

BRIDGE REPLACEMENT - PPCB  
BRFN-175-1(75)--39-67

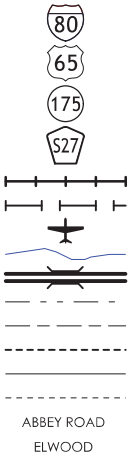
MONONA COUNTY

MONONA COUNTY - DESIGN NO. 121

LEGEND

INTERSTATE HIGHWAY  
PRIMARY HIGHWAY-DIVIDED  
PRIMARY HIGHWAY  
PORTLAND CEMENT CONCRETE ROAD  
ASPHALT ROAD  
BITUMINOUS ROAD  
GRAVEL ROAD  
EARTHEN ROAD

INTERSTATE HIGHWAY  
UNITED STATES HIGHWAY  
STATE HIGHWAY  
COUNTY HIGHWAY  
RAILROAD  
PIPELINE  
AIRPORT  
HYDROLOGY  
BRIDGE  
STATE BOUNDARY  
COUNTY BOUNDARY  
CORPORATE BOUNDARY  
TOWNSHIP LINE  
SECTION LINE  
ROAD NAMES  
UNINCORPORATED PLACE



TRANSPORTATION DEVELOPMENT DIVISION  
PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

MONONA COUNTY

BRIDGE REPLACEMENT - PPCB

1A 175 - BRIDGE OVER MAPLE RIVER

1.0 MILES WEST of E JCT 1A 141

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

REVISIONS



1-800-292-8989

www.iowaonecall.com



STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED  
ON SHEET NUMBER C.3

DESIGN DATA RURAL

2022 AADT 1,300 V.P.D.  
2042 AADT 1,500 V.P.D.  
2041 DHV - V.P.H.  
TRUCKS 16 %  
Total Design ESALs -

|                               |
|-------------------------------|
| TOTAL SHEETS                  |
| 78                            |
| PROJECT NUMBER                |
| BRFN-175-1(75)--39-67         |
| R.O.W. PROJECT NUMBER         |
| PROJECT IDENTIFICATION NUMBER |
| 17-67-175-020                 |

INDEX OF SHEETS

| NO.         | DESCRIPTION                     |
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| 1           | TITLE SHEET                     |
| 2           | ESTIMATE SHEET - DESIGN NO. 121 |
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| SPS.1-SPS.2 | SOIL PROFILE SHEETS             |
| C.1-C.2     | ESTIMATE SHEETS FOR ROADWAY     |
| RC.2-RC.3   | ESTIMATE SHEETS FOR ROADSIDE    |
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INDEX OF SEALS

| SHEET NO.   | NAME             | TYPE                |
|-------------|------------------|---------------------|
| 1           | DARIN G. BROWN   | STRUCTURAL DESIGN   |
| 1           | DAVID R. CLAMAN  | HYDRAULIC DESIGN    |
| SPS.1, CS.1 | DAVID J. HEER    | GEOTECHNICAL DESIGN |
| A.1         | KELLY C. BELL    | ROADWAY DESIGN      |
| RC.1        | SEANA K. GODBOLD | LANDSCAPE DESIGN    |

HYDRAULIC DESIGN

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature *David R. Claman* Date 8-2-2021

Printed or Typed Name David R. Claman

My license renewal date is December 31, 2022

Pages or sheets covered by this seal: SHEETS 5 THRU 7 OF 78

STRUCTURAL DESIGN

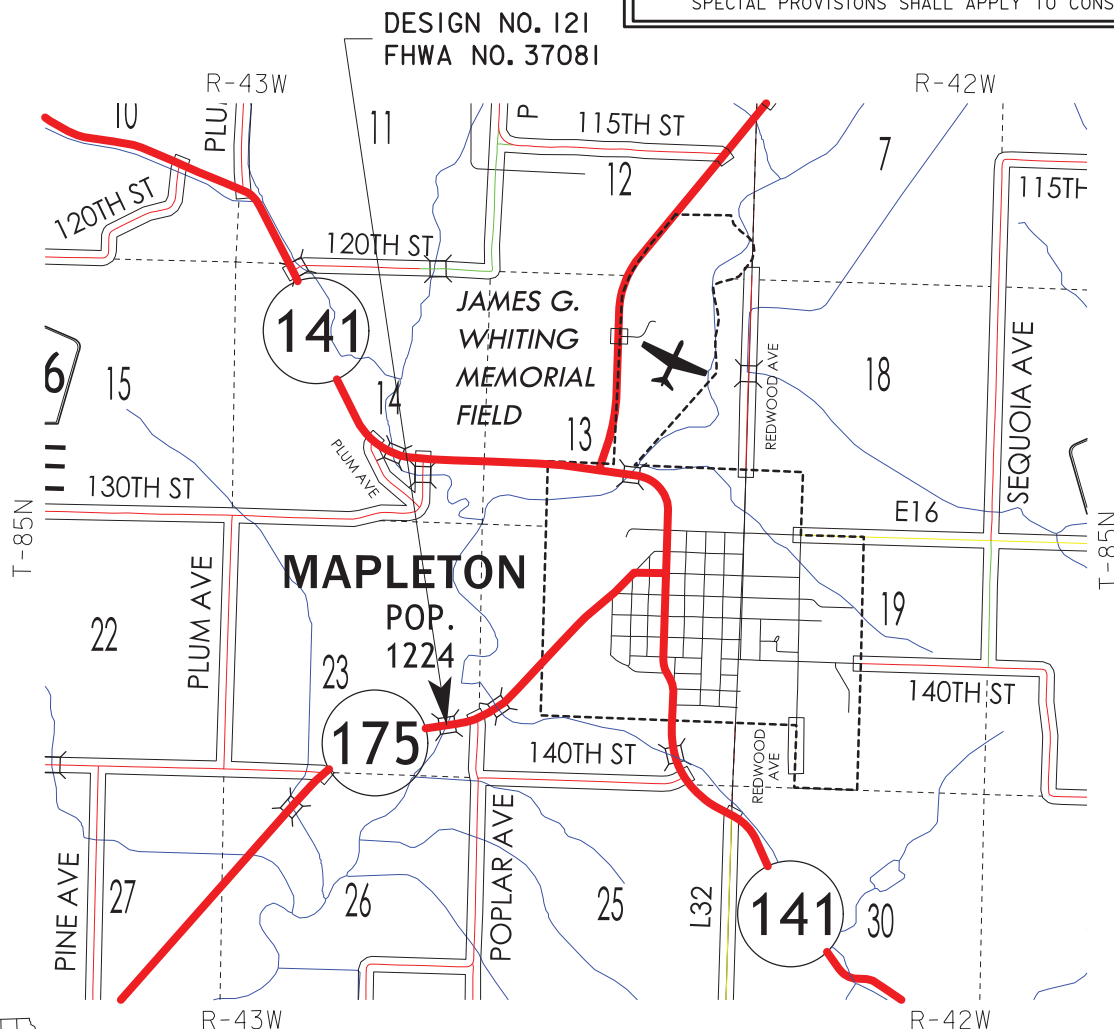
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature *Darin G. Brown* Date 8-2-2021

Printed or Typed Name Darin G. Brown

My license renewal date is December 31, 2022

Pages or sheets covered by this seal: SHEETS 1 THRU 31 OF 78



LOCATION MAP

PROJECT DIRECTORY NAME: 6717502017

DESIGN TEAM: SCHEMMER

ENGLISH

IOWA DOT \* BRIDGES AND STRUCTURES BUREAU

FILE NO. 31872

MONONA COUNTY

PROJECT NUMBER BRFN-175-1(75)--39-67

SHEET NUMBER 1

| ESTIMATED BRIDGE QUANTITIES |              |  |      |         |                   |
|-----------------------------|--------------|--|------|---------|-------------------|
| ITEM NO.                    | ITEM CODE    | ITEM   | UNIT | TOTAL   | AS BUILT QUANTITY |
| 1                           | 2104-2710020 | EXCAVATION, CLASS 10, CHANNEL                    | CY   | 2337    |                   |
| 2                           | 2401-6745625 | REMOVAL OF EXISTING BRIDGE                       | LS   | 1       |                   |
| 3                           | 2402-2720000 | EXCAVATION, CLASS 20                             | CY   | 129.6   |                   |
| 4                           | 2402-2721000 | EXCAVATION, CLASS 21                             | CY   | 262.4   |                   |
| 5                           | 2403-0100010 | STRUCTURAL CONCRETE (BRIDGE)                     | CY   | 879.7   |                   |
| 6                           | 2404-7775000 | REINFORCING STEEL                                | LB   | 64,508  |                   |
| 7                           | 2404-7775005 | REINFORCING STEEL, EPOXY COATED                  | LB   | 135,667 |                   |
| 8                           | 2404-7775009 | REINFORCING STEEL, STAINLESS STEEL               | LB   | 4,708   |                   |
| 9                           | 2407-0564085 | BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTD85  | EACH | 12      |                   |
| 10                          | 2407-0564125 | BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTD125 | EACH | 6       |                   |
| 11                          | 2408-7800000 | STRUCTURAL STEEL                                 | LB   | 6518    |                   |
| 12                          | 2414-6424110 | CONCRETE BARRIER RAILING                         | LF   | 652     |                   |
| 13                          | 2499-2300001 | DECK DRAINS                                      | LS   | 1       |                   |
| 14                          | 2501-0201057 | PILES, STEEL, HP 10 X 57                         | LF   | 2600    |                   |
| 15                          | 2501-0201473 | PILES, STEEL, HP 14 X 73                         | LF   | 4860    |                   |
| 16                          | 2501-6335010 | PREBORED HOLES                                   | LF   | 260     |                   |
| 17                          | 2507-3250005 | ENGINEERING FABRIC                               | SY   | 2736    |                   |
| 18                          | 2507-6800032 | REVTMENT CLASS C                                 | TON  | 3528    |                   |
| 19                          | 2507-8029000 | EROSION STONE                                    | TON  | 212     |                   |
| 20                          | 2520-3350015 | FIELD OFFICE                                     | EA   | 1       |                   |
| 21                          | 2526-8285000 | CONSTRUCTION SURVEY                              | LS   | 1       |                   |
| 22                          | 2533-4980005 | MOBILIZATION                                     | LS   | 1       |                   |
| 23                          | 2536-6745045 | REMOVAL OF ASBESTOS                              | LS   | 1       |                   |

| ESTIMATE REFERENCE INFORMATION |              |  |
|--------------------------------|--------------|--|
| ITEM NO.                       | ITEM CODE    | DESCRIPTION  |
| 10                             | 2407-0564125 | PRETENSIONED PRESTRESSED CONCRETE, BTD125<br>STIRRUP EXTENSION FOR 6b3 BARS HAS BEEN MODIFIED.<br><br>INCLUDES PIER BEARING MATERIAL.<br><br>INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC FILES TO THE ENGINEER.   |
| 11                             | 2408-7800000 | STRUCTURAL STEEL<br>INCLUDES ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS.  |
| 12                             | 2414-6424110 | CONCRETE BARRIER RAILING<br>INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS. INCLUDES 328.5 FT. OF 2" DIA. RIGID STEEL CONDUIT, IN SOUTH RAIL.<br><br>IF PLACEMENT OF CONCRETE IS DONE BY THE SLIPFORMING METHOD, CLASS BR CONCRETE IS REQUIRED. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. PRICE BID FOR THIS ITEM SHALL INCLUDE THE COST OF CAST-IN-PLACE FORMS IF REQUIRED FOR PLACEMENT OF THE CONCRETE. |
| 13                             | 2499-2300001 | DECK DRAINS<br>INCLUDES 12 NEW DECK DRAINS. REFER TO DESIGN SHEET 28 FOR LOCATIONS, AND DESIGN SHEET 12 FOR MATERIALS AND THE DETAILS OF THEIR CONSTRUCTION. MEASUREMENT WILL BE LUMP SUM FOR ALL DECK DRAINS REQUIRED AS SPECIFIED IN THE PLANS. THE PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EQUIPMENT AND LABOR, AND FOR PERFORMANCE OF ALL WORK NECESSARY FOR FABRICATING AND INSTALLING THE DECK DRAINS AS PER PLAN.   |
| 16                             | 2501-6335010 | PREBORED HOLES<br>INCLUDES ALL COST OF LABOR AND MATERIALS OF BENTONITE SLURRY IN PREBORED HOLES.  |
| 17                             | 2507-3250005 | ENGINEERING FABRIC<br>ENGINEERING FABRIC SHALL BE MATERIAL AS SPECIFIED FOR EMBANKMENT EROSION CONTROL IN ACCORDANCE WITH ARTICLE 4196.01, B, 3 OF THE STANDARD SPECIFICATIONS.  |
| 18                             | 2507-6800032 | REVTMENT CLASS C<br>ESTIMATED AT 1.6 TON/CU YD.  |
| 19                             | 2507-8029000 | EROSION STONE<br>ESTIMATED AT 1.6 TON/CU YD.   |

| ESTIMATE REFERENCE INFORMATION |              |  |
|--------------------------------|--------------|--|
| ITEM NO.                       | ITEM CODE    | DESCRIPTION  |
| 2                              | 2401-6745625 | REMOVAL OF EXISTING BRIDGE<br>INCLUDES ALL WORK FOR REMOVAL AND DISPOSAL OF EXISTING REVETMENT GIRDERS, AND SUBSTRUCTURE UNITS (DESIGN NO 1654A). WORK UNDER THIS DESIGN SHALL INCLUDE REMOVAL OF REMNANTS OF MONONA DESIGN NO. 1530, INCLUDING THE SUBSTRUCTURE UNITS. WORK SHALL INCLUDE REMOVAL OF A 42' X 20' I-BEAM APPROACH SPAN FROM THE CHANNEL LOCATED JUST TO THE SOUTH OF THE EXISTING BRIDGE. EXISTING TIMBER PILE IN THE FORESLOPES SHALL BE REMOVED TO 1' BELOW PROPOSED FINISHED GRADE WITH THE REMAINING LENGTH LEFT IN PLACE.<br><br>CONTRACTOR TO ADD THE FOLLOWING INFORMATION WHEN SUBMITTING THE IOWA DNR "NOTIFICATION OF DEMOLITION" FORM:<br><br>NAME OF ASBESTOS INSPECTOR: BRAD AZELTINE<br>DATE INSPECTED: 6/29/2016<br>IA LICENSE NUMBER: IOWA DOT<br>INSPECTOR PHONE: 515-239-1938<br>PROCEDURE USED TO DETECT PRESENCE OF ASBESTOS MATERIALS: POLARIZED LIGHT MICROSCOPY (PLM) |
| 3                              | 2402-2720000 | EXCAVATION, CLASS 20<br>INCLUDES EXCAVATION FOR BRIDGE ABUTMENTS AND WINGS.<br><br>CLASS 20 EXCAVATION QUANTITIES ARE BASED ON THE ASSUMPTION THAT THE CHANNEL EXCAVATION IS COMPLETED PRIOR TO STARTING CONSTRUCTION OF THE ABUTMENTS AND PIERS.  |
| 4                              | 2402-2721000 | EXCAVATION, CLASS 21<br>INCLUDES EXCAVATION FOR BRIDGE PIERS.  |
| 4                              | 2403-0100010 | STRUCTURAL CONCRETE (BRIDGE)<br>INCLUDES ALL RESILIENT JOINT FILLER REQUIRED.<br><br>INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING, AND SUBDRAIN OUTLET AT ABUTMENTS AND TOE OF BERM.<br><br>INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WINGS.  |
| 9                              | 2407-0564085 | PRETENSIONED PRESTRESSED CONCRETE, BTD85<br>STIRRUP EXTENSION FOR 6b3 BARS HAS BEEN MODIFIED.<br><br>INCLUDES ABUTMENT AND PIER BEARING MATERIAL.<br><br>INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC FILES TO THE ENGINEER.   |

NOTE:  
ROADWAY QUANTITIES SHOWN  
ELSEWHERE IN THESE PLANS.

DESIGN FOR 30° SKEW (L.A.)

299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0 END SPANS127'-0 INTERIOR SPAN

BRIDGE QUANTITIES

STA. 664+20.50 (☒ IA 175)AUGUST, 2021

MONONA COUNTY

IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

DESIGN SHEET NO. 1 OF 30FILE NO. 31872DESIGN NO. 121

## SUMMARY OF CONCRETE QUANTITIES

| LOCATION                              | STRUCTURAL<br>CONCRETE | HPC STRUCTURAL<br>CONCRETE |
|---------------------------------------|------------------------|----------------------------|
| WEST ABUT. FTG.                       | 25.4                   | =====                      |
| EAST ABUT. FTG.                       | 25.4                   | =====                      |
| BRIDGE DECK + ABUT. & PIER DIAPHRAGMS | 502.8                  | =====                      |
| ABUTMENT WINGS                        | 9.3                    | =====                      |
| PIER #1                               | 158.4                  | =====                      |
| PIER #2                               | 158.4                  | =====                      |
|                                       |                        |                            |
|                                       |                        |                            |
|                                       |                        |                            |
|                                       |                        |                            |
|                                       |                        |                            |
|                                       |                        |                            |
|                                       |                        |                            |
|                                       |                        |                            |
|                                       |                        |                            |
|                                       |                        |                            |
|                                       |                        |                            |
|                                       |                        |                            |
| TOTAL (CU. YDS.)                      | 879.7                  | =====                      |

## SUMMARY OF REINFORCING STEEL

| LOCATION                                 | NON-COATED<br>REINFORCING STEEL | STAINLESS STEEL<br>REINFORCING STEEL | EPOXY COATED<br>REINFORCING STEEL |
|--|---------------------------------|--------------------------------------|-----------------------------------|
| BRIDGE DECK + ABUT. FTG. **              | 270                             | _____                                | 123,420                           |
| ABUTMENT WINGS                           | _____                           | _____                                | 1,016                             |
| BARRIER RAIL - SOUTH RAIL                | _____                           | 1,970                                | 5,145                             |
| BARRIER RAIL - NORTH RAIL                | _____                           | 1,970                                | 5,022                             |
| BARRIER RAIL END SECTION                 | _____                           | 4 AT 192                             | 4 AT 266                          |
| PIER #1                                  | 32,119                          | _____                                | _____                             |
| PIER #2                                  | 32,119                          | _____                                | _____                             |
|  |                                 |                                      |                                   |
|  |                                 |                                      |                                   |
|  |                                 |                                      |                                   |
|  |                                 |                                      |                                   |
|  |                                 |                                      |                                   |
|  |                                 |                                      |                                   |
|  |                                 |                                      |                                   |
|  |                                 |                                      |                                   |
|  |                                 |                                      |                                   |
| ** INCLUDES ABUTMENT AND PIER DIAPHRAGMS | _____                           | _____                                | _____                             |
| TOTAL (LBS.)                             | 64,508                          | 4,708                                | 135,667                           |

## SUMMARY OF EXCAVATION

[illegible]

## SUMMARY OF FOUNDATIONS

[illegible]

## SUMMARY OF STRUCTURAL STEEL

| LOCATION     | TOTAL (LBS.) |
|--------------|--------------|
| DIAPHRAGMS   | 6518         |
|              |              |
|              |              |
|              |              |
|              |              |
|              |              |
|              |              |
|              |              |
|              |              |
|              |              |
|              |              |
| TOTAL (LBS.) | 6518         |

## SUMMARY OF BEARINGS

[illegible]

DESIGN FOR 30° SKEW (L.A.)

299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0 END SPANS 127'-0 INTERIOR SPAN

SUMMARY QUANTITIES SHEET

STA. 664+20.50 (C 1A 175) AUGUST, 2021

MONONA COUNTY

IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

DESIGN SHEET NO. 2 OF 30 FILE NO. 31872 DESIGN NO. 121

GENERAL NOTES:

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 240’ X 26’ CONTINUOUS I-BEAM BRIDGE, MONONA DESIGN NO. 1654A, FHWA NO. 037080, MAINT. NO. 6727.6S175, WITH A YEAR OF CONSTRUCTION OF 1954. ELECTRONIC PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE REMOVAL OF EXISTING REVETMENT, GIRDERS, AND SUBSTRUCTURE UNITS OF DESIGN NOS. 1654A AND 1530 AS NOTED BELOW AND ON DESIGN SHEET 4. WORK UNDER THIS DESIGN SHALL INCLUDE REMOVAL OF REMNANTS OF MONONA DESIGN NO. 1530, INCLUDING THE SUBSTRUCTURE UNITS AND REMOVAL OF A 42’ X 20’ I-BEAM APPROACH SPAN FROM THE CHANNEL LOCATED JUST TO THE SOUTH OF THE EXISTING BRIDGE. EXISTING SUBSTRUCTURE AND TIMBER PILES FOR DESIGN NO. 1530 SHALL BE REMOVED TO 1’ BELOW PROPOSED FINISHED GRADE WITH THE REMAINING LENGTH LEFT IN PLACE UNLESS NOTED OTHERWISE ON DESIGN SHEET 4.

REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401, OF THE STANDARD SPECIFICATIONS OR AS SHOWN IN THESE PLANS.

THIS BRIDGE IS DESIGNED FOR HL-93 LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

ALL PLAN DIMENSIONS ARE HORIZONTAL UNLESS NOTED OTHERWISE

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE BRIDGE CONTRACTOR OF THE STARTING DATE.

IT SHALL BE THE BRIDGE CONTRACTOR’S RESPONSIBILITY TO PROVIDE SITES FOR EXCESS EXCAVATED MATERIAL. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

ALL REINFORCING BARS AND BARS NOTED AS DOWELS SUPPLIED FOR THIS STRUCTURE SHALL BE DEFORMED REINFORCEMENT UNLESS OTHERWISE NOTED OR SHOWN.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5d1 IS  $\frac{5}{8}$  INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

|                 |    |    |    |    |    |    |    |    |    |
|-----------------|----|----|----|----|----|----|----|----|----|
| ENGLISH SIZE    | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| BAR DESIGNATION | 10 | 13 | 16 | 19 | 22 | 25 | 29 | 32 | 36 |

CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USE OF A CLASS BR CONCRETE IN ACCORDANCE WITH ARTICLE 2513.03, A, 2, OF THE STANDARD SPECIFICATIONS. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. CLASS D CONCRETE IS NOT PERMITTED FOR CONCRETE BARRIER RAILS (CAST-IN-PLACE OR SLIPFORMED METHOD).

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING STABILITY OF PRESTRESSED CONCRETE BEAMS DURING ERECTION AND CONSTRUCTION UP THROUGH THE CONCRETE BRIDGE DECK REACHING ITS FULL 28-DAY STRENGTH. THE CONTRACTOR SHALL PROVIDE SUFFICIENT TEMPORARY ANCHOR BRACING AT BEAM ENDS AND TEMPORARY INTERMEDIATE BRACING AS NEEDED TO ENSURE PRESTRESSED BEAM STABILITY. PARTIALLY OR FULLY INSTALLED PERMANENT BRACING AS SHOWN IN THESE DESIGN PLANS SHALL NOT BE ASSUMED SUFFICIENT TO BRACE PRESTRESSED BEAMS DURING ERECTION AND CONSTRUCTION. TEMPORARY BRACING SHALL NOT BE WELDED TO PRESTRESSED BEAM STIRRUPS.

LONGITUDINAL GROOVING OF THE BRIDGE DECK WILL BE REQUIRED IN ACCORDANCE WITH ARTICLE 2412.03, D OF THE STANDARD SPECIFICATIONS. LONGITUDINAL GROOVING QUANTITIES FOR THIS PROJECT ARE INCLUDED IN THE ROADWAY PLANS.

AT THE CONTRACTORS OPTION TRANSPARENT STAY-IN PLACE DECK FORMS MAY BE USED FOR THIS PROJECT. THE STAY-IN-PLACE FORMS SHALL HAVE A MINIMUM AVERAGE TRANSPARENCY OF 70%. ALL STRUCTURAL STEEL MEMBERS USED IN THE FORM ASSEMBLY (INCLUDING COLD-FORMED AND ROLLED) SHALL BE CORROSION PROTECTED. THE FORM ASSEMBLY SHALL HAVE A MAXIMUM UNIT WEIGHT OF 3.5 PSF OVER THE FULL FORM PANEL AREA. SHOP DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED FOR THE ENGINEER’S REVIEW. THE TRANSPARENT STAY-IN-PLACE FORM MATERIAL AND INSTALLATION COST SHALL BE INCLUDED IN THE PAY ITEM FOR STRUCTURAL CONCRETE (BRIDGE), WITH NO ADDITIONAL COST TO THE STATE.

THE PROJECT WILL IMPACT UNITED STATES GEOLOGICAL SURVEY (USGS) STREAM GAGE 06607200, MAPLE RIVER AT MAPLETON, IA. CONTACT THE USGS 30 DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION OPERATIONS THAT WILL IMPACT THE GAGE. USGS CONTACT:  
PRIMARY - CHRIS TEMEYER, USGS, COUNCIL BLUFFS, IA  
PHONE: 402-917-0225 EMAIL: ctemeyer@usgs.gov  
SECONDARY - JON NANIA, USGS, IOWA CITY, IA.  
PHONE: 319-358-3655 EMAIL: jfnania@usgs.gov

STREAM GAGE APPURTENANCES REMAINING FOLLOWING RELOCATION BY THE USGS WILL BE REMOVED IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS.

LABORATORY ANALYSIS HAS IDENTIFIED ASBESTOS AT THIS SITE. ASBESTOS SHALL BE REMOVED PRIOR TO BRIDGE DEMOLITION OPERATIONS. REMOVAL, TRANSPORT, AND DISPOSAL SHALL BE IN ACCORDANCE WITH SECTION 2536, OF THE STANDARD SPECIFICATIONS.

|  |  |
|--|--|
| REQUIRED DNR INFORMATION INCLUDES:   |  |
| YEAR CONSTRUCTED - 1954  |  |
| ASBESTOS LOCATION - EXPANSION JOINT MATERIAL BETWEEN THE TOP OF THE ABUTMENTS AND THE BRIDGE DECK/DIAPHRAGMS |  |
| FHWA NUMBER  | - INFORMATION PROVIDED ELSEWHERE IN PLAN |
| ROAD/ROUTE (CITY)  | - INFORMATION PROVIDED ELSEWHERE IN PLAN |
| COUNTY   | - INFORMATION PROVIDED ELSEWHERE IN PLAN |
| DIRECTION TO BRIDGE  | - INFORMATION PROVIDED ELSEWHERE IN PLAN |
| BRIDGE SIZE  | - INFORMATION PROVIDED ELSEWHERE IN PLAN |
| NUMBER OF DECKS  | - 1 (TYP.)                               |
| ASBESTOS INSPECTOR/AMOUNTS   | - BRAD AZELTINE/100 SQ. FT. (ESTIMATED)  |

A SCRAPE SAMPLE WAS TAKEN FROM THE ABUTMENT BEARINGS OF THIS BRIDGE TO GET AN INDICATION OF THE EXISTENCE OF AND LEVEL OF TOTAL LEAD AND TOTAL CHROMIUM. ANALYSIS OF TOTAL LEAD ON THIS SAMPLE WAS 1400 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 840 PPM. A SCRAPE SAMPLE WAS TAKEN FROM THE BEAMS OF THIS BRIDGE TO GET AN INDICATION OF THE EXISTENCE OF AND LEVEL OF TOTAL LEAD AND TOTAL CHROMIUM. ANALYSIS OF TOTAL LEAD ON THIS SAMPLE WAS 1100 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 130 PPM. THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE IOWA DOT’S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

THE BRIDGE CONTRACTOR SHALL PREBORE HOLES FOR ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE APPROACH ROADWAY" ON DESIGN SHEET 4. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING.

SPECIFICATIONS:

DESIGN: AASHTO LRFD 8th Ed, SERIES OF 2017, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.  
CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8th Ed, SERIES OF 2017, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.  
REINFORCING STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 5, GRADE 60 FOR EPOXY COATED AND NON-COATED, AND GRADE 60 OR 75 FOR STAINLESS.  
CONCRETE IN ACCORDANCE WITH AASHTO LRFD SECTION 5, f’c = 4.0 KSI, EXCEPT PRESTRESSED BEAM CONCRETE AS NOTED.  
PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEET 19.  
BRIDGE DECK CONCRETE f’c = 4.0 KSI  
STRUCTURAL STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 6. ASTM A709 GRADE 36, GRADE 50, AND GRADE 50W ( AASHTO M270 GRADE 36, GRADE 50, AND GRADE 50W ).

BRIDGE DECK DIMENSIONS TABLE

| NO. | ITEM               | UNIT | QUANTITY |
|-----|--------------------|------|----------|
| 1   | DECK LENGTH        | L.F. | 302.5    |
| 2   | MINIMUM DECK WIDTH | L.F. | 47.2     |
| 3   | MAXIMUM DECK WIDTH | L.F. | 47.2     |
| 4   | DECK AREA          | S.F. | 14,266   |

1. DECK LENGTH IS MEASURED FROM FACE-TO-FACE OF PAVING NOTCHES ALONG THE CENTERLINE OF THE ROADWAY.
- 2, 3. DECK WIDTHS ARE MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE CENTERLINE OF ROADWAY.
4. DECK AREA IS TO BE BASED ON THE FACE-TO-FACE PAVING NOTCH DISTANCE AND OUT-TO-OUT DECK DIMENSIONS.

SHOP DRAWING SUBMITTALS

SHOP DRAWINGS SHALL BE SUBMITTED FOR THE FOLLOWING ITEMS SHOWN IN THE TABLE BELOW. (NOTE ADDITIONAL SHOP DRAWINGS MAY BE REQUIRED IN ACCORDANCE WITH ARTICLE 1105.03 OF THE STANDARD SPECIFICATIONS.)

SUBMITTAL REQUIREMENTS FOR SHOP DRAWINGS SHOULD BE IN ACCORDANCE WITH ARTICLE 1105.03, OF THE STANDARD SPECIFICATIONS, FOR HIGHWAY AND BRIDGE CONSTRUCTION OF THE IOWA DEPARTMENT OF TRANSPORTATION.

SHOP DRAWINGS SHALL BE SUBMITTED WITH THE FOLLOWING NAMING CONVENTION:  
(Paren)\_County\_DesignNumber\_SubmittalDescription.pdf  
Example: (090)\_BlackHawk\_Design915\_DeckDrains.pdf

|   |   |
|---|---|
| 1 | STEEL INTERMEDIATE DIAPHRAGMS             |
| 2 | DECK DRAINS                               |
| 3 | TRANSPARENT STAY-IN-PLACE FORMS (IF USED) |
|   |   |
|   |   |

TRAFFIC CONTROL PLAN

THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

NOTE:  
POLLUTION PREVENTION PLAN IS SHOWN ELSEWHERE IN THESE PLANS.

NOTE:  
ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR 30° SKEW (L.A.)

