NEW BRIDGE - PPCB LETTING DATE 12-21-2021

IM-080-7(152)251--13-52

JOHNSON COUNTY

JOHNSON COUNTY - DESIGN 1120

## LEGEND

- INTERSTATE HIGHWAY
- PRIMARY HIGHWAY-DIVIDED
- PRIMARY HIGHWAY
- PORTLAND CEMENT CONCRETE ROAD
- ASPHALT ROAD
- BITUMINOUS ROAD
- GRAVEL ROAD
- EARTHEN ROAD
- INTERSTATE HIGHWAY (80)
- UNITED STATES HIGHWAY (65)
- STATE HIGHWAY (175)
- COUNTY HIGHWAY (S27)
- RAILROAD
- PIPELINE
- AIRPORT
- HYDROLOGY
- BRIDGE
- STATE BOUNDARY
- COUNTY BOUNDARY
- CORPORATE BOUNDARY
- TOWNSHIP LINE
- SECTION LINE
- ROAD NAMES (ABBEY ROAD)
- UNINCORPORATED PLACE (ELWOOD)

IOWA DOT

Highway Administration

PLANS OF PROPOSED IMPROVEMENTS ON THE

# INTERSTATE ROAD SYSTEM

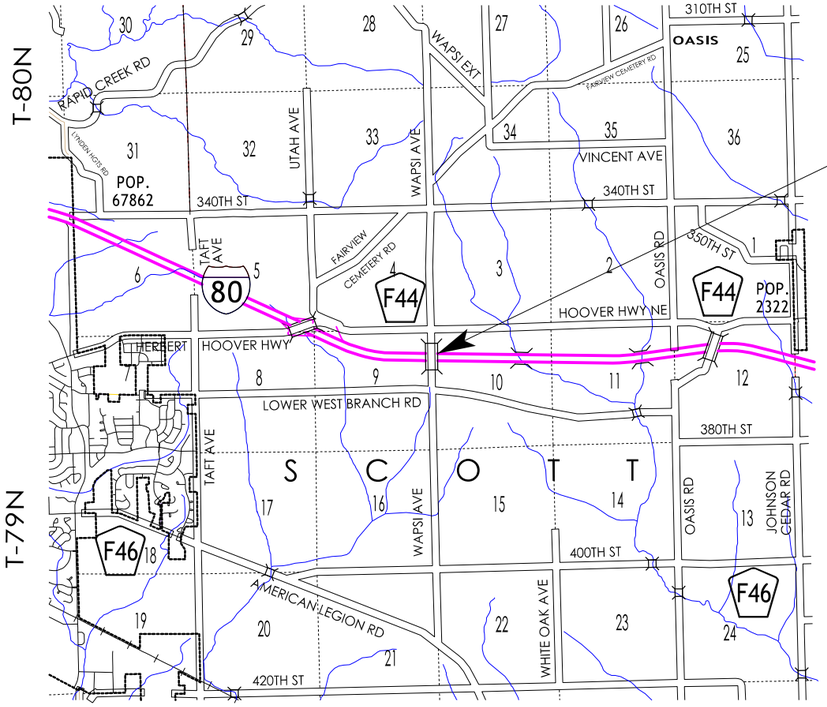
## JOHNSON COUNTY

NEW BRIDGE - PPCB

*WAPSI AVENUE OVER I-80*

*1.2 MI. E. OF JCT. SR F44*

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.




LOCATION MAP

DESIGN 1120
FHWA 32171

PROJECT DIRECTORY NAME: 5208002016

## ENGLISH STANDARD BRIDGE PLANS

| STANDARD | ISSUED | REVISED |
|---|---|---|
| | | |

REVISIONS

| | TOTAL SHEETS |
|---|---|
| | ? |
| PROJECT NUMBER | |
| IM-080-7(152)251--13-52 | |
| R.O.W. PROJECT NUMBER | |
| ? | |
| PROJECT IDENTIFICATION NUMBER | |
| 16-52-080-020 | |

## INDEX OF SHEETS

| NO. | DESCRIPTION |
|---|---|
| 1 | TITLE SHEET |
| | |
| 2 | ESTIMATE SHEET - DESIGN 1120 |
| 2-29 | DESIGN 1120 |
| SPS.1-SPS.2 | SOIL PROFILE SHEETS |
| ? | ESTIMATE SHEET FOR ROADWAY |
| ? | ROADWAY SHEETS |

IOWA ONE CALL

1-800-292-8989 | 811

www.iowaonecall.com

Know what's below. Call before you dig.

REVISIONS TO THIS DESIGN PLAN AND/OR PROJECT SPECIFICATIONS SHOULD BE SUBMITTED BY _____

## STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED ON SHEET NUMBER _____

## DESIGN DATA RURAL WAPSI AVE.

| | | |
|---|---|---|
| 2025 AADT | ? | V.P.D. |
| 2045 AADT | ? | V.P.D. |
| 2045 DHV | ? | V.P.H. |
| TRUCKS | ? | % |
| Total Design ESALs | - | |

## DESIGN DATA RURAL I-80

| | | |
|---|---|---|
| 2025 AADT | 45,600 | V.P.D. |
| 2045 AADT | 73,700 | V.P.D. |
| 2045 DHV | 7600 | V.P.H. |
| TRUCKS | 38 | % |
| Total Design ESALs | - | |

## INDEX OF SEALS

| SHEET NO. | NAME | TYPE |
|---|---|---|
| 1 | THOMAS J. CIHA | STRUCTURAL DESIGN |
| SPS.1 | JOHN CHRISTIANSEN | GEOTECHNICAL DESIGN |
| B.1 | ? | ROADWAY DESIGN |

## STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER THOMAS J. CIHA 17951 IOWA

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.

??-??-20??
Date

Signature: Thomas J. Ciha
Printed or typed name

My license renewal date is December 31, 2021

Pages or sheets covered by this seal: SHEETS 1 THRU 29 OF ?

PRELIMINARY NOT FOR CONSTRUCTION

# ESTIMATED BRIDGE QUANTITIES

| ITEM NO. | ITEM CODE | ITEM | UNITS | QUANTITY | AS BUILT QUANTITY |
|---|---|---|---|---|---|
| 1 | 2402-2720000 | EXCAVATION, CL 20 | CY | 326 | |
| 2 | 2403-0100010 | STRUCTURAL CONCRETE (BRIDGE) | CY | 120.5 | |
| 3 | 2403-7000210 | HIGH PERFORMANCE STRUCTURAL CONCRETE | CY | 335.7 | |
| 4 | 2404-7775000 | REINFORCING STEEL | LB | 6483 | |
| 5 | 2404-7775005 | REINFORCING STEEL, EPOXY COATED | LB | 102,762 | |
| 6 | 2404-7775009 | REINFORCING STEEL, STAINLESS STEEL | LB | 4667 | |
| 7 | 2407-0564340 | BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTE140 | EACH | 4 | |
| 8 | 2407-0564350 | BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTE150 | EACH | 4 | |
| 9 | 2408-7800000 | STRUCTURAL STEEL | LB | 11,193 | |
| 10 | 2414-6424038 | CONCRETE BARRIER RAIL, 3'-8" | LF | 646 | |
| 11 | 2499-2300001 | DECK DRAINS | LS | 1 | |
| 12 | 2501-0201057 | PILES, STEEL, HP 10 X 57 | LF | 3735 | |
| 13 | 2501-6335010 | PREBORED HOLES | LF | 180 | |
| 14 | 2507-2638620 | MACADAM STONE SLOPE PROTECTION | SY | 433 | |
| 15 | 2507-2638660 | BRIDGE WING ARMORING - MACADAM STONE | SY | 28 | |
| 16 | 2520-3350015 | FIELD OFFICE | EACH | 1 | |
| 17 | 2526-8285000 | CONSTRUCTION SURVEY | LS | 1 | |
| 18 | 2533-4980005 | MOBILIZATION | LS | 1 | |
| | | | | | |
| | | | | | |

ITEM NO. ESTIMATE REFERENCE INFORMATION

2 INCLUDES COST OF FURNISHING AND PLACING SPLASH BASINS (INCLUDING EXCAVATION, EROSION STONE OR CLASS E REVETMENT, ENGINEERING FABRIC). INCLUDES ALL RESILIENT JOINT FILLER REQUIRED. INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING, AND SUBDRAIN OUTLET AT ABUTMENTS. INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WINGS.

3 THIS BID ITEM INCLUDES THE CONCRETE FOR THE DECK, ABUTMENT, PIER DIAPHRAGM, AND WINGWALLS. REFER TO THE DEVELOPMENTAL SPECIFICATION FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES FOR ADDITIONAL INFORMATION.

7,8 INCLUDES PIER AND ABUTMENT BEARING MATERIAL. INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC SPREADSHEET TO THE ENGINEER.

10 INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS. INCLUDES 642' OF 2" DIAMETER RIGID STEEL CONDUIT. 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.

11 INCLUDES ALL NEW DECK DRAINS. REFER TO DESIGN SHEET 4 FOR LOCATION. REFER TO DESIGN SHEETS 23 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.

12 INCLUDES FURNISHING AND INSTALLING STEEL PILE POINTS FOR PIER PILES.

14 INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, MACADAM STONE, 4" x 6" TREATED TIMBERS, $\frac{1}{2}$" DIAMETER STEEL PINS (OR REBARS), POROUS BACKFILL OR GRANULAR SUBBASE BACKFILL AT FRONT FACE OF ABUTMENT FOOTING, AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING.

15 INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, MACADAM STONE, 4" x 6" TREATED TIMBERS, $\frac{1}{2}$" DIAMETER STEEL PINS (OR REBARS), AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING ARMORING.

NOTE:
ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR 1°40'49.81" SKEW (L.A.)

291'-11 $\frac{1}{4}$ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## ESTIMATED QUANTITIES

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 1 OF 30 FILE NO. 31630 DESIGN NO. 1120



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## SUMMARY OF CONCRETE QUANTITIES

| LOCATION | STRUCTURAL CONCRETE | HPC STRUCTURAL CONCRETE |
|---|---|---|
| S. ABUT. FTG. | 18.9 | ——— |
| N. ABUT. FTG. | 18.8 | ——— |
| BRIDGE DECK + ABUT. & PIER DIAPHAGMS | ——— | 326.1 |
| ABUTMENT WINGS | ——— | 4 AT 2.4 = 9.6 |
| PIER | 82.8 | |
| TOTAL (CY) | 120.5 | 335.7 |

## SUMMARY OF REINFORCING STEEL

| LOCATION | NON-COATED REINFORCING STEEL | STAINLESS STEEL REINFORCING STEEL | EPOXY COATED REINFORCING STEEL |
|---|---|---|---|
| BRIDGE DECK + ABUT. FTG. ** | 185 | ——— | 79,728 |
| ABUTMENT WINGS | ——— | ——— | 4 AT 271 = 1084 |
| BARRIER RAIL - TWO RAILS | ——— | 3899 | 17,897 |
| BARRIER RAIL END SECTION | ——— | 4 AT 192 = 768 | 4 AT 266 = 1064 |
| PIER | 6298 | ——— | 2989 |
| ** INCLUDES ABUTMENT AND PIER DIAPHRAGMS | ——— | ——— | ——— |
| TOTAL (LB) | 6483 | 4667 | 102,762 |

## SUMMARY OF EXCAVATION

| LOCATION | CLASS 20 EXCAVATION |
|---|---|
| S. ABUTMENT | 98 |
| N. ABUTMENT | 98 |
| PIER | 130 |
| TOTAL (CY) | 326 |

## SUMMARY OF FOUNDATIONS

| LOCATION | SUBSTRUCTURE TYPE | FOUNDATION TYPE | NUMBER | LENGTH (LF) | TOTAL (LF) |
|---|---|---|---|---|---|
| S. ABUTMENT | INTERGRAL ABUTMENT | HP10x57 | 9 | 100 | 900 |
| N. ABUTMENT | INTEGRAL ABUTMENT | HP10x57 | 9 | 115 | 1035 |
| PIER | FRAME PIER | HP10x57 | 20 | 90 | 1800 |

## SUMMARY OF STRUCTURAL STEEL

| LOCATION | TOTAL (LB) |
|---|---|
| INTERMEDIATE DIAPHRAGMS | 1632 |
| TOTAL (LB) | 1632 |

## SUMMARY OF BEARINGS

| LOCATION | BEARING TYPE | NUMBER | ASSOCIATED BID ITEM |
|---|---|---|---|
| S. ABUTMENT | 3x3 BAR | 4 | INCIDENTAL ITEM |
| N. ABUTMENT | 3x3 BAR | 4 | INCIDENTAL ITEM |
| PIER | PLAIN NEOPRENE 1" | 4 | INCIDENTAL ITEM |
| PIER | PLAIN NEOPRENE TAPERED | 4 | INCIDENTAL ITEM |

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## SUMMARY QUANTITIES SHEET

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 2 OF 30 FILE NO. 31630 DESIGN NO. 1120



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# GENERAL NOTES:

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 215'-5 x 24'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE, DESIGN NO. 459 WITH A YEAR OF CONSTRUCTION OF 1959. ELECTRONIC PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS.

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

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.

THE APPROACH FILLS AS SHOWN ARE NOT A PART OF THIS CONTRACT, BUT ARE TO BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

REMOVAL OF EXISTING BRIDGE IS NOT PART OF THIS CONTRACT. THE BRIDGE CONTRACTOR SHALL VERIFY THAT THE EXISTING NORTH ABUTMENT FOOTING HAS BEEN REMOVED TO ENSURE PROPER THERMAL MOVEMENT OF THE PROPOSED NORTH ABUTMENT.

ABUTMENT PILES SHALL NOT BE DRIVEN FOR A MINIMUM OF 21 DAYS FOLLOWING COMPLETION OF APPROACH FILLS. THE TIME PERIOD BETWEEN COMPLETION OF FILLS AND DRIVING PILES MAY BE CHANGED AS ORDERED BY THE ENGINEER BASED UPON REVIEW OF SETTLEMENT PLATES.

CAST IN-ONE-PIECE STEEL PILE POINTS ARE REQUIRED FOR THE PIER PILES IN ACCORDANCE WITH ARTICLE 4167.02 OF THE CURRENT STANDARD SPECIFICATIONS AND MATERIALS I.M. 468.

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

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).

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.

THE ROAD WILL BE CLOSED TO TRAFFIC DURING CONSTRUCTION. SEE TRAFFIC CONTROL PLAN NOTE ON THIS SHEET.

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.

DURING CONSTRUCTION OF THIS PROJECT THE BRIDGE CONTRACTOR WILL BE REQUIRED TO COORDINATE OPERATIONS WITH THOSE OF OTHER CONTRACTORS WORKING WITHIN THE SAME AREA. OTHER WORK IN PROGRESS DURING THE SAME PERIOD OF TIME WILL INCLUDE, BUT IS NOT LIMITED TO, CONSTRUCTION OF THE FOLLOWING PROJECTS:

IM-NHS-080-7(114)248--03-52 - GRADING
IM-NHS-080-7(127)248--03-52 - PCC PAVEMENT - NEW

ROADWAY EXCAVATION IS TO BE DONE BY OTHERS AND IS NOT A PART OF THIS CONTRACT. EXCAVATION QUANTITIES FOR THE PIERS AND ABUTMENTS ARE BASED ON THE ASSUMPTION THAT ROADWAY EXCAVATION WILL HAVE BEEN COMPLETED AND ABUTMENT FILLS ARE IN PLACE PRIOR TO STARTING CONSTRUCTION OF THE PIERS.

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 (5a) 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 |

# S. ABUT. PILE DESIGN NOTES:

THE CONTRACT LENGTH OF 100 FEET FOR THE SOUTH ABUTMENT PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 201 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.75. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

# S. ABUT. PILE DRIVING NOTE:

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR THE SOUTH ABUTMENT PILES IS 133 TONS AT END OF DRIVE OR LATER RETAPS. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

# N. ABUT. PILE DESIGN NOTES:

THE CONTRACT LENGTH OF 115 FEET FOR THE NORTH ABUTMENT PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 216 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.75. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

# N. ABUT. PILE DRIVING NOTE:

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR THE SOUTH ABUTMENT PILES IS 144 TONS AT END OF DRIVE OR LATER RETAPS. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

# PIER PILE DESIGN NOTES:

THE CONTRACT LENGTH OF 90 FEET FOR THE PIER PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 209 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

# PIER PILE DRIVING NOTE:

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR THE PIER PILES IS 157 TONS AT END OF DRIVE OR RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

## 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 | INTERMEDIATE DIAPHRAGMS |
| 2 | DECK DRAINS |
| | |

## BRIDGE DECK DIMENSIONS TABLE

| NO. | ITEM | UNIT | QUANTITY |
|---|---|---|---|
| 1 | DECK LENGTH | L.F. | 295.0 |
| 2 | MINIMUM DECK WIDTH | L.F. | 33.2 |
| 3 | MAXIMUM DECK WIDTH | L.F. | 33.2 |
| 4 | DECK AREA | S.F. | 9,784 |

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.

# SPECIFICATIONS:

DESIGN:
AASHTO LRFD 8th Ed, SERIES OF 2017, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.

CONSTRUCTION:
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, INCLUDING:

- DEVELOPMENTAL SPECIFICATIONS FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES.

# 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 14.

BRIDGE DECK CONCRETE f'c = 4.0 KSI.

STRUCTURAL STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 6. ASTM A709 GRADE 36 AND GRADE 50 (AASHTO M270 GRADE 36 AND GRADE 50).

NOTE:
POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

TRAFFIC CONTROL PLAN NOTE:
WAPSI AVE. WILL BE CLOSED TO THRU TRAFFIC. I-80 WILL BE OPEN TO THRU TRAFFIC. REFER TO IM-NHS-080-7(114)248--03-52 FOR THE TRAFFIC CONTROL PLAN.

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

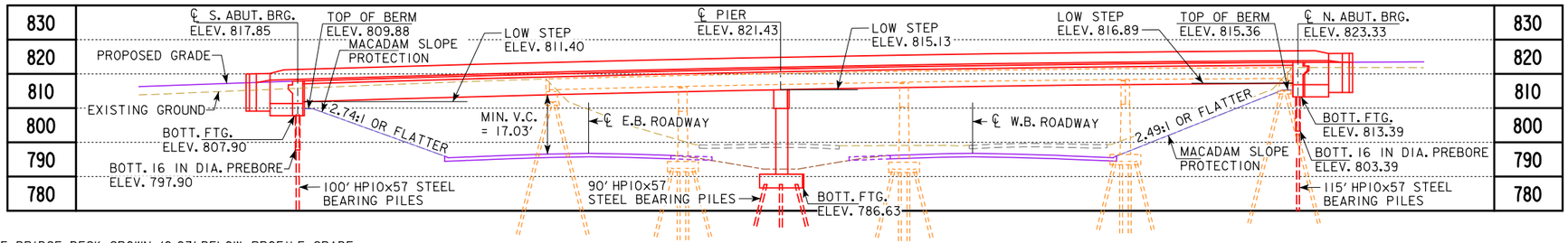
## GENERAL NOTES

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

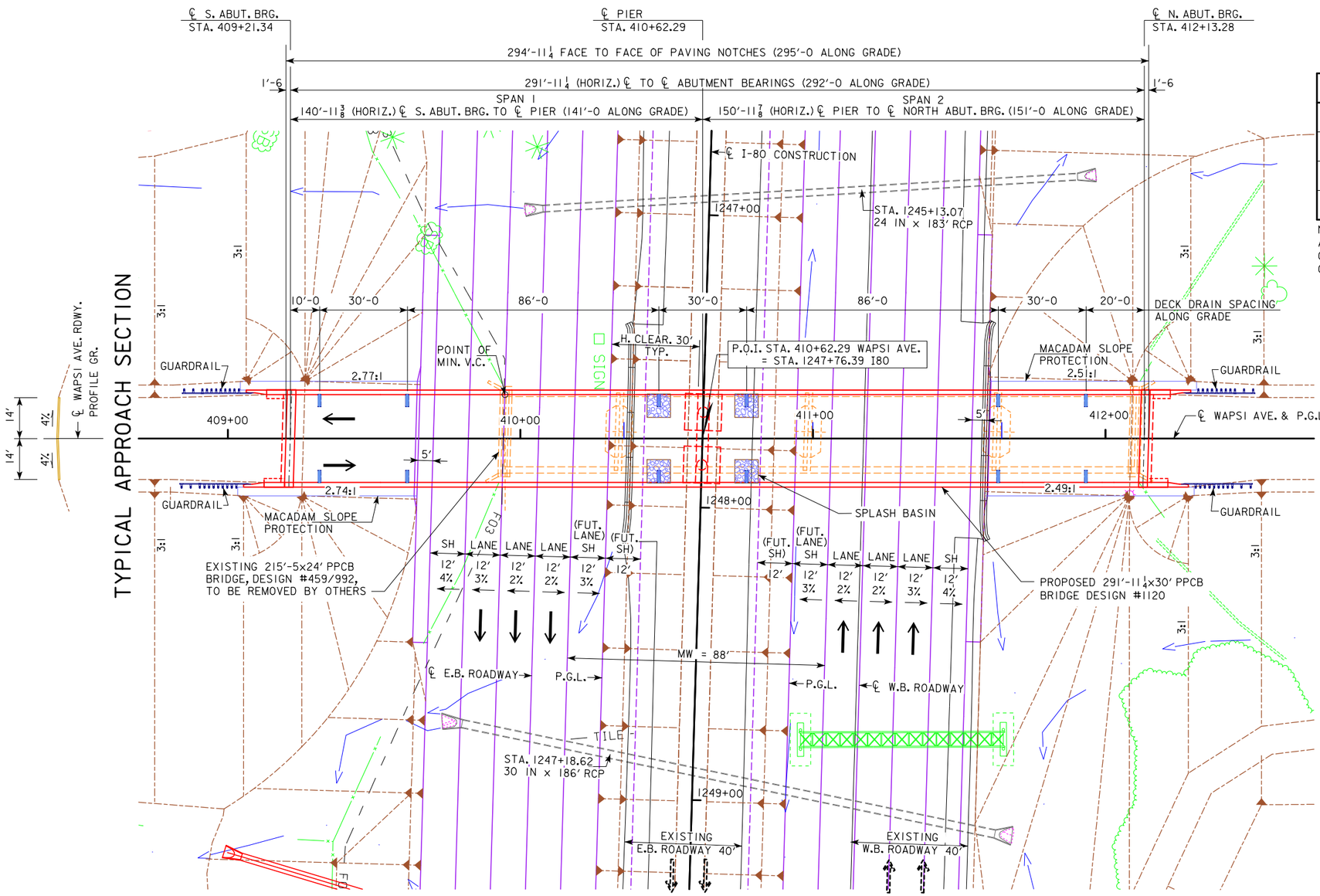
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 3 OF 30 FILE NO. 31630 DESIGN NO. 1120




NOTE:
TOP OF BRIDGE DECK CROWN '0.03' BELOW PROFILE GRADE.

## LONGITUDINAL SECTION ALONG ℄ APPROACH ROADWAY




## TYPICAL APPROACH SECTION

## SITUATION PLAN

CONTROL POINT NO. 13: NORTHING 7939541.987, EASTING 20566200.750, ELEV. 780.030, SET FENO MONUMENT 12" DEEP STAMPED "CP13"

G1=+1.000% G2=-1.763%

VPI STA = 1247+00.170 VC = 2900.00'
VPI ELEV = 806.51

## PROPOSED PROFILE GRADE I-80

G1=+5.750% G2=-3.008%

VPI STA = 411+25.000 VC = 1000.00'
VPI ELEV = 833.44

## PROPOSED PROFILE GRADE WAPSI AVE.

## BRIDGE COORDINATES

| LOCATION | ℄ S. ABUT. BRG. | ℄ PIER | ℄ N. ABUT. BRG. |
|---|---|---|---|
| W. EDGE OF DECK | E=20566050.661 N=7939531.483 | E=20566051.408 N=7939672.477 | E=20566052.209 N=7939823.419 |
| ℄ APPROACH ROADWAY | E=20566067.242 N=7939530.955 | E=20566067.989 N=7939671.903 | E=20566068.789 N=7939822.891 |
| E. EDGE OF DECK | E=20566083.822 N=7939530.427 | E=20566084.569 N=7939671.328 | E=20566085.369 N=7939822.363 |

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.

