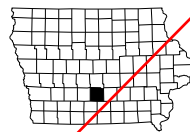


**WARREN CO.**

**BRIDGE REPLACEMENT - PPCB**  
BRF-065-3(83)--38-91

LETTING DATE  
12-19-2023



| INDEX OF SHEETS |  |
|-----------------|--|
| No.             | DESCRIPTION                                      |
| <b>A Sheets</b> | <b>Title Sheets</b>                              |
| A.1             | Title Sheet                                      |
| A.2             | Location Map Sheet                               |
| * A.3 - 4       | Design Criteria Worksheets (Temporary)           |
| <b>B Sheets</b> | <b>Typical Cross Sections and Details</b>        |
| B.1 - 2         | Typical Cross Sections and Details               |
| <b>C Sheets</b> | <b>Quantities and General Information</b>        |
| C.1             | Standard Road Plans                              |
| <b>D Sheets</b> | <b>Mainline Plan and Profile Sheets</b>          |
| * D.1           | Plan & Profile Legend & Symbol Information Sheet |
| * D.2 - 5       | US 65  |
| <b>G Sheets</b> | <b>Survey Sheets</b>                             |
| G.1 - 3         | Reference Ties and Bench Marks                   |
| G.4             | Horizontal Control Tab. for all Alignments       |
| <b>J Sheets</b> | <b>Traffic Control and Staging Sheets</b>        |
| * J.1           | Traffic Control Plan                             |
| * J.2 - 3       | Staging and Traffic Control                      |
| <b>V Sheets</b> | <b>Bridge Situation Plans</b>                    |
| * V.1           | Bridge Situation Plan                            |
| <b>W Sheets</b> | <b>Mainline Cross Sections</b>                   |
| W.1             | Cross Sections Legend & Symbol Information Sheet |
| W.2 - 4         | US 65  |
|                 | * Color Plan Sheets                              |



**Highway Division**

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM  
**WARREN COUNTY**  
BRIDGE REPLACEMENT - PPCB

US 65 over Otter Creek, 1.6 miles south of County Rd G58

SCALES: As Noted

Refer to the Proposal Form for list of applicable specifications.  
Value Engineering Saves. Refer to Article 1105.14 of the Specifications.



REVISIONS

|                               |                      |
|-------------------------------|----------------------|
| TOTAL                         | 24                   |
| PROJECT IDENTIFICATION NUMBER | 19-91-065-010        |
| PROJECT NUMBER                | BRF-065-3(83)--38-91 |
| R.O.W. PROJECT NUMBER         |                      |

Field Exam (virtual) review.  
6/24/2021  
Attendees

- Liz Finarty
- Jim Ellis
- Bob Younie
- Steven Schroder
- Jim Webb
- Bob Porter
- Mark Claeys
- Dave Claman
- Jill Garton
- Brandy Beavers
- Marv May
- Steven McElmeel
- Mark Werner
- Greg Shuger
- Josh Stott
- Tony Bower

SIIMS shows traffic count at 2,140 in 2020, county map shows 2,360 in 2016? Which correct?

File No.: 32032

| DESIGN DATA RURAL |        |           |        |
|-------------------|--------|-----------|--------|
| 2016              | AADT   | 2360      | V.P.D. |
| 2044              | AADT   | 3040      | V.P.D. |
| 2044              | DHV    | 314       | V.P.H. |
|                   | TRUCKS | 13        | %      |
| Total             |        |           |        |
| Design            | ESALs  | 2,866,000 |        |

| INDEX OF SEALS |      |                         |
|----------------|------|-------------------------|
| SHEET NO.      | NAME | TYPE                    |
| A.1            | X    | Primary Signature Block |
|                |      |                         |
|                |      |                         |
|                |      |                         |

| DESIGN ACTIVITIES |            |                    |                |
|-------------------|------------|--------------------|----------------|
|                   | DUE DATE   | EVENT              | DATE COMPLETED |
| D02               | 6/18/2021  | Field Exam         | ----           |
| D03               | 7/16/2021  | Drainage Submittal | ----           |
| B01               | 10/15/2021 | Bridge Submittal   | ----           |
| D05               | 11/19/2021 | ROW Submittal      | ----           |
|                   |            |                    |                |

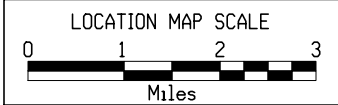
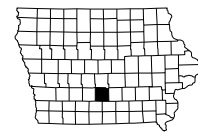
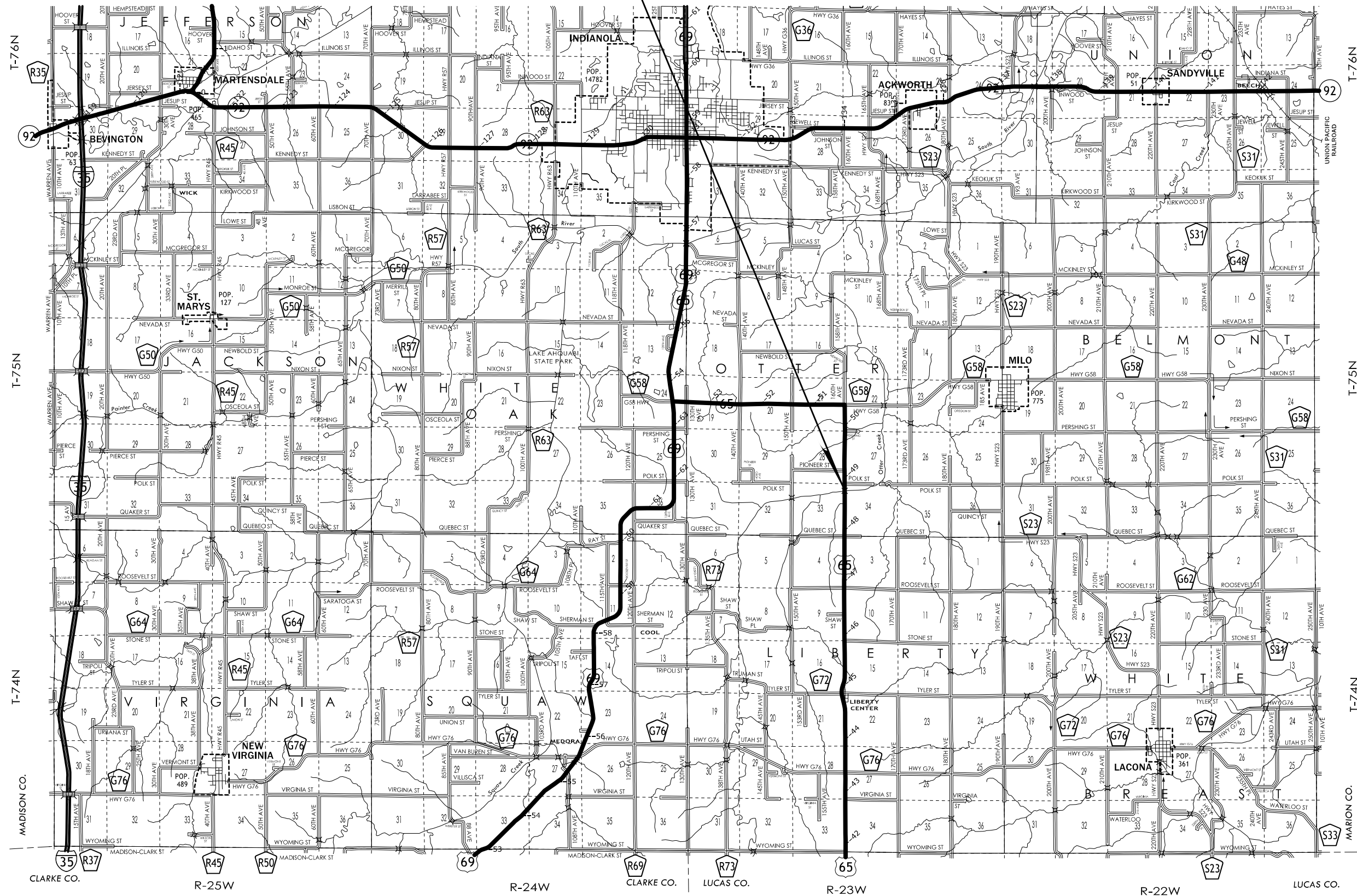
**PRELIMINARY PLANS**

Subject to change by final design.

D2 PLAN - Date: June 4, 2021

DOT may issue a new FHWA number at B01.

### US 65 BRIDGE REPLACEMENT FHWA NO. 050880



|                        |   |                                    |                       |
|------------------------|---|------------------------------------|-----------------------|
| <b>Roadway</b>         | US 65   |                                    |                       |
| <b>PIN Number</b>      |   |                                    | <b>Submittal Date</b> |
| <b>Project Number</b>  | BRF-065-3(83)--38-91  |                                    | <b>Approval Date</b>  |
| <b>District</b>        | District 5  | <b>Assistant District Engineer</b> | Steve McElmeel        |
| <b>County</b>          | WARREN  | or                                 |                       |
| <b>Route</b>           | US 65   | <b>Office Director</b>             |                       |
| <b>Location</b>        | US 65 Bridge over Otter Creek, 1.6 miles south of south junction County Road G58. |                                    |                       |
| <b>Work Type</b>       | PPCB Bridge Replacement   |                                    |                       |
| <b>Segment Manager</b> |   |                                    |                       |
| <b>Designer</b>        | Stanley Consultants, Inc.   |                                    |                       |

[Design Manual Section 1C-1](#)  
Last Updated: 04-29-19

### Rural Two-Lane Highways (Rural Arterials)

| Design Element  | Preferred   | Acceptable   | Project Values |
|---|---|--|----------------|
| Design speed (mph)  | 60  | 50   | 60             |
| Maximum superelevation rate (Refer to Section 2A-2)   | 6%  | 8%   | N/A            |
| Design lane width (ft)  | 12  | 12   | 12             |
| Full depth paved width (ft)   | 12  | 12   | 12             |
| Right turn lane (ft)  | 12  | 10   | N/A            |
| Climbing Lane (ft)  | 12  | 12   | N/A            |
| Left turn lane (ft)   | 12  | 10   | N/A            |
| Pavement cross-slope (on tangent sections)  | Through lanes                                     | 1.5% minimum, 2% maximum   | 2%             |
|   | Auxiliary and turn lanes                          | 3% maximum   | N/A            |
|   | Crown break at centerline                         | 4% maximum   | 4%             |
| Shoulder cross-slope (on tangent sections)  | 4%  | Shoulder cross-slope cannot be less than the adjacent lane, 6% max for paved or granular shoulders, 8% max for earth shoulders | 4%             |
| Curb type (Refer to Section 3C-2)   | Design speed = 50 or 55 mph                       | 6-inch sloped  | N/A            |
|   | Design speed ≥ 60 mph                             | 4-inch sloped  | 4-inch sloped  |
| Foreslope (For fill areas greater than 40 ft, contact the Soils Design Section for assistance)                          | Adjacent to shoulder                              | 10:1 for 4' then 6:1   | 6:1            |
|   | Beyond standard ditch depth and design clear zone | 3.5:1  | 3.5:1          |
|   | Curbed roadways                                   | 2%   | N/A            |
| Backslope (For cut areas greater than 25 feet, contact the Soils Design Section for assistance with backslope benches.) | 3:1   | 2.5:1  | 3:1            |
| Transverse Slopes   | w/ drainage structures                            | 8:1  | 8:1            |
|   | w/o drainage structures                           | 10:1   | 10:1           |
| Ditches (Refer to Section 3G-1)   | Outside ditch (depth x width) (ft)                | 5 x 10   | 5 x 10         |
| Bridge width—new*   | Bridge length ≤ 200 ft                            | design lane widths + effective shoulder widths   | N/A            |
|   | Bridge length > 200 ft                            | design lane widths + effective shoulder widths   | 44'            |
| Bridge width—existing*  |   | design lane widths + no less than 2 ft left and right  | N/A            |
| Vertical clearance (ft) (above lanes, shoulders and 25 feet left and right of the center of railroad tracks)            | Over primary                                      | 16.5   | N/A            |
|   | Over non-primary                                  | 16.5 at interchange locations, 15 at all other locations   | N/A            |
|   | Over railroad                                     | 23.3   | N/A            |
|   | Sign trusses and pedestrian bridges               | 17.5   | N/A            |
| Structural Capacity   | Contact Office of Bridges and Structures          | Contact Office of Bridges and Structures   | ----           |
| Level of Service  | B   | B  | ----           |

See Notes On Next Sheet.