299’-0 X 44’-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

86’-0 END SPANS127’-0 INTERIOR SPAN

GENERAL NOTES

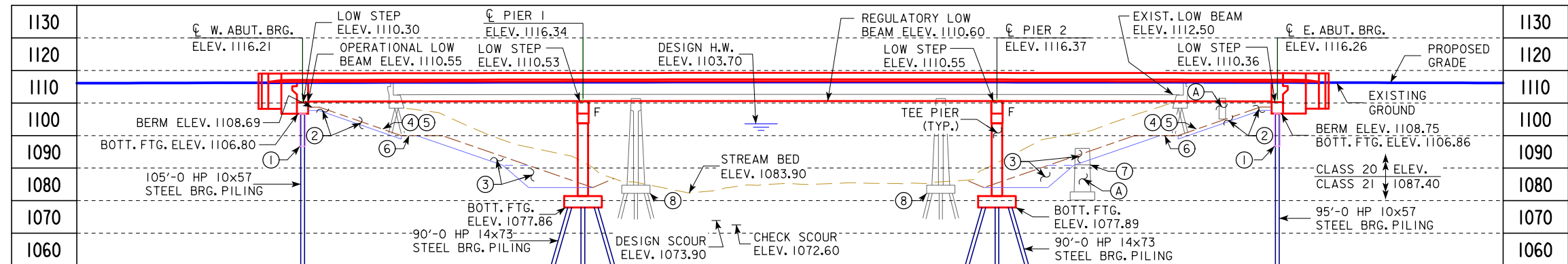
STA. 664+20.50 (C 1A 175)AUGUST, 2021

MONONA COUNTY

IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

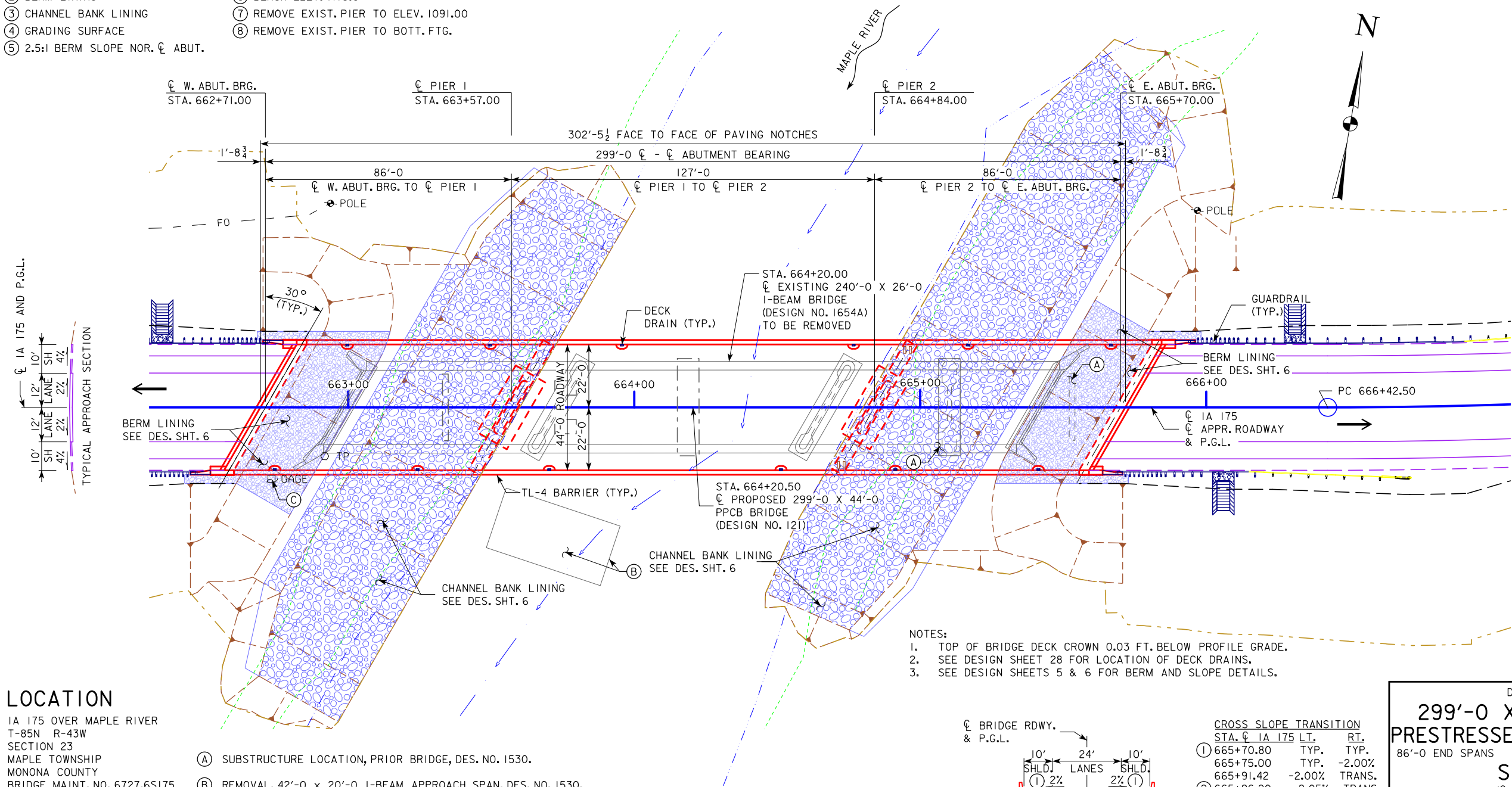
DESIGN SHEET NO. 3 OF 30 FILE NO. 31872 DESIGN NO. 121





- ① BOTT. PRE-BORE ELEV. 1096.80 (WEST ABUT.),  
ELEV. 1096.86 (EAST ABUT.)
- ② BERM LINING
- ③ CHANNEL BANK LINING
- ④ GRADING SURFACE
- ⑤ 2.5:1 BERM SLOPE NOR.  $\phi$  ABUT.
- ⑥ BENCH ELEV. 1110.0
- ⑦ REMOVE EXIST. PIER TO ELEV. 1091.00
- ⑧ REMOVE EXIST. PIER TO BOTT. FTG.

## LONGITUDINAL SECTION ALONG $\phi$ APPROACH ROADWAY



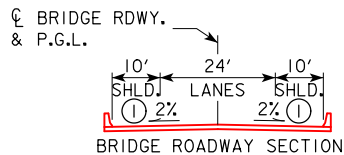
## LOCATION

IA 175 OVER MAPLE RIVER  
T-85N R-43W  
SECTION 23  
MAPLE TOWNSHIP  
MONONA COUNTY  
BRIDGE MAINT. NO. 6727.6S175  
FHWA NO. 037081  
LATITUDE 42.156900°  
LONGITUDE -95.809745°

- (A) SUBSTRUCTURE LOCATION, PRIOR BRIDGE, DES. NO. 1530.
- (B) REMOVAL, 42'-0" x 20'-0" I-BEAM APPROACH SPAN, DES. NO. 1530.  
SEE GENERAL NOTES.
- (C) USGS STREAM GAGE 06607200, MAPLE RIVER AT MAPLETON, IA  
SEE GENERAL NOTES.

## SITUATION PLAN

- NOTES:
- TOP OF BRIDGE DECK CROWN 0.03 FT. BELOW PROFILE GRADE.
  - SEE DESIGN SHEET 28 FOR LOCATION OF DECK DRAINS.
  - SEE DESIGN SHEETS 5 & 6 FOR BERM AND SLOPE DETAILS.

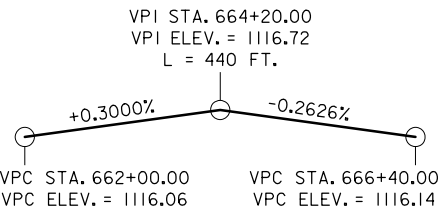


| CROSS SLOPE TRANSITION |               |        |        |
|------------------------|---------------|--------|--------|
| STA. $\phi$ IA 175     | LT.           | RT.    |        |
| ① 665+70.80            | TYP.          | TYP.   |        |
| 665+75.00              | TYP.          | -2.00% | TRANS. |
| 665+91.42              | -2.00%        | TRANS. |        |
| ② 665+96.20            | -2.05%        | TRANS. |        |
| 666+87.20              | -2.97%        | +1.16% |        |
| 667+25.00              | -3.43%        | +2.84% |        |
| ①                      | END S.E. WING |        |        |
| ②                      | END N.E. WING |        |        |

BENCH MARK:  
BM C 159, NGS DISK  
X=16,472,170.7 Y=7,288,517.7  
IOWA RCS ZONE 6 (COUNCIL BLUFFS), SURVEY FEET  
ELEV. = 1097.92 NAVD88/1ARTN (GEOD12B)

## CURVE DATA

IA 175 (M.L.)  
PI STA. 673+12.04  
PC STA. 666+42.50  
PT STA. 679+30.45  
 $\Delta = 38^{\circ}38'08.97''$  (LT)  
T = 669.54'  
L = 1,287.95'  
E = 113.95'  
R = 1,909.99'  
e = --



## PROPOSED PROFILE GRADE IA 175

## HYDRAULIC DATA

DRAINAGE AREA = 670 SQ. MI.  
STREAM SLOPE = 3.78 FT./MI.  
AVG. LOW WATER STAGE = 1087.4

$Q_{25} = 19,500$  CFS  
STAGE = 1102.7

$Q_{50} = 22,900$  CFS  
STAGE = 1103.7  
REGULATORY LOW BEAM = 1110.6  
BACKWATER = 0.27 FT.  
AVG. BRIDGE VELOCITY = 7.3 FPS

$Q_{100} = 26,100$  CFS  
STAGE = 1104.4  
OPERATIONAL LOW BEAM = 1110.55  
BACKWATER = 0.32 FT.  
AVG. BRIDGE VELOCITY = 7.9 FPS

$Q_{200} = 30,400$  CFS  
STAGE = 1105.2  
AVG. BRIDGE VELOCITY = 8.8 FPS  
CALCULATED DESIGN SCOUR = 1073.9

$Q_{500} = 33,700$  CFS  
STAGE = 1105.8  
AVG. BRIDGE VELOCITY = 9.4 FPS  
CALCULATED CHECK SCOUR = 1072.6

ROADWAY OVERTOP >500 YR. EVENT  
ROADWAY OVERTOP 1108.1  
STA. 626+50 (MP 26.9)

## UTILITIES LEGEND

FO - FIBER OPTIC  
GAGE - STREAM GAGE

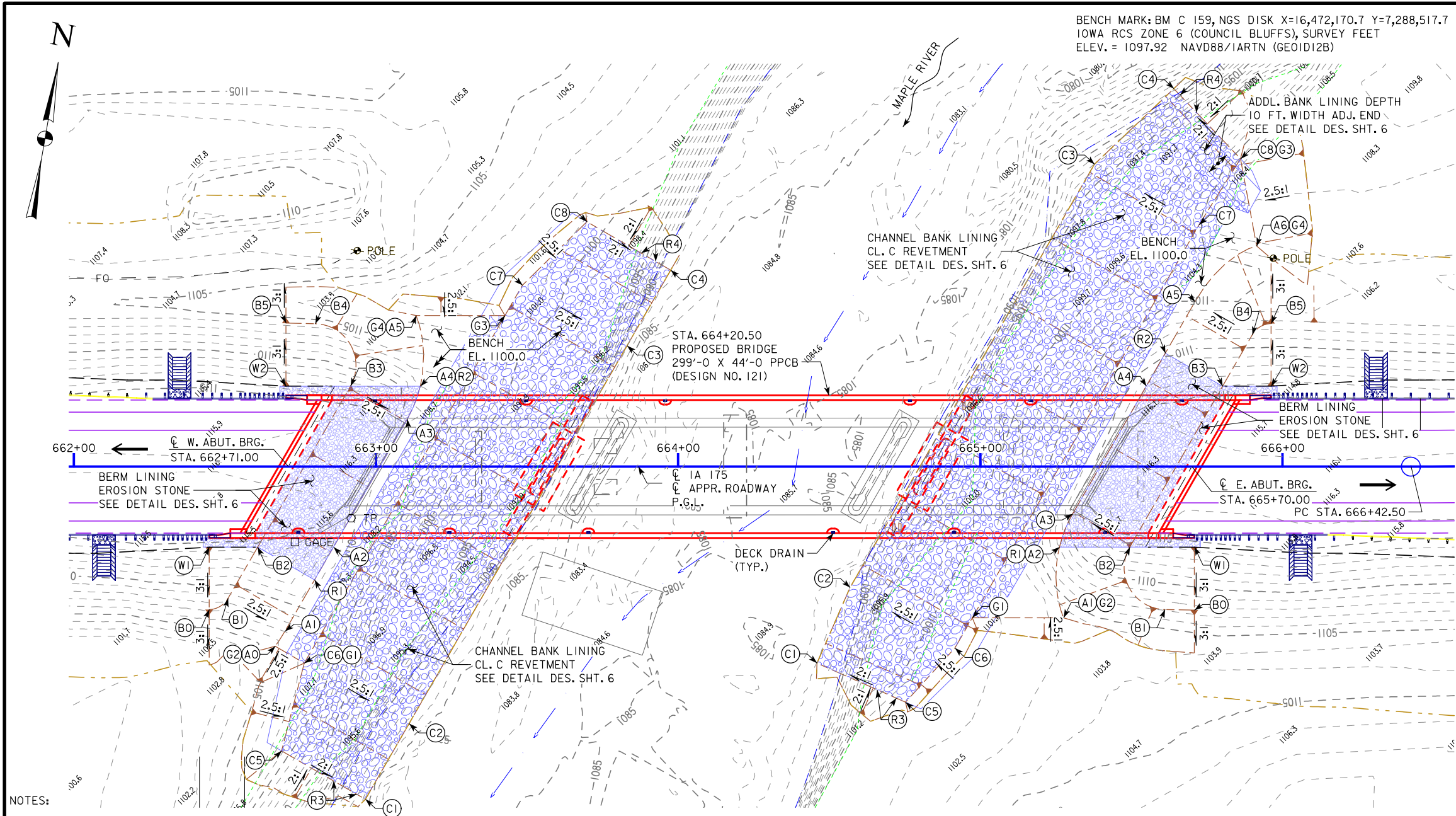
UTILITIES SHOWN ON THIS SHEET ARE  
FOR INFORMATION ONLY, SEE ROAD  
DESIGN SHEETS FOR FINAL UTILITY  
INFORMATION.

## TRAFFIC ESTIMATE

2022 AADT 1,300 V.P.D.  
2042 AADT 1,500 V.P.D.  
2041 DHV -- V.P.H.  
TRUCKS 16%  
TOTAL DESIGN ESALS --

DESIGN FOR 30° SKEW (L.A.)  
**299'-0" X 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
86'-0" END SPANS 127'-0" INTERIOR SPAN  
**SITUATION PLAN**  
STA. 664+20.50 ( $\phi$  IA 175) AUGUST, 2021  
**MONONA COUNTY**  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 4 OF 30 FILE NO. 31872 DESIGN NO. 121





## SITE PLAN

### WEST BRIDGE WING GRADING CONTROL:

- (W1) 662+44.80 M.L., 26.58' RT., EL. 1115.59
- (W2) 662+70.20 M.L., 26.58' LT., EL. 1115.65

### EAST BRIDGE WING GRADING CONTROL:

- (W1) 665+70.80 M.L., 26.58' RT., EL. 1115.71
- (W2) 665+96.20 M.L., 26.58' LT., EL. 1115.65

### WEST BENCH GRADING CONTROL:

- (G1) 662+76.3 M.L., 65.0' RT., EDGE BENCH, GCL, EL. 1100.0
- (G2) 662+66.6 M.L., 59.4' RT., EDGE BENCH, GCL, EL. 1100.0
- (G3) 663+42.7 M.L., 50.0' LT., EDGE BENCH, EL. 1100.0
- (G4) 50.0' LT., EDGE BENCH, EL. 1100.0

### EAST BENCH GRADING CONTROL:

- (G1) 664+97.3 M.L., 50.0' RT., EDGE BENCH, EL. 1100.0
- (G2) 50.0' RT., EDGE BENCH, EL. 1100.0
- (G3) 665+86.1 M.L., 101.8' LT., EDGE BENCH, GCL, EL. 1100.0
- (G4) 665+91.4 M.L., 73.0' LT., EDGE BENCH, GCL, EL. 1100.0

### WEST REVETMENT LAYOUT NOTES:

- (R1) 662+79.7 M.L., 37.5' RT., EDGE BERM LINING, PERP. BERM SLOPE, PTS. (B2)-(R1)
- (R2) 26.6' LT., EDGE BERM LINING, PTS. (B3)-(A4)
- (R3) BEGIN CHANNEL BANK LINING, EDGE LINING, PTS. (C1)-(C5)
- (R4) END CHANNEL BANK LINING, EDGE LINING, PTS. (C4)-(C8)

### EAST REVETMENT LAYOUT NOTES:

- (R1) 26.6' RT., EDGE BERM LINING, PTS. (B2)-(A2)
- (R2) 665+61.2 M.L., 37.5' LT., EDGE BERM LINING, PERP. BERM SLOPE, PTS. (B3)-(R2)
- (R3) BEGIN CHANNEL BANK LINING, EDGE LINING, PTS. (C1)-(C5)
- (R4) END CHANNEL BANK LINING, EDGE LINING, PTS. (C4)-(C8)

### BERM SLOPE LOCATION TABLE:

REFER TO PTS. (W1), (W2), (B2)-(B3), (A2)-(A3)-(A4)  
BERM SLOPE ELEVATIONS REFER TO GRADING SURFACE

DESIGN FOR 30° SKEW (L.A.)

**299'-0" X 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0" END SPANS 127'-0" INTERIOR SPAN

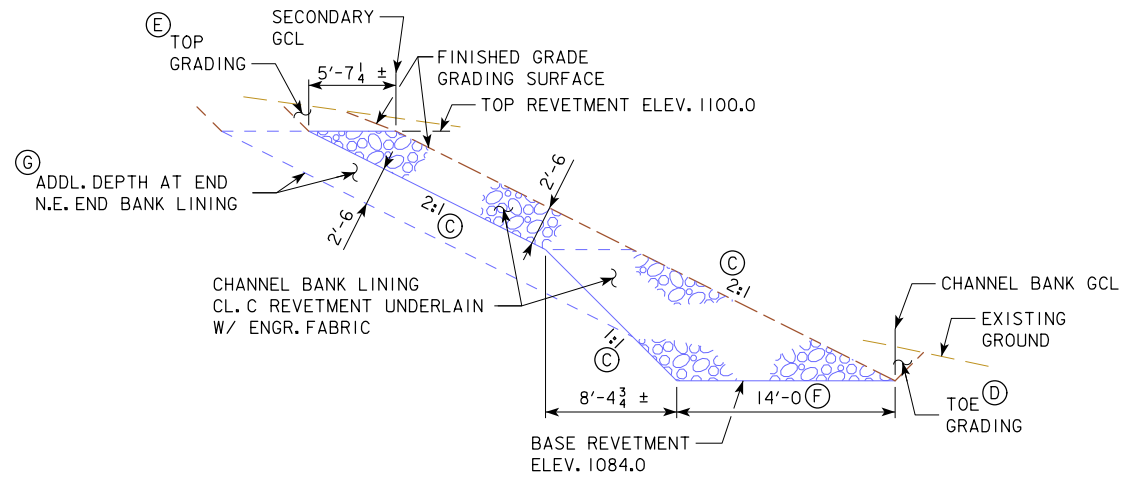
**SITUATION PLAN - SITE**

STA. 664+20.50 (C/LA 175) AUGUST, 2021

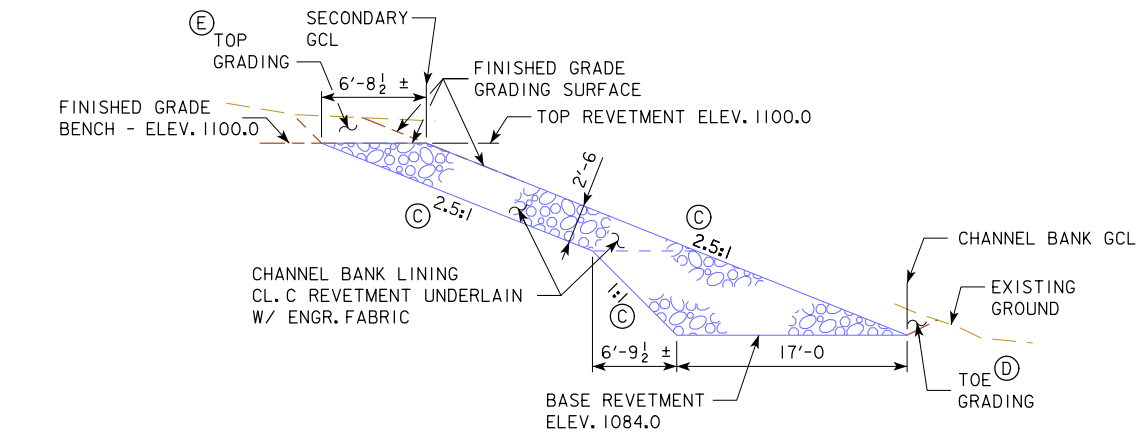
**MONONA COUNTY**

IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

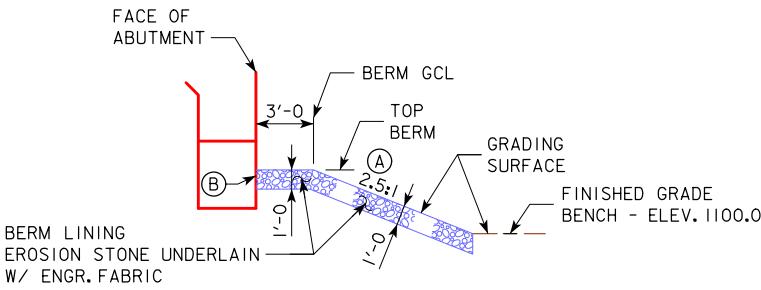
DESIGN SHEET NO. 5 OF 30 FILE NO. 31872 DESIGN NO. 121



CHANNEL BANK LINING - AT END



CHANNEL BANK LINING - TYPICAL



SECTION THROUGH BERM LINING

- (A) SLOPE NOR.  $\phi$  ABUT. / BERM GRADING CONTROL LINE (GCL) (PT. B2-B3).
- (B) CARRY ENGR. FABRIC UP FACE ABUTMENT.
- (C) SLOPE NOR. CHANNEL BANK GRADING CONTROL LINE (GCL).
- (D) EXCAVATE TO EXISTING GROUND OR FILL W/ REVETMENT AS REQUIRED.
- (E) EXCAVATE AT 1:1 SLOPE BEYOND BENCH LIMITS AS REQUIRED TO PLACE REVETMENT. BACKFILL TO EXISTING/FINISHED GRADE.
- (F) TRANSITION WIDTH FROM 17' TYP. TO 14' AT END THROUGH SIDE SLOPE TRANSITION.
- (G) ADDL. REVETMENT DEPTH, 10' WIDTH PARALLEL TO CHANNEL BANK GCL. DUB UP TO NORMAL PLACEMENT GRADE AT 1:1 SLOPE.

| ESTIMATED REVETMENT QUANTITIES |                       |                     |                         |                 |
|--------------------------------|-----------------------|---------------------|-------------------------|-----------------|
| REVETMENT TYPE - LOCATION      | REVETMENT CL. C (TON) | EROSION STONE (TON) | ENGINEERING FABRIC (SY) | EXCAVATION (CY) |
| BERM LINING - WEST             | -                     | 105.4               | 197.6                   | 65.9            |
| BERM LINING - EAST             | -                     | 106.1               | 198.9                   | 66.3            |
| CHANNEL BANK LINING - WEST     | 1,681.9               | -                   | 1,127.2                 | 1,051.2         |
| CHANNEL BANK LINING - EAST     | 1,846.1               | -                   | 1,211.9                 | 1,153.8         |
| TOTALS                         | 3,528.0               | 211.5               | 2,735.6                 | 2,337.2         |

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.  
REVETMENT AND EROSION STONE ESTIMATED AT 1.6 TON/CY

DESIGN FOR 30° SKEW (L.A.)

**299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0 END SPANS 127'-0 INTERIOR SPAN

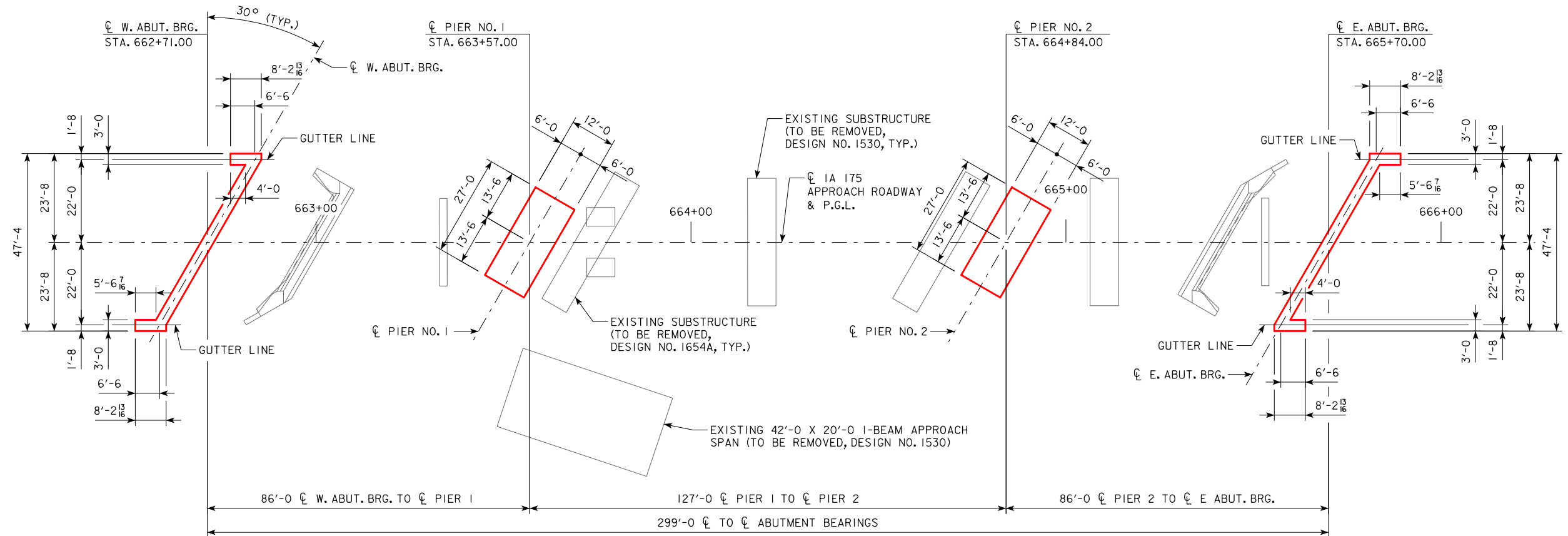
**SITUATION PLAN - MISCELLANEOUS**

STA. 664+20.50 (C 1A 175) AUGUST, 2021

**MONONA COUNTY**

IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

DESIGN SHEET NO. 6 OF 30 FILE NO. 31872 DESIGN NO. 121



STAKING DIAGRAM

BRIDGE COORDINATES

| LOCATION           | ℄ W. ABUT. BRG.                 | ℄ PIER 1                        | ℄ PIER 2                        | ℄ E. ABUT. BRG.                 |
|--------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| NORTH EDGE OF DECK | E=16479142.122<br>N=7294839.063 | E=16479226.864<br>N=7294853.719 | E=16479352.007<br>N=7294875.363 | E=16479436.749<br>N=7294890.019 |
| ℄ APPROACH ROADWAY | E=16479132.725<br>N=7294813.505 | E=16479217.467<br>N=7294828.161 | E=16479342.609<br>N=7294849.804 | E=16479427.351<br>N=7294864.460 |
| SOUTH EDGE OF DECK | E=16479123.327<br>N=7294787.946 | E=16479208.069<br>N=7294802.602 | E=16479333.211<br>N=7294824.245 | E=16479417.953<br>N=7294838.901 |

NOTE: AN ELECTRONIC FILE CONTAINING THE BRIDGE COORDINATE DATA IS AVAILABLE AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL VERIFY THESE COORDINATES WITH THE PROJECT HORIZONTAL CONTROL INFORMATION PROVIDED IN THE ROAD PLANS.

DESIGN FOR 30° SKEW (L.A.)

**299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0 END SPANS      127'-0 INTERIOR SPAN

**STAKING DIAGRAM**

STA. 664+20.50 (℄ IA 175)      AUGUST, 2021

**MONONA COUNTY**

IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

DESIGN SHEET NO. 7 OF 30    FILE NO. 31872    DESIGN NO. 121



| STEP | PIER NO. 1     | PIER NO. 2      |
|------|----------------|-----------------|
| a    | $1\frac{7}{8}$ | 2               |
| b    | $1\frac{7}{8}$ | $1\frac{5}{16}$ |
| c    | 2              | $1\frac{7}{8}$  |
| d    | 2              | $1\frac{7}{8}$  |

[illegible]

THREE PIER (S)

LOW STEP

4'-2"

2'-1" 2'-1"

CL PIER

CONSTRUCTION JOINT

3 3'-8 3

1'-10 1'-10

CONSTRUCTION JOINT

4'-2 4'-2

1'-6 SEE FOOTING 1'-6

DETAILS

4'-2"

3 1/2" 3 SPA. 7" 3 SPA. 3 1/2"

6

LOW STEP

11a1

5c1

6a3

2" CL.

6a4

3 1/2"

8b1

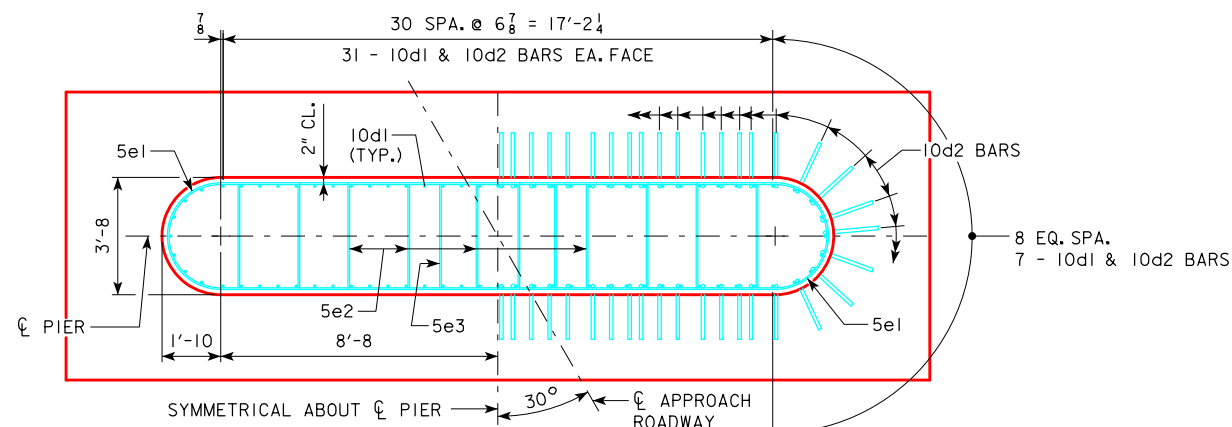
2" CL.