## MINIMUM VERTICAL CLEARANCE

OVERHEAD STATION = 409+94.64, 13.08' LT
OVERHEAD ELEVATION = 819.70
DEPTH OF SUPERSTRUCTURE = 6.08'
UNDERPASS STATION = 1247+65.30, 68.00' RT
UNDERPASS ELEVATION = 796.59
MINIMUM VERTICAL CLEARANCE = 17.03'

## TRAFFIC ESTIMATE (WAPSI AVE.)

| | | |
|---|---|---|
| 2025 AADT | ? | V.P.D. |
| 2045 AADT | ? | V.P.D. |
| 2045 DHV | ? | V.P.H. |
| TRUCKS | ? | % |
| TOTAL DESIGN ESALs | - | |

## TRAFFIC ESTIMATE (I-80)

| | | |
|---|---|---|
| 2025 AADT | 45,600 | V.P.D. |
| 2045 AADT | 73,700 | V.P.D. |
| 2045 DHV | 7600 | V.P.H. |
| TRUCKS | 38 | % |
| TOTAL DESIGN ESALs | - | |

## UTILITIES LEGEND:

F03 - FIBER OPTIC
E03 - ELECTRIC
- POWER POLE

## LOCATION

WAPSI AVENUE OVER I -80
T-79N R-5W
SECTIONS 9 & 10
SCOTT TOWNSHIP
JOHNSON COUNTY
FHWA NO. 32171
BRIDGE MAINT. NO. 5250.60080
LATITUDE 41.667540°
LONGITUDE -91.424868°

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## SITUATION PLAN

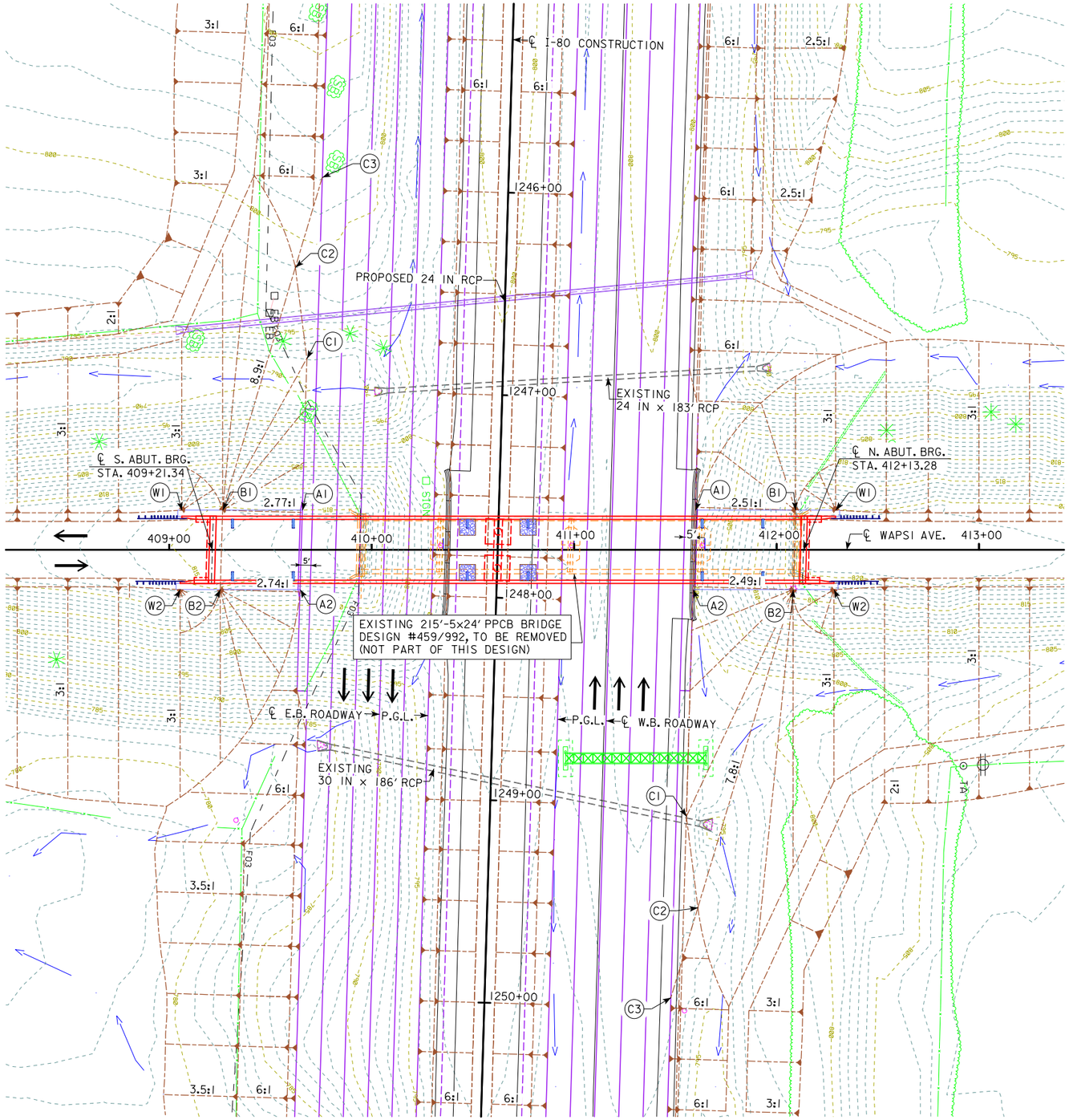
STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 4 OF 30 FILE NO. 31630 DESIGN NO. 1120

CONTROL POINT NO. 13: NORTHING 7939541.987, EASTING 20566200.750, ELEV. 780.030, SET FENO MONUMENT 12" DEEP STAMPED "CP13"




SITE PLAN

## BERM SLOPE LOCATION TABLE

| POINTS | SOUTH ABUTMENT | | | NORTH ABUTMENT | | |
|---|---|---|---|---|---|---|
| | STATION | OFFSET | ELEV. | STATION | OFFSET | ELEV. |
| A1 | 409+65.83 | 19.58' LT | 795.57 | 411+59.91 | 19.58' LT | 795.60 |
| A2 | 409+64.68 | 19.58' RT | 795.39 | 411+58.76 | 19.58' RT | 795.42 |
| B1 | 409+26.42 | 19.58' LT | 809.78 | 412+09.36 | 19.58' LT | 815.27 |
| B2 | 409+25.27 | 19.58' RT | 809.78 | 412+08.21 | 19.58' RT | 815.27 |
| W1 | 409+06.28 | 19.58' LT | 816.95 | 412+29.22 | 19.58' LT | 823.00 |
| W2 | 409+05.40 | 19.58' RT | 816.93 | 412+28.34 | 19.58' RT | 823.00 |

BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE

## RECOVERABLE BERM LOCATION TABLE

| | SOUTH ABUTMENT | | | NORTH ABUTMENT | | |
|---|---|---|---|---|---|---|
| | STATION | OFFSET | ELEV | STATION | OFFSET | ELEV |
| C1 | 409+68.02 | 94.49' LT | 795.87 | 411+55.47 | 131.63' RT | 794.83 |
| C2 | 409+62.34 | 139.46' LT | 795.75 | 411+61.16 | 176.60' RT | 794.28 |
| C3 | 409+75.65 | 183.87' LT | 796.36 | 411.47.85 | 221.02' RT | 794.48 |
| B | 409+26.42 | 19.58' LT | 809.78 | 412+08.21 | 19.58' RT | 815.27 |

REFER TO EW-203 FOR TYPICAL LOCATIONS.

N

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## SITUATION PLAN - SITE

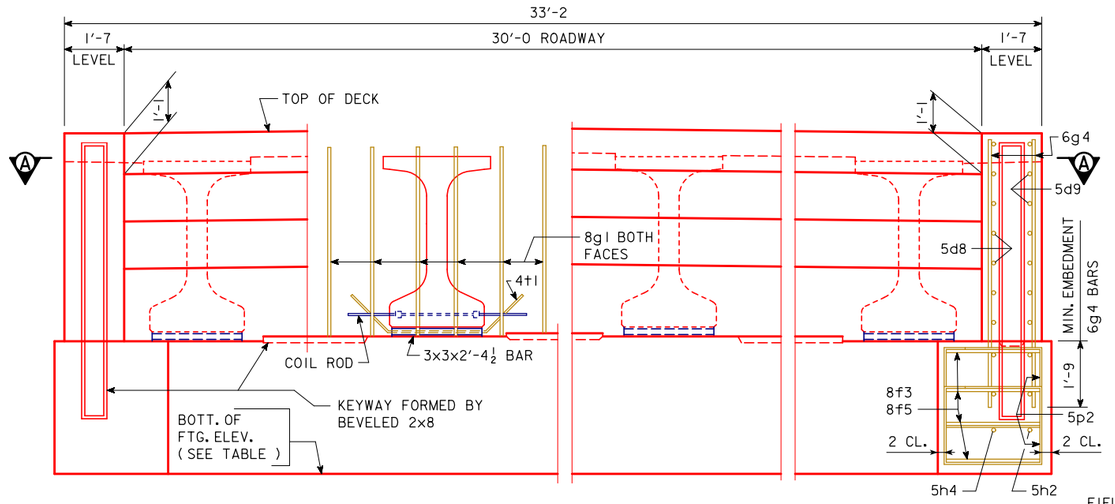
STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

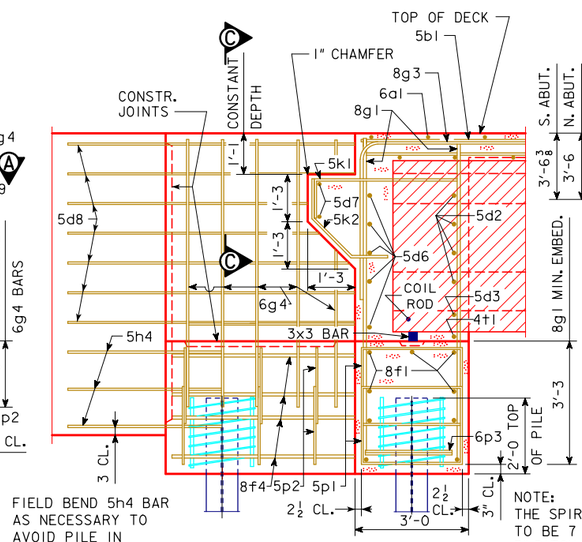
DESIGN SHEET NO. 5 OF 30 FILE NO. 31630 DESIGN NO. 1120

DESIGN TEAM T.J.C. / J.S.I. / J.A.E. Foth | JOHNSON COUNTY | PROJECT NUMBER IM-080-7(152)251--13-52 | SHEET NUMBER 6




## PART REAR ELEVATION AT ABUTMENT

( WINGS NOT SHOWN )

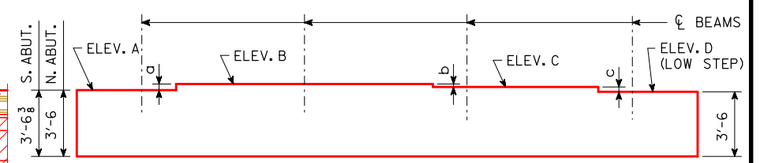



FIELD BEND 5h4 BAR AS NECESSARY TO AVOID PILE IN ABUTMENT WING.

## PART SECTION B-B

NOTE:
THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 21" DIAMETER, 3" PITCH WITH 3 - L $\frac{7}{8} \times \frac{7}{8} \times \frac{1}{8}$ SPACERS PUNCHED TO HOLD SPIRAL.

CONTROL POINT NO. 13: NORTHING 7939541.987, EASTING 20566200.750, ELEV. 780.030, SET FENO MONUMENT 12" DEEP STAMPED "CP13"




## ABUTMENT STEP DIAGRAM

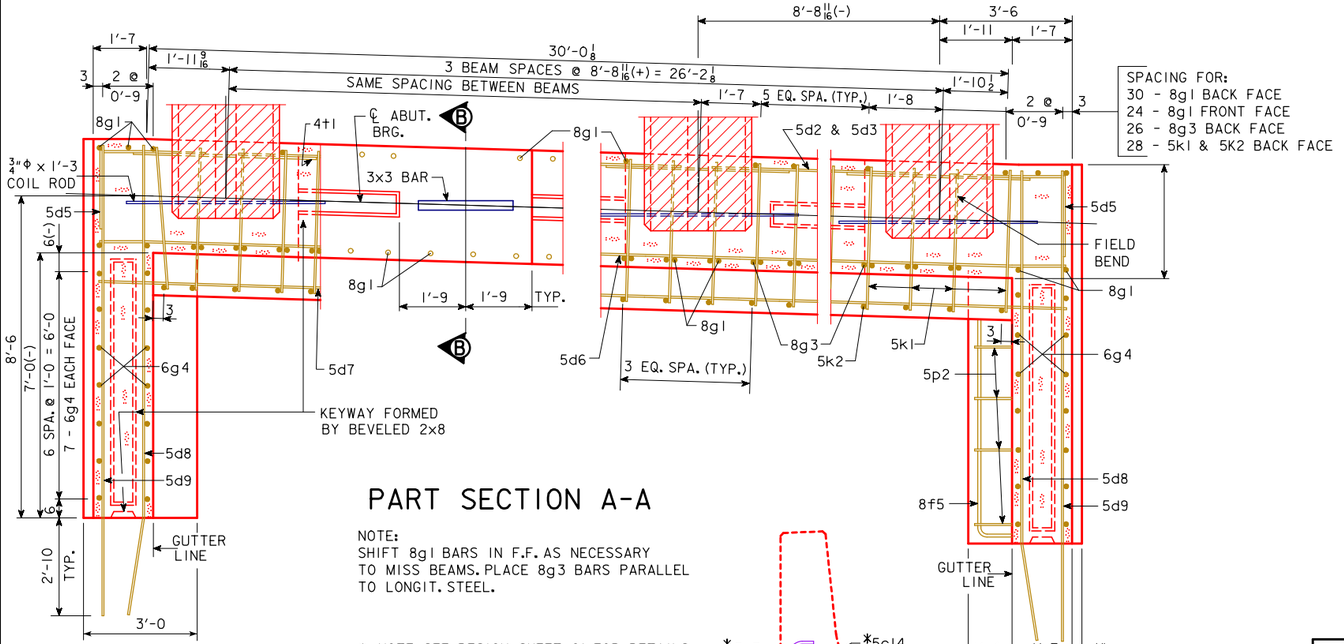
( REAR ELEVATION AT S. ABUT.; FRONT ELEVATION AT N. ABUT. )

### TABLE OF ABUTMENT STEPS

| STEP | S. ABUT. | N. ABUT. |
|---|---|---|
| a | $1\frac{15}{16}$ | $2\frac{1}{16}$ |
| b | $\frac{1}{8}$ | 0 |
| c | $2\frac{3}{16}$ | $2\frac{1}{16}$ |
| | | |

### TABLE OF ABUTMENT ELEVATIONS

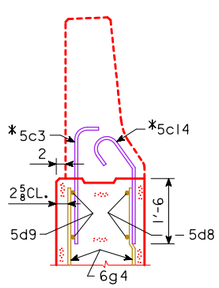
| POINT | S. ABUT. | N. ABUT. |
|---|---|---|
| ELEV. A | 811.43 | 816.89 |
| ELEV. B | 811.59 | 817.07 |
| ELEV. C | 811.58 | 817.07 |
| ELEV. D | 811.40 | 816.89 |
| | | |
| BOTT. FTG. ELEV. | 807.90 | 813.39 |



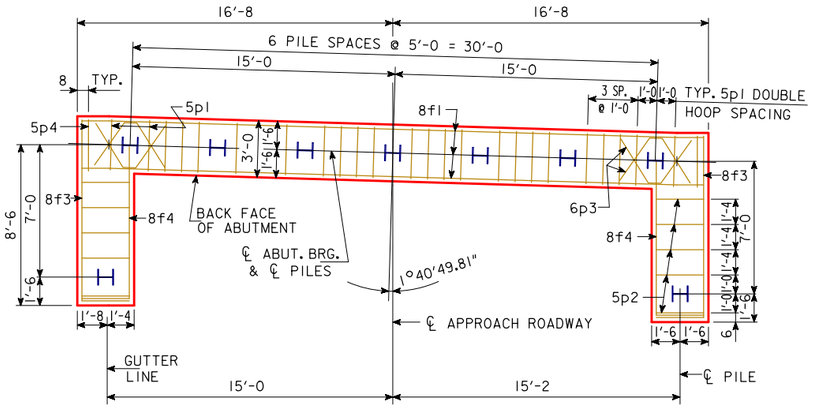

## PART SECTION A-A

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

* NOTE: SEE DESIGN SHEET 21 FOR DETAILS OF BARRIER RAIL. REINFORCING BARS 5c3 AND 5c14 ARE INCLUDED IN SUPERSTRUCTURE QUANTITIES.




## PART SECTION C-C




## ABUTMENT PILE PLAN

## ABUTMENT NOTES:

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

IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK OR BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE STATE.

### ABUTMENT CONCRETE QUANTITY

| LOCATION | QUANTITY |
|---|---|
| SOUTH ABUTMENT FOOTING | 18.9 |
| NORTH ABUTMENT FOOTING | 18.8 |
| TOTAL (CY) | 37.7 |

NOTE: CONCRETE QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

NOTE: 9 - HP 10 x 57 STEEL BEARING PILING REQUIRED AT EACH ABUTMENT.

NOTE: BARRIER RAIL NOT SHOWN IN DETAILS.

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## ABUTMENT DETAILS

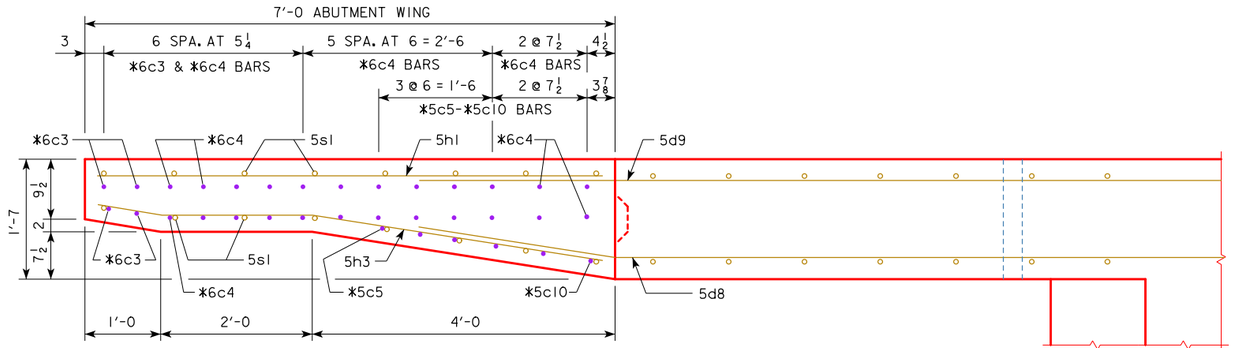
STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

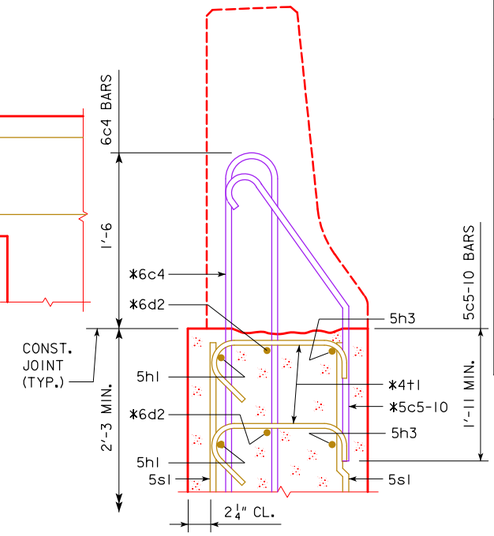
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 6 OF 30 FILE NO. 31630 DESIGN NO. 1120

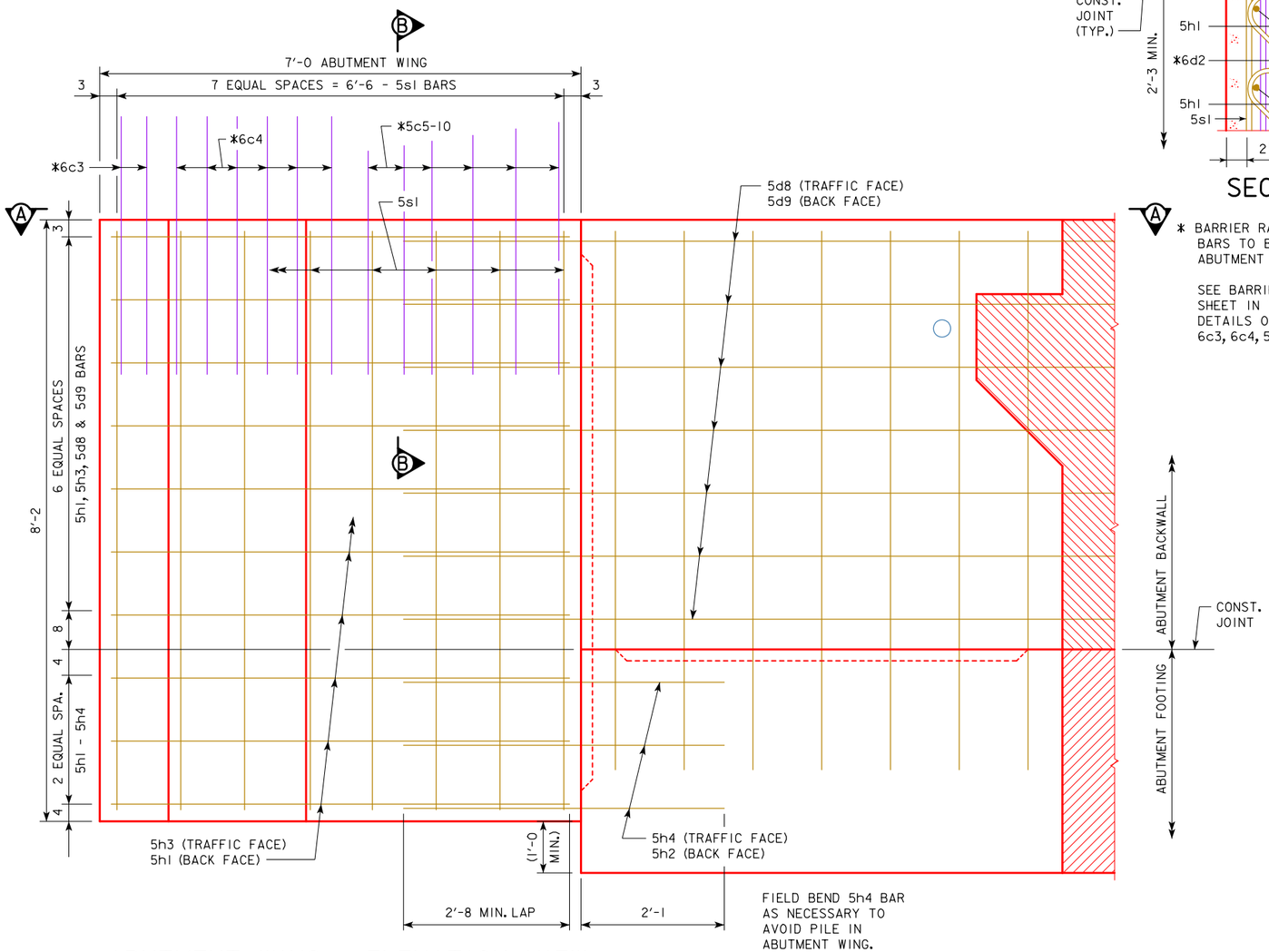
CORRECTION 04-14 - ADDED CONCRETE QUANTITY TABLE & REFERRAL NOTE TO SUMMARY QUANTITY SHEET. REMOVED DESIGN BEARING NOTE FOR ABUT. PILING FROM ABUTMENT NOTES.
ENGLISHBTINTEGRALBRIDGES.DGN - 2086-BTE - THIS SHEET ISSUED 02-08.




VIEW A-A




SECTION B-B




ABUTMENT WING - ELEVATION VIEW

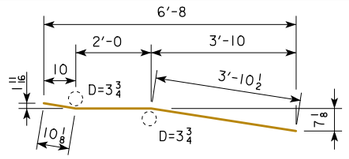
A

* 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 & 4t1.

## REINFORCING BAR LIST - ONE ABUT. WING

| BAR | LOCATION | SHAPE | NO. | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| 5h1 | HORIZONTAL BACK FACE | | 10 | 6'-8 | 70 |
| 5h3 | HORIZONTAL TRAFFIC FACE | | 10 | 6'-9 | 70 |
| | | | | | |
| 5s1 | VERTICAL BOTH FACES | | 16 | 7'-10 | 131 |
| | | | | | |
| | REINFORCING STEEL EPOXY COATED - TOTAL (LB) | | | | 271 |




5h3

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

## BENT BAR DETAILS

## HIGH PERFORMANCE CONCRETE PLACEMENT SUMMARY

| CONCRETE | TOTAL |
|---|---|
| ONE ABUTMENT WING | 2.4 |
| | |
| TOTAL (CY) | 2.4 |

**NOTE:**

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

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## ABUTMENT WING DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

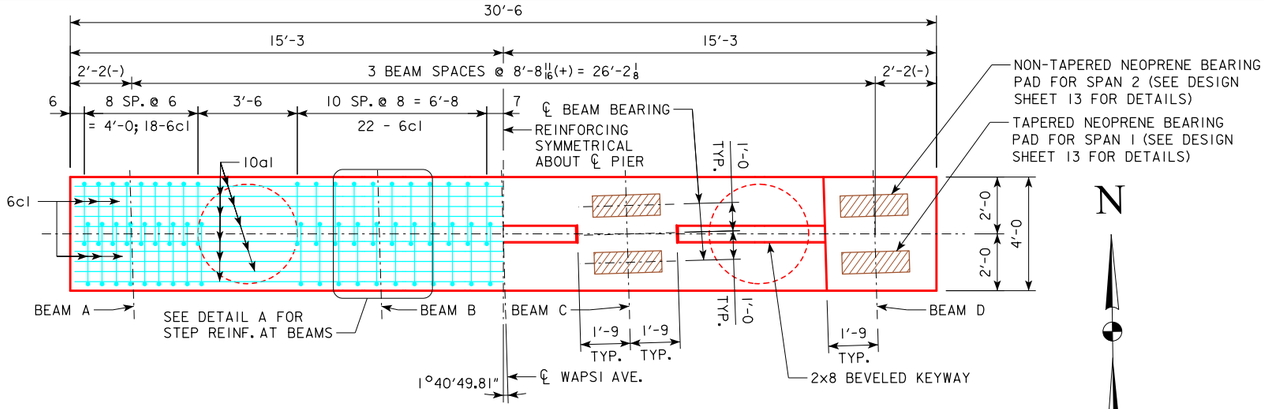
DESIGN SHEET NO. 7 OF 30 FILE NO. 31630 DESIGN NO. 1120

CORRECTION 04-14 - ADDED REFERRAL NOTE TO SUMMARY QUANTITIES SHEET.
ENGLISHMISCELLANEOUSBRIDGES.DGN - 2114 - THIS SHEET ISSUED 02-08.

