3812429.12 1183.66
12437.05 1183.8712479.23 1186.2612499.47 1187.6612519.36 1188.1512549.59 1189.24
12570.47 1189.8912584.98 1190.7112600.88 1191.64 12620.1 1192.1512647.23 1193.34
12653.13 1193.34

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Manning's n Values      num=      3
Sta   n Val   Sta   n Val   Sta   n Val
10254   .111301.53   .03311312.84   .1

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Bank Sta: Left   Right   Lengths: Left Channel   Right   Coeff Contr.   Expan.
        11301.5311312.84           0           0           0           .1           .3
Right Levee      Station=11312.84   Elevation= 1116.86

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SUMMARY OF MANNING'S N VALUES

River:Trib to Jim Blue

Reach	River Sta.	n1	n2	n3
Trib to Jim Blue	1295	.035	.03	.035
Trib to Jim Blue	1262	.035	.03	.035
Trib to Jim Blue	1199	.035	.033	.035
Trib to Jim Blue	1112	.1	.033	.1
Trib to Jim Blue	1048	.1	.033	.1
Trib to Jim Blue	1000	.1	.033	.1

SUMMARY OF REACH LENGTHS

River: Trib to Jim Blue

Reach	River Sta.	Left	Channel	Right
Trib to Jim Blue	1295	32.57	32.57	32.57
Trib to Jim Blue	1262	63.23	63.23	63.23
Trib to Jim Blue	1199	86.7	86.7	86.7
Trib to Jim Blue	1112	63.77	63.77	63.77
Trib to Jim Blue	1048	47.73	47.73	47.73
Trib to Jim Blue	1000	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Trib to Jim Blue

Reach	River Sta.	Contr.	Expan.
Trib to Jim Blue	1295	.1	.3
Trib to Jim Blue	1262	.1	.3
Trib to Jim Blue	1199	.1	.3
Trib to Jim Blue	1112	.1	.3
Trib to Jim Blue	1048	.1	.3
Trib to Jim Blue	1000	.1	.3

Appendix D - Hydraulic Model - Existing Bridge

HEC-RAS Plan: Existing River: Trib to Jim Blue Reach: Trib to Jim Blue

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Trib to Jim Blue	1295 U/S FAR	Q2	261.00	1116.79	1119.60	1119.02	1119.64	0.000749	2.07	203.22	253.51	0.26
Trib to Jim Blue	1295 U/S FAR	Q5	490.00	1116.79	1120.81	1119.33	1120.82	0.000173	1.38	547.87	309.39	0.14
Trib to Jim Blue	1295 U/S FAR	Q10	688.00	1116.79	1121.62	1119.55	1121.64	0.000109	1.28	815.22	345.06	0.11
Trib to Jim Blue	1295 U/S FAR	Q25	993.00	1116.79	1122.72	1119.76	1122.73	0.000071	1.22	1218.12	386.15	0.10
Trib to Jim Blue	1295 U/S FAR	Q50	1330.00	1116.79	1123.84	1119.95	1123.85	0.000051	1.18	1669.71	420.00	0.08
Trib to Jim Blue	1295 U/S FAR	Q100	1560.00	1116.79	1126.11	1120.06	1126.12	0.000017	0.85	2706.06	487.10	0.05
Trib to Jim Blue	1295 U/S FAR	Q500	2460.00	1116.79	1126.77	1120.45	1126.78	0.000031	1.20	3032.76	503.75	0.07
Trib to Jim Blue	1262 U/S	Q2	261.00	1116.68	1119.54		1119.61	0.000932	2.39	164.23	194.11	0.30
Trib to Jim Blue	1262 U/S	Q5	490.00	1116.68	1120.79		1120.82	0.000243	1.69	449.62	256.75	0.16
Trib to Jim Blue	1262 U/S	Q10	688.00	1116.68	1121.61		1121.63	0.000155	1.57	673.53	289.34	0.14
Trib to Jim Blue	1262 U/S	Q25	993.00	1116.68	1122.71		1122.73	0.000104	1.50	1018.92	338.61	0.12
Trib to Jim Blue	1262 U/S	Q50	1330.00	1116.68	1123.83		1123.85	0.000073	1.43	1421.64	376.45	0.10
Trib to Jim Blue	1262 U/S	Q100	1560.00	1116.68	1126.11		1126.12	0.000024	1.01	2374.72	453.89	0.06
Trib to Jim Blue	1262 U/S	Q500	2460.00	1116.68	1126.77		1126.78	0.000042	1.41	2678.38	470.80	0.08
Trib to Jim Blue	1199 U/S BRIDGE	Q2	261.00	1116.26	1118.96	1118.72	1119.43	0.009290	5.54	47.13	32.75	0.81
Trib to Jim Blue	1199 U/S BRIDGE	Q5	490.00	1116.26	1120.46	1119.54	1120.75	0.002768	4.45	116.24	129.85	0.49
Trib to Jim Blue	1199 U/S BRIDGE	Q10	688.00	1116.26	1121.27	1119.97	1121.58	0.002041	4.58	158.88	180.16	0.44
Trib to Jim Blue	1199 U/S BRIDGE	Q25	993.00	1116.26	1122.65	1120.53	1122.71	0.000393	2.52	589.90	255.39	0.20
Trib to Jim Blue	1199 U/S BRIDGE	Q50	1330.00	1116.26	1123.80	1121.02	1123.84	0.000231	2.23	919.76	318.09	0.16
Trib to Jim Blue	1199 U/S BRIDGE	Q100	1560.00	1116.26	1126.10	1121.34	1126.11	0.000056	1.36	1781.33	424.04	0.08
Trib to Jim Blue	1199 U/S BRIDGE	Q500	2460.00	1116.26	1126.75	1121.77	1126.78	0.000091	1.83	2063.37	443.26	0.11
Trib to Jim Blue	1154.25	Bridge										
Trib to Jim Blue	1112 D/S BRIDGE	Q2	261.00	1115.97	1117.98	1117.98	1118.62	0.014864	6.40	40.77	32.05	1.00
Trib to Jim Blue	1112 D/S BRIDGE	Q5	490.00	1115.97	1118.60	1118.71	1119.57	0.013894	7.92	66.40	59.74	1.03
Trib to Jim Blue	1112 D/S BRIDGE	Q10	688.00	1115.97	1118.76	1119.17	1120.35	0.020724	10.21	74.36	70.62	1.27
Trib to Jim Blue	1112 D/S BRIDGE	Q25	993.00	1115.97	1119.14	1119.76	1121.37	0.023233	12.15	94.33	98.10	1.39
Trib to Jim Blue	1112 D/S BRIDGE	Q50	1330.00	1115.97	1119.51	1120.34	1122.38	0.024980	13.88	113.66	125.74	1.47
Trib to Jim Blue	1112 D/S BRIDGE	Q100	1560.00	1115.97	1119.28	1120.70	1124.11	0.046950	17.94	101.55	110.18	1.99
Trib to Jim Blue	1112 D/S BRIDGE	Q500	2460.00	1115.97	1120.67	1121.87	1125.12	0.025059	17.55	173.42	186.11	1.57
Trib to Jim Blue	1048 D/S	Q2	261.00	1114.35	1117.68	1117.44	1117.99	0.004789	5.25	131.74	177.78	0.61
Trib to Jim Blue	1048 D/S	Q5	490.00	1114.35	1118.25	1118.02	1118.59	0.004881	6.12	238.75	198.99	0.63
Trib to Jim Blue	1048 D/S	Q10	688.00	1114.35	1118.61	1118.32	1118.98	0.005067	6.75	313.78	213.47	0.66
Trib to Jim Blue	1048 D/S	Q25	993.00	1114.35	1118.99	1118.68	1119.44	0.005932	7.85	396.15	225.83	0.73
Trib to Jim Blue	1048 D/S	Q50	1330.00	1114.35	1119.28	1119.01	1119.85	0.007157	9.08	463.15	235.11	0.81
Trib to Jim Blue	1048 D/S	Q100	1560.00	1114.35	1119.50	1119.19	1120.11	0.007488	9.63	515.51	242.34	0.83
Trib to Jim Blue	1048 D/S	Q500	2460.00	1114.35	1120.01	1119.86	1120.94	0.010516	12.32	643.23	259.36	1.01
Trib to Jim Blue	1000 D/S FAR	Q2	261.00	1115.08	1117.26	1117.26	1117.63	0.013139	6.92	115.30	143.77	0.96
Trib to Jim Blue	1000 D/S FAR	Q5	490.00	1115.08	1117.68	1117.68	1118.19	0.015294	8.70	180.77	178.77	1.08
Trib to Jim Blue	1000 D/S FAR	Q10	688.00	1115.08	1117.95	1117.93	1118.55	0.016594	9.86	234.73	213.43	1.15
Trib to Jim Blue	1000 D/S FAR	Q25	993.00	1115.08	1118.41	1118.41	1119.00	0.014488	10.40	345.98	269.84	1.10
Trib to Jim Blue	1000 D/S FAR	Q50	1330.00	1115.08	1118.77	1118.77	1119.38	0.013872	11.04	447.99	290.14	1.10
Trib to Jim Blue	1000 D/S FAR	Q100	1560.00	1115.08	1118.85	1118.55	1119.59	0.016618	12.29	470.96	292.56	1.21
Trib to Jim Blue	1000 D/S FAR	Q500	2460.00	1115.08	1119.46	1119.43	1120.29	0.016594	13.81	658.64	320.27	1.25

Plan: Existing Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Profile: Q2

E.G. US. (ft)	1119.43	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1118.96	E.G. Elev (ft)	1119.36	1119.21
Q Total (cfs)	261.00	W.S. Elev (ft)	1118.88	1118.63
Q Bridge (cfs)	261.00	Crit W.S. (ft)	1118.02	1118.03
Q Weir (cfs)		Max Chl Dpth (ft)	2.96	2.71
Weir Sta Lft (ft)		Vel Total (ft/s)	5.54	6.12
Weir Sta Rgt (ft)		Flow Area (sq ft)	47.08	42.68
Weir Submerg		Froude # Chl	0.58	0.66
Weir Max Depth (ft)		Specif Force (cu ft)	112.26	104.90
Min El Weir Flow (ft)	1124.01	Hydr Depth (ft)	2.85	2.57
Min El Prs (ft)	1121.76	W.P. Total (ft)	21.77	23.94
Delta EG (ft)	0.81	Conv. Total (cfs)	3545.4	2898.0
Delta WS (ft)	0.97	Top Width (ft)	16.52	16.58
BR Open Area (sq ft)	120.84	Frctn Loss (ft)	0.14	0.59
BR Open Vel (ft/s)	6.12	C & E Loss (ft)	0.01	0.01
BR Sluice Coef		Shear Total (lb/sq ft)	0.73	0.90
BR Sel Method	Energy only	Power Total (lb/ft s)	4.06	5.52

Plan: Existing Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Profile: Q5

E.G. US. (ft)	1120.75	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1120.46	E.G. Elev (ft)	1120.55	1120.56
Q Total (cfs)	490.00	W.S. Elev (ft)	1119.06	1119.07
Q Bridge (cfs)	490.00	Crit W.S. (ft)	1119.06	1119.07
Q Weir (cfs)		Max Chl Dpth (ft)	3.14	3.15
Weir Sta Lft (ft)		Vel Total (ft/s)	9.80	9.81
Weir Sta Rgt (ft)		Flow Area (sq ft)	50.01	49.94
Weir Submerg		Froude # Chl	0.97	0.98
Weir Max Depth (ft)		Specif Force (cu ft)	225.12	225.06
Min El Weir Flow (ft)	1124.01	Hydr Depth (ft)	3.02	3.01
Min El Prs (ft)	1121.76	W.P. Total (ft)	22.23	26.51
Delta EG (ft)	1.18	Conv. Total (cfs)	3867.0	3589.3
Delta WS (ft)	1.86	Top Width (ft)	16.56	16.59
BR Open Area (sq ft)	120.84	Frctn Loss (ft)		
BR Open Vel (ft/s)	9.81	C & E Loss (ft)		
BR Sluice Coef		Shear Total (lb/sq ft)	2.26	2.19
BR Sel Method	Momentum	Power Total (lb/ft s)	22.10	21.50

Plan: Existing Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Profile: Q10

E.G. US. (ft)	1121.58	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1121.27	E.G. Elev (ft)	1121.43	1121.44
Q Total (cfs)	688.00	W.S. Elev (ft)	1120.11	1120.12
Q Bridge (cfs)	688.00	Crit W.S. (ft)	1120.11	1120.12
Q Weir (cfs)		Max Chl Dpth (ft)	4.19	4.20
Weir Sta Lft (ft)		Vel Total (ft/s)	9.22	9.21
Weir Sta Rgt (ft)		Flow Area (sq ft)	74.58	74.69
Weir Submerg		Froude # Chl	0.79	0.79
Weir Max Depth (ft)		Specif Force (cu ft)	337.20	336.97
Min El Weir Flow (ft)	1124.01	Hydr Depth (ft)	2.67	2.68
Min El Prs (ft)	1121.76	W.P. Total (ft)	37.02	43.45
Delta EG (ft)	1.23	Conv. Total (cfs)	5356.7	5131.5
Delta WS (ft)	2.52	Top Width (ft)	27.89	27.91
BR Open Area (sq ft)	120.84	Frctn Loss (ft)		0.38
BR Open Vel (ft/s)	9.22	C & E Loss (ft)		0.00

Plan: Existing Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Profile: Q10 (Continued)

BR Sluice Coef		Shear Total (lb/sq ft)	2.07	1.93
BR Sel Method	Energy only	Power Total (lb/ft s)	19.14	17.77

Plan: Existing Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Profile: Q25

E.G. US. (ft)	1122.71	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1122.65	E.G. Elev (ft)	1122.54	1122.55
Q Total (cfs)	993.00	W.S. Elev (ft)	1120.86	1120.86
Q Bridge (cfs)	993.00	Crit W.S. (ft)	1120.86	1120.86
Q Weir (cfs)		Max Chl Dpth (ft)	4.94	4.94
Weir Sta Lft (ft)		Vel Total (ft/s)	10.40	10.40
Weir Sta Rgt (ft)		Flow Area (sq ft)	95.50	95.51
Weir Submerg		Froude # Chl	0.82	0.82
Weir Max Depth (ft)		Specif Force (cu ft)	524.44	524.25
Min El Weir Flow (ft)	1124.01	Hydr Depth (ft)	3.40	3.40
Min El Prs (ft)	1121.76	W.P. Total (ft)	40.03	47.90
Delta EG (ft)	1.34	Conv. Total (cfs)	7676.9	7368.1
Delta WS (ft)	3.51	Top Width (ft)	28.05	28.06
BR Open Area (sq ft)	120.84	Frctn Loss (ft)		0.38
BR Open Vel (ft/s)	10.40	C & E Loss (ft)		0.00
BR Sluice Coef		Shear Total (lb/sq ft)	2.49	2.26
BR Sel Method	Energy only	Power Total (lb/ft s)	25.91	23.51

Plan: Existing Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Profile: Q50

E.G. US. (ft)	1123.84	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1123.80	E.G. Elev (ft)	1123.63	1123.64
Q Total (cfs)	1330.00	W.S. Elev (ft)	1121.58	1121.60
Q Bridge (cfs)	1330.00	Crit W.S. (ft)	1121.58	1121.60
Q Weir (cfs)		Max Chl Dpth (ft)	5.66	5.67
Weir Sta Lft (ft)		Vel Total (ft/s)	11.49	11.46
Weir Sta Rgt (ft)		Flow Area (sq ft)	115.71	116.08
Weir Submerg		Froude # Chl	0.85	0.85
Weir Max Depth (ft)		Specif Force (cu ft)	754.54	754.41
Min El Weir Flow (ft)	1124.01	Hydr Depth (ft)	4.10	4.12
Min El Prs (ft)	1121.76	W.P. Total (ft)	42.92	52.27
Delta EG (ft)	1.46	Conv. Total (cfs)	10092.1	9759.3
Delta WS (ft)	4.28	Top Width (ft)	28.20	28.21
BR Open Area (sq ft)	120.84	Frctn Loss (ft)		0.40
BR Open Vel (ft/s)	11.49	C & E Loss (ft)		0.00
BR Sluice Coef		Shear Total (lb/sq ft)	2.92	2.57
BR Sel Method	Energy only	Power Total (lb/ft s)	33.60	29.50

Plan: Existing Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Profile: Q100

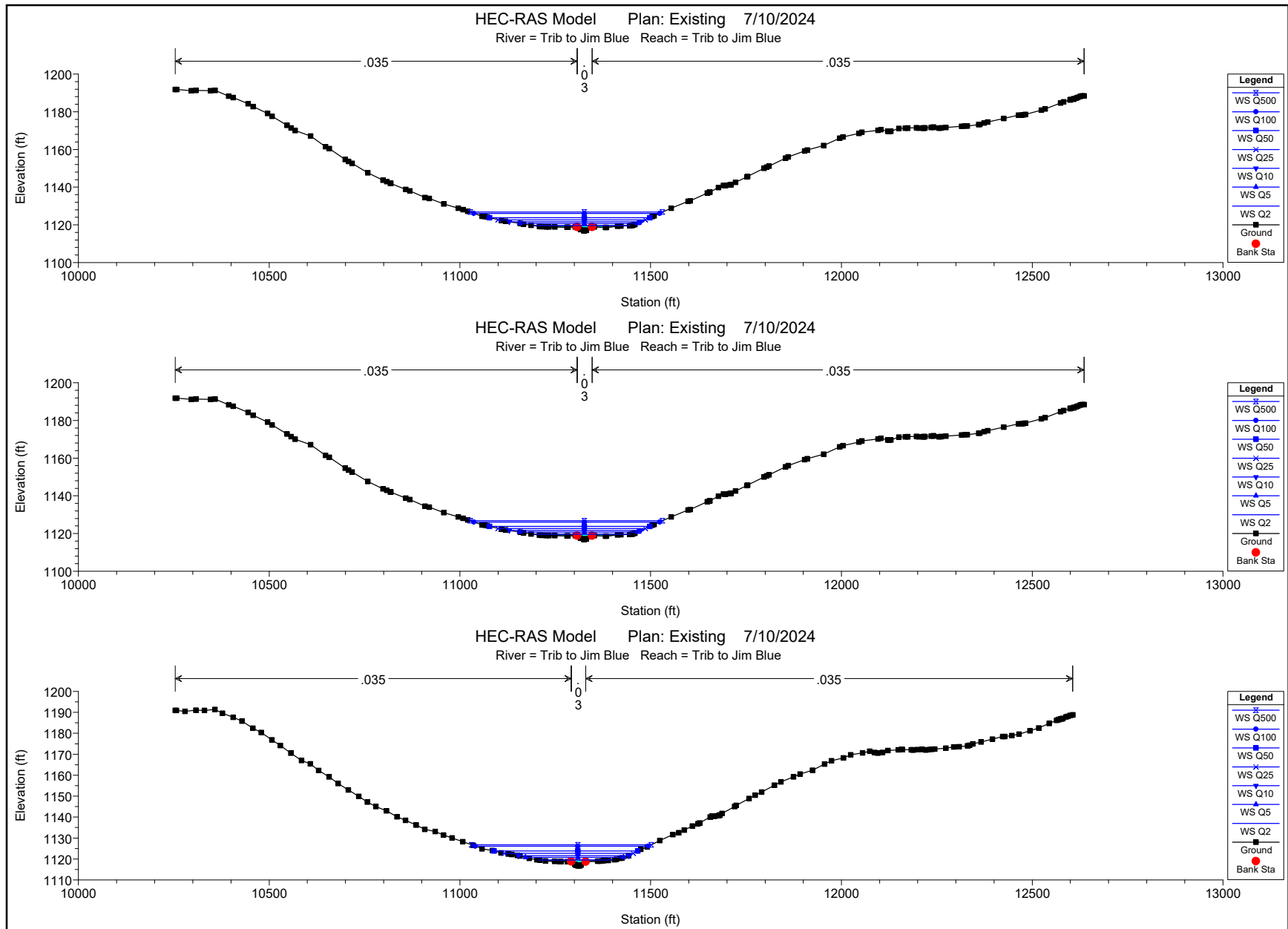
E.G. US. (ft)	1126.11	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1126.10	E.G. Elev (ft)	1126.10	1125.95
Q Total (cfs)	1560.00	W.S. Elev (ft)	1126.01	1125.21
Q Bridge (cfs)	340.44	Crit W.S. (ft)	1125.07	1125.21
Q Weir (cfs)		Max Chl Dpth (ft)	10.09	9.29
Weir Sta Lft (ft)		Vel Total (ft/s)	2.45	4.29
Weir Sta Rgt (ft)		Flow Area (sq ft)	635.82	364.06
Weir Submerg		Froude # Chl	0.14	0.40
Weir Max Depth (ft)		Specif Force (cu ft)	1340.48	1147.72
Min El Weir Flow (ft)	1124.01	Hydr Depth (ft)	1.68	1.18
Min El Prs (ft)	1121.76	W.P. Total (ft)	449.76	389.65