10d1

3'-2"

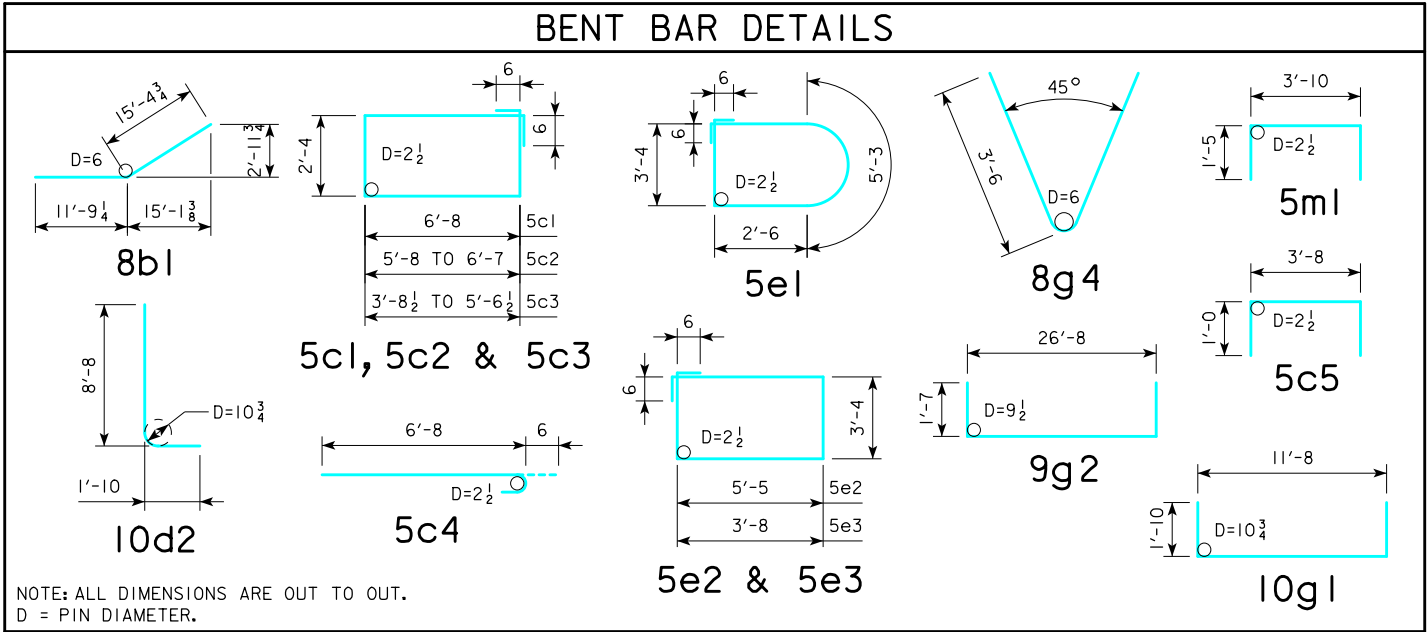
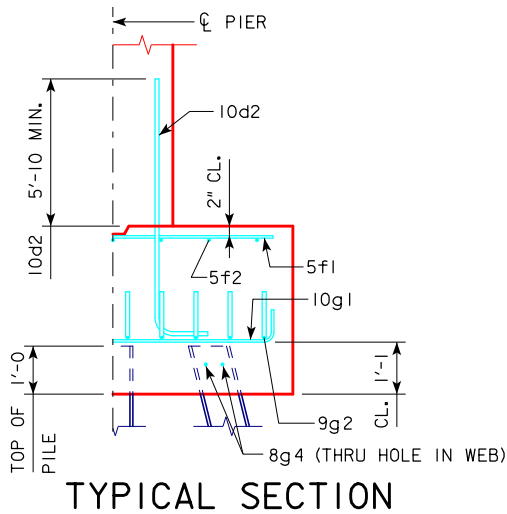
7'-0"

5ml & 5nl  
BAR LAYOUT



SECTION A-A

DESIGN FOR 30° SKEW (L.A.)  
299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
86'-0 END SPANS 127'-0 INTERIOR SPAN  
TEE PIER CAP AND COLUMN  
STA. 664+20.50 (C 1A 175) AUGUST, 2021  
MONONA COUNTY  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 8 OF 30 FILE NO. 31872 DESIGN NO. 121



### PIER NO. 1 PILE NOTES:

THE CONTRACT LENGTH OF 90 FEET FOR THE PIER NO. 1 PILES IS BASED ON A MIXED SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 235 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL. PIER PILES ALSO WERE DESIGNED FOR A FACTORED TENSION FORCE OF 45 KIPS.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING. DESIGN SCOUR (200-YEAR) WAS ASSUMED TO AFFECT THE UPPER 4 FEET OF EMBEDDED PILE LENGTH AND CAUSE 11 KIPS OF DRIVING RESISTANCE.

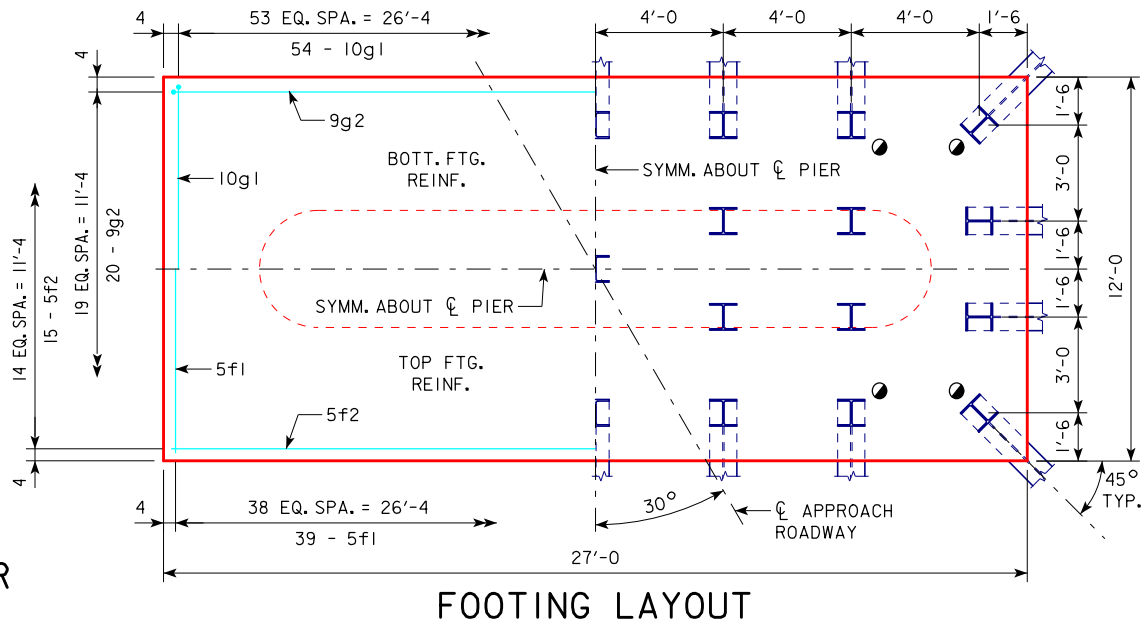
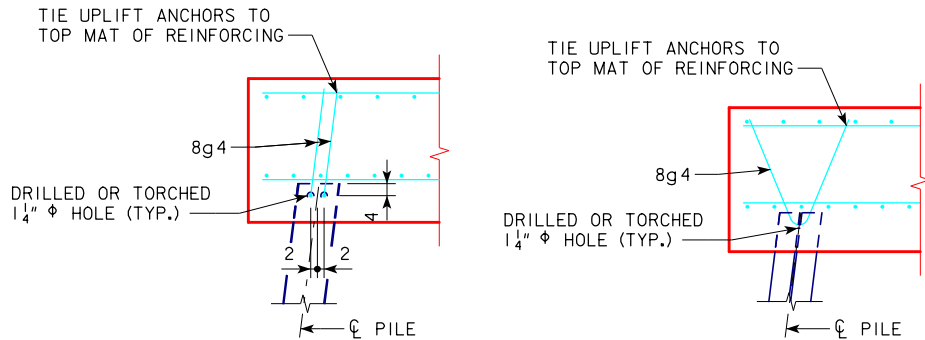
THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER NO. 1 PILES IS 186 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 83 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

### FOOTING NOTES:

● DENOTES PILE REQUIRING UPLIFT ANCHORS, SEE UPLIFT ANCHOR DETAILS.

PILE DIMENSIONS ARE SHOWN AT BOTTOM OF FOOTING. BATTER PILES IN EXTERIOR ROWS 1:4 IN THE DIRECTION SHOWN.

27 - HP 14 x 73 STEEL BEARING PILING REQUIRED AT EACH PIER.



| REINFORCING BAR LIST - PIER NO. 1 |                              |       |     |        |        |
|-----------------------------------|------------------------------|-------|-----|--------|--------|
| BAR                               | LOCATION                     | SHAPE | NO. | LENGTH | WEIGHT |
| 11a1                              | CAP, TOP, LONGIT.            |       | 24  | 51'-8  | 6588   |
| 6a3                               | CAP, SIDE, LONGIT.           |       | 8   | 51'-8  | 621    |
| 6a4                               | CAP, SIDE, LONGIT.           |       | 6   | VARIES | 350    |
| 8b1                               | CAP, BOTTOM, LONGIT.         |       | 8   | 27'-2  | 580    |
| 5c1                               | CAP HOOPS, MIDDLE            |       | 26  | 19'-0  | 515    |
| 5c2                               | CAP HOOPS                    |       | 48  | VARIES | 897    |
| 5c3                               | CAP HOOPS, PIER ENDS         |       | 68  | VARIES | 1058   |
| 5c4                               | CAP, VERTICAL                |       | 20  | 7'-2   | 149    |
| 5c5                               | CAP ENDS                     |       | 6   | 5'-8   | 35     |
| 10d1                              | STEM VERTICAL                |       | 76  | 25'-2  | 8230   |
| 10d2                              | FOOTING DOWEL                |       | 76  | 10'-6  | 3434   |
| 5e1                               | STEM, HORIZ., HOOPS AT ENDS  |       | 44  | 14'-7  | 669    |
| 5e2                               | STEM, HORIZ., HOOPS          |       | 88  | 18'-6  | 1698   |
| 5e3                               | STEM, HORIZ., HOOP AT MIDDLE |       | 22  | 15'-0  | 344    |
| 5f1                               | FOOTING, TOP                 |       | 39  | 11'-8  | 475    |
| 5f2                               | FOOTING, TOP                 |       | 15  | 26'-8  | 417    |
| 10g1                              | FOOTING, BOTTOM              |       | 54  | 15'-4  | 3563   |
| 9g2                               | FOOTING, BOTTOM              |       | 20  | 29'-10 | 2029   |
| 8g4                               | UPLIFT ANCHOR                |       | 16  | 7'-0   | 299    |
| 5m1                               | CAP, STEP, TRANSVERSE        |       | 16  | 6'-8   | 111    |
| 5n1                               | CAP, STEP, LONGIT.           |       | 16  | 3'-5   | 57     |
| TOTAL (LBS.)                      |                              |       |     |        | 32,119 |

| REINFORCING BAR LIST - PIER NO. 2 |                              |       |     |        |        |
|-----------------------------------|------------------------------|-------|-----|--------|--------|
| BAR                               | LOCATION                     | SHAPE | NO. | LENGTH | WEIGHT |
| 11a1                              | CAP, TOP, LONGIT.            |       | 24  | 51'-8  | 6588   |
| 6a3                               | CAP, SIDE, LONGIT.           |       | 8   | 51'-8  | 621    |
| 6a4                               | CAP, SIDE, LONGIT.           |       | 6   | VARIES | 350    |
| 8b1                               | CAP, BOTTOM, LONGIT.         |       | 8   | 27'-2  | 580    |
| 5c1                               | CAP HOOPS, MIDDLE            |       | 26  | 19'-0  | 515    |
| 5c2                               | CAP HOOPS                    |       | 48  | VARIES | 897    |
| 5c3                               | CAP HOOPS, PIER ENDS         |       | 68  | VARIES | 1058   |
| 5c4                               | CAP, VERTICAL                |       | 20  | 7'-2   | 149    |
| 5c5                               | CAP ENDS                     |       | 6   | 5'-8   | 35     |
| 10d1                              | STEM VERTICAL                |       | 76  | 25'-2  | 8230   |
| 10d2                              | FOOTING DOWEL                |       | 76  | 10'-6  | 3434   |
| 5e1                               | STEM, HORIZ., HOOPS AT ENDS  |       | 44  | 14'-7  | 669    |
| 5e2                               | STEM, HORIZ., HOOPS          |       | 88  | 18'-6  | 1698   |
| 5e3                               | STEM, HORIZ., HOOP AT MIDDLE |       | 22  | 15'-0  | 344    |
| 5f1                               | FOOTING, TOP                 |       | 39  | 11'-8  | 475    |
| 5f2                               | FOOTING, TOP                 |       | 15  | 26'-8  | 417    |
| 10g1                              | FOOTING, BOTTOM              |       | 54  | 15'-4  | 3563   |
| 9g2                               | FOOTING, BOTTOM              |       | 20  | 29'-10 | 2029   |
| 8g4                               | UPLIFT ANCHOR                |       | 16  | 7'-0   | 299    |
| 5m1                               | CAP, STEP, TRANSVERSE        |       | 16  | 6'-8   | 111    |
| 5n1                               | CAP, STEP, LONGIT.           |       | 16  | 3'-5   | 57     |
| TOTAL (LBS.)                      |                              |       |     |        | 32,119 |

| CONCRETE PLACEMENT SUMMARY |       |
|----------------------------|-------|
| CONCRETE                   | TOTAL |
| PIER NO. 1                 | 158.4 |
| PIER NO. 2                 | 158.4 |
| TOTAL (CU. YDS.)           | 316.8 |

DESIGN FOR 30° SKEW (L.A.)  
**299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
86'-0 END SPANS 127'-0 INTERIOR SPAN  
**TEE PIER FOOTINGS**  
STA. 664+20.50 (CL IA 175) AUGUST, 2021  
**MONONA COUNTY**  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 9 OF 30 FILE NO. 31872 DESIGN NO. 121

47'-2

44'-0 ROADWAY

1'-7 LEVEL

1'-7 LEVEL

TOP OF DECK

COIL ROD

KEYWAY FORMED BY BEVELED 2x8

BOTT. OF FTG. ELEV. (SEE TABLE)

3x3x2'-4 1/2 BAR

8g1 BOTH FACES

4+1

5d9

5d8

6g4

8f3

8f5

2 CL.

5p2

1'-9

MIN. EMBEDMENT 6g4 BARS

[illegible]

NOTE:  
SHIFT 8g1 BARS IN F.F. AS NECESSARY  
TO MISS BEAMS. PLACE 8g3 BARS PARALLEL  
TO LONGIT. STEEL.

ABUTMENT NOTES:

Figure 1 consists of two schematic diagrams, (a) and (b), illustrating the proposed structure. Diagram (a) is a top view showing a red dashed outline of the main structure and a purple solid outline of a smaller component. Labels include \*5c3, 2, 2g CL, 5d9, 1'-6, 5d8, \*5c14, 5p2, 8f5, 6g4, 5d8, 5d9, and a GUTTER LINE. Diagram (b) is a side view showing the profile of the structure with labels 1'-4, 1'-7, and 1''.

BENCH MARK: BM C 159, NGS DISK X=16,472,170.7 Y=7,288,517.7 IOWA RCS ZONE 6 (COUNCIL BLUFFS), SURVEY FEET ELEV. = 1097.92 NAVD88/IARTN (GEOID12B)

CONSTANT DEPTH

TOP OF DECK

1" CHAMFER

5b1

8g3

6a1

8g1

5k1

5d7

5k2

5d6

COIL ROD

5d3

4t1

8f1

6p3

3x3 BAR

CONSTR. JOINTS

5d8

5h4

CL.

W. ABUT. 3'-6"

E. ABUT. 3'-6"

8g1 MIN. EMBED. 3'-3"

2'-0" TOP OF PILE

ELEV. A

ELEV. B

ELEV. C

ELEV. D

ELEV. E

ELEV. F

BEAMS

NOTE:  
ELEV. D IS THE HIGH STEP ON THE EAST ABUTMENT

### ABUTMENT STEP DIAGRAM

(REAR ELEVATION WEST ABUTMENT;  
FRONT ELEVATION EAST ABUTMENT)

| STEP | WEST ABUT.       | EAST ABUT.       |
|------|------------------|------------------|
| a    | 1 $\frac{3}{16}$ | 2                |
| b    | 1 $\frac{3}{16}$ | 2                |
| c    | 0 $\frac{1}{8}$  | 0 $\frac{1}{8}$  |
| d    | 2 $\frac{1}{16}$ | 1 $\frac{3}{16}$ |
| e    | 2 $\frac{1}{16}$ | 1 $\frac{1}{16}$ |

| POINT   | WEST ABUT. | EAST ABUT. |
|---------|------------|------------|
| ELEV. A | 1110.35    | 1110.36 *  |
| ELEV. B | 1110.50    | 1110.53    |
| ELEV. C | 1110.65    | 1110.70    |
| ELEV. D | 1110.65    | 1110.71    |
| ELEV. E | 1110.47    | 1110.56    |

[illegible]

ABUTMENT CONCRETE QUANTITY

| LOCATION              | QUANTITY |
|-----------------------|----------|
| WEST ABUTMENT FOOTING | 25.4     |
| EAST ABUTMENT FOOTING | 25.4     |
| TOTAL (CU. YDS.)      | 50.8     |

NOTE: 13 - HP 10 x 57 STEEL BEARING PILING  
REQUIRED AT EACH ABUTMENT.

DESIGN FOR 30° SKEW (L.A.)

299'-0" X 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0" END SPANS                      127'-0" INTERIOR SPAN

### ABUTMENT FOOTING DETAILS

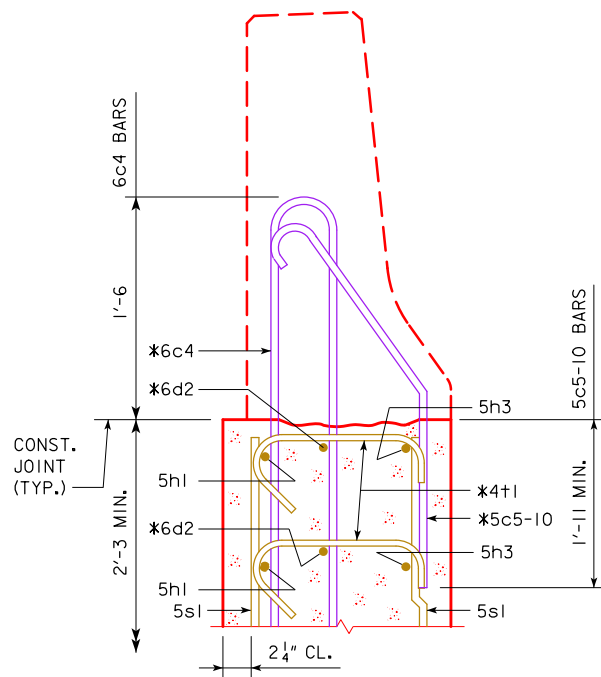
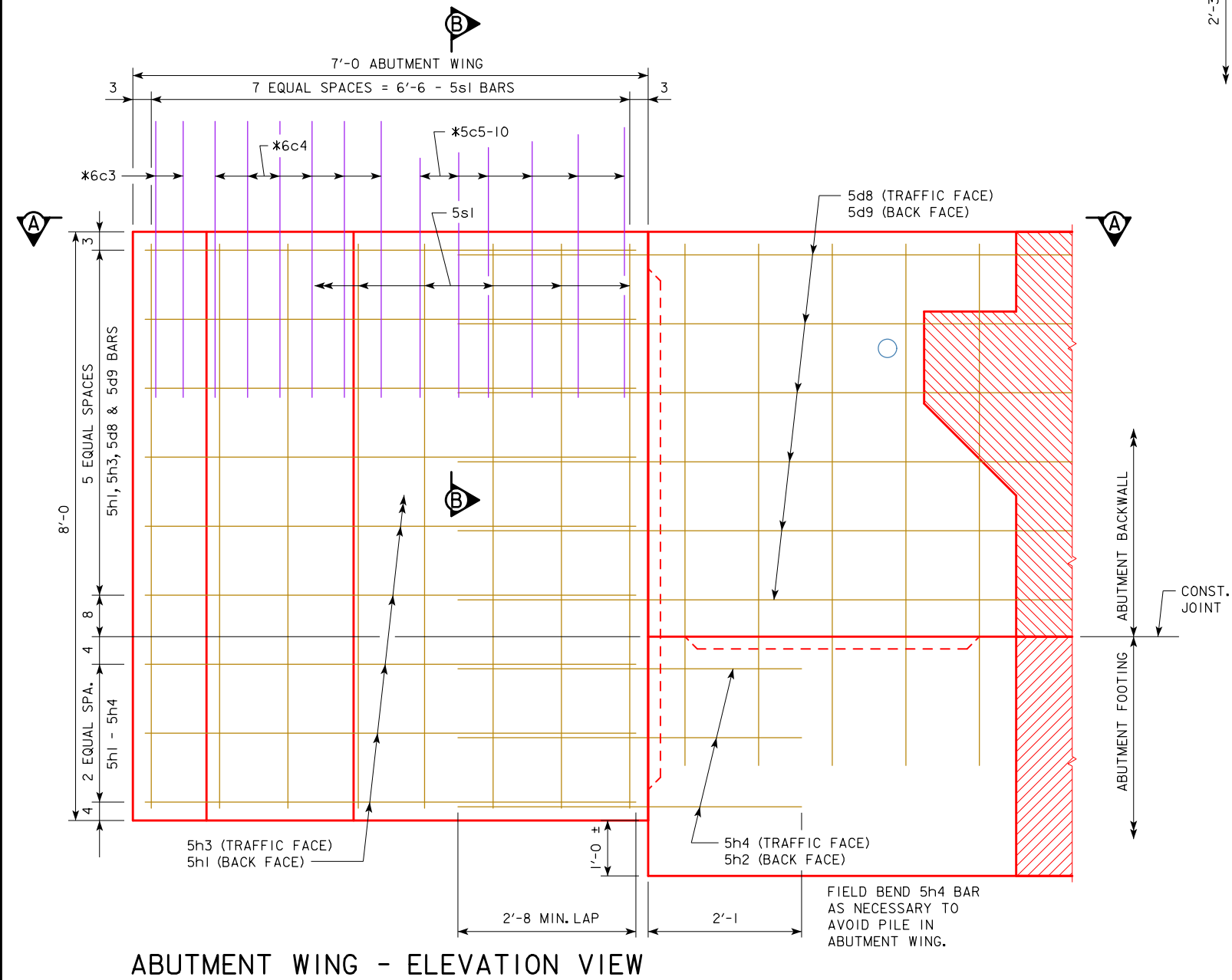
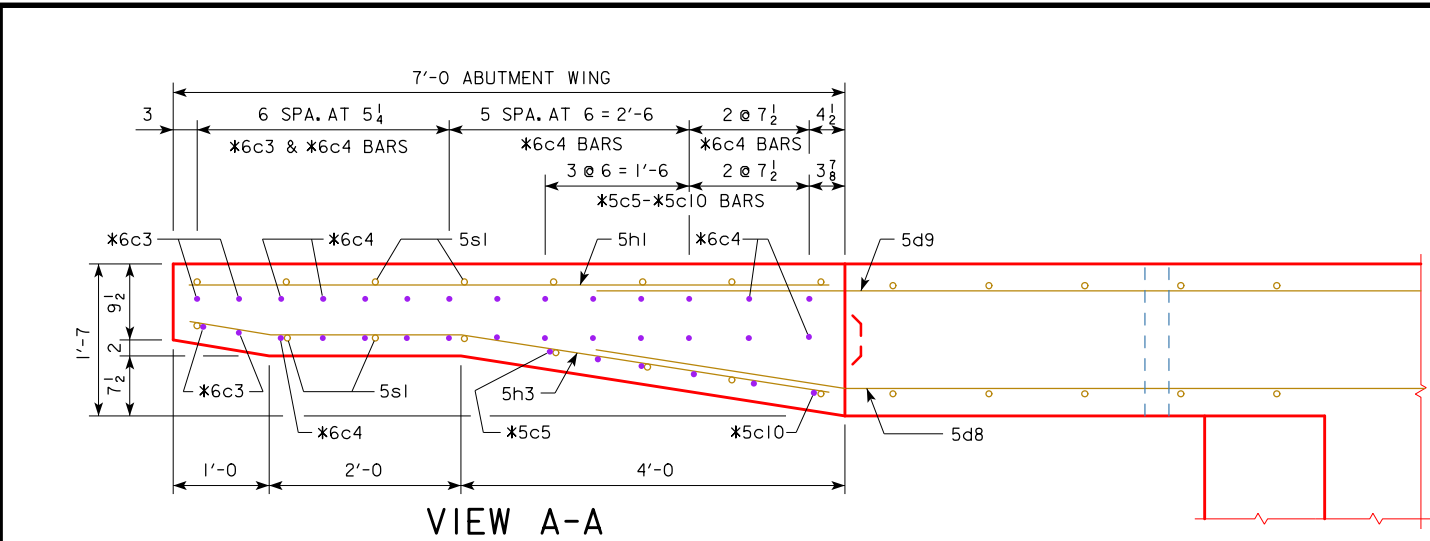
AUGUST, 2021

MONONA COUNTY

IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

DESIGN SHEET NO. 10 OF 30 FILE NO. 31872 DESIGN NO. 121

CORRECTION 04-14 - ADDED REFERRAL NOTE TO SUMMARY QUANTITIES SHEET.  
ENGLISH\MISCELLANEOUS\BRIDGES.DGN - 2113 - THIS SHEET ISSUED 02-08.



### SECTION B-B

\* BARRIER RAIL END SECTION BARS TO BE PLACED WITH ABUTMENT WING.

SEE BARRIER RAIL END SECTION SHEET IN THESE PLANS FOR DETAILS OF REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4+1.

### REINFORCING BAR LIST - ONE ABUT. WING

| BAR   | LOCATION                | SHAPE | NO. | LENGTH | WEIGHT |
|---|-------------------------|-------|-----|--------|--------|
| 5h1   | HORIZONTAL BACK FACE    |       | 9   | 6'-8   | 63     |
| 5h3   | HORIZONTAL TRAFFIC FACE |       | 9   | 6'-9   | 63     |
| 5s1   | VERTICAL BOTH FACES     |       | 16  | 7'-8   | 128    |
| REINFORCING STEEL EPOXY COATED - TOTAL (LBS.) |                         |       |     |        | 254    |

**5h3**

NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

| CONCRETE PLACEMENT SUMMARY |       |
|----------------------------|-------|
| CONCRETE                   | TOTAL |
| ONE ABUTMENT WING          | 2.3   |
| TOTAL (CU. YDS.)           | 2.3   |

**NOTE:**

CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

DESIGN FOR 30° SKEW (L.A.)

**299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0 END SPANS 127'-0 INTERIOR SPAN

**ABUTMENT WING DETAILS**

STA. 664+20.50 (C 1A 175) AUGUST, 2021

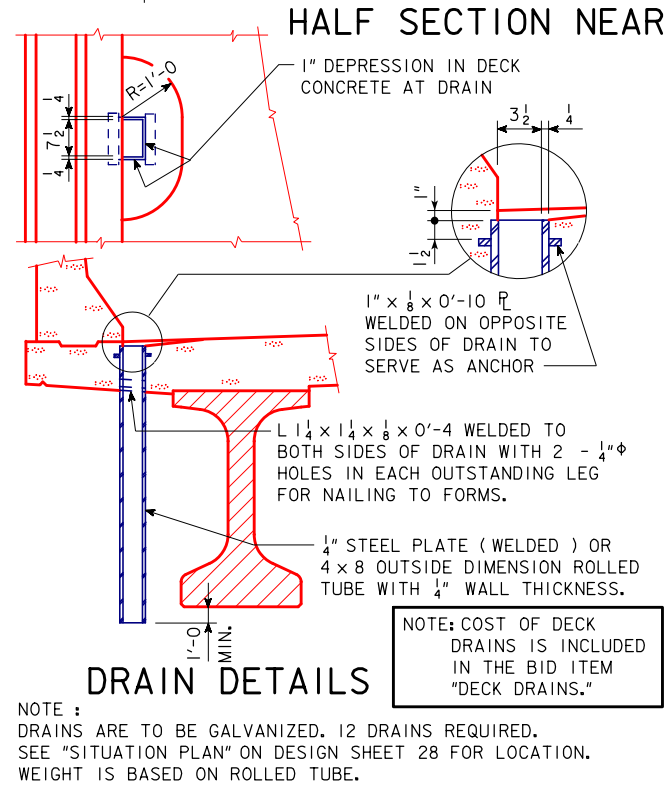
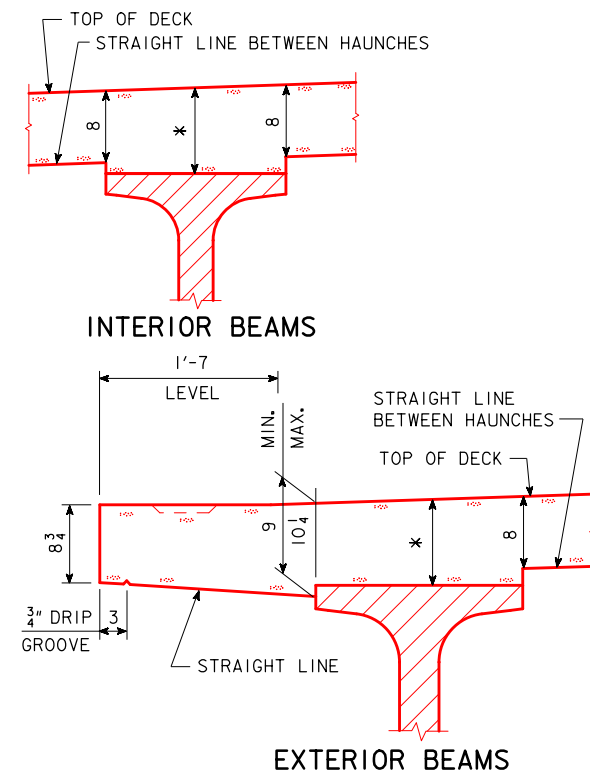
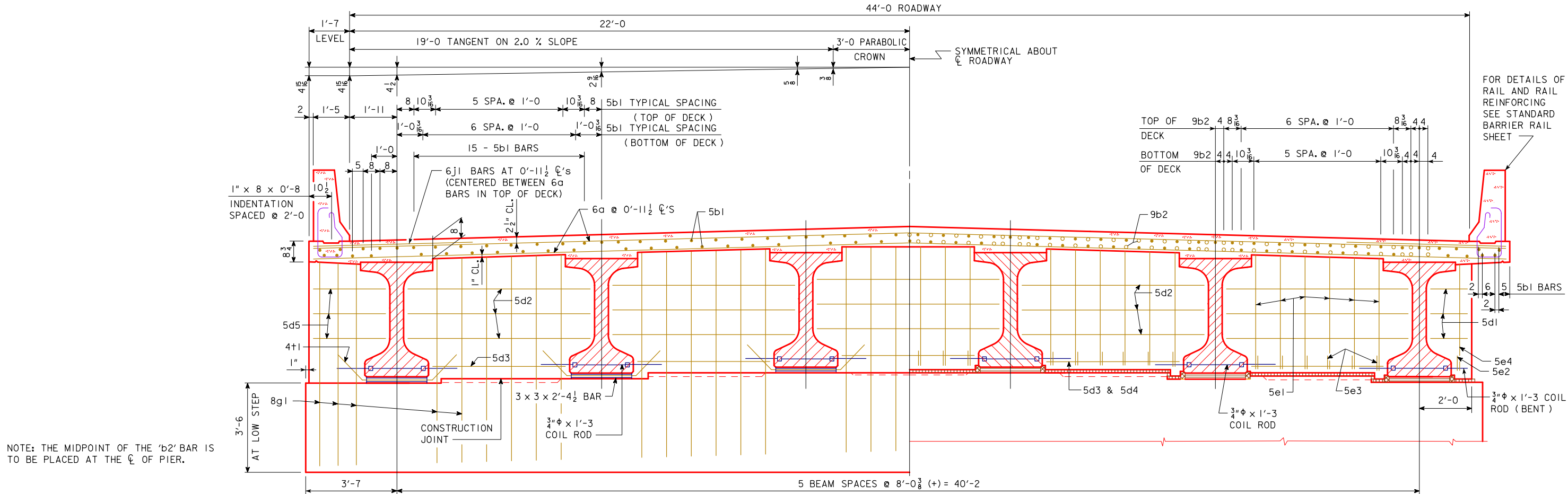
**MONONA COUNTY**

IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

DESIGN SHEET NO. 11 OF 30 FILE NO. 31872 DESIGN NO. 121



CORRECTION 04-14 - ADDED REFERRAL NOTE TO SUMMARY QUANTITIES SHEET FOR THE DRAIN WEIGHT. NOTE ABOUT CHOICE OF EPOXY OR STAINLESS STEEL DECK TO BARRIER RAIL BARS. ENGLISHBTINTEGRALBRIDGES.DGN - 4384-BTD-6 - THIS SHEET ISSUED 02-08.



| DATA FOR ONE DRAIN  |          |
|---------------------|----------|
| BEAM SIZE           | BTD      |
| DRAIN WEIGHT (LBS.) | 120      |
| DRAIN LENGTH (FT.)  | 6'-2 3/4 |

NOTE: FOR DETAILS OF INTERMEDIATE DIAPHRAGMS SEE DESIGN SHEETS 22 & 23.