Structural Capacity, Standard Vehicle?

|  |                          |  |  |                          |                |   |
|--|--------------------------|--|--|--------------------------|----------------|---|
| <b>Design year ADT = 3,040 (yr. 2044)</b>  |                          |  |  |                          |                |   |
| <a href="#">Design Manual Section 1C-1</a><br>Last Updated: 04-29-19                         |                          | <b>Effective Shoulder Width and Type for Two-Lane Highways</b> |  |                          |                |   |
| Preferred (values shown in feet)   |                          |  | Acceptable (values shown in feet)      |                          |                | Project Values  |
|  | Rural Roadways           | Urban Roadways   |  | Rural Roadways           | Urban Roadways |   |
| Turn lanes with shoulders  | 6                        | 6  | Turn lanes with shoulders              | 6                        | 0              | N/A   |
| Turn lanes with curbs  | 6                        | See Section <a href="#">3C-2</a>                               | Turn lanes with curbs                  | 6                        | 0              | N/A   |
|  | Effective Shoulder Width | Paved Width  |  | Effective Shoulder Width | Paved Width    |   |
| Climbing Lanes   | 6                        | 4  | Climbing Lanes                         | 4                        | 0              | N/A   |
| Two-Lane Highways  | Effective Shoulder Width | Paved Width  | Two-Lane Highways                      | Effective Shoulder Width | Paved Width    |   |
| Routes where bicycles are to be accommodated   | 10                       | 10   | Design year ADT > 2000 vpd             | 8                        | 0*             | 10' Paved at bridge approaches, then transition to 6' paved/4' granular |
| On roadways approaching urban areas (due to increased bike traffic)                          | 10                       | 10   |  |                          |                |   |
| On all curves with a superelevation rate of 7.0% or greater                                  | 10                       | 10   |  |                          |                |   |
| On roadways with design year ADT > 5000  | 10                       | 6  | Design year ADT between 400 - 2000 vpd | 6                        | 0*             |   |
| <b>On all other NHS</b>  | <b>10</b>                | <b>6</b>   | Design year ADT < 400 vpd              | 4                        | 0*             |   |
| On non-NHS routes with design year ADT > 3000  | 10                       | 6  |  |                          |                |   |
| On non-NHS routes with design year ADT < 3000  | 8                        | 0*   |  |                          |                |   |
| *Requires safety edge-Refer to Section <a href="#">3C-6</a>                                  |                          |  |  |                          |                |   |
| Curbs should be located beyond the outer edge of the effective shoulder width in rural areas |                          |  |  |                          |                |   |
| Refer to Section <a href="#">3C-2</a> for curb offsets in urban areas                        |                          |  |  |                          |                |   |

discussed transition from full width to 6'/4'; refer to B sheet standard detail.

|   |  |  |                       |      |      |      |      |   |     |      |      |      |      |                |      |
|---|--|--|-----------------------|------|------|------|------|---|-----|------|------|------|------|----------------|------|
| <b>Roadway Design Speed (mph) = 60</b>  |  |  |                       |      |      |      |      |   |     |      |      |      |      |                |      |
| <a href="#">Design Manual Section 1C-1</a><br>Last Updated: 04-29-19                                    |  | <b>Design Criteria for High Speed Roadways</b>                   |                       |      |      |      |      |   |     |      |      |      |      |                |      |
| Design Element  |  | Preferred Criteria   |                       |      |      |      |      | Acceptable Criteria   |     |      |      |      |      | Project Values |      |
|   |  | Design Speed, mph  |                       |      |      |      |      | Design Speed, mph   |     |      |      |      |      |                |      |
|   |  | 50   | 55                    | 60   | 65   | 70   | 75   | 50  | 55  | 60   | 65   | 70   | 75   |                |      |
| Stopping sight distance (ft) (Refer to Section <a href="#">6D-1</a> )                                   |  | 425  | 495                   | 570  | 645  | 730  | 820  | 425   | 495 | 570  | 645  | 730  | 820  | 570            |      |
| Minimum horizontal curve radius (ft) (Refer to Sections <a href="#">2A-2</a> and <a href="#">2A-3</a> ) | Method 5 superelevation and side friction distribution | e <sub>max</sub> = 6%  | 833                   | 1060 | 1330 | 1660 | 2040 | 2500  | 833 | 1060 | 1330 | 1660 | 2040 | 2500           | 1330 |
|   |  |  | e <sub>max</sub> = 8% | --   | --   | --   | --   | --  | --  | 758  | 960  | 1200 | 1480 | 1810           | 2210 |
| Minimum vertical curve length (ft) (Refer to Section <a href="#">2B-1</a> )                             |  | 150  | 165                   | 180  | 195  | 210  | 225  | 150   | 165 | 180  | 195  | 210  | 225  | 180            |      |
| Minimum rate of vertical curvature (K) (Refer to Section <a href="#">2B-1</a> )                         | crest vertical curves                                  | 84   | 114                   | 151  | 193  | 247  | 312  | 84  | 114 | 151  | 193  | 247  | 312  | 151            |      |
|   | sag vertical curves                                    | roadways without fixed-source lighting                           | 96                    | 115  | 136  | 157  | 181  | 206   | 96  | 115  | 136  | 157  | 181  | 206            | 136  |
|   |  | roadways with fixed-source lighting                              | 96                    | 115  | 136  | 157  | 181  | 206   | 54  | 66   | 78   | 91   | 106  | 121            | 136  |
| Minimum gradient (%) (Refer to Section <a href="#">2B-1</a> )   |  | 0.5  |                       |      |      |      |      | 0.3% with a curb, 0.0% without a curb                             |     |      |      |      |      | 0.5            |      |
| Maximum gradient (%) (Refer to Section <a href="#">2B-1</a> )   | Urban roadways   | 4  |                       | 3    |      |      |      | 7   | 6   | 6    | --   | --   | --   | N/A            |      |
|   | Rural roadways   | 4  |                       | 3    |      |      |      | 5   | 5   | 4    | 4    | 4    | 4    | 3%             |      |
|   | Interstates  | 4  |                       | 3    |      |      |      | 5   | 5   | 4    | 4    | 4    | 4    | N/A            |      |
| Clear zone  |  | See "Preferred Clear Zone" table in Section <a href="#">8A-2</a> |                       |      |      |      |      | See "Acceptable Clear Zone" table in Section <a href="#">8A-2</a> |     |      |      |      |      | 40'            |      |

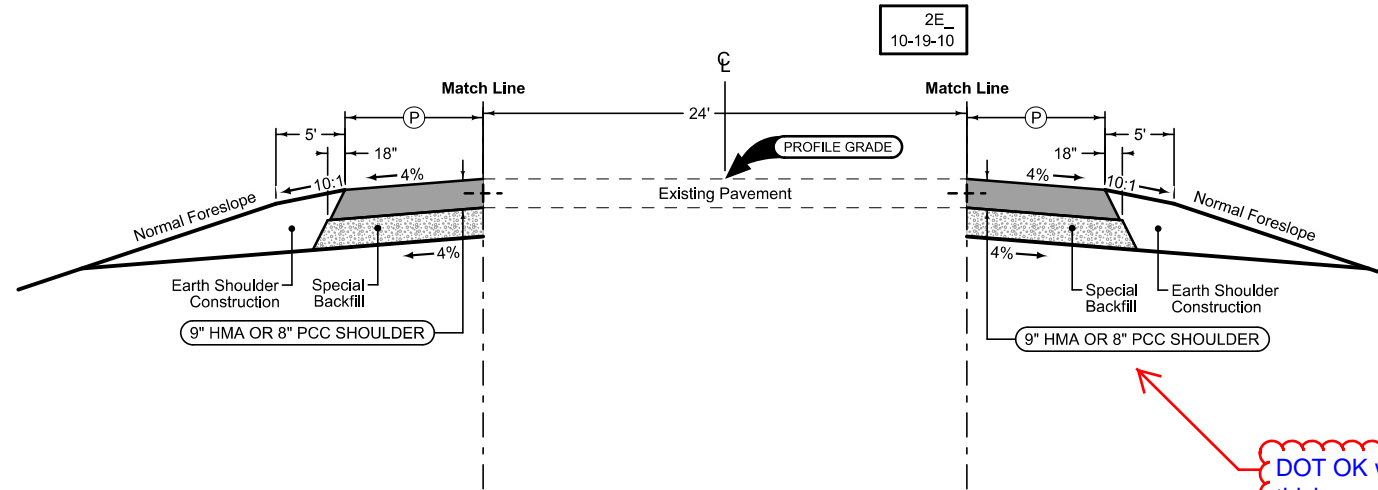
Field Exam discussion: Yes proceed to use acceptable criteria to keep grading work within R.O.W. and minimize disturbance.

Achieving 40 ft clear zone is not practical. Discuss at Field Exam. 30 ft clear zone would meet acceptable clear zone given design speed and traffic count. We can achieve 4:1 foreslope for 30 ft and then 2:1 to tie into existing slope. See cross sections based on 4:1/2:1 foreslope.

**Paved Shoulder at Guardrail**

PCC Shoulder Jointing:  
 Longitudinal joint: BT-1 or BT-5  
 Transverse joints: C at mainline spacing  
 HMA Shoulder Jointing:  
 Longitudinal joint: B

| 2_P_Guard_04-21-20 |           |           |
|--------------------|-----------|-----------|
| STATION TO STATION | (P)       | Feet      |
| 398+72.58          | 398+89.60 | 13.9      |
| 398+89.60          | 399+33.37 | 13.9-12.1 |
| 403+48.87          | 403+89.37 | 11.6      |
| 403+89.37          | 404+44.00 | 11.6-13.8 |
| 404+44.00          | 404+64.00 | 13.8      |



DOT OK with shoulder thicknesses.