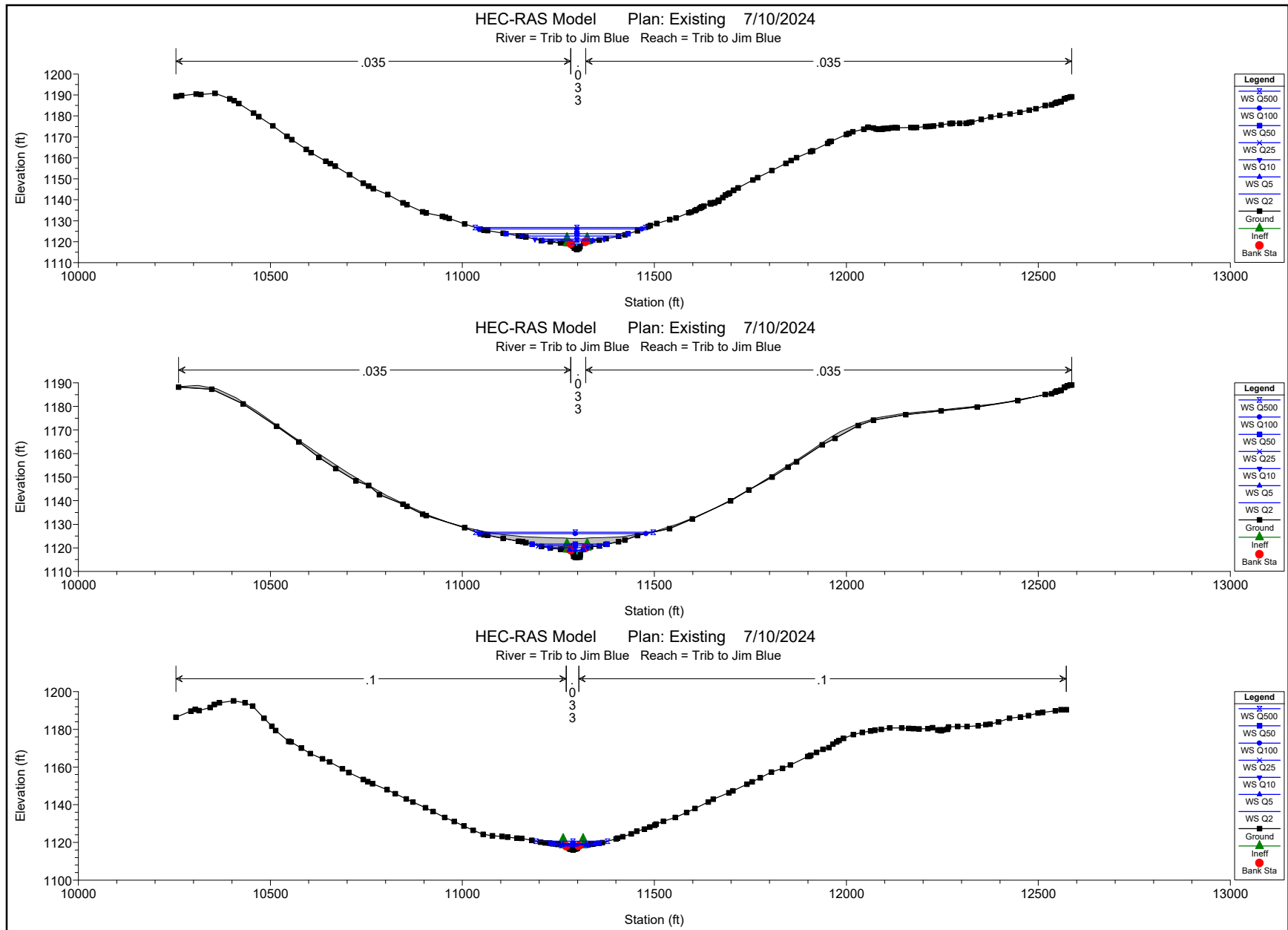
Plan: Existing Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Profile: Q100 (Continued)

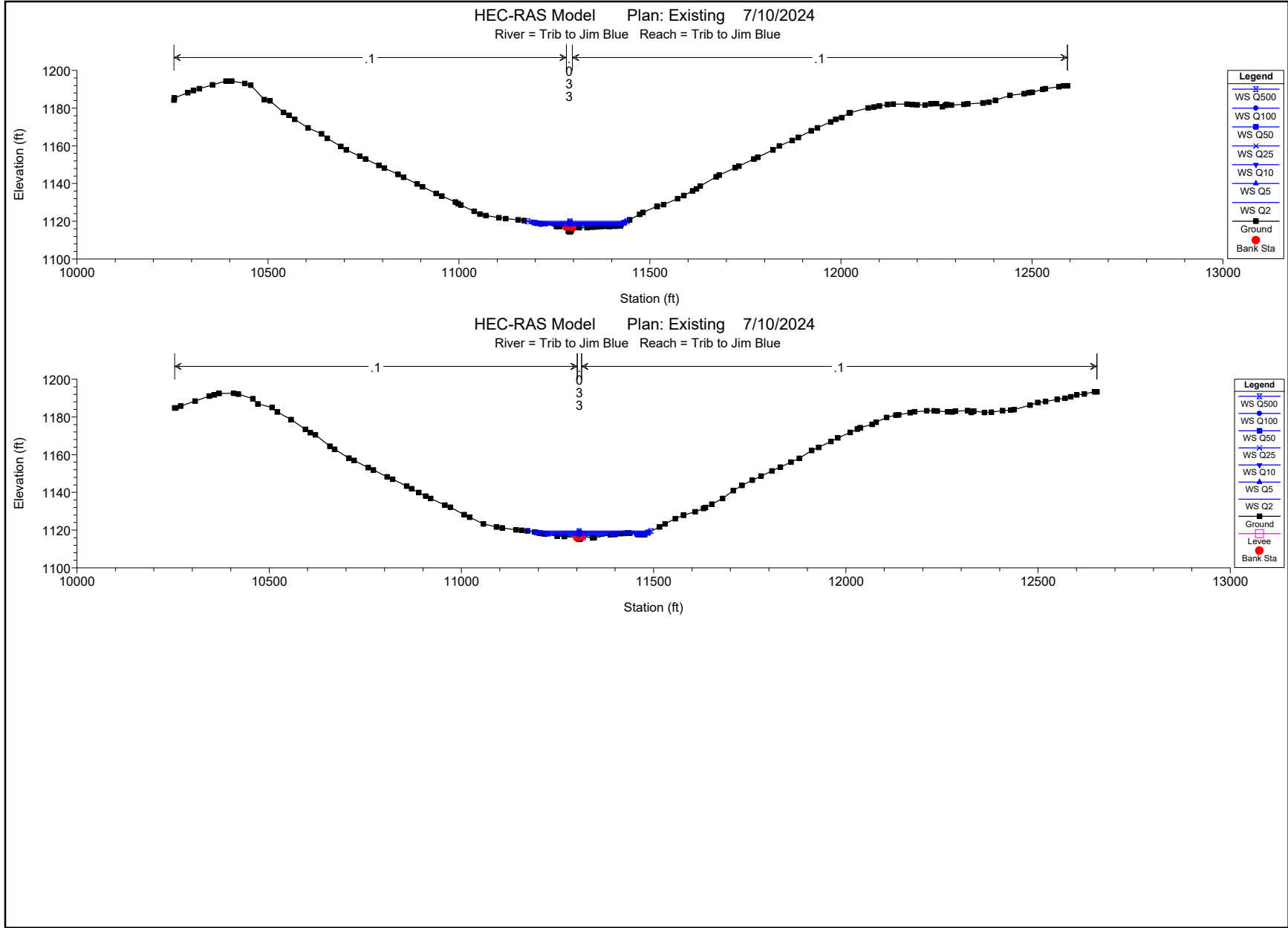
Delta EG (ft)	2.00	Conv. Total (cfs)	35194.0	12148.9
Delta WS (ft)	6.82	Top Width (ft)	377.84	307.47
BR Open Area (sq ft)	120.84	Frctn Loss (ft)	0.10	0.68
BR Open Vel (ft/s)	2.82	C & E Loss (ft)	0.06	0.10
BR Sluice Coef		Shear Total (lb/sq ft)	0.17	0.96
BR Sel Method	Energy only	Power Total (lb/ft s)	0.43	4.12

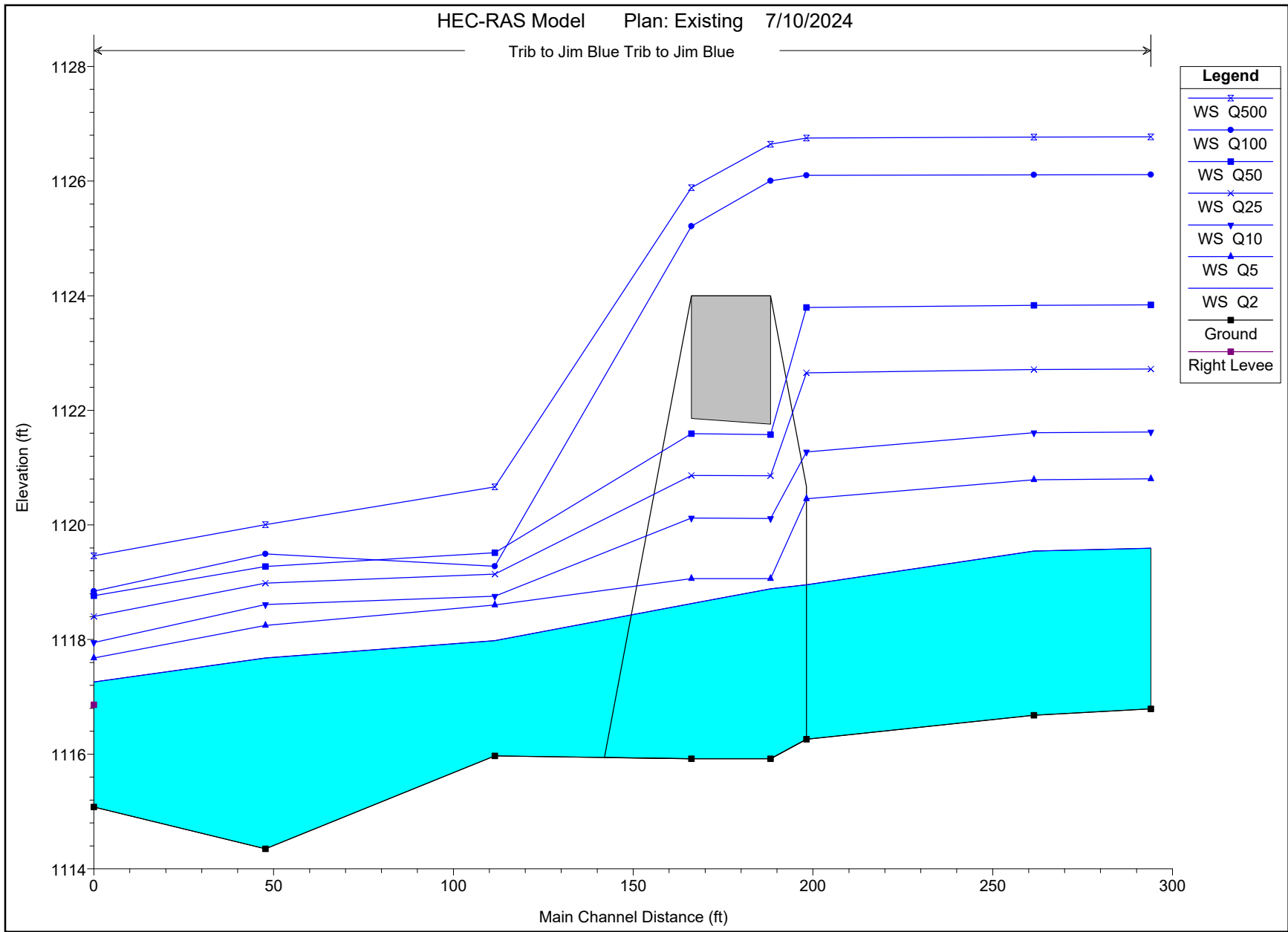
Plan: Existing Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Profile: Q500

E.G. US. (ft)	1126.78	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1126.75	E.G. Elev (ft)	1126.77	1126.61
Q Total (cfs)	2460.00	W.S. Elev (ft)	1126.65	1125.88
Q Bridge (cfs)	328.64	Crit W.S. (ft)	1125.45	1125.88
Q Weir (cfs)		Max Chl Dpth (ft)	10.72	9.96
Weir Sta Lft (ft)		Vel Total (ft/s)	2.76	4.15
Weir Sta Rgt (ft)		Flow Area (sq ft)	891.59	592.94
Weir Submerg		Froude # Chl	0.15	0.38
Weir Max Depth (ft)		Specif Force (cu ft)	1917.96	1625.55
Min El Weir Flow (ft)	1124.01	Hydr Depth (ft)	2.11	1.61
Min El Prs (ft)	1121.76	W.P. Total (ft)	494.45	451.31
Delta EG (ft)	1.66	Conv. Total (cfs)	57124.1	18913.1
Delta WS (ft)	6.09	Top Width (ft)	422.50	369.12
BR Open Area (sq ft)	120.84	Frctn Loss (ft)	0.09	0.50
BR Open Vel (ft/s)	2.72	C & E Loss (ft)	0.06	0.04
BR Sluice Coef		Shear Total (lb/sq ft)	0.21	1.39
BR Sel Method	Energy only	Power Total (lb/ft s)	0.58	5.76









HEC-RAS HEC-RAS 6.3.1 September 2022
 U.S. Army Corps of Engineers
 Hydrologic Engineering Center
 609 Second Street
 Davis, California

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X      X  XXXXXX   XXXX      XXXX      XX      XXXX
X      X  X        X      X      X      X      X
X      X  X        X        X      X      X      X
XXXXXXXX XXXX      X        XXX XXXX      XXXXXX   XXXX
X      X  X        X        X      X      X      X
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PROJECT DATA

Project Title: HEC-RAS Model
 Project File : Post Oak Rd.prj
 Run Date and Time: 7/10/2024 9:32:52 AM

Project in English units

Project Description:

CRS Info=<SpatialReference> <CoordinateSystem Code="2268"
 Unit="US_survey_Foot" AcadCode="OK83-SF" /></SpatialReference>

PLAN DATA

Plan Title: Existing

Plan File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
 Civil\Docs\Drainage\Models\Post Oak Rd.p02

Geometry Title: Existing

Geometry File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
 Civil\Docs\Drainage\Models\Post Oak Rd.g02

Flow Title : Steady Flow

Flow File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
 Civil\Docs\Drainage\Models\Post Oak Rd.f01

Plan Description:

Existing scenario w/32' Steel Girder bridge

Plan Summary Information:

Number of: Cross Sections	=	6	Multiple Openings	=	0
Culverts	=	0	Inline Structures	=	0
Bridges	=	1	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 20
 Maximum difference tolerance = 0.33
 Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
 Conveyance Calculation Method: At breaks in n values only
 Friction Slope Method: Average Conveyance
 Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Steady Flow

Flow File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
 Civil\Docs\Drainage\Models\Post Oak Rd.f01

Flow Data (cfs)

River	Reach	RS	Q2	Q5	Q10	Q25	Q50	Q100	Q500
Trib to Jim Blue	Trib to Jim Blue	1295	261	490	688	993	1330	1560	2460

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
Trib to Jim Blue	Trib to Jim Blue	Q2	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q5	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q10	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q25	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q50	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q100	Normal S = 0.01659
S = 0.01659			Normal
Trib to Jim Blue	Trib to Jim Blue	Q500	Normal S = 0.01659
S = 0.01659			Normal

GEOMETRY DATA

Geometry Title: Existing

Geometry File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
Civil\Docs\Drainage\Models\Post Oak Rd.g02

CROSS SECTION

RIVER: Trib to Jim Blue

REACH: Trib to Jim Blue RS: 1295

INPUT

Description:

Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10254	1191.82	10257.4	1191.8210295.92	1191.1410308.14	1191.3710346.66	1191.18			
10358.46	1191.36	10393.7	1188.310405.63	1187.4810444.75	1184.2110457.78	1182.72			
10496	1179.05	10507.8	1177.5910547.09	1172.7510557.51	1171.3710568.03	1170.06			
10608.82	1167.1810647.78	1161.4910657.59	1160.4410699.27	1154.6210708.43	1153.61				
10717.63	1152.5910758.32	1147.6410798.43	1143.7110808.06	114310817.55	1142.03				
10818.64	1141.9510858.11	1138.8410868.56	1137.9810908.37	1134.4910919.43	1134.06				
10957.95	1131.1110995.66	1128.8211007.82	1128.0311020.36	1127.2411058.45	1124.59				
11064.49	1124.411071.59	1124.1711108.76	1122.2711119.24	1121.9311158.19	1120.75				
11166.56	1120.3911186.81	1119.7911208.74	1119.1411214.36	1119.0111226.37	1118.93				
11233.37	1118.8911248.86	1118.8411280.92	1118.7311283.04	1118.7211302.51	1118.88				
11307.56	1118.8911309.64	1118.5811316.42	1117.5111324.57	1116.8911325.84	1116.79				
11330.06	1117.1111330.26	1117.1311331.11	1117.1411343.99	1118.5511346.43	1118.86				
11351.95	1118.9111381.21	1118.711383.78	1118.6811413.45	1119.3211422.07	1119.38				
11445.02	1119.5411449.64	1119.6811450.78	1119.7311452.22	1119.7911453.91	1119.86				
11458.59	1120.1411503.77	1124.3811508.87	1124.7511553.52	1128.8611597.93	1132.48				
11603.37	1132.7811648.12	1136.9211653.77	1137.3411655.31	1137.4611677.72	1139.79				
11690.88	1140.9111694.89	1140.9111695.44	1140.8311695.57	1140.7511695.66	1140.82				
11707	1141.2211710.58	1141.3511710.65	1141.3511710.72	1141.3911722.47	1142.53				
11752.38	1145.4911754.05	1145.711797.44	1149.9511803.85	1150.5711810.31	1151.16				
11854.06	1155.4711860.72	1156.111903.79	1159.2211910.64	1159.7411953.59	1162.1				
11995.94	1165.9712003.62	1166.6612045.95	1168.4812053.47	1169.112095.75	1170.18				
12103.47	1170.5412121.17	1169.6712124.51	1169.5612129.32	1169.6812150.81	1171.13				
12167.55	1171.3312173.33	1171.3412173.63	1171.3512196.38	1171.5712202.05	1171.33				
12214.13	1171.4212215.29	1171.2912215.36	1171.312216.73	1171.4312219.13	1171.47				
12235.12	1171.7	12240	1171.74 12241.4	1171.7312241.41	1171.7512255.92	1171.31			
12259.39	1171.3912261.97	1171.4412273.75	1171.6412314.92	1172.2312323.52	1172.48				
12329.7	1172.4812359.95	1173.1612362.54	1173.2812373.88	1174.112383.35	1174.52				
12425.54	1176.4912463.94	1178.1912472.07	1178.2712477.04	1178.38 12482.1	1178.55				
12523.98	1180.8512534.21	1181.4812574.09	1184.6112582.47	1185.27 12599.1	1186.31				
12599.94	1186.3612600.55	1186.3612600.76	1186.3712608.67	1186.7112609.13	1186.84				
12609.52	1186.8112615.59	1187.3212619.61	1187.6712625.89	1188.1312628.73	1188.3				
12631.81	1188.4312635.85	1188.43							

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10254	.03511307.56	.0311346.43	.035		

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	11307.56	11346.43		32.57	32.57	32.57		.1	.3

CROSS SECTION

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1262

INPUT

Description:

Station Elevation Data				num=	154				
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10254	1190.92	10257.2	1190.92	10279.71	1190.52	10307.89	1191.05	10330.19	1190.93
10357.67	1191.37	10378.01	1189.61	10405.87	1187.69	10428.51	1185.81	10457.57	1182.46
10479.24	1180.37	10507.43	1176.89	10529.58	1174.16	10557.03	1170.51	10584.97	1167.02
10607.91	1165.39	10629.62	1162.21	10657.25	1159.23	10680.55	1155.97	10707.62	1152.99
10735.06	1149.94	10757.58	1147.21	10779.56	1145.04	10807.42	1142.97	10835.11	1140.17
10857.44	1138.42	10885.28	1136.13	10907.62	1134.18	10935.26	1133.11	10957.36	1131.41
10979.69	1130.04	11007.33	1128.24	11034.93	1126.51	11057.73	1124.91	11085.52	1124.04
11107.86	1122.94	11126.71	1122.38	11136.06	1122.11	11150.72	1121.68	11157.66	1121.48
11181.65	1120.32	11201.38	1119.68	11209.09	1119.43	11223.95	1119.02	11248.38	1118.86
11262.39	1118.77	11263.22	1118.75	11265.14	1118.76	11282.1	1118.78	11291.95	1118.79
11301	1117.45	11302.63	1117.21	11304.55	1117.05	11309.54	1116.68	11310.54	1116.76
11313.86	1116.81	11314.64	1116.81	11317.34	1117.11	11330.11	1118.72	11361	1118.99
11366.24	1118.96	11372.95	1119.11	11377.13	1119.14	11388.71	1119.26	11404.93	1119.68
11410.33	1119.82	11420.09	1120.34	11424.33	1120.54	11441.56	1121.53	11474.13	1124.58
11490.92	1125.79	11523.98	1128.84	11558.29	1131.63	11573.87	1132.52	11587.8	1133.81
11608.99	1135.78	11624.28	1136.91	11628.45	1137.23	11655.92	1140.08	11661.01	1140.45
11665.47	1140.44	11665.5	1140.42	11665.64	1140.33	11669.49	1140.46	11677.38	1140.74
11681.35	1140.89	11681.4	1140.93	11681.47	1140.97	11686.7	1141.73	11720.1	1145.04
11724.47	1145.57	11757.98	1148.85	11774.38	1150.44	11791.01	1151.96	11824.38	1155.24
11841.45	1156.86	11874.16	1159.23	11891.74	1160.59	11924.12	1162.37	11955.85	1165.27
11974.1	1166.91	12005.63	1168.26	12024.04	1169.79	12055.26	1170.61	12073.92	1171.46
12086.88	1170.83	12095.32	1170.56	12107.49	1170.87	12121.69	1171.83	12149.32	1172.17
12156.94	1172.18	12157.75	1172.21	12159.32	1172.21	12159.69	1172.21	12182.78	1172.14
12186.39	1172.14	12188.39	1172.04	12199.1	1172.19	12210.9	1172.31	12211.82	1172.3
12211.83	1172.34	12221.41	1172.05	12229.72	1172.25	12235.91	1172.36	12244.38	1172.51
12273.86	1172.94	12294.16	1173.53	12308.83	1173.54	12330.25	1174.03	12336.32	1174.32
12344.34	1174.91	12365.84	1175.86	12395.5	1177.25	12422.31	1178.44	12427.96	1178.5
12446.49	1178.91	12465.51	1179.55	12494.34	1181.14	12517.42	1182.58	12544.54	1184.7
12563.63	1186.22	12568.79	1186.54	12568.97	1186.54	12569.46	1186.59	12574.8	1186.81
12577.59	1186.93	12577.75	1186.97	12578.55	1186.91	12580.62	1187.08	12588.98	1187.83
12593.47	1188.15	12599.46	1188.52	12605.99	1188.78	12606.04	1188.78		

Manning's n Values				num=	3
Sta	n Val	Sta	n Val	Sta	n Val
10254	.035	11291.95	.031	11330.11	.035

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	11291.95	11330.11		63.23	63.23	63.23		.1	.3

CROSS SECTION

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1199

INPUT

Description:

Station Elevation Data		num= 174	
Sta	Elev	Sta	Elev
10254	1189.3310256.27	1189.3310269.03	1189.7210306.68
10355.97	1190.810394.32	1188.2110405.69	1187.3110418.07
10469.66	1179.7510506.22	1175.2410543.46	1170.3110555.81
10606.07	1162.5110644.43	1158.410656.12	1157.2810669.06
10742.12	1147.8910755.96	1146.5210767.69	1145.3110805.95
10855.94	1137.65 10896.8	1134.3 10906	1133.7210947.96
10965.73	1131.1211006.13	1128.4911046.49	1125.9411056.15
11106.15	1124.0211146.34	1122.7911156.05	1122.5811165.65
11229.03	1120.0111255.93	1119.3811261.59	1119.3911271.38
11282.15	1118.9311288.08	1117.8211291.93	1116.9711296.51
11300.15	1116.5511303.08	1116.7711303.82	1116.8211306.58
11318.25	1119.6511321.11	1119.9511333.63	1120.3311356.37
11406.41	1122.5811423.24	1123.31 11456.2	1125.2411483.65
11506.42	1128.6611540.17	1130.5711556.27	1131.2811589.54
11606.61	1134.811609.29	1135.2411618.09	1135.9111621.79
11629.24	1136.9311646.07	1138.3611646.08	1138.3711646.21
11646.64	1138.4711646.67	1138.4211646.87	1138.0411654.98
11657.7	1138.6711666.62	1139.2711666.65	1139.3311666.84
11667.28	1139.68 11667.3	1139.6811667.41	1139.6611677.83
11691.81	1142.7911693.98	1142.9911695.74	1143.2111705.97
11718.18	1145.74 11756.7	1149.46 11769.1	1150.6111806.18
11856.19	1158.7411870.35	1160.0811906.57	1162.8811911.83
11956.4	1167.6511960.72	1167.9312000.15	1171.1812006.49
12045.2	1173.7112056.12	1174.6112057.25	1174.66 12070.6
12082.53	1173.6612087.45	1173.7112093.15	1173.7512093.97
12097.05	1173.9412097.65	1173.9112100.36	1173.9512106.19
12108.6	1174.0512109.91	1174.1212118.42	1174.3312127.82
12168.24	1174.5412175.44	1174.4912182.57	1174.512206.02
12218.68	1175.0512226.89	1175.1912246.65	1175.7212269.52
12276.78	1176.4912295.18	1176.5312311.96	1176.5312319.91
12351.24	1178.3312376.39	1179.4412399.46	1180.3112426.39
12476.45	1182.7312493.62	1183.4712518.48	1185.0312534.19
12547.64	1186.4512548.07	1186.4712548.36	1186.4912551.86
12558.75	1186.8512559.21	1186.8712567.82	1188.1112568.28
12575.38	1188.6412582.34	1189.0612583.59	1189.1112586.77

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
10254	.03511282.15	.03311321.11	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11282.15	11321.11	86.7	86.7	86.7	.1	.3

Ineffective Flow		num= 2	
Sta L	Sta R	Elev	Permanent
10254	11272.72	1121.76	F
11325.07	112586.77	1121.76	F

BRIDGE

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1154.25

INPUT

Description:

Distance from Upstream XS = 10
 Deck/Roadway Width = 22
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 119

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
10259.59	1188.33		10260.7	1188.35		10309.56	1188.89	
10309.74	1188.89		10310.97	1188.86		10311.35	1188.85	
10359.07	1187.46		10359.67	1187.44		10405.76	1184.07	
10409.71	1183.75		10455.83	1178.95		10459.73	1178.55	
10463.49	1178.11		10509.68	1172.83		10558.51	1167.25	
10559.6	1167.12		10579.26	1164.99		10608.94	1161.77	
10609.29	1161.73		10659.7	1156.33		10659.7	1156.33	
10660.24	1156.27		10708.81	1151.15		10709.53	1151.08	
10710.27	1151.01		10759.73	1146.19		10805.87	1141.98	
10808.9	1141.71		10809.06	1141.69		10827.75	1140.23	
10859.26	1137.77		10859.52	1137.75		10909.23	1134.06	
10909.65	1134.03		10959.14	1131.04		10959.76	1131	
10959.96	1130.99		10960.39	1130.97		11009.66	1128.62	
11011	1128.57		11059.7	1126.78		11109.44	1125.52	
11109.71	1125.51		11143.83	1124.99		11159.18	1124.76	
11159.7	1124.75		11208.67	1124.4		11209.42	1124.4	
11209.75	1124.4		11241.21	1124.25		11259.41	1124.16	
11259.79	1124.16		11282.72	1124	1121.76	11315.07	1124	1121.76
11339.73	1124.3		11339.99	1124.3		11359.68	1124.33	
11409.22	1124.61		11409.81	1124.61		11458.83	1125.71	
11459.64	1125.72		11467.64	1125.99		11508.38	1127.33	
11509.86	1127.39		11557.46	1129.91		11559.78	1130.03	
11608.14	1133.18		11609.78	1133.29		11610.36	1133.33	
11658.81	1136.94		11660.01	1137.03		11661.26	1137.14	
11709.11	1141.18		11709.74	1141.24		11758.84	1145.86	
11760.35	1146		11808.92	1150.89		11809.91	1151	
11848.67	1155		11859.73	1156.13		11860	1156.16	
11860.29	1156.19		11900.2	1160.42		11909.86	1161.44	
11909.92	1161.45		11911.71	1161.65		11934.79	1164.26	
11950.63	1165.98		11959.64	1166.95		11970.07	1167.97	
11980.27	1168.96		11980.78	1169		11994.52	1170.03	
12030.14	1172.69		12031.43	1172.76		12080.44	1175.2	
12082.81	1175.27		12130.35	1176.53		12131.53	1176.55	
12180.15	1177.48		12228.69	1178.22		12229.87	1178.24	
12275.47	1179		12279.55	1179.07		12280.32	1179.08	
12328.95	1179.96		12330.41	1179.99		12378.22	1180.94	
12380.21	1180.97		12427.77	1182.16		12430.14	1182.21	
12477.82	1183.72		12480.23	1183.8		12517.41	1184.95	
12518.49	1184.98		12564.07	1187.36		12565.35	1187.42	
12565.9	1187.46		12579.84	1187.46				

Upstream Bridge Cross Section Data

Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10261.05	1188.22	10347.32	1187.31	10429.27	1181.07	10516.12	1171.52	10574.3	1164.9
10626.19	1158.41	10670.34	1153.64	10722.63	1148.39	10755.96	1146.52	10784.21	1142.54
10844.95	1138.54	10855.94	1137.65	10896.8	1134.3	10906	1133.72	11006.13	1128.49
11046.49	1125.94	11056.15	1125.55	11066.01	1125.27	11106.15	1124.02	11146.34	1122.79
11156.05	1122.58	11165.65	1122.23	11206.3	1120.55	11229.03	1120.01	11255.93	1119.38
11261.59	1119.39	11271.38	1119.26	11276.65	1119.19	11282.15	1118.93	11288.08	1117.82
11289.96	1117.33	11290.06	1116.35	11294.17	1115.92	11298.44	1115.93	11302.31	1116.05
11306.67	1116.08	11307.1	1117.18	11316.05	1119.26	11318.25	1119.65	11321.11	1119.95
11333.63	1120.33	11356.37	1120.79	11374.34	1121.48	11406.41	1122.58	11423.24	1123.31
11456.2	1125.24	11539.49	1128.11	11598.75	1132.26	11698.68	1139.95	11746.32	1144.58
11806.74	1149.95	11848	1154.22	11870.51	1156.54	11937.11	1163.66	11970.58	1166.42
12031	1171.91	12070.6	1174.22	12154.61	1176.48	12247.07	1178.14	12340.98	1179.76
12446.38	1182.49	12518.48	1185.03	12534.19	1185.41	12543.77	1186.08	12547.64	1186.45
12548.07	1186.47	12548.36	1186.49	12551.86	1186.61	12558.27	1186.82	12558.75	1186.85
12559.21	1186.87	12567.82	1188.11	12568.28	1188.17	12568.95	1188.22	12575.38	1188.64
12582.34	1189.06	12583.59	1189.11	12586.77	1189.11				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10261.05	.035	11282.15	.033	11321.11	.035

Bank Sta: Left Right Coeff Contr. Expan.
11282.15 11321.11 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
10261.05	11272.72	1121.76	F
11325.07	12586.77	1121.76	F

Downstream Deck/Roadway Coordinates

num= 118

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
10249.94	1188.35		10298.8	1188.89		10298.98	1188.89	
10300.21	1188.86		10300.59	1188.85		10348.31	1187.46	
10348.91	1187.44		10395	1184.07		10398.95	1183.75	
10445.07	1178.95		10448.97	1178.55		10452.73	1178.11	
10498.92	1172.83		10547.75	1167.25		10548.84	1167.12	
10568.5	1164.99		10598.18	1161.77		10598.53	1161.73	
10648.94	1156.33		10648.94	1156.33		10649.48	1156.27	
10698.05	1151.15		10698.77	1151.08		10699.51	1151.01	
10748.97	1146.19		10795.11	1141.98		10798.14	1141.71	
10798.3	1141.69		10816.99	1140.23		10848.5	1137.77	
10848.76	1137.75		10898.47	1134.06		10898.89	1134.03	
10948.38	1131.04		10949	1131		10949.2	1130.99	
10949.63	1130.97		10998.9	1128.62		11000.24	1128.57	
11048.94	1126.78		11098.68	1125.52		11098.95	1125.51	
11133.07	1124.99		11148.42	1124.76		11148.94	1124.75	
11197.91	1124.4		11198.66	1124.4		11198.99	1124.4	
11230.45	1124.25		11248.65	1124.16		11249.03	1124.16	
11272.02	1124	1121.86	11304.65	1124	1121.86	11328.97	1124.3	
11329.23	1124.3		11348.92	1124.33		11398.46	1124.61	
11399.05	1124.61		11448.07	1125.71		11448.88	1125.72	
11456.88	1125.99		11497.62	1127.33		11499.1	1127.39	
11546.7	1129.91		11549.02	1130.03		11597.38	1133.18	

11599.02	1133.29	11599.6	1133.33	11648.05	1136.94
11649.25	1137.03	11650.5	1137.14	11698.35	1141.18
11698.98	1141.24	11748.08	1145.86	11749.59	1146
11798.16	1150.89	11799.15	1151	11837.91	1155
11848.97	1156.13	11849.24	1156.16	11849.53	1156.19
11889.44	1160.42	11899.1	1161.44	11899.16	1161.45
11900.95	1161.65	11924.03	1164.26	11939.87	1165.98
11948.88	1166.95	11959.31	1167.97	11969.51	1168.96
11970.02	1169	11983.76	1170.03	12019.38	1172.69
12020.67	1172.76	12069.68	1175.2	12072.05	1175.27
12119.59	1176.53	12120.77	1176.55	12169.39	1177.48
12217.93	1178.22	12219.11	1178.24	12264.71	1179
12268.79	1179.07	12269.56	1179.08	12318.19	1179.96
12319.65	1179.99	12367.46	1180.94	12369.45	1180.97
12417.01	1182.16	12419.38	1182.21	12467.06	1183.72
12469.47	1183.8	12506.65	1184.95	12507.73	1184.98
12553.31	1187.36	12554.59	1187.42	12555.14	1187.46
12569.08	1187.46				

Downstream Bridge Cross Section Data

Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10252.13	1188.13	10288.61	1187.94	10308.15	1187.35	10373.36	1183.69	10405.17	1182.3
10436.99	1178.69	10518.54	1167.69	10572.33	1162.19	10635.08	1155.39	10686.63	1150.94
10753.87	1145.18	10843.54	1137.31	10909.97	1131.69	11028.34	1126.46	11054.16	1124.29
11078.26	1123.53	11103.89	1123.2	11117.6	1122.77	11141.98	1122.3	11154.1	1122.16
11181.07	1121.13	11203.9	1120.16	11215.65	1119.79	11226.87	1119.65	11234.81	1119.33
11247.16	1119.05	11249.87	1118.97	11261.71	1118.62	11270.34	1118.06	11272.61	1117.76
11278.49	1116.58	11279.46	1116.31	11283.46	1116.11	11283.8	1115.92	11289.85	1115.93
11291.63	1116.05	11295.91	1116.07	11296.07	1116.61	11298.15	1116.74	11299.7	1117.08
11303.62	1118.16	11306.53	1118.25	11310.36	1118.44	11318.41	1118.52	11327.46	1118.75
11335.04	1118.97	11339.86	1119.11	11354.87	1119.46	11364.69	1119.93	11400.38	1121.88
11404.27	1122.32	11417.63	1123.04	11439.92	1124.55	11454.44	1125.98	11532.81	1128.56
11632.4	1133.88	11681.35	1138.59	11748.88	1143.31	11836.65	1151.07	11937.93	1160.9
12000.39	1167.5	12069.6	1170.57	12130.37	1173.43	12181.01	1174.87	12277.22	1174.87
12368.38	1178.96	12461.22	1183.67	12544.3	1189.83	12559.2	1190.49	12572.76	1190.49

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10252.13	.11	1270.34	.03	11303.62	.1

Bank Sta: Left Right Coeff Contr. Expan.

11270.34 11303.62 .1 .3

Ineffective Flow num= 2

Sta L Sta R Elev Permanent

10252.13 11262.72 1121.86 F

11314.65 12572.76 1121.86 F

Upstream Embankment side slope	=	3 horiz. to 1.0 vertical
Downstream Embankment side slope	=	3 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow	=	.98
Elevation at which weir flow begins	=	
Energy head used in spillway design	=	
Spillway height used in design	=	
Weir crest shape	=	Broad Crested

Number of Abutments = 2

Abutment Data

Upstream num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11282.07	1121.86	11284.82	1121.86	11284.87	1120.87	11284.91	1119.71	11287.58	1119.54
11290.17	1119.43	11290.2	1118.07	11290.24	1116.31	11294.23	1115.92		

Downstream num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11272.02	1121.86	11274.06	1121.86	11274.11	1120.87	11274.15	1119.71	11276.82	1119.54
11279.41	1119.43	11279.44	1118.07	11279.48	1116.31	11283.47	1116.11		

Abutment Data

Upstream num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11302.31	1116.05	11306.66	1116.07	11306.69	1117.74	11306.71	1119.22	11309.59	1119.4
11312.65	1119.58	11312.87	1120.61	11313.08	1121.81	11315.07	1121.81		

Downstream num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
11291.55	1116.05	11295.9	1116.07	11295.93	1117.74	11295.95	1119.22	11298.83	1119.4
11301.89	1119.58	11302.11	1120.61	11302.32	1121.86	11304.65	1121.86		

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

Energy

Selected Low Flow Methods = Highest Energy Answer

High Flow Method

Energy Only

Additional Bridge Parameters

Add Friction component to Momentum

Do not add Weight component to Momentum

Class B flow critical depth computations use critical depth
inside the bridge at the upstream end

Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Trib to Jim Blue

REACH: Trib to Jim Blue RS: 1112

INPUT

Description:

Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10254	1186.4	10293.3	1189.71	10304.06	1190.57	10314.07	1189.91	10343.23	1191.56
10354.06	1193.24	10367.48	1194.03	10404.24	1195.07	10434.28	1194.02	10453.72	1192.31
10483.73	1185.86	10504.18	1181.55	10513.91	1179.36	10547.9	1173.54	10554.11	1173.28
10580.53	1170.08	10604.14	1167.08	10635.7	1164.32	10654.04	1162.66	10687.54	1159.11
10704.17	1157.11	10741.93	1153.36	10753.93	1152.27	10765.89	1151.11	10803.56	1147.95
10825.45	1145.87	10853.97	1143.12	10871.03	1141.42	10903.92	1138.42	10923.69	1136.41