**SUPERSTRUCTURE NOTES:**

THE BRIDGE DECK AS SHOWN INCLUDES 1/2" INTEGRAL WEARING SURFACE.

THE PIER AND ABUTMENT DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHICALLY WITH THE BRIDGE DECK.

COST OF ALL RESILIENT EXPANSION JOINT FILLER MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)".

ALL BEAMS ARE TO BE SET VERTICAL.

FORMS FOR THE DECK AND BARRIER RAIL ARE TO BE SUPPORTED BY THE PRESTRESSED CONCRETE BEAMS.

CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

ALL DECK AND DIAPHRAGM REINFORCING IS TO BE WIRED IN PLACE AND ADEQUATELY SUPPORTED BEFORE CONCRETE IS PLACED.

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2" CLEAR BELOW TOP OF DECK. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF DECK. TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF BAR HIGH CHAIRS OR DECK BOLSTERS SPACED 4'-0" APART. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, BAR HIGH CHAIRS, AND DECK BOLSTERS.

COST OF BEARING MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS".

TRANSVERSE DECK REINFORCING MAY BE SPLICED WITH ONE LAP LOCATED AS FOLLOWS:

TOP BAR - LAP MIDWAY BETWEEN BEAMS (MIN. LAP = 1'-10").

BOTTOM BARS - LAP OVER BEAMS (MIN. LAP = 1'-10").

PAYMENT FOR REINFORCING BARS SHALL BE BASED ON NO SPLICES, AND NO ALLOWANCE SHALL BE MADE FOR THE ADDITIONAL LENGTH OF BAR REQUIRED FOR THE USE OF SPLICES.

DESIGN FOR 30° SKEW (L.A.)

**299'-0" X 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0" END SPANS 127'-0" INTERIOR SPAN

**BRIDGE DECK CROSS SECTION**

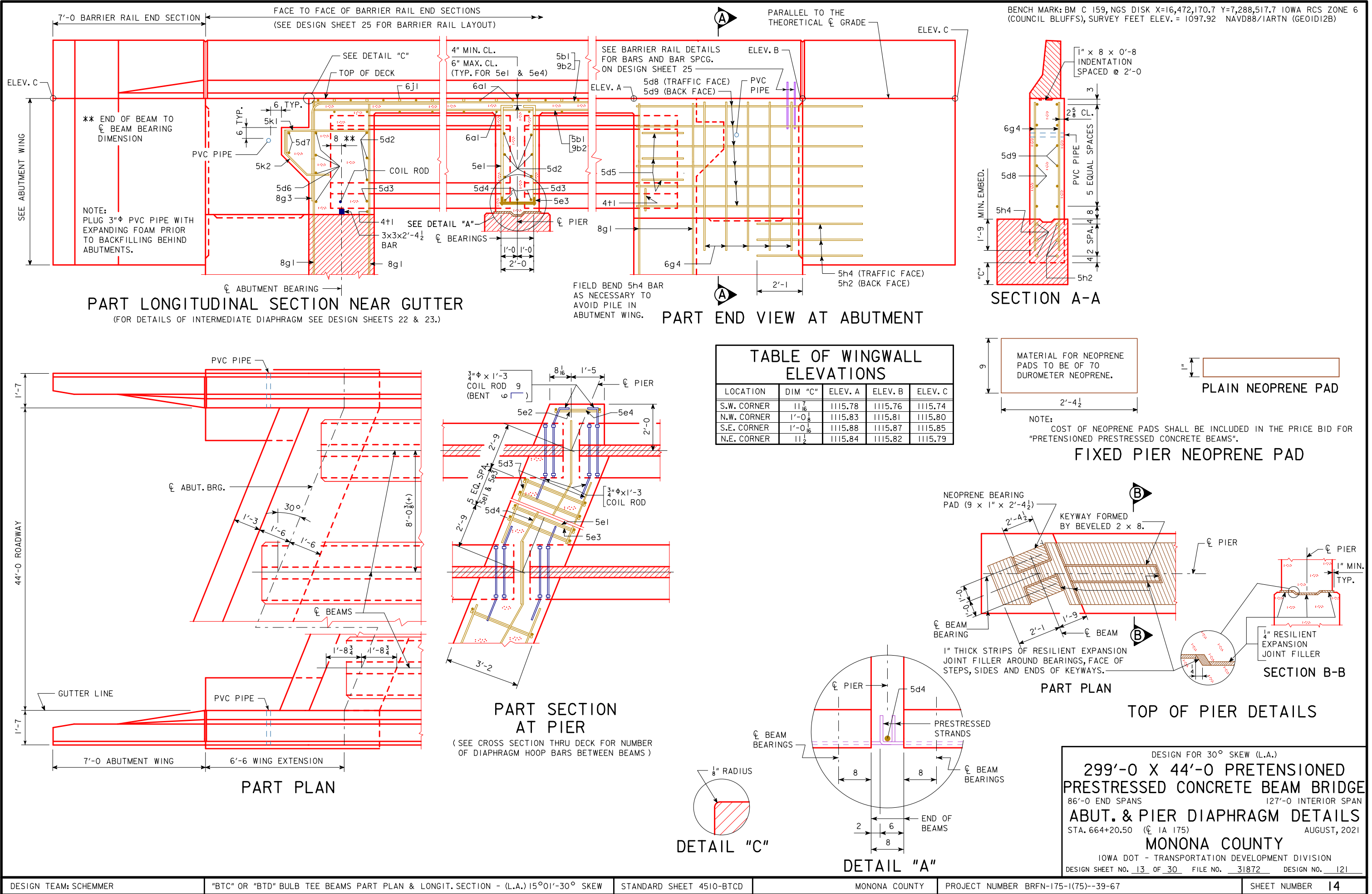
STA. 664+20.50 (CL IA 175) AUGUST, 2021

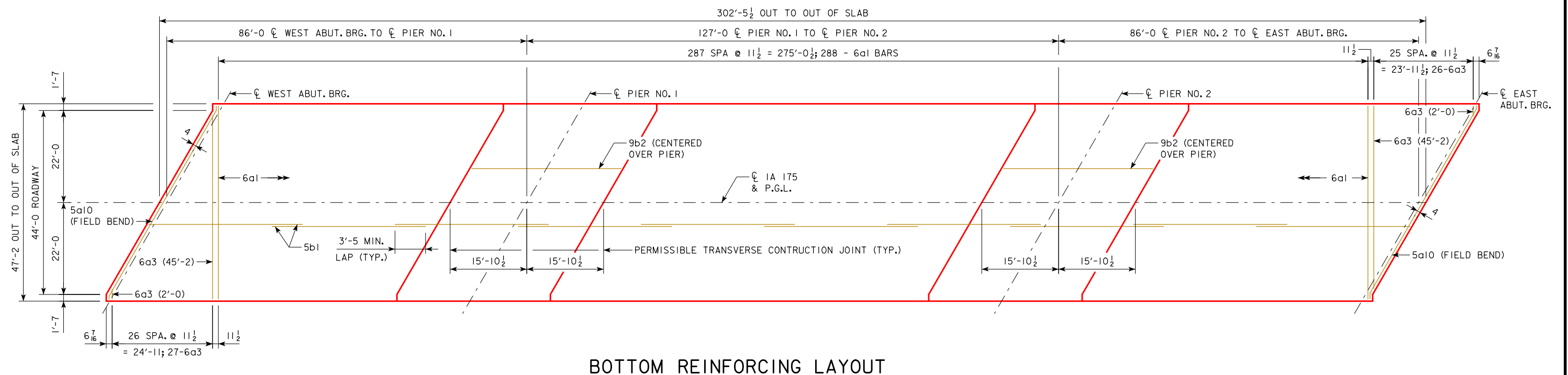
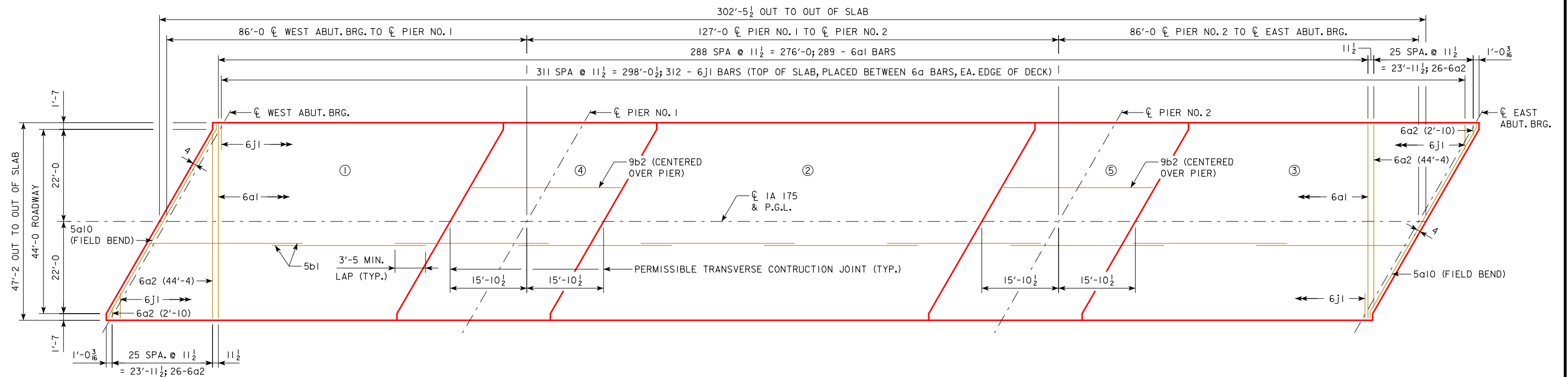
**MONONA COUNTY**

IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

DESIGN SHEET NO. 12 OF 30 FILE NO. 31872 DESIGN NO. 121

REVISED 01-12 - ADDED FIELD BEND 5h4 BAR TO AVOID PILE IN ABUTMENT WING NOTE.  
ENGLISHBTRINTEGRALBRIDGES.DGN - 4510-BTCD - THIS SHEET ISSUED 02-08.





### CONCRETE PLACEMENT DIAGRAM

NOTE: CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. AN APPROVED ALTERNATE PROCEDURE IS TO PLACE THE CONCRETE DECK IN ONE CONTINUOUS POUR BEGINNING AT ONE END OF THE BRIDGE. ALTERNATE PROCEDURES FOR PLACING DECK CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. THE BRIDGE ENGINEER SHALL REVIEW ANY ALTERNATE PROCEDURES. THE COST OF ANY ADDITIONAL ANALYSIS AND PLAN MODIFICATIONS SHALL BE PAID FOR BY THE CONTRACTOR. THE ENGINEER SHALL DETERMINE IF A RETARDING ADMIXTURE IS REQUIRED TO MAINTAIN PLASTICITY OF THE CONCRETE DECK DURING PLACEMENT.

DECK CONCRETE SECTIONS SHALL CURE FOR A MINIMUM OF 48 HOURS AND SHALL ACHIEVE A MINIMUM STRENGTH OF 75% OF THE 28 DAY DECK CONCRETE STRENGTH PRIOR TO REMOVING DECK HEADERS AND BEGINNING AN ADJACENT POUR.

DESIGN FOR 30° SKEW (L.A.)  
299'-0" X 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
86'-0" END SPANS 127'-0" INTERIOR SPAN  
SUPERSTRUCTURE DETAILS  
STA. 664+20.50 (C 1A 175) AUGUST, 2021  
MONONA COUNTY  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 14 OF 30 FILE NO. 31872 DESIGN NO. 121



WEST ABUTMENT PILE NOTES:

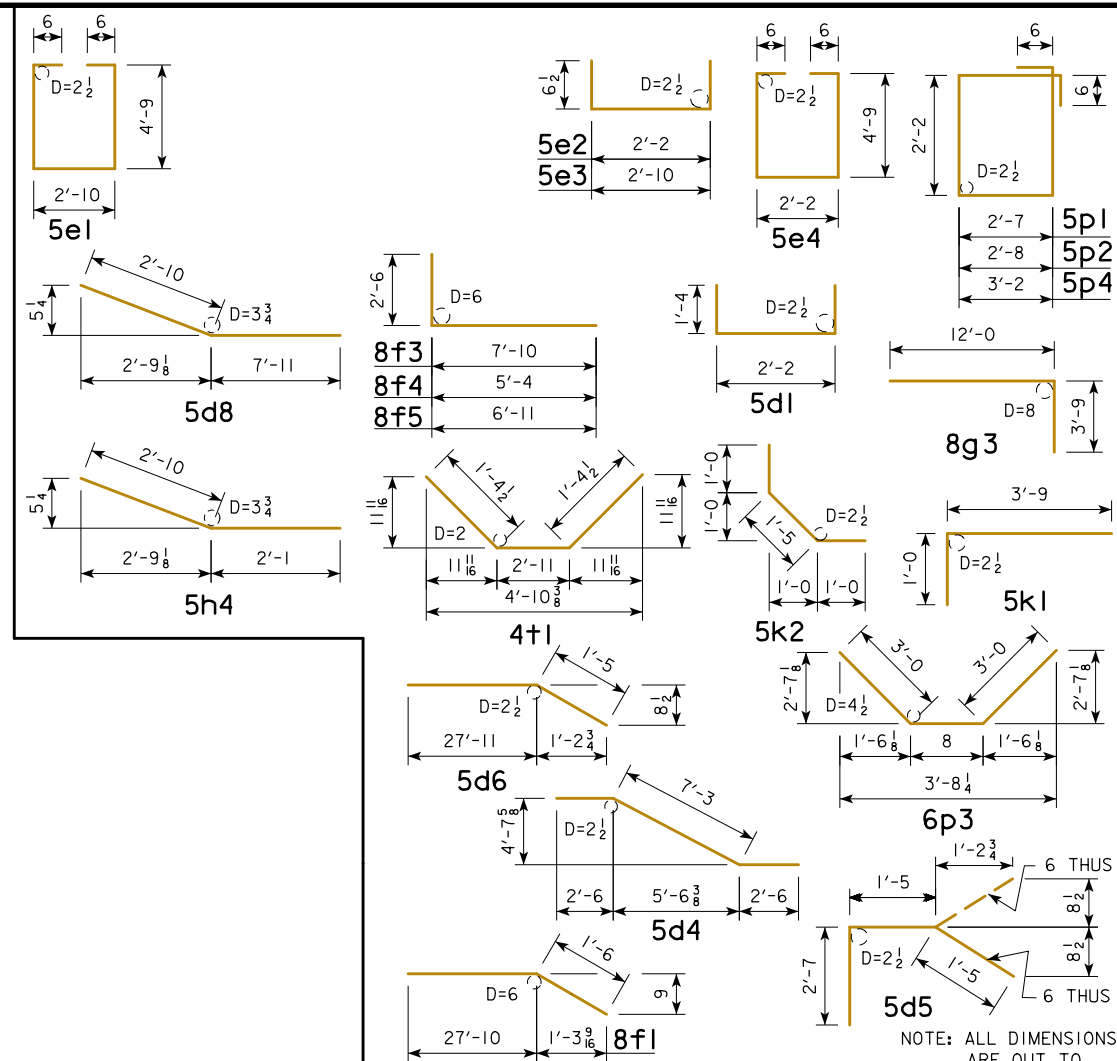
THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR ( $\phi$ ) OF 0.65 FOR SOIL. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR WEST ABUTMENT PILES IS 108 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 60 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

EAST ABUTMENT PILE NOTES:

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A MIXED SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR ( $\phi$ ) OF 0.65 FOR SOIL. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR EAST ABUTMENT PILES IS 108 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IN NO CASE SHALL A PILE BE EMBEDDED LESS THAN 60 FEET. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.



# BENT BAR DETAILS







































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## CONCRETE PLACEMENT QUANTITIES

| LOCATION                       | QUANTITY |
|--------------------------------|----------|
| SECTION 1, DECK & ABUT. DIAPH. | 125.9    |
| SECTION 2, DECK                | 116.7    |
| SECTION 3, DECK & ABUT. DIAPH. | 125.5    |
| SECTION 4, DECK & PIER DIAPH.  | 67.5     |
| SECTION 5, DECK & PIER DIAPH.  | 67.2     |
|                                |          |
|                                |          |
|                                |          |
|                                |          |
|                                |          |
|                                |          |
| TOTAL (CU. YDS.)               | 502.8    |

NOTE:  
CONCRETE AND REINFORCING STEEL QUANTITIES ARE INCLUDED  
ON THE SUMMARY QUANTITIES SHEET.

## REINFORCING BAR LIST

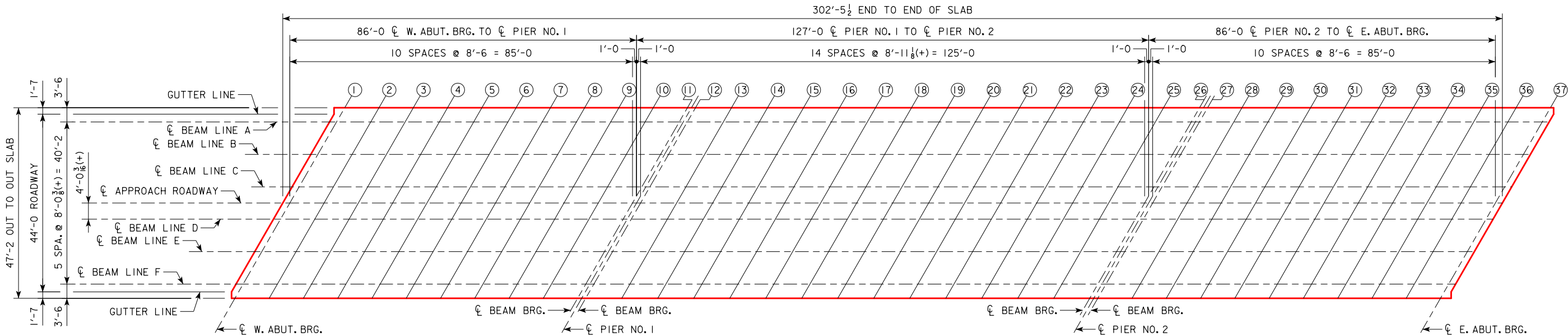
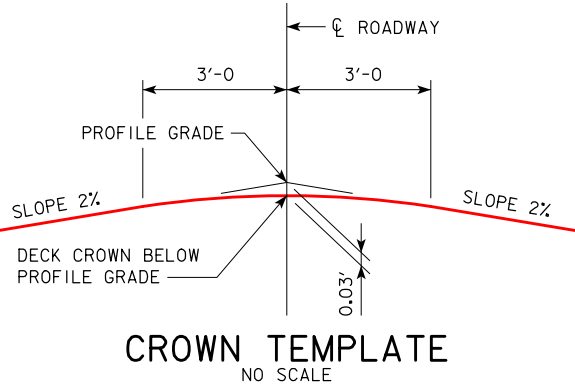
| BAR   | LOCATION   | SHAPE   | NO. | LENGTH | WEIGHT  |
|---|--|---|-----|--------|---------|
| 6a1   | DECK TRANSV. TOP & BOTT.   |    | 577 | 46'-10 | 40,588  |
| 6a2   | DECK TRANSV. TOP ENDS  |    | 52  | VARIES | 1842    |
| 6a3   | DECK TRANSV. BOTT. ENDS  |    | 54  | VARIES | 1913    |
| 5a10  | DECK TRANSV. TOP & BOTT. ENDS  |    | 4   | 53'-7  | 224     |
|   |  |   |     |        |         |
|   |  |   |     |        |         |
|   |  |   |     |        |         |
| 5b1   | DECK LONGIT. TOP & BOTT.   |    | 873 | 36'-3  | 33,007  |
| 9b2   | DECK LONGIT. TOP & BOTT. AT PIERS  |    | 198 | 31'-5  | 21,150  |
|   |  |   |     |        |         |
| 5d1   | PIER DIAPH. ENDS   |    | 12  | 4'-10  | 60      |
| 5d2   | PIER & ABUT. DIAPH. LONGIT.  |    | 90  | 8'-2   | 767     |
| 5d3   | PIER & ABUT. DIAPH. LONGIT.  |    | 30  | 5'-11  | 185     |
| 5d4   | PIER DIAPH. LONGIT.  |    | 10  | 12'-3  | 128     |
| 5d5   | ABUT. DIAPH. ENDS  |    | 12  | 5'-5   | 68      |
| 5d6   | ABUT. DIAPH. LONGIT. B.F.  |    | 16  | 27'-11 | 466     |
| 5d7   | PAVING NOTCH LONGIT.   |    | 8   | 28'-3  | 236     |
| 5d8   | ABUT. DIAPH. WING EXT. LONGIT.   |    | 24  | 10'-9  | 269     |
| 5d9   | ABUT. DIAPH. WING EXT. LONGIT.   |    | 24  | 10'-8  | 267     |
|   |  |   |     |        |         |
|   |  |   |     |        |         |
| 5e1   | PIER DIAPH. HOOPS  |    | 60  | 13'-4  | 834     |
| 5e2   | PIER DIAPH. TIES ENDS  |    | 4   | 3'-3   | 14      |
| 5e3   | PIER DIAPH. TIES   |    | 60  | 3'-11  | 245     |
| 5e4   | PIER DIAPH. HOOPS ENDS   |    | 4   | 12'-8  | 53      |
|   |  |   |     |        |         |
|   |  |   |     |        |         |
| 8f1   | ABUT. FOOTING LONGIT. BOTH F.  |    | 36  | 29'-4  | 2820    |
| 8f3   | ABUT. EXTENSION LONGIT.  |    | 16  | 10'-4  | 441     |
| 8f4   | ABUT. EXTENSION LONGIT.  |    | 8   | 7'-10  | 167     |
| 8f5   | ABUT. EXTENSION LONGIT.  |    | 8   | 9'-5   | 201     |
|   |  |   |     |        |         |
| 8g1   | ABUT. VERT. BOTH F.  |    | 164 | 8'-5   | 3685    |
| 8g3   | ABUT. DIAPH. VERT. B.F.  |    | 84  | 15'-9  | 3532    |
| 6g4   | ABUT. DIAPH. WING EXT. VERT.   |    | 40  | 6'-11  | 416     |
|   |  |   |     |        |         |
| 5h2   | ABUT. TO WING ANCHOR   |   | 12  | 4'-11  | 62      |
| 5h4   | ABUT. TO WING ANCHOR   |  | 12  | 4'-11  | 62      |
|   |  |   |     |        |         |
| 6j1   | TOP OF DECK TRANSV. (AT RAIL)  |  | 624 | 6'-3   | 5858    |
|   |  |   |     |        |         |
| 5k1   | PAVING NOTCH   |  | 86  | 4'-9   | 426     |
| 5k2   | PAVING NOTCH   |  | 86  | 3'-5   | 306     |
|   |  |   |     |        |         |
| 5p1   | ABUT. HOOPS  |  | 208 | 10'-6  | 2278    |
| 5p2   | ABUT. EXTENSION HOOPS  |  | 24  | 10'-8  | 267     |
| 6p3   | ABUT. BOTT. AT PILES   |  | 44  | 6'-8   | 441     |
| 5p4   | ABUT. HOOPS AT ENDS  |  | 8   | 11'-8  | 97      |
| 4t1   | UNDER BEAMS AT ABUTMENTS   |  | 12  | 5'-8   | 45      |
|   |  |   |     |        |         |
|   |  |   |     |        |         |
|   |  |   |     |        |         |
|   |  |   |     |        |         |
| REINFORCING STEEL EPOXY COATED - TOTAL (LBS.) |  |   |     |        | 123,420 |
| #2  | PILE SPIRAL  |  | 26  | 38'-6  | 170     |
|   | SPIRAL SPACERS, $L_s \times \frac{7}{8} \times \frac{7}{8} \times \frac{1}{8} \times 0.70$ |  | 78  | 1'-10  | 100     |
|   |  |   |     |        |         |
|   |  |   |     |        |         |
|   |  |   |     |        |         |
|   |  |   |     |        |         |
|   |  |   |     |        |         |
| REINFORCING STEEL - TOTAL (LBS.)              |  |   |     |        | 270     |

DESIGN FOR 30° SKEW (L.A.)  
299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
86'-0 END SPANS 127'-0 INTERIOR SPAN  
DECK, ABUT. & DIAPH. QUANTITIES  
STA. 664+20.50 (CL IA 175) AUGUST, 2021  
MONONA COUNTY  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 15 OF 30 FILE NO. 31872 DESIGN NO. 121



| TOP OF SLAB ELEVATIONS    |                          |         |         |         |         |         |         |         |         |         |         |                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |  |  |                          |  |
|---------------------------|--------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--|--|--------------------------|--|
| BEAM LINE                 | ℄ W.<br>ABUT.<br>BEARING |         |         |         |         |         |         |         |         |         |         | ℄ PIER NO. 1<br>BEARINGS |         |         |         |         |         |         |         |         |         |         |         |         |         |         |         |  |  | ℄ PIER NO. 2<br>BEARINGS |  |
|                           | LINE 1                   | LINE 2  | LINE 3  | LINE 4  | LINE 5  | LINE 6  | LINE 7  | LINE 8  | LINE 9  | LINE 10 | LINE 11 | LINE 12                  | LINE 13 | LINE 14 | LINE 15 | LINE 16 | LINE 17 | LINE 18 | LINE 19 | LINE 20 | LINE 21 | LINE 22 | LINE 23 | LINE 24 | LINE 25 | LINE 26 | LINE 27 |  |  |                          |  |
| NORTH GUTTER LINE         | 1115.83                  | 1115.84 | 1115.86 | 1115.87 | 1115.88 | 1115.90 | 1115.91 | 1115.92 | 1115.93 | 1115.94 | 1115.94 | 1115.95                  | 1115.95 | 1115.96 | 1115.96 | 1115.97 | 1115.97 | 1115.97 | 1115.97 | 1115.97 | 1115.97 | 1115.97 | 1115.96 | 1115.96 | 1115.95 | 1115.95 | 1115.95 |  |  |                          |  |
| GIRDER A                  | 1115.86                  | 1115.88 | 1115.89 | 1115.91 | 1115.92 | 1115.93 | 1115.95 | 1115.96 | 1115.97 | 1115.97 | 1115.98 | 1115.98                  | 1115.99 | 1116.00 | 1116.00 | 1116.01 | 1116.01 | 1116.01 | 1116.01 | 1116.01 | 1116.01 | 1116.01 | 1116.00 | 1116.00 | 1115.99 | 1115.99 | 1115.99 |  |  |                          |  |
| GIRDER B                  | 1116.01                  | 1116.03 | 1116.05 | 1116.06 | 1116.07 | 1116.09 | 1116.10 | 1116.11 | 1116.12 | 1116.13 | 1116.14 | 1116.14                  | 1116.15 | 1116.15 | 1116.16 | 1116.16 | 1116.17 | 1116.17 | 1116.17 | 1116.17 | 1116.17 | 1116.17 | 1116.17 | 1116.16 | 1116.16 | 1116.15 | 1116.15 |  |  |                          |  |
| GIRDER C                  | 1116.17                  | 1116.18 | 1116.20 | 1116.21 | 1116.23 | 1116.24 | 1116.25 | 1116.27 | 1116.28 | 1116.29 | 1116.29 | 1116.30                  | 1116.30 | 1116.31 | 1116.32 | 1116.32 | 1116.33 | 1116.33 | 1116.33 | 1116.33 | 1116.33 | 1116.33 | 1116.33 | 1116.32 | 1116.32 | 1116.32 | 1116.31 |  |  |                          |  |
| ℄ APPROACH RDWY. & P.G.L. | 1116.21                  | 1116.23 | 1116.24 | 1116.26 | 1116.27 | 1116.29 | 1116.30 | 1116.31 | 1116.32 | 1116.33 | 1116.34 | 1116.34                  | 1116.35 | 1116.36 | 1116.37 | 1116.37 | 1116.38 | 1116.38 | 1116.38 | 1116.38 | 1116.38 | 1116.38 | 1116.38 | 1116.38 | 1116.37 | 1116.37 | 1116.37 |  |  |                          |  |
| GIRDER D                  | 1116.16                  | 1116.17 | 1116.19 | 1116.21 | 1116.22 | 1116.23 | 1116.25 | 1116.26 | 1116.27 | 1116.28 | 1116.29 | 1116.29                  | 1116.30 | 1116.31 | 1116.31 | 1116.32 | 1116.32 | 1116.33 | 1116.33 | 1116.33 | 1116.33 | 1116.33 | 1116.33 | 1116.33 | 1116.32 | 1116.32 | 1116.32 |  |  |                          |  |
| GIRDER E                  | 1115.98                  | 1116.00 | 1116.02 | 1116.04 | 1116.05 | 1116.07 | 1116.08 | 1116.09 | 1116.10 | 1116.11 | 1116.12 | 1116.13                  | 1116.14 | 1116.15 | 1116.16 | 1116.16 | 1116.17 | 1116.17 | 1116.17 | 1116.17 | 1116.17 | 1116.17 | 1116.17 | 1116.17 | 1116.16 | 1116.16 | 1116.16 |  |  |                          |  |
| GIRDER F                  | 1115.81                  | 1115.83 | 1115.85 | 1115.87 | 1115.88 | 1115.90 | 1115.91 | 1115.92 | 1115.94 | 1115.95 | 1115.96 | 1115.96                  | 1115.97 | 1115.98 | 1115.99 | 1115.99 | 1116.00 | 1116.00 | 1116.01 | 1116.01 | 1116.01 | 1116.01 | 1116.01 | 1116.01 | 1116.01 | 1116.00 | 1116.00 |  |  |                          |  |
| SOUTH GUTTER LINE         | 1115.77                  | 1115.79 | 1115.81 | 1115.83 | 1115.84 | 1115.86 | 1115.87 | 1115.88 | 1115.90 | 1115.91 | 1115.92 | 1115.92                  | 1115.93 | 1115.94 | 1115.95 | 1115.95 | 1115.96 | 1115.96 | 1115.97 | 1115.97 | 1115.97 | 1115.97 | 1115.97 | 1115.97 | 1115.97 | 1115.96 | 1115.96 |  |  |                          |  |

|                           |         |         |         |         |         |         |         |         |         |         | ℄ E.<br>ABUT.<br>BEARING |
|---------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------------|
|                           | LINE 28 | LINE 29 | LINE 30 | LINE 31 | LINE 32 | LINE 33 | LINE 34 | LINE 35 | LINE 36 | LINE 37 |                          |
| NORTH GUTTER LINE         | 1115.94 | 1115.93 | 1115.92 | 1115.91 | 1115.90 | 1115.89 | 1115.88 | 1115.86 | 1115.85 | 1115.83 |                          |
| GIRDER A                  | 1115.98 | 1115.97 | 1115.96 | 1115.95 | 1115.94 | 1115.93 | 1115.92 | 1115.90 | 1115.89 | 1115.87 |                          |
| GIRDER B                  | 1116.14 | 1116.14 | 1116.13 | 1116.12 | 1116.11 | 1116.10 | 1116.08 | 1116.07 | 1116.06 | 1116.04 |                          |
| GIRDER C                  | 1116.31 | 1116.30 | 1116.29 | 1116.28 | 1116.27 | 1116.26 | 1116.25 | 1116.24 | 1116.22 | 1116.21 |                          |
| ℄ APPROACH RDWY. & P.G.L. | 1116.36 | 1116.35 | 1116.35 | 1116.34 | 1116.33 | 1116.32 | 1116.30 | 1116.29 | 1116.28 | 1116.26 |                          |
| GIRDER D                  | 1116.31 | 1116.30 | 1116.30 | 1116.29 | 1116.28 | 1116.27 | 1116.26 | 1116.25 | 1116.23 | 1116.22 |                          |
| GIRDER E                  | 1116.15 | 1116.15 | 1116.14 | 1116.13 | 1116.12 | 1116.11 | 1116.10 | 1116.09 | 1116.08 | 1116.07 |                          |
| GIRDER F                  | 1116.00 | 1115.99 | 1115.98 | 1115.98 | 1115.97 | 1115.96 | 1115.95 | 1115.94 | 1115.93 | 1115.91 |                          |
| SOUTH GUTTER LINE         | 1115.96 | 1115.95 | 1115.95 | 1115.94 | 1115.93 | 1115.92 | 1115.91 | 1115.90 | 1115.89 | 1115.88 |                          |



DESIGN FOR 30° SKEW (L.A.)