**Paved Shoulder at Guardrail**

PCC Shoulder Jointing:  
 Longitudinal joint: BT-1 or BT-5  
 Transverse joints: C at mainline spacing  
 HMA Shoulder Jointing:  
 Longitudinal joint: B

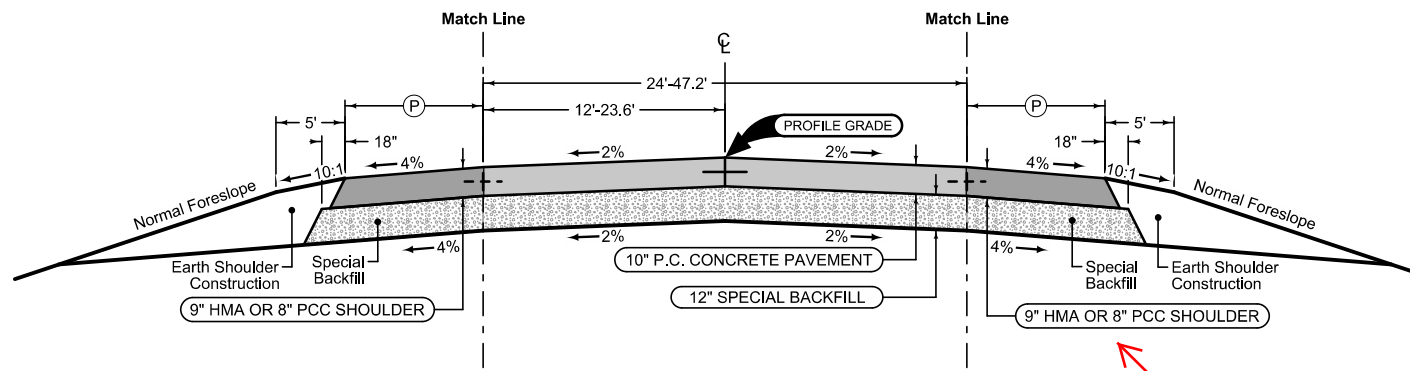
| 2_P_Guard_04-21-20 |           |           |
|--------------------|-----------|-----------|
| STATION TO STATION | (P)       | Feet      |
| 398+23.76          | 398+43.76 | 13.6      |
| 398+43.76          | 398+97.06 | 13.6-11.5 |
| 398+97.06          | 399+33.37 | 11.5      |
| 403+48.87          | 403+94.15 | 11.8-13.6 |
| 403+94.15          | 404+14.15 | 13.6      |

EXISTING US 65

**Paved Shoulder at Guardrail**

PCC Shoulder Jointing:  
 Longitudinal joint: BT-1 or BT-5  
 Transverse joints: C at mainline spacing  
 HMA Shoulder Jointing:  
 Longitudinal joint: B

| 2_P_Guard_04-21-20 |           |           |
|--------------------|-----------|-----------|
| STATION TO STATION | (P)       | Feet      |
| 399+33.37          | 399+46.80 | 12.1-11.6 |
| 399+46.80          | 399+62.99 | 11.6      |
| 402+85.00          | 403+48.87 | 11.6      |



DOT OK with shoulder thicknesses.

THICKNESSES SHOWN FOR THROUGH LANES ARE FOR STND/S-F PC CONCRETE PAVEMENT. FOR AREAS NOTED AS BR-203 APPROACH PAVEMENT, REFER TO STANDARD ROAD PLAN BR-203 FOR DETAILS OF PAVEMENT SECTION.

Mainline Jointing:  
 STND/SF PC CONCRETE PAVEMENT  
 Transverse joints: CD at 17' spacing  
 Longitudinal joint: L-2  
 BR-203 APPROACH PAVEMENT  
 Match Jointing per SRP BR-203

| 2P_04-21-20        |           |                               |
|--------------------|-----------|-------------------------------|
| STATION TO STATION |           |                               |
| 399+33.37          | 399+52.99 | STND/S-F PC CONCRETE PAVEMENT |
| 399+52.99          | 400+22.99 | BR-203 APPROACH PAVEMENT      |
| 402+85.00          | 403+35.00 | BR-203 APPROACH PAVEMENT      |
| 403+35.00          | 403+48.87 | STND/S-F PC CONCRETE PAVEMENT |

See Sheet B.2 for "Paved Shoulder at Guardrail" Details

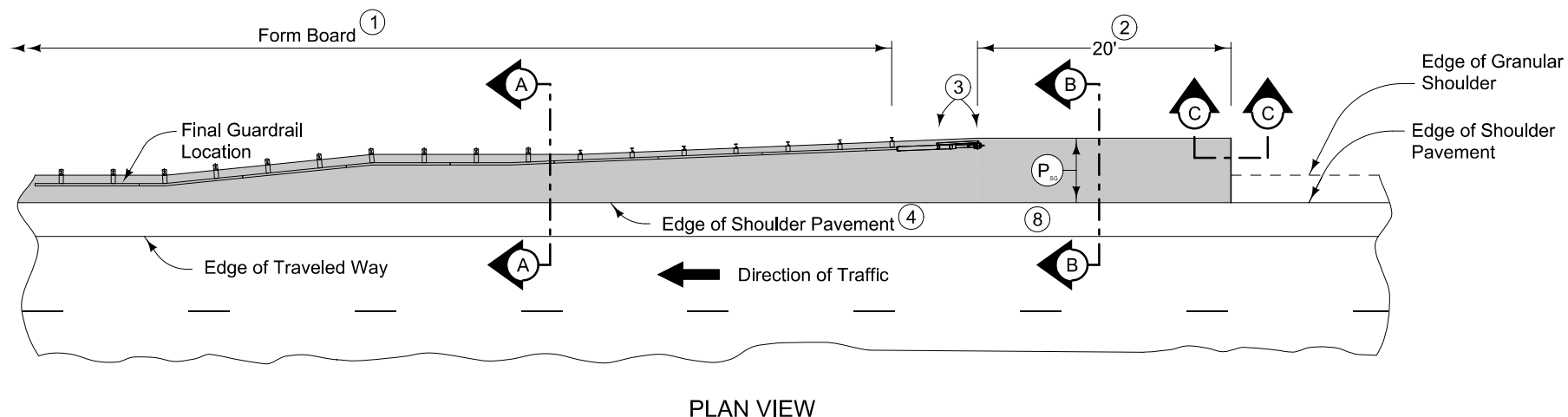
**Paved Shoulder at Guardrail**

PCC Shoulder Jointing:  
 Longitudinal joint: BT-1 or BT-5  
 Transverse joints: C at mainline spacing  
 HMA Shoulder Jointing:  
 Longitudinal joint: B

| 2_P_Guard_04-21-20 |           |           |
|--------------------|-----------|-----------|
| STATION TO STATION | (P)       | Feet      |
| 399+33.37          | 399+82.99 | 11.6      |
| 402+85.00          | 403+42.49 | 11.6      |
| 403+42.49          | 403+48.87 | 11.6-11.8 |

For Paved Shldr, PCC For Bridge End Drain, Refer to DR-402 - Sta. 399+82.99 to Sta. 400+02.99

US 65

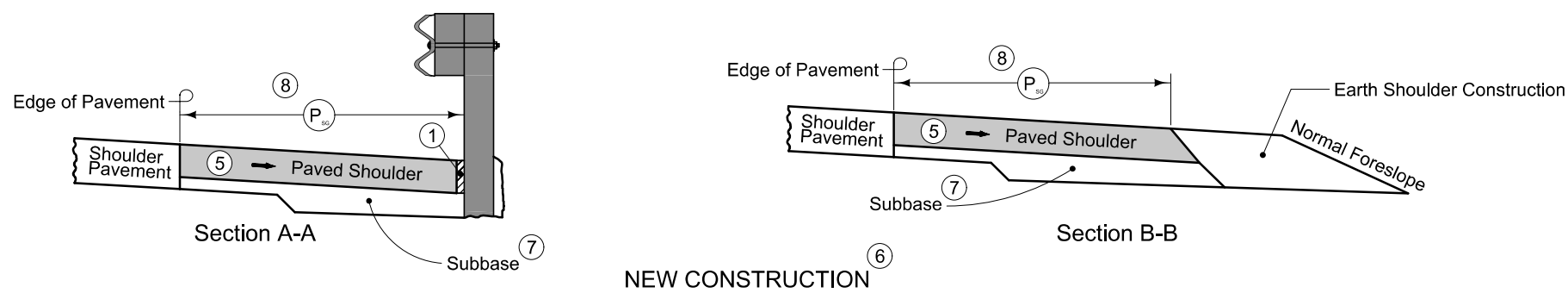


9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

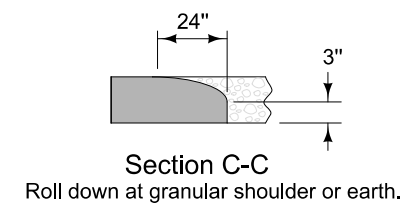
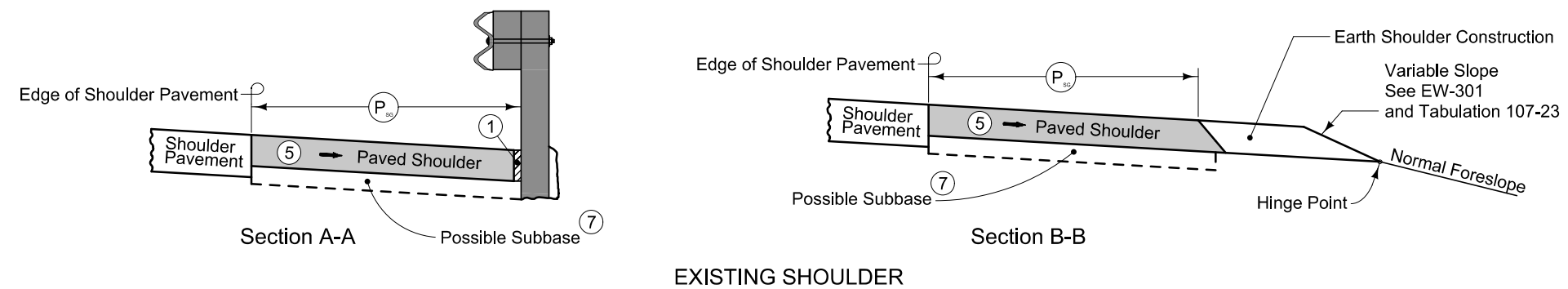
Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

Refer to Tabulation 112-9 for shoulder quantities.



- ① PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown.
- ② Continue paved shoulder 20 feet beyond the center of the first post.
- ③ Shoulder may be notched for first 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ④ 'KT-1 joint for PCC shoulder. 'B' joint for HMA shoulder.
- ⑤ Match shoulder slope.
- ⑥ The Contractor has the option to pave the paved shoulder at guardrail and the partial width paved shoulder as one operation.
- ⑦ Refer to other details in the plan.
- ⑧ P is based on 8" block is used for BA-205 and BA-225 end terminals and P will need to be reduced by 4 inches when BA-205 and BA-225 are specified.



PAVED SHOULDER AT GUARDRAIL (ADJACENT TO PARTIAL WIDTH PAVED SHOULDER)



### SURVEY SYMBOLS

- CP Control Point
- ▲ SCR Section Corner
- ⊕ SEP Septic Tank
- OUT Tile Outlet
- ⚡ PPA Midamerican Electric
- ⊕ TW Top of Water
- △ ROW Right of Way Mark
- SIGN
- △ SI Sign
- △ BM Bench Mark
- MM Mile Marker Post

- C Centerline BL of Road (ML or SR)
- BNK Stream Bank
- TLNR Tree Line Right
- FW Wire Fence
- TLNL Tree Line Left
- ROC Gravel Pile Extents
- CON Concrete or A/C Slab
- RET Retaining Walls
- RIP Rip-Rap
- GDL Guard Rail Steel
- BRG Bridge
- BL Topo Breakline
- D Centerline Draw or Stream
- SNP Unpaved Shoulder
- SH Paved Shoulder
- EP Edge of Paved Roads (ML or SR)
- PIP Pipe Culvert

### SURVEYED UTILITY OWNER SYMBOLS

Sub-Surface Utility Mapping Quality Level is in accordance with CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data.