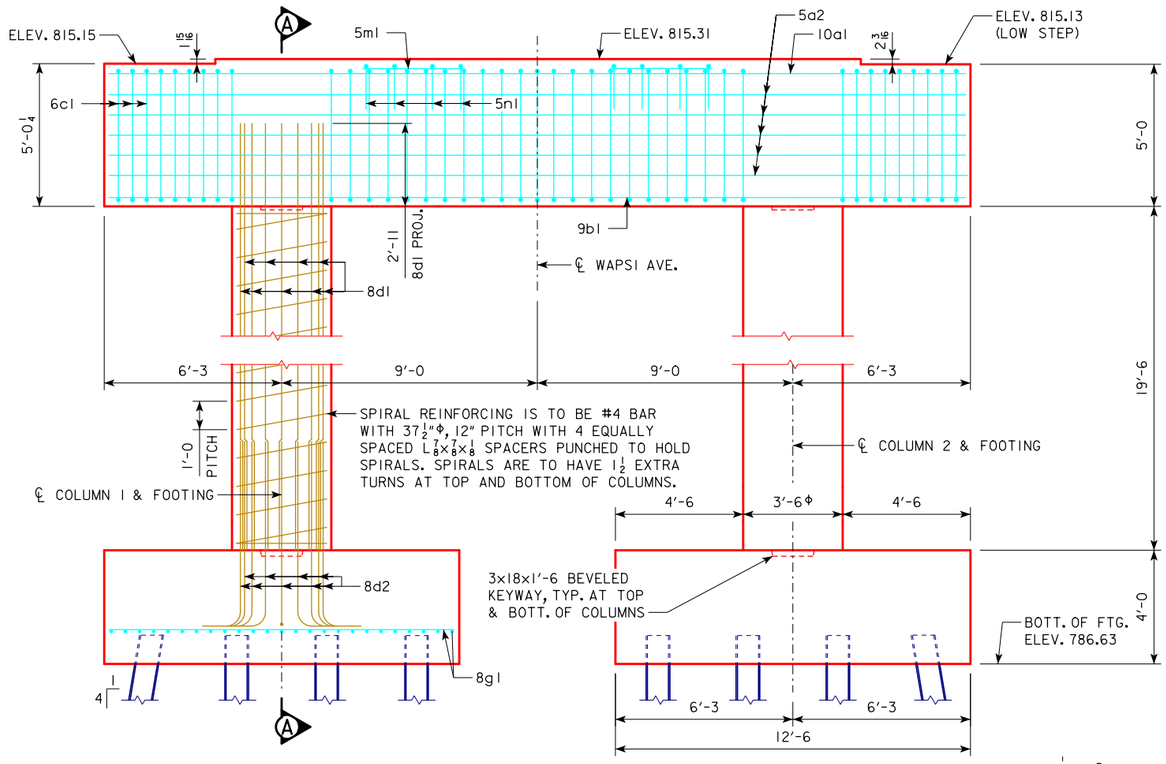



3/19/2021 12:33:13 PM untitled pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\5208002016\BRFinal\Foth\BRG_52080152.dgn 521120S007 11x17_pdf.pltcfg

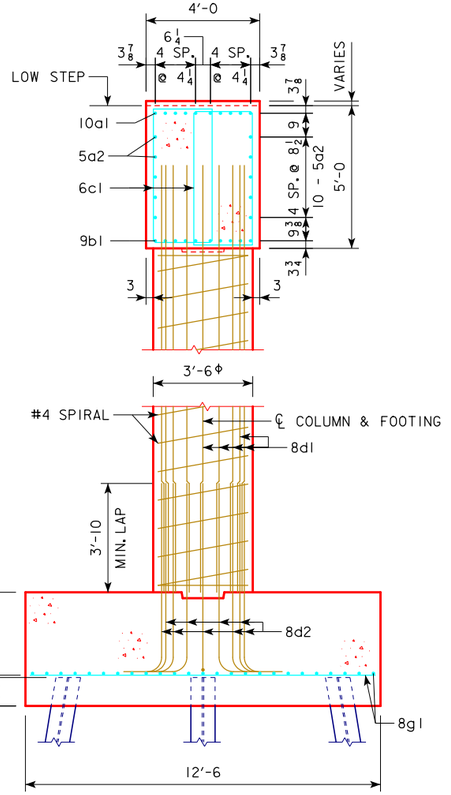
CONTROL POINT NO. 13: NORTHING 7939541.987, EASTING 20566200.750, ELEV. 780.030, SET FENO MONUMENT 12" DEEP STAMPED "CP13"



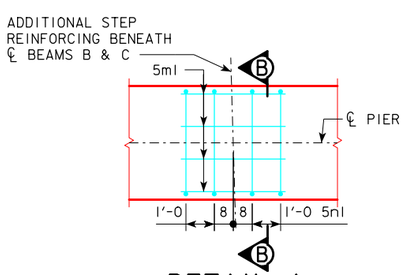

## PLAN VIEW OF PIER CAP



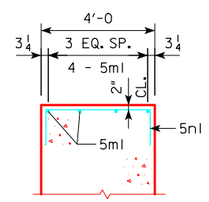

## PIER ELEVATION
(LOOKING NORTH)



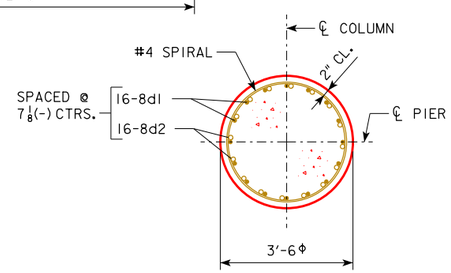

## SECTION A-A




## DETAIL A




## SECTION B-B




## COLUMN SECTION

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## PIER DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 8 OF 30 FILE NO. 31630 DESIGN NO. 1120

## PIER NOTES:

THE SPIRAL REINFORCING MAY BE SPLICED BY LAPPING 1'-9. THE LENGTH OF THE SPIRAL SHOWN DOES NOT INCLUDE THE LAPPED LENGTH OF THE SPLICES. THE COST OF THE LAPS AT SPLICES IS TO BE INCLUDED IN THE PRICE BID FOR OTHER REINFORCEMENT.

COLUMN TIES SPACED AT 12" CENTERS MAY BE SUBSTITUTED FOR THE SPIRAL REINFORCEMENT. PAYMENT WILL BE BASED ON THE WEIGHT OF SPIRAL REINFORCEMENT. NO ADJUSTMENTS IN REINFORCING STEEL PAY WEIGHT WILL BE ALLOWED. SEE BENT BAR DETAILS FOR SPLICE LAP LENGTH.

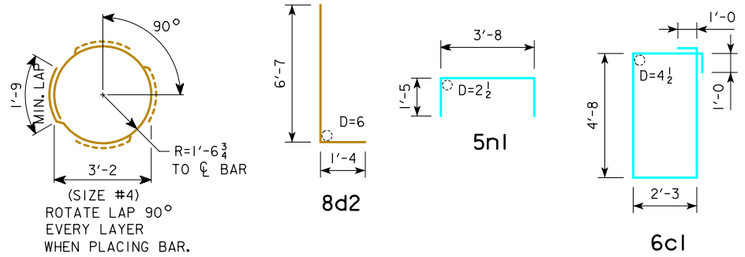
ALL BATTERED PILE SHALL BE TRIMMED TO A HORIZONTAL LINE TO AID IN THE PLACEMENT OF REINFORCING.

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

STEEL PILE POINTS ARE REQUIRED FOR THE STEEL H-PILES AT THE PIERS.

FORMS FOR PIER CAP SHALL BE REMOVED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. EARLY FORM REMOVAL IS PROHIBITED.

## BENT BAR DETAILS




ALTERNATE COLUMN TIE

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

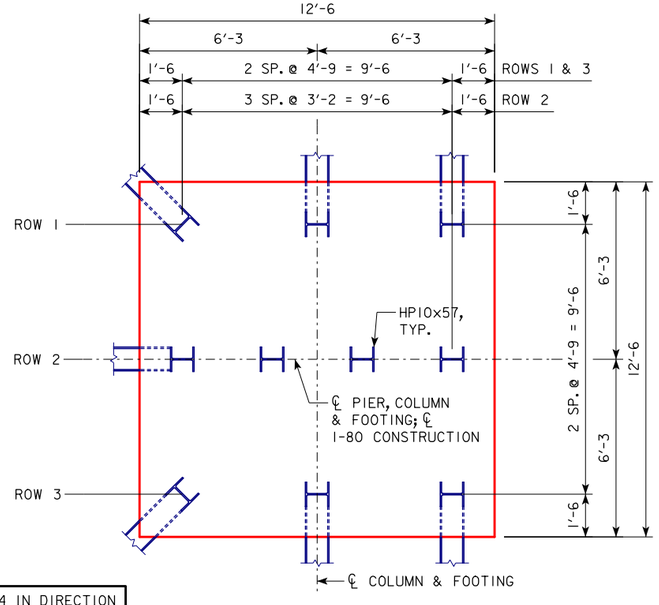
## REINFORCING BAR LIST - ONE PIER

| | BAR | LOCATION | SHAPE | NO. | LENGTH | WEIGHT |
|---|---|---|---|---|---|---|
| NON-COATED | 10a1 | CAP, LONGIT. TOP | | 10 | 30'-2 | 1298 |
| | 5a2 | CAP, LONGIT. SIDES | | 10 | 30'-2 | 315 |
| | 9b1 | CAP, LONGIT. BOTTOM | | 10 | 30'-2 | 1026 |
| | 6c1 | CAP STIRRUPS | | 82 | 15'-10 | 1950 |
| | 8g1 | FOOTING, LONGIT. & TRANSV. | | 50 | 12'-2 | 1624 |
| | 5m1 | CAP STEP, LONGIT. | | 8 | 3'-8 | 31 |
| | 5n1 | CAP STEP, TRANSV. | | 8 | 6'-6 | 54 |
| | | REINFORCING STEEL - TOTAL (LB) | | | | 6298 |
| EPOXY COATED | #4 | COLUMN SPIRAL | | 2 | 218'-2 | 291 |
| | | SPIRAL SPACERS L 7/8 x 7/8 x 1/8 (0.7 LB/FT) | | 8 | 19'-2 | 107 |
| | 8d1 | COLUMN VERT. | | 32 | 22'-5 | 1915 |
| | 8d2 | COLUMN DOWELS | | 32 | 7'-11 | 676 |
| | | REINFORCING STEEL EPOXY COATED - TOTAL (LB) | | | | 2989 |

## CONCRETE PLACEMENT QUANTITIES

| LOCATION | QUANTITY |
|---|---|
| CAP | 22.6 |
| COLUMNS | 13.9 |
| FOOTINGS | 46.3 |
| TOTAL (CY) | 82.8 |

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



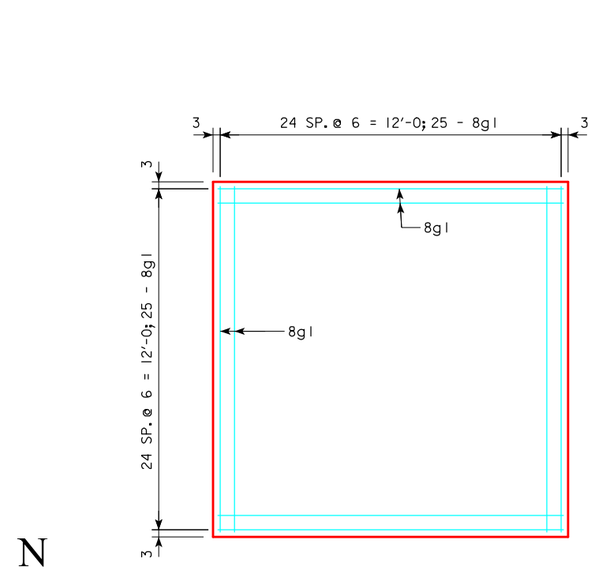

BATTER PILES 1:4 IN DIRECTION SHOWN AT BOTH FOOTINGS.

## PILE LAYOUT PLAN

(W. FOOTING SHOWN; E. FOOTING OPPOSITE HAND)

NOTE:
PILE SPACING SHOWN AT BOTTOM OF FOOTING.

10 - HP10x57 STEEL BEARING PILING REQUIRED FOR EACH FOOTING.




## FOOTING REINFORCING PLAN

N

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## PIER DETAILS

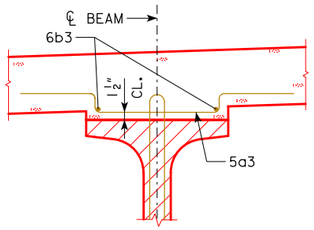
STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

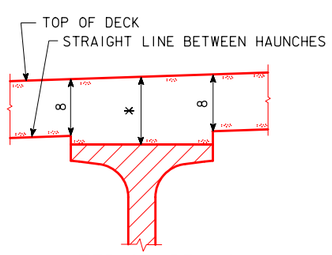
DESIGN SHEET NO. 9 OF 30 FILE NO. 31630 DESIGN NO. 1120

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 - 4380-BTE-4 - THIS SHEET ISSUED 02-08.

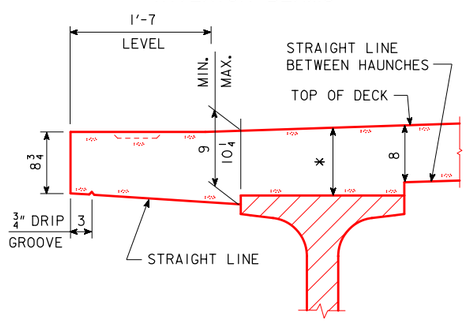



## SECTION - ADDITIONAL HAUNCH REINFORCING

NOTE:
SEE DESIGN SHEET 16 FOR LOCATION OF ADDITIONAL HAUNCH REINFORCING. LONGITUDINAL 6b3 BARS SHALL RUN THE LENGTH OF THE 5a3 BAR PLACEMENT. MINIMUM LAP SPLICE FOR 6b3 BARS = 2'-2.



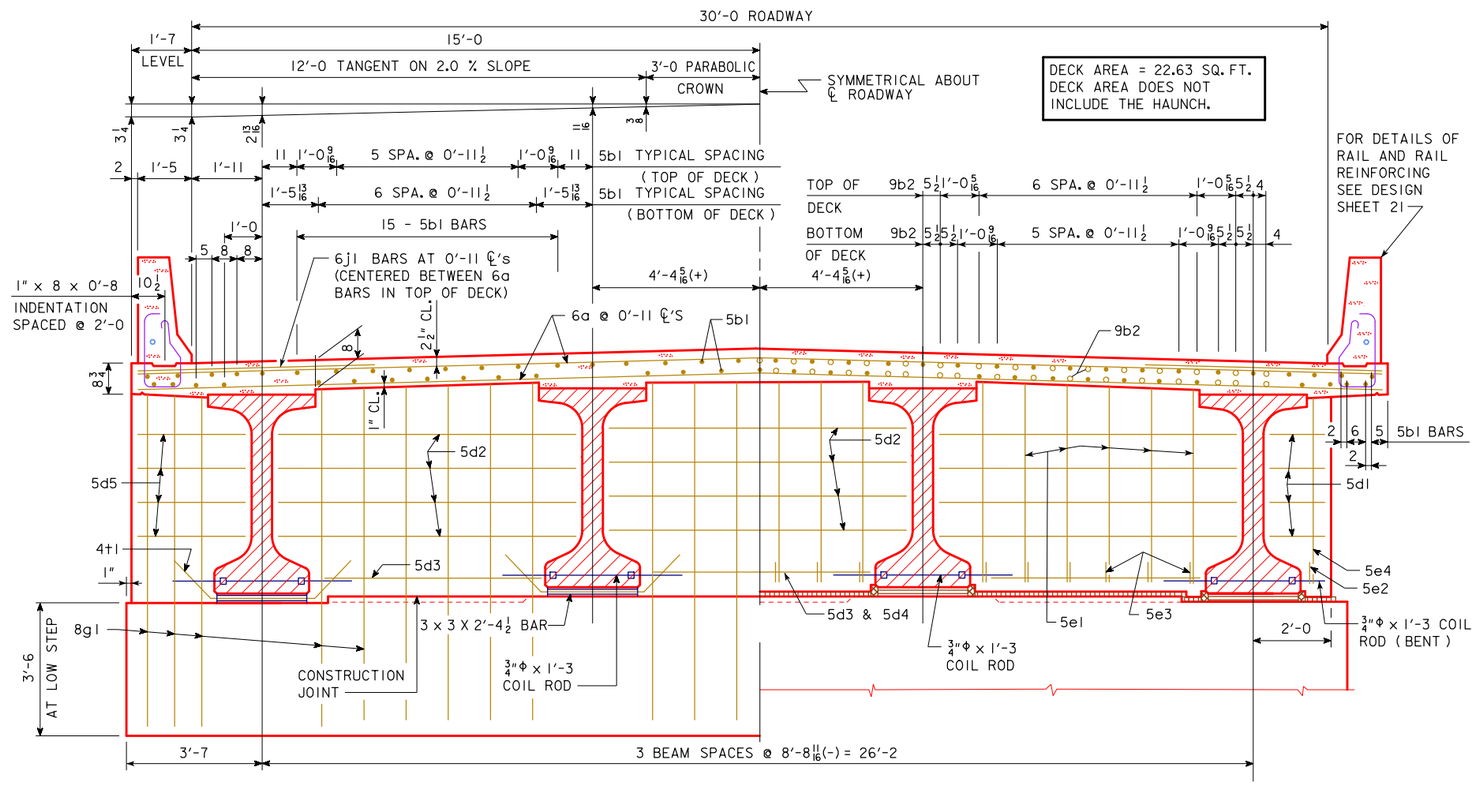

INTERIOR BEAMS




EXTERIOR BEAMS

## TYPICAL DECK AND HAUNCH DETAIL

* FOR DECK THICKNESS OVER BEAMS SEE HAUNCH AND CAMBER DETAILS ON DESIGN SHEET 12.




HALF SECTION NEAR ABUTMENT

HALF SECTION NEAR PIER

NOTE: FOR DETAILS OF INTERMEDIATE DIAPHRAGMS SEE DESIGN SHEETS 17 & 18.

## SUPERSTRUCTURE NOTES:

THE BRIDGE DECK AS SHOWN INCLUDES ½" INTEGRAL WEARING SURFACE.

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

COST OF ALL PREFORMED 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 2½" 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".

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## BRIDGE DECK CROSS SECTION

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 10 OF 30 FILE NO. 31630 DESIGN NO. 1120

| DESIGN TEAM T.J.C. / J.S.I. / J.A.E. Foth | 30' RDWY. PPCB ( BTE BEAMS - INTEGRAL ABUT. ) CROSS SECTION ( SPANS 60' - 150' ) | STANDARD SHEET 4380-BTE-4 | JOHNSON COUNTY | PROJECT NUMBER IM-080-7(152)251--13-52 | SHEET NUMBER 11 |
|---|---|---|---|---|---|

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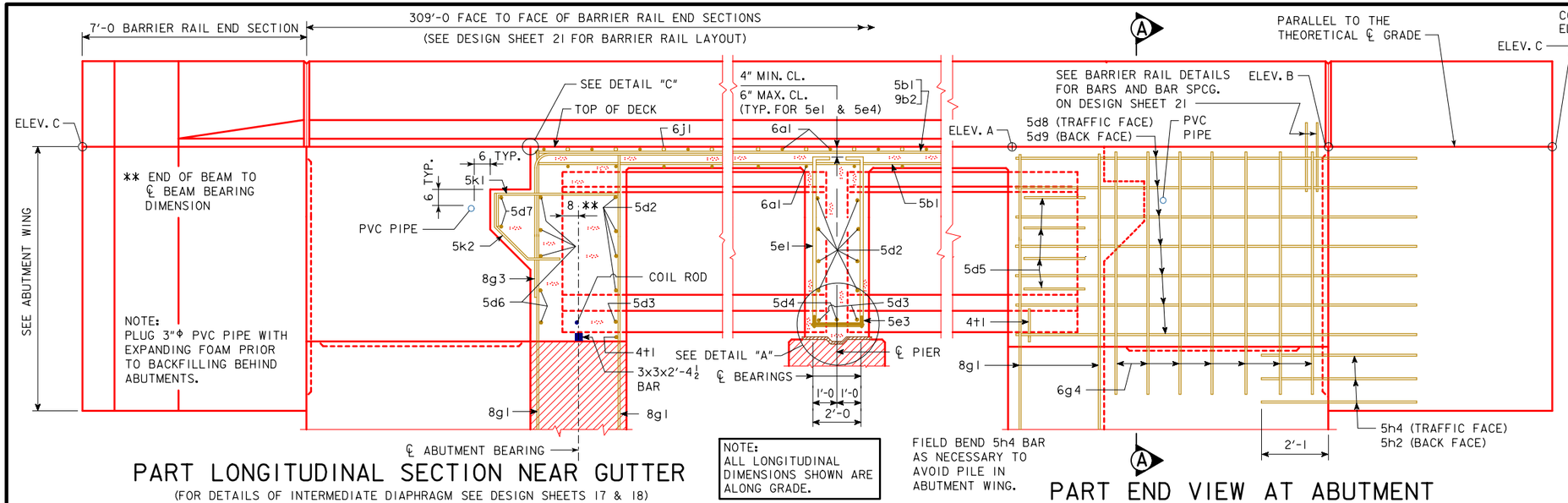
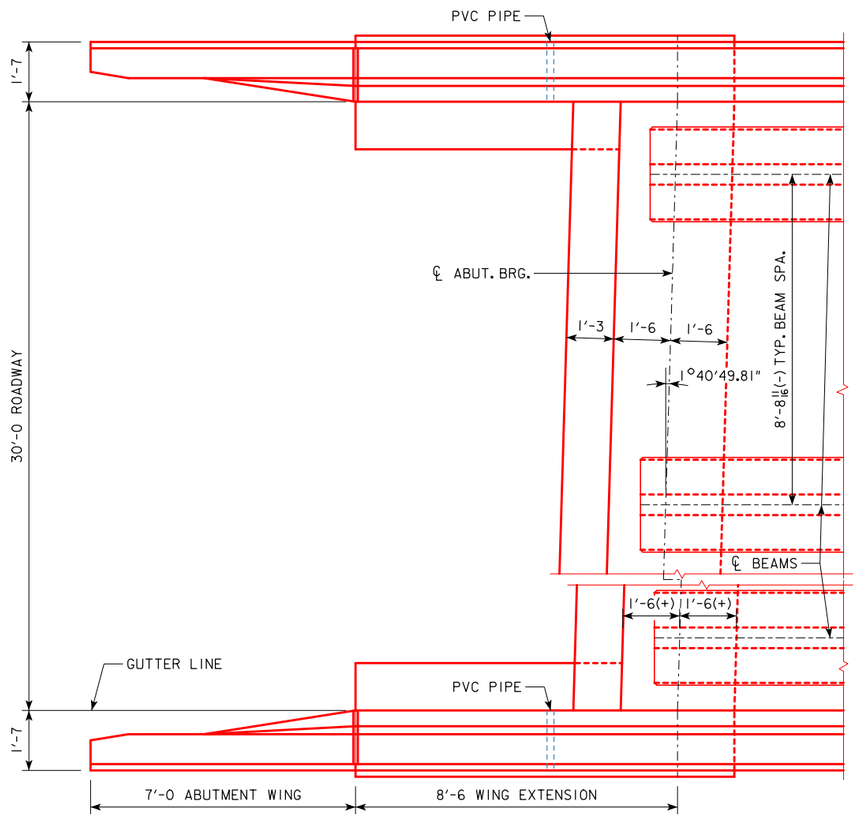
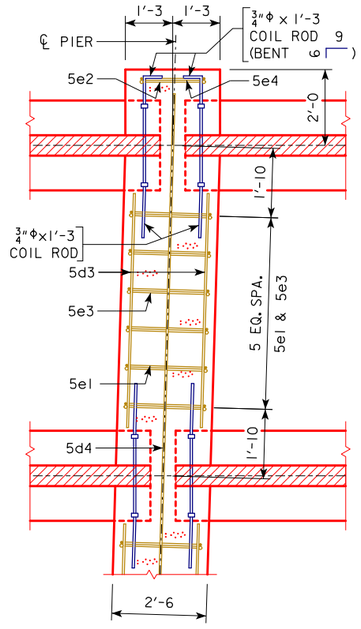



## PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE DESIGN SHEETS 17 & 18)



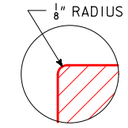

## PART PLAN



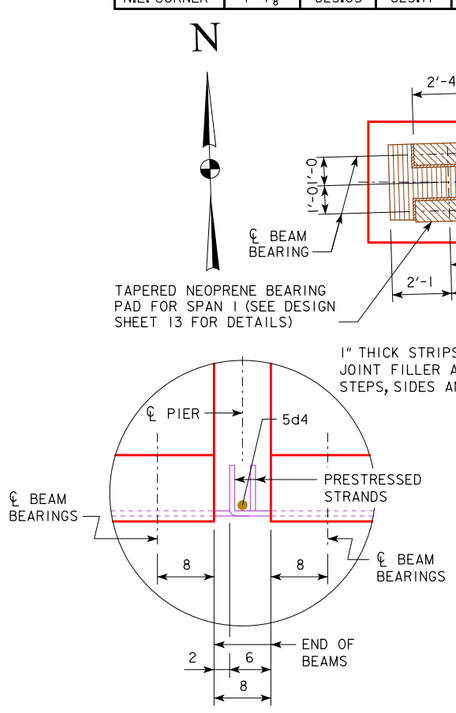

## PART SECTION AT PIER

## TABLE OF WINGWALL ELEVATIONS

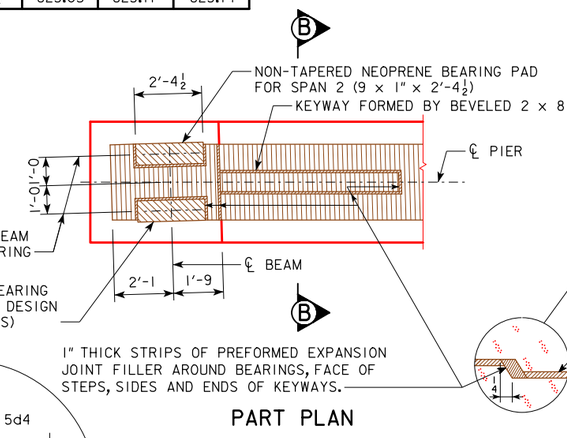
| LOCATION | DIM "C" | ELEV. A | ELEV. B | ELEV. C |
|---|---|---|---|---|
| S.W. CORNER | 1'-0 5/8 | 817.65 | 817.33 | 817.10 |
| N.W. CORNER | 1'-7 1/2 | 823.06 | 823.11 | 823.15 |
| S.E. CORNER | 1'-0 1/4 | 817.62 | 817.30 | 817.07 |
| N.E. CORNER | 1'-7 3/8 | 823.05 | 823.11 | 823.14 |



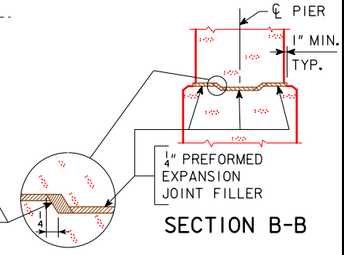

## DETAIL "C"




## DETAIL "A"




## PART PLAN




## SECTION B-B

## TOP OF PIER DETAILS

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## SUPERSTRUCTURE DETAILS

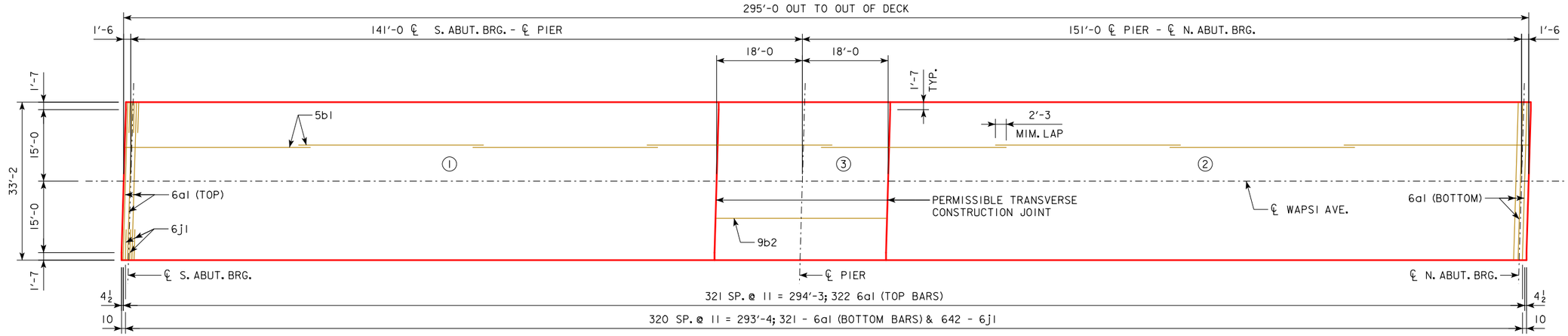
STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 11 OF 30 FILE NO. 31630 DESIGN NO. 1120

REVISED 01-12 - ADDED FIELD BEND 5h4 BAR TO AVOID PILE IN ABUTMENT WING NOTE.
ENGLISHBTINTEGRALBRIDGES.DGN - 4508-BTE - THIS SHEET ISSUED 02-08.