299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0 END SPANS127'-0 INTERIOR SPAN

TOP OF SLAB ELEVATIONS

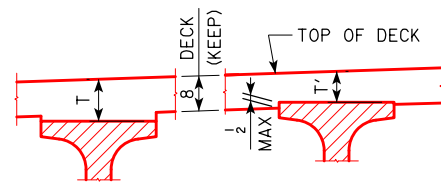
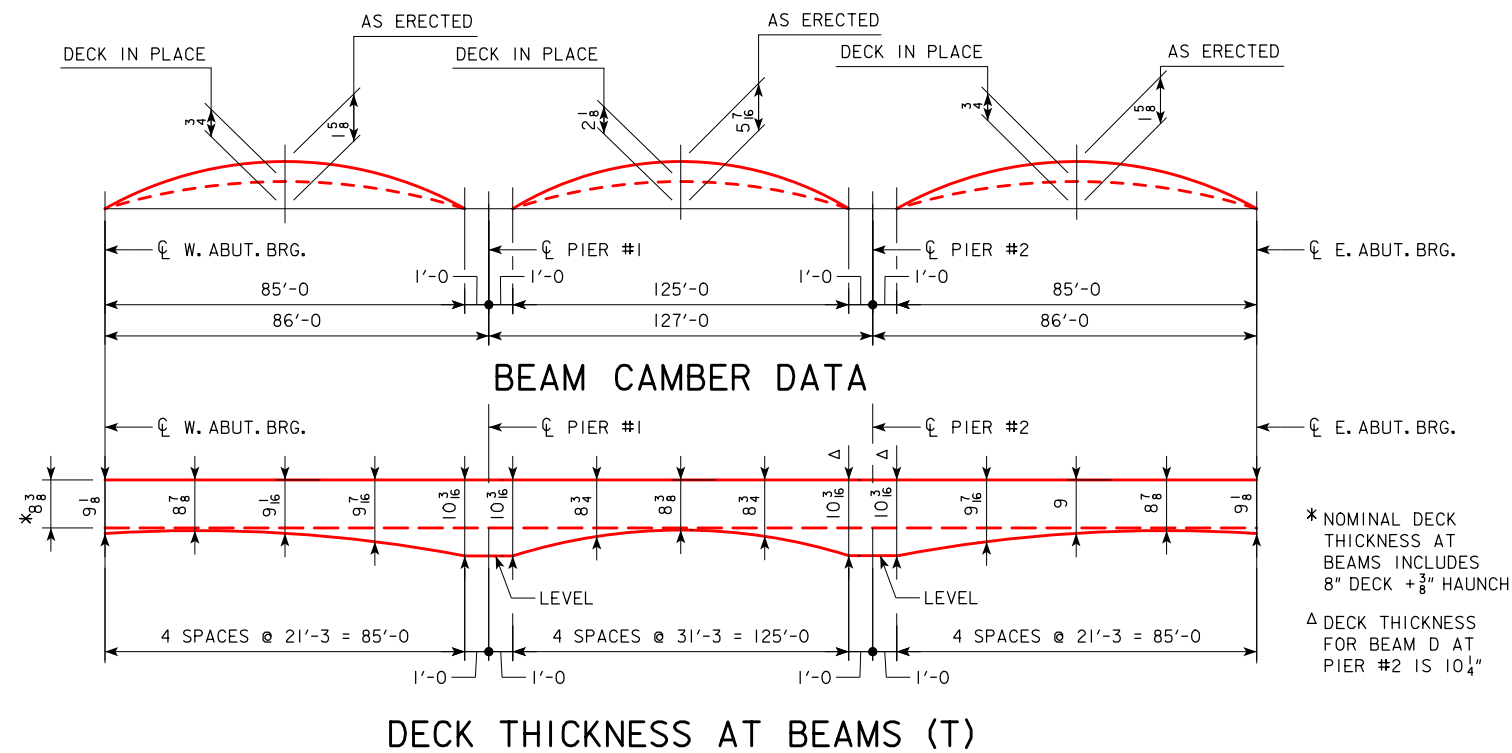
STA. 664+20.50 (℄ IA 175)AUGUST, 2021

MONONA COUNTY

IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

DESIGN SHEET NO. 16 OF 30FILE NO. 31872DESIGN NO. 121

REVISED 06-2017 - REMOVED CENTER 6b BAR FROM UNDER "#4 BAR IN BEAM" IN "SECTION THRU SLAB HAUNCH" DETAIL. (WAS THREE 6b BARS NOW TWO).  
REVISED 07-2019: CHANGED ALL REFERENCES OF "SLAB" TO "DECK".  
ENGLISHMISCELLANEOUSBRIDGES.DGN - 1065 - THIS SHEET ISSUED 02-08.



### DECK THICKNESS DETAILS

NOTE: THE DECK THICKNESS (T) AT BEAMS IS BASED ON THE ANTICIPATED BEAM CAMBER AND DEFLECTIONS. THESE VALUES ARE USED BY THE DESIGNER TO SET BEAM ELEVATIONS AND ESTIMATE CONCRETE QUANTITIES. REFER TO THE HAUNCH DATA DETAILS SHEET FOR ADDITIONAL INFORMATION TO AID THE CONTRACTOR IN SETTING THE FIELD HAUNCHES REQUIRED FOR CONSTRUCTION.

DESIGN FOR 30° SKEW (L.A.)  
**299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
86'-0 END SPANS 127'-0 INTERIOR SPAN  
**DECK THICKNESS DETAILS**  
STA. 664+20.50 (CL 1A 175) AUGUST, 2021  
**MONONA COUNTY**  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 17 OF 30 FILE NO. 31872 DESIGN NO. 121

REVISED 06-12 - THE ALLOWABLE FIELD HAUNCH MAX. & MIN. WAS CHANGED TO INCHES & DECIMALS OF FEET. NOTE & NOTE 1 WERE CHANGED. THE SLAB HAUNCH LOCATIONS EXAMPLE WAS REPLACED WITH A NOTE.  
REVISED 07-2019: CHANGED ALL REFERENCES OF "SLAB" TO "DECK".  
ENGLISH\MISCELLANEOUS\BRIDGES.DGN - 1066 - THIS SHEET ISSUED 02-08.

BENCH MARK: BM C 159, NGS DISK X=16,472,170.7 Y=7,288,517.7 IOWA RCS ZONE 6 (COUNCIL BLUFFS), SURVEY FEET ELEV. = 1097.92 NAVD88/IARTN (GEOID12B)

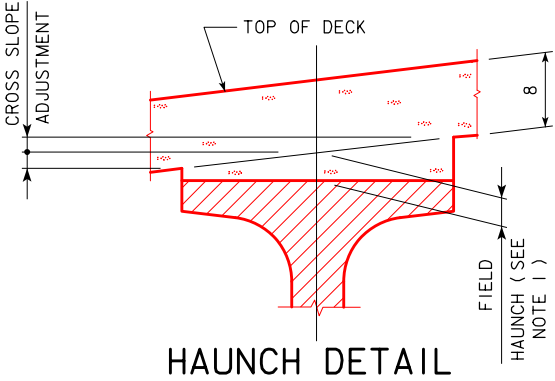
| TABLE OF BEAM LINE DECK HAUNCH ELEVATIONS |                          |         |         |         |         |         |         |         |         |                          |                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |                          |         |
|---|--------------------------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------------|--------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------------------------|---------|
| BEAM LINE                                 | ℄ W.<br>ABUT.<br>BEARING |         |         |         |         |         |         |         |         |                          | ℄ PIER NO. 1<br>BEARINGS |         |         |         |         |         |         |         |         |         |         |         |         |         |         | ℄ PIER NO. 2<br>BEARINGS |         |
|   | LINE 1                   | LINE 2  | LINE 3  | LINE 4  | LINE 5  | LINE 6  | LINE 7  | LINE 8  | LINE 9  | LINE 10                  | LINE 11                  | LINE 12 | LINE 13 | LINE 14 | LINE 15 | LINE 16 | LINE 17 | LINE 18 | LINE 19 | LINE 20 | LINE 21 | LINE 22 | LINE 23 | LINE 24 | LINE 25 | LINE 26                  | LINE 27 |
| A   | 1115.20                  | 1115.24 | 1115.27 | 1115.30 | 1115.33 | 1115.34 | 1115.35 | 1115.35 | 1115.34 | 1115.33                  | 1115.31                  | 1115.32 | 1115.39 | 1115.45 | 1115.51 | 1115.56 | 1115.59 | 1115.61 | 1115.62 | 1115.62 | 1115.59 | 1115.56 | 1115.51 | 1115.45 | 1115.39 | 1115.32                  | 1115.32 |
| B   | 1115.35                  | 1115.39 | 1115.42 | 1115.45 | 1115.48 | 1115.50 | 1115.50 | 1115.50 | 1115.50 | 1115.49                  | 1115.47                  | 1115.47 | 1115.54 | 1115.61 | 1115.67 | 1115.72 | 1115.75 | 1115.77 | 1115.78 | 1115.78 | 1115.76 | 1115.72 | 1115.67 | 1115.62 | 1115.55 | 1115.48                  | 1115.48 |
| C   | 1115.50                  | 1115.54 | 1115.58 | 1115.61 | 1115.63 | 1115.65 | 1115.66 | 1115.66 | 1115.65 | 1115.64                  | 1115.63                  | 1115.63 | 1115.70 | 1115.77 | 1115.83 | 1115.87 | 1115.91 | 1115.93 | 1115.94 | 1115.94 | 1115.92 | 1115.88 | 1115.84 | 1115.78 | 1115.72 | 1115.65                  | 1115.65 |
| D   | 1115.49                  | 1115.53 | 1115.57 | 1115.60 | 1115.62 | 1115.64 | 1115.65 | 1115.65 | 1115.65 | 1115.64                  | 1115.62                  | 1115.63 | 1115.70 | 1115.76 | 1115.82 | 1115.87 | 1115.91 | 1115.93 | 1115.94 | 1115.94 | 1115.92 | 1115.88 | 1115.84 | 1115.78 | 1115.72 | 1115.65                  | 1115.65 |
| E   | 1115.32                  | 1115.36 | 1115.40 | 1115.43 | 1115.46 | 1115.47 | 1115.48 | 1115.49 | 1115.48 | 1115.47                  | 1115.46                  | 1115.46 | 1115.53 | 1115.60 | 1115.66 | 1115.71 | 1115.75 | 1115.77 | 1115.78 | 1115.78 | 1115.76 | 1115.72 | 1115.68 | 1115.62 | 1115.56 | 1115.49                  | 1115.49 |
| F   | 1115.15                  | 1115.19 | 1115.23 | 1115.26 | 1115.29 | 1115.31 | 1115.32 | 1115.32 | 1115.31 | 1115.30                  | 1115.29                  | 1115.29 | 1115.37 | 1115.43 | 1115.49 | 1115.55 | 1115.58 | 1115.61 | 1115.62 | 1115.61 | 1115.59 | 1115.56 | 1115.52 | 1115.46 | 1115.40 | 1115.33                  | 1115.33 |
|   |                          |         |         |         |         |         |         |         |         | ℄ E.<br>ABUT.<br>BEARING |                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |                          |         |
|   | LINE 28                  | LINE 29 | LINE 30 | LINE 31 | LINE 32 | LINE 33 | LINE 34 | LINE 35 | LINE 36 | LINE 37                  |                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |                          |         |
| A   | 1115.34                  | 1115.35 | 1115.36 | 1115.36 | 1115.35 | 1115.33 | 1115.31 | 1115.28 | 1115.24 | 1115.21                  |                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |                          |         |
| B   | 1115.50                  | 1115.51 | 1115.52 | 1115.52 | 1115.51 | 1115.50 | 1115.48 | 1115.45 | 1115.41 | 1115.37                  |                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |                          |         |
| C   | 1115.66                  | 1115.68 | 1115.69 | 1115.69 | 1115.68 | 1115.67 | 1115.64 | 1115.62 | 1115.58 | 1115.54                  |                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |                          |         |
| D   | 1115.67                  | 1115.68 | 1115.69 | 1115.69 | 1115.69 | 1115.67 | 1115.65 | 1115.62 | 1115.59 | 1115.55                  |                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |                          |         |
| E   | 1115.51                  | 1115.52 | 1115.53 | 1115.54 | 1115.53 | 1115.52 | 1115.50 | 1115.47 | 1115.44 | 1115.40                  |                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |                          |         |
| F   | 1115.35                  | 1115.37 | 1115.38 | 1115.38 | 1115.38 | 1115.36 | 1115.34 | 1115.31 | 1115.28 | 1115.25                  |                          |         |         |         |         |         |         |         |         |         |         |         |         |         |         |                          |         |

MISCELLANEOUS DATA TABLE

|  | BEAM LINE         |     | ⌄ W.<br>ABUT.<br>BEARING  |                           |               |               |               |               |               |               |               |               |                           | ⌄ PIER NO. 1<br>BEARINGS  |                           |                |                |                |         |                |                 |                |         |                |                |                |               |                           | ⌄ PIER NO. 2<br>BEARINGS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|-------------------|-----|---------------------------|---------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------------------|---------------------------|---------------------------|----------------|----------------|----------------|---------|----------------|-----------------|----------------|---------|----------------|----------------|----------------|---------------|---------------------------|--------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |                   |     | LINE 1                    | LINE 2                    | LINE 3        | LINE 4        | LINE 5        | LINE 6        | LINE 7        | LINE 8        | LINE 9        | LINE 10       | LINE 11                   | LINE 12                   | LINE 13                   | LINE 14        | LINE 15        | LINE 16        | LINE 17 | LINE 18        | LINE 19         | LINE 20        | LINE 21 | LINE 22        | LINE 23        | LINE 24        | LINE 25       | LINE 26                   | LINE 27                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ANTICIPATED DEFLECTION DUE TO DECK (IN.) | ALL               |     | 0                         | $\frac{1}{4}$             | $\frac{1}{2}$ | $\frac{3}{4}$ | $\frac{7}{8}$ | $\frac{7}{8}$ | $\frac{7}{8}$ | $\frac{3}{4}$ | $\frac{1}{2}$ | $\frac{1}{4}$ | 0                         | 0                         | $\frac{3}{4}$             | $1\frac{1}{2}$ | $2\frac{1}{8}$ | $2\frac{5}{8}$ | 3       | $3\frac{1}{4}$ | $3\frac{5}{16}$ | $3\frac{1}{4}$ | 3       | $2\frac{5}{8}$ | $2\frac{1}{8}$ | $1\frac{1}{2}$ | $\frac{3}{4}$ | 0                         | 0                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CROSS SLOPE ADJUSTMENTS (IN.)            | A, B, C, D, E & F |     | $\frac{5}{16}$            |                           |               |               |               |               |               |               |               |               |                           |                           |                           |                |                |                |         |                |                 |                |         |                |                |                |               |                           |                          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ALLOWABLE FIELD HAUNCH (IN. & FT.)       | MAX.              | ALL | $3\frac{1}{2}$<br>(0.292) | $2\frac{1}{2}$ (0.208)    |               |               |               |               |               |               |               |               |                           | $3\frac{1}{2}$<br>(0.292) | $2\frac{1}{2}$ (0.208)    |                |                |                |         |                |                 |                |         |                |                |                |               | $3\frac{1}{2}$<br>(0.292) |                          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | MIN.              | ALL | $\frac{1}{2}$<br>(0.0417) | $-\frac{3}{16}$ (-0.0133) |               |               |               |               |               |               |               |               |                           | $\frac{1}{2}$<br>(0.0417) | $-\frac{3}{16}$ (-0.0133) |                |                |                |         |                |                 |                |         |                |                |                |               | $\frac{1}{2}$<br>(0.0417) |                          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | BEAM LINE         |     |                           |                           |               |               |               |               |               |               |               |               | ⌄ E.<br>ABUT.<br>BEARING  |                           |                           |                |                |                |         |                |                 |                |         |                |                |                |               |                           |                          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |                   |     | LINE 28                   | LINE 29                   | LINE 30       | LINE 31       | LINE 32       | LINE 33       | LINE 34       | LINE 35       | LINE 36       | LINE 37       |                           |                           |                           |                |                |                |         |                |                 |                |         |                |                |                |               |                           |                          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ANTICIPATED DEFLECTION DUE TO DECK (IN.) | ALL               |     | $\frac{1}{4}$             | $\frac{1}{2}$             | $\frac{3}{4}$ | $\frac{7}{8}$ | $\frac{7}{8}$ | $\frac{7}{8}$ | $\frac{3}{4}$ | $\frac{1}{2}$ | $\frac{1}{4}$ | 0             |                           |                           |                           |                |                |                |         |                |                 |                |         |                |                |                |               |                           |                          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CROSS SLOPE ADJUSTMENTS (IN.)            | A, B, C, D, E & F |     | $\frac{5}{16}$            |                           |               |               |               |               |               |               |               |               |                           |                           |                           |                |                |                |         |                |                 |                |         |                |                |                |               |                           |                          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| ALLOWABLE FIELD HAUNCH (IN. & FT.)       | MAX.              | ALL | $2\frac{1}{2}$ (0.208)    |                           |               |               |               |               |               |               |               |               | $3\frac{1}{2}$<br>(0.292) |                           |                           |                |                |                |         |                |                 |                |         |                |                |                |               |                           |                          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | MIN.              | ALL | $-\frac{3}{16}$ (-0.0133) |                           |               |               |               |               |               |               |               |               | $\frac{1}{2}$<br>(0.0417) |                           |                           |                |                |                |         |                |                 |                |         |                |                |                |               |                           |                          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

NOTE:  
HAUNCH LOCATIONS ARE AT THE SAME LOCATION AS THE ENCIRCLED LETTERS AND NUMBERS SHOWN ON DECK ELEVATIONS SHEET.

NOTE:  
HAUNCH LOCATIONS ARE AT THE SAME LOCATION AS THE ENCIRCLED LETTERS AND NUMBERS SHOWN ON DECK ELEVATIONS SHEET.



NOTE:  
BRIDGE SEAT ELEVATIONS ARE SET BASED ON THEORETICAL CAMBER AND BEAM DEFLECTIONS. THESE BRIDGE SEATS WILL PROVIDE A THEORETICAL BEAM HAUNCH WITHIN DESIGN PARAMETERS. FIELD HAUNCHES ARE DETERMINED USING SURVEYED TOP OF BEAM ELEVATIONS AND "BEAM LINE HAUNCH ELEVATION" DATA. ALLOWABLE MAXIMUM AND MINIMUM "FIELD HAUNCH" VALUES ARE GIVEN IN INCHES AND DECIMALS OF FEET IN THE "MISCELLANEOUS DATA" TABLE. "CROSS SLOPE ADJUSTMENT" VALUES WILL AID THE CONTRACTOR IN DETERMINING ACTUAL FORMED HAUNCH DIMENSIONS AT THE EDGES OF THE TOP FLANGE.

NOTE 1:  
TO CALCULATE FIELD HAUNCH REQUIRED AT EACH LOCATION, SURVEY THE BEAM TOPS CONSISTENT WITH THE SPACINGS SHOWN ON THE "TOP OF DECK ELEVATIONS LAYOUT". SUBTRACT THE SURVEYED BEAM SHOT FROM THE "BEAM LINE HAUNCH ELEVATION". THIS VALUE WILL BE THE HAUNCH NEEDED (SEE "FIELD HAUNCH" IN HAUNCH DETAIL). THE "BEAM LINE HAUNCH ELEVATION" INCLUDES ADJUSTMENTS FOR DECK THICKNESSES AND ANTICIPATED DEFLECTIONS. NO ADDITIONAL CALCULATIONS ARE REQUIRED. IF THE FIELD HAUNCH EXCEEDS THE MAXIMUMS AND MINIMUMS SHOWN IN INCHES AND DECIMALS OF FEET IN THE MISCELLANEOUS DATA TABLE, ADJUSTMENTS TO THE GRADE OR ADDITIONAL HAUNCH REINFORCEMENT WILL BE REQUIRED.

DESIGN FOR 30° SKEW (L.A.)

299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0 END SPANS 127'-0 INTERIOR SPAN

DECK HAUNCH DATA DETAILS

STA. 664+20.50 (℄ 1A 175) AUGUST, 2021

MONONA COUNTY

IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

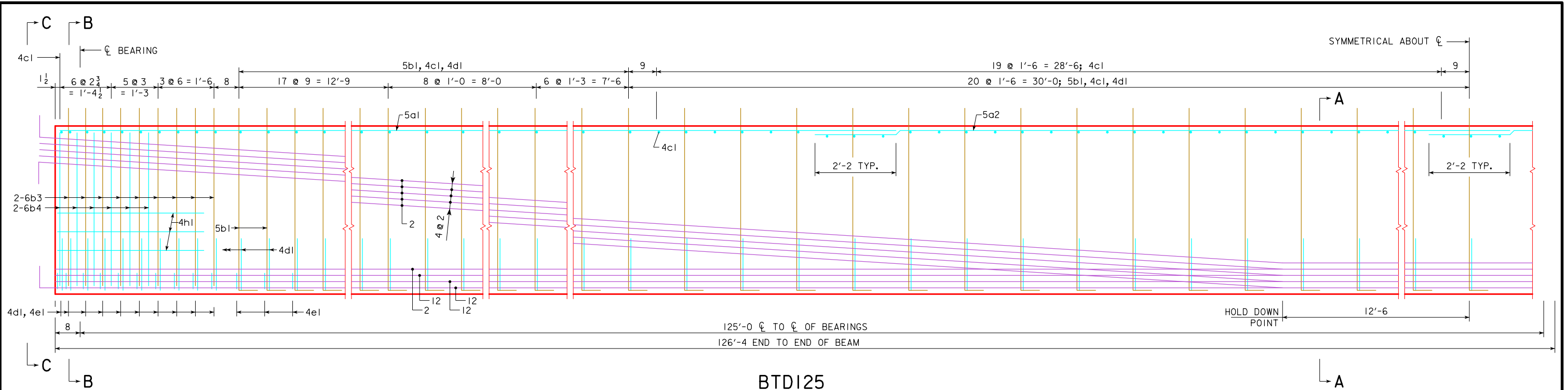
DESIGN SHEET NO. 18 OF 30 FILE NO. 31872 DESIGN NO. 121



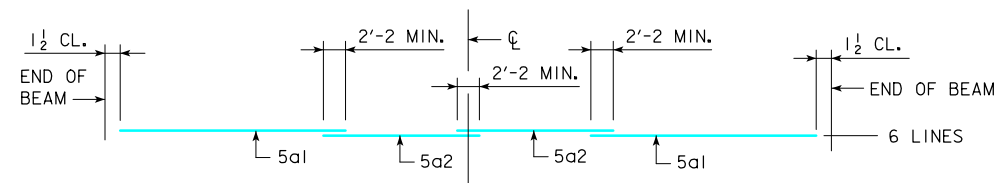




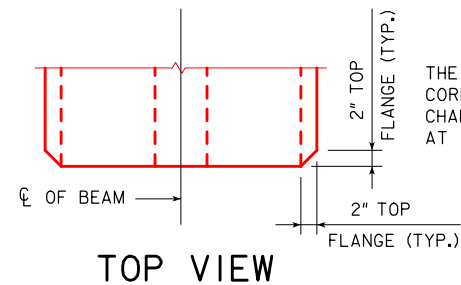
REVISED 10-07 - 5b2 BAR DELETED, 5b1 BAR LENGTHENED TO EXTEND 5 INCHES ABOVE BEAM TOP.  
ENGLISHBEAMS.DGN 4746 - THIS SHEET ISSUED 05-04.



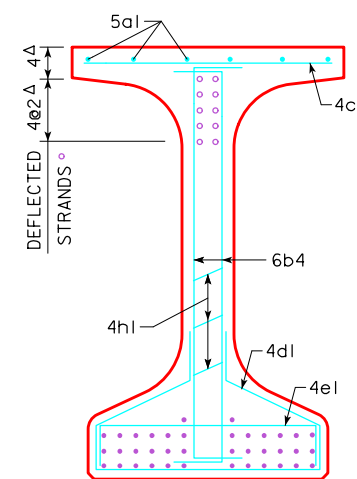
TOP FLANGE LONGITUDINAL BAR LAYOUT



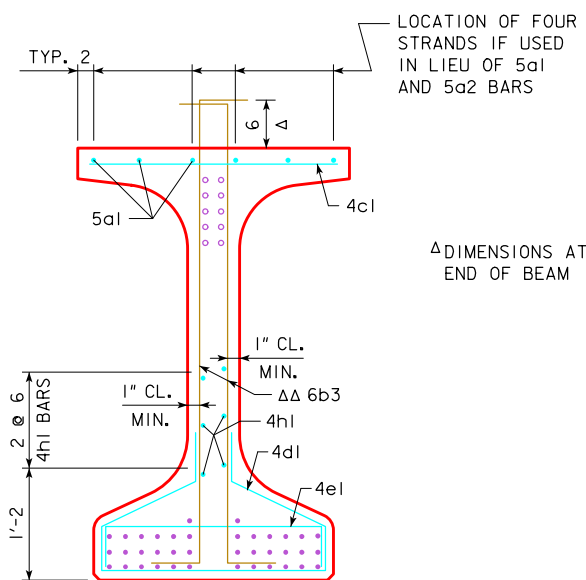
Δ NOTE: STIRRUP EXTENSION FOR 6b3 BARS HAS BEEN MODIFIED.



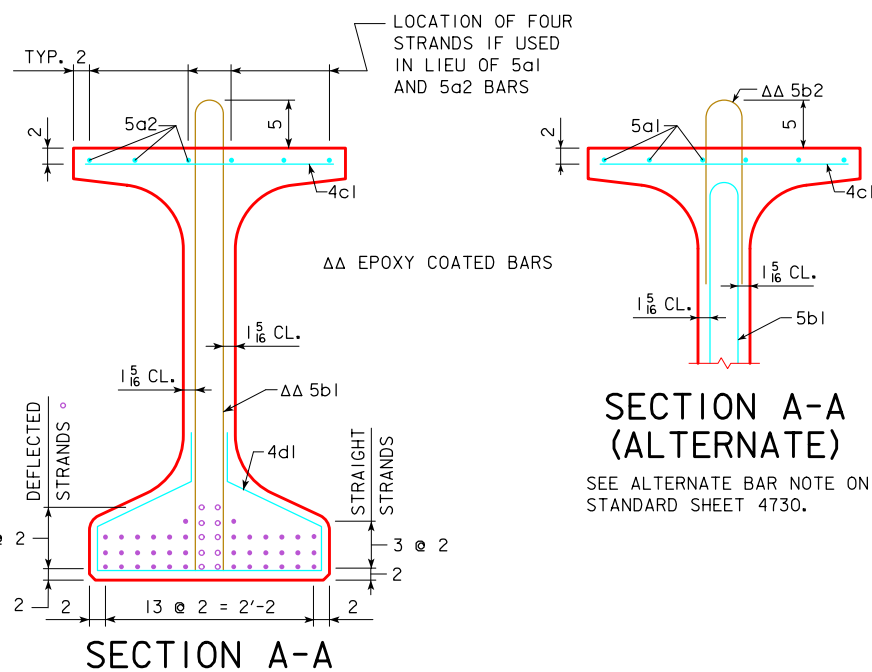
THE TOP FLANGE BEAM CORNERS ARE TO BE CHAMFERED 2" AS SHOWN AT BOTH ENDS OF THE BEAM.