10953.85 1133.2510978.52 1131.111004.25 1128.7611028.34 1126.4611054.16 1124.29
 11078.26 1123.5311103.89 1123.2 11117.6 1122.7711141.98 1122.3 11154.1 1122.16
 11181.07 1121.13 11203.9 1120.1611215.65 1119.7911226.87 1119.6511234.81 1119.33
 11247.16 1119.0511249.87 1118.9711261.71 1118.6211270.34 1118.0611272.61 1117.76
 11278.49 1116.5811282.33 1116.3311287.75 1115.9711292.33 1116.3111296.07 1116.6
 11298.15 1116.74 11299.7 1117.0811303.62 1118.1611306.53 1118.2511310.36 1118.44
 11318.41 1118.5211327.46 1118.7511335.04 1118.9711339.86 1119.1111354.87 1119.46
 11364.69 1119.9311400.38 1121.8811404.27 1122.3211417.63 1123.0411439.92 1124.55
 11454.44 1125.9811474.18 1127.1211488.37 1128.1711501.07 1129.1111504.55 1129.7
 11523.57 1131.19 11554.6 1133.2911584.23 1135.8711605.89 1138.08 11640.3 1141.45
 11653.25 1142.9811694.22 1146.3511704.71 1147.34 11741.2 1150.8611754.63 1152.15
 11775.67 1154.2311804.67 1157.2911833.86 1159.2911854.29 1161.0811899.94 1165.56
 11904.12 1165.7511907.31 1166.2811922.02 1167.811938.84 1169.3911954.19 1170.23
 11965.16 1172.2211974.72 1173.2511980.98 1174 11993 1175.15 12017.9 1177.19
 12041.41 1178.3812063.17 1179.0612074.52 1179.4212090.94 1180.0312112.78 1180.76
 12144.43 1180.7412162.79 1180.512174.74 1180.3512189.59 1180.2412212.58 1180.39
 12224.42 1180.8912238.05 1179.6512243.33 1179.75 12244.4 1179.3812247.54 1179.17
 12252.55 1179.7312262.77 1180.0112263.59 1180.1512266.03 1181.1912290.36 1181.48
 12314.45 1181.5112343.27 1181.83 12363.2 1182.5212374.43 1182.8 12396.3 1183.87
 12424.98 1185.86 12453.2 1186.5712474.54 1187.26 12499 1188.6412511.18 1188.94
 12544.3 1189.83 12559.2 1190.4912572.76 1190.49

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 10254 .111270.34 .03311303.62 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 11270.3411303.62 63.77 63.77 63.77 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 1025411262.72 1121.86 F
 11314.6512572.76 1121.86 F

CROSS SECTION

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1048

INPUT

Description:

Station Elevation Data num= 132
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 10254 1184.2310254.97 1185.410289.95 1188.2110305.08 1189.2610320.18 1190.31
 10355 1192.2810390.09 1194.3510405.29 1194.37 10439.5 1193.1210454.76 1192.15
 10490.52 1184.5710505.22 1183.8310540.71 1177.75 10555.1 1176.1410569.74 1174.07
 10605.01 1169.5710640.57 1166.3510655.36 1163.9410690.77 1159.6810705.29 1157.83
 10740.75 1154.5910755.34 1153.07 10790 1149.6810804.33 1148.2510840.48 1144.8
 10855.03 1143.3610890.57 1139.8210905.04 1138.2710940.13 1134.7110954.98 1133.32
 10990.37 1130.2310998.44 1129.3611005.12 1128.6411039.64 1125.3511054.97 1123.81
 11070.53 1123.04 11104.6 1121.93 11122.5 1121.3811154.86 1120.7311170.21 1120.44
 11202.72 1119.0411205.16 1118.9611214.51 1118.59 11255 1117.36 11255.5 1117.35
 11257.24 1117.2911264.04 1117.2511281.01 1117.0811286.77 1114.7911286.99 1114.72
 11287.13 1114.7111290.47 1114.3511290.81 1114.411293.48 1114.8811295.03 1115.91
 11296.15 1116.6511296.57 1116.8211300.27 1116.6811314.72 1116.5911335.17 1116.66

11348.69	1116.8311360.75	1116.9611371.53	1117.2711375.41	1117.3511379.77	1117.44
11384.64	1117.5111393.32	1117.2411404.03	1117.45 11409.1	1117.3711415.95	1117.54
11419.95	1117.6311422.26	1117.6711424.07	1118.1511432.58	1119.3111447.07	1120.73
11472.85	1123.7411481.55	1124.65 11518.3	1127.9811518.97	1127.8711535.54	1128.82
11572.37	1131.9311588.76	1133.6611611.94	1136.0911621.95	1137.19 11631.8	1138.66
11673.5	1143.5811681.53	1144.4111722.84	1148.3 11733.2	1149.311772.39	1153.04
11782.07	1153.9611821.94	1157.7811838.75	1159.9511872.17	1162.8411888.69	1164.45
11922.22	1167.9511938.52	1169.4711972.98	1172.7111986.09	1174.1112001.77	1174.93
12022.02	1177.4 12024.5	1177.6212071.81	1180.1112086.22	1180.5612100.54	1181.1
12121.96	1181.8712136.62	1182.1 12172.7	1182.1 12186.8	1181.9112199.52	1181.74
12220.17	1181.58 12235.2	1182.212249.93	1182.3412265.85	1180.712273.51	1181.54
12276.84	1182.0312289.33	1181.6712322.53	1181.9612332.55	1182.2512372.28	1182.76
12372.36	1182.7712387.03	1183.1512404.76	1184.15 12442.6	1186.7712479.95	1187.69
12492.26	1188.1312500.73	1188.39 12528.2	1189.9512534.93	1190.3512570.93	1191.29
12582.28	1191.79 12592.8	1191.79			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10254	.111281.01	.03311296.57	.1		

Bank	Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
	11281.01	111296.57	47.73	47.73	47.73	.1	.3

CROSS SECTION

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1000

INPUT

Description:

Station Elevation Data		num= 131							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10254	1184.7910257.13	1184.7910269.88	1185.8210307.23	1188.410344.43	1191.01				
10356.9	1191.7110369.48	1192.4610407.33	1192.5110420.04	1192.0510457.33	1189.66				
10470.6	1186.8510507.51	1184.9710520.96	1182.6710557.18	1178.6210593.98	1173.4				
10607.1	1171.7210620.35	1170.52 10657.8	1164.4310670.51	1162.9 10707.3	1158.22				
10720.85	1156.9810757.48	1153.1710770.94	1151.8510806.96	1148.2510820.92	1146.92				
10857.3	1143.310870.86	1141.9510889.38	1139.97 10907.1	1138.0810920.33	1136.74				
10957.17	1133.2910971.19	1132.0711007.32	1128.211021.49	1126.8611057.13	1123.3				
11091.27	1121.6411106.18	1121.1811141.79	1120.1311156.75	1119.8511171.96	1119.48				
11190.81	1119.0111202.33	1118.4511205.57	1118.3411212.18	1118.1811215.28	1118.08				
11218.99	1117.9611248.78	1116.7911268.19	1116.61 11301.2	1116.1611301.53	1116.16				
11301.61	1116.1311304.56	1115.2611306.41	1115.0811308.26	1115.3311309.43	1115.49				
11309.5	1115.5211310.97	1116.1111312.84	1116.8611316.78	1116.7111341.27	1115.84				
11345.26	1115.9611387.51	1117.5111396.27	1117.7311398.25	1117.81 11400.1	1117.87				
11413.68	1118.0811423.38	1118.2311432.67	1118.5611438.39	1118.3911460.76	1117.67				
11468.48	1117.6911473.17	1117.6211476.64	1117.5411484.87	1118.6611515.34	1121.65				
11529.92	1123.3411556.19	1126.0711577.83	1128.0211578.21	1127.9711608.15	1129.68				
11629.71	1131.4811634.91	1132.0311651.44	1133.7611679.33	1136.8111707.08	1140.93				
11729.97	1143.6411756.88	1146.4211779.69	1148.57 11808.2	1151.3311829.33	1153.34				
11857.26	115611879.13	1158.111911.08	1162.2311929.31	1163.82 11961.3	1166.94				
11979.47	1168.8412011.22	1171.8212030.01	1173.5912037.12	1174.3512068.42	1176.01				
12078.64	1177.2512106.22	1179.67 12130.1	1180.9412137.31	1181.1612167.02	1182.29				
12179.1	1182.7312210.16	1183.2112229.88	1183.2212237.54	1183.1112265.09	1182.77				

12276.31 1182.6812284.43 1183.0212316.93 1183.3512326.25 1182.412330.73 1182.89
 12332.67 1183.1712360.85 1182.3812378.58 1182.53 12407.5 1183.3812429.12 1183.66
 12437.05 1183.8712479.23 1186.2612499.47 1187.6612519.36 1188.1512549.59 1189.24
 12570.47 1189.8912584.98 1190.7112600.88 1191.64 12620.1 1192.1512647.23 1193.34
 12653.13 1193.34

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 10254 .111301.53 .03311312.84 .1

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 11301.5311312.84 0 0 0 .1 .3
 Right Levee Station=11312.84 Elevation= 1116.86

SUMMARY OF MANNING'S N VALUES

River:Trib to Jim Blue

Reach	River Sta.	n1	n2	n3
Trib to Jim Blue	1295	.035	.03	.035
Trib to Jim Blue	1262	.035	.03	.035
Trib to Jim Blue	1199	.035	.033	.035
Trib to Jim Blue	1154.25	Bridge		
Trib to Jim Blue	1112	.1	.033	.1
Trib to Jim Blue	1048	.1	.033	.1
Trib to Jim Blue	1000	.1	.033	.1

SUMMARY OF REACH LENGTHS

River: Trib to Jim Blue

Reach	River Sta.	Left	Channel	Right
Trib to Jim Blue	1295	32.57	32.57	32.57
Trib to Jim Blue	1262	63.23	63.23	63.23
Trib to Jim Blue	1199	86.7	86.7	86.7
Trib to Jim Blue	1154.25	Bridge		
Trib to Jim Blue	1112	63.77	63.77	63.77
Trib to Jim Blue	1048	47.73	47.73	47.73
Trib to Jim Blue	1000	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Trib to Jim Blue

Reach	River Sta.	Contr.	Expan.
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Trib to Jim Blue	1295	.1	.3
Trib to Jim Blue	1262	.1	.3
Trib to Jim Blue	1199	.1	.3
Trib to Jim Blue	1154.25	Bridge	
Trib to Jim Blue	1112	.1	.3
Trib to Jim Blue	1048	.1	.3
Trib to Jim Blue	1000	.1	.3

Appendix E - Hydraulic Model - Proposed Bridge

HEC-RAS Plan: Proposed: 3-12"x7" RCB River: Trib to Jim Blue Reach: Trib to Jim Blue

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Trib to Jim Blue	1295 U/S FAR	Q2	261.00	1116.79	1119.59	1119.02	1119.63	0.000768	2.09	201.12	252.96	0.27
Trib to Jim Blue	1295 U/S FAR	Q5	490.00	1116.79	1120.46	1119.33	1120.49	0.000319	1.74	443.15	297.12	0.18
Trib to Jim Blue	1295 U/S FAR	Q10	688.00	1116.79	1121.02	1119.55	1121.04	0.000246	1.72	614.14	318.60	0.17
Trib to Jim Blue	1295 U/S FAR	Q25	993.00	1116.79	1121.73	1119.76	1121.75	0.000202	1.77	850.66	349.52	0.16
Trib to Jim Blue	1295 U/S FAR	Q50	1330.00	1116.79	1122.39	1119.95	1122.41	0.000177	1.84	1090.47	376.03	0.15
Trib to Jim Blue	1295 U/S FAR	Q100	1560.00	1116.79	1122.89	1120.06	1122.92	0.000151	1.82	1284.45	391.31	0.14
Trib to Jim Blue	1295 U/S FAR	Q500	2460.00	1116.79	1124.79	1120.45	1124.81	0.000093	1.76	2083.44	453.70	0.12
Trib to Jim Blue	1262 U/S	Q2	261.00	1116.68	1119.53		1119.60	0.000957	2.42	162.36	193.44	0.30
Trib to Jim Blue	1262 U/S	Q5	490.00	1116.68	1120.43		1120.47	0.000447	2.12	360.10	242.69	0.22
Trib to Jim Blue	1262 U/S	Q10	688.00	1116.68	1120.99		1121.03	0.000351	2.11	502.36	264.46	0.20
Trib to Jim Blue	1262 U/S	Q25	993.00	1116.68	1121.70		1121.74	0.000291	2.18	699.96	293.46	0.19
Trib to Jim Blue	1262 U/S	Q50	1330.00	1116.68	1122.36		1122.41	0.000259	2.27	903.57	323.15	0.18
Trib to Jim Blue	1262 U/S	Q100	1560.00	1116.68	1122.87		1122.91	0.000223	2.24	1073.30	345.65	0.17
Trib to Jim Blue	1262 U/S	Q500	2460.00	1116.68	1124.77		1124.81	0.000132	2.12	1792.55	415.01	0.14
Trib to Jim Blue	1199 U/S BRIDGE	Q2	261.00	1116.26	1118.72	1118.72	1119.39	0.014587	6.54	39.89	29.77	1.00
Trib to Jim Blue	1199 U/S BRIDGE	Q5	490.00	1116.26	1119.54	1119.54	1120.32	0.011066	7.16	71.64	68.60	0.92
Trib to Jim Blue	1199 U/S BRIDGE	Q10	688.00	1116.26	1119.99	1119.99	1120.88	0.010897	7.75	93.89	92.58	0.93
Trib to Jim Blue	1199 U/S BRIDGE	Q25	993.00	1116.26	1120.55	1120.55	1121.59	0.009501	8.45	127.99	138.53	0.90
Trib to Jim Blue	1199 U/S BRIDGE	Q50	1330.00	1116.26	1121.04	1121.04	1122.24	0.008993	9.18	159.28	168.62	0.90
Trib to Jim Blue	1199 U/S BRIDGE	Q100	1560.00	1116.26	1121.88	1121.32	1122.79	0.005064	8.05	212.93	212.01	0.71
Trib to Jim Blue	1199 U/S BRIDGE	Q500	2460.00	1116.26	1124.71	1122.28	1124.79	0.000370	3.10	1231.39	363.21	0.21
Trib to Jim Blue	1154.25	Culvert										
Trib to Jim Blue	1112 D/S BRIDGE	Q2	261.00	1115.97	1117.98	1117.98	1118.62	0.014864	6.40	40.77	32.05	1.00
Trib to Jim Blue	1112 D/S BRIDGE	Q5	490.00	1115.97	1118.74	1118.74	1119.56	0.010911	7.35	75.13	69.04	0.92
Trib to Jim Blue	1112 D/S BRIDGE	Q10	688.00	1115.97	1119.20	1119.20	1120.18	0.010046	8.12	104.74	102.95	0.92
Trib to Jim Blue	1112 D/S BRIDGE	Q25	993.00	1115.97	1119.76	1119.76	1120.99	0.009804	9.21	140.84	143.21	0.94
Trib to Jim Blue	1112 D/S BRIDGE	Q50	1330.00	1115.97	1120.30	1120.30	1121.77	0.009628	10.19	175.53	170.99	0.95
Trib to Jim Blue	1112 D/S BRIDGE	Q100	1560.00	1115.97	1120.62	1120.62	1122.26	0.009725	10.85	195.81	184.24	0.97
Trib to Jim Blue	1112 D/S BRIDGE	Q500	2460.00	1115.97	1121.81	1121.81	1123.98	0.009244	12.65	271.95	235.80	0.99
Trib to Jim Blue	1048 D/S	Q2	261.00	1114.35	1117.68	1117.44	1117.99	0.004789	5.25	131.74	177.78	0.61
Trib to Jim Blue	1048 D/S	Q5	490.00	1114.35	1118.25	1118.02	1118.59	0.004881	6.12	238.75	198.99	0.63
Trib to Jim Blue	1048 D/S	Q10	688.00	1114.35	1118.61	1118.32	1118.98	0.005064	6.75	313.85	213.48	0.66
Trib to Jim Blue	1048 D/S	Q25	993.00	1114.35	1118.98	1118.68	1119.44	0.005953	7.86	395.60	225.74	0.73
Trib to Jim Blue	1048 D/S	Q50	1330.00	1114.35	1119.28	1119.01	1119.85	0.007138	9.07	463.64	235.17	0.81
Trib to Jim Blue	1048 D/S	Q100	1560.00	1114.35	1119.50	1119.19	1120.11	0.007490	9.63	515.45	242.33	0.83
Trib to Jim Blue	1048 D/S	Q500	2460.00	1114.35	1120.01	1119.86	1120.94	0.010518	12.32	643.17	259.35	1.01
Trib to Jim Blue	1000 D/S FAR	Q2	261.00	1115.08	1117.26	1117.26	1117.63	0.013139	6.92	115.30	143.77	0.96
Trib to Jim Blue	1000 D/S FAR	Q5	490.00	1115.08	1117.68	1117.68	1118.19	0.015294	8.70	180.77	178.77	1.08
Trib to Jim Blue	1000 D/S FAR	Q10	688.00	1115.08	1117.95	1117.93	1118.55	0.016594	9.86	234.73	213.43	1.15
Trib to Jim Blue	1000 D/S FAR	Q25	993.00	1115.08	1118.41	1118.41	1119.00	0.014488	10.40	345.98	269.84	1.10
Trib to Jim Blue	1000 D/S FAR	Q50	1330.00	1115.08	1118.77	1118.77	1119.38	0.013872	11.04	447.99	290.14	1.10
Trib to Jim Blue	1000 D/S FAR	Q100	1560.00	1115.08	1118.85	1118.55	1119.59	0.016618	12.29	470.96	292.56	1.21
Trib to Jim Blue	1000 D/S FAR	Q500	2460.00	1115.08	1119.46	1119.43	1120.29	0.016594	13.81	658.64	320.27	1.25

Plan: Proposed: 3-12'x7' RCB Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Culv Group: Triple RCB Profile: Q2

Q Culv Group (cfs)	261.00	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	2.74
Q Barrel (cfs)	87.00	Culv Vel DS (ft/s)	2.61
E.G. US. (ft)	1118.68	Culv Inv El Up (ft)	1115.86
W.S. US. (ft)	1118.72	Culv Inv El Dn (ft)	1115.74
E.G. DS (ft)	1118.62	Culv Frctn Ls (ft)	0.01
W.S. DS (ft)	1117.98	Culv Exit Loss (ft)	0.00
Delta EG (ft)	0.06	Culv Entr Loss (ft)	0.06
Delta WS (ft)	0.74	Q Weir (cfs)	
E.G. IC (ft)	1117.69	Weir Sta Lft (ft)	
E.G. OC (ft)	1118.68	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	1118.51	Weir Max Depth (ft)	
Culv WS Outlet (ft)	1118.51	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.05	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	1.18	Min El Weir Flow (ft)	1124.44

Plan: Proposed: 3-12'x7' RCB Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Culv Group: Triple RCB Profile: Q5

Q Culv Group (cfs)	490.00	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	3.92
Q Barrel (cfs)	163.33	Culv Vel DS (ft/s)	3.78
E.G. US. (ft)	1119.69	Culv Inv El Up (ft)	1115.86
W.S. US. (ft)	1119.54	Culv Inv El Dn (ft)	1115.74
E.G. DS (ft)	1119.56	Culv Frctn Ls (ft)	0.01
W.S. DS (ft)	1118.74	Culv Exit Loss (ft)	0.00
Delta EG (ft)	0.13	Culv Entr Loss (ft)	0.12
Delta WS (ft)	0.81	Q Weir (cfs)	
E.G. IC (ft)	1118.67	Weir Sta Lft (ft)	
E.G. OC (ft)	1119.69	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	1119.34	Weir Max Depth (ft)	
Culv WS Outlet (ft)	1119.34	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.59	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	1.79	Min El Weir Flow (ft)	1124.44

Plan: Proposed: 3-12'x7' RCB Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Culv Group: Triple RCB Profile: Q10

Q Culv Group (cfs)	688.00	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	4.81
Q Barrel (cfs)	229.33	Culv Vel DS (ft/s)	4.66
E.G. US. (ft)	1120.37	Culv Inv El Up (ft)	1115.86
W.S. US. (ft)	1119.99	Culv Inv El Dn (ft)	1115.74
E.G. DS (ft)	1120.18	Culv Frctn Ls (ft)	0.02
W.S. DS (ft)	1119.20	Culv Exit Loss (ft)	0.00
Delta EG (ft)	0.20	Culv Entr Loss (ft)	0.18
Delta WS (ft)	0.79	Q Weir (cfs)	
E.G. IC (ft)	1119.41	Weir Sta Lft (ft)	
E.G. OC (ft)	1120.37	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	1119.83	Weir Max Depth (ft)	
Culv WS Outlet (ft)	1119.84	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.98	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	2.25	Min El Weir Flow (ft)	1124.44

Plan: Proposed: 3-12'x7' RCB Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Culv Group: Triple RCB Profile: Q25

Q Culv Group (cfs)	993.00	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	6.01
Q Barrel (cfs)	331.00	Culv Vel DS (ft/s)	5.85
E.G. US. (ft)	1121.29	Culv Inv El Up (ft)	1115.86
W.S. US. (ft)	1120.55	Culv Inv El Dn (ft)	1115.74
E.G. DS (ft)	1120.99	Culv Frctn Ls (ft)	0.02
W.S. DS (ft)	1119.76	Culv Exit Loss (ft)	0.00
Delta EG (ft)	0.30	Culv Entr Loss (ft)	0.28
Delta WS (ft)	0.79	Q Weir (cfs)	
E.G. IC (ft)	1120.43	Weir Sta Lft (ft)	
E.G. OC (ft)	1121.29	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	1120.45	Weir Max Depth (ft)	
Culv WS Outlet (ft)	1120.46	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	2.54	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	2.87	Min El Weir Flow (ft)	1124.44

