RECONSTRUCTION - BRIDGE DECK REPLACEMENT
BRFN-150-2(15)--39-06
LETTING DATE 4/19/2016

BENTON COUNTY - DESIGN NO. 315

BENTON COUNTY

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 Division

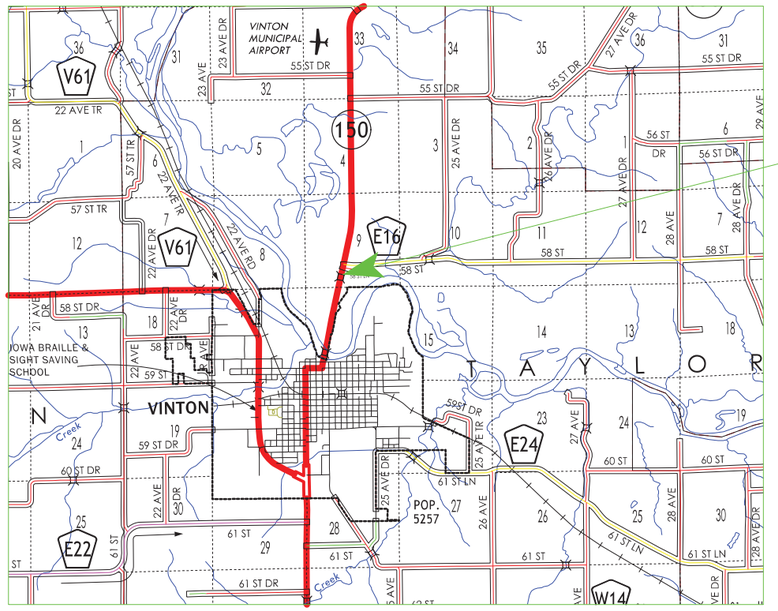
PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

BENTON COUNTY

RECONSTRUCTION - BRIDGE DECK REPLACEMENT
IA 150 OVER CEDAR RIVER OVERFLOW
0.1 MI. SOUTH OF JCT. SR E16

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

PROJECT DIRECTORY NAME: 06015001014

ENGLISH STANDARD BRIDGE PLANS

STANDARD	ISSUED	REVISED

REVISIONS

	TOTAL SHEETS
	33
PROJECT NUMBER	
BRFN-150-2(15)--39-06	
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	
14-06-150-010	

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATED BRIDGE QUANTITIES
2-16	DESIGN NO. 315
C.1	ESTIMATED ROADWAY QUANTITIES
A.1-U.2	ROADWAY SHEETS

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STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED ON SHEET NUMBER C.2

DESIGN DATA RURAL

2013	AADT	4,270	V.P.D.
20--	AADT	—	V.P.D.
20--	DHV	—	V.P.H.
TRUCKS		6	%
Total Design ESALs			

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	CARL M. SCHIPFMANN	STRUCTURAL DESIGN
A.1	MARC A. WHITMORE	ROAD DESIGN

STRUCTURAL DESIGN

REGISTERED PROFESSIONAL ENGINEER — Carl M. Schipfmann — 21350 — 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.

Carl M. Schipfmann — 01/25/2016
Signature — Date

Carl M. Schipfmann
Printed or Typed Name

My license renewal date is December 31, 2017

Pages or sheets covered by this seal: SHEETS 1 THRU 16 OF 16

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ESTIMATED BRIDGE QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT
1	2401-6750001	REMOVALS, AS PER PLAN	LS	1	
2	2402-2720000	EXCAVATION CLASS 20	CY	69.6	
3	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	275.5	
4	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	117,980	
5	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	3,968	
6	2408-7800000	STRUCTURAL STEEL	LB	5,047	
7	2413-1200000	STEEL EXTRUSION JOINT WITH NEOPRENE	LF	62	
8	2413-1200100	NEOPRENE GLAND INSTALLATION AND TESTING	LF	92.5	
9	2414-6424110	CONCRETE BARRIER RAILING	LF	650	
10	2508-0804000	BRIDGE CLEANING FOR PAINTING	LS	1	
11	2508-0805000	BLAST CLEANING OF STRUCTURAL STEEL	LS	1	
12	2508-0970000	CONTAINMENT	LS	1	
13	2508-0991000	PAINTING OF STRUCTURAL STEEL	LS	1	
14	2533-4980005	MOBILIZATION	LS	1	