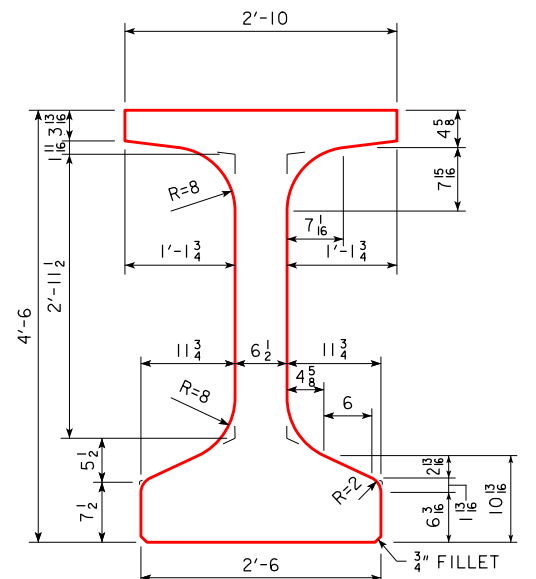
SECTION C-C



SECTION B-B



SECTION A-A (ALTERNATE)



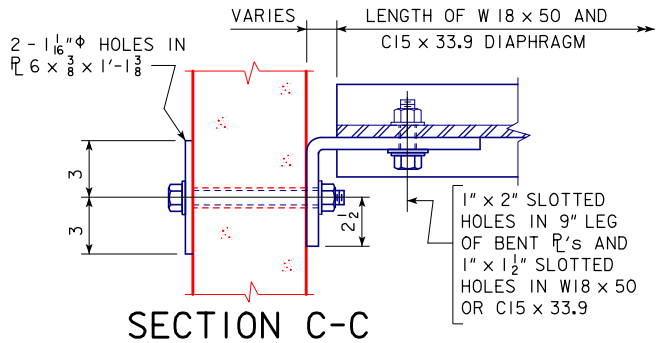
BTD BEAM CROSS SECTION

BEAM SECTION PROPERTIES

AREA = 748.8 in<sup>2</sup>  
 $\bar{y}_b$  = 24.64 in  
I = 285,860 in<sup>4</sup>

DESIGN FOR 30° SKEW (L.A.)  
**299'-0" X 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
86'-0" END SPANS 127'-0" INTERIOR SPAN  
**BTDI25 BEAM DETAILS**  
STA. 664+20.50 ( $\bar{C}$  IA 175) AUGUST, 2021  
**MONONA COUNTY**  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 21 OF 30 FILE NO. 31872 DESIGN NO. 121

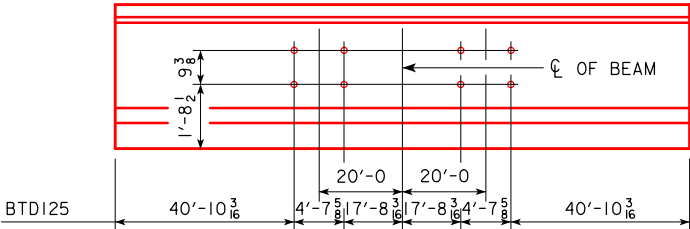
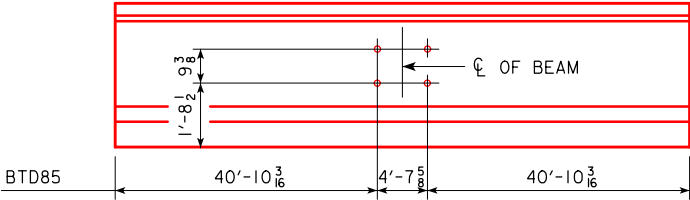
ENGLISHBEAMS.DGN - 1036-I-BTD - THIS SHEET ISSUED 06-14, SHEET 1 OF 2.



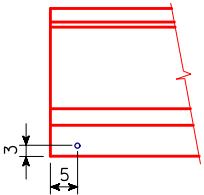
| STRUCTURAL STEEL |           |
|------------------|-----------|
| WEIGHT           | 6518 LBS. |

NOTE: STRUCTURAL STEEL WEIGHT IS INCLUDED ON THE SUMMARY QUANTITIES SHEET.

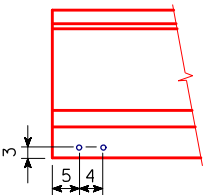
**NOTES:**  
ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.  
SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.  
ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.  
THE 1 1/2"  $\phi$  HOLES FOR THE 7/8"  $\phi$  H.S. BOLTS SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.  
THE 7/8"  $\phi$  H.S. BOLTS THROUGH THE WEB SHALL HAVE A THREAD LENGTH OF 3" MIN. AND 4" MAX. AND SHALL MEET THE REQUIREMENTS OF ASTM A449.  
ALL BOLTS ARE TO BE TIGHTENED PRIOR TO PLACING BRIDGE FLOOR CONCRETE.



### INTERMEDIATE DIAPHRAGM BOLT HOLE LOCATIONS



### INTEGRAL ABUT.



### FIXED PIER

### BEAM COIL TIE LOCATIONS

| BULB TEE "D" BEAM INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL           |   |                               |        |
|---|---|-------------------------------|--------|
| ONE BEAM CONNECTION (DETAIL "F" AND/OR DETAIL "G" )                 |   |                               | WEIGHT |
| 2 - 7/8" $\phi$ x 9 1/4" H.S. BOLTS WITH NUTS & WASHERS = 4.8 LBS.  |   | NO. OF BEAM CONNECTIONS<br>40 | 192    |
| ONE DETAIL "F"  | 1 - BACKING PL 6 x 3/8 x 1'-1 3/8" = 8.5 LBS.   | 40                            | 340    |
|   | 1 - BENT PL 9 x 6 x 1/2 x 1'-1 3/8" = 28.5 LBS. | 40                            | 1140   |
| ONE DIAPHRAGM   |   |                               |        |
|   |   | NUMBER OF DIAPHRAGMS          |        |
| 8 - 7/8" $\phi$ x 2 3/4" H.S. BOLTS WITH NUTS & WASHERS = 10.3 LBS. |   | 20                            | 206    |
|   |   |                               |        |
|   |   |                               |        |
|   |   |                               |        |
|   |   |                               |        |
|   |   |                               |        |
| 1 - C15 x 33.9 = 33.9 LBS./FT.                                      | LENGTH OF MEMBER<br>6'-10 1/8"                  | 20                            | 4640   |
|   |   |                               |        |
|   |   |                               |        |
|   |   |                               |        |
| INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL - TOTAL (LBS.)              |   |                               | 6518   |

DESIGN FOR 30° SKEW (L.A.)

299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0 END SPANS127'-0 INTERIOR SPAN

STEEL INTERM. DIAPH. DETAILS

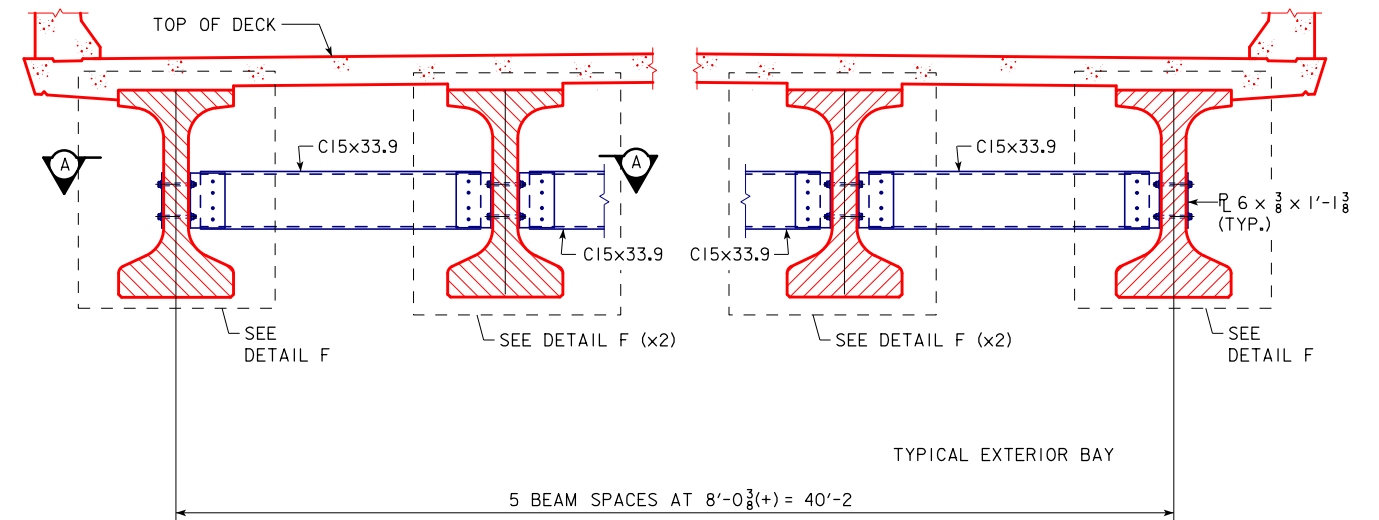
STA. 664+20.50 (CL IA 175)AUGUST, 2021

MONONA COUNTY

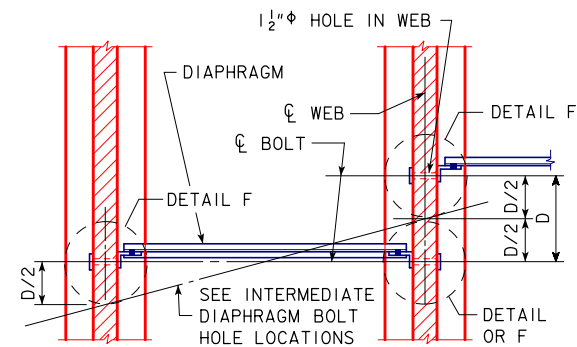
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

DESIGN SHEET NO. 22 OF 30FILE NO. 31872DESIGN NO. 121

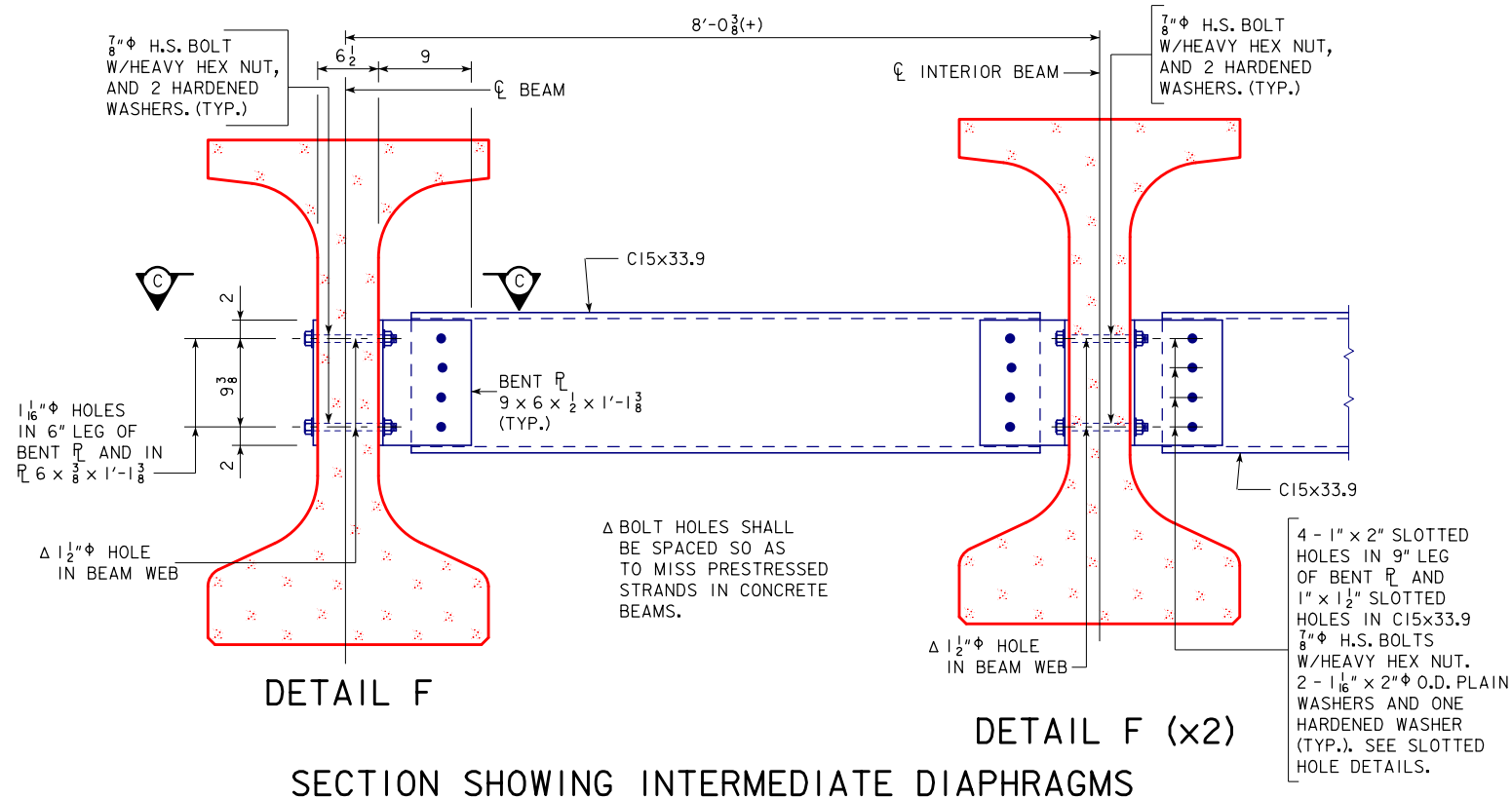
ENGLISHBEAMS.DGN - 1036-2-BTD - THIS SHEET ISSUED 06-14. SHEET 2 OF 2.



SECTION SHOWING INTERMEDIATE DIAPHRAGM



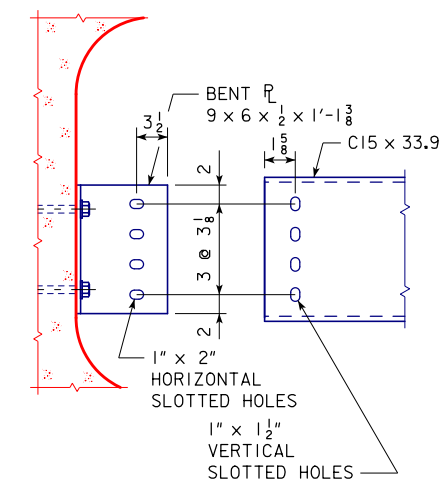
PART SECTION A-A



DETAIL F

DETAIL F (x2)

SECTION SHOWING INTERMEDIATE DIAPHRAGMS

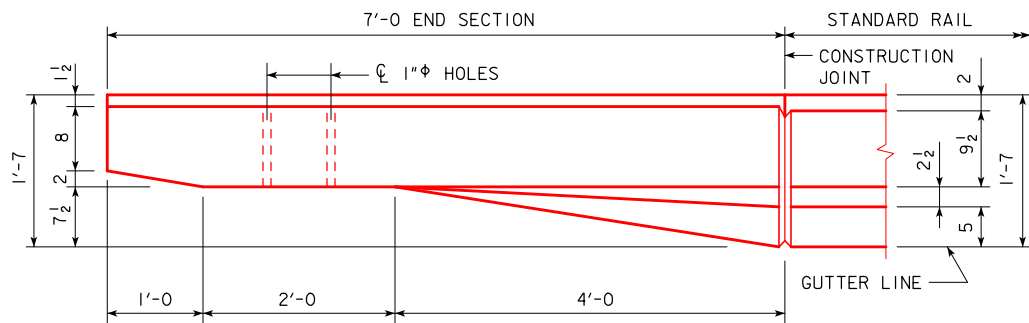


SLOTTED HOLE DETAILS

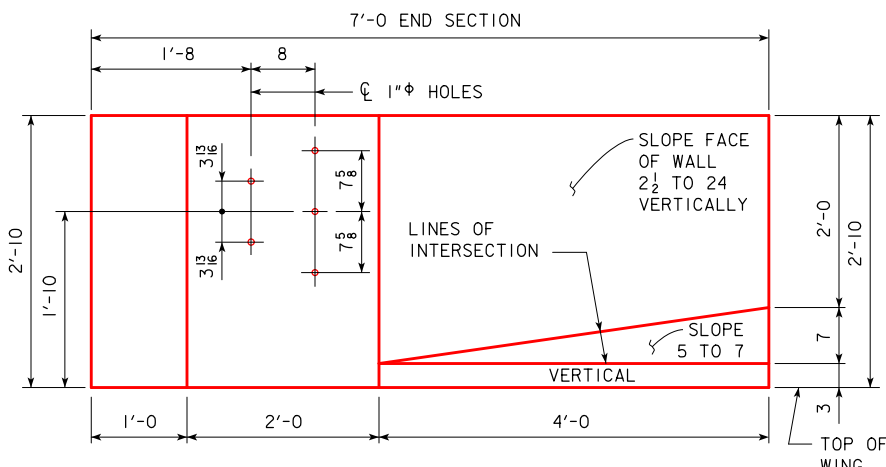
DESIGN FOR 30° SKEW (L.A.)  
**299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
86'-0 END SPANS 127'-0 INTERIOR SPAN  
**STEEL INTERM. DIAPH. DETAILS**  
STA. 664+20.50 (CL IA 175) AUGUST, 2021  
**MONONA COUNTY**  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 23 OF 30 FILE NO. 31872 DESIGN NO. 121



ENGLISHDECKRAILBRIDGES.DGN 1017S - THIS SHEET ISSUED 04-14 - ADDED STAINLESS STEEL REINFORCING BAR LIST AND CHANGED 6c3, 6c4 & 5c5-10 BARS TO STAINLESS STEEL.

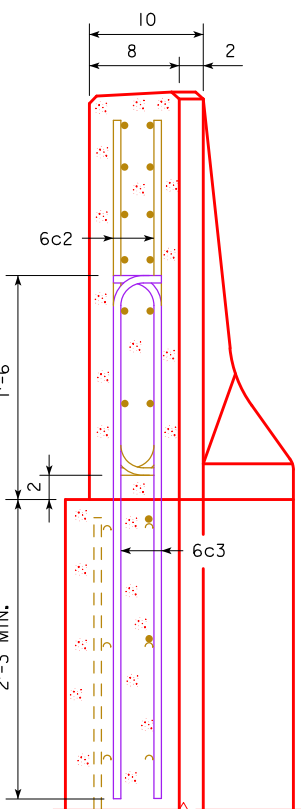


PART PLAN VIEW

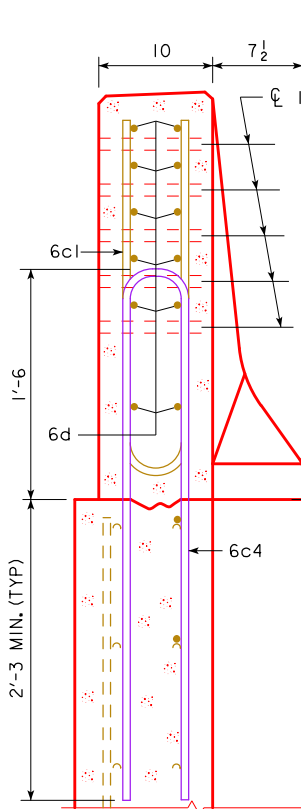


PART ELEVATION VIEW

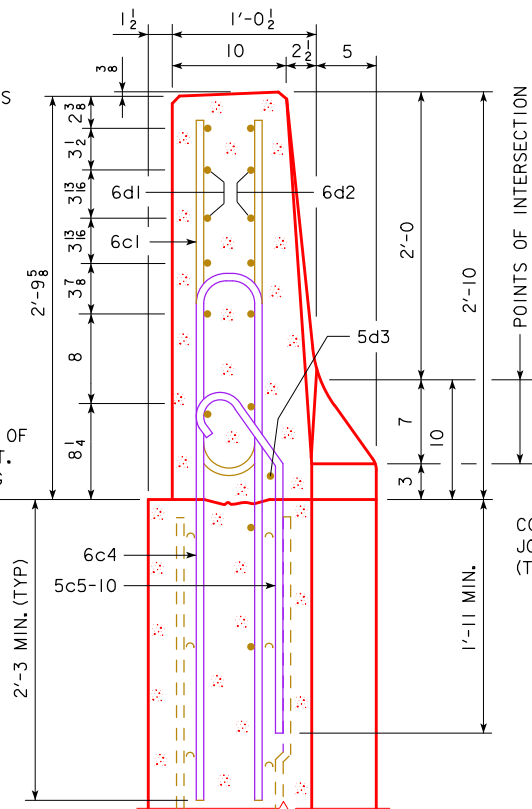
PROVIDE 5 HOLES FORMED WITH 1" PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



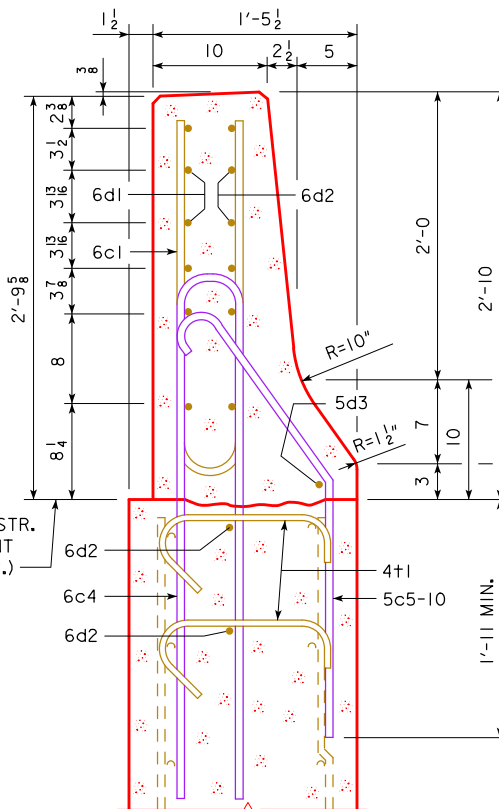
VIEW A-A



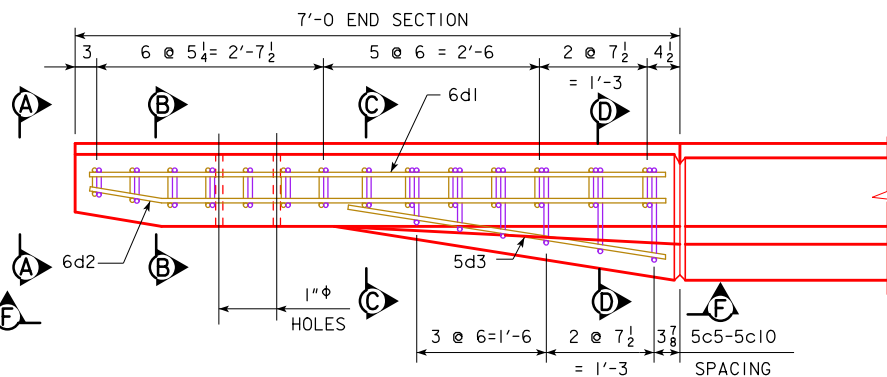
SECTION B-B



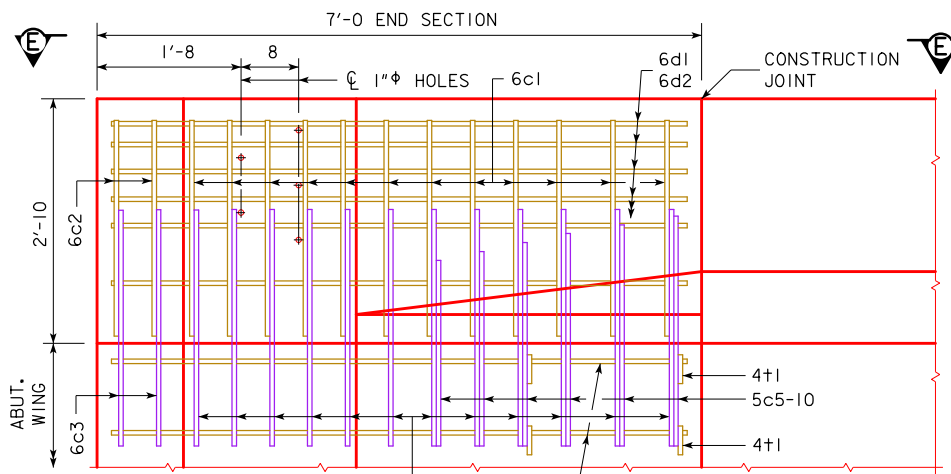
SECTION C-C



SECTION D-D



PART VIEW E-E



PART VIEW F-F

NOTE:  
4+1 PLACEMENT - 2 BARS EACH  
LEVEL OF 6d2 IN WING FOOTING.

NOTE:  
CONSTRUCTION JOINT BETWEEN  
TOP OF WING AND BARRIER  
RAIL IS ROUGHENED CONCRETE.

NOTE:  
THE 10" RADIUS AND 1 1/2" RADIUS  
ARE TYPICAL AND SHALL BE  
USED WHEN CONSTRUCTING THE  
CORNERS FOR VIEW A-A,  
SECTION B-B, SECTION C-C AND  
SECTION D-D.

NOTE:  
THE 6c4, 6c3, 5c5-10, 2 - 6d2 AND  
4+1 BARS ARE TO BE PLACED  
WITH THE ABUTMENT WING. THE  
DETAILS FOR PLACEMENT ARE  
SHOWN ON THE WING ABUTMENT  
SHEET.

NOTE:  
DASHED LINES BELOW THE TOP OF  
WING ARE THE ABUTMENT WING  
REINFORCING STEEL. SEE WING  
ABUTMENT SHEET FOR PLACEMENT.

## EPOXY COATED REINF. STEEL - ONE END SECT.

| BAR                              | LOCATION                     | SHAPE | NO. | LENGTH | WEIGHT |
|----------------------------------|------------------------------|-------|-----|--------|--------|
| 6c1                              | RAIL, VERTICAL               |       | 12  | 5'-6   | 99     |
| 6c2                              | RAIL, VERTICAL               |       | 4   | 2'-10  | 17     |
| 6d1                              | RAIL, HORIZONTAL             |       | 6   | 6'-8   | 60     |
| 6d2                              | RAIL, HORIZONTAL             |       | 8   | 6'-9   | 81     |
| 5d3                              | RAIL, HORIZONTAL             |       | 1   | 3'-9   | 4      |
| 4+1                              | RAIL, ABUTMENT WING TIE BARS |       | 4   | VARIES | 5      |
| EPOXY REINF. TOTAL WEIGHT (LBS.) |                              |       |     |        | 266    |

## STAINLESS STEEL REINF. STEEL - ONE END SECT.

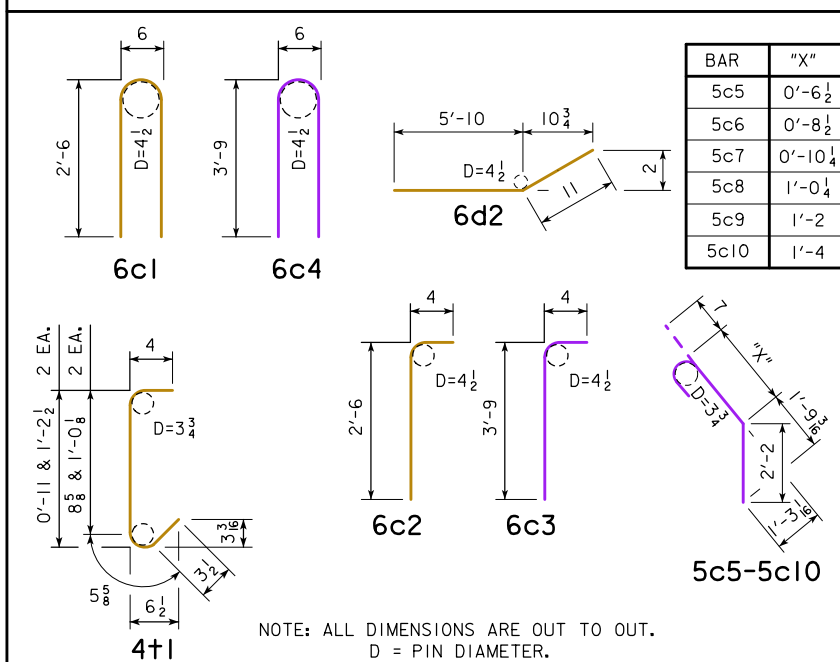
| BAR                                 | LOCATION       | SHAPE | NO. | LENGTH | WEIGHT |
|-------------------------------------|----------------|-------|-----|--------|--------|
| 6c3                                 | RAIL, VERTICAL |       | 4   | 4'-1   | 25     |
| 6c4                                 | RAIL, VERTICAL |       | 12  | 8'-0   | 144    |
| 5c5-10                              | RAIL, VERTICAL |       | 6   | VARIES | 23     |
| STAINLESS STEEL TOTAL WEIGHT (LBS.) |                |       |     |        | 192    |

NOTE: REINFORCING STEEL QUANTITIES ARE  
INCLUDED ON THE SUMMARY QUANTITIES SHEET.

## CONCRETE PLACEMENT SUMMARY

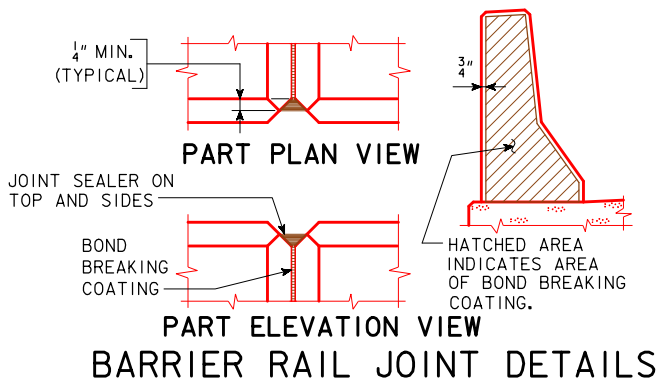
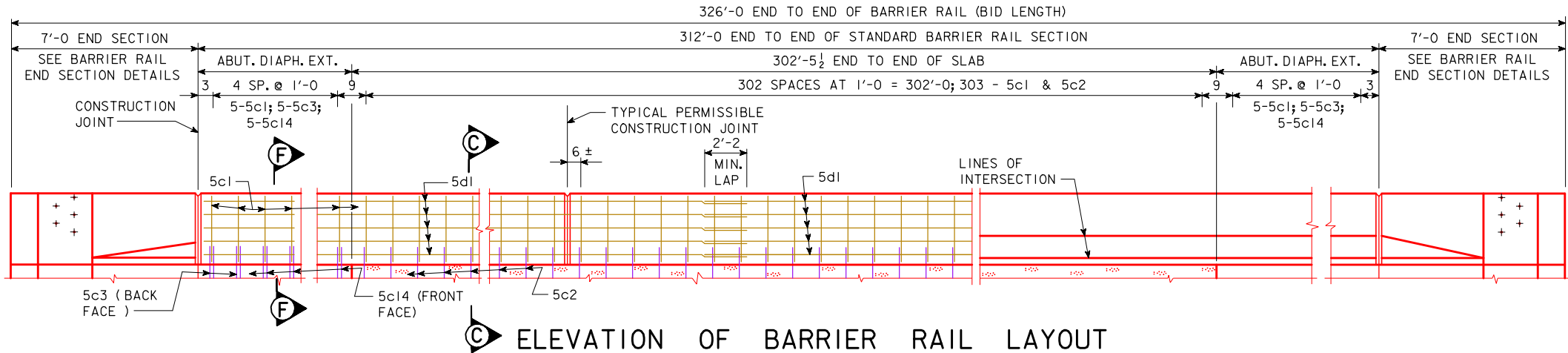
| SECTION                      | TOTAL        |
|------------------------------|--------------|
| BARRIER RAIL ONE END SECTION | 0.65 CU. YD. |

## BENT BAR DETAILS

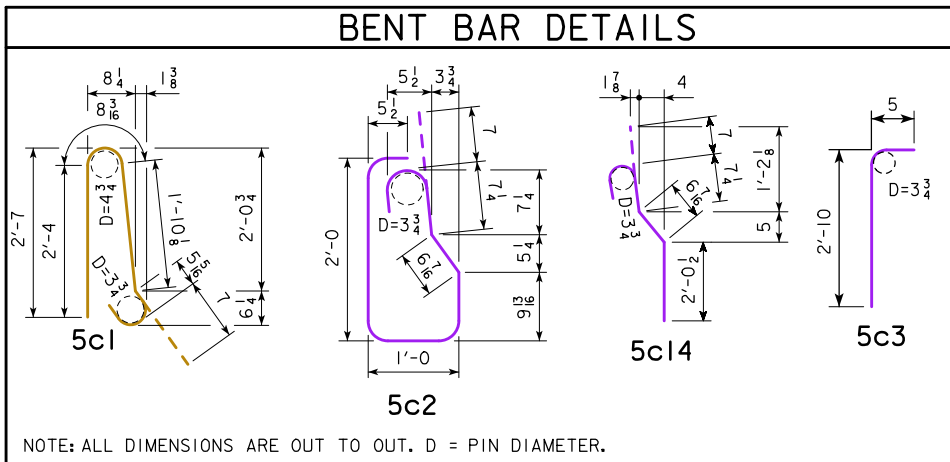


DESIGN FOR 30° SKEW (L.A.)  
**299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
86'-0 END SPANS 127'-0 INTERIOR SPAN  
**BARRIER RAIL END SECTION**  
STA. 664+20.50 (CL IA 175) AUGUST, 2021  
**MONONA COUNTY**  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 24 OF 30 FILE NO. 31872 DESIGN NO. 121

ENGLISHDECKRAILBRIDGES.DGN 1020SC - THIS SHEET ISSUED 04-14 - ADDED STAINLESS STEEL REINFORCING BAR LIST AND CHANGED 5c2, 5c3, 5c14 BARS TO STAINLESS STEEL..