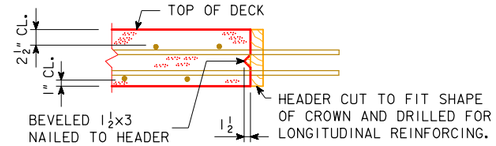



# DECK LONGITUDINAL REINFORCING LAYOUT & CONCRETE PLACEMENT DIAGRAM

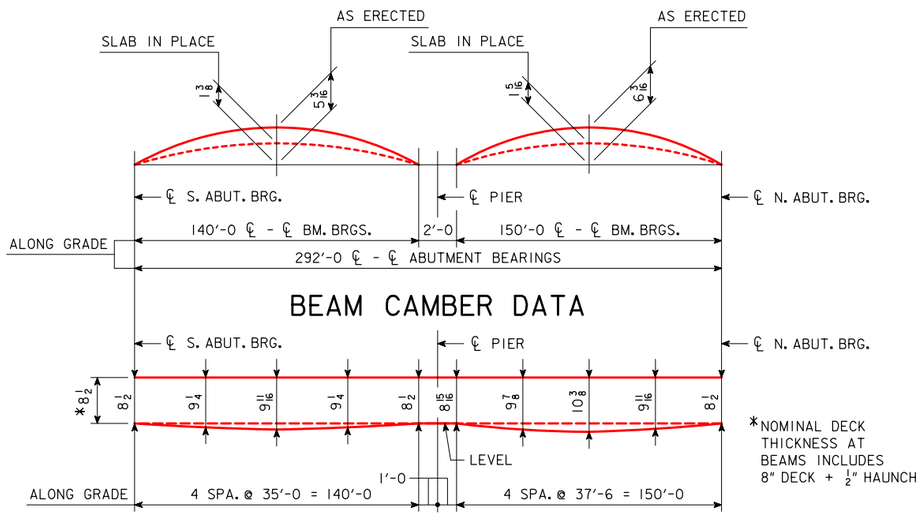
NOTE: ALL LONGITUDINAL DIMENSIONS SHOWN ARE ALONG GRADE.

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.

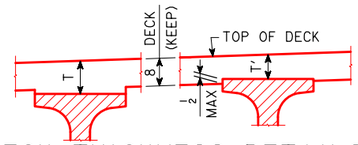
DECK CONCRETE SECTIONS SHALL CURE FOR A MINIMUM OF 48 HOURS AND SHALL ACHIEVE A MINIMUM STRENGTH OF 75% OF THE 28 DAY DECK CONCRETE STRENGTH PRIOR TO REMOVING DECK HEADERS AND BEGINNING AN ADJACENT POUR.




## PERMISSIBLE TRANSVERSE DECK CONSTRUCTION JOINT




## DECK THICKNESS AT BEAMS (T)




## 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 ON THIS SHEET FOR ADDITIONAL INFORMATION TO AID THE CONTRACTOR IN SETTING THE FIELD HAUNCHES REQUIRED FOR CONSTRUCTION.

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

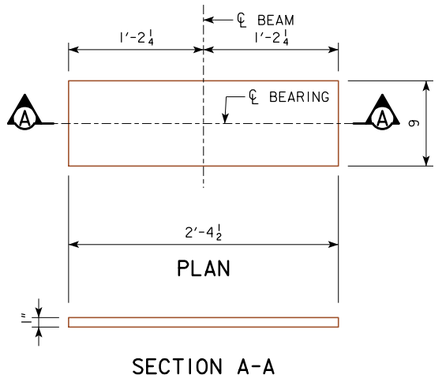
## SUPERSTRUCTURE DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

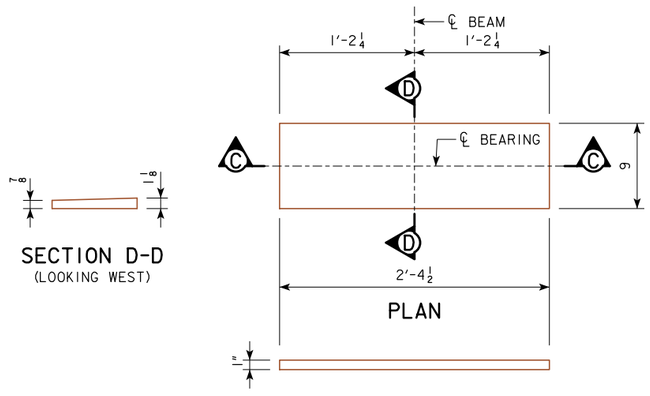
DESIGN SHEET NO. 12 OF 30 FILE NO. 31630 DESIGN NO. 1120




SECTION A-A

## NON-TAPERED NEOPRENE BEARING PAD DETAIL

(4 TOTAL REQUIRED)




SECTION D-D
(LOOKING WEST)

SECTION C-C

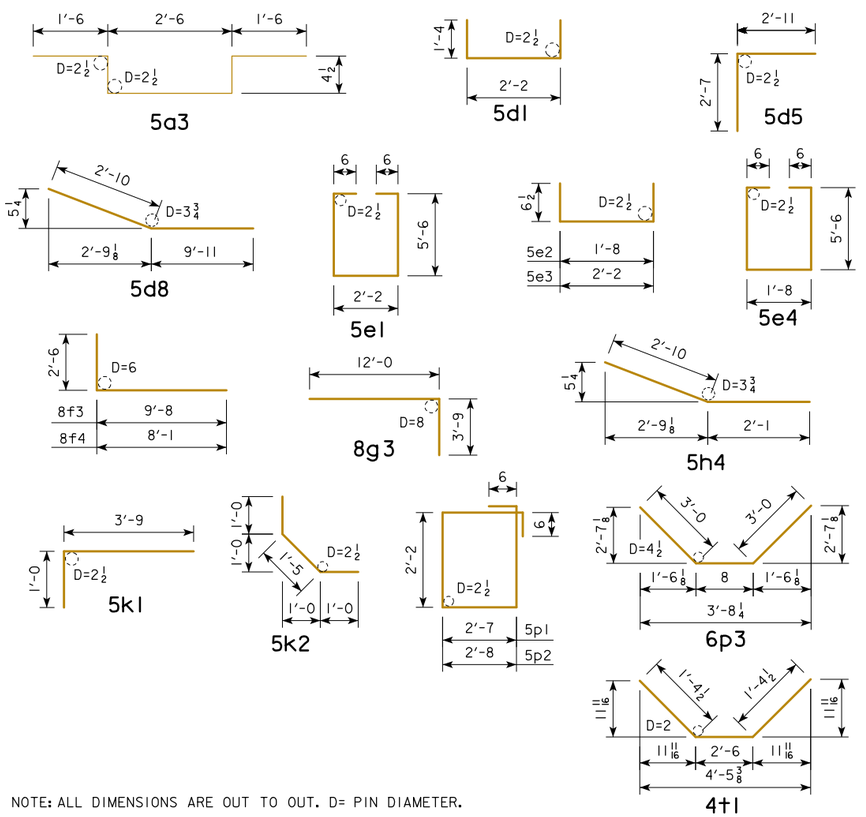
## TAPERED NEOPRENE BEARING PAD DETAIL

(4 TOTAL REQUIRED)

NOTE:
COST OF NEOPRENE PADS SHALL BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS".

MATERIAL FOR NEOPRENE PADS TO BE OF 70 DUROMETER NEOPRENE.

## BENT BAR DETAILS




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

## HIGH PERFORMANCE CONCRETE PLACEMENT QUANTITIES

| LOCATION | QUANTITY |
|---|---|
| SECTION 1, DECK & ABUT. DIAPH. | 134.9 |
| SECTION 2, DECK & ABUT. DIAPH. | 146.6 |
| SECTION 3, DECK & PIER DIAPH. | 44.6 |
| | |
| TOTAL (CU. YDS.) | 326.1 |

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

## REINFORCING BAR LIST

| | BAR | LOCATION | SHAPE | NO. | LENGTH | WEIGHT |
|---|---|---|---|---|---|---|
| EPOXY COATED REINFORCING | 6a1 | DECK TRANSV. TOP & BOTT. | | 643 | 32'-10 | 31710 |
| | 5a2 | DECK TRANSV. AT DRAINS | | 48 | 3'-0 | 150 |
| | 5a3 | HAUNCH TRANSV. | | 47 | 6'-3 | 306 |
| | 5b1 | DECK LONGIT. TOP & BOTTOM | | 520 | 38'-10 | 21062 |
| | 9b2 | DECK LONGIT. TOP AT PIERS | | 61 | 35'-8 | 7397 |
| | 6b3 | HAUNCH LONGIT. | | 4 | 34'-10 | 209 |
| | 5d1 | PIER DIAPH. ENDS | | 8 | 4'-10 | 40 |
| | 5d2 | PIER & ABUT. DIAPH. LONGIT. | | 48 | 7'-10 | 392 |
| | 5d3 | PIER & ABUT. DIAPH. LONGIT. | | 12 | 5'-10 | 73 |
| | 5d4 | PIER DIAPH. LONGIT. | | 1 | 28'-8 | 30 |
| | 5d5 | ABUT. DIAPH. ENDS | | 16 | 5'-5 | 90 |
| | 5d6 | ABUT. DIAPH. LONGIT. B.F. | | 10 | 32'-10 | 342 |
| | 5d7 | PAVING NOTCH LONGIT. | | 4 | 32'-10 | 137 |
| | 5d8 | ABUT. DIAPH. WING EXT. LONGIT. | | 28 | 12'-9 | 372 |
| | 5d9 | ABUT. DIAPH. WING EXT. LONGIT. | | 28 | 12'-8 | 370 |
| | 5e1 | PIER DIAPH. HOOPS | | 18 | 14'-2 | 266 |
| | 5e2 | PIER DIAPH. TIES ENDS | | 2 | 2'-9 | 6 |
| | 5e3 | PIER DIAPH. TIES | | 18 | 3'-3 | 61 |
| | 5e4 | PIER DIAPH. HOOPS ENDS | | 2 | 13'-8 | 29 |
| | 8f1 | ABUT. FOOTING LONGIT. BOTH F. | | 18 | 33'-0 | 1586 |
| | 8f3 | ABUT. EXTENSION LONGIT. | | 16 | 12'-4 | 527 |
| | 8f4 | ABUT. EXTENSION LONGIT. | | 16 | 10'-7 | 452 |
| | 8g1 | ABUT. VERT. BOTH F. | | 108 | 9'-3 | 2667 |
| | 8g3 | ABUT. DIAPH. VERT. B.F. | | 52 | 15'-9 | 2187 |
| | 6g4 | ABUT. DIAPH. WIGN EXT. VERT. | | 56 | 7'-10 | 659 |
| | 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) | | 642 | 6'-3 | 6027 |
| | 5k1 | PAVING NOTCH | | 56 | 4'-9 | 277 |
| | 5k2 | PAVING NOTCH | | 56 | 3'-5 | 200 |
| | 5p1 | ABUT. HOOPS | | 112 | 10'-6 | 1227 |
| | 5p2 | ABUT. EXTENSION HOOPS | | 40 | 10'-8 | 445 |
| | 6p3 | ABUT. BOTT. AT PILES | | 28 | 6'-8 | 280 |
| | 4t1 | UNDER BEAMS AT ABUTMENTS | | 8 | 5'-3 | 28 |
| | | REINFORCING STEEL EPOXY COATED - TOTAL (LB) | | | | 79,728 |
| NON-COATED | #2 | PILE SPIRAL | | 18 | 38'-6 | 116 |
| | | SPIRAL SPACERS L 7/8 x 7/8 x 1/8 x 0.70 | | 54 | 1'-10 | 69 |
| | | REINFORCING STEEL - TOTAL (LB) | | | | 185 |

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## SUPERSTRUCTURE DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 13 OF 30 FILE NO. 31630 DESIGN NO. 1120

REVISED 07-2015 - CHANGED CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.
ENGLISHBTINTEGRALBRIDGES.DGN - 4519-BTE - THIS SHEET ISSUED 02-08.

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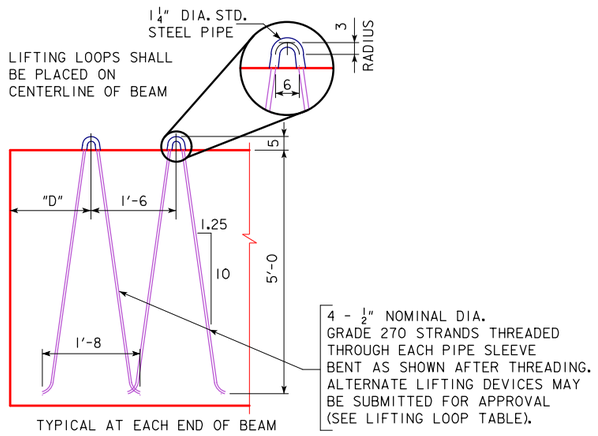
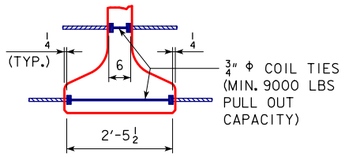
REVISION 08-12 - I.M. REFERENCE NOTE FOR SEALING BEAM ENDS DISTINGUISHES BETWEEN THE FABRICATOR AND CONTRACTOR. DECK PANEL OPTION NOTE WAS DELETED.
ENGLISHBEAMS.DGN - 4770sl - THIS SHEET ISSUED 02-08.




## LIFTING LOOP DETAIL

NUMBER AND EXACT LOCATION OF COIL TIES TO BE AS DETAILED ON DESIGN SHEET 17




## COIL TIE DETAIL

### LIFTING LOOP AND OVERHANG TABLE

| BEAMS | LIFTING LOOPS EACH END | # OF STRANDS PER LOOP | D | BEAM OVERHANG (FT) |
|---|---|---|---|---|
| BTE140 | 2 | 4 | 9'-3 | 16 |
| BTE150 | 2 | 4 | 12'-3 | 16 |
| | | | | |

** IN ACCORDANCE WITH ARTICLE 2407.03, K OF THE STANDARD SPECIFICATIONS.

LIFTING LOOPS SHALL CARRY LOADS EQUALLY.




THE TOP AND BOTTOM ROWS OF THE DEFLECTED STRANDS ARE TO BE CUT WITH 1'-6 PROJECTIONS WHICH ARE TO BE SHOP BENT AS SHOWN. THE REMAINING TOP DEFLECTED STRANDS ARE TO BE CUT WITH 5" PROJECTIONS.
SIX BOTTOM STRANDS ARE TO BE CUT WITH 1'-6 PROJECTIONS WHICH ARE TO BE SHOP BENT AS SHOWN. THE REMAINING BOTTOM STRANDS ARE TO BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.




TYPICAL AT BOTH BEAM ENDS

## STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS

## BTE BEAM DATA

| BTE BEAM | SPAN LENGTH ℄-℄ BEARING | OVERALL BEAM LENGTH (L) | CONCRETE STRENGTH f'ci (ksi) | CONCRETE STRENGTH f'c (ksi) | STRAND SIZE DIA. (in) | NO. OF STRAND STRAIGHT | NO. OF STRAND DEFLECTED | TOTAL INITIAL PRESTRESS ③ kips | HOLD DOWN FORCE-kips | CAMBER (in) AT RELEASE | CAMBER (in) AFTER LOSSES | DEFLECTION (in) Δ D IMMEDIATE ① (ELASTIC) Δ I STEEL DIAPHRAGM | DEFLECTION (in) Δ D TIME ② (PLASTIC) Δ T STEEL DIAPHRAGM | PERMISSIBLE MAXIMUM SPACING HL-93 LOADING STEEL DIAPHRAGM | WEIGHT (TONS) | CONCRETE (CU YD.) | REINFORCING STEEL (WEIGHT-LBS) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BTE140 | 140'-0 | 141'-4 | 7.50 | 8.50 | 0.60 | 40 | 8 | 2042 | 26.0 | 2.97 | 5.21 | 3.22 | 0.80 | 8'-8 11/16(-) | 59.4 | 29.3 | 3897 |
| BTE150 | 150'-0 | 151'-4 | 8.00 | 9.00 | 0.60 | 44 | 12 | 2383 | 33.7 | 3.52 | 6.17 | 4.09 | 1.03 | 8'-8 11/16(-) | 63.6 | 31.4 | 4194 |
| | | | | | | | | | | | | | | | | | |

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A SLAB ( 8 in ) AND HAUNCH ( 1.5 in ) WEIGHT OF:
0.93 kips/ft FOR 8'-8 11/16(-) BEAM SPACING AND TWO STEEL DIAPHRAGMS ( 0.500 kips ) PLACED 20'-0, ON EITHER SIDE, OF THE BEAM CENTERLINE.

② DEFLECTIONS DUE TO THE COMBINED EFFECT OF CREEP DUE TO WEIGHT OF SLAB AND SHRINKAGE OF SLAB.
TOTAL BEAM DEFLECTIONS AT ℄ OF SPAN, $\Delta_D$ , DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:
(A) $\Delta_D = \Delta_I + \Delta_T$ FOR SIMPLE SPAN.
(B) $\Delta_D = \Delta_I + \frac{3}{4}\Delta_T$ FOR END SPANS OF CONTINUOUS BRIDGE.
(C) $\Delta_D = \Delta_I + \frac{1}{2}\Delta_T$ FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.

③ TOTAL INITIAL PRESTRESS IS BASED ON 72.6% f's, f's. = 270 ksi. AND As = 0.217 in².

CALCULATED DESIGN CAMBERS HAVE BEEN REDUCED FROM THEIR THEORETICAL VALUES BY 15% TO AID CONSTRUCTABILITY.

## DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE TO BE IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2007.
REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.
CONCRETE IN ACCORDANCE WITH SECTION 5.
PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 270.

## SPECIFICATIONS:

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.
DESIGN: A.A.S.H.T.O. LRFD, SERIES OF 2007, WITH MINOR MODIFICATIONS.

## BEAM NOTES:

THESE BEAMS ARE DESIGNED FOR AASHTO LIVE LOADS AS INDICATED IN ABOVE TABLE WITH AN ALLOWANCE OF 20 LBS PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.
ALL PPC BEAMS SHALL USE HIGH PERFORMANCE CONCRETE ( HPC ) IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
HOLD DOWN POINTS FOR DEFLECTED STRANDS MAY BE MOVED TOWARD ENDS OF BEAM A DISTANCE OF 0.05 L MAXIMUM AT PRODUCER'S OPTION.
ALL PRESTRESSING STRANDS EXCEPT LIFTING LOOP STRANDS SHALL BE 0.60 in. NOMINAL DIAMETER (NOMINAL STEEL AREA = 0.217 in²) AND CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS. MINIMUM STRAND BREAKING STRENGTH SHALL BE 58.6 kips.
TOPS OF BEAMS ARE TO BE STRUCK OFF LEVEL AND FINISHED AS PER MATERIALS IM570.
BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.
BEAMS TO BE USED IN BRIDGES MADE CONTINUOUS BY THE POURED IN PLACE FLOOR, ARE TO BE AT LEAST 28 DAYS OLD BEFORE THE FLOOR IS PLACED UNLESS A SHORTER CURING TIME IS APPROVED BY THE BRIDGE ENGINEER.
THE PORTIONS OF THE PRESTRESSED BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT AND PIER DIAPHRAGMS SHALL BE ROUGHENED FOR A DISTANCE OF 10" FROM THE BEAM END BY SANDBLASTING OR OTHER APPROVED METHODS TO PROVIDE SUITABLE BOND BETWEEN THE BEAM AND THE DIAPHRAGM IN ACCORDANCE WITH ARTICLE 2403.03, I, OF THE STANDARD SPECIFICATIONS.
ALL BEAMS ARE TO BE INCREASED IN LENGTH TO COMPENSATE FOR ELASTIC SHORTENING, CREEP AND SHRINKAGE.
FOR TRANSPORTING, THE ALLOWABLE OVERHANG IS SHOWN IN THE LIFTING LOOP AND OVERHANG TABLE.
THE CONTRACTOR SHALL ASSURE THE LATERAL STABILITY OF THE BEAMS DURING HANDLING, TRANSPORTING AND ERECTION BY PROVIDING TEMPORARY BRACING AS NEEDED.
HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.
MINIMUM CONCRETE f'c (AT 28 DAYS) AND MINIMUM f'ci AT RELEASE ARE LOCATED IN THE BTE BEAM DATA TABLE ABOVE.
FOUR 0.60 IN. DIAMETER STRANDS STRESSED TO NOT MORE THAN 5000 lbs. EACH MAY BE USED IN LIEU OF BARS 5a1 AND 5a2 IN THE TOP FLANGE.

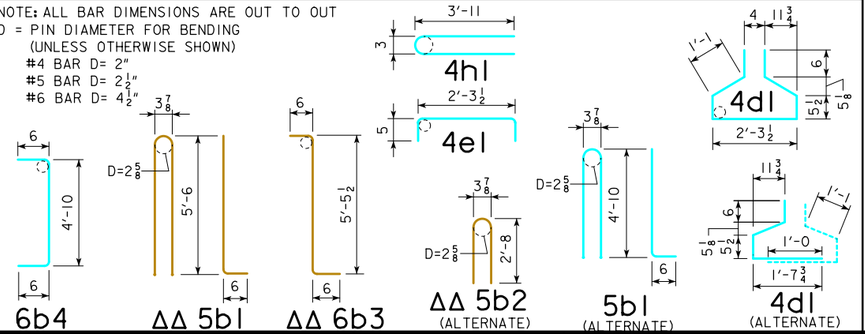
ΔΔ 5b1 AND 6b3 BARS TO BE EPOXY COATED
* 6b3 AND 6b4 BARS TO BE USED IN PAIRS

### REINFORCING BAR LIST

| | BEAM BAR | BEAM SHAPE | BTE140 NO. | BTE140 LENGTH | BTE150 NO. | BTE150 LENGTH |
|---|---|---|---|---|---|---|
| | 5a1 | | 12 | 33'-10 | 12 | 38'-10 |
| | 5a2 | | 12 | 40'-0 | 12 | 40'-0 |
| ΔΔ | 5b1 | | 105 | 12'-2 | 115 | 12'-2 |
| ΔΔ * | 6b3 | | 56 | 6'-6 | 52 | 6'-6 |
| * | 6b4 | | 12 | 5'-10 | 20 | 5'-10 |
| | 4c1 | | 171 | 2'-7 | 183 | 2'-7 |
| | 4d1 | | 135 | 6'-5 | 147 | 6'-5 |
| | 4e1 | | 34 | 3'-2 | 36 | 3'-2 |
| | 4h1 | | 8 | 8'-0 | 8 | 8'-0 |

### BENT BAR DETAILS

NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT
D = PIN DIAMETER FOR BENDING (UNLESS OTHERWISE SHOWN)
#4 BAR D= 2"
#5 BAR D= 2½"
#6 BAR D= 4½"




### ALTERNATE BAR NOTES:

ALTERNATE BARS SHOWN IN BENT BAR DETAILS MAY BE USED IN LIEU OF REINFORCING BARS SHOWN IN BAR LIST. NO ADDITIONAL PAYMENT SHALL BE MADE FOR USE OF ALTERNATE BARS.