Remark Abbreviations  
 QLA Quality Level A Highest guideline quality level  
 QLD Quality Level D Lowest guideline quality level

- W(C) WL1C Warren Water District - Quality C
- T1(C) TL1C Windstream Communications - Quality C
- FO(C) FO1C Mediacom Communications - Quality C
- ⚡ PPA Midamerican Electric

### PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

| LINEWORK         | Design Color No. | Description  |
|------------------|------------------|--|
| Green            | (2)              | Existing Topographic Features and Labels                               |
| Blue             | (1)              | Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation    |
| Magenta          | (5)              | Existing Utilities   |
| SHADING          |                  |  |
| Design Color No. | Description      |  |
| Yellow           | (4)              | Highlight for Critical Notes or Features                               |
| Red              | (3)              | Delineates Restricted Areas  |
| Lavender         | (9)              | Temporary Pavement Shading   |
| Gray, Light      | (48)             | Proposed Pavement Shading  |
| Gray, Med        | (80)             | Proposed Granular Shading  |
| Gray, Dark       | (112)            | Proposed Grade and Pave Shading "In conjunction with a paving project" |
| Brown, Light     | (236)            | Grading Shading  |
| Tan              | (8)              | Proposed Sidewalk Shading  |
| Blue, Light      | (230)            | Proposed Sidewalk Landing Shading                                      |
| Pink             | (11)             | Proposed Sidewalk Ramp Shading   |

### PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

| LINEWORK    | Design Color No. | Description                     |
|-------------|------------------|---------------------------------|
| Green       | (2)              | Existing Ground Line Profile    |
| Blue        | (1)              | Proposed Profile and Annotation |
| Magenta     | (5)              | Existing Utilities              |
| Blue, Light | (230)            | Proposed Ditch Grades, Left     |
| Black       | (0)              | Proposed Ditch Grades, Median   |
| Rust        | (14)             | Proposed Ditch Grades, Right    |

- Reference Point
- Station
- Survey Line
- Section Corner
- Ground Line Intercept
- Saw Cut
- Guardrail
- Trench Drain
- HighTension Cable Guardrail
- Sheet Pile
- Pavement Removal
- Clearing & Grubbing Area

### RIGHT-OF-WAY LEGEND

- ▲ Proposed Right-of-Way
- △ Existing Right of Way
- ▲ Existing and Proposed Right-of-Way
- ▲ Easement and Existing Right-of-Way
- Easement (Temporary)
- Easement
- C/A Access Control
- Property Line

## PLAN AND PROFILE LEGEND AND SYMBOL INFORMATION SHEET

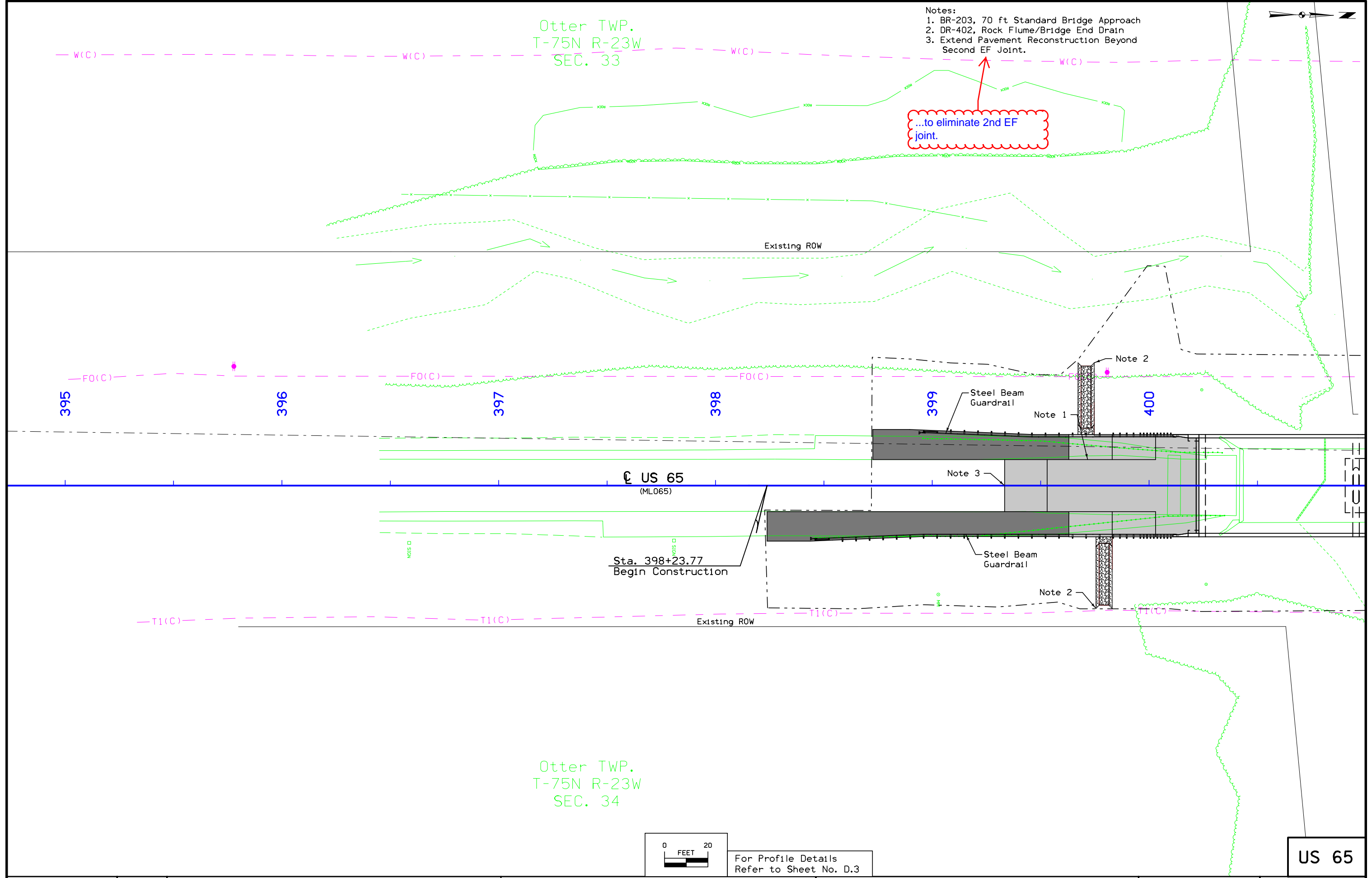
(COVERS SHEET SERIES D)



Otter TWP.  
T-75N R-23W  
SEC. 33

- Notes:
1. BR-203, 70 ft Standard Bridge Approach
  2. DR-402, Rock Flume/Bridge End Drain
  3. Extend Pavement Reconstruction Beyond Second EF Joint.

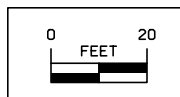
...to eliminate 2nd EF joint.



US 65  
(ML065)

Sta. 398+23.77  
Begin Construction

Otter TWP.  
T-75N R-23W  
SEC. 34



For Profile Details  
Refer to Sheet No. D.3

US 65

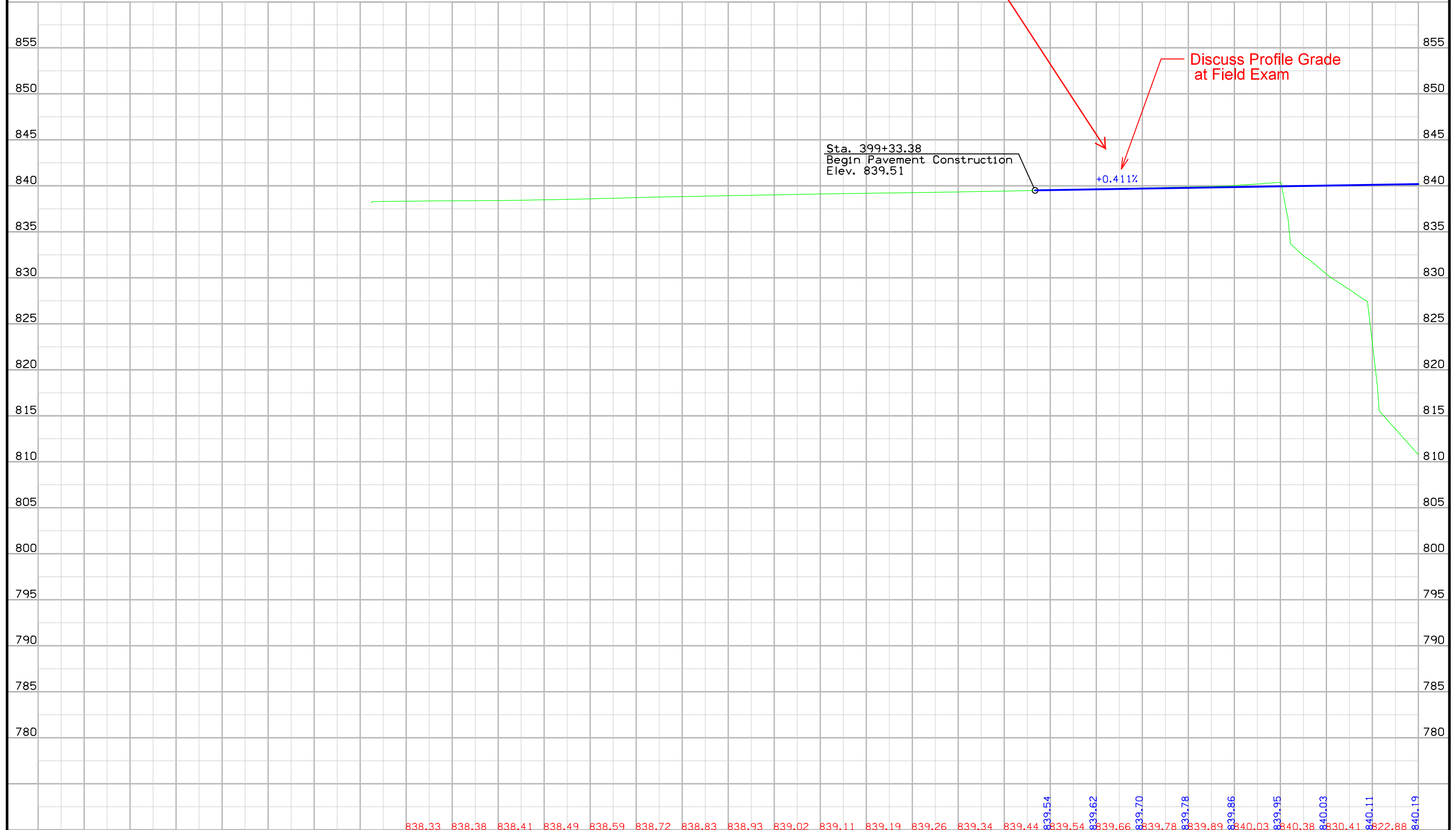
For Plan Details  
Refer to Sheet No. D.2