Plan: Proposed: 3-12'x7' RCB Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Culv Group: Triple RCB Profile: Q50

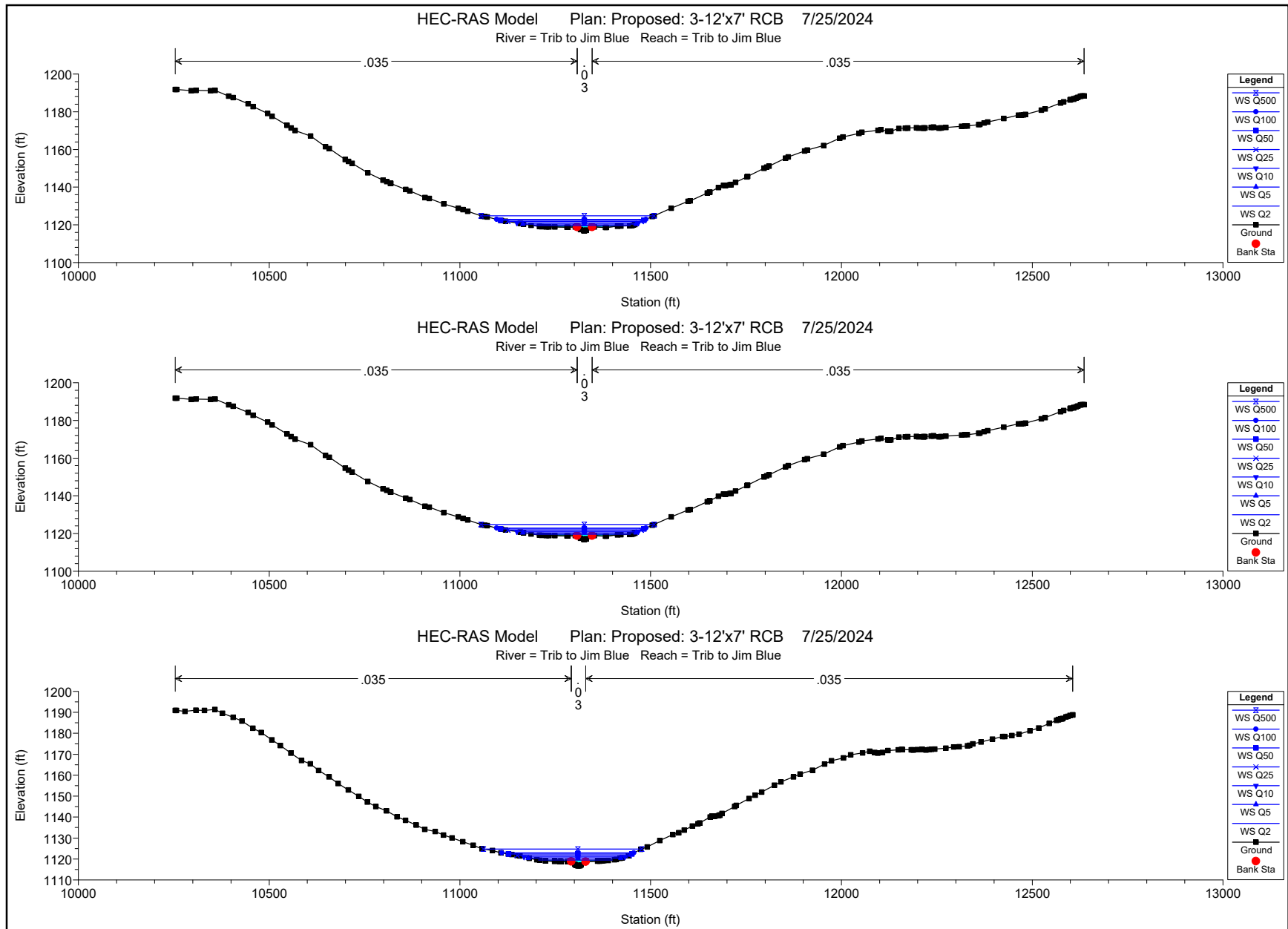
Q Culv Group (cfs)	1330.00	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	7.19
Q Barrel (cfs)	443.33	Culv Vel DS (ft/s)	7.01
E.G. US. (ft)	1122.20	Culv Inv El Up (ft)	1115.86
W.S. US. (ft)	1121.04	Culv Inv El Dn (ft)	1115.74
E.G. DS (ft)	1121.77	Culv Frctn Ls (ft)	0.03
W.S. DS (ft)	1120.30	Culv Exit Loss (ft)	0.00
Delta EG (ft)	0.43	Culv Entr Loss (ft)	0.40
Delta WS (ft)	0.74	Q Weir (cfs)	
E.G. IC (ft)	1121.44	Weir Sta Lft (ft)	
E.G. OC (ft)	1122.20	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	1121.00	Weir Max Depth (ft)	
Culv WS Outlet (ft)	1121.01	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	3.10	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	3.49	Min El Weir Flow (ft)	1124.44

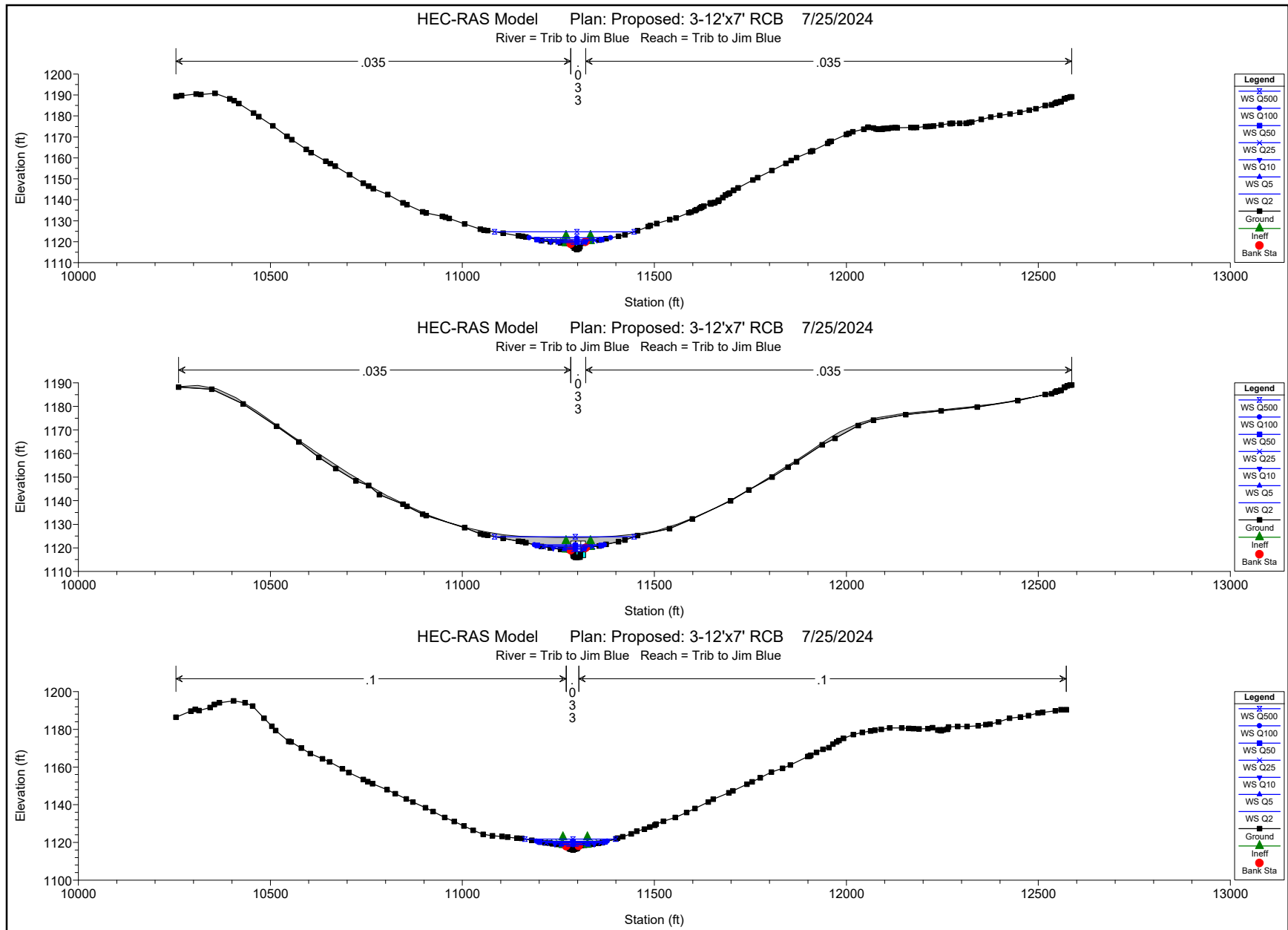
Plan: Proposed: 3-12'x7' RCB Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Culv Group: Triple RCB Profile: Q100

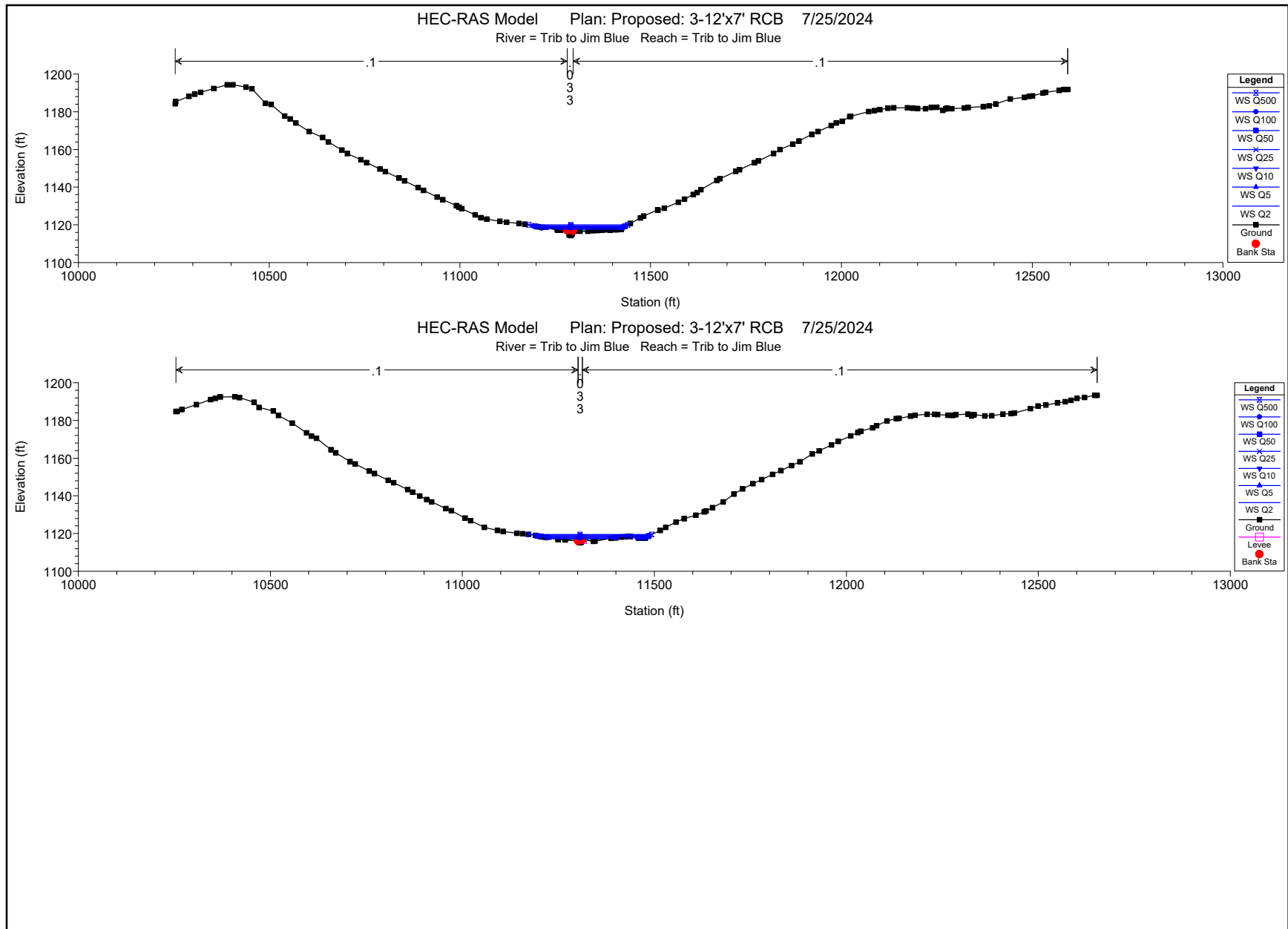
Q Culv Group (cfs)	1560.00	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	7.94
Q Barrel (cfs)	520.00	Culv Vel DS (ft/s)	7.75
E.G. US. (ft)	1122.79	Culv Inv El Up (ft)	1115.86
W.S. US. (ft)	1121.88	Culv Inv El Dn (ft)	1115.74
E.G. DS (ft)	1122.26	Culv Frctn Ls (ft)	0.03
W.S. DS (ft)	1120.62	Culv Exit Loss (ft)	0.00
Delta EG (ft)	0.52	Culv Entr Loss (ft)	0.49
Delta WS (ft)	1.26	Q Weir (cfs)	
E.G. IC (ft)	1122.09	Weir Sta Lft (ft)	
E.G. OC (ft)	1122.79	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	1121.32	Weir Max Depth (ft)	
Culv WS Outlet (ft)	1121.33	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	3.47	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	3.88	Min El Weir Flow (ft)	1124.44

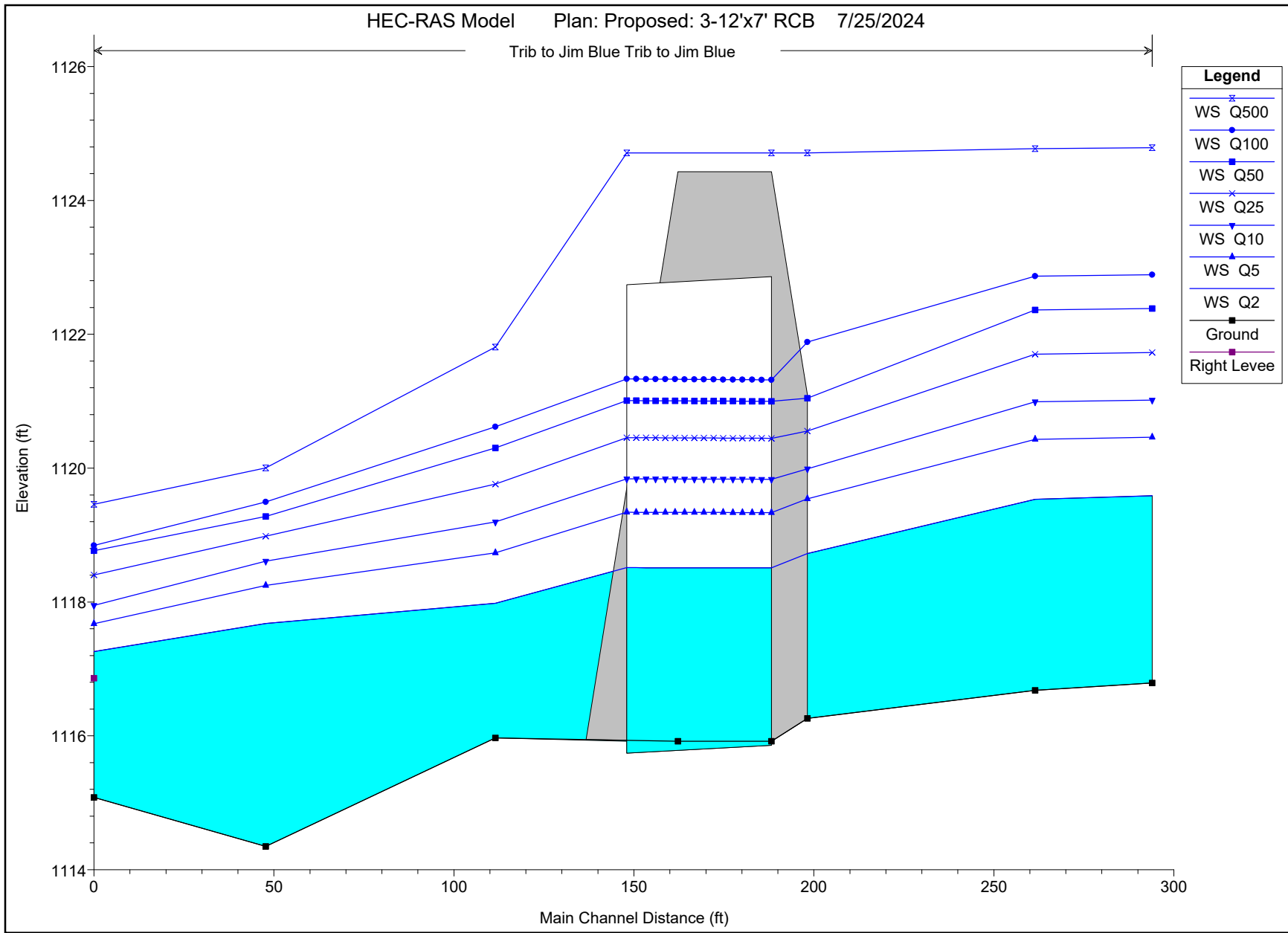
Plan: Proposed: 3-12'x7' RCB Trib to Jim Blue Trib to Jim Blue RS: 1154.25 Culv Group: Triple RCB Profile: Q500

Q Culv Group (cfs)	2375.74	Culv Full Len (ft)	
# Barrels	3	Culv Vel US (ft/s)	9.96
Q Barrel (cfs)	791.91	Culv Vel DS (ft/s)	9.76
E.G. US. (ft)	1124.80	Culv Inv El Up (ft)	1115.86
W.S. US. (ft)	1124.71	Culv Inv El Dn (ft)	1115.74
E.G. DS (ft)	1123.98	Culv Frctn Ls (ft)	0.05
W.S. DS (ft)	1121.81	Culv Exit Loss (ft)	0.00
Delta EG (ft)	0.82	Culv Entr Loss (ft)	0.77
Delta WS (ft)	2.90	Q Weir (cfs)	84.26
E.G. IC (ft)	1124.53	Weir Sta Lft (ft)	11170.08
E.G. OC (ft)	1124.80	Weir Sta Rgt (ft)	11379.64
Culvert Control	Outlet	Weir Submerg	0.00
Culv WS Inlet (ft)	1122.49	Weir Max Depth (ft)	0.37
Culv WS Outlet (ft)	1122.50	Weir Avg Depth (ft)	0.28
Culv Nml Depth (ft)	4.69	Weir Flow Area (sq ft)	58.47
Culv Crt Depth (ft)	5.13	Min El Weir Flow (ft)	1124.44









HEC-RAS HEC-RAS 6.3.1 September 2022
 U.S. Army Corps of Engineers
 Hydrologic Engineering Center
 609 Second Street
 Davis, California

```

X      X  XXXXXX      XXXX      XXXX      XX      XXXX
X      X  X          X      X      X      X  X      X
X      X  X          X          X      X      X      X
XXXXXXXX XXXX      X          XXX XXXX      XXXXXX      XXXX
X      X  X          X          X      X      X      X      X
X      X  X          X      X      X      X      X      X
X      X  XXXXXX      XXXX      X      X      X      X      XXXXX

```

PROJECT DATA

Project Title: HEC-RAS Model
 Project File : Post Oak Rd.prj
 Run Date and Time: 7/25/2024 1:53:58 PM

Project in English units

Project Description:

CRS Info=<SpatialReference> <CoordinateSystem Code="2268"
 Unit="US_survey_Foot" AcadCode="OK83-SF" /></SpatialReference>

PLAN DATA

Plan Title: Proposed: 3-12'x7' RCB
 Plan File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
 Civil\Docs\Drainage\Models\Post Oak Rd.p11

Geometry Title: Proposed: 3-12'x7' RCB
 Geometry File : G:\projects\2024\2403010281_City of Norman_Post Oak
 Bridge\05 Civil\Docs\Drainage\Models\Post Oak Rd.g07

Flow Title : Steady Flow
 Flow File : G:\projects\2024\2403010281_City of Norman_Post Oak
 Bridge\05 Civil\Docs\Drainage\Models\Post Oak Rd.f01