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## BTE BEAM DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 14 OF 30 FILE NO. 31630 DESIGN NO. 1120

DESIGN TEAM T.J.C. / J.S.I. / J.A.E. Foth | BULB TEE "E" BEAMS - SHEET 1 OF 2 | STANDARD SHEET 4770 | JOHNSON COUNTY | PROJECT NUMBER IM-080-7(152)251--13-52 | SHEET NUMBER 15

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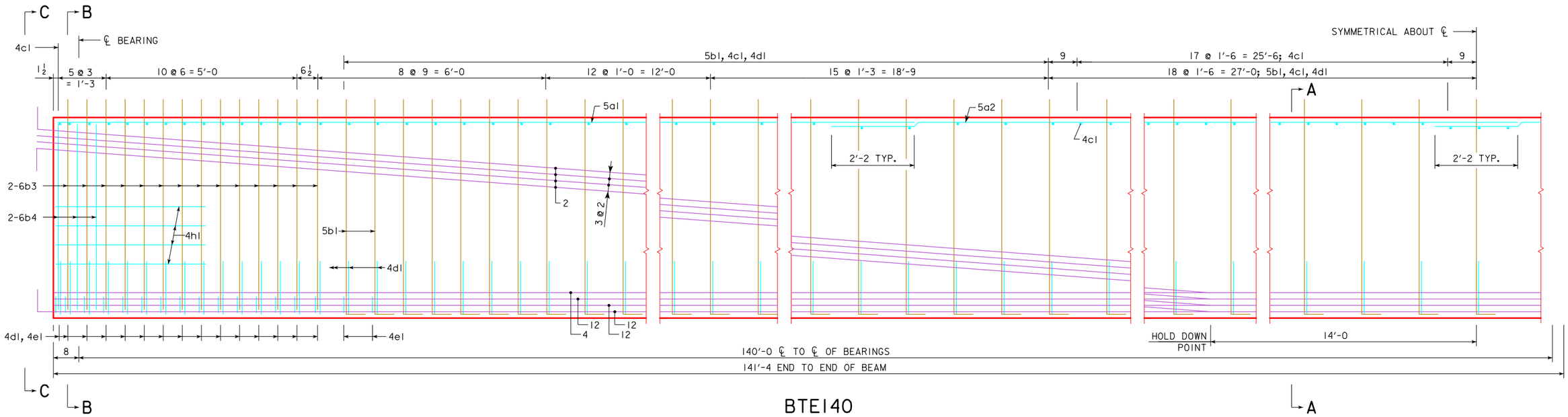
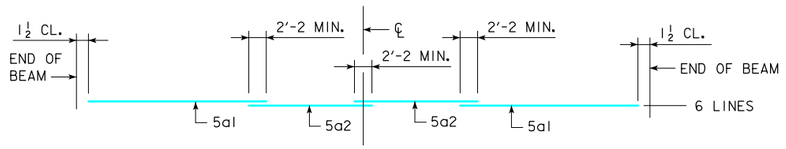
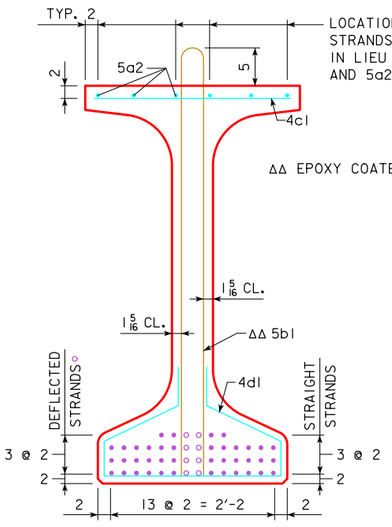


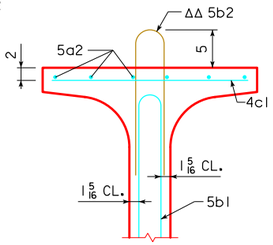

BTE140




TOP FLANGE LONGITUDINAL BAR LAYOUT

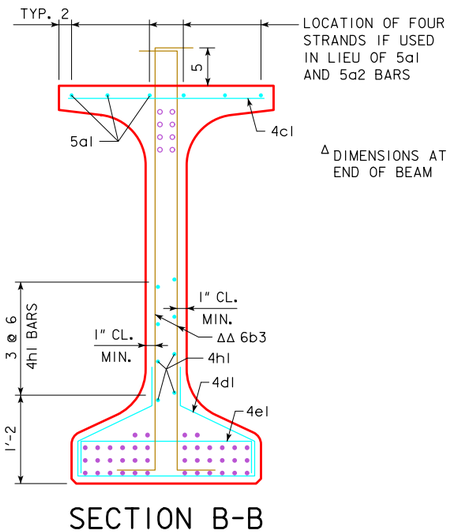



SECTION A-A

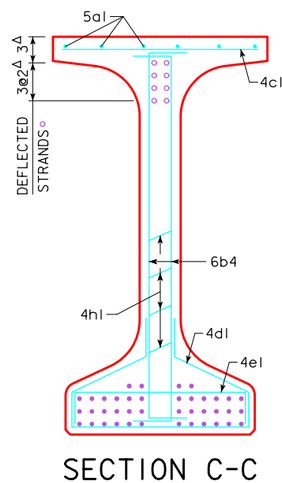



SECTION A-A (ALTERNATE)

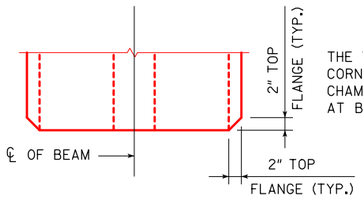
SEE ALTERNATE BAR NOTE ON DESIGN SHEET 14.




SECTION B-B




SECTION C-C

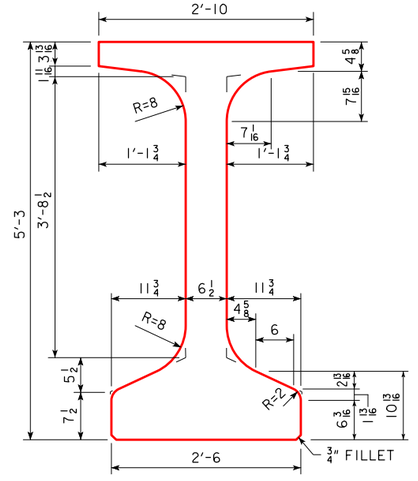



TOP VIEW

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

AREA = 807.4 in²
$\bar{y}_b$ = 28.75 in
I = 422,790 in⁴

BEAM SECTION PROPERTIES




BTE BEAM CROSS SECTION

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## BTE140 BEAM DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 15 OF 30 FILE NO. 31630 DESIGN NO. 1120

REVISED 05-12 - ALTERNATE SECTION A-A 5a1 BAR CHANGED TO 5a2.
ENGLISHBEAMS.DGN - 4787 - THIS SHEET ISSUED 02-08.

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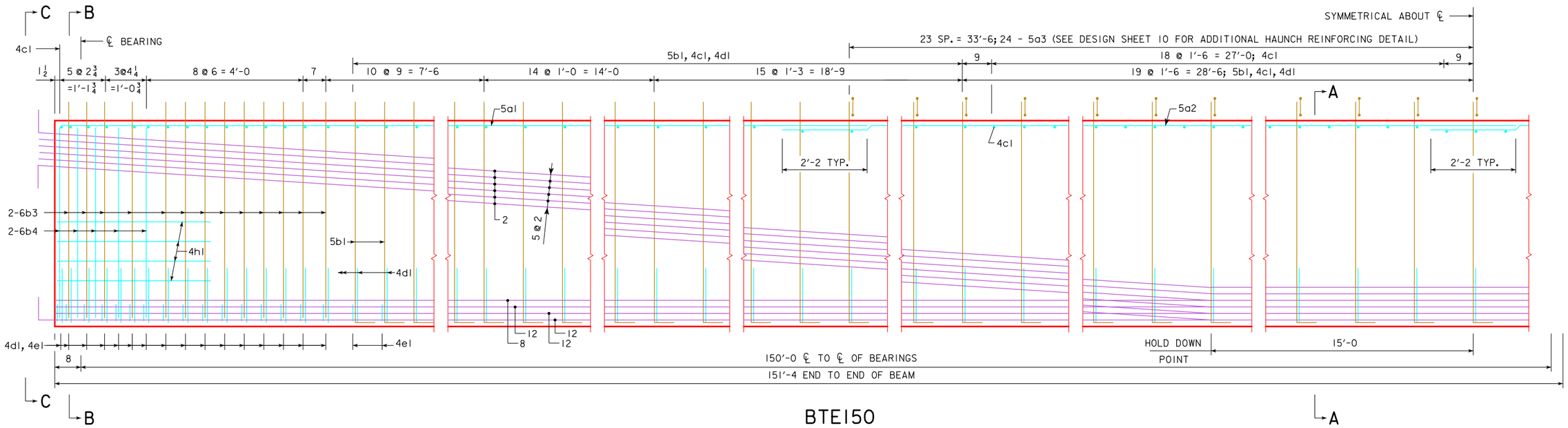
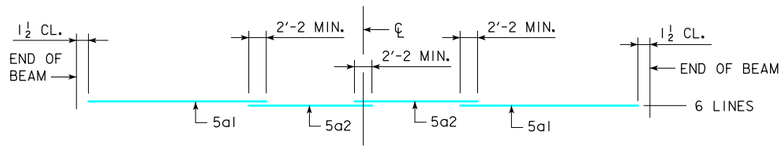
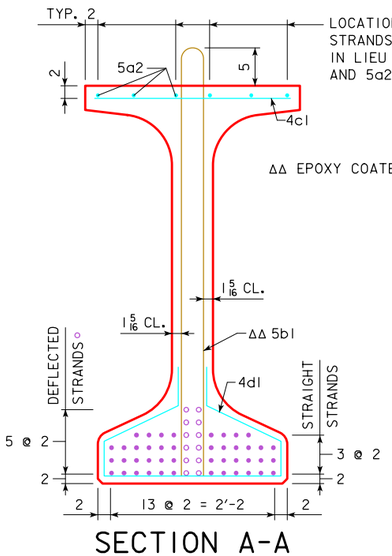


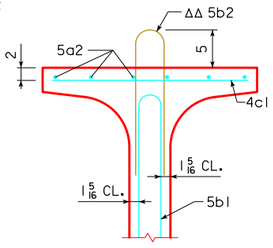

BTE150




TOP FLANGE LONGITUDINAL BAR LAYOUT

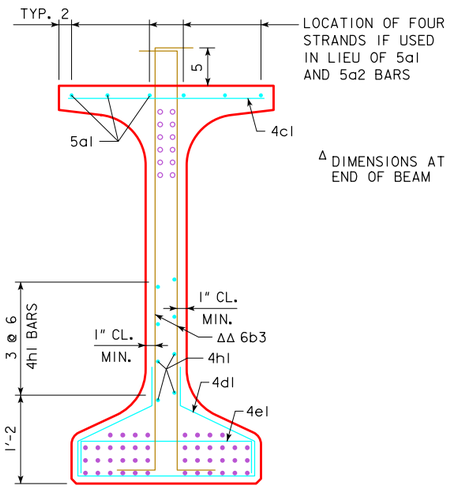



SECTION A-A

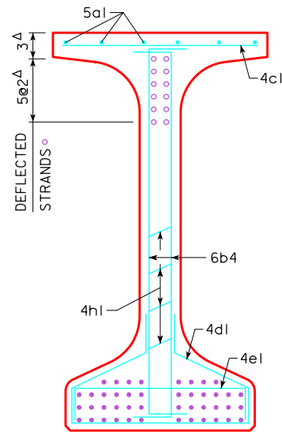



SECTION A-A (ALTERNATE)

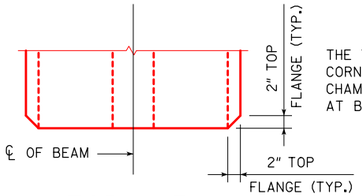
SEE ALTERNATE BAR NOTE ON DESIGN SHEET 14.




SECTION B-B




SECTION C-C

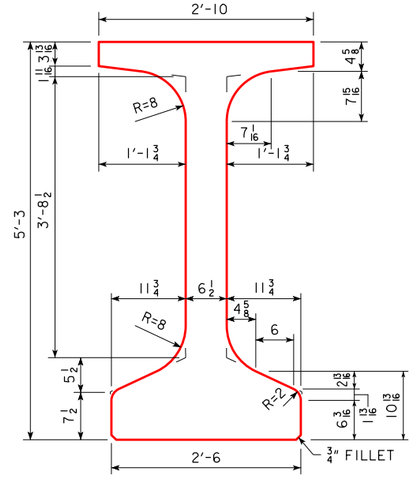



TOP VIEW

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

AREA = 807.4 in²
$\bar{y}_b$ = 28.75 in
I = 422,790 in⁴

BEAM SECTION PROPERTIES




BTE BEAM CROSS SECTION

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## BTE150 BEAM DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 16 OF 30 FILE NO. 31630 DESIGN NO. 1120

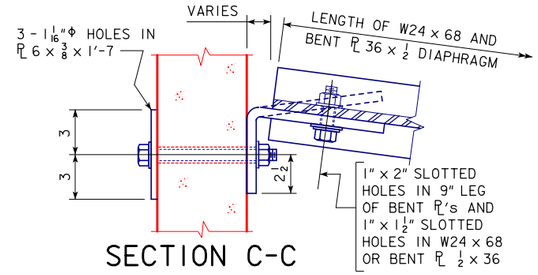
# BULB TEE "E" BEAM INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL

| ONE BEAM CONNECTION (DETAIL "D" AND/OR DETAIL "E") | | NO. OF BEAM CONNECTIONS | WEIGHT |
|---|---|---|---|
| 3 - $\frac{7}{8}$"Φ x 9$\frac{1}{4}$" H.S. BOLTS WITH NUTS & WASHERS = 7.2 LBS. | | 16 | 115 |
| | | | |
| ONE DETAIL "E" | 2 - BENT PL 9 x 6 x $\frac{1}{2}$ x 1'-7 = 80.8 LBS. | 8 | 646 |
| ONE DETAIL "D" | 1 - BACKING PL 6 x $\frac{3}{8}$ x 1'-7 = 12.1 LBS. | 8 | 97 |
| | 1 - BENT PL 9 x 6 x $\frac{1}{2}$ x 1'-7 = 40.4 LBS. | 8 | 323 |

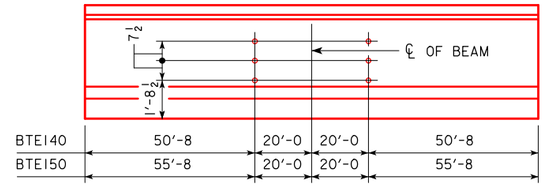
| ONE DIAPHRAGM | | | |
|---|---|---|---|
| | | NUMBER OF DIAPHRAGMS | |
| 10 - $\frac{7}{8}$"Φ x 2$\frac{1}{4}$" H.S.BOLTS WITH NUTS & WASHERS = 9.7 LBS. | | 12 | 116 |
| 18 - $\frac{7}{8}$"Φ x 2$\frac{1}{2}$" H.S.BOLTS WITH NUTS & WASHERS = 19.5 LBS. | | 8 | 156 |
| 4 - $\frac{7}{8}$"Φ x 2" H.S.BOLTS WITH NUTS & WASHERS = 4.0 LBS. | | 8 | 32 |
| 2 - PL 6$\frac{1}{2}$ x $\frac{3}{8}$ x 1'-2 = 19.5 LBS. | | 8 | 156 |
| 4 - PL 6$\frac{1}{2}$ x $\frac{1}{8}$ x 1'-2 = 12.9 LBS. | | 8 | 103 |
| | | | |
| | | | |
| | | | |
| | LENGTH OF MEMBER | | |
| 1 - W24 x 68 = 68 LBS./FT. | 7'-6$\frac{1}{2}$ | 8 | 4103 |
| 1 - BENT PL 36 x $\frac{1}{2}$ = 61.3 LBS./FT. | 7'-6$\frac{1}{2}$ | 4 | 1849 |
| 1 - WI4 x 38 = 38 LBS./FT. | 6'-1$\frac{5}{8}$ | 8 | 1865 |
| | | | |
| | | | |
| INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL - TOTAL (LB) | | | 9561 |

| STRUCTURAL STEEL | |
|---|---|
| WEIGHT | 9561 LB |
| | |

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




SECTION C-C




INTERMEDIATE DIAPHRAGM BOLT HOLE LOCATIONS

## NOTES:

ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.

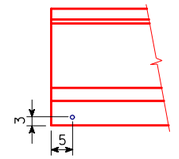
SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.

ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.

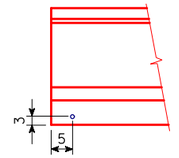
THE 1$\frac{1}{2}$"Φ HOLES FOR THE $\frac{7}{8}$"Φ H.S. BOLTS SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.

THE $\frac{7}{8}$"Φ 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.




INTEGRAL ABUT.




FIXED PIER

BEAM COIL TIE LOCATIONS

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11$\frac{1}{4}$ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## INTERMEDIATE DIAPHRAGM DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 17 OF 30 FILE NO. 31630 DESIGN NO. 1120

ENGLISHBEAMS.DGN - 1036-1-BTE - THIS SHEET ISSUED 06-14. SHEET 1 OF 2.

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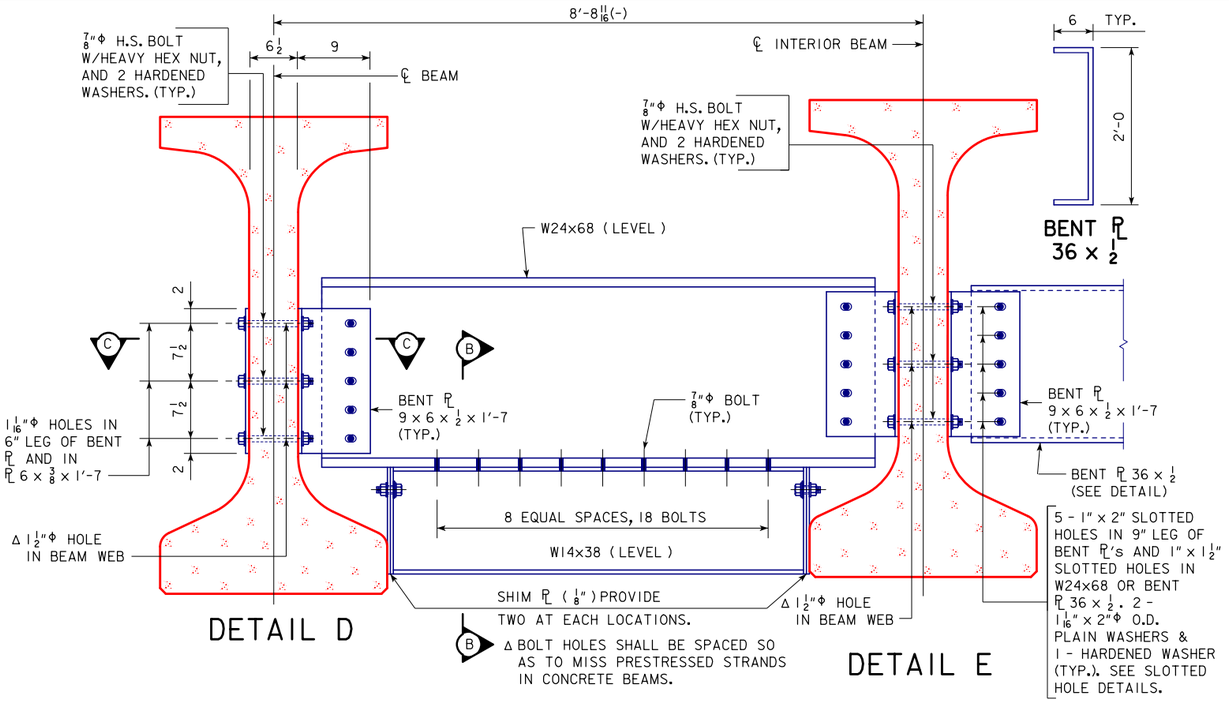
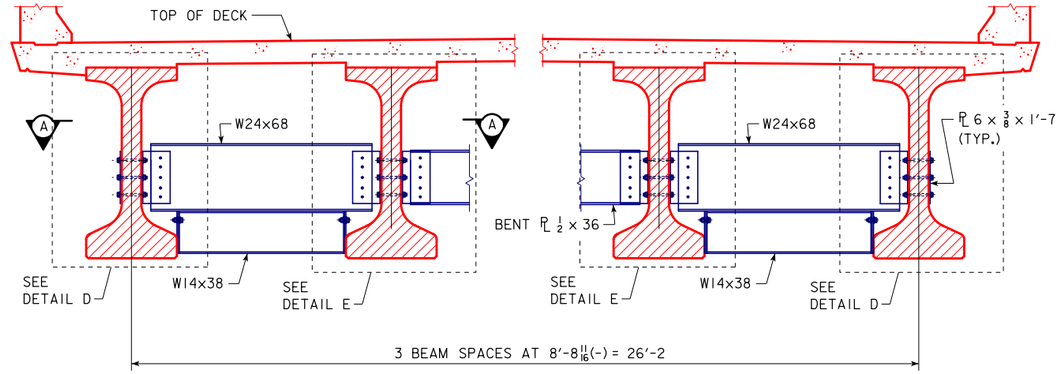
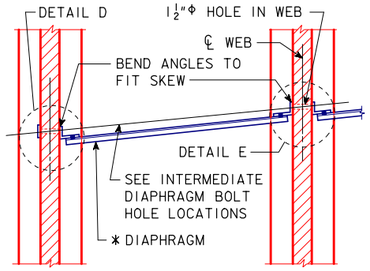



## SECTION SHOWING INTERMEDIATE DIAPHRAGMS AT EXTERIOR BAY OVER TRAVELED ROADWAY SPANS

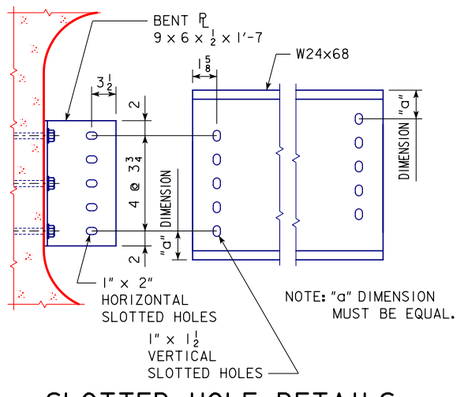
NOTE: W24x68 AND WI4x38 SHALL BE INSTALLED ONLY IN THE OUTSIDE BAYS OVER THE TRAVELED ROADWAY.




## SECTION SHOWING INTERMEDIATE DIAPHRAGM

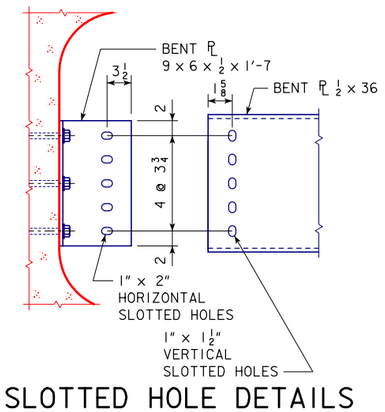



## PART SECTION A-A

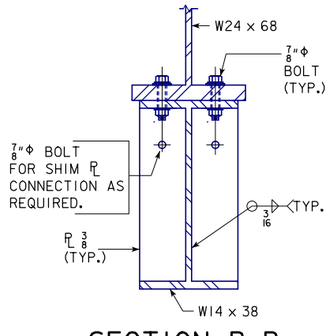



## SLOTTED HOLE DETAILS

* NOTE: THE WI4 x 38 WILL REQUIRE BEVELED ENDS TO MATCH THE SKEW.