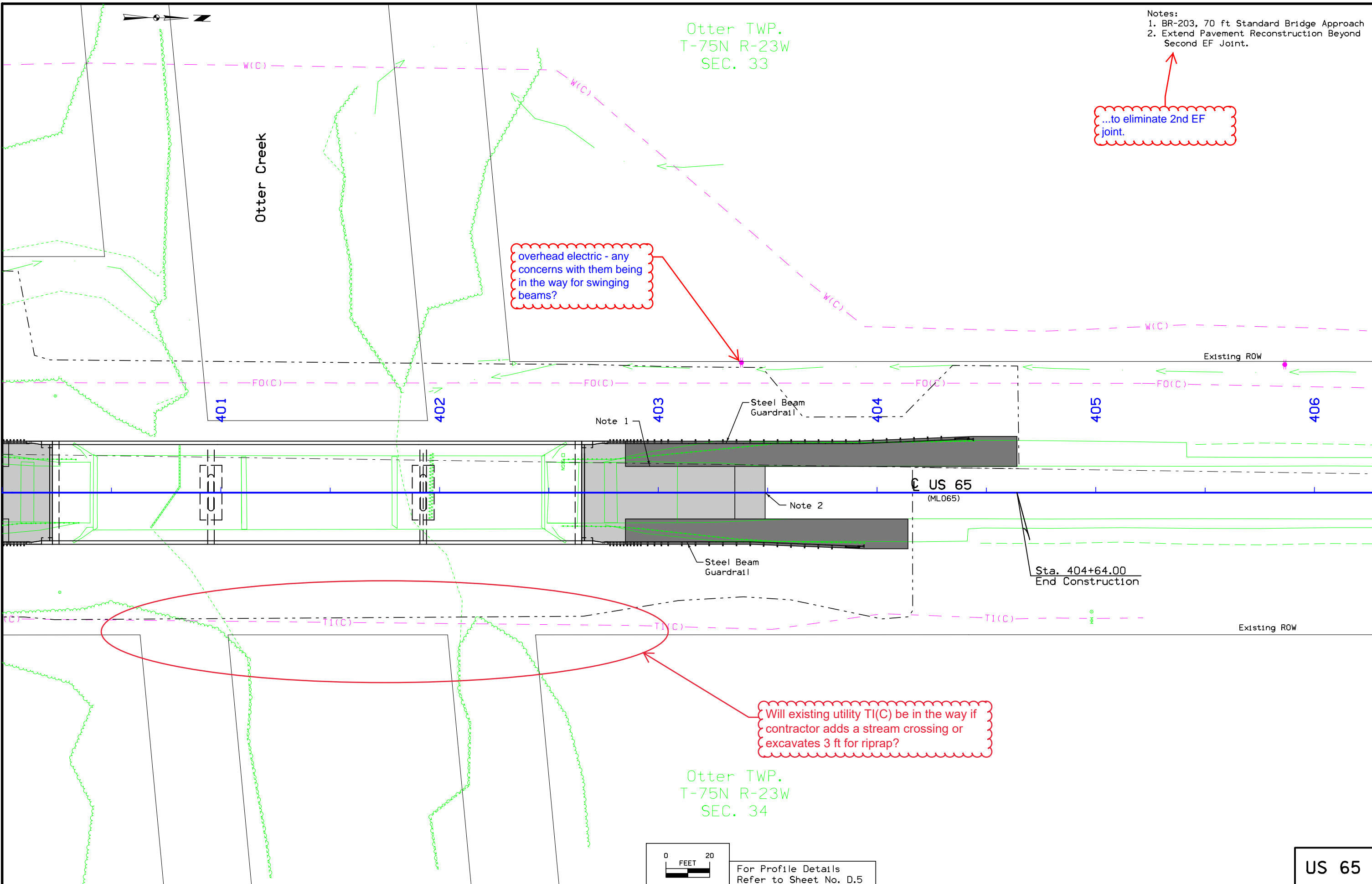
DOT is OK with this  
profile grade. Proceed to  
use.

Discuss Profile Grade  
at Field Exam

Sta. 399+33.38  
Begin Pavement Construction  
Elev. 839.51

+0.411%





Otter TWP.  
T-75N R-23W  
SEC. 33

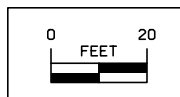
- Notes:
- BR-203, 70 ft Standard Bridge Approach
  - Extend Pavement Reconstruction Beyond Second EF Joint.

...to eliminate 2nd EF joint.

overhead electric - any concerns with them being in the way for swinging beams?

Will existing utility TI(C) be in the way if contractor adds a stream crossing or excavates 3 ft for riprap?

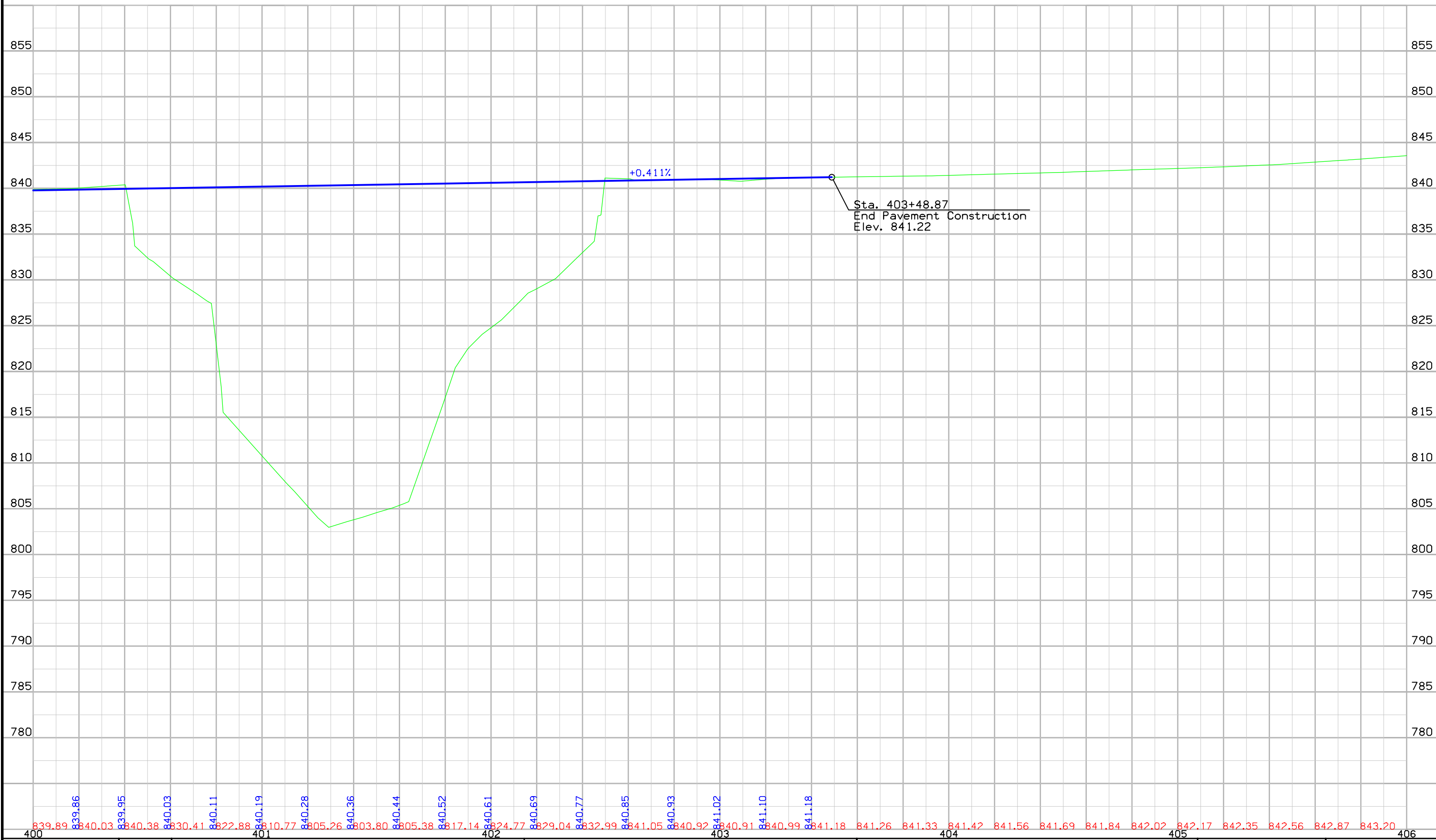
Otter TWP.  
T-75N R-23W  
SEC. 34



For Profile Details Refer to Sheet No. D.5

US 65

For Plan Details  
Refer to Sheet No. D.4



## Survey Information

**WARREN COUNTY  
BRF-065-3(83)—38-91  
OTTER CREEK BRIDGE  
OTTER TWP, IOWA  
PIN# - 19-91-065-010**

### Contact Information

Fieldwork performed by: Martin & Whitacre, Surveyors & Engineers, Inc.  
1508 Bidwell Road  
Muscatine, IA 52761  
POC: Matt Krause, P.L.S. 563-263-7691  
EMAIL: MKRAUSE@MARTIN-WHITACRE.COM

Survey Data Submitted to: Stanley Consultants  
225 Iowa Ave.  
Muscatine, IA 52761  
POC: Tony Bower  
EMAIL: bowertony@stanleygroup.com

### Party Personnel

Project Manager - Matt Krause, PLS  
Party Chief - Mike Sandsness  
Rodman - Eric Allison

### Date(s) of Survey

|            |               |
|------------|---------------|
| Begin Date | June 15, 2020 |
| End Date   | June 28, 2020 |

### General Information

This survey was completed to provide topographic survey information for the design of a new bridge over Otter Creek in Otter TWP, Iowa.

### Horizontal Control

The coordinate system used is NAD83(2011) (Epoch 2010.00) Iowa Regional Coordinate System Zone 8 – Ames-Des Moines, U. S. Survey Feet.

Did not check into any existing GPS Control points due to closest monument being more than 10 miles from project. Six on-site control points were set on the north and south sides of the creek. Three on each side of the bridge. The six on-site control points were observed with GPS for 3 minute windows on 2 separate occasions, with appropriate time spans in-between, using the Iowa RTN. All new Control Points were held at the observed Horizontal Positions.

### Vertical Control

The vertical datum used is NAVD88 computed from GPS Observations and Geoid 12A.

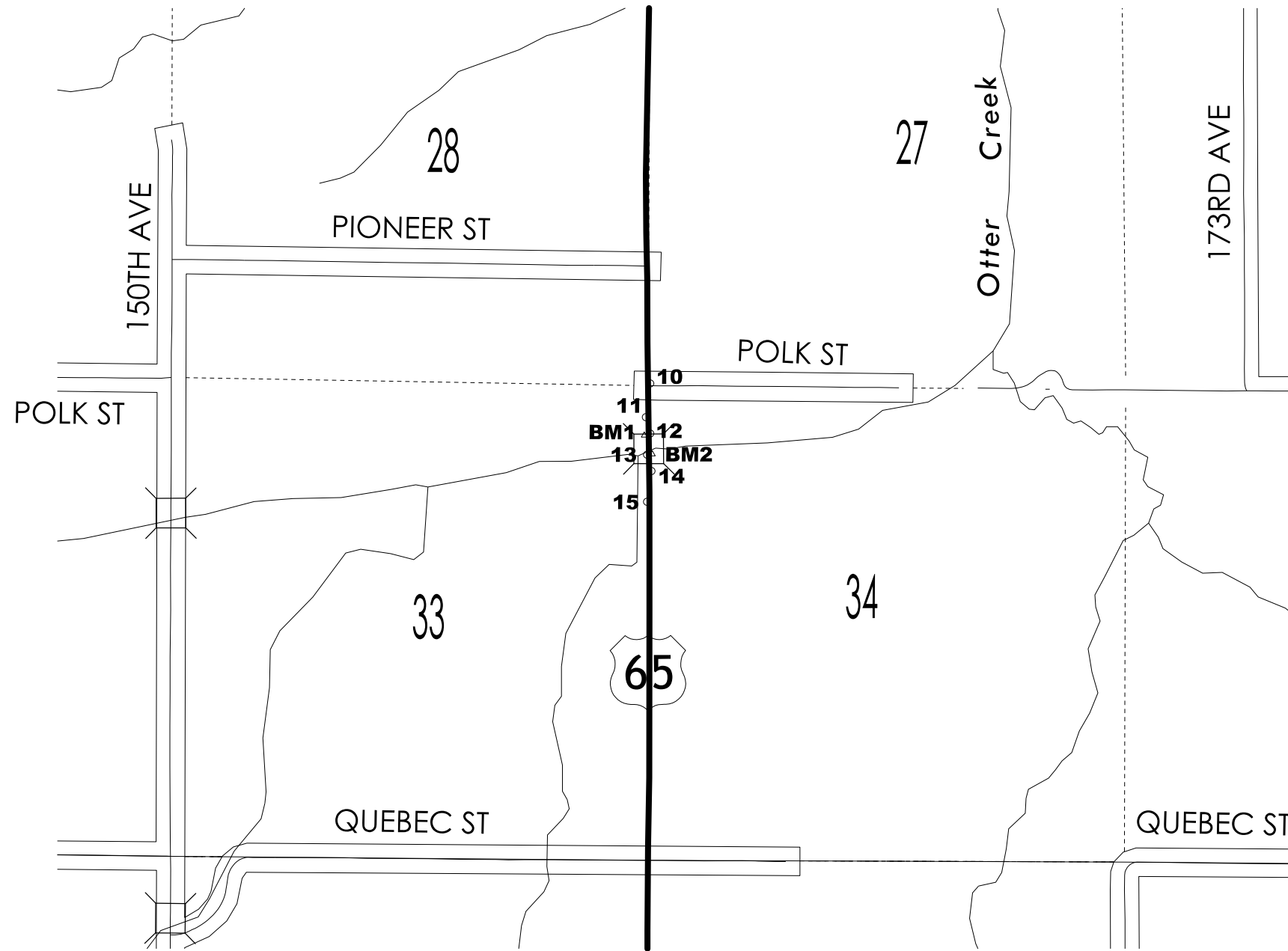
No existing Benchmarks were observed due to nearest monument more than 10 miles from the project. The observed GPS elevations were held at 6 on-site control points based on the average differences between the Observed GPS elevations and leveled elevations. Elevations were then computed for the new benchmarks based on the differential levels. The maximum error of closure for all loops was .00'.