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2401-6750001	REMOVALS, AS PER PLAN INCLUDES ITEMS AS DESCRIBED IN THE "GENERAL NOTES" AND "REMOVAL NOTES" AND REFERENCED ON THE APPROACH SLAB SHEETS.
2	2402-2720000	EXCAVATION CLASS 20
3	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)
4	2404-7775005	REINFORCING STEEL, EPOXY COATED
5	2404-7775009	REINFORCING STEEL, STAINLESS STEEL
6	2408-7800000	STRUCTURAL STEEL INCLUDES NEW SHEAR STUDS AND 8 DECK DRAINS. THIS ESTIMATE IS GIVEN ONLY FOR THE CONTRACTOR'S INFORMATION. THERE WILL BE NO ADDITIONAL PAYMENT IF THE ACTUAL NUMBER OF SHEAR STUDS VARY FROM THE ESTIMATED AMOUNTS SHOWN ON DESIGN SHEET 10.
7	2413-1200000	STEEL EXTRUSION JOINT WITH NEOPRENE INCLUDES ALL NECESSARY HARDWARE AND ACCESSORIES INCLUDING THE ANCHORAGE SYSTEM, TEMPORARY ERECTION MATERIAL AND THE $\frac{3}{8}$" BARRIER PLATES WITH THEIR ANCHORAGE SYSTEM. EXCLUDES INSTALLATION OF NEOPRENE GLAND.
8	2413-1200100	NEOPRENE GLAND INSTALLATION AND TESTING INCLUDES COST OF REMOVING EXISTING NEOPRENE GLAND AND FURNISHING REPLACEMENT GLAND AT NORTH ABUTMENT. INCLUDES INSTALLATION OF NEOPRENE GLAND AND WATER TESTING OF JOINT.
9	2414-6424110	CONCRETE BARRIER RAILING 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.

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
10	2508-0804000	BRIDGE CLEANING FOR PAINTING SEE NOTE ON BID ITEM 13.
11	2508-0805000	BLAST CLEANING OF STRUCTURAL STEEL SEE NOTE ON BID ITEM 13.
12	2508-0970000	CONTAINMENT THE DISPOSAL WILL BE PAID FOR AS PART OF CONTAINMENT. SEE NOTE ON BID ITEM 13.
13	2508-0991000	PAINTING OF STRUCTURAL STEEL A PORTION OF THIS BRIDGE IS TO BE PAINTED IN THE LOCATION DESIGNATED ON DESIGN SHEET 6. AREAS EMBEDDED IN CONCRETE SHALL NOT BE PAINTED. ALL STEEL TO BE PAINTED SHALL BE BLASTED TO SP-10. THE PAINT SYSTEM SHALL BE THE EPOXY SYSTEM. THIS INCLUDES A ZINC-RICH EPOXY, AN ALUMINUM EPOXY MASTIC INTERMEDIATE COAT, AND AN ALIPHATIC POLYURETHANE TOPCOAT. THE TOTAL AREA OF STRUCTURAL STEEL IN THE ZONE DESIGNATED TO BE PAINTED IS ESTIMATED TO BE 152 SQ. FT. THIS ESTIMATE IS GIVEN ONLY FOR THE CONTRACTOR'S INFORMATION. THERE WILL BE NO ADDITIONAL PAYMENT IF THE ACTUAL AREAS IN THE ZONES VARY FROM THE ESTIMATED AMOUNTS SHOWN.
14	2533-04980005	MOBILIZATION

NOTE:
ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS 122'-0 CENTER SPAN

QUANTITIES

STATION 59+62.15 JAN 2015

BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 15 FILE NO. 31121 DESIGN NO. 315

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GENERAL NOTES:

THIS DESIGN INVOLVES THE BRIDGE DECK REPLACEMENT ON THE SOUTH 312'x30' CONTINUOUS WELDED GIRDER UNIT ON IA 150 OVER CEDAR RIVER OVERFLOW. COPIES OF ORIGINAL DESIGN AND REPAIR PLANS WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS - HIGHWAY DIVISION - IOWA D.O.T. - AMES. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON REHABILITATION PLANS (ORIGINAL DESIGN NO. 439 AND REHAB DESIGN NO. 984). THE BRIDGE CONTRACTOR SHALL FIELD VERIFY THESE DETAILS BEFORE STARTING CONSTRUCTION. REPAIR AND REDECKING OF THE BRIDGE SHALL CONSIST OF:

1. REMOVING THE EXISTING CONCRETE DECK ON THE FIRST THREE SPANS AND CONSTRUCTING A NEW DECK WITH A 30' ROADWAY WIDTH AND F-SHAPE BARRIER.
2. REPLACING THE EXISTING GUARD RAILS ON THE SOUTH AND NORTH ENDS OF THE BRIDGE.
3. REPLACING THE EXISTING STRIP SEAL JOINTS AT THE SOUTH ABUTMENT, AT PIER 3, AND THE EXPANSION JOINT GLAND AT THE NORTH ABUTMENT.