NOTE: REINFORCING STEEL QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.



## BARRIER RAIL NOTES:

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

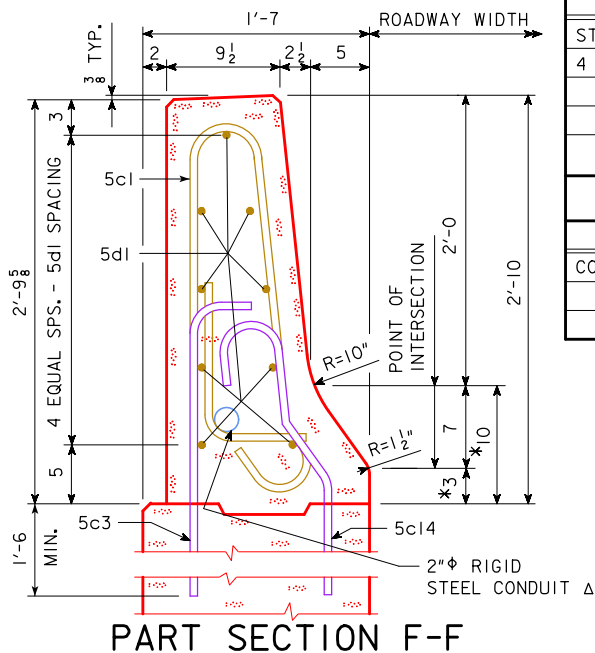
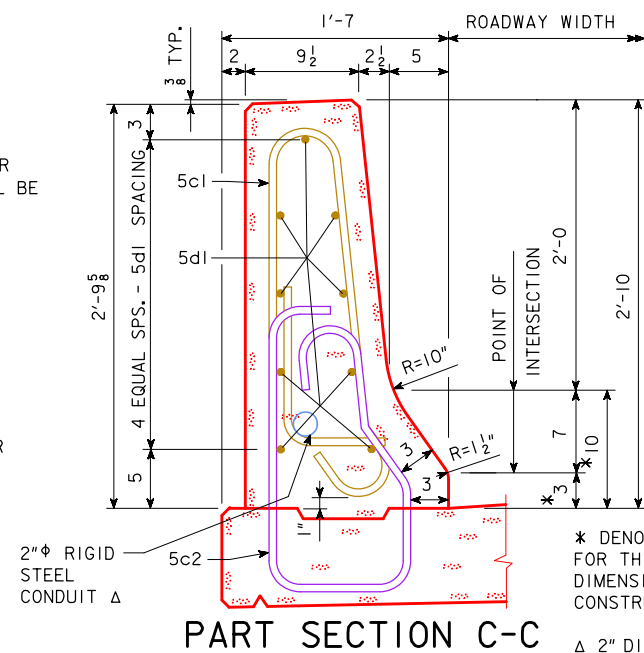
THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 20 FEET. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER. COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.

ALL BARRIER RAIL REINFORCING STEEL IS TO BE EITHER EPOXY COATED OR STAINLESS STEEL AS SHOWN. THE STAINLESS STEEL REINFORCING STEEL SHALL BE DEFORMED BAR GRADE 60 MEETING THE REQUIREMENTS OF MATERIALS I.M. 452.

THE CONCRETE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS. THE NUMBER OF LINEAL FEET OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES. PRICE BID FOR CONCRETE BARRIER RAILING SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS. IF CONDUIT IS REQUIRED IN THIS PLAN THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.

THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED. TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL C GRADE.

CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 2.84 SQUARE FEET.



## EPOXY COATED REINF. STEEL - TWO RAILS

| SECTION                  | BAR | LOCATION           | SHAPE | NO. | LENGTH | WEIGHT |
|--------------------------|-----|--------------------|-------|-----|--------|--------|
| STANDARD SECTIONS        | 5c1 | RAIL, VERTICAL     |       | 626 | 5'-11" | 3863   |
|                          | 5d1 | RAIL, LONGITUDINAL |       | 162 | 36'-7" | 6181   |
|                          |     |                    |       |     |        |        |
|                          |     |                    |       |     |        |        |
| EPOXY STEEL TOTAL (LBS.) |     |                    |       |     |        | 10,044 |

## STAINLESS STEEL REINF. STEEL - TWO RAILS

| SECTION                      | BAR  | LOCATION       | SHAPE | NO. | LENGTH | WEIGHT |
|------------------------------|------|----------------|-------|-----|--------|--------|
| STANDARD SECTIONS            | 5c2  | RAIL, VERTICAL |       | 606 | 6'-0"  | 3792   |
|                              | 5c3  | RAIL, VERTICAL |       | 20  | 3'-3"  | 68     |
|                              | 5c14 | RAIL, VERTICAL |       | 20  | 3'-10" | 80     |
|                              |      |                |       |     |        |        |
| STAINLESS STEEL TOTAL (LBS.) |      |                |       |     |        | 3940   |

## CONCRETE PLACEMENT SUMMARY

| SECTION   | TOTAL |
|---|-------|
| STANDARD SECTION      624'-0 @ 0.1052 CU. YD. PER FT. | 65.6  |
| 4 END SECTIONS  |       |

## CONCRETE BARRIER RAIL QUANTITIES

| ITEM                     | UNIT | QUANTITY |
|--------------------------|------|----------|
| CONCRETE BARRIER RAILING | L.F. | 652'-0"  |

DESIGN FOR 30° SKEW (L.A.)

**299'-0" X 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0" END SPANS 127'-0" INTERIOR SPAN

**BARRIER RAIL DETAILS**

STA. 664+20.50 (CL 1A 175) AUGUST, 2021

**MONONA COUNTY**

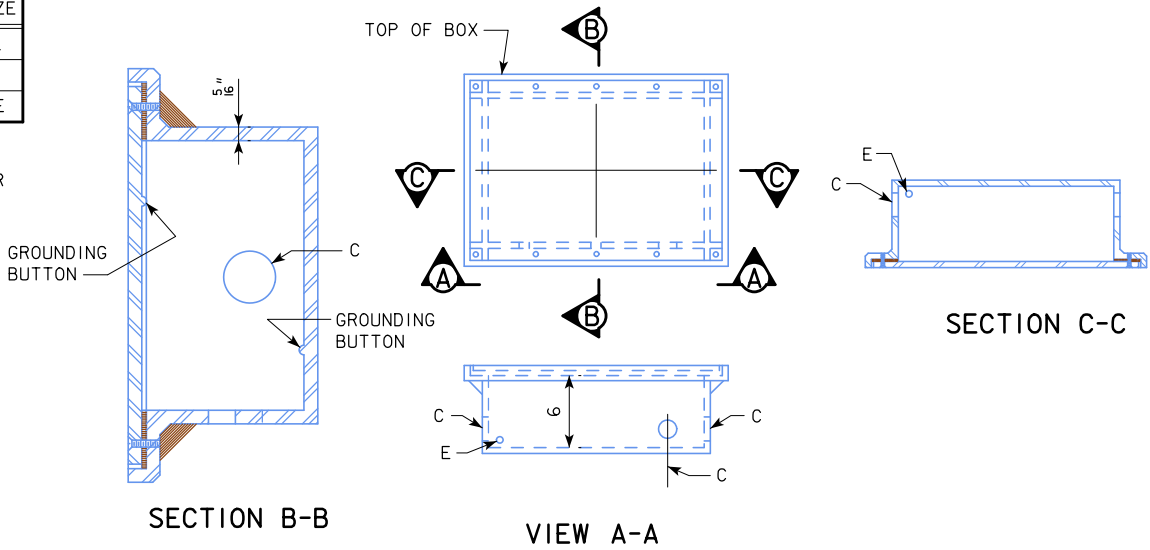
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

DESIGN SHEET NO. 25 OF 30 FILE NO. 31872 DESIGN NO. 121

REVISED 09-14 - ADD STAINLESS STEEL NOTE TO THE LIGHTING NOTES.  
REVISED 09-2016 - ADDED STANDARD SPECIFICATIONS 4185.02.B.2 IN LIGHTING NOTES. CHANGED BAR MARK FROM "x" to "p".  
ENGLISHDECKRAILBRIDGES.DGN 1030ASI - THIS SHEET REDRAWN 9-8-88

| BOSSSED FOR | HOLE | FOR CONDUIT SIZE  |
|-------------|------|-------------------|
| 5 THREADS   | C    | 2"ϕ RIGID STEEL   |
| NONE        | E    | 1/2"ϕ COPPER PIPE |

NOTE:  
THE GROUNDING BUTTONS ARE TO BE BLIND DRILLED AND TAPPED FOR 3/8"ϕ x 0'-0 3/4" BOLTS.



LI-104 JUNCTION BOX  
WATERTIGHT, CAST IRON - FLUSH MOUNT

**LIGHTING NOTES:**  
SEE LI-104 STANDARD ROAD PLAN FOR ADDITIONAL INFORMATION ON JUNCTION BOXES.  
CONSTRUCTION SHALL CONFORM TO THE CURRENT IOWA D.O.T. STANDARD AND SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.  
CONDUIT INSTALLATION SHALL BE IN ACCORDANCE WITH ARTICLE 2523.03, N, OF THE STANDARD SPECIFICATIONS.  
ALL "C" ENTRANCE HOLES IN JUNCTION BOXES SHALL BE DRILLED AND TAPPED FOR THE SPECIFIED CONDUIT SIZE. ALL OTHER HOLES SHALL HAVE A CONCRETE - TIGHT SLIP FIT. CONDUIT ENDS SHALL NOT PROTRUDE INTO JUNCTION BOX MORE THAN 1/4". DRAIN PIPE END SHALL BE FLUSH WITH INSIDE SURFACE OF BOX. GROUNDING BUTTONS SHALL BE LOCATED APPROXIMATELY 3" FROM THE INSIDE SURFACE OF THE BOX WALL, AND NOT CLOSER THAN 3" TO THE EDGE OF ANY HOLE IN THE BOX FLOOR. HOLES FOR DRAIN PIPE SHALL BE PLACED IN THE LOW CORNER OF THE BOX, WITH A MINIMUM CLEARANCE OF 1" BETWEEN THE EDGE OF THE HOLE AND THE INSIDE SURFACE OF THE BOX WALL. TYPICAL DETAILS ARE SHOWN ON THIS SHEET.  
THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.  
STAINLESS-STEEL REINFORCEMENT SHALL NOT BE ALLOWED TO BE IN CONTACT WITH THE UNCOATED REINFORCEMENT, BARE METAL FORMING HARDWARE, OR TO GALVANIZED ATTACHMENTS OR GALVANIZED CONDUIT.

DESIGN FOR 30° SKEW (L.A.)

299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE

86'-0 END SPANS127'-0 INTERIOR SPAN

CONDUIT DETAILS

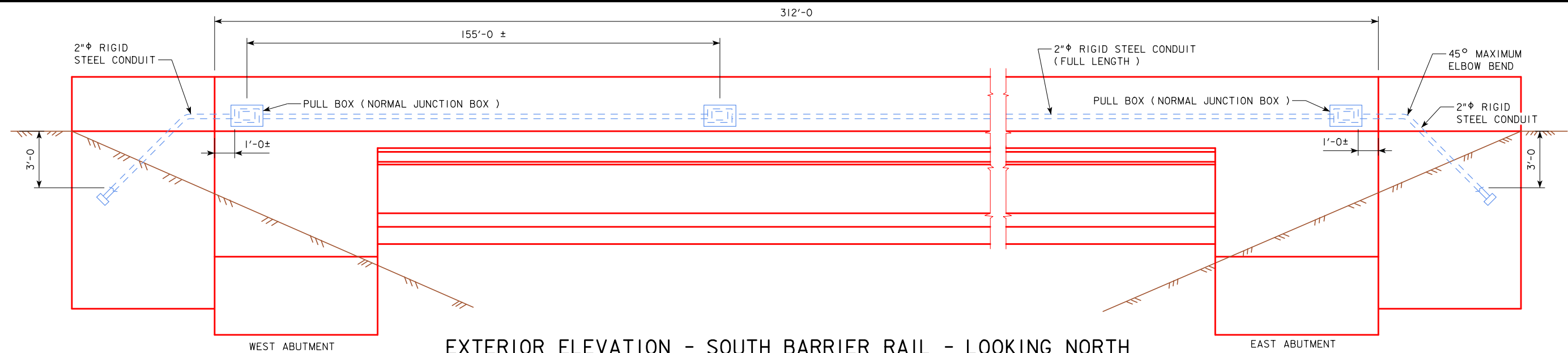
STA. 664+20.50 (C 1A 175)AUGUST, 2021

MONONA COUNTY

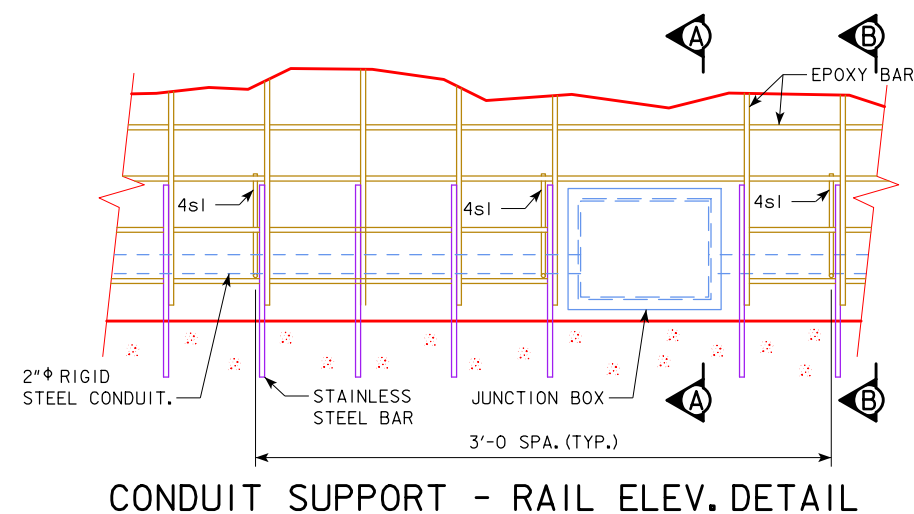
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION

DESIGN SHEET NO. 26 OF 30FILE NO. 31872DESIGN NO. 121

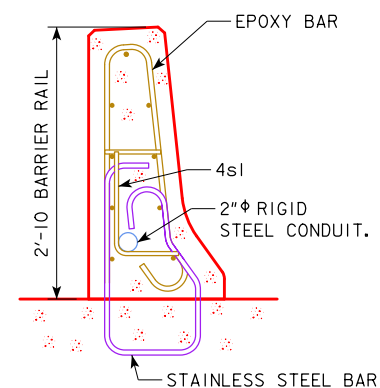
REVISION 05-11 - ADDED THE WORD 'MINIMUM' TO THE 3 1/2 INCH DIMENSION FOR THE LOCATION OF THE 2 INCH CONDUIT IN THE BARRIER RAIL.  
 REVISED 09-2016 - ADDED CONDUIT SUPPORT RAIL DETAIL TO KEEP CONDUIT ISOLATED FROM THE STAINLESS STEEL REINFORCING.  
 ENGLISHDECKRAILBRIDGES.DGN I030AS2 - THIS SHEET ISSUED 09-03.



EXTERIOR ELEVATION - SOUTH BARRIER RAIL - LOOKING NORTH



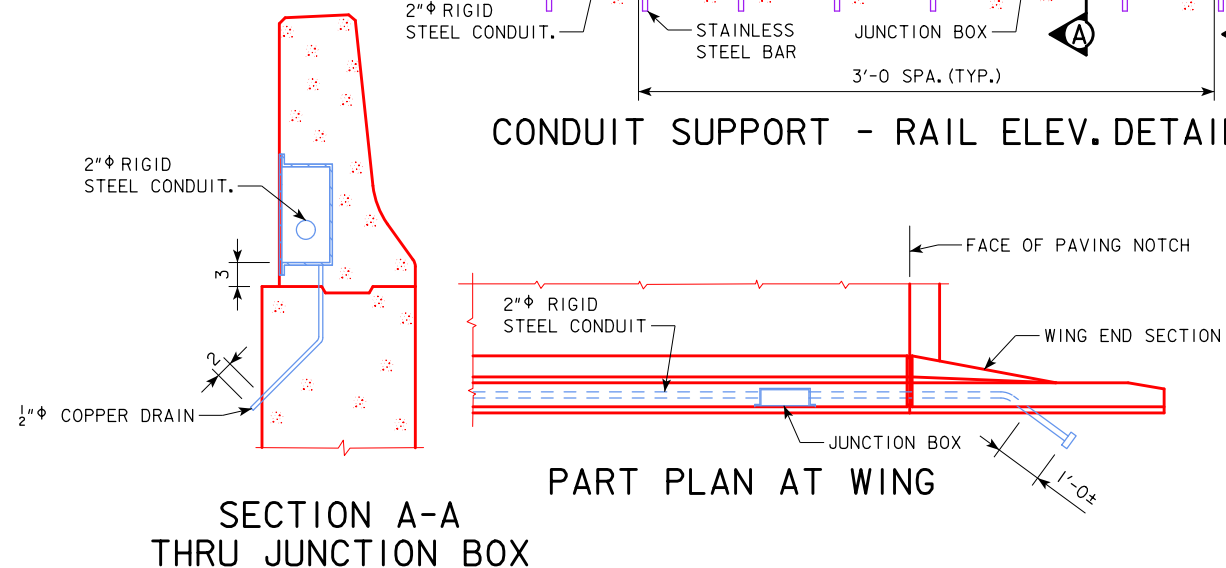
CONDUIT SUPPORT - RAIL ELEV. DETAIL



### SECTION B-B - CONDUIT SUPPORT

ONLY USED IN RAIL WITH CONDUIT, USE 3'-0" SPACING. GALVANIZED CONDUIT SHALL NOT COME INTO CONTACT WITH THE STAINLESS STEEL REINFORCING.

( 105 REQUIRED )




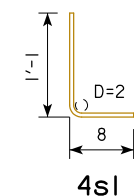
SECTION A-A  
THRU JUNCTION BOX

PART PLAN AT WING

NOTES:  
REINFORCING STEEL QUANTITIES ARE  
INCLUDED ON THE SUMMARY QUANTITIES SHEET.

FOR JUNCTION BOX DETAILS, SEE DESIGN SHEET 26.

| EPOXY REINFORCING STEEL-ONE RAIL |              |   |     |        |        |
|----------------------------------|--------------|---|-----|--------|--------|
| BAR                              | LOCATION     | SHAPE   | NO. | LENGTH | WEIGHT |
| 4sI                              | RAIL CONDUIT |  | 105 | 1'-9   | 123    |
| TOTAL WEIGHT (LBS.)              |              |   |     |        | 123    |



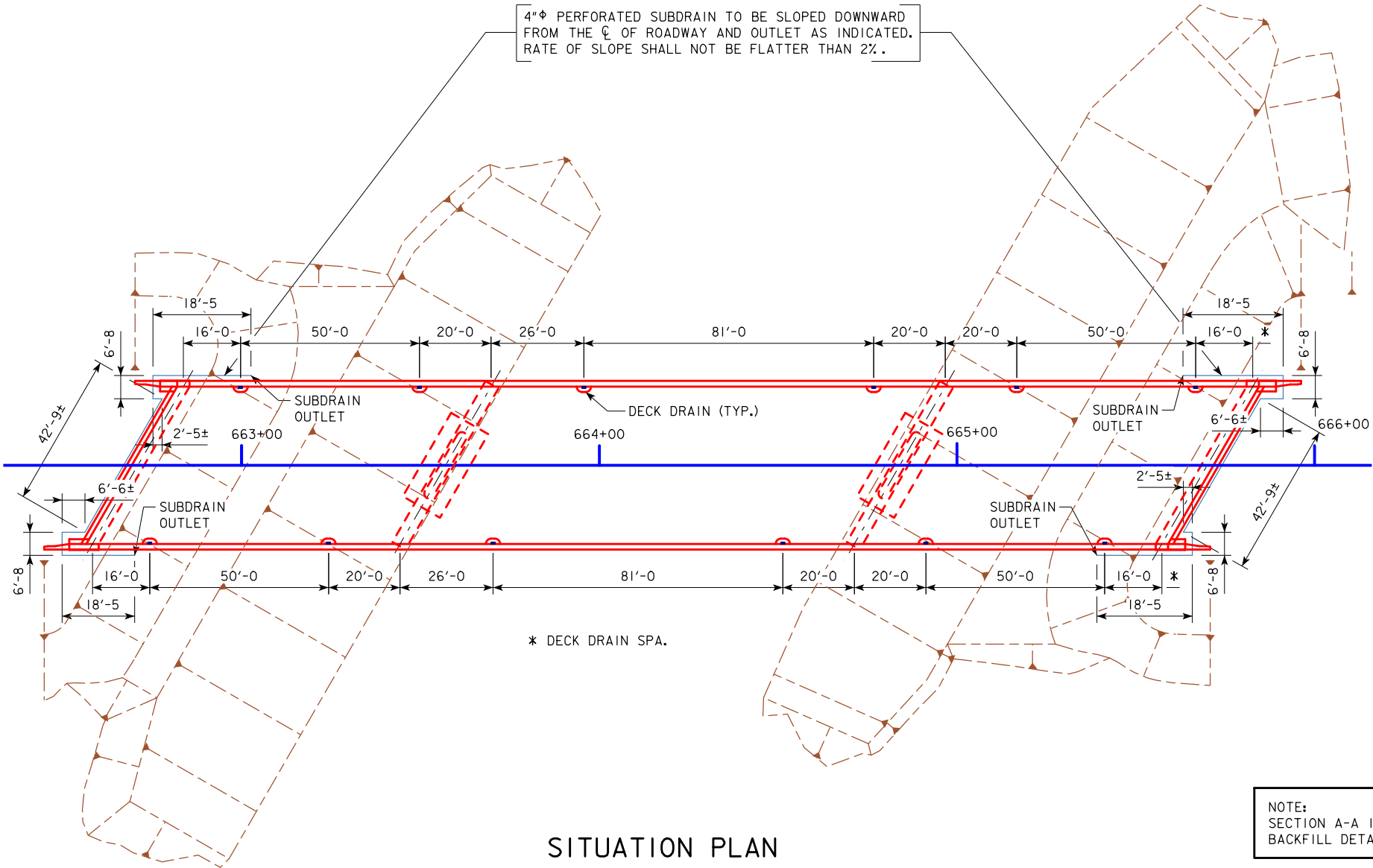
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

DESIGN FOR 30° SKEW (L.A.)  
299'-0" X 44'-0" PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE  
86'-0" END SPANS 127'-0" INTERIOR SPAN  
CONDUIT DETAILS  
STA. 664+20.50 (C 1A 175) AUGUST, 2021  
MONONA COUNTY  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 27 OF 30 FILE NO. 31872 DESIGN NO. 121



REVISED 10-14 - TWO ADDITIONAL FORESLOPE PROTECTION DETAILS WERE ADDED OUTSIDE OF THE BORDER TO SHOW REVETMENT UP TO BACK OF ABUTMENT FOOTING.  
ENGLISHFORESLOPEPROTECTIONBRIDGE.DGN 1007C - THIS SHEET ISSUED 06-02 FOR WATER CROSSINGS.

BENCH MARK: BM C 159, NGS DISK X=16,472,170.7 Y=7,288,517.7 IOWA RCS ZONE 6 (COUNCIL BLUFFS), SURVEY FEET ELEV. = 1097.92 NAVD88/IARTN (GEOID12B)



NOTE:  
SECTION A-A IS SHOWN ON ABUTMENT  
BACKFILL DETAILS SHEET.

SUBDRAIN NOTES :

THIS PLAN SHEET SHOWS DETAILS FOR PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.

THE SUBDRAINS SHALL BE 4" IN DIAMETER AND SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS.

THE SUBDRAIN OUTLET SHALL CONSIST OF A LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET. THE LENGTH OF THE OUTLET PIPE SHALL BE DETERMINED BY THE REVETMENT AND IT'S PLACEMENT LOCATION. THE CONTRACTOR IS TO INSURE THE OUTLET PIPE IS ADEQUATELY STRONG ENOUGH AND WILL NOT BE DAMAGED WHEN REVETMENT IS PLACED. A CHECK WILL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT THE SUBDRAIN IS NOT DAMAGED AND IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS. IF A METAL OUTLET PIPE IS USED, IT SHALL BE 6 INCHES IN DIAMETER AND COUPLED TO THE 4 INCH DIAMETER SUBDRAIN IN ONE OF THE TWO FOLLOWING WAYS.

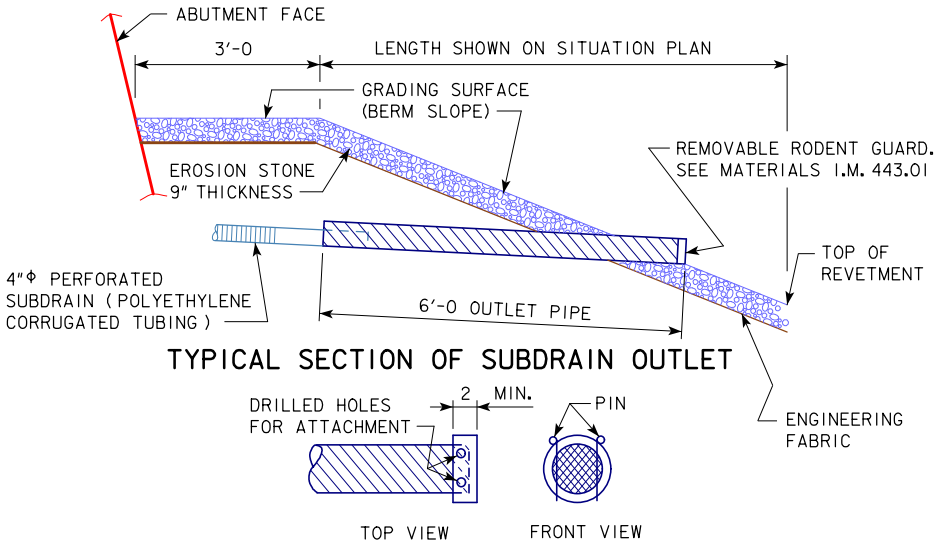
1. USE AN INSIDE FIT REDUCER COUPLER (COUPLER MUST BE INSERTED A MINIMUM OF 1'-0 INTO THE METAL OUTLET PIPE).
2. INSERT 1'-0 OF THE 4"  $\phi$  SUBDRAIN INTO THE 6"  $\phi$  METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.

THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE.

THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

SUBDRAIN OUTLET ELEVATIONS

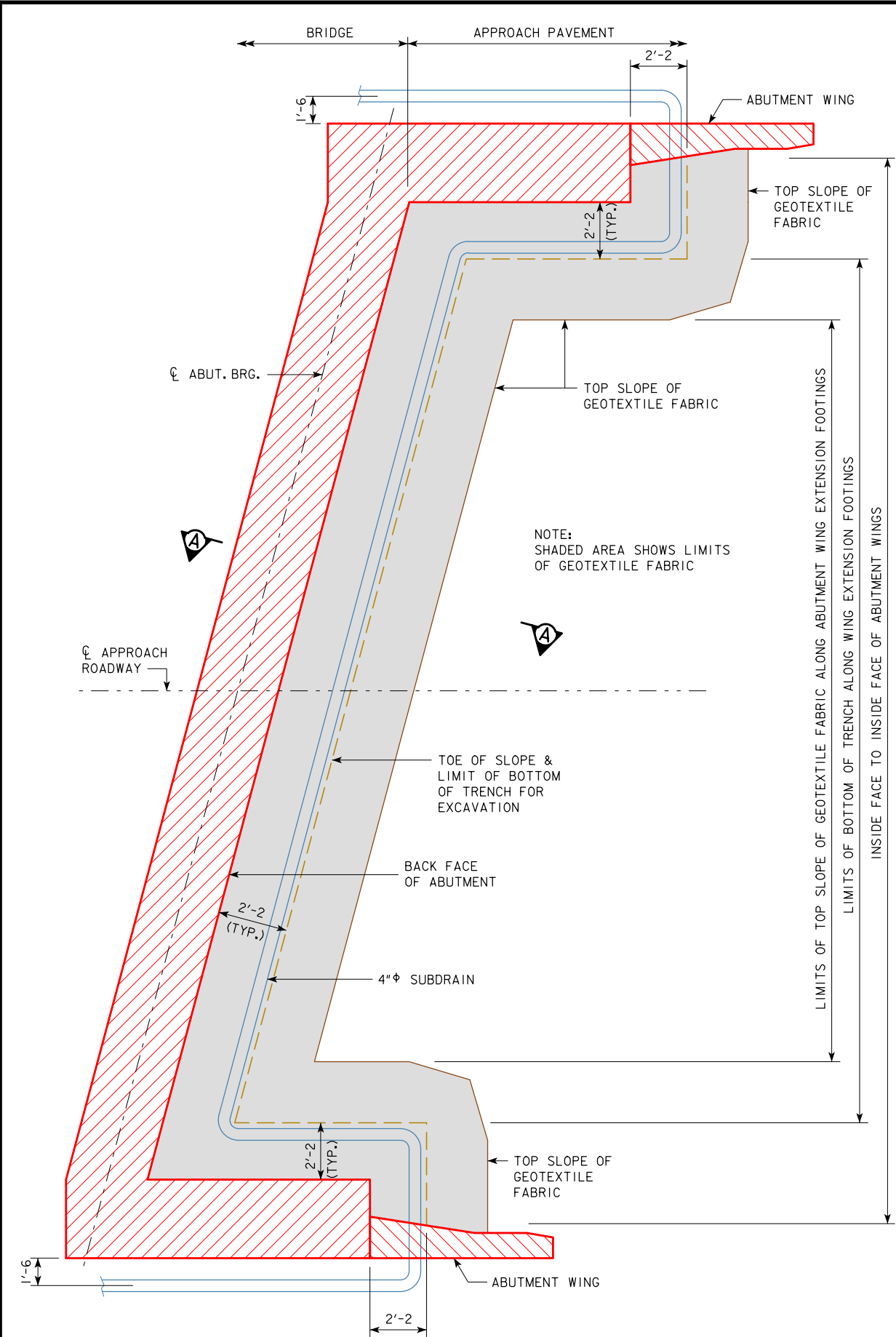
| LOCATION      | ELEVATION |
|---------------|-----------|
| WEST ABUTMENT | 1106.52   |
| EAST ABUTMENT | 1106.58   |



REMOVABLE RODENT GUARD DETAILS  
EROSION STONE (EMBEDDED) OUTLET DETAILS

DESIGN FOR 30° SKEW (L.A.)  
**299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
86'-0 END SPANS 127'-0 INTERIOR SPAN  
**SUBDRAIN DETAILS**  
STA. 664+20.50 (C/LA 175) AUGUST, 2021  
**MONONA COUNTY**  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 28 OF 30 FILE NO. 31872 DESIGN NO. 121

REVISED 09-14 - THE TECHNICAL DATA INFORMATION TABLE WAS REMOVED AND IS LOCATED IN THE STANDARD SPECIFICATIONS. CHANGED SURFACE FLOODING TIME TO 5 MINUTE INCREMENTS.  
REVISED 09-2016 - CHANGED THE BRIDGE APPROACH PAVEMENT STANDARD TO "BR" (WAS "RK").  
ENGLISHFORSLOPEPROTECTIONBRIDGES.DGN - 1007E - THIS SHEET ISSUED 08-07.