### Alignment Information

No horizontal alignments for the existing roadways were computed for this survey.

### CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points  
Primary control is for use with RTK base stations and for RTN validation.  
Future surveys will use primary project control to establish temporary  
control as needed for construction or other surveying applications.



HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 8

Coordinate listing from next sheet will be used with 1aRTN for monument  
recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2010.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 8

| Point # | Northing      | Easting        | Elevation | Description  |
|---------|---------------|----------------|-----------|--|
| 10      | 7,369,053.630 | 18,559,494.823 | 849.60    | 1/2"x36" REBAR, NORTH SIDE POLK ST, IN EAST SIDE HWY65 IN GRAVEL     |
| 11      | 7,368,677.186 | 18,559,447.509 | 840.92    | 1/2"x36" REBAR, WEST SIDE OF HWY65, AT END OF GUARDRAIL IN GRAVEL    |
| 12      | 7,368,496.329 | 18,559,496.057 | 840.83    | 1/2"x36" REBAR, EAST SIDE OF HWY65, 9' NORTH OF NE BRIDGE WINGWALL   |
| 13      | 7,368,260.600 | 18,559,461.161 | 839.54    | 1/2"x36" REBAR, WEST SIDE OF HWY65, 10' SOUTH OF SW BRIDGE WINGWALL  |
| 14      | 7,368,076.440 | 18,559,509.062 | 838.50    | 1/2"x36" REBAR, EAST SIDE OF HWY65, 3' SOUTH OF GAURDRAIL IN GRAVEL  |
| 15      | 7,367,735.098 | 18,559,460.157 | 836.81    | 1/2"x36" REBAR, WEST SIDE OF HWY65, SOUTH EDGE OF GRAVEL FIELD DRIVE |
| BM 1    | 7,368,485.387 | 18,559,463.085 | 843.82    | CUT "X" IN TOP OF WHEEL BARRIER WALL AT NW CORNER OF BRIDGE          |
| BM 2    | 7,368,275.352 | 18,559,495.774 | 842.95    | CUT "X" IN TOP OF WHEEL BARRIER WALL AT SE CORNER OF BRIDGE          |

**ALIGNMENT COORDINATES**

| Name | Location | Point on Tangent |              |             | Begin Spiral |              |             | Begin Curve |              |             | Simple Curve PI or Master PI of SCS |              |             | End Curve |              |             | End Spiral |              |             |
|------|----------|------------------|--------------|-------------|--------------|--------------|-------------|-------------|--------------|-------------|-------------------------------------|--------------|-------------|-----------|--------------|-------------|------------|--------------|-------------|
|      |          | Station          | Coordinates  |             | Station      | Coordinates  |             | Station     | Coordinates  |             | Station                             | Coordinates  |             | Station   | Coordinates  |             | Station    | Coordinates  |             |
|      |          |                  | Y (Northing) | X (Easting) |              | Y (Northing) | X (Easting) |             | Y (Northing) | X (Easting) |                                     | Y (Northing) | X (Easting) |           | Y (Northing) | X (Easting) |            | Y (Northing) | X (Easting) |
| 1    | ML065    | 394+05.28 R1     | 7367639.21   | 18559488.40 |              |              |             |             |              |             |                                     |              |             |           |              |             |            |              |             |
| 2    | ML065    | 408+81.30 R1     | 7369115.11   | 18559469.54 |              |              |             |             |              |             |                                     |              |             |           |              |             |            |              |             |
|      |          |                  |              |             |              |              |             |             |              |             |                                     |              |             |           |              |             |            |              |             |
|      |          |                  |              |             |              |              |             |             |              |             |                                     |              |             |           |              |             |            |              |             |
|      |          |                  |              |             |              |              |             |             |              |             |                                     |              |             |           |              |             |            |              |             |



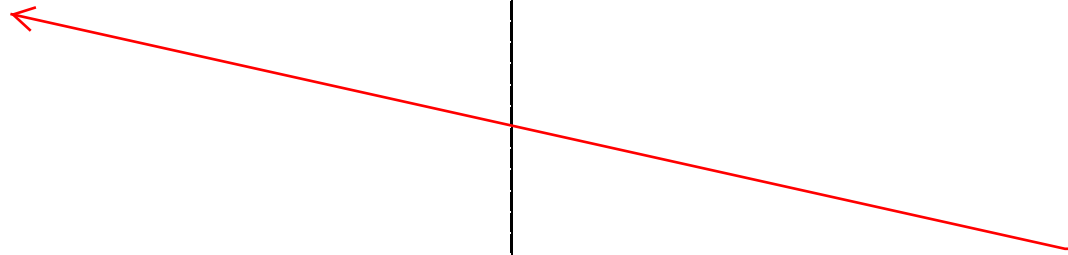
108-23A  
08-01-08

### TRAFFIC CONTROL PLAN

US 65  
-Both lanes of US 65 will be closed to traffic for the duration of the project. Offsite detour shall be as shown on J sheets.

Polk St  
-Maintain traffic for the duration of the project.

Private Entrances  
-Maintain access to US 65 for the duration of the project.



DOT would prefer Contractor handles all offsite detour signage as part of LS Traffic Control bid item.

108-26A  
08-01-08

### STAGING NOTES

Stage 1:  
-Close US 65 to traffic. Install offsite detour signage.  
-Remove existing bridge and construct new bridge over Otter Creek.  
-Construct new approach pavement and shoulders. Construct new guardrail.

Stage 2:  
-Install permanent erosion control measures and seeding/fertilizing.  
-Open US 65 to traffic.

**TRAFFIC CONTROL**

US 65 over Otter Creek, located 1.6 miles south of south junction of County Road G58, built in 1958.

Work includes bridge replacement, replacing bridge approaches and 'EF' joints, including removal of 2<sup>nd</sup> EF joints, and replacing guardrail.

Traffic Controls

Intersections or drives within 1,000 feet of the bridge:

- Field Entrances, 530 ft south of bridge, east and west sides (to remain open)
- Polk St (Level B road), 540 ft north of bridge, east side (to remain open)
- Private Entrance, 580 ft north of bridge, west side (to remain open)

~~Option 1: Construction will be staged half the bridge at a time maintaining single lane, minimum 10.5' wide, open to traffic on the bridge. Traffic control will involve TBR and traffic signals in accordance with Standard Road Plan (SRP) TC-217, and restricted width signage per SRP SI-882. Shoulder strengthening will be required.~~

Option 2: The bridge will be closed to traffic during construction. Traffic control will involve a signed detour route in conjunction with Standard Road Plan TC-252. Use of PDMS's is also assumed. The suggested detour route for SB US 65 is US 65 south to US 65/US 69 junction, then continue south on US 69 to County Road G-76, then east on County Road G-76 to US 65. See detour map on next page. The suggested detour route for NB US 65 is the same route as previously stated but in reverse order.

**B. Detour Analysis**

The alternative that includes an off-site detour will utilize primary and Warren County routes. The proposed detour route has been evaluated by the Bridges and Structures Rating Engineer and can carry all primary legal loads. The following Warren County structures have been added to the next cycle of bridge inspections:

| FHWA # | Structure Type |
|--------|----------------|
| 333041 | PPCB Bridge    |

**C. Recommendations**

It is recommended that the present structure be replaced with Alternative #2 as described in this concept. Alternative #2 is the lower cost alternative. Alternative #2 also eliminates the need for a longitudinal construction joint on the bridge which will reduce potential for future maintenance issue and simpler, safer construction.

**D. Construction Sequence**

It is anticipated that all work on this project will be awarded to one prime contractor. The Bridges and Structures Bureau will coordinate the plan preparation with assistance from the Design Bureau.

Maintaining traffic through staged bridge construction was investigated and included as an alternative in this Draft Concept. However, the preferred Alternative #2 includes an offsite detour which allows bridge removal and construction in a single stage resulting in a safer, simpler construction sequence.

**E. ADA Accommodations**

There are no bike paths or sidewalks adjacent to US 65 project area; therefore, no ADA accommodations are planned in conjunction with this project.