## SLOTTED HOLE DETAILS




## SECTION B-B

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## INTERMEDIATE DIAPHRAGM DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 18 OF 30 FILE NO. 31630 DESIGN NO. 1120

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

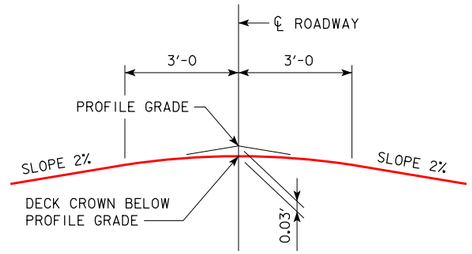
CONTROL POINT NO. 13: NORTHING 7939541.987, EASTING 20566200.750,
ELEV. 780.030, SET FENO MONUMENT 12" DEEP STAMPED "CP13"

## TOP OF DECK ELEVATIONS

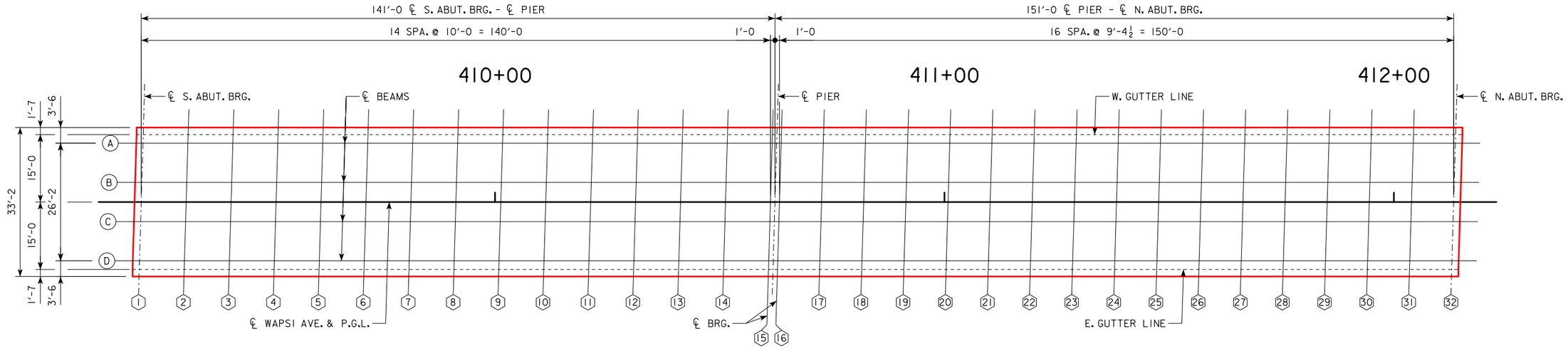
| | ℄ S. ABUT. BRG. | | | | | | | | | | | | | | ℄ PIER BEARINGS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOCATION | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ | ⑮ | ⑯ | ⑰ | ⑱ | ⑲ | ⑳ | ㉑ | ㉒ | ㉓ | ㉔ | ㉕ | ㉖ | ㉗ |
| W. GUTTER LINE | 817.60 | 817.91 | 818.21 | 818.50 | 818.79 | 819.06 | 819.33 | 819.59 | 819.84 | 820.08 | 820.31 | 820.53 | 820.75 | 820.95 | 821.15 | 821.19 | 821.36 | 821.53 | 821.69 | 821.84 | 821.99 | 822.12 | 822.25 | 822.37 | 822.49 | 822.59 | 822.69 |
| BEAM LINE A | 817.63 | 817.95 | 818.25 | 818.54 | 818.82 | 819.10 | 819.37 | 819.63 | 819.87 | 820.12 | 820.35 | 820.57 | 820.78 | 820.99 | 821.19 | 821.23 | 821.40 | 821.57 | 821.73 | 821.88 | 822.02 | 822.16 | 822.29 | 822.41 | 822.52 | 822.63 | 822.73 |
| BEAM LINE B | 817.80 | 818.11 | 818.41 | 818.71 | 818.99 | 819.27 | 819.53 | 819.79 | 820.04 | 820.28 | 820.52 | 820.74 | 820.95 | 821.16 | 821.36 | 821.39 | 821.57 | 821.74 | 821.90 | 822.05 | 822.19 | 822.33 | 822.46 | 822.58 | 822.69 | 822.80 | 822.90 |
| ℄ WAPSI AVE. & PGL | 817.85 | 818.16 | 818.47 | 818.76 | 819.05 | 819.32 | 819.59 | 819.85 | 820.10 | 820.34 | 820.57 | 820.79 | 821.01 | 821.21 | 821.41 | 821.45 | 821.62 | 821.79 | 821.95 | 822.10 | 822.25 | 822.39 | 822.52 | 822.64 | 822.75 | 822.86 | 822.96 |
| BEAM LINE C | 817.79 | 818.10 | 818.41 | 818.70 | 818.98 | 819.26 | 819.53 | 819.79 | 820.04 | 820.28 | 820.51 | 820.73 | 820.95 | 821.15 | 821.35 | 821.39 | 821.57 | 821.73 | 821.89 | 822.05 | 822.19 | 822.33 | 822.46 | 822.58 | 822.69 | 822.80 | 822.90 |
| BEAM LINE D | 817.61 | 817.92 | 818.22 | 818.52 | 818.80 | 819.08 | 819.35 | 819.61 | 819.86 | 820.10 | 820.33 | 820.55 | 820.77 | 820.97 | 821.17 | 821.21 | 821.39 | 821.55 | 821.71 | 821.87 | 822.01 | 822.15 | 822.28 | 822.40 | 822.51 | 822.62 | 822.72 |
| E. GUTTER LINE | 817.57 | 817.88 | 818.18 | 818.48 | 818.76 | 819.04 | 819.31 | 819.57 | 819.82 | 820.06 | 820.29 | 820.51 | 820.73 | 820.94 | 821.13 | 821.17 | 821.35 | 821.51 | 821.68 | 821.83 | 821.97 | 822.11 | 822.24 | 822.36 | 822.48 | 822.58 | 822.68 |

## TOP OF DECK ELEVATIONS

| | | | | | ℄ N. ABUT. BRG. |
|---|---|---|---|---|---|
| LOCATION | ㉘ | ㉙ | ㉚ | ㉛ | ㉜ |
| W. GUTTER LINE | 822.78 | 822.86 | 822.94 | 823.00 | 823.06 |
| BEAM LINE A | 822.82 | 822.90 | 822.98 | 823.04 | 823.10 |
| BEAM LINE B | 822.99 | 823.07 | 823.15 | 823.22 | 823.28 |
| ℄ WAPSI AVE. & PGL | 823.05 | 823.13 | 823.20 | 823.27 | 823.33 |
| BEAM LINE C | 822.99 | 823.07 | 823.15 | 823.21 | 823.27 |
| BEAM LINE D | 822.81 | 822.89 | 822.97 | 823.04 | 823.10 |
| E. GUTTER LINE | 822.77 | 822.86 | 822.93 | 823.00 | 823.06 |




CROWN TEMPLATE
NO SCALE




TOP OF DECK ELEVATIONS LAYOUT

NOTE: ALL LONGITUDINAL DIMENSIONS SHOWN ARE ALONG GRADE.

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## TOP OF DECK ELEVATIONS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 19 OF 30 FILE NO. 31630 DESIGN NO. 1120

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CONTROL POINT NO. 13: NORTHING 7939541.987, EASTING 20566200.750, ELEV. 780.030, SET FENO MONUMENT 12" DEEP STAMPED "CP13"

## TABLE OF BEAM LINE HAUNCH ELEVATIONS

| LOCATION | ℄ S. ABUT. BRG. ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ | ℄ PIER BEARINGS ⑮ | ⑯ | ⑰ | ⑱ | ⑲ | ⑳ | ㉑ | ㉒ | ㉓ | ㉔ | ㉕ | ㉖ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BEAM LINE A | 816.97 | 817.35 | 817.72 | 818.07 | 818.41 | 818.72 | 819.01 | 819.28 | 819.52 | 819.74 | 819.93 | 820.10 | 820.26 | 820.40 | 820.52 | 820.56 | 820.81 | 821.06 | 821.29 | 821.50 | 821.70 | 821.87 | 822.02 | 822.15 | 822.25 | 822.34 |
| BEAM LINE B | 817.13 | 817.52 | 817.89 | 818.24 | 818.58 | 818.89 | 819.18 | 819.45 | 819.69 | 819.90 | 820.10 | 820.27 | 820.43 | 820.56 | 820.69 | 820.73 | 820.98 | 821.23 | 821.46 | 821.67 | 821.87 | 822.04 | 822.19 | 822.32 | 822.43 | 822.51 |
| BEAM LINE C | 817.13 | 817.51 | 817.88 | 818.23 | 818.57 | 818.88 | 819.17 | 819.44 | 819.68 | 819.90 | 820.09 | 820.27 | 820.42 | 820.56 | 820.68 | 820.72 | 820.98 | 821.22 | 821.45 | 821.67 | 821.86 | 822.04 | 822.19 | 822.32 | 822.42 | 822.51 |
| BEAM LINE D | 816.94 | 817.33 | 817.70 | 818.05 | 818.39 | 818.70 | 818.99 | 819.26 | 819.50 | 819.72 | 819.91 | 820.09 | 820.24 | 820.38 | 820.51 | 820.54 | 820.80 | 821.04 | 821.28 | 821.49 | 821.68 | 821.86 | 822.01 | 822.14 | 822.25 | 822.33 |

## MISCELLANEOUS DATA TABLE

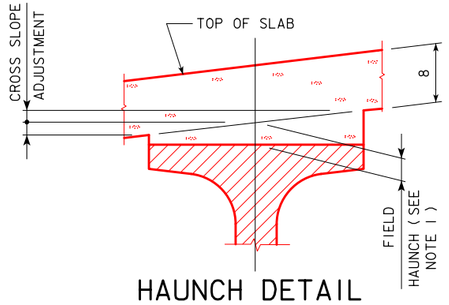
| | BEAM LINE | ℄ S. ABUT. BRG. ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ | ⑩ | ⑪ | ⑫ | ⑬ | ⑭ | ℄ PIER BEARINGS ⑮ | ⑯ | ⑰ | ⑱ | ⑲ | ⑳ | ㉑ | ㉒ | ㉓ | ㉔ | ㉕ | ㉖ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANTICIPATED DEFLECTION DUE TO SLAB (IN.) | ALL | 0 | $\frac{7}{8}$ | $1\frac{11}{16}$ | $2\frac{7}{16}$ | 3 | $3\frac{7}{16}$ | $3\frac{3}{4}$ | $3\frac{13}{16}$ | $3\frac{3}{4}$ | $3\frac{7}{16}$ | 3 | $2\frac{7}{16}$ | $1\frac{11}{16}$ | $\frac{7}{8}$ | 0 | 0 | $\frac{15}{16}$ | $1\frac{7}{8}$ | $2\frac{3}{4}$ | $3\frac{7}{16}$ | $4\frac{1}{16}$ | $4\frac{1}{2}$ | $4\frac{3}{4}$ | $4\frac{7}{8}$ | $4\frac{3}{4}$ | $4\frac{1}{2}$ |
| CROSS SLOPE ADJUSTMENTS (IN.) | ALL | $\pm\frac{5}{16}$ | | | | | | | | | | | | | | | | | | | | | | | | | |
| ALLOWABLE FIELD HAUNCH (IN. & FT.) | MAX. ALL | $2\frac{1}{2}$ (0.208) | | | | | | | | | | | | | | | | | | | | | | | | $3\frac{1}{2}$ (0.292) | |
| | MIN. ALL | $-\frac{3}{16}$ (-0.016) | | | | | | | | | | | | | | | | | | | | | | | | $\frac{1}{2}$ (0.042) | |

## TABLE OF BEAM LINE HAUNCH ELEVATIONS

| LOCATION | ㉗ | ㉘ | ㉙ | ㉚ | ㉛ | ℄ N. ABUT. BRG. ㉜ |
|---|---|---|---|---|---|---|
| BEAM LINE A | 822.40 | 822.44 | 822.46 | 822.47 | 822.46 | 822.44 |
| BEAM LINE B | 822.57 | 822.61 | 822.63 | 822.64 | 822.63 | 822.61 |
| BEAM LINE C | 822.57 | 822.61 | 822.63 | 822.64 | 822.63 | 822.61 |
| BEAM LINE D | 822.39 | 822.43 | 822.45 | 822.46 | 822.45 | 822.43 |

## MISCELLANEOUS DATA TABLE

| | BEAM LINE | ㉗ | ㉘ | ㉙ | ㉚ | ㉛ | ℄ N. ABUT. BRG. ㉜ |
|---|---|---|---|---|---|---|---|
| ANTICIPATED DEFLECTION DUE TO SLAB (IN.) | ALL | $4\frac{1}{16}$ | $3\frac{7}{16}$ | $2\frac{3}{4}$ | $1\frac{7}{8}$ | $\frac{15}{16}$ | 0 |
| CROSS SLOPE ADJUSTMENTS (IN.) | ALL | $\pm\frac{5}{16}$ | | | | | |
| ALLOWABLE FIELD HAUNCH (IN. & FT.) | MAX. ALL | $2\frac{1}{2}$ (0.208) | | | | | |
| | MIN. ALL | $-\frac{3}{16}$ (-0.016) | | | | | |




HAUNCH DETAIL

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.

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

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## HAUNCH DATA DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 20 OF 30 FILE NO. 31630 DESIGN NO. 1120

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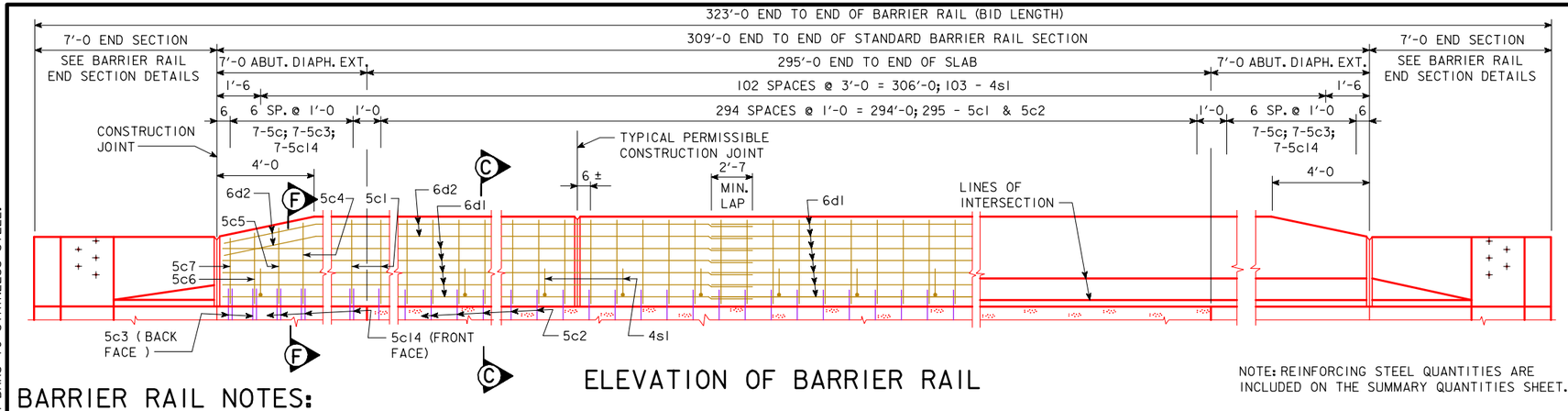
REVISED 09-2016 - CHANGED 5c1 BAR LENGTH TO 7'-5 (IT WAS 5'-11 IN ERROR).
ENGLISHDECKRAILBRIDGES.DGN 1020SF - THIS SHEET ISSUED 04-14 - ADDED STAINLESS STEEL REINFORCING BAR LIST AND CHANGED 5c2, 5c3, 5c14 BARS TO STAINLESS STEEL.




## ELEVATION OF BARRIER RAIL

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.

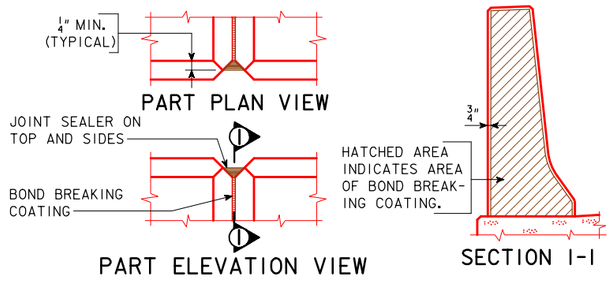
ALL BARRIER RAIL REINFORCING STEEL IS TO BE EITHER EPOXY COATED OR STAINLESS STEEL AS SHOWN. THE STAINLESS STEEL REINFORCING STEEL SHALL BE DEFORMED BAR GRADE 60 MEETING THE REQUIREMENTS OF MATERIALS I.M. 452.

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 3'-8 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.

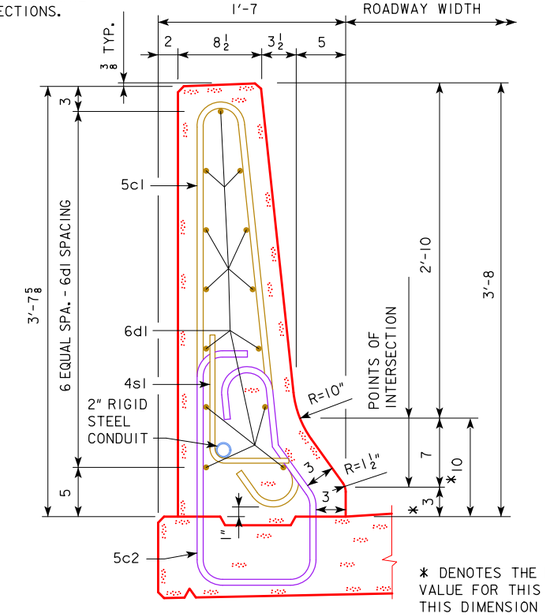
TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL ℄ GRADE, EXCEPT AT THE SPECIAL SECTIONS.

CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 3.46 SQUARE FEET EXCEPT THE 4'-0 SLOPED ENDS AT THE END SECTIONS.

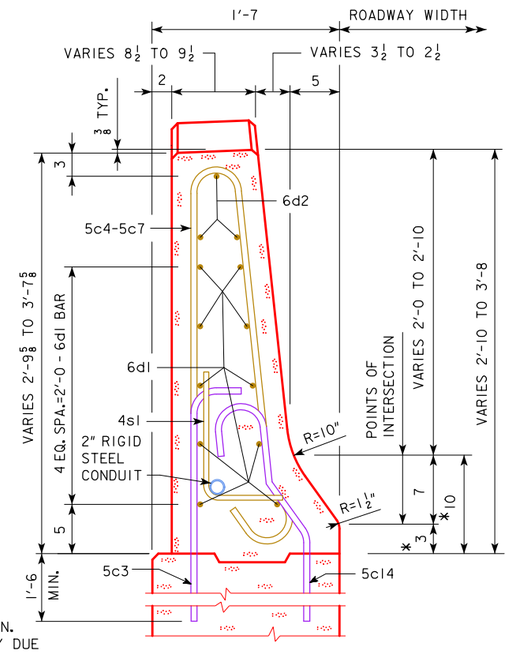



## BARRIER RAIL JOINT DETAILS

NOTE: ALL LONGITUDINAL DIMENSIONS SHOWN ARE ALONG GRADE.




## PART SECTION C-C




## PART SECTION F-F

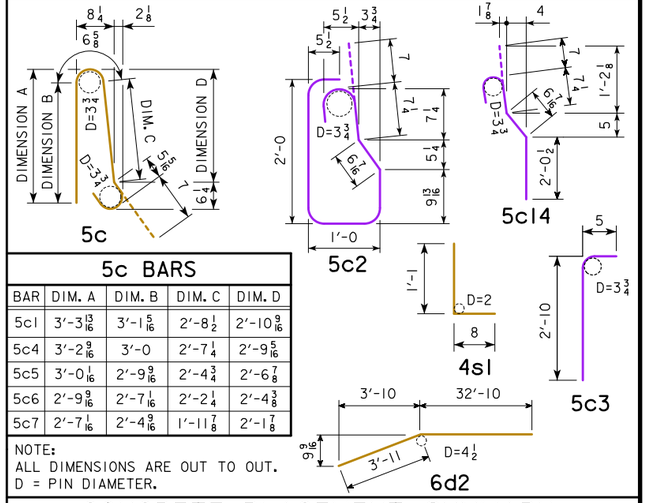
## EPOXY COATED REINF. STEEL - TWO RAILS

| SECTION | BAR | LOCATION | SHAPE | NO. | LENGTH | WEIGHT |
|---|---|---|---|---|---|---|
| STANDARD SECTIONS | 5c1 | RAIL, VERTICAL | | 602 | 7'-5 | 4657 |
| | 5c4 | RAIL, VERTICAL, TOP SLOPED ENDS | | 4 | 7'-3 | 30 |
| | 5c5 | RAIL, VERTICAL, TOP SLOPED ENDS | | 4 | 6'-10 | 29 |
| | 5c6 | RAIL, VERTICAL, TOP SLOPED ENDS | | 4 | 6'-5 | 27 |
| | 5c7 | RAIL, VERTICAL, TOP SLOPED ENDS | | 4 | 6'-0 | 25 |
| | 6d1 | RAIL, LONGITUDINAL | | 222 | 36'-8 | 12,226 |
| | 6d2 | RAIL, LONGITUDINAL AT ENDS | | 12 | 36'-9 | 662 |
| | 4s1 | RAIL, CONDUIT | | 206 | 1'-9 | 241 |
| | | | EPOXY STEEL TOTAL (LB) | | | 17,897 |

## STAINLESS STEEL REINF. STEEL - TWO RAILS

| SECTION | BAR | LOCATION | SHAPE | NO. | LENGTH | WEIGHT |
|---|---|---|---|---|---|---|
| STANDARD SECTIONS | 5c2 | RAIL, VERTICAL | | 590 | 6'-0 | 3692 |
| | 5c3 | RAIL, VERTICAL | | 28 | 3'-3 | 95 |
| | 5c14 | RAIL, VERTICAL | | 28 | 3'-10 | 112 |
| | | | STAINLESS STEEL TOTAL (LB) | | | 3899 |

## BENT BAR DETAILS




### 5c BARS

| BAR | DIM. A | DIM. B | DIM. C | DIM. D |
|---|---|---|---|---|
| 5c1 | 3'-3 13/16 | 3'-1 5/16 | 2'-8 1/2 | 2'-10 9/16 |
| 5c4 | 3'-2 9/16 | 3'-0 | 2'-7 1/4 | 2'-9 5/16 |
| 5c5 | 3'-0 1/16 | 2'-9 9/16 | 2'-4 3/4 | 2'-6 7/8 |
| 5c6 | 2'-9 9/16 | 2'-7 1/16 | 2'-2 1/4 | 2'-4 3/8 |
| 5c7 | 2'-7 1/16 | 2'-4 9/16 | 1'-11 7/8 | 2'-1 7/8 |

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

## CONCRETE PLACEMENT SUMMARY

| | SECTION | | TOTAL |
|---|---|---|---|
| Δ | STANDARD SECTION | 618.0 @ 0.1281 CY PER FT. | 79.0 |
| | | | |
| | | TOTAL (CY) | 79.0 |

Δ DEDUCT 0.044 CU. YD. FOR ONE SLOPED END.

## CONCRETE BARRIER RAIL QUANTITIES

| ITEM | UNIT | QUANTITY |
|---|---|---|
| CONCRETE BARRIER RAILING, 3'-8 | LF | 646.0 |
| | | |

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## BARRIER RAIL DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 21 OF 30 FILE NO. 31630 DESIGN NO. 1120

| DESIGN TEAM T.J.C. / J.S.I. / J.A.E. Foth | 3'-8 BARRIER RAIL -- INTEGRAL ABUTMENTS WITH WING EXTENSIONS | STANDARD SHEET 1020SF | JOHNSON COUNTY | PROJECT NUMBER IM-080-7(152)251--13-52 | SHEET NUMBER 22 |
|---|---|---|---|---|---|

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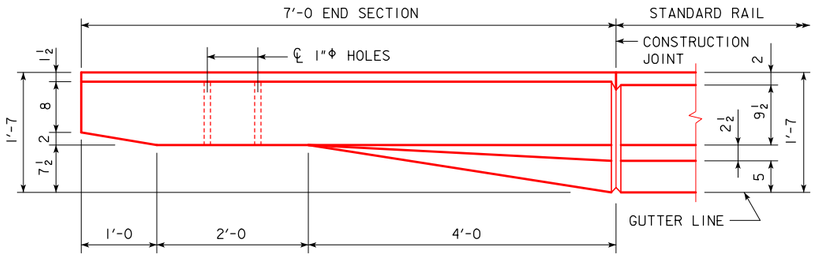
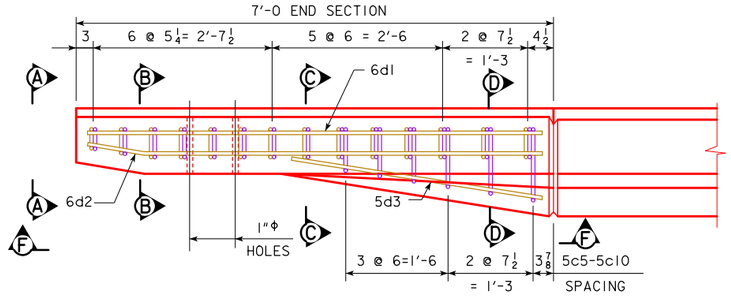
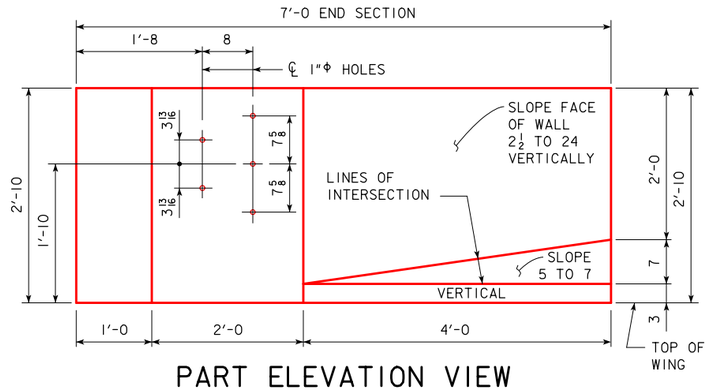



## PART PLAN VIEW

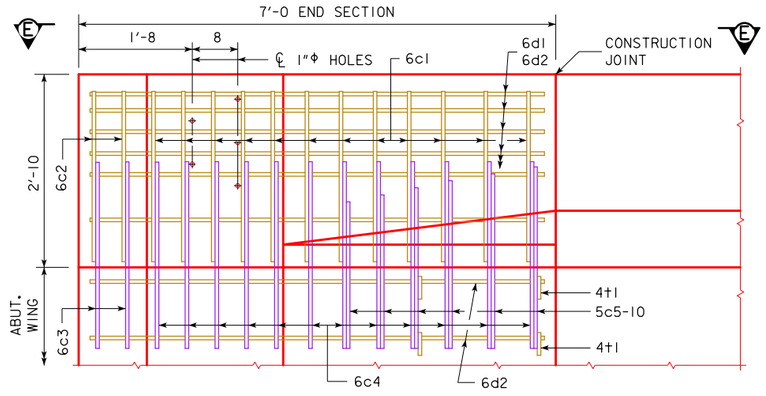



## PART VIEW E-E

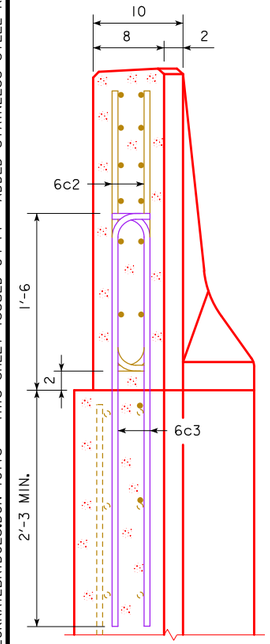



## PART ELEVATION VIEW

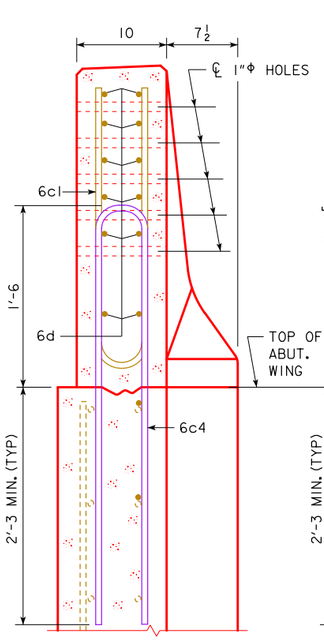
PROVIDE 5 HOLES FORMED WITH 1"Φ PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