ABUTMENT PLAN WITH WING EXTENSIONS

ABUTMENT BACKFILL PROCESS:

THE BASE OF THE EXCAVATION SUBGRADE BEHIND THE ABUTMENT IS TO BE GRADED WITH A 4% SLOPE AWAY FROM THE ABUTMENT FOOTING AND A 2% CROSS SLOPE IN THE DIRECTION OF THE SUBDRAIN OUTLET. THIS EXCAVATION SHAPING IS TO BE DONE PRIOR TO BEGINNING INSTALLATION OF THE GEOTEXTILE AND BACKFILL MATERIAL.

AFTER THE SUBGRADE HAS BEEN SHAPED, THE GEOTEXTILE FABRIC SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAILS SHOWN. THE FABRIC IS INTENDED TO BE INSTALLED IN THE BASE OF THE EXCAVATION AND EXTENDED VERTICALLY UP THE ABUTMENT BACKWALL, ABUTMENT WING WALLS, AND EXCAVATION FACE TO A HEIGHT THAT WILL BE APPROXIMATELY 1 TO 2 FOOT HIGHER THAN THE HEIGHT OF THE POROUS BACKFILL PLACEMENT AS SHOWN IN THE "BACKFILL DETAILS" ON THIS SHEET. THE STRIPS OF THE FABRIC PLACED SHALL OVERLAP APPROXIMATELY 1 FOOT AND SHALL BE PINNED IN PLACE. THE FABRIC SHALL BE ATTACHED TO THE ABUTMENT BY USING LATH FOLDED IN THE FABRIC AND SECURED TO THE CONCRETE WITH SHALLOW CONCRETE NAILS. THE FABRIC PLACED AGAINST THE EXCAVATION FACE SHALL BE PINNED.

WHEN THE FABRIC IS IN PLACE, THE SUBDRAIN SHALL BE INSTALLED DIRECTLY ON THE FABRIC AT THE TOE OF THE REAR EXCAVATION SLOPE. A SLOT WILL NEED TO BE CUT IN THE FABRIC AT THE POINT WHERE THE SUBDRAIN EXITS THE FABRIC NEAR THE END OF THE ABUTMENT WING WALL.

POROUS BACKFILL IS THEN PLACED AND LEVELED, NO COMPACTION IS REQUIRED.

THE REMAINING WORK INVOLVES BACKFILLING WITH FLOODABLE BACKFILL, SURFACE FLOODING, AND VIBRATORY COMPACTION. THE FLOODABLE BACKFILL MATERIAL SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FLOODABLE BACKFILL SHALL BE PLACED IN INDIVIDUAL LIFTS, SURFACE FLOODED, AND COMPACTED WITH VIBRATORY COMPACTION TO ENSURE FULL CONSOLIDATION. LIMIT THE LOOSE LIFTS TO NO MORE THAN 2 FEET OF THICKNESS.

START SURFACE FLOODING FOR EACH FLOODABLE BACKFILL LIFT AT THE HIGH POINT OF THE SUBDRAIN AND PROGRESS TO THE LOW POINT WHERE THE SUBDRAIN EXITS THE FABRIC. TO ENSURE UNIFORM SURFACE FLOODING, WATER RUNNING FULL IN A 2-INCH DIAMETER HOSE SHOULD BE SPRAYED IN SUCCESSIVE 6-FOOT TO 8-FOOT INCREMENTS FOR 5 MINUTES WITHIN EACH INCREMENT.

FLOODABLE BACKFILL LIFT PLACEMENT, FLOODING, AND COMPACTION SHALL PROGRESS UNTIL THE REQUIRED FULL THICKNESS OF THE ABUTMENT BACKFILL HAS BEEN COMPLETED.

WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

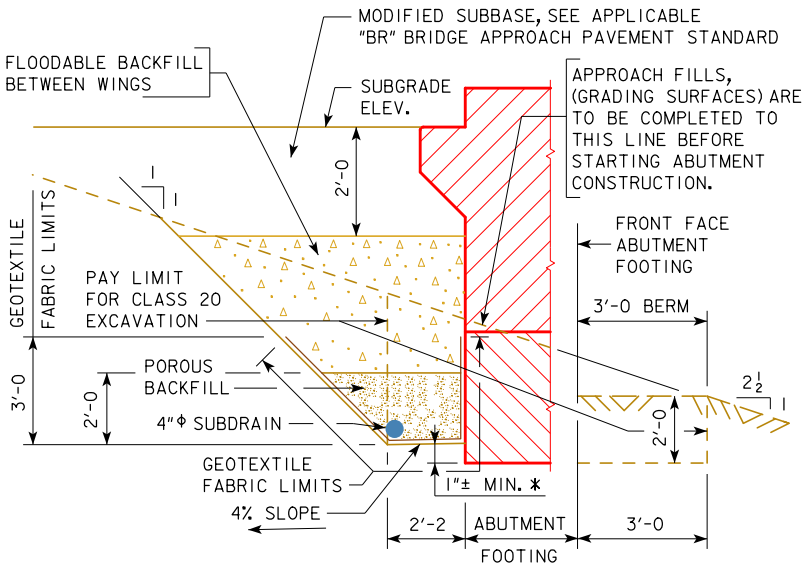
THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR STRUCTURAL CONCRETE.

NOTE:

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM CL APPROACH ROADWAY WHEN OUTLETTING BOTH SIDES OF THE ABUTMENT.

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM HIGH END WHEN OUTLETTING AT ONE END OF THE ABUTMENT.

THE GEOTEXTILE FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 6 OF THE STANDARD SPECIFICATIONS. IF THE ENGINEERING FABRIC IS LAPPED THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.



SECTION A-A  
BACKFILL DETAILS

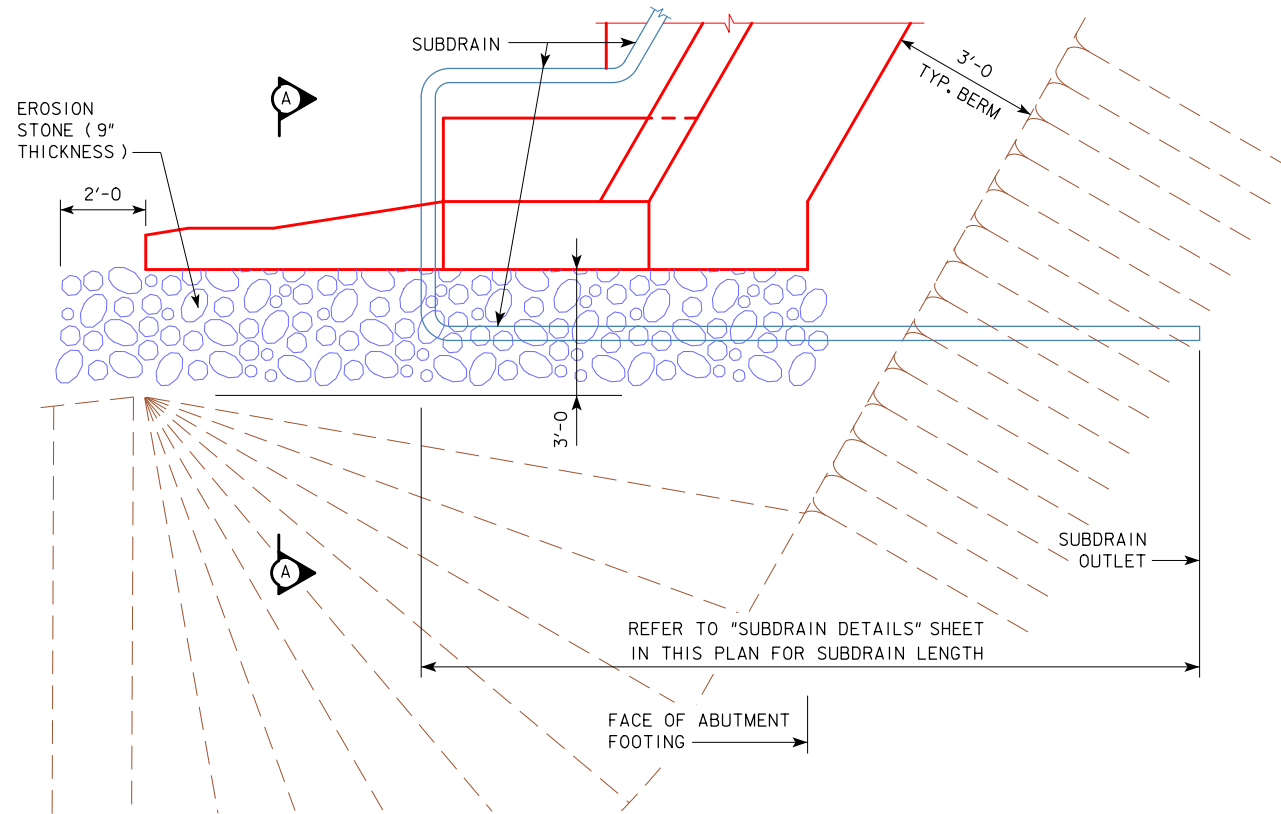
NOTE: GEOTEXTILE FABRIC WILL BE ATTACHED TO FACE OF ABUTMENT FOOTING AND WINGS.

\* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

NOTE:  
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT SHOWN ON THIS SHEET WHICH ARE PERTINENT TO THIS STRUCTURE.

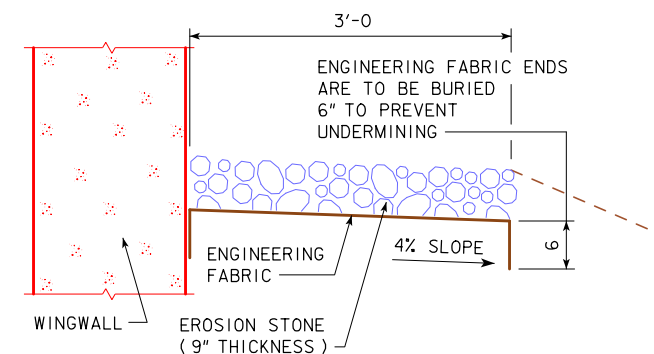
DESIGN FOR 30° SKEW (L.A.)  
**299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**  
86'-0 END SPANS 127'-0 INTERIOR SPAN  
**ABUTMENT BACKFILL DETAILS**  
STA. 664+20.50 (CL IA 175) AUGUST, 2021  
**MONONA COUNTY**  
IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION  
DESIGN SHEET NO. 29 OF 30 FILE NO. 31872 DESIGN NO. 121

REVISED 06-14 - ADDED 2 FEET OF LENGTH OF EROSION STONE IN FRONT OF THE BRIDGE WING.  
ENGLISHFORSLOPEPROTECTIONBRIDGES.DGN 1005A - THIS SHEET ISSUED 06-02.



TOP VIEW OF WING ARMORING WITH WING EXTENSION

A CHECK SHALL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT IT IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS.



SECTION A-A

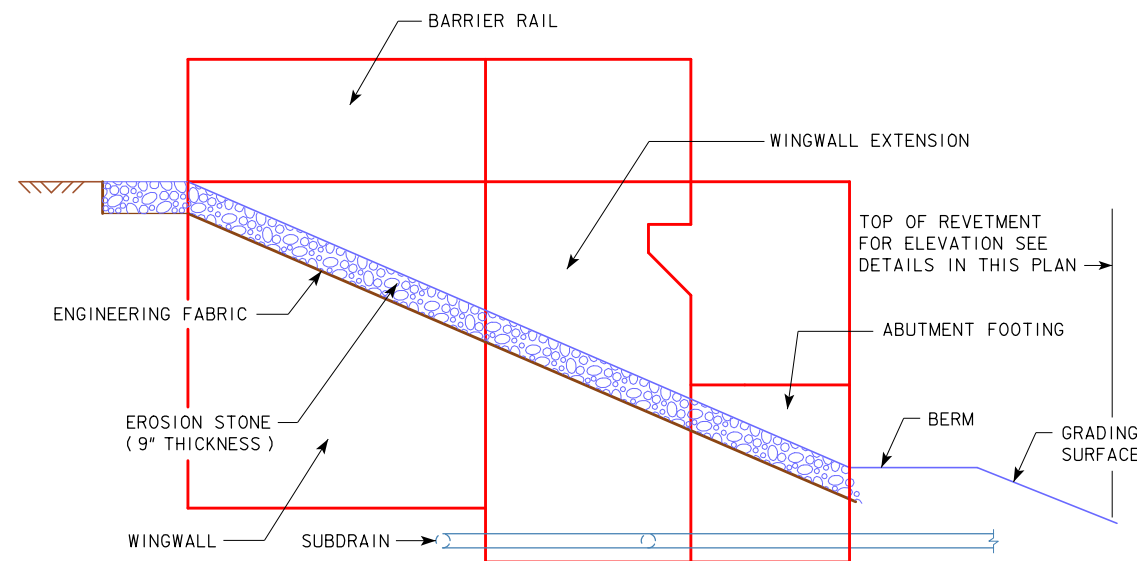
### GENERAL NOTES:

EROSION STONE SHALL BE PLACED ALONG THE SIDES OF THE WINGS AND ABUTMENT FOOTING AS SHOWN IN SECTION A-A. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE EROSION STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS.

THE EROSION STONE SHALL BE IN ACCORDANCE WITH SECTION 4130, OF THE STANDARD SPECIFICATIONS. MATERIAL PASSING THE 3 INCH SCREEN BUT 100% RETAINED ON A 1 INCH SCREEN MAY BE USED AS CHOKER STONE.

THE EROSION STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM 9" DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

PAYMENT FOR THE BRIDGE WING ARMORING WILL BE BID PER SQUARE YARD. COST WILL INCLUDE ENGINEERING FABRIC, EROSION STONE, EXCAVATION, SHAPING, AND COMPACTION TO DIMENSIONS SHOWN IN THESE PLANS. BID ITEM SHALL BE "BRIDGE WING ARMORING - EROSION STONE".

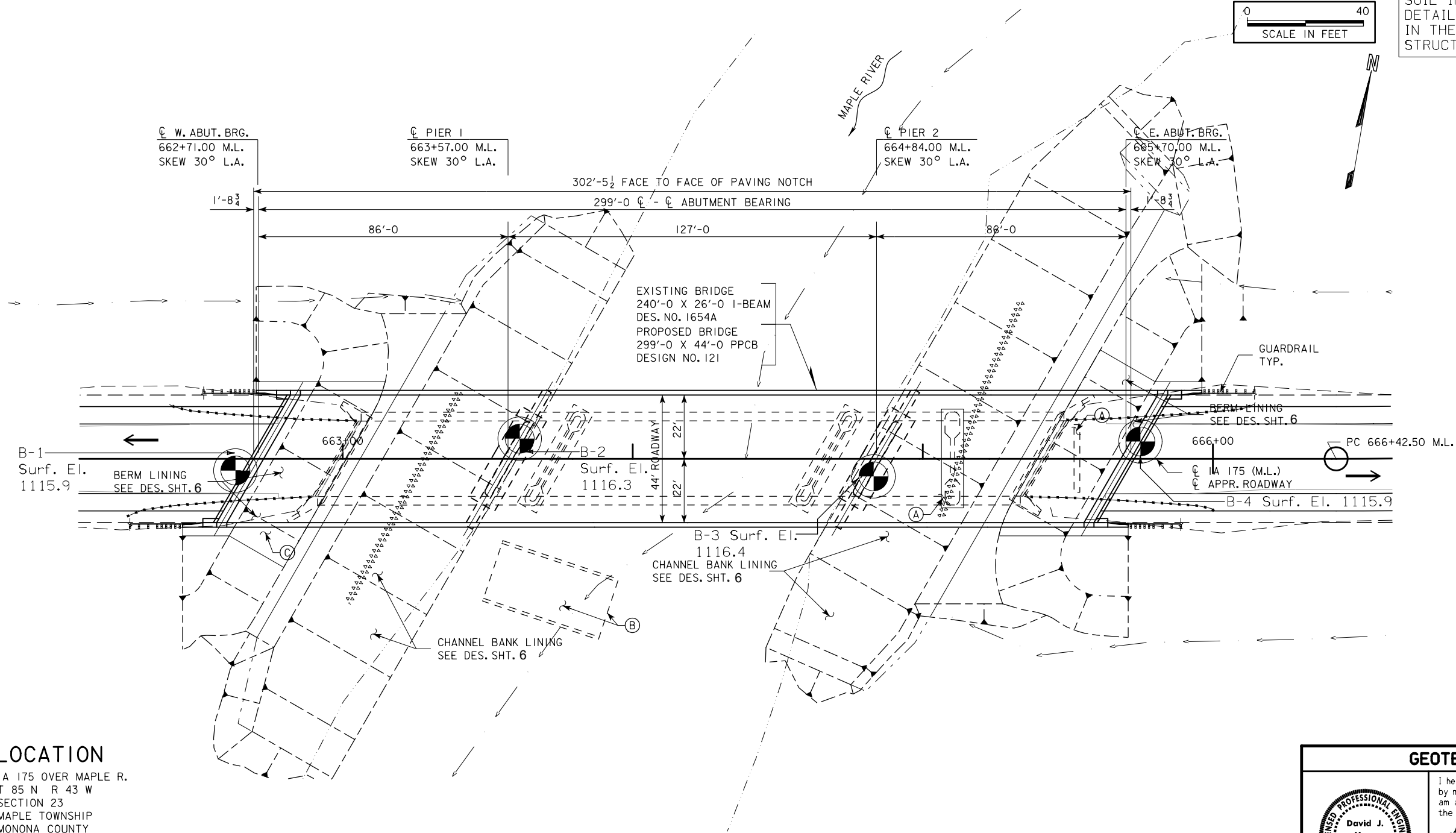


PROFILE VIEW OF WING ARMORING WITH WING EXTENSION

(INTEGRAL ABUTMENT WITH WING EXTENSIONS)

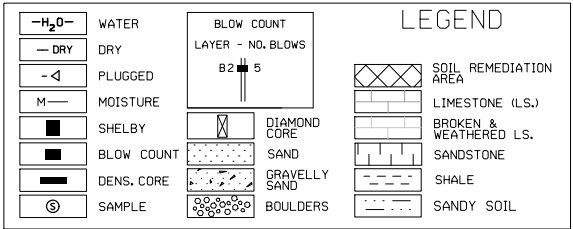
|  |                      |
|--|----------------------|
| DESIGN FOR 30° SKEW (L.A.)                     |                      |
| 299'-0 X 44'-0 PRETENSIONED                    |                      |
| PRESTRESSED CONCRETE BEAM BRIDGE               |                      |
| 86'-0 END SPANS                                | 127'-0 INTERIOR SPAN |
| BRIDGE WING ARMORING                           |                      |
| STA. 664+20.50 (CL 1A 175)                     | AUGUST, 2021         |
| MONONA COUNTY                                  |                      |
| IOWA DOT - TRANSPORTATION DEVELOPMENT DIVISION |                      |
| DESIGN SHEET NO. 30 OF 30                      | FILE NO. 31872       |
| DESIGN NO. 121                                 |                      |

THIS SHEET IS INCLUDED TO SHOW  
SOIL INFORMATION.  
DETAILS AND NOTES SHOWN ELSEWHERE  
IN THESE PLANS SHALL BE USED FOR  
STRUCTURE CONSTRUCTION.



LOCATION

IA 175 OVER MAPLE R.  
T 85 N R 43 W  
SECTION 23  
MAPLE TOWNSHIP  
MONONA COUNTY  
BRIDGE MAINT. NO. 6727.6S175  
FHWA NO. 037081  
STA. 664+20.50 C M.L.  
LATITUDE 42.156900°  
LONGITUDE -95.809745°



| Water Level Observations (Ft.) |              |                |                            |                |
|--------------------------------|--------------|----------------|----------------------------|----------------|
| Boring No.                     | Date Drilled | While Drilling | Immediately after Drilling | After Drilling |
| B-1                            | 07/07/2020   | 28.4           | NOT PERFORMED              | 20.7 @ 24 Hrs. |
| B-2                            | 07/24/2020   | NOT PERFORMED  | NOT PERFORMED              | NOT PERFORMED  |
| B-3                            | 07/24/2020   | NOT PERFORMED  | NOT PERFORMED              | NOT PERFORMED  |
| B-4                            | 07/21/2020   | 27.5           | 29.9 @ 0 Hrs.              | 28.7 @ 24 Hrs. |

**GEOTECHNICAL DESIGN**

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

*David J. Heer* 02-23-2021  
Signature Date  
David J. Heer  
Printed or Typed Name  
My license renewal date is December 31, 2022.

Pages or sheets covered by this seal: SPS.1 and SPS.2

DAVID J. HEER  
12100  
IOWA

DESIGN FOR 30° SKEW (L.A.)

**299'-0 X 44'-0 PRETENSIONED  
PRESTRESSED CONCRETE BEAM BRIDGE**

86'-0 END SPANS      127'-0 INT. SPANS

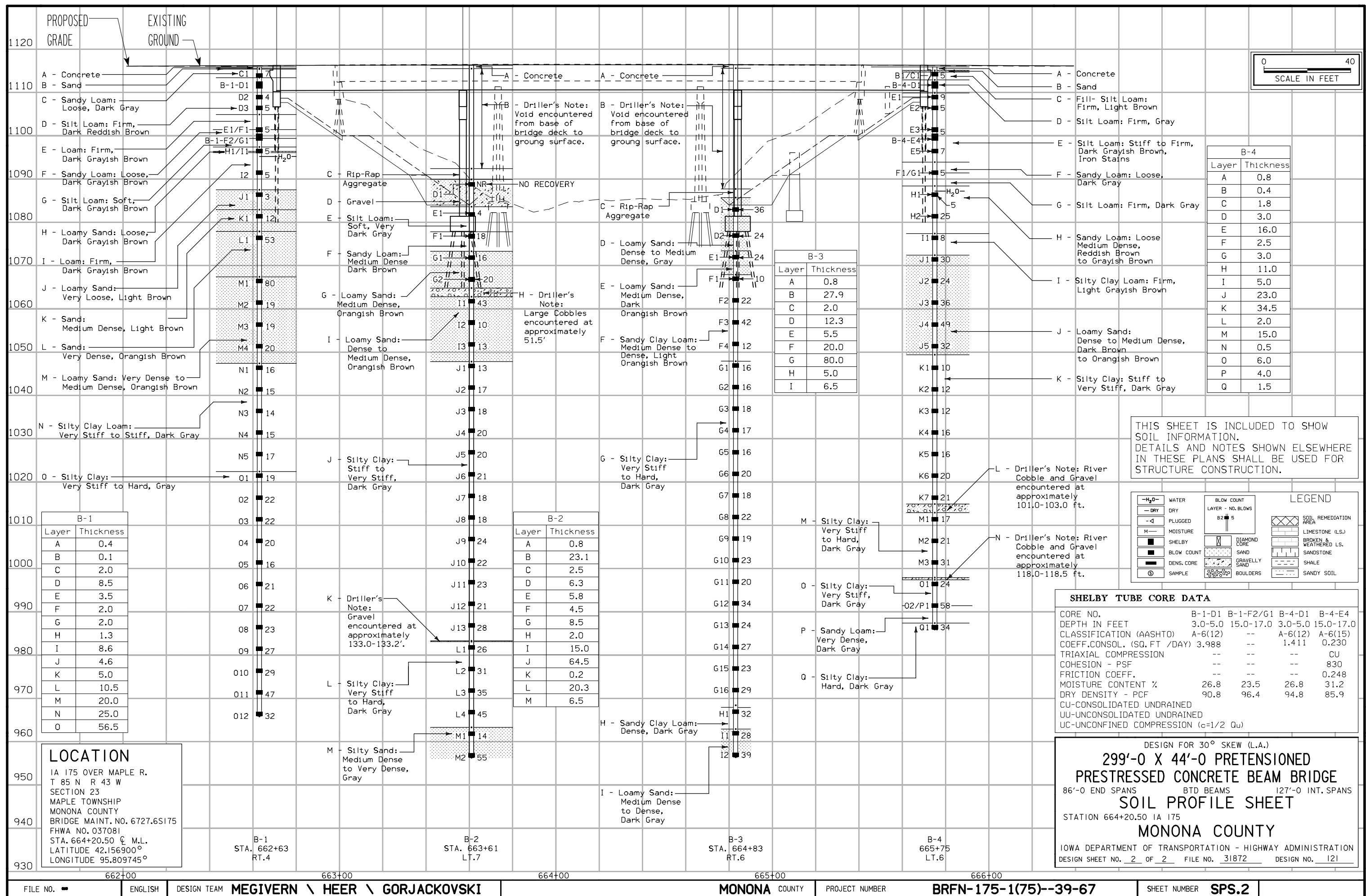
**SITUATION PLAN**

STATION 664+20.50 IA 175

**MONONA COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
DESIGN SHEET NO. 1 OF 2 FILE NO. 31872 DESIGN NO. 121





ESTIMATED PROJECT QUANTITIES AND REFERENCE NOTES

Division 1: Roadway Items

| Item no. | Item Code    | Item   | Unit | Quantities | Estimate Reference Notes  |
|----------|--------------|--|------|------------|---|
|          |              |  |      | Estimated  |   |
|          |              |  |      | Division 1 |   |
| 1        | 2101-0850001 | CLEARING AND GRUBBING  | ACRE | 1.9        | Quantity includes all disturbed areas.  |
| 2        | 2102-0425070 | SPECIAL BACKFILL   | TON  | 137        | See Tab. 112-9 in the C Sheets for locations and details.   |
| 3        | 2102-2710070 | EXCAVATION, CLASS 10, ROADWAY AND BORROW   | CY   | 5,014      | See Tab. 107-28 in the T Sheets for locations and details.<br><br>Overhaul is incidental to roadway excavation and will not be paid for separately. |
| 4        | 2102-2710090 | EXCAVATION, CLASS 10, WASTE  | CY   | 2,026      | See Tab. 107-28 in the T Sheets for locations and details.  |
| 5        | 2102-2712015 | EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS   | CY   | 5          | See Tab. 103-7 in the CS Sheets.  |
| 6        | 2105-8425015 | TOPSOIL, STRIP, SALVAGE AND SPREAD   | CY   | 2,365      | See Tab 107-28 in the T Sheets and Tab 103-10 in the CS Sheets for locations and details.   |
| 7        | 2115-0100000 | MODIFIED SUBBASE   | CY   | 83.7       | See Tab. 100-24 in the C Sheets for locations and details.  |
| 8        | 2121-7425010 | GRANULAR SHOULDERS, TYPE A   | TON  | 114.7      | See Tab. 112-9 in the C Sheets for locations and details.   |
| 9        | 2122-5190008 | PAVED SHOULDER, P.C. CONCRETE, 8 IN.   | SY   | 400.4      | See Tab. 112-9 in the C Sheets for locations and details.   |
| 10       | 2123-7450000 | SHOULDER CONSTRUCTION, EARTH   | STA  | 7.6        |   |
| 11       | 2301-0690203 | BRIDGE APPROACH, BR-203  | SY   | 771.6      | See Tab. 112-6 in the C Sheets for locations and details.   |
| 12       | 2301-1033095 | STANDARD OR SLIP FORM PORTLAND CEMENT CONCRETE PAVEMENT, CLA SS C, CLASS 3 DURABILITY, 9.5 IN. | SY   | 200.8      | See Tab. 100-24 in the C Sheets for locations and details.  |
| 13       | 2412-0000100 | LONGITUDINAL GROOVING IN CONCRETE  | SY   | 2,115.8    | See Tab. 100-28 in the C Sheets for locations and details.  |
| 14       | 2502-8212034 | SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.  | LF   | 145        | See Tab. 104-9 in the CS Sheets for locations and details.  |
| 15       | 2502-8221306 | SUBDRAIN OUTLET, DR-306  | EACH | 2          |   |
| 16       | 2503-0500402 | BRIDGE END DRAIN, DR-402   | EACH | 4          | See Tab. 104-8A in the C Sheets for locations and details.  |
| 17       | 2505-4008120 | REMOVAL OF STEEL BEAM GUARDRAIL  | LF   | 260        | See Tab. 110-7A in the C Sheets for locations and details.  |
| 18       | 2505-4008300 | STEEL BEAM GUARDRAIL   | LF   | 125        | See Tab. 108-8A in the C Sheets for locations and details.  |
| 19       | 2505-4008410 | STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201  | EACH | 4          |   |
| 20       | 2505-4021010 | STEEL BEAM GUARDRAIL END ANCHOR, BOLTED  | EACH | 4          |   |
| 21       | 2505-4021720 | STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205  | EACH | 4          |   |
| 22       | 2510-6745850 | REMOVAL OF PAVEMENT  | SY   | 701.8      | See Tab. 110-1 and Tab 102-5 in the C Sheets for locations and details.   |
| 23       | 2527-9263109 | PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED  | STA  | 2,071.96   | See Tab. 108-22 in the C Sheets for locations and details.  |
| 24       | 2528-2518000 | SAFETY CLOSURE   | EACH | 4          | See Tab. 108-13A in the C Sheets for locations and details.   |

| Item no. | Item Code    | Item                                 | Unit | Quantities | Estimate Reference Notes  |
|----------|--------------|--------------------------------------|------|------------|---|
|          |              |                                      |      | Estimated  |   |
|          |              |                                      |      | Division 1 |   |
| 25       | 2528-8445110 | TRAFFIC CONTROL                      | LS   | 1          |   |
| 26       | 2528-9290050 | PORTABLE DYNAMIC MESSAGE SIGN (PDMS) | CDAY | 0          | See Proposal<br><br>2-PDMS units to be placed at the beginning of the closure/detour (Mapleton westbound IA175/IA141 and Castana eastbound IA175) a week in advance of the closure with the message "IA175 Closed Starting (Add Date)." |





[illegible]

Refer to Standard Road Plan DR-401 and DR-402

[illegible][illegible]

Refer to Section 2518 of the Standard Specifications

[illegible]