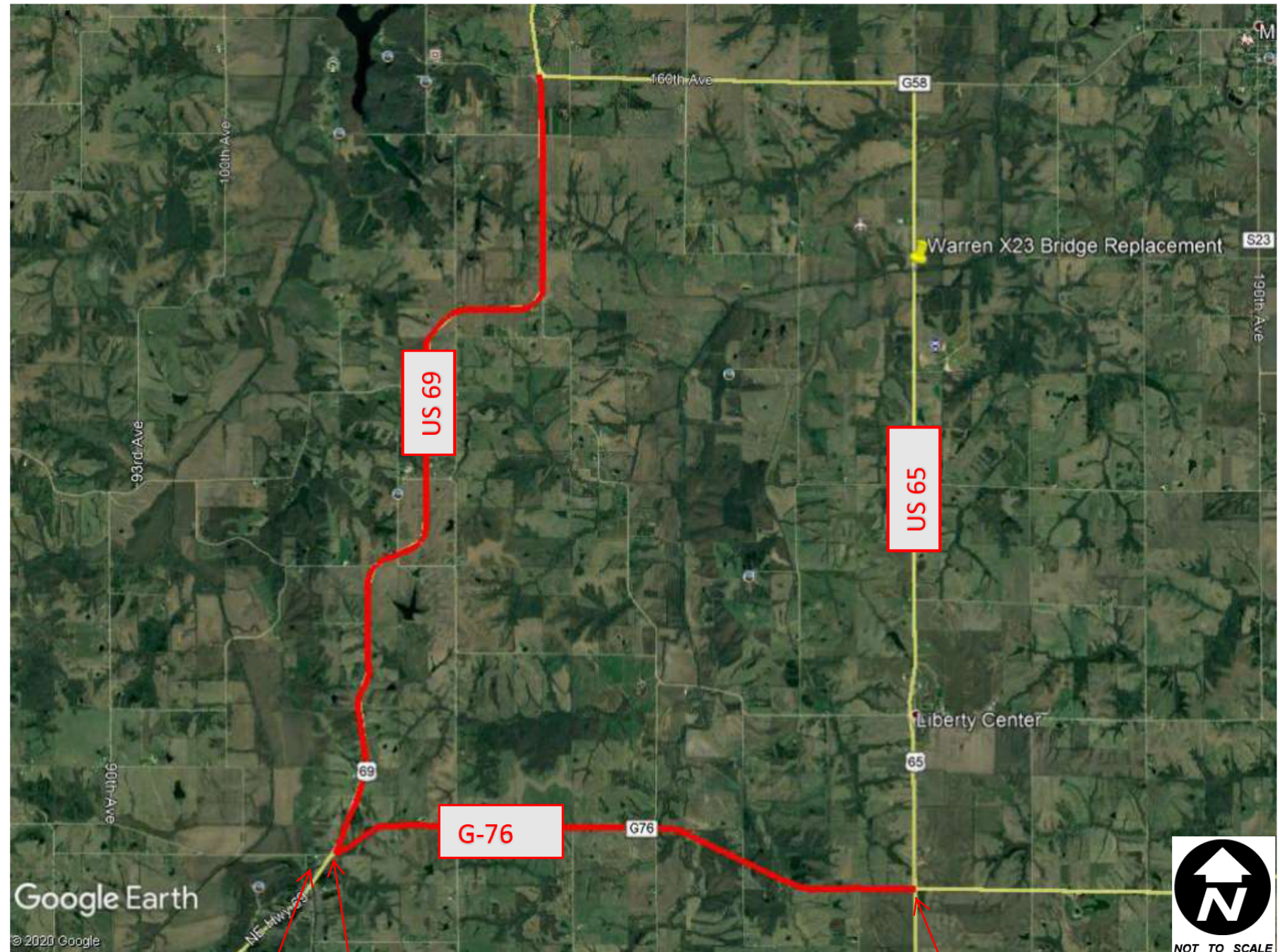
**F. Special Considerations**

The ABC Rating Score of 35 is less than the first stage filter threshold of 50, therefore an ACC option was dismissed from further consideration.

Existing overhead utility lines on the west side will need additional consideration during design to evaluate if it needs to be relocated.

Right-of-way does not appear to be required for this project.

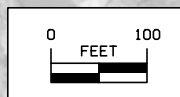
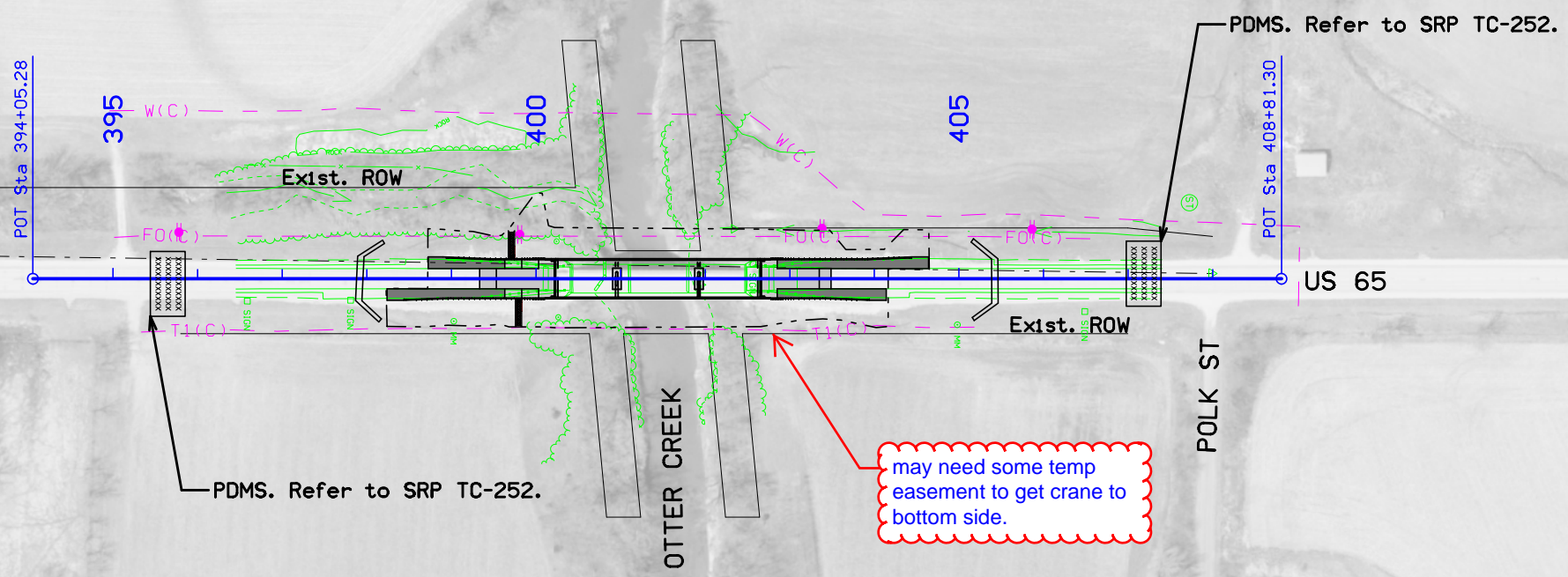
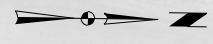
It is anticipated that a Section 404 Permit will be required. It is expected that the work will be covered by Nationwide Permit 14 or Regional Permit 7.

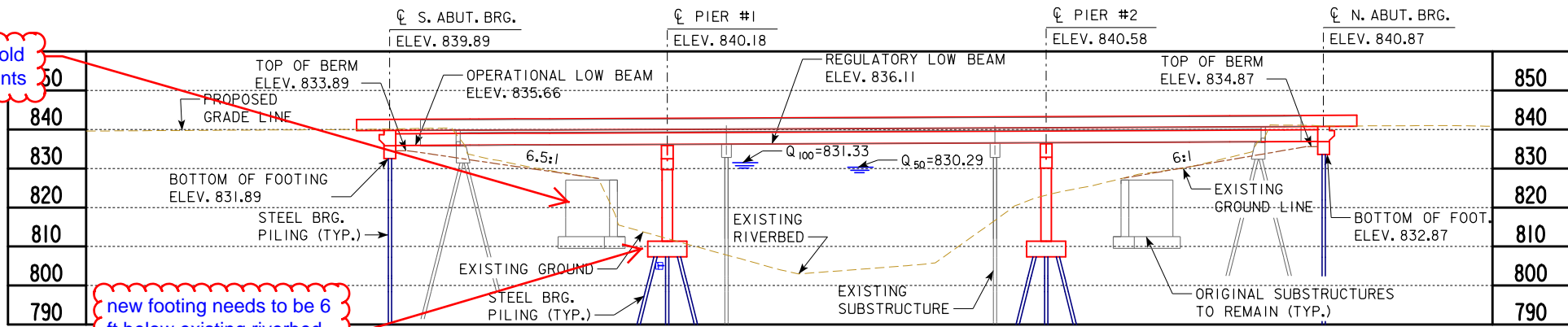


District suggests looking at all way stop here during detour.

County may have concerns with safety at this intersection.

County may have concerns with safety at this intersection.





+0.411%  
 VPI STA. = 399+33.38 VPI STA. = 403+48.87  
 VPI ELEV. = 839.51 VPI ELEV. = 841.22

**PROPOSED PROFILE GRADE US 65**

**HYDRAULIC DATA**

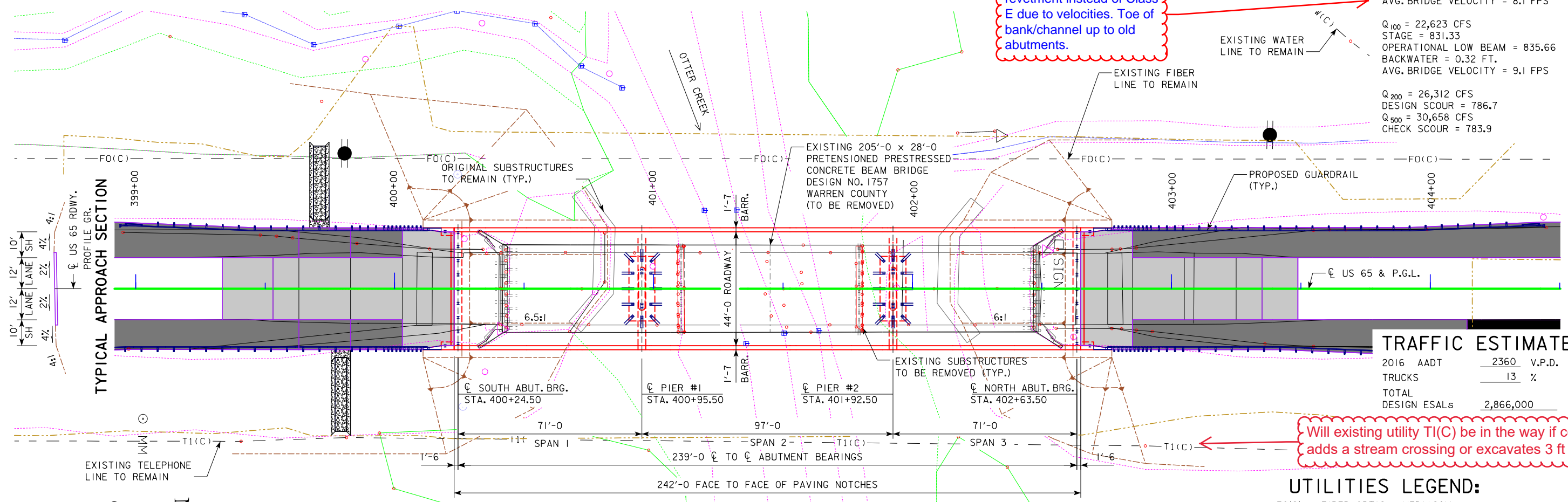
DRAINAGE AREA = 139.0 SQ. MI.  
 STREAM SLOPE = 1.1 FT./MI.  
 Q<sub>50</sub> = 19,057 CFS  
 STAGE = 830.29  
 REGULATORY LOW BEAM = 836.11  
 AVG. BRIDGE VELOCITY = 8.1 FPS  
 Q<sub>100</sub> = 22,623 CFS  
 STAGE = 831.33  
 OPERATIONAL LOW BEAM = 835.66  
 BACKWATER = 0.32 FT.  
 AVG. BRIDGE VELOCITY = 9.1 FPS  
 Q<sub>200</sub> = 26,312 CFS  
 DESIGN SCOUR = 786.7  
 Q<sub>500</sub> = 30,658 CFS  
 CHECK SCOUR = 783.9

look at removing both old spread footing abutments

remove all exist. piling down a min. of 3 ft below finished grade to make room for new Class B revetment.

new footing needs to be 6 ft below existing riverbed.

DOT: go with Class B revetment instead of Class E due to velocities. Toe of bank/channel up to old abutments.



**TRAFFIC ESTIMATE**

|                    |           |        |
|--------------------|-----------|--------|
| 2016 AADT          | 2360      | V.P.D. |
| TRUCKS             | 13        | %      |
| TOTAL DESIGN ESALs | 2,866,000 |        |

Will existing utility T1(C) be in the way if contractor adds a stream crossing or excavates 3 ft for riprap.

**UTILITIES LEGEND:**

- FO(C) - FIBER OPTIC - MADIACOM
- POWER POLE - MIDAMERICAN ELECTRIC
- W(C) - WATER MAIN - WARREN WATER DISTRICT
- T1(C) - TELEPHONE - WINDSTREAM

UTILITIES SHOWN ON THIS SHEET ARE FOR INFORMATION ONLY, SEE ROAD DESIGN SHEETS FOR FINAL UTILITY INFORMATION.

**NOTES:**

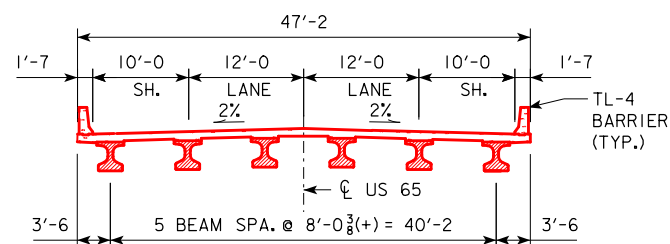
- ALL UNITS ARE IN FEET UNLESS NOTED OTHERWISE.
- TL-4 BRIDGE RAILING PROPOSED
- TOP OF BRIDGE DECK AT CL US 65 IS 0.03' BELOW THE PROFILE GRADE TO ACCOUNT FOR PARABOLIC CROWN.
- PIER TYPE - TEE PIERS
- BEAM TYPE - BTB BEAMS
- FOUNDATION TYPE TO BE CONFIRMED DURING FINAL DESIGN.
- BERM SLOPES TO BE CONFIRMED DURING FINAL DESIGN.



**LOCATION**

US 65 OVER OTTER CREEK  
 T-75N R-23W  
 SECTION 33 & 34  
 OTTER TOWNSHIP  
 WARREN COUNTY  
 FHWA NO. 50880  
 BRIDGE MAINT. NO. 9148.8S065  
 LATITUDE 41.260427°  
 LONGITUDE -93.500341°

PRELIMINARY  
 DESIGN FOR 0° SKEW  
**239'-0" X 44'-0" PRETENSIONED  
 PRESTRESSED CONCRETE BEAM BRIDGE**  
 71' END SPANS (BTB BEAM TYPE) 92' INTERIOR SPAN  
**SITUATION PLAN**  
 STATION 401+44.00 JUNE 2021  
**WARREN COUNTY**  
 IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
 DESIGN SHEET NO. 1 OF 1 FILE NO. DESIGN NO.



**PROPOSED CROSS SECTION**

**LINE STYLE LEGEND OF CROSS SECTION SHEETS (ROAD)**

- · — · — · — Existing Ground Line
- Proposed Template
- Proposed Topsoil Placement
- · · · · Additional Topsoil Removal
- Subgrade Treatment
- - - - - Granular Shoulder
- Pavement
- - - - - Existing Pipe\RCB
- Proposed Pipe\RCB
- Proposed Dike
- All Elements Associated with Proposed Entrances

**LINE STYLE LEGEND OF CROSS SECTION SHEETS (SOILS)**

- TS ——— Topsoil (Class 10)
- SLOPE DRESSING — Slope Dressing Only
- CL 10 ——— Class 10 Materials
- SEL LO ——— Select Loams And Clay-Loams
- SEL SA ——— Select Sand
- UNS A ——— Unsuitable Type A Disposal
- UNS B ——— Unsuitable Type B Disposal
- UNS C ——— Unsuitable Type C Disposal
- SHALE ——— Shale
- WASTE ——— Waste
- B&W LS ——— Broken and Weathered Rock
- ROCK ——— Solid Rock
- BLDRS ——— Boulders

Note: All layer lines and descriptions identify layers above the line.

Note: Vertical or near vertical lines connecting soil layers at edges of cross sections are only for the purpose of calculating template quantities and do not depict soil stratification.

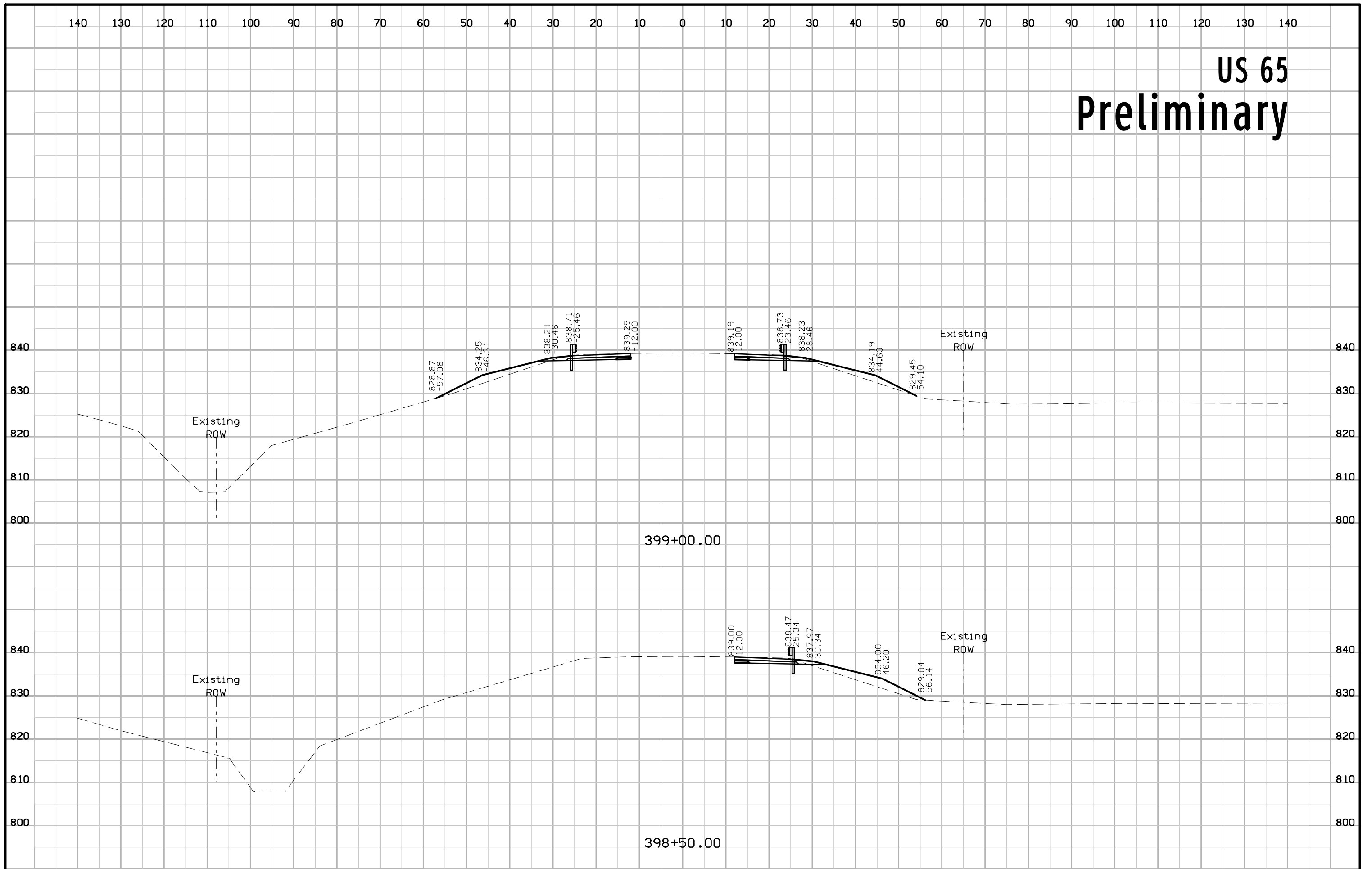
**SYMBOL LEGEND OF CROSS SECTION SHEETS**

- Existing ROW  
|  
Existing Right-of-Way Limit
- Proposed ROW  
|  
Proposed Right-of-Way Limit
- Temporary ROW  
|  
Temporary Right-of-Way Limit

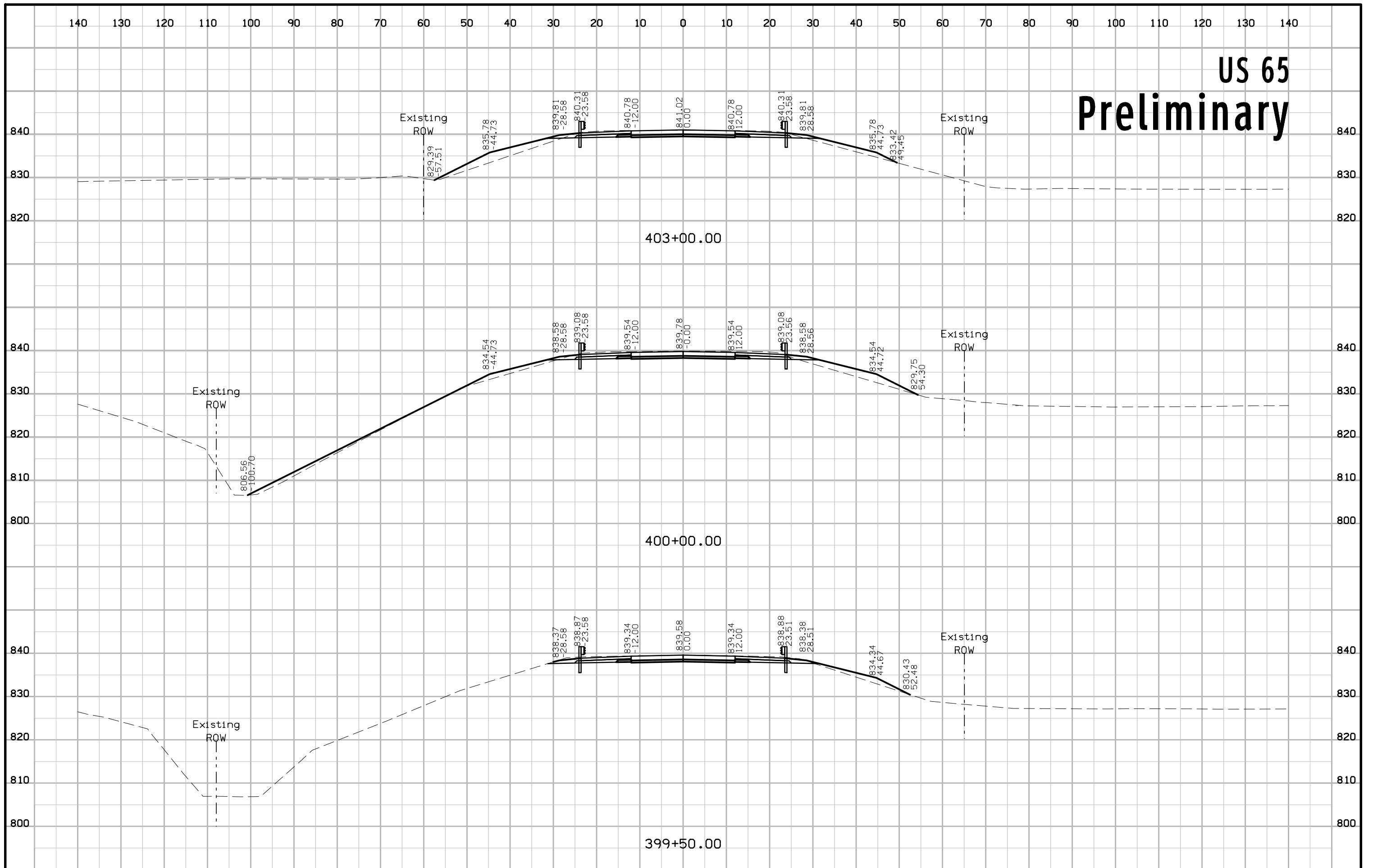
**CROSS SECTION  
LEGEND AND SYMBOL  
INFORMATION SHEET**

(COVERS SHEET SERIES W, X, Y, & Z)

# US 65 Preliminary



# US 65 Preliminary



# US 65 Preliminary