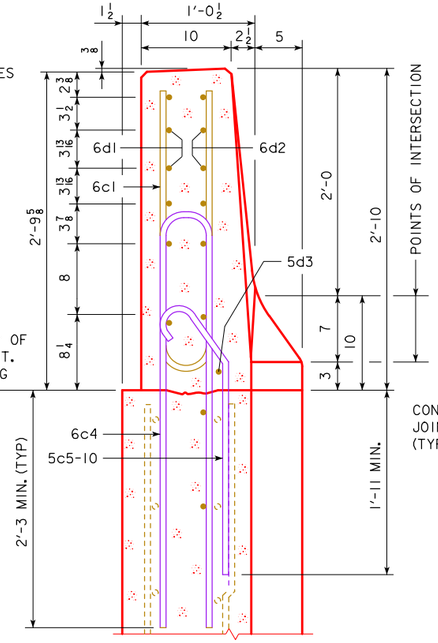

## PART VIEW F-F



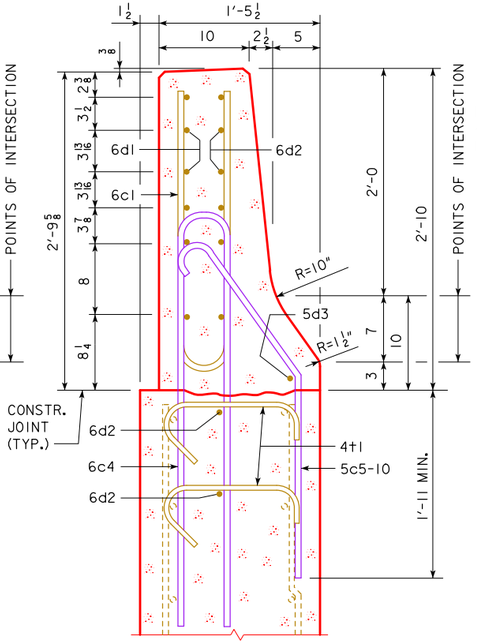

## VIEW A-A




## SECTION B-B




## SECTION C-C




## SECTION D-D

NOTE:
4t1 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 1½" 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 4t1 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 |
| | | | | | |
| 4t1 | RAIL, ABUTMENT WING TIE BARS | | 4 | VARIES | 5 |
| | | | | | |
| | | | EPOXY REINF. TOTAL WEIGHT (LB) | | 266 |

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

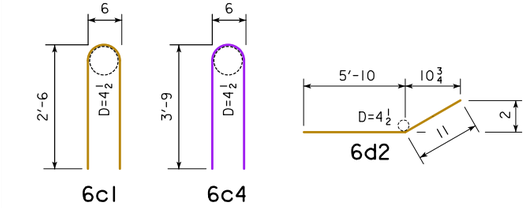
| BAR | LOCATION | SHAPE | NO. | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| 6c3 | RAIL, VERTICAL | | 4 | 4'-1 | 25 |
| 6c4 | RAIL, VERTICAL | | 12 | 8'-0 | 144 |
| 5c5-10 | RAIL, VERTICAL | | 6 | VARIES | 23 |
| | | | | | |
| | | | STAINLESS STEEL TOTAL WEIGHT (LB) | | 192 |

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

## CONCRETE PLACEMENT SUMMARY

| SECTION | TOTAL |
|---|---|
| BARRIER RAIL ONE END SECTION | 0.65 CY |
| | |

## BENT BAR DETAILS




| BAR | "X" |
|---|---|
| 5c5 | 0'-6½ |
| 5c6 | 0'-8½ |
| 5c7 | 0'-10¼ |
| 5c8 | 1'-0¼ |
| 5c9 | 1'-2 |
| 5c10 | 1'-4 |

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

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## BARRIER END SECTION DETAILS

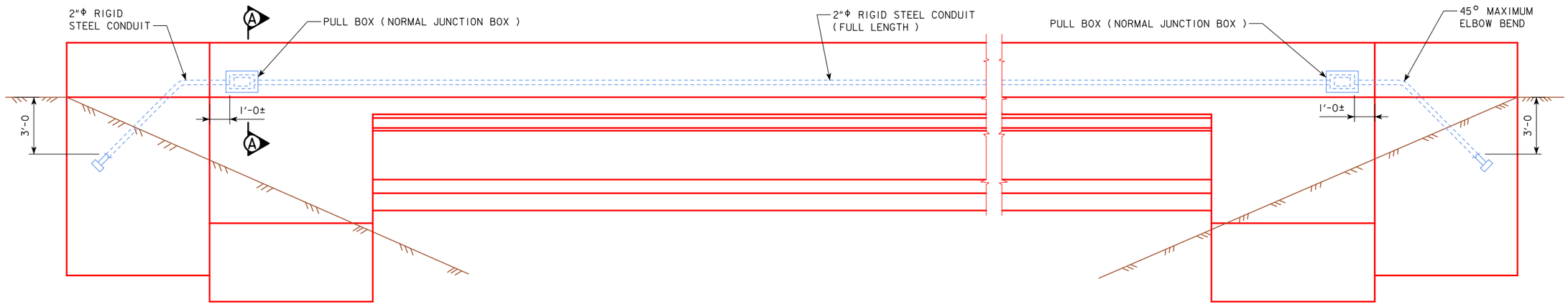
STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

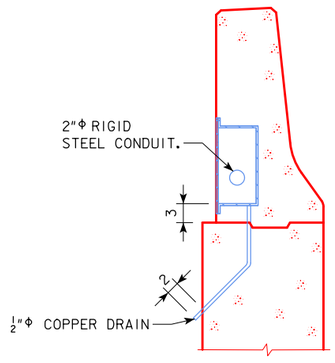
DESIGN SHEET NO. 22 OF 30 FILE NO. 31630 DESIGN NO. 1120

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

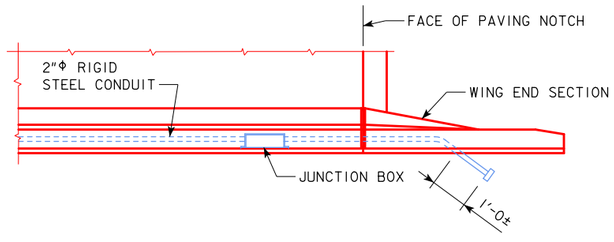



# EXTERIOR ELEVATION - EAST & WEST BARRIER RAIL

NOTE:
GALVANIZED CONDUIT SHALL NOT COME INTO CONTACT
WITH THE STAINLESS STEEL REINFORCING.




SECTION A-A




PART PLAN AT WING

DESIGN FOR 1°40'49.81" SKEW (L.A.)

291'-11¼ x 30'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

LIGHTING DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

JOHNSON COUNTY

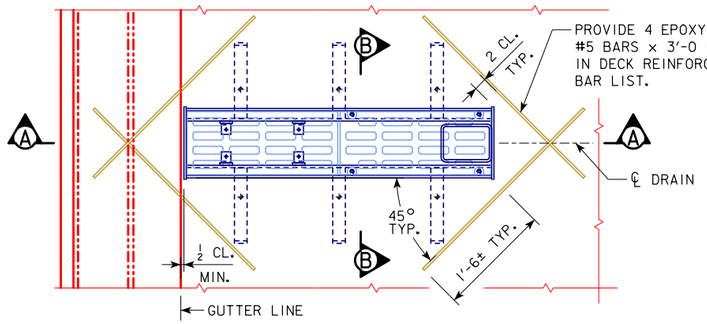
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 23 OF 30 FILE NO. 31630 DESIGN NO. 1120

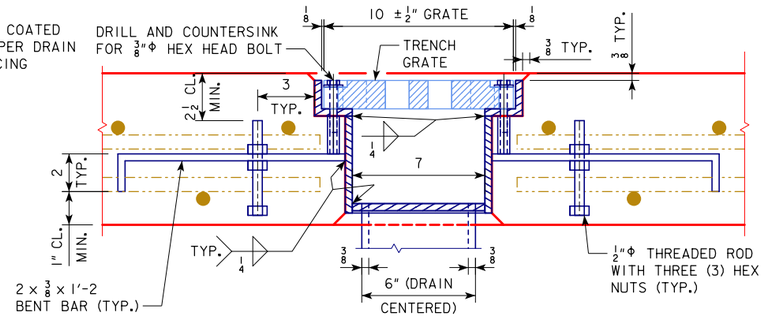
REVISION 05-11 - ADDED THE WORD 'MINIMUM' TO THE 3½ INCH DIMENSION FOR THE LOCATION OF THE 2 INCH CONDUIT IN THE BARRIER RAIL.
REVISED 09-2016 - ADDED CONDUIT SUPPORT RAIL DETAIL TO KEEP CONDUIT ISOLATED FROM THE STAINLESS STEEL REINFORCING.
ENGLISHDECKRAILBRIDGES.DGN 1030AS2 - THIS SHEET ISSUED 09-03.




3/19/2021 12:33:35 PM untitled pw:\\projectwise.dot.int.lan:PWMain\Documents\Projects\5208002016\BRFinal\Foth\BRG_52080152.dgn 521120S023 11x17_pdf.pltcfg

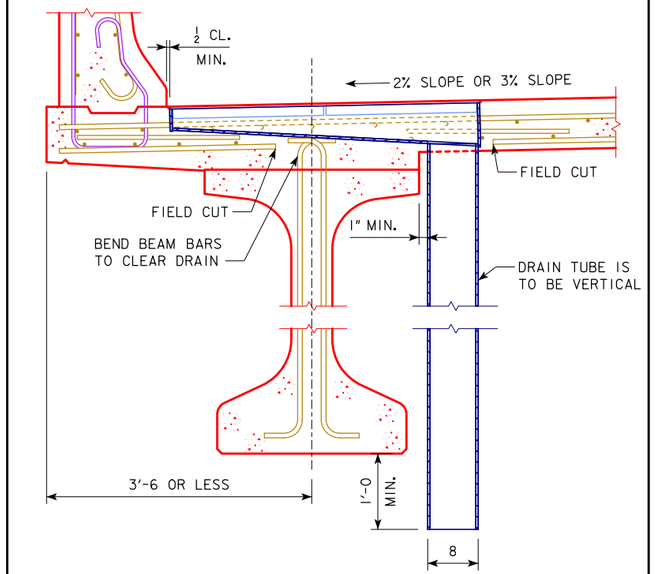



PART PLAN AT DRAIN




PART SECTION B-B - SHOWING DTL. B OPTION

(DETAIL IS SHOWN USING 10" WIDE GRATE)




PART SECTION A-A

## DRAIN NOTES

THE DRAINS SHALL BE ⅜ INCH THICK STEEL. THE DRAIN ASSEMBLIES SHALL BE GALVANIZED AFTER FABRICATION. THE BID ITEM "DECK DRAIN" SHALL INCLUDE ALL COSTS ASSOCIATED WITH FABRICATING AND INSTALLING THE DECK DRAINS AS PER PLAN.

THE DRAIN TRENCH GRATES SHALL BE FERROUS CASTINGS. METAL USED IN THE MANUFACTURE OF CASTINGS SHALL CONFORM TO ASTM A48-83 CLASS 35B OR BETTER GRAY IRON CASTINGS IN ACCORDANCE WITH CURRENT IOWA D.O.T. STANDARD SPECIFICATIONS. FINISH OF CASTINGS SHALL BE SMOOTH AND FREE OF DEFECTS. TRENCH GRATES SHALL BE CAPABLE OF CARRYING AASHTO HL-93 LOADING. GALVANIZING OF THE TRENCH GRATES IS NOT REQUIRED.

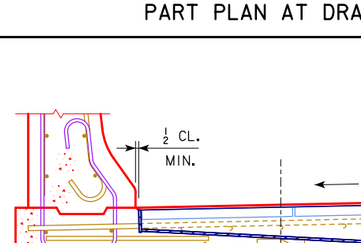
DRAINS SHALL BE CENTERED OVER THE NEAREST BOTTOM TRANSVERSE DECK REINFORCING BAR FROM THE LOCATION DESIGNATED ON THE SITUATION PLAN. THE BOTTOM TRANSVERSE DECK REINFORCING BAR SHALL BE CUT OFF TO PROVIDE 1 INCH CLEARANCE FROM THE DRAIN. THE TOP TRANSVERSE DECK REINFORCING BARS ON EACH SIDE OF THE DRAIN, SHALL BE SPACED AS NECESSARY TO PROVIDE 1 INCH CLEARANCE FROM THE DRAIN. LONGITUDINAL DECK REINFORCING BARS THAT CONFLICT WITH THE DRAIN SHALL BE CUT OFF TO PROVIDE 2 INCH CLEARANCE FROM THE DRAIN. ALL CUT ENDS OF BARS SHALL BE COATED WITH EPOXY PATCHING MATERIAL SUPPLIED BY THE MANUFACTURER OF THE EPOXY COATING. LONGITUDINAL DECK REINFORCING BARS SHALL BE SHIFTED AS NECESSARY TO ACCOMMODATE ANCHOR BARS.

## MATERIALS

PLATES, BARS, THREADED RODS AND ANGLES SHALL MEET THE REQUIREMENTS ASTM A709 GRADE 36. THE TUBE STEEL SHALL MEET THE REQUIREMENTS ASTM A500 GRADE B.

⅜"Φ MECHANICALLY GALVANIZED STEEL FLAT HEAD SCREW SHALL MEET THE REQUIREMENTS OF ASTM B695-04 (2009) AND ASTM F835-12.

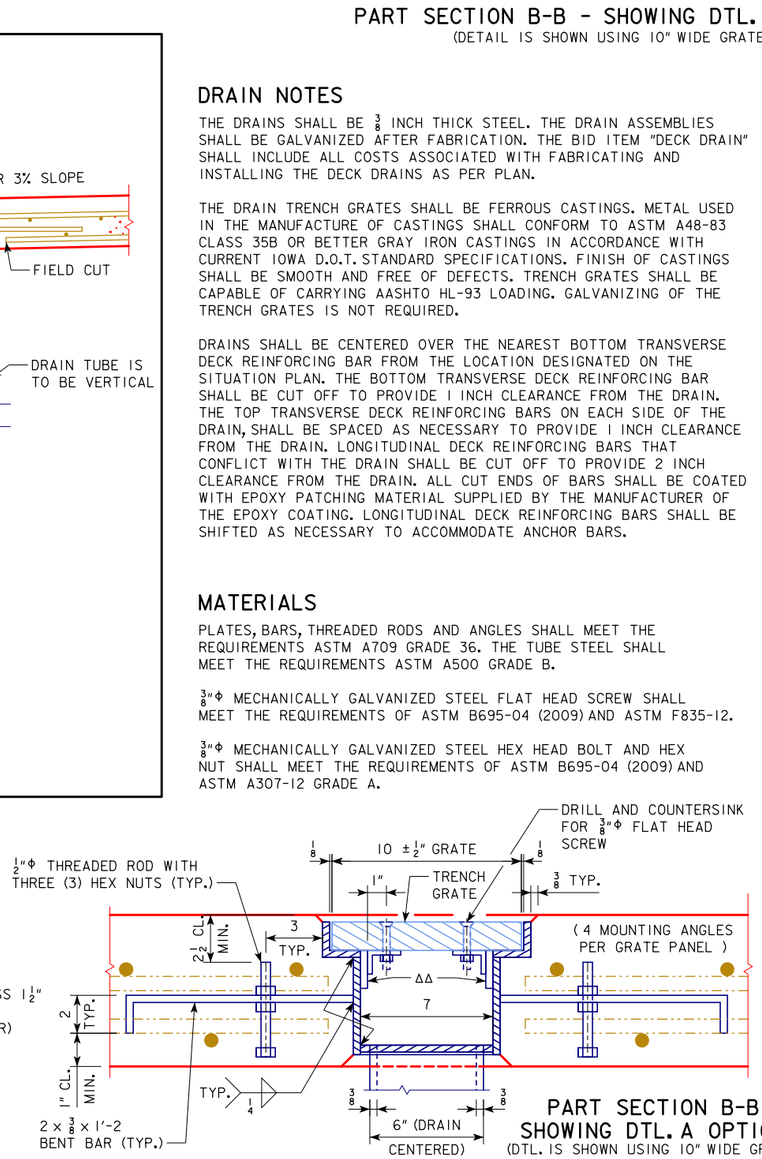
⅜"Φ MECHANICALLY GALVANIZED STEEL HEX HEAD BOLT AND HEX NUT SHALL MEET THE REQUIREMENTS OF ASTM B695-04 (2009) AND ASTM A307-12 GRADE A.




DRAIN TRENCH GRATE DETAILS

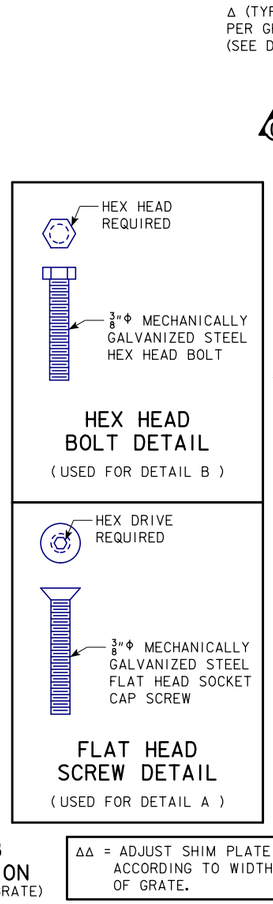
( 2 GRATES REQUIRED PER DRAIN )

NOTE: PATTERN AND DIRECTION OF GRATE OPENINGS SHALL BE SIMILAR TO THE PATTERN SHOWN.




PART SECTION B-B SHOWING DTL. A OPTION

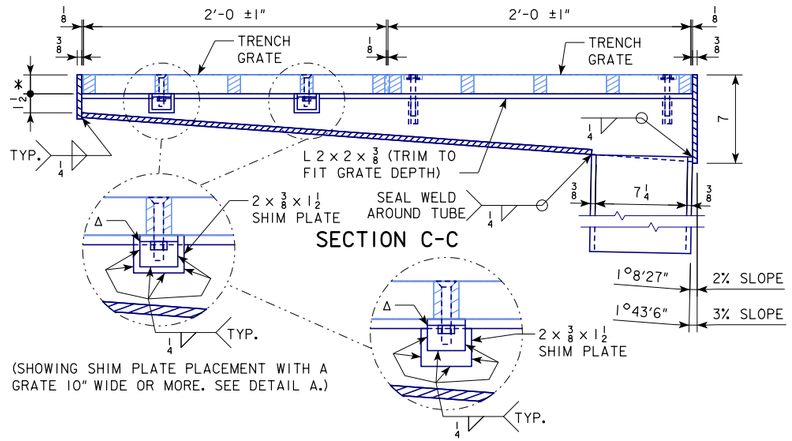
(DTL. IS SHOWN USING 10" WIDE GRATE)




ΔΔ = ADJUST SHIM PLATE ACCORDING TO WIDTH OF GRATE.

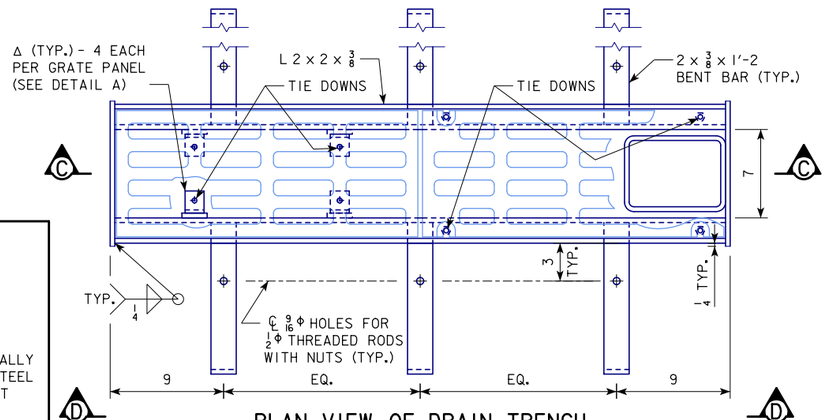
* = DEPTH BASED ON TRENCH GRATE MANUFACTURER.

Δ = L 1¾ x 1¼ x ¼ x 0'-1½ LONG (TYP. - SEE DETAIL A).



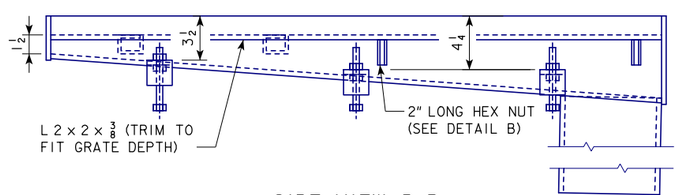

(SHOWING SHIM PLATE PLACEMENT WITH A GRATE 10" WIDE OR MORE. SEE DETAIL A.)

(SHOWING SHIM PLATE PLACEMENT WITH A GRATE LESS THAN 10" WIDE. SEE DETAIL A.)




PLAN VIEW OF DRAIN TRENCH

( GRATE TIE DOWNS SHOW BOTH DETAIL A AND DETAIL B )




SIDE VIEW D-D

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## DECK DRAIN DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

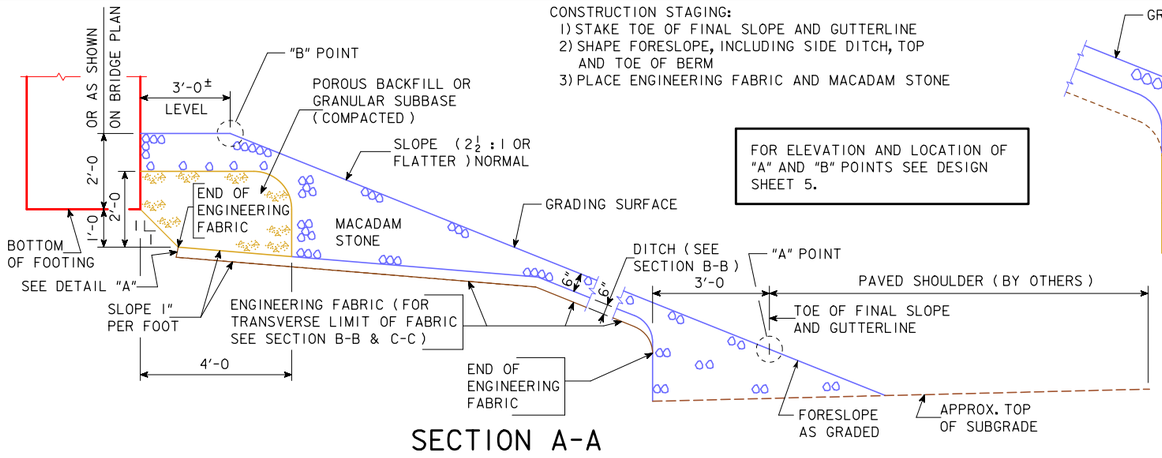
## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

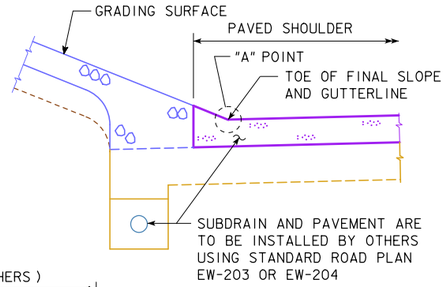
DESIGN SHEET NO. 24 OF 30 FILE NO. 31630 DESIGN NO. 1120

REVISED 06-2017 - SHEET IS REDRAWN TO ACCOMODATE THE USE OF A 6" x 8" x ⅜" STRUCTURAL DRAIN TUBE. (WAS 8" DIA. x ⅜" STRUCTURAL DRAIN TUBE MAY BE SUBSTITUTED WITH A 8" x 8" x ⅜" STRUCTURAL TUBE).
REVISED 04-2018 - ADDED ADDITIONAL WELD SYMBOL ARROWS TO DRAIN TRENCH DETAILS IN PART SECTIONS B-B, SECTIONS B-B & C-C AND "PLAN VIEW OF DRAIN TRENCH" FOR CLARITY, ADDED "SEAL WELD AROUND TUBE" IN SECTION C-C.
REVISED 07-2019: UPDATED WELD SYMBOLS ON DRAIN TRENCH DETAILS IN PART "SECTION B-B & C-C" AND "PLAN VIEW OF DRAIN TRENCH" ADDED "ΔΔΔ = DIMENSION TO BE PROVIDED ON SHOP DRAWINGS" TO DOWN SPOUT BRACKET ON STEEL GIRDER DETAIL. CHANGED ALL REFERENCES OF "SLAB" TO "DECK".
ENGLISH\MISCELLANEOUS\BRIDGES.DGN 1054 - THIS SHEET REDRAWN 11-00.