Plan Description:

Proposed scenario w/3-12'x6'-10" RCB

Plan Summary Information:

Number of: Cross Sections = 6 Multiple Openings = 0
 Culverts = 1 Inline Structures = 0
 Bridges = 0 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
 Critical depth calculation tolerance = 0.01
 Maximum number of iterations = 20
 Maximum difference tolerance = 0.33
 Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
 Conveyance Calculation Method: At breaks in n values only
 Friction Slope Method: Average Conveyance
 Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: Steady Flow

Flow File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
 Civil\Docs\Drainage\Models\Post Oak Rd.f01

Flow Data (cfs)

River	Reach	RS	Q2	Q5	Q10	Q25	Q50	Q100	Q500
Trib to Jim Blue	Trib to Jim Blue	1295	261	490	688	993	1330	1560	2460

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
Trib to Jim Blue	Trib to Jim Blue	Q2	Normal S = 0.01659
Normal S = 0.01659			
Trib to Jim Blue	Trib to Jim Blue	Q5	Normal S = 0.01659
Normal S = 0.01659			
Trib to Jim Blue	Trib to Jim Blue	Q10	Normal S = 0.01659
Normal S = 0.01659			
Trib to Jim Blue	Trib to Jim Blue	Q25	Normal S = 0.01659

Normal S = 0.01659

Trib to Jim BlueTrib to Jim BlueQ50

Normal S = 0.01659

Normal S = 0.01659

Trib to Jim BlueTrib to Jim BlueQ100

Normal S = 0.01659

Normal S = 0.01659

Trib to Jim BlueTrib to Jim BlueQ500

Normal S = 0.01659

Normal S = 0.01659

GEOMETRY DATA

Geometry Title: Proposed: 3-12'x7' RCB

Geometry File : G:\projects\2024\2403010281_City of Norman_Post Oak Bridge\05
Civil\Docs\Drainage\Models\Post Oak Rd.g07

CROSS SECTION

RIVER: Trib to Jim Blue

REACH: Trib to Jim Blue RS: 1295

INPUT

Description:

Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10254	1191.82	10257.4	1191.82	10295.92	1191.14	10308.14	1191.37	10346.66	1191.18
10358.46	1191.36	10393.7	1188.31	10405.63	1187.48	10444.75	1184.21	10457.78	1182.72
10496	1179.05	10507.8	1177.59	10547.09	1172.75	10557.51	1171.37	10568.03	1170.06
10608.82	1167.18	10647.78	1161.49	10657.59	1160.44	10699.27	1154.62	10708.43	1153.61
10717.63	1152.59	10758.32	1147.64	10798.43	1143.71	10808.06	1143	10817.55	1142.03
10818.64	1141.95	10858.11	1138.84	10868.56	1137.98	10908.37	1134.49	10919.43	1134.06
10957.95	1131.11	10995.66	1128.82	11007.82	1128.03	11020.36	1127.24	11058.45	1124.59
11064.49	1124.41	11071.59	1124.17	11108.76	1122.27	11119.24	1121.93	11158.19	1120.75
11166.56	1120.39	11186.81	1119.79	11208.74	1119.14	11214.36	1119.01	11226.37	1118.93
11233.37	1118.89	11248.86	1118.84	11280.92	1118.73	11283.04	1118.72	11302.51	1118.88
11307.56	1118.89	11309.64	1118.58	11316.42	1117.51	11324.57	1116.89	11325.84	1116.79
11330.06	1117.11	11330.26	1117.13	11331.11	1117.14	11343.99	1118.55	11346.43	1118.86
11351.95	1118.91	11381.21	1118.71	11383.78	1118.68	11413.45	1119.32	11422.07	1119.38
11445.02	1119.54	11449.64	1119.68	11450.78	1119.73	11452.22	1119.79	11453.91	1119.86
11458.59	1120.14	11503.77	1124.38	11508.87	1124.75	11553.52	1128.86	11597.93	1132.48
11603.37	1132.78	11648.12	1136.92	11653.77	1137.34	11655.31	1137.46	11677.72	1139.79
11690.88	1140.91	11694.89	1140.91	11695.44	1140.83	11695.57	1140.75	11695.66	1140.82
11707	1141.22	11710.58	1141.35	11710.65	1141.35	11710.72	1141.39	11722.47	1142.53
11752.38	1145.49	11754.05	1145.71	11797.44	1149.95	11803.85	1150.57	11810.31	1151.16
11854.06	1155.47	11860.72	1156.11	11903.79	1159.22	11910.64	1159.74	11953.59	1162.1
11995.94	1165.97	12003.62	1166.66	12045.95	1168.48	12053.47	1169.11	12095.75	1170.18
12103.47	1170.54	12121.17	1169.67	12124.51	1169.56	12129.32	1169.68	12150.81	1171.13

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12167.55 1171.3312173.33 1171.3412173.63 1171.3512196.38 1171.5712202.05 1171.33
12214.13 1171.4212215.29 1171.2912215.36 1171.312216.73 1171.4312219.13 1171.47
12235.12 1171.7 12240 1171.74 12241.4 1171.7312241.41 1171.7512255.92 1171.31
12259.39 1171.3912261.97 1171.4412273.75 1171.6412314.92 1172.2312323.52 1172.48
12329.7 1172.4812359.95 1173.1612362.54 1173.2812373.88 1174.112383.35 1174.52
12425.54 1176.4912463.94 1178.1912472.07 1178.2712477.04 1178.38 12482.1 1178.55
12523.98 1180.8512534.21 1181.4812574.09 1184.6112582.47 1185.27 12599.1 1186.31
12599.94 1186.3612600.55 1186.3612600.76 1186.3712608.67 1186.7112609.13 1186.84
12609.52 1186.8112615.59 1187.3212619.61 1187.6712625.89 1188.1312628.73 1188.3
12631.81 1188.4312635.85 1188.43

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```

Manning's n Values      num=      3
Sta   n Val   Sta   n Val   Sta   n Val
10254   .03511307.56   .0311346.43   .035

```

```

Bank Sta: Left   Right   Lengths: Left Channel   Right   Coeff Contr.   Expan.
          11307.5611346.43          32.57   32.57   32.57          .1          .3

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CROSS SECTION

```

RIVER: Trib to Jim Blue
REACH: Trib to Jim Blue   RS: 1262

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INPUT

Description:

```

Station Elevation Data      num=      154
Sta   Elev   Sta   Elev   Sta   Elev   Sta   Elev   Sta   Elev
10254 1190.92 10257.2 1190.9210279.71 1190.5210307.89 1191.0510330.19 1190.93
10357.67 1191.3710378.01 1189.610405.87 1187.6910428.51 1185.810457.57 1182.46
10479.24 1180.3710507.43 1176.8910529.58 1174.1610557.03 1170.5110584.97 1167.02
10607.91 1165.3910629.62 1162.2110657.25 1159.2310680.55 1155.9710707.62 1152.99
10735.06 1149.9410757.58 1147.210779.56 1145.0410807.42 1142.9710835.11 1140.17
10857.44 1138.4210885.28 1136.1310907.62 1134.1810935.26 1133.1110957.36 1131.41
10979.69 1130.0411007.33 1128.2411034.93 1126.5111057.73 1124.9111085.52 1124.04
11107.86 1122.9411126.71 1122.3811136.06 1122.1111150.72 1121.6811157.66 1121.48
11181.65 1120.3211201.38 1119.6811209.09 1119.4311223.95 1119.0211248.38 1118.86
11262.39 1118.7711263.22 1118.7511265.14 1118.76 11282.1 1118.7811291.95 1118.79
11301 1117.4511302.63 1117.211304.55 1117.0511309.54 1116.6811310.54 1116.76
11313.86 1116.811314.64 1116.811317.34 1117.111330.11 1118.72 11361 1118.99
11366.24 1118.9611372.95 1119.111377.13 1119.1411388.71 1119.2611404.93 1119.68
11410.33 1119.8211420.09 1120.3411424.33 1120.5411441.56 1121.5311474.13 1124.58
11490.92 1125.7911523.98 1128.8411558.29 1131.6311573.87 1132.52 11587.8 1133.81
11608.99 1135.7811624.28 1136.9111628.45 1137.2311655.92 1140.0811661.01 1140.45
11665.47 1140.44 11665.5 1140.4211665.64 1140.3311669.49 1140.4611677.38 1140.74
11681.35 1140.89 11681.4 1140.9311681.47 1140.97 11686.7 1141.73 11720.1 1145.04
11724.47 1145.5711757.98 1148.8511774.38 1150.4411791.01 1151.9611824.38 1155.24
11841.45 1156.8611874.16 1159.2311891.74 1160.5911924.12 1162.3711955.85 1165.27
11974.1 1166.912005.63 1168.2612024.04 1169.7912055.26 1170.612073.92 1171.46
12086.88 1170.8312095.32 1170.5612107.49 1170.8712121.69 1171.8312149.32 1172.17

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12156.94	1172.1812157.75	1172.212159.32	1172.2112159.69	1172.2112182.78	1172.14
12186.39	1172.1412188.39	1172.04 12199.1	1172.19 12210.9	1172.3112211.82	1172.3
12211.83	1172.3412221.41	1172.0512229.72	1172.2512235.91	1172.3612244.38	1172.51
12273.86	1172.9412294.16	1173.5312308.83	1173.5412330.25	1174.0312336.32	1174.32
12344.34	1174.912365.84	1175.86 12395.5	1177.2512422.31	1178.4412427.96	1178.5
12446.49	1178.9112465.51	1179.5512494.34	1181.1412517.42	1182.5812544.54	1184.7
12563.63	1186.2212568.79	1186.5412568.97	1186.5412569.46	1186.59 12574.8	1186.81
12577.59	1186.9312577.75	1186.9712578.55	1186.9112580.62	1187.0812588.98	1187.83
12593.47	1188.1512599.46	1188.5212605.99	1188.7812606.04	1188.78	

Manning's n Values		num=	3
Sta	n Val	Sta	n Val
10254	.03511291.95	.0311330.11	.035

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
11291.95	11330.11	63.23	63.23	63.23	.1	.3

CROSS SECTION

RIVER: Trib to Jim Blue

REACH: Trib to Jim Blue RS: 1199

INPUT

Description:

Station Elevation Data		num=	174						
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10254	1189.33	10256.27	1189.33	10269.03	1189.72	10306.68	1190.43	10319.32	1190.2
10355.97	1190.81	10394.32	1188.21	10405.69	1187.31	10418.07	1185.94	10456.5	1181.45
10469.66	1179.75	10506.22	1175.24	10543.46	1170.31	10555.81	1168.77	10593.57	1164.03
10606.07	1162.51	10644.43	1158.41	10656.12	1157.28	10669.06	1155.98	10705.93	1151.91
10742.12	1147.89	10755.96	1146.52	10767.69	1145.31	10805.95	1142.49	10844.95	1138.54
10855.94	1137.65	10896.8	1134.3	10906	1133.72	10947.96	1132.09	10955.96	1131.62
10965.73	1131.12	11006.13	1128.49	11046.49	1125.94	11056.15	1125.55	11066.01	1125.27
11106.15	1124.02	11146.34	1122.79	11156.05	1122.58	11165.65	1122.23	11206.3	1120.55
11229.03	1120.01	11255.93	1119.38	11261.59	1119.39	11271.38	1119.26	11276.65	1119.19
11282.15	1118.93	11288.08	1117.82	11291.93	1116.97	11296.51	1116.61	11298.66	1116.26
11300.15	1116.55	11303.08	1116.77	11303.82	1116.82	11306.58	1117.58	11316.05	1119.26
11318.25	1119.65	11321.11	1119.95	11333.63	1120.33	11356.37	1120.79	11374.34	1121.48
11406.41	1122.58	11423.24	1123.31	11456.2	1125.24	11483.65	1127.24	11489.41	1127.66
11506.42	1128.66	11540.17	1130.57	11556.27	1131.28	11589.54	1133.76	11596.13	1134.19
11606.61	1134.81	11609.29	1135.24	11618.09	1135.91	11621.79	1136.28	11623.43	1136.49
11629.24	1136.93	11646.07	1138.36	11646.08	1138.37	11646.21	1138.44	11646.25	1138.45
11646.64	1138.47	11646.67	1138.42	11646.87	1138.04	11654.98	1138.51	11656.25	1138.57
11657.7	1138.67	11666.62	1139.27	11666.65	1139.33	11666.84	1139.69	11666.89	1139.69
11667.28	1139.68	11667.3	1139.68	11667.41	1139.66	11677.83	1141.11	11685.71	1142.15
11691.81	1142.79	11693.98	1142.99	11695.74	1143.21	11705.97	1144.49	11706.64	1144.55
11718.18	1145.74	11756.7	1149.46	11769.1	1150.61	11806.18	1153.94	11842.69	1157.43
11856.19	1158.74	11870.35	1160.08	11906.57	1162.88	11911.83	1163.37	11951.11	1166.89
11956.4	1167.65	11960.72	1167.93	12000.15	1171.18	12006.49	1171.71	12016.88	1172.42

12045.2	1173.71	12056.12	1174.61	12057.25	1174.66	12070.6	1174.22	12077.74	1173.76
12082.53	1173.66	12087.45	1173.71	12093.15	1173.75	12093.97	1173.85	12094.74	1173.93
12097.05	1173.94	12097.65	1173.91	12100.36	1173.95	12106.19	1174.12	12108.07	1174.03
12108.6	1174.05	12109.91	1174.12	12118.42	1174.33	12127.82	1174.55	12132.53	1174.42
12168.24	1174.54	12175.44	1174.49	12182.57	1174.51	12206.02	1174.92	12211.64	1174.99
12218.68	1175.05	12226.89	1175.19	12246.65	1175.72	12269.52	1176.38	12271.39	1176.28
12276.78	1176.49	12295.18	1176.53	12311.96	1176.53	12319.91	1176.82	12326.43	1177.13
12351.24	1178.33	12376.39	1179.44	12399.46	1180.31	12426.39	1180.92	12452.25	1181.79
12476.45	1182.73	12493.62	1183.47	12518.48	1185.03	12534.19	1185.41	12543.77	1186.08
12547.64	1186.45	12548.07	1186.47	12548.36	1186.49	12551.86	1186.61	12558.27	1186.82
12558.75	1186.85	12559.21	1186.87	12567.82	1188.11	12568.28	1188.17	12568.95	1188.22
12575.38	1188.64	12582.34	1189.06	12583.59	1189.11	12586.77	1189.11		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10254	.035	11282.15	.033	11321.11	.035

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11282.15	11321.11		86.7	86.7	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
10254	11269.89	1122.86	F
11333.85	12586.77	1122.86	F

CULVERT

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1154.25

INPUT

Description:

Distance from Upstream XS = 10
 Deck/Roadway Width = 26
 Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 107			
Sta	Hi Cord	Lo Cord	
10259.59	1188.33		
10309.74	1188.89		
10359.07	1187.46		
10409.71	1183.75		
10463.49	1178.11		
10559.6	1167.12		
10609.29	1161.73		
10660.24	1156.27		
10710.27	1151.01		
10808.9	1141.71		
10859.26	1137.77		
10909.65	1134.03		
10260.7	1188.35		
10310.97	1188.86		
10359.67	1187.44		
10455.83	1178.95		
10509.68	1172.83		
10579.26	1164.99		
10659.7	1156.33		
10708.81	1151.15		
10759.73	1146.19		
10809.06	1141.69		
10859.52	1137.75		
10959.14	1131.04		
10309.56	1188.89		
10311.35	1188.85		
10405.76	1184.07		
10459.73	1178.55		
10558.51	1167.25		
10608.94	1161.77		
10659.7	1156.33		
10709.53	1151.08		
10805.87	1141.98		
10827.75	1140.23		
10909.23	1134.06		
10959.76	1131		

10959.96	1130.99	10960.39	1130.97	11009.66	1128.62
11011	1128.57	11059.7	1126.78	11107.88	1125.49
11150.1	1124.95	11200.1	1124.57	11244.95	1124.43
11316.46	1124.43	11350.45	1124.51	11400.1	1125
11450.1	1125.8	11487.32	1126.69	11508.38	1127.33
11509.86	1127.39	11557.46	1129.91	11559.78	1130.03
11608.14	1133.18	11609.78	1133.29	11610.36	1133.33
11658.81	1136.94	11660.01	1137.03	11661.26	1137.14
11709.11	1141.18	11709.74	1141.24	11758.84	1145.86
11760.35	1146	11808.92	1150.89	11809.91	1151
11848.67	1155	11859.73	1156.13	11860	1156.16
11860.29	1156.19	11900.2	1160.42	11909.86	1161.44
11909.92	1161.45	11911.71	1161.65	11934.79	1164.26
11950.63	1165.98	11959.64	1166.95	11970.07	1167.97
11980.27	1168.96	11980.78	1169	11994.52	1170.03
12030.14	1172.69	12031.43	1172.76	12080.44	1175.2
12082.81	1175.27	12130.35	1176.53	12131.53	1176.55
12180.15	1177.48	12228.69	1178.22	12229.87	1178.24
12275.47	1179	12279.55	1179.07	12280.32	1179.08
12328.95	1179.96	12330.41	1179.99	12378.22	1180.94
12380.21	1180.97	12427.77	1182.16	12430.14	1182.21
12477.82	1183.72	12480.23	1183.8	12517.41	1184.95
12518.49	1184.98	12564.07	1187.36	12565.35	1187.42
12565.9	1187.46	12579.84	1187.46		

Upstream Bridge Cross Section Data

Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10261.05	1188.22	10347.32	1187.31	10429.27	1181.07	10516.12	1171.52	10574.3	1164.9
10626.19	1158.41	10670.34	1153.64	10722.63	1148.39	10755.96	1146.52	10784.21	1142.54
10844.95	1138.54	10855.94	1137.65	10896.8	1134.3	10906	1133.72	11006.13	1128.49
11046.49	1125.94	11056.15	1125.55	11066.01	1125.27	11106.15	1124.02	11146.34	1122.79
11156.05	1122.58	11165.65	1122.23	11206.3	1120.55	11229.03	1120.01	11255.93	1119.38
11261.59	1119.39	11271.38	1119.26	11276.65	1119.19	11282.15	1118.93	11288.08	1117.82
11289.96	1117.33	11290.06	1116.35	11294.17	1115.92	11298.44	1115.93	11302.31	1116.05
11306.67	1116.08	11307.1	1117.18	11316.05	1119.26	11318.25	1119.65	11321.11	1119.95
11333.63	1120.33	11356.37	1120.79	11374.34	1121.48	11406.41	1122.58	11423.24	1123.31
11456.2	1125.24	11539.49	1128.11	11598.75	1132.26	11698.68	1139.95	11746.32	1144.58
11806.74	1149.95	11848	1154.22	11870.51	1156.54	11937.11	1163.66	11970.58	1166.42
12031	1171.91	12070.6	1174.22	12154.61	1176.48	12247.07	1178.14	12340.98	1179.76
12446.38	1182.49	12518.48	1185.03	12534.19	1185.41	12543.77	1186.08	12547.64	1186.45
12548.07	1186.47	12548.36	1186.49	12551.86	1186.61	12558.27	1186.82	12558.75	1186.85
12559.21	1186.87	12567.82	1188.11	12568.28	1188.17	12568.95	1188.22	12575.38	1188.64
12582.34	1189.06	12583.59	1189.11	12586.77	1189.11				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10261.05	.035	11282.15	.033	11321.11	.035

Bank Sta: Left Right Coeff Contr. Expan.

11282.1511321.11 .1 .3
 Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 10261.0511269.89 1122.86 F
 11333.8512586.77 1122.86 F

Downstream Deck/Roadway Coordinates

num= 108

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
10249.94	1188.35				10298.8	1188.89				10298.98	1188.89			
10300.21	1188.86				10300.59	1188.85				10348.31	1187.46			
10348.91	1187.44				10395	1184.07				10398.95	1183.75			
10445.07	1178.95				10448.97	1178.55				10452.73	1178.11			
10498.92	1172.83				10547.75	1167.25				10548.84	1167.12			
10568.5	1164.99				10598.18	1161.77				10598.53	1161.73			
10648.94	1156.33				10648.94	1156.33				10649.48	1156.27			
10698.05	1151.15				10698.77	1151.08				10699.51	1151.01			
10748.97	1146.19				10795.11	1141.98				10798.14	1141.71			
10798.3	1141.69				10816.99	1140.23				10848.5	1137.77			
10848.76	1137.75				10898.47	1134.06				10898.89	1134.03			
10948.38	1131.04				10949	1131				10949.2	1130.99			
10949.63	1130.97				10998.9	1128.62				11000.24	1128.57			
11048.94	1126.78				11098.68	1125.52				11098.95	1125.51			
11107.88	1125.49				11150.1	1124.95				11200.1	1124.57			
11244.95	1124.43				11316.46	1124.43				11350.45	1124.51			
11400.1	1125				11450.1	1125.8				11487.32	1126.69			
11497.62	1127.33				11499.1	1127.39				11546.7	1129.91			
11549.02	1130.03				11597.38	1133.18				11599.02	1133.29			
11599.6	1133.33				11648.05	1136.94				11649.25	1137.03			
11650.5	1137.14				11698.35	1141.18				11698.98	1141.24			
11748.08	1145.86				11749.59	1146				11798.16	1150.89			
11799.15	1151				11837.91	1155				11848.97	1156.13			
11849.24	1156.16				11849.53	1156.19				11889.44	1160.42			
11899.1	1161.44				11899.16	1161.45				11900.95	1161.65			
11924.03	1164.26				11939.87	1165.98				11948.88	1166.95			
11959.31	1167.97				11969.51	1168.96				11970.02	1169			
11983.76	1170.03				12019.38	1172.69				12020.67	1172.76			
12069.68	1175.2				12072.05	1175.27				12119.59	1176.53			
12120.77	1176.55				12169.39	1177.48				12217.93	1178.22			
12219.11	1178.24				12264.71	1179				12268.79	1179.07			
12269.56	1179.08				12318.19	1179.96				12319.65	1179.99			
12367.46	1180.94				12369.45	1180.97				12417.01	1182.16			
12419.38	1182.21				12467.06	1183.72				12469.47	1183.8			
12506.65	1184.95				12507.73	1184.98				12553.31	1187.36			
12554.59	1187.42				12555.14	1187.46				12569.08	1187.46			

Downstream Bridge Cross Section Data

Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10252.13	1188.13	10288.61	1187.94	10308.15	1187.35	10373.36	1183.69	10405.17	1182.3

10436.99 1178.6910518.54 1167.6910572.33 1162.1910635.08 1155.3910686.63 1150.94
 10753.87 1145.1810843.54 1137.310909.97 1131.6911028.34 1126.4611054.16 1124.29
 11078.26 1123.5311103.89 1123.2 11117.6 1122.7711141.98 1122.3 11154.1 1122.16
 11181.07 1121.13 11203.9 1120.1611215.65 1119.7911226.87 1119.6511234.81 1119.33
 11247.16 1119.0511249.87 1118.9711261.71 1118.6211270.34 1118.0611272.61 1117.76
 11278.49 1116.5811279.46 1116.3111283.46 1116.11 11283.8 1115.9211289.85 1115.93
 11291.63 1116.0511295.91 1116.0711296.07 1116.611298.15 1116.74 11299.7 1117.08
 11303.62 1118.1611306.53 1118.2511310.36 1118.4411318.41 1118.5211327.46 1118.75
 11335.04 1118.9711339.86 1119.1111354.87 1119.4611364.69 1119.9311400.38 1121.88
 11404.27 1122.3211417.63 1123.0411439.92 1124.5511454.44 1125.9811532.81 1128.56
 11632.4 1133.8811681.35 1138.5911748.88 1143.311836.65 1151.0711937.93 1160.9
 12000.39 1167.5 12069.6 1170.5712130.37 1173.4312181.01 1174.8712277.22 1174.87
 12368.38 1178.9612461.22 1183.67 12544.3 1189.83 12559.2 1190.4912572.76 1190.49

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 10252.13 .111270.34 .03311303.62 .1

Bank Sta: Left Right Coeff Contr. Expan.
 11270.3411303.62 .1 .3

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 10252.1311261.73 1122.74 F
 11325.7512572.76 1122.74 F

Upstream Embankment side slope = 3 horiz. to 1.0 vertical
 Downstream Embankment side slope = 3 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name Shape Rise Span
 Triple RCB Box 7 12
 FHWA Chart # 8 - flared wingwalls
 FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
 Solution Criteria = Highest U.S. EG
 Culvert Upstrm Dist Length Top n Bottom n Depth Blocked Entrance Loss Coef
 Exit Loss Coef
 10 40.19 .011 .011 0 .5

1

Number of Barrels = 3
 Upstream Elevation = 1115.86
 Centerline Stations
 Sta. Sta. Sta.
 11288.63 11301.611314.59
 Downstream Elevation = 1115.74

Centerline Stations

Sta. Sta. Sta.
11280.95 11293.96 11306.96

CROSS SECTION

RIVER: Trib to Jim Blue

REACH: Trib to Jim Blue RS: 1112

INPUT

Description:

Station Elevation Data num= 133

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10254	1186.4	10293.3	1189.71	10304.06	1190.57	10314.07	1189.91	10343.23	1191.56
10354.06	1193.24	10367.48	1194.03	10404.24	1195.07	10434.28	1194.02	10453.72	1192.31
10483.73	1185.86	10504.18	1181.55	10513.91	1179.36	10547.9	1173.54	10554.11	1173.28
10580.53	1170.08	10604.14	1167.08	10635.7	1164.32	10654.04	1162.66	10687.54	1159.11
10704.17	1157.11	10741.93	1153.36	10753.93	1152.27	10765.89	1151.11	10803.56	1147.95
10825.45	1145.87	10853.97	1143.12	10871.03	1141.42	10903.92	1138.42	10923.69	1136.41
10953.85	1133.25	10978.52	1131.11	11004.25	1128.76	11028.34	1126.46	11054.16	1124.29
11078.26	1123.53	11103.89	1123.2	11117.6	1122.77	11141.98	1122.3	11154.1	1122.16
11181.07	1121.13	11203.9	1120.16	11215.65	1119.79	11226.87	1119.65	11234.81	1119.33
11247.16	1119.05	11249.87	1118.97	11261.71	1118.62	11270.34	1118.06	11272.61	1117.76
11278.49	1116.58	11282.33	1116.33	11287.75	1115.97	11292.33	1116.31	11296.07	1116.6
11298.15	1116.74	11299.7	1117.08	11303.62	1118.16	11306.53	1118.25	11310.36	1118.44
11318.41	1118.52	11327.46	1118.75	11335.04	1118.97	11339.86	1119.11	11354.87	1119.46
11364.69	1119.93	11400.38	1121.88	11404.27	1122.32	11417.63	1123.04	11439.92	1124.55
11454.44	1125.98	11474.18	1127.12	11488.37	1128.17	11501.07	1129.11	11504.55	1129.7
11523.57	1131.19	11554.6	1133.29	11584.23	1135.87	11605.89	1138.08	11640.3	1141.45
11653.25	1142.98	11694.22	1146.35	11704.71	1147.34	11741.2	1150.86	11754.63	1152.15
11775.67	1154.23	11804.67	1157.29	11833.86	1159.29	11854.29	1161.08	11899.94	1165.56
11904.12	1165.75	11907.31	1166.28	11922.02	1167.81	11938.84	1169.39	11954.19	1170.23
11965.16	1172.22	11974.72	1173.25	11980.98	1174	11993	1175.15	12017.9	1177.19
12041.41	1178.38	12063.17	1179.06	12074.52	1179.42	12090.94	1180.03	12112.78	1180.76
12144.43	1180.74	12162.79	1180.51	12174.74	1180.35	12189.59	1180.24	12212.58	1180.39
12224.42	1180.89	12238.05	1179.65	12243.33	1179.75	12244.4	1179.38	12247.54	1179.17
12252.55	1179.73	12262.77	1180.01	12263.59	1180.15	12266.03	1181.19	12290.36	1181.48
12314.45	1181.51	12343.27	1181.83	12363.2	1182.52	12374.43	1182.8	12396.3	1183.87
12424.98	1185.86	12453.2	1186.57	12474.54	1187.26	12499	1188.64	12511.18	1188.94
12544.3	1189.83	12559.2	1190.49	12572.76	1190.49				

Manning's n Values

num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10254	.111	1270.34	.033	11303.62	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11270.34	11303.62		63.77	63.77	.1	.3

Ineffective Flow num= 2
Sta L Sta R Elev Permanent

10254 11261.73 1122.74 F
 11325.75 12572.76 1122.74 F

CROSS SECTION

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1048

INPUT

Description:

Station Elevation Data num= 132

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10254	1184.23	10254.97	1185.41	10289.95	1188.21	10305.08	1189.26	10320.18	1190.31
10355	1192.28	10390.09	1194.35	10405.29	1194.37	10439.5	1193.12	10454.76	1192.15
10490.52	1184.57	10505.22	1183.83	10540.71	1177.75	10555.1	1176.14	10569.74	1174.07
10605.01	1169.57	10640.57	1166.35	10655.36	1163.94	10690.77	1159.68	10705.29	1157.83
10740.75	1154.59	10755.34	1153.07	10790	1149.68	10804.33	1148.25	10840.48	1144.8
10855.03	1143.36	10890.57	1139.82	10905.04	1138.27	10940.13	1134.71	10954.98	1133.32
10990.37	1130.23	10998.44	1129.36	11005.12	1128.64	11039.64	1125.35	11054.97	1123.81
11070.53	1123.04	11104.6	1121.93	11122.5	1121.38	11154.86	1120.73	11170.21	1120.44
11202.72	1119.04	11205.16	1118.96	11214.51	1118.59	11255	1117.36	11255.5	1117.35
11257.24	1117.29	11264.04	1117.25	11281.01	1117.08	11286.77	1114.79	11286.99	1114.72
11287.13	1114.71	11290.47	1114.35	11290.81	1114.41	11293.48	1114.88	11295.03	1115.91
11296.15	1116.65	11296.57	1116.82	11300.27	1116.68	11314.72	1116.59	11335.17	1116.66
11348.69	1116.83	11360.75	1116.96	11371.53	1117.27	11375.41	1117.35	11379.77	1117.44
11384.64	1117.51	11393.32	1117.24	11404.03	1117.45	11409.1	1117.37	11415.95	1117.54
11419.95	1117.63	11422.26	1117.67	11424.07	1118.15	11432.58	1119.31	11447.07	1120.73
11472.85	1123.74	11481.55	1124.65	11518.3	1127.98	11518.97	1127.87	11535.54	1128.82
11572.37	1131.93	11588.76	1133.66	11611.94	1136.09	11621.95	1137.19	11631.8	1138.66
11673.5	1143.58	11681.53	1144.41	11722.84	1148.3	11733.2	1149.31	11772.39	1153.04
11782.07	1153.96	11821.94	1157.78	11838.75	1159.95	11872.17	1162.84	11888.69	1164.45
11922.22	1167.95	11938.52	1169.47	11972.98	1172.71	11986.09	1174.11	12001.77	1174.93
12022.02	1177.4	12024.5	1177.62	12071.81	1180.11	12086.22	1180.56	12100.54	1181.1
12121.96	1181.87	12136.62	1182.1	12172.7	1182.1	12186.8	1181.91	12199.52	1181.74
12220.17	1181.58	12235.2	1182.21	12249.93	1182.34	12265.85	1180.71	12273.51	1181.54
12276.84	1182.03	12289.33	1181.67	12322.53	1181.96	12332.55	1182.25	12372.28	1182.76
12372.36	1182.77	12387.03	1183.15	12404.76	1184.15	12442.6	1186.77	12479.95	1187.69
12492.26	1188.13	12500.73	1188.39	12528.2	1189.95	12534.93	1190.35	12570.93	1191.29
12582.28	1191.79	12592.8	1191.79						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10254	.111	11281.01	.033	11296.57	.1

Bank	Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
	11281.01	11296.57	47.73	47.73	47.73	.1	.3

CROSS SECTION

RIVER: Trib to Jim Blue
 REACH: Trib to Jim Blue RS: 1000

INPUT

Description:

Station Elevation Data num= 131

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
10254	1184.79	10257.13	1184.79	10269.88	1185.82	10307.23	1188.41	0344.43	1191.01
10356.9	1191.71	10369.48	1192.46	10407.33	1192.51	10420.04	1192.05	10457.33	1189.66
10470.6	1186.85	10507.51	1184.97	10520.96	1182.67	10557.18	1178.62	10593.98	1173.4
10607.1	1171.72	10620.35	1170.52	10657.8	1164.43	10670.51	1162.9	10707.3	1158.22
10720.85	1156.98	10757.48	1153.17	10770.94	1151.85	10806.96	1148.25	10820.92	1146.92
10857.3	1143.31	10870.86	1141.95	10889.38	1139.97	10907.1	1138.08	10920.33	1136.74
10957.17	1133.29	10971.19	1132.07	11007.32	1128.21	11021.49	1126.86	11057.13	1123.3
11091.27	1121.64	11106.18	1121.18	11141.79	1120.13	11156.75	1119.85	11171.96	1119.48
11190.81	1119.01	11202.33	1118.45	11205.57	1118.34	11212.18	1118.18	11215.28	1118.08
11218.99	1117.96	11248.78	1116.79	11268.19	1116.61	11301.2	1116.16	11301.53	1116.16
11301.61	1116.13	11304.56	1115.26	11306.41	1115.08	11308.26	1115.33	11309.43	1115.49
11309.5	1115.52	11310.97	1116.11	11312.84	1116.86	11316.78	1116.71	11341.27	1115.84
11345.26	1115.96	11387.51	1117.51	11396.27	1117.73	11398.25	1117.81	11400.1	1117.87
11413.68	1118.08	11423.38	1118.23	11432.67	1118.56	11438.39	1118.39	11460.76	1117.67
11468.48	1117.69	11473.17	1117.62	11476.64	1117.54	11484.87	1118.66	11515.34	1121.65
11529.92	1123.34	11556.19	1126.07	11577.83	1128.02	11578.21	1127.97	11608.15	1129.68
11629.71	1131.48	11634.91	1132.03	11651.44	1133.76	11679.33	1136.81	11707.08	1140.93
11729.97	1143.64	11756.88	1146.42	11779.69	1148.57	11808.2	1151.33	11829.33	1153.34
11857.26	1156.11	11879.13	1158.11	11911.08	1162.23	11929.31	1163.82	11961.3	1166.94
11979.47	1168.84	12011.22	1171.82	12030.01	1173.59	12037.12	1174.35	12068.42	1176.01
12078.64	1177.25	12106.22	1179.67	12130.1	1180.94	12137.31	1181.16	12167.02	1182.29
12179.1	1182.73	12210.16	1183.21	12229.88	1183.22	12237.54	1183.11	12265.09	1182.77
12276.31	1182.68	12284.43	1183.02	12316.93	1183.35	12326.25	1182.41	12330.73	1182.89
12332.67	1183.17	12360.85	1182.38	12378.58	1182.53	12407.5	1183.38	12429.12	1183.66
12437.05	1183.87	12479.23	1186.26	12499.47	1187.66	12519.36	1188.15	12549.59	1189.24
12570.47	1189.89	12584.98	1190.71	12600.88	1191.64	12620.1	1192.15	12647.23	1193.34
12653.13	1193.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
10254	.111	10301.53	.033	11312.84	.1

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	11301.53	11312.84		0	0	.1	.3
Right Levee	Station=11312.84		Elevation=		1116.86		

SUMMARY OF MANNING'S N VALUES

River:Trib to Jim Blue

Reach	River Sta.	n1	n2	n3
Trib to Jim Blue	1295	.035	.03	.035
Trib to Jim Blue	1262	.035	.03	.035
Trib to Jim Blue	1199	.035	.033	.035
Trib to Jim Blue	1154.25	Culvert		
Trib to Jim Blue	1112	.1	.033	.1
Trib to Jim Blue	1048	.1	.033	.1
Trib to Jim Blue	1000	.1	.033	.1

SUMMARY OF REACH LENGTHS

River: Trib to Jim Blue

Reach	River Sta.	Left	Channel	Right
Trib to Jim Blue	1295	32.57	32.57	32.57
Trib to Jim Blue	1262	63.23	63.23	63.23
Trib to Jim Blue	1199	86.7	86.7	86.7
Trib to Jim Blue	1154.25	Culvert		
Trib to Jim Blue	1112	63.77	63.77	63.77
Trib to Jim Blue	1048	47.73	47.73	47.73
Trib to Jim Blue	1000	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

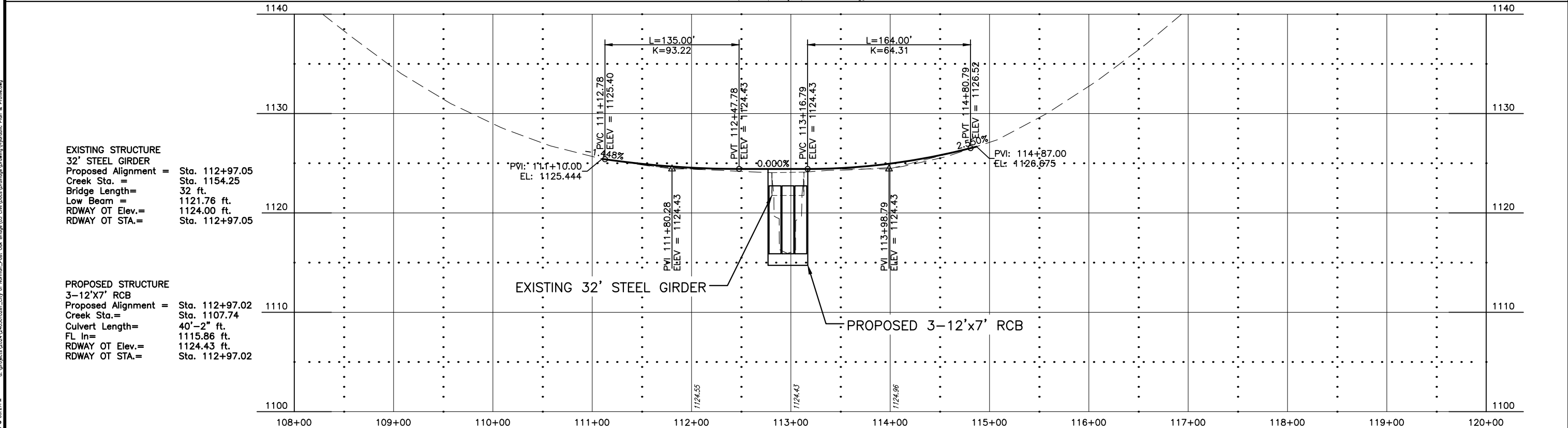
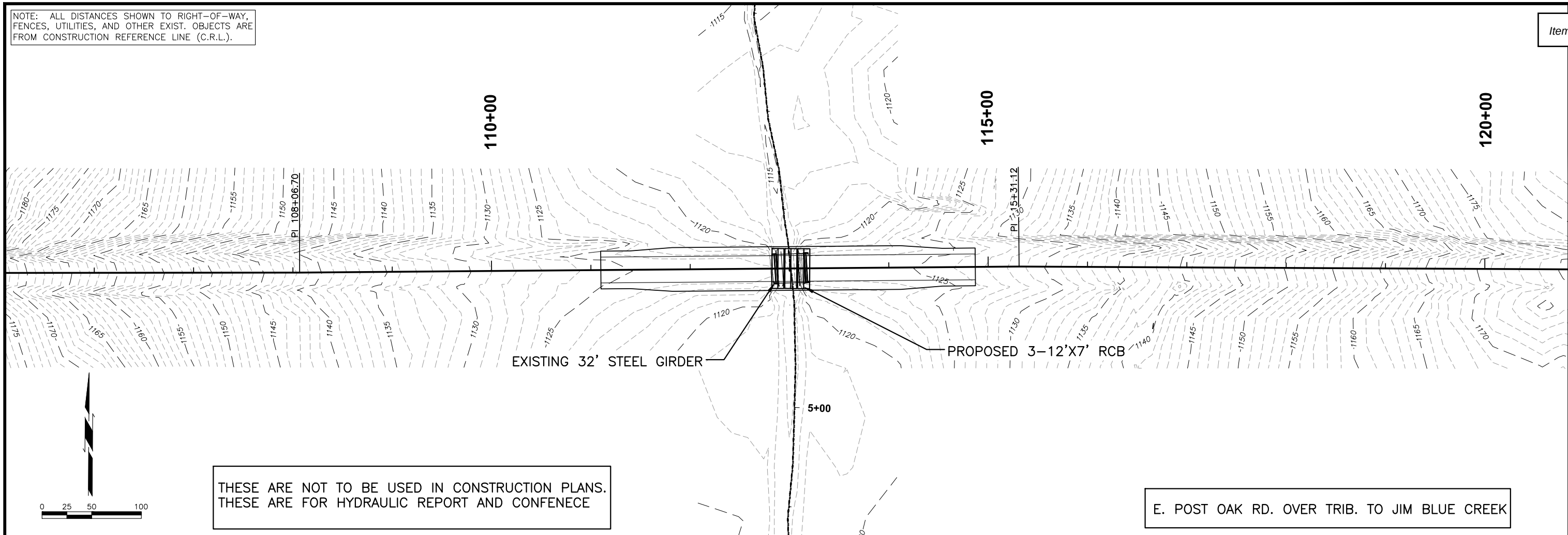
River: Trib to Jim Blue

Reach	River Sta.	Contr.	Expan.
Trib to Jim Blue	1295	.1	.3
Trib to Jim Blue	1262	.1	.3
Trib to Jim Blue	1199	.1	.3
Trib to Jim Blue	1154.25	Culvert	
Trib to Jim Blue	1112	.1	.3
Trib to Jim Blue	1048	.1	.3
Trib to Jim Blue	1000	.1	.3

Appendix H - Hydraulic P&P - Creek Flowline Profile

NOTE: ALL DISTANCES SHOWN TO RIGHT-OF-WAY, FENCES, UTILITIES, AND OTHER EXIST. OBJECTS ARE FROM CONSTRUCTION REFERENCE LINE (C.R.L.).

Item 2.



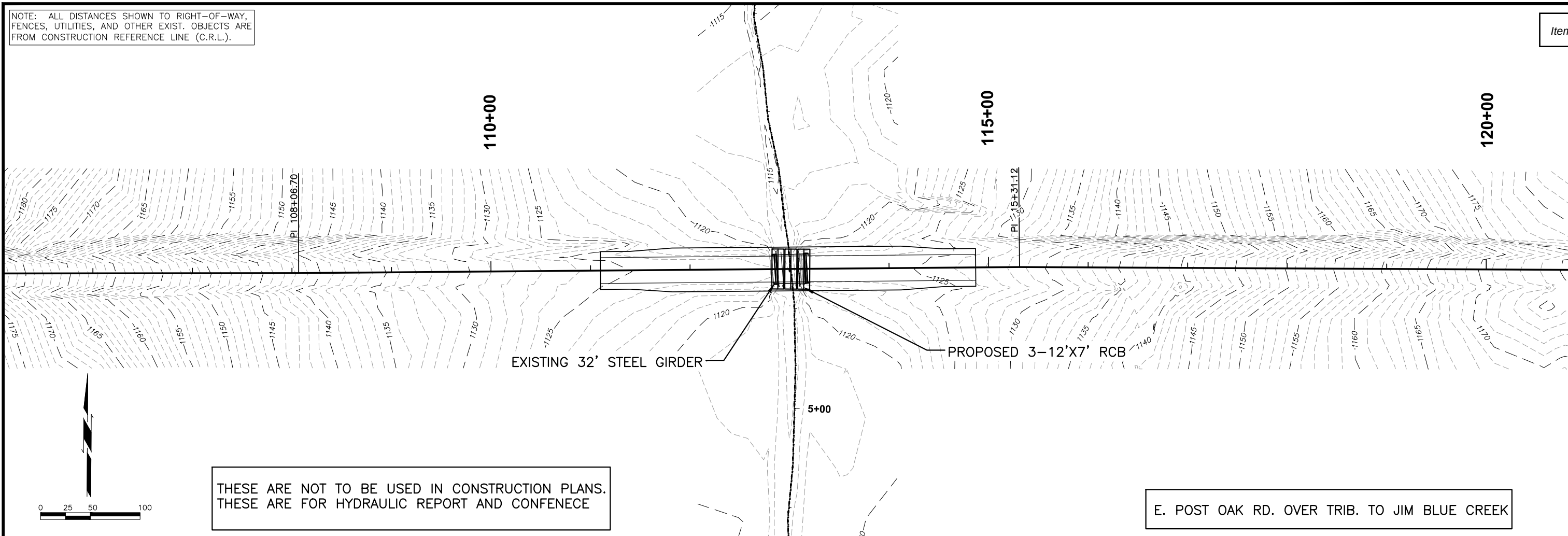
EXISTING STRUCTURE
32' STEEL GIRDER
Proposed Alignment = Sta. 112+97.05
Creek Sta. = Sta. 1154.25
Bridge Length= 32 ft.
Low Beam = 1121.76 ft.
RDWAY OT Elev.= 1124.00 ft.
RDWAY OT STA.= Sta. 112+97.05

PROPOSED STRUCTURE
3-12'x7' RCB
Proposed Alignment = Sta. 112+97.02
Creek Sta.= Sta. 1107.74
Culvert Length= 40'-2" ft.
FL In= 1115.86 ft.
RDWAY OT Elev.= 1124.43 ft.
RDWAY OT STA.= Sta. 112+97.02

DESIGN	DJG	E. POST OAK RD.	CLEVELAND COUNTY
DRAWN	DJG		
CHECKED	XXX		
MKEC			
HYDRAULIC PLAN & PROFILE			
JOB PIECE NO. K-2324-151 Sheet No. 1			

NOTE: ALL DISTANCES SHOWN TO RIGHT-OF-WAY, FENCES, UTILITIES, AND OTHER EXIST. OBJECTS ARE FROM CONSTRUCTION REFERENCE LINE (C.R.L.).

Item 2.

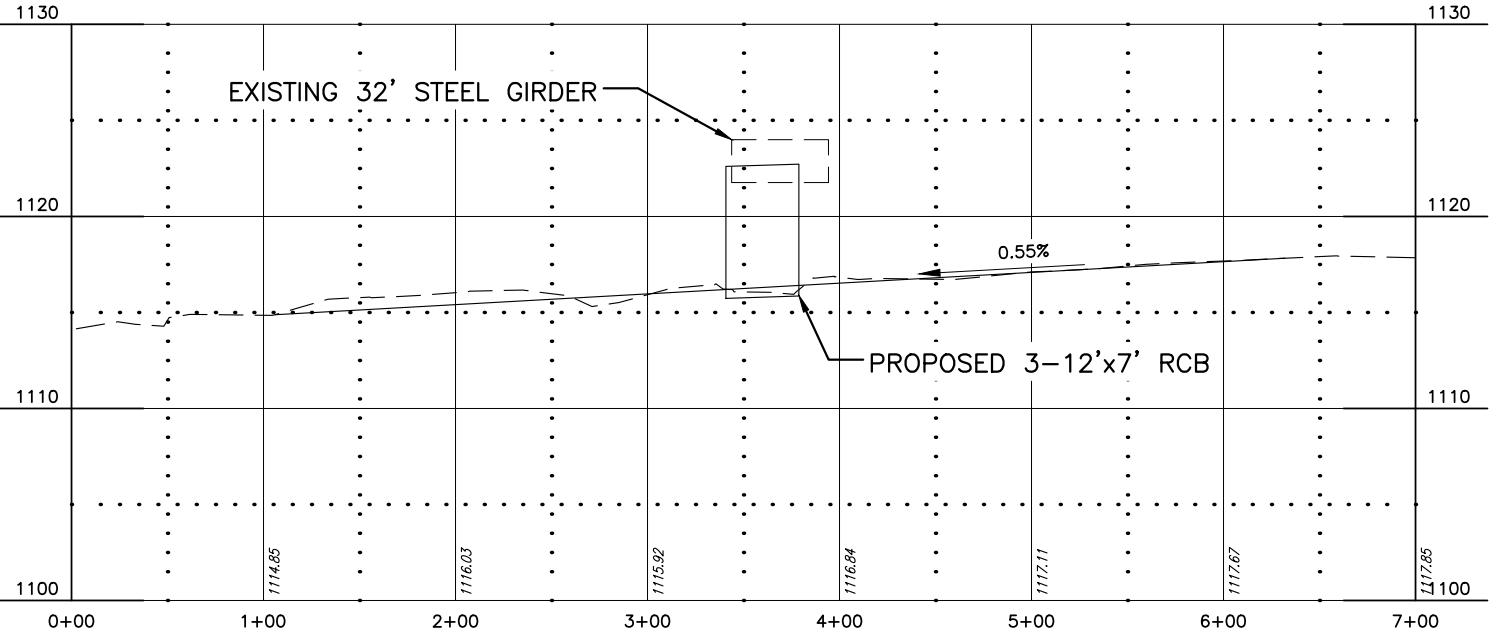


THESE ARE NOT TO BE USED IN CONSTRUCTION PLANS.
THESE ARE FOR HYDRAULIC REPORT AND CONFENECE

E. POST OAK RD. OVER TRIB. TO JIM BLUE CREEK

EXISTING STRUCTURE
32' STEEL GIRDER
Proposed Alignment = Sta. 112+97.05
Creek Sta. = Sta. 1154.25
Bridge Length= 32 ft.
Low Beam = 1121.76 ft.
RDWAY OT Elev.= 1124.00 ft.
RDWAY OT STA.= Sta. 112+97.05

PROPOSED STRUCTURE
3-12'x7' RCB
Proposed Alignment = Sta. 112+97.02
Creek Sta.= Sta. 1107.74
Culvert Length= 40'-2" ft.
FL In= 1115.86 ft.
RDWAY OT Elev.= 1124.43 ft.
RDWAY OT STA.= Sta. 112+97.02



DESIGN	DJG	E. POST OAK RD.	CLEVELAND COUNTY
DRAWN	DJG		
CHECKED	XXX		
MKEC		CREEK FLOWLINE PROFILE	
		JOB PIECE NO. K-2324-151 Sheet No. 2	

Oklahoma Dept. of Transportation - Bridge Inspection Report

Item 2.

NBI No.:
26914Structure No.:
14E1280N3200002Local ID:
044Suff. Rating:
47.50

FO

Bridge Description:

IDENTIFICATION

32ft. STEEL GIRDER

1. State: Oklahoma
2. Division: Division 3
3. County: CLEVELAND
4. City: NORMAN
Admin Area: Unknown
5a. On/Under: Route On Structure
5b. Kind of Hwy: City Street
5c. Lvl of Srvc: Mainline
5d. Route No.: E1280
5e. Dir. Sufx: N/A (NBI)

7. Facility Carried E POST OAK RD
6. Feat. CREEK
9. 0.2 MI E 96TH AVE SE
11. Mile Post: 1.336 mi
13. LRS / Sub Rte: -1 / -1
16. Latitude: 35° 09' 37.29"
17. Longitude: 097° 17' 39.00"
98. Border Unknown (P)
% Responsible: 0.00
99. Border Brdg #: Unknown

STRUCTURE TYPE AND MATERIALS

43a/b. Main Span: Steel / Stringer/Girder
44a/b. Appr. Span: N/A / Not Applicable (P)
45. # of Main Spans: 1
46. # of Appr. Spans: 0
107. Deck Type: Steel Plate
108a. Wearing Surface: Bituminous
108b. Membrane: None
108c. Deck protection: None

AGE AND SERVICE

19. Detour Length: 0.6 mi
27. Year Built: 2002
28a/b. Lanes on/und: 2 / 0
29. ADT: 220
30. Year of ADT: 2020
42a/b. Type of Svc on/und: Highway / Waterway

106. Year Reconst.: -1
109. Truck ADT: 15%

GEOMETRIC DATA

10. Vert. Clearance: 99.99 ft
32. Appr Rwy Width: 23.00 ft
33. Median: No median
34. Skew: 0.00°
35. Struct. Flared: No flare
47. Horizontal Clr: 27.70 ft
48. Length Max Span: 28.00 ft
49. Struct. Length: 32.00 ft

50a. Curb/Sdwk Width L: 0.00 ft
50b. Curb/Sdwk Width R: 0.00 ft
51. Width Curb to Curb: 27.70 ft
52. Width Out to Out: 29.53 ft
Deck Area: 947.22 sq. ft
53. Min. Vert. Cl. Ovr Brg: 99.99 ft
54a. Min. Vt. Undclr. Ref: N Feature not hwy c
54b. Min. Vert. Undclr.: 0.00 ft
55a. Min. Lat. Undclr. Ref: N Feature not hwy
55. Min. Lat. Underclr. R: 0.00 ft
56. Min. Lat. Underclr. L: 0.00 ft

OKLAHOMA ITEMS

200c. Temperature: 73
200d. Weather: Cloudy
201. Struc. Stl. ASTM Desig.: -1 / -1
202. Waterprf. Membrane: -1
Date Installed: 01/01/1901
203. Type Exp. Device: Open Joint-No Device
204. Type of Railing: Metal Railing (other)
205. Material Quantity: -1.00
208a. Type of Abutment: Pedestal
b. Type of Found.: Bears on Natural Found.
209. Type of Pier/Found.: - / -
210. Foundation Elev.: -1.00 -1.00 -1.00
211. Wear. Surf. Prot. Sys.: -
Date Installed: 01/01/1901
211c. Silane Reapplied
211d. Date:
213. Utilities Attached:

214a. Posted Weight Limit: 121212
b. Posted Speed Limit: 50
c. Narrow/1way Brdg Sign: No
d. Vertical Clr. Sign: No
Adv. Warning Sign: No
e. Navigation Lights?: NA
Working/Not Working: NA
215. Overpass: ACOG
218. Functionally Obsolete: FO
220. Bridge Redecked: -
221. Substr. Cond. (U/W): -
222. Fill Over RCB:
223. Appr. Slab/Rwy Cond.: 2
225. Paint Type/Ovrct: Red Lead 3 Coat System
226. Date Painted: 2002
227. Paint Color: Silver
233. Deck Forming:
238. School Bus Rte.: Current bus route
240. Appr. Rwy Type.: Asphalt/Bituminous
243. Grdr Spacing/No.: /

INSPECTION

Type	Insp. Req.	Insp. Done	Freq.	Insp. Date	Next Insp.
NBI:		1	24 months	10/25/2023	10/25/2025
FC:	N	0		NA	NA
UW:	N	0		NA	NA
OS:	N	0		NA	NA

CLASSIFICATION

12. Base Hwy Net.: Not on Base Network
20. Toll Facility: On free road
21. Custodian: City
22. Owner: City
26. Function Class: 07 Rural Mjr Collecto
37. Historical Sig.: Not eligible for NRHP
100. Def. Hwy: Not a STRAHNET hwy

101. Parallel Str.: No || bridge exists
102. Traffic Dir.: 2-way traffic
103. Temp. Str.: Not Applicable (P)
104. Hwy System: Not on NHS
105. Fed Land Hwy: IRR-Indian Res Rd
110. Defense Hwy: Not a STRAHNET hwy
112. NBIS Length: Long Enough

CONDITION

58. Deck: 5 Fair
62. Culvert: N/A (NBI)
59. Sup.: 5 Fair
61. Chan./Chan. Prot.: 7 Minor Damage
60. Sub: 5 Fair

Flowline Notes:

2023, FL = 7.0 ft to NTOD next to gabion.
2021, FL = 7.2 ft to NTOD. 2019, FL = 7.5ft from NE corner.

LOAD RATING AND POSTING

31. Design Load MS 18 (HS 20)
41. Post. Status: P Posted for load
70. Posting: 0 >39.9% below
63. Op / 65. Inv. Rating Meth.: 1 LF Load Factor / 1 LF Load Factor

	H	HS	3-3	EV3	SHV
64. Operating Rating (tons):	12.80	19.10	33.40	16.50	18.40
66. Inventory Rating (tons):	7.70	11.50	20.00	9.90	

Date Rated 12/04/2019

APPRAISAL

36a. Brdg Rail: 0 Substandard
36b. Transition: 0 Substandard
36c. Appr. Rail: 0 Substandard
36d. Appr. Rail Ends: 0 Substandard
67. Str Evaluation: 2 Intolerable - Repl

68. Deck Geom.: 5 Above Tolerable
69. Vert./Horiz. Undclr: Not applicable (NB)
71. Waterway Adeq: 8 Equal Desirable
72. Appr. Alignment: 7 Above Min Criteria
113. Scour Critical: 5 Stable w/in footing

PROPOSED IMPROVEMENT

94. Bridge Cost: \$174,000
95. Roadway Cost: \$96,000
96. Total Cost: \$276,000
97. Yr. of Cost Est.: 2015

75. Type of Work: 31 Repl-Load Capacity
76. Lngth of Improvement: 111.7 ft
114. Future ADT: 440
115. Yr. of Future ADT: 2040

NAVIGATION DATA

38. Nav. Control: Permit Not Required
39. Vert. Clearance: 0.0 ft
40. Horiz. Clearance: 0.0 ft

111. Pier Protect.: Not Applicable (P)
116. Lift Bridge Vert. Clr.: 0.0 ft

244. Span Lengths:

245. Girder Depth:
246a. Type of Overlay: AC Overlay
b. Overlay Thickness: 6.00
c. Overlay Date: 02/01/2002
d. Only Depth Changed >1": N

247. Protective Systems:

248. # Field Splices w/ Corrosion:
249. Scour Crit. POA Exists?: No
250. Headwall:
258. Plans w/Found. in ODOT File -
259. Scour Eval. in ODOT File: -
263. Interchange at Intersection: -
264. Interstate Milepoint:

Oklahoma Dept. of Transportation - Bridge Inspection Report

Item 2.

NBI No.:
26914

Structure No.:
14E1280N3200002

Local ID:
044

Suff. Rating:
47.50

FO

Inspection Date: 10/25/23 Wayne Roesner

Invoice No.: HWL141023 Inspected With: Lukas Evans

Wayne Roesner (Ite)

Digitally signed by Wayne Roesner (Ite)
DN: C=US, E=wroesner@hwlochner.com,
O=Lochner, CN=Wayne Roesner (Ite)
Date: 2023.12.19 15:54:58-06'00'

BRIDGE NOTES:

INSPECTION NOTES: 10/25/23

Gabions are protecting both abutments.

ELEMENT CONDITION STATE DATA

Elem. / Env	Description	Unit	Total Qty	% 1	Qty. 1	% 2	Qty. 2	% 3	Qty. 3	% 4	Qty. 4
30 / 4	Steel Deck - Orthotropic	sq.ft	947.00	0%	0.00	0%	0.00	96%	907.00	4%	40.00
Deck is using the girders (laying on their sides) as stay-in-place forms. They are filled with asphalt not concrete. Web areas with some section loss. Isolated areas with moderate loss.											
510 / 4	Wearing Surfaces	sq.ft	947.00	100%	947.00	0%	0.00	0%	0.00	0%	0.00
Asphalt wearing surface.											
107 / 4	Steel Opn Girder/Beam	ft	196.00	100%	196.00	0%	0.00	0%	0.00	0%	0.00
FX - Large areas of rust & pitting present. Needs to place plates over holes. Girders are laying on their sides. Girders are slightly bowed. Flanges & webs have areas of minor surface rust.											
515 / 4	Steel Protective Coating	sq.ft	1,416.00	0%	0.00	0%	0.00	100%	1,416.00	0%	0.00
Paint system has failed. Paint system was red lead paint.											
215 / 4	Re Conc Abutment	ft	59.00	85%	50.00	15%	9.00	0%	0.00	0%	0.00
Minor cracks & spalls. Large vertical crack with some separation on the NE corner of the east abutment. No settlement at this time.											
330 / 4	Metal Bridge Railing	ft	62.00	50%	31.00	50%	31.00	0%	0.00	0%	0.00
Minor areas of rust.											
919 / 4	St.(Rail) Prot. Coat	sq.ft	136.00	0%	0.00	0%	0.00	100%	136.00	0%	0.00
Paint system is failing.											
865 / 4	St.Open Gird End(5Ft)	ft	90.00	90%	81.00	10%	9.00	0%	0.00	0%	0.00
963 / 4	Steel Section Loss SF	each	1.00	0%	0.00	100%	1.00	0%	0.00	0%	0.00
Minor pitting exists on beams. Minimum section loss of flange areas. Isolated areas of minor section loss present on web areas.											

**OKLAHOMA DEPARTMENT OF TRANSPORTATION
ON-SYSTEM ROUTINE INSPECTION
PHOTOGRAPH RECORD FORM**

Item 2.

County: Cleveland ODOT District: 3 Facility Carried: E POST OAK RD
Structure: 14E1280N3200002 NBI# 26914 Feature Intersected: CREEK



Roadway view, looking west



Roadway view, looking east

**OKLAHOMA DEPARTMENT OF TRANSPORTATION
ON-SYSTEM ROUTINE INSPECTION
PHOTOGRAPH RECORD FORM**

Item 2.

County: Cleveland ODOT District: 3 Facility Carried: E POST OAK RD
Structure: 14E1280N3200002 NBI# 26914 Feature Intersected: CREEK



Elevation view, looking north