FAINT LINES ON PLANS INDICATE EXISTING PORTION OF THE BRIDGE.

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

IT IS THE INTENT OF THIS DESIGN TO USE THE EXISTING STEEL BEAMS AS CONSTRUCTED.

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

THE TOP AND INTERIOR FACES OF THE EXISTING CONCRETE RAILING ARE TO BE CLEANED AND SEALED IN ACCORDANCE WITH ARTICLE 2403.03, P, OF THE STANDARD SPECIFICATIONS. IF NEW SECTIONS OF RAIL ARE CONSTRUCTED, THE NEW SECTIONS SHALL NOT BE SEALED. ALL COSTS ASSOCIATED WITH CLEANING AND SEALING OF THE CONCRETE RAILS SHALL BE INCLUDED IN THE UNIT PRICE BID ITEM "STRUCTURAL CONCRETE (BRIDGE)".

UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE STARTING DATE. KNOWN UTILITIES: 1) CENTURY LINK, 2) EAST CENTRAL IOWA REC

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.

A SCRAPE SAMPLE WAS TAKEN TO GET AN INDICATION OF THE EXISTENCE OF AND LEVEL OF TOTAL CHROMIUM AND TOTAL LEAD PARTS PER MILLION (PPM.)

ANALYSIS OF TOTAL LEAD ON THE SAMPLE WAS:
4400 PPM ABUTMENT BEARING
4100 PPM GIRDER

ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS:
1600 PPM ABUTMENT BEARING
880 PPM GIRDER

THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE IOWA DOT'S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

CONSTRUCTION SHALL BE DONE IN STAGES WITH AT LEAST ONE LANE OF TRAFFIC MAINTAINED AT ALL TIMES IN ACCORDANCE WITH "TRAFFIC CONTROL PLAN" NOTE.

CONSTRUCTION STAGES 2 & 3 AS DETAILED ON THESE PLANS MAY BE REVERSED AT THE CONTRACTOR'S OPTION SUBJECT TO THE ENGINEER'S APPROVAL.

THE LUMP SUM BID FOR "REMOVALS AS PER PLAN" INCLUDES ALL COSTS ASSOCIATED WITH REMOVAL OF THE EXISTING CONCRETE DECK AND BARRIER RAILS AS NOTED AND SHOWN IN THESE PLANS.

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.

1	DECK DRAIN DETAILS
2	EXPANSION DEVICE DETAILS
3	DEMOLITION PLAN

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5a) IS $\frac{5}{8}$" DIA. 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

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

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.

SPECIFICATIONS:

DESIGN:
AASHTO SERIES OF 2002.

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

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 2002.

REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60.

CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 4,000 PSI.

STRUCTURAL STEEL IN ACCORDANCE WITH SECTION 10, ASTM A709 GRADE 50. (AASHTO M270 GRADE 50).

DESIGN HISTORY AT THIS SITE

DES. NO.	TYPE OF WORK
439	ORIGINAL DESIGN
163	UNIT 1 ADDITION
984	UNIT 1 RE-DECK UNIT 2 REPLACEMENT

TRAFFIC CONTROL PLAN

REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

NOTE:
POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS 122'-0 CENTER SPAN

GENERAL NOTES

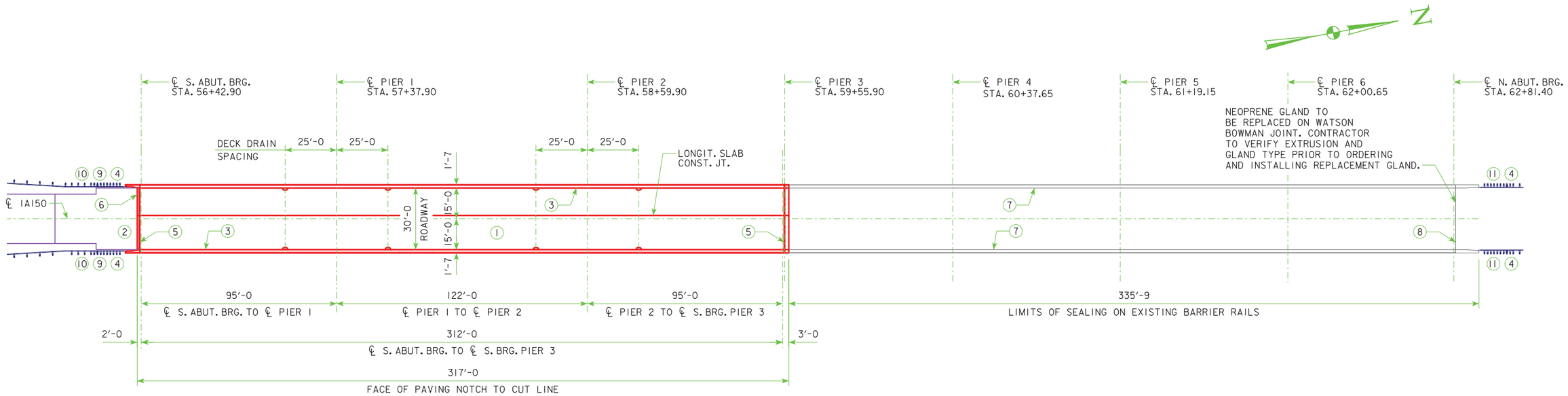
STATION 59+62.15 JAN 2015

BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 15 FILE NO. 31121 DESIGN NO. 315

BENCH MARK NO. 10284 - STA 56+41.41, 16.052' RT., CUT 'X' TOP OF SE BRIDGE BARRIER/ABUTMENT ℄ IA150 BRIDGE - ELEV.=793.43
BENCH MARK NO. 10161 - STA 62+82.95, 16.174' LT., CUT 'X' TOP OF NW BRIDGE BARRIER/ABUTMENT ℄ IA150 BRIDGE - ELEV.=792.95



SITUATION PLAN

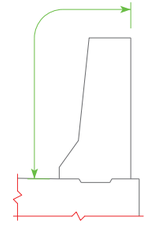
NOTE:
SEE DESIGN SHEET 8 FOR DRAIN DETAILS.

VPI STA 59+43.70
PI ELEV 794.73
VC = 600'
R = -0.4317

PROFILE GRADE IA 150

TRAFFIC ESTIMATE

2013 AADT	4270	V.P.D.
20__ AADT	_	V.P.D.
20__ DHV	_	V.P.H.
TRUCKS	6	%
TOTAL DESIGN ESALs	_	



LIMITS OF SEALING ON EXISTING BARRIER RAILS

LOCATION

IA150 OVER CEDAR RIVER OVERFLOW
T 85 N R 10 W
SECTION 9
TAYLOR TOWNSHIP
BENTON COUNTY
BRIDGE MAINT. NO. 0602.3S150
LATITUDE 42.182696°
LONGITUDE -92.020126°
FHWA NO. 14471

REPAIRS SHALL CONSIST OF:

1. REMOVE AND REPLACE 317' OF EXISTING BRIDGE DECK ACCORDING TO PLANS.
2. REMOVE AND REPLACE 40' APPROACH PAVEMENT.
3. INSTALL NEW BARRIER RAILS.
4. INSTALL NEW GUARDRAIL AT ABUTMENTS AS SHOWN IN THE ROADWAY SHEETS.
5. REMOVE AND REPLACE EXISTING EXPANSION JOINT AND NEOPRENE GLAND.
6. INSTALL NEW JOINT AS SHOWN IN THE ROADWAY SHEETS.
7. SEAL INSIDE AND TOP FACES OF BARRIER RAIL.
8. REPLACE NEOPRENE GLAND.
9. ADD PAVED SHOULDERS NEXT TO GUARDRAIL AS SHOWN IN THE ROADWAY SHEETS.
10. REMOVE EXISTING INTAKES AND REPLACE WITH FLUMES AS SHOWN IN THE ROADWAY SHEETS.
11. PLUG EXISTING INTAKES AND REPLACE WITH FLUMES AS SHOWN IN THE ROADWAY SHEETS.

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS 122'-0 CENTER SPAN

SITUATION PLAN