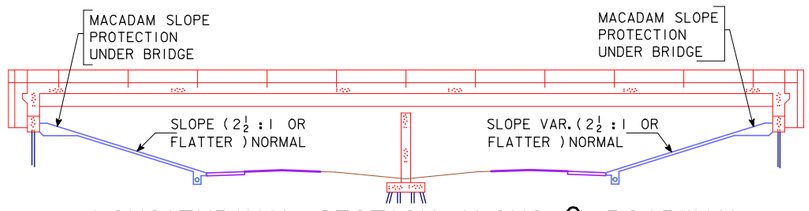
| DESIGN TEAM T.J.C. / J.S.I. / J.A.E. Foth | AESTHETIC DECK DRAIN DETAILS | STANDARD SHEET 1054 | JOHNSON COUNTY | PROJECT NUMBER IM-080-7(152)251--13-52 | SHEET NUMBER 25 |
|---|---|---|---|---|---|



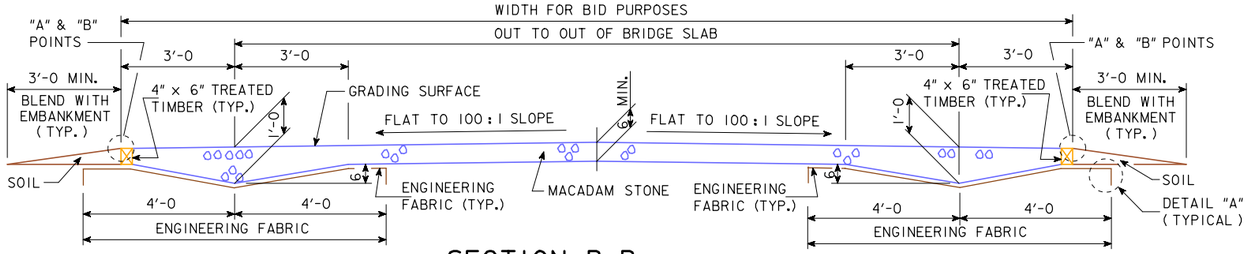

## SECTION A-A



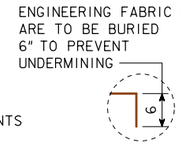

## FINAL CONSTRUCTION SECTION A-A



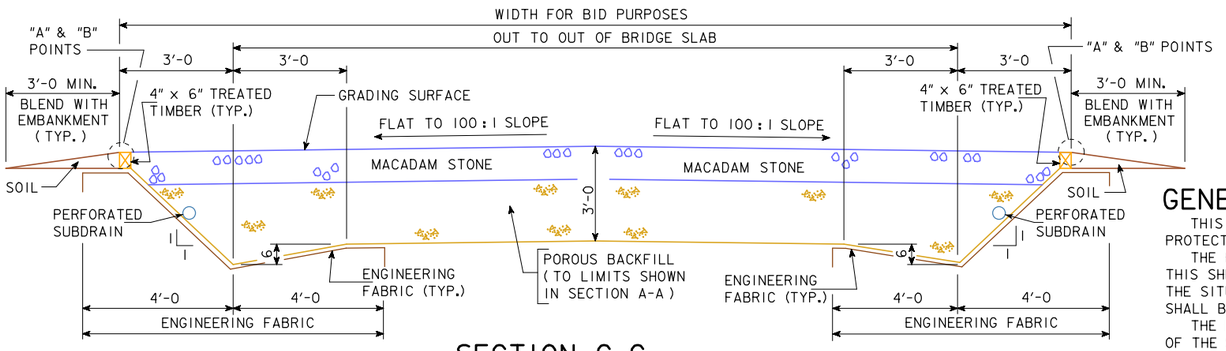

## LONGITUDINAL SECTION ALONG ℄ ROADWAY



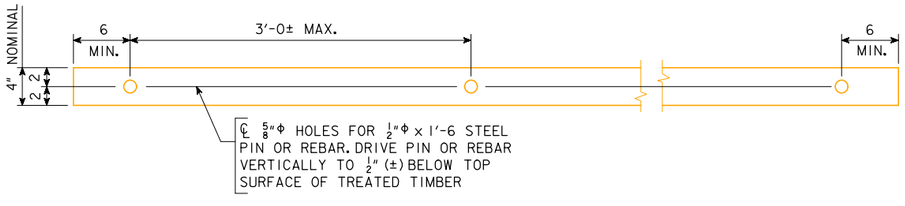

## SECTION B-B



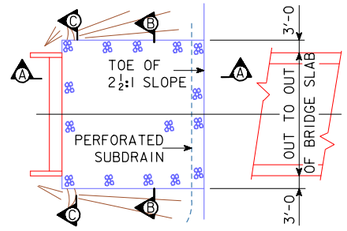

## DETAIL "A"




## SECTION C-C




## 4 x 6 TREATED TIMBER EDGING DETAILS




## SLOPE PROTECTION LAYOUT

## GENERAL NOTES:

THIS PLAN SHEET SHOWS DETAILS FOR PLACING A "MACADAM STONE SLOPE PROTECTION" UNDER OVERHEAD STRUCTURES.

THE BRIDGE BERM FORESLOPE SHALL BE COMPACTED AND SHAPED AS SHOWN ON THIS SHEET, SHAPING WILL INCLUDE EXCAVATION, FROM THE GRADING SURFACE SHOWN, THE SITUATION PLAN, AND AS DIRECTED BY THE ENGINEER. THE BERM FORESLOPE SHALL BE FIRM WHEN THE ENGINEERING FABRIC AND MACADAM STONE ARE PLACED.

THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, 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.

THE MACADAM STONE SHALL BE IN ACCORDANCE WITH SECTION 4122, OF THE STANDARD SPECIFICATIONS, COARSE MATERIAL (NO CHOKE STONE IS ALLOWED).

WOOD PRESERVATIVE TREATMENT FOR THE TIMBER EDGING SHALL MEET THE REQUIREMENTS FOR GUARDRAIL POSTS, SAWED FOUR SIDES, IN ACCORDANCE WITH SECTION 4161, OF THE STANDARD SPECIFICATIONS.

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

PAYMENT FOR "MACADAM STONE SLOPE PROTECTION" WILL BE MADE ON A SQUARE YARD BASIS FOR SLOPE PROTECTION CONSTRUCTED. THE UNIT PRICE BID PER SQUARE YARD SHALL INCLUDE ALL COSTS FOR MATERIAL AND LABOR REQUIRED TO CONSTRUCT THE SLOPE PROTECTION SHOWN ON THESE PLANS.

THE BERM FORESLOPE SHAPING AND COMPACTING AND THE DISPOSAL OF EXCESS SOIL FROM SHAPING OR TRENCHING SHALL BE CONSIDERED INCIDENTAL TO PLACING THE SLOPE PROTECTION. WHERE EROSION CONTROL WORK HAS BEEN COMPLETED THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PLANT MATERIALS DESTROYED ADJACENT TO THE SLOPE PROTECTION AREA. THE CONTRACTOR SHALL REPLANT, RESEED AND REMULCH ALL DISTURBED AREAS, DESIGNATED BY THE ENGINEER, IN ACCORDANCE WITH SECTION 2601, OF THE STANDARD SPECIFICATIONS, AT THE CONTRACTOR'S EXPENSE.

THE BRIDGE CONTRACTOR IS TO INSTALL SUBDRAINS AS DETAILED ON THE SUBDRAIN DETAILS SHEET.

## ESTIMATED QUANTITIES

| DESCRIPTION | LOCATION | QUANTITY |
|---|---|---|
| MACADAM STONE SLOPE PROTECTION | NORTH ABUT. | 242 SY |
| | | |
| | | |
| MACADAM STONE SLOPE PROTECTION | SOUTH ABUT. | 191 SY |
| | | |
| | TOTAL | 433 SY |

ITEMS TO BE INCLUDED IN "MACADAM STONE SLOPE PROTECTION":
EXCAVATING, SHAPING AND COMPACTING
ENGINEERING FABRIC
MACADAM STONE
4" x 6" TREATED TIMBER EDGING
½"Φ STEEL PINS (OR REBARS)
POROUS BACKFILL OR GRANULAR SUBBASE BACKFILL AT FRONT FACE ABUTMENT FOOTING

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

# MACADAM STONE SLOPE PROTECTION

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

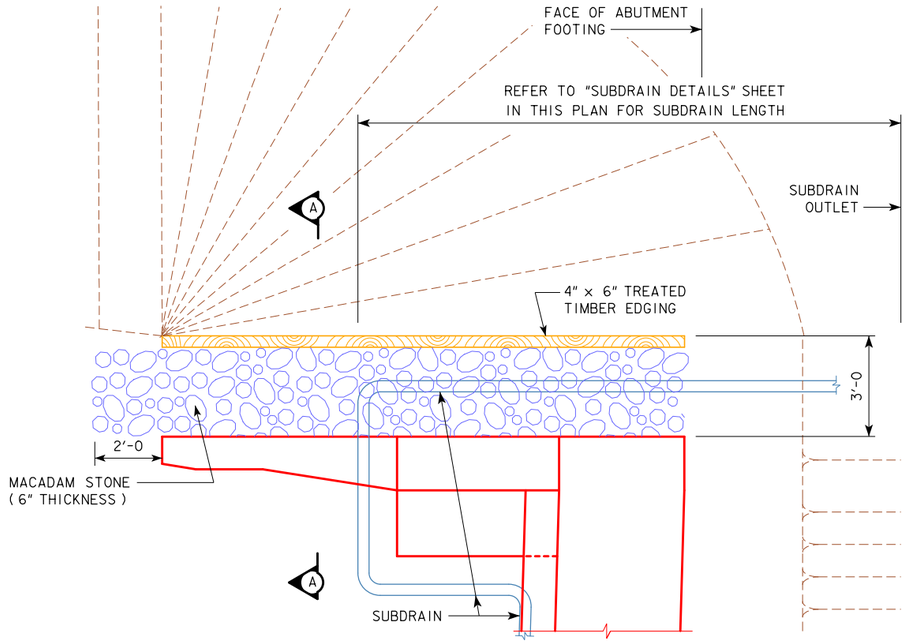
# JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

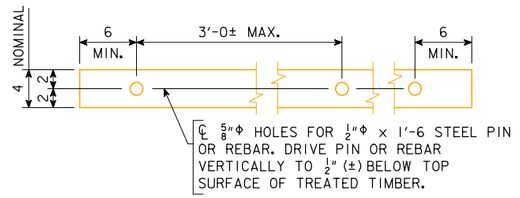
DESIGN SHEET NO. 25 OF 30 FILE NO. 31630 DESIGN NO. 1120

REVISED 10-12 - LOCATED THE "A" AND "B" POINTS IN SECTION A-A & FINAL CONSTRUCTION SECTION A-A DETAILS.
ENGLISHFORESLOPEPROTECTIONBRIDGES.DGN 1006E - THIS SHEET ISSUED 9-16-92

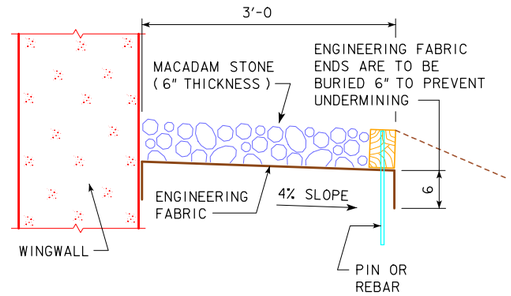
| DESIGN TEAM T.J.C. / J.S.I. / J.A.E. Foth | MACADAM STONE SLOPE PROTECTION (INTEGRAL ABUTMENTS) | STANDARD SHEET 1006E | JOHNSON COUNTY | PROJECT NUMBER IM-080-7(152)251--13-52 | SHEET NUMBER 26 |
|---|---|---|---|---|---|




TOP VIEW OF WING ARMORING WITH WING EXTENSION




4" x 6" TREATED TIMBER EDGING DETAILS




SECTION A-A

## GENERAL NOTES:

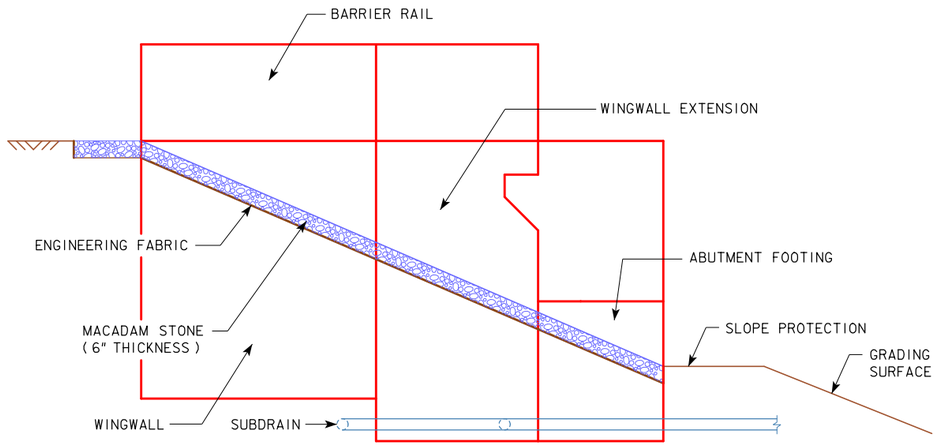
MACADAM STONE SHALL BE PLACED ALONG THE SIDE OF THE WING AND ABUTMENT FOOTING AS SHOWN IN SECTION A-A. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE MACADAM STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC IN ACCORDANCE WITH ARTICLE 4196.01,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

THE MACADAM STONE SHALL BE IN ACCORDANCE WITH SECTION 4122, OF THE STANDARD SPECIFICATIONS, COARSE MATERIAL ( NO CHOKE STONE IS ALLOWED ).

WOOD PRESERVATIVE TREATMENT FOR THE TIMBER EDGING SHALL MEET THE REQUIREMENTS FOR GUARDRAIL POSTS, SAWED FOUR SIDES, IN ACCORDANCE WITH SECTION 4161, OF THE STANDARD SPECIFICATIONS.

THE MACADAM STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM 6" 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, MACADAM STONE, TREATED TIMBER EDGING, EXCAVATION, SHAPING, AND COMPACTION TO DIMENSIONS SHOWN IN THESE PLANS. BID ITEM SHALL BE "BRIDGE WING ARMORING - MACADAM STONE.




PROFILE VIEW OF WING ARMORING WITH WING EXTENSION

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11 1/4 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## BRIDGE WING ARMORING

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 26 OF 30 FILE NO. 31630 DESIGN NO. 1120

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

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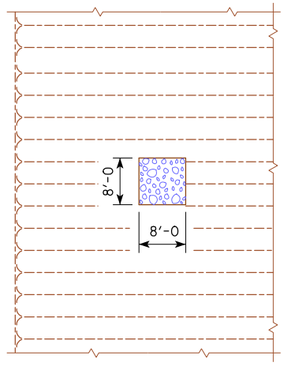
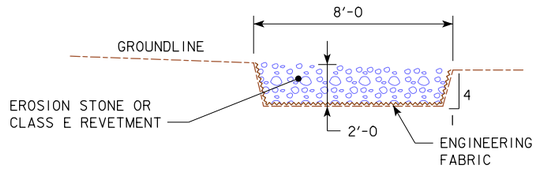



## SPLASH BASIN UNDER BRIDGE DRAIN PLAN VIEW

## SPLASH BASIN NOTE:

THE COST OF FURNISHING AND PLACING SPLASH BASINS ( INCLUDING EXCAVATION, EROSION STONE OR CLASS E REVETMENT, AND ENGINEERING FABRIC ) IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE ( BRIDGE )". NO EXTRA PAYMENT WILL BE MADE. TOTAL NUMBER OF SPLASH BASINS = 4.




## SPLASH BASIN UNDER BRIDGE DRAIN TYPICAL SECTION

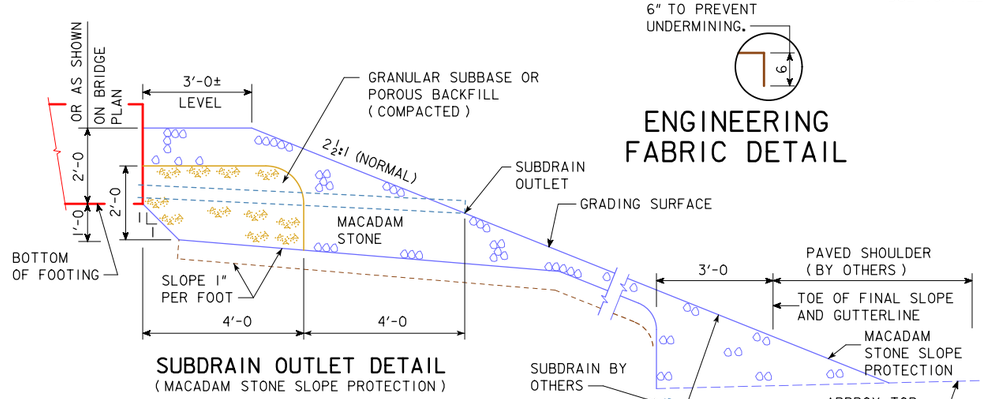
## SUBDRAIN NOTES:

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 6'-0 LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET.

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.



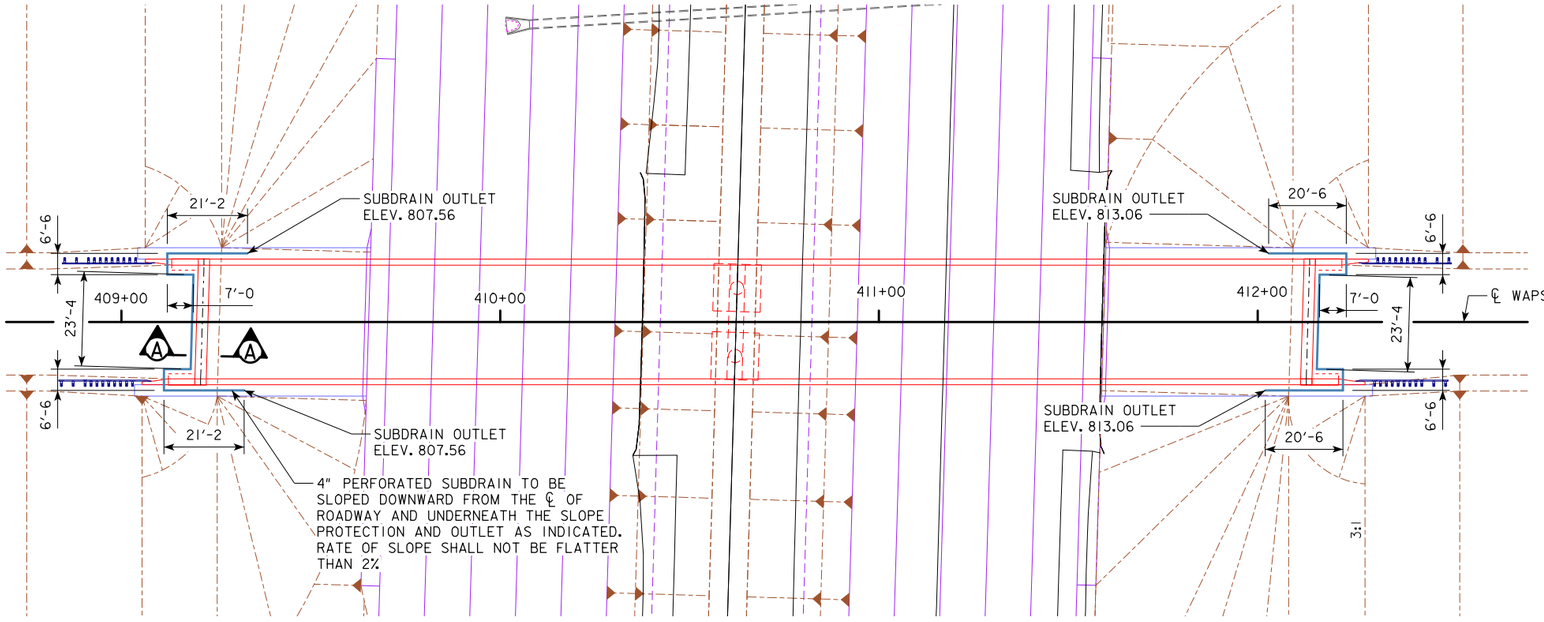

## SUBDRAIN OUTLET DETAIL
( MACADAM STONE SLOPE PROTECTION )

ENGINEERING FABRIC ENDS ARE TO BE BURIED 6" TO PREVENT UNDERMINING.




## ENGINEERING FABRIC DETAIL

## SECTION B-B

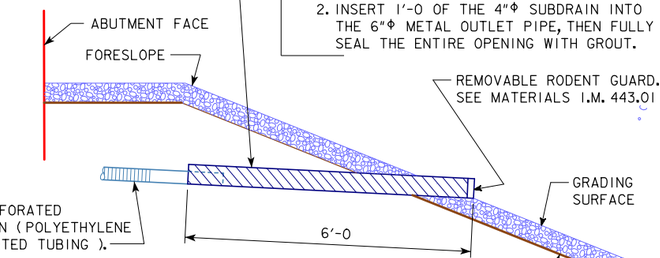



## SITUATION PLAN
SHOWING SUBDRAIN LOCATIONS

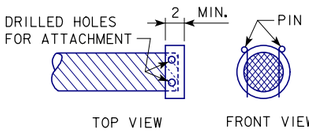
NOTE:
SECTION A-A IS SHOWN ON ABUTMENT BACKFILL DETAILS SHEET.

6"Φ CORRUGATED METAL PIPE OUTLET, OR 4"Φ CORRUGATED DOUBLE-WALLED PE OR PVC PIPE OUTLET WITH AN APPROPRIATE COUPLER. IF METAL PIPE IS USED, THE PIPES SHOULD BE COUPLED IN ONE OF THE TWO FOLLOWING WAYS.

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




## TYPICAL SECTION OF SUBDRAIN OUTLET




## REMOVABLE RODENT GUARD DETAILS

## OUTLET DETAILS

DESIGN FOR 1°40'49.81" SKEW (L.A.)

# 291'-11¼ x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

141'-0 & 151'-0 END SPANS

## SUBDRAIN DETAILS

STA. 410+67.31 (WAPSI AVE.) OCTOBER, 2021

## JOHNSON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 27 OF 30 FILE NO. 31630 DESIGN NO. 1120

REVISED 07-11 - THE BERM SLOPE IS IDENTIFIED AS THE GRADING SURFACE.
ENGLISHFORESLOPEPROTECTIONBRIDGES.DGN 1007B - THIS SHEET ISSUED 06-02.

| DESIGN TEAM T.J.C. / J.S.I. / J.A.E. Foth | SUBDRAIN DETAILS FOR 2 SPAN BRIDGES ( MACADAM STONE SLOPE PROTECTION ) | STANDARD SHEET 1007B | JOHNSON COUNTY | PROJECT NUMBER IM-080-7(152)251--13-52 | SHEET NUMBER 28 |
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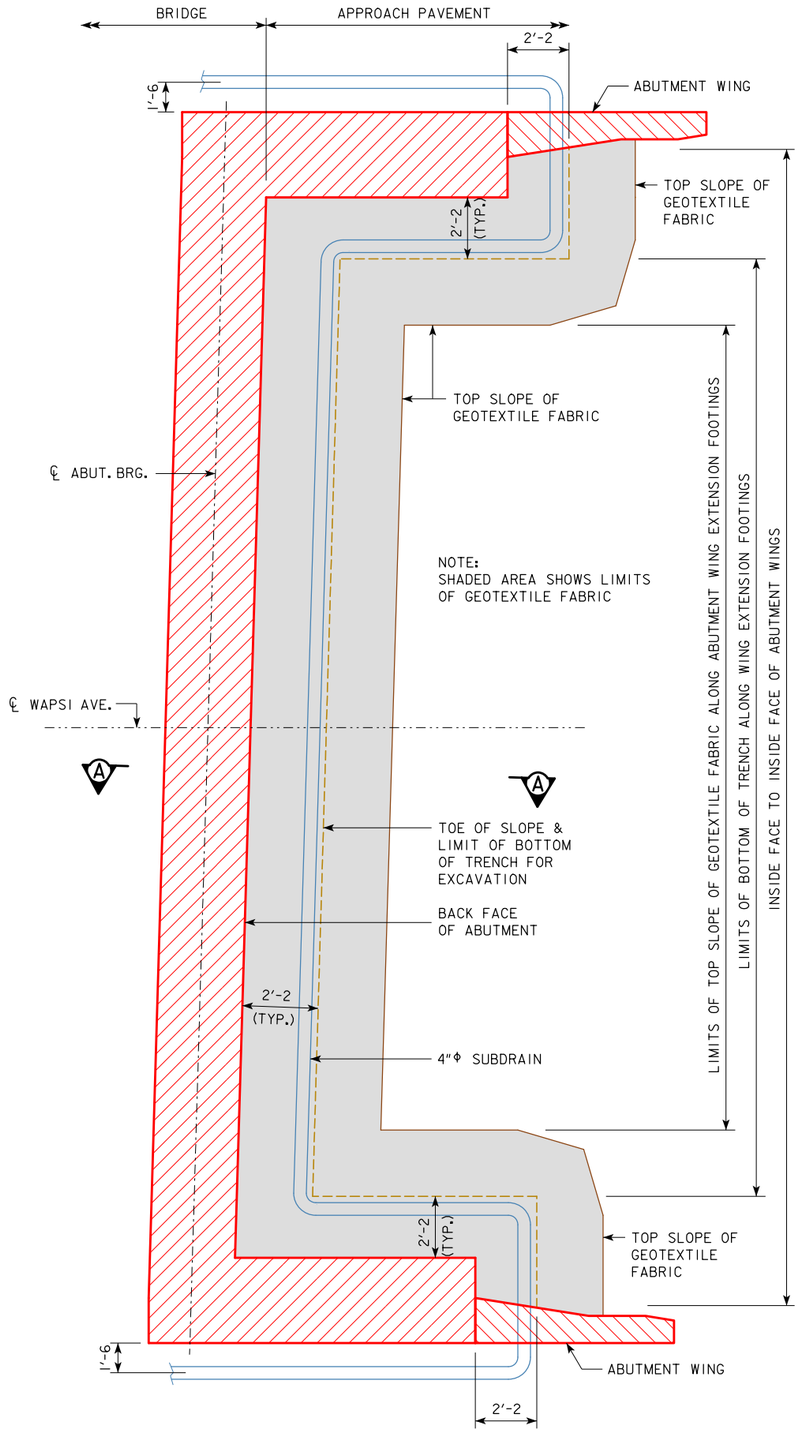



ABUTMENT PLAN

## 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.

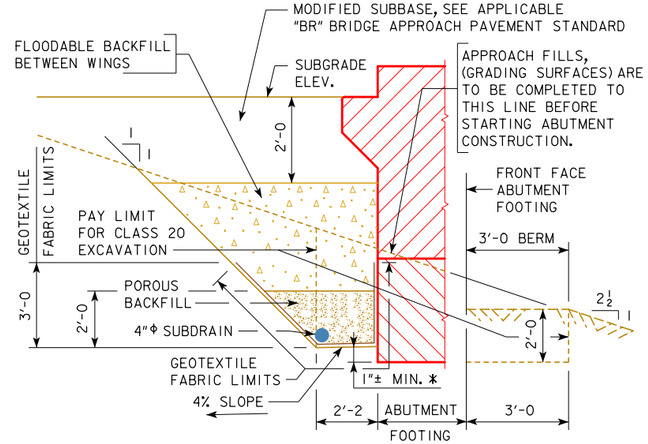
WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS WILL NOT BE MEASURED SEPARATELY FOR PAYMENT.

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 ℄ APPROACH ROADWAY.

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.

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IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY ADMINISTRATION

DESIGN SHEET NO. 28 OF 30 FILE NO. 31630 DESIGN NO. 1120

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").
ENGLISHFORESLOPEPROTECTIONBRIDGES.DGN - 1007E - THIS SHEET ISSUED 08-07.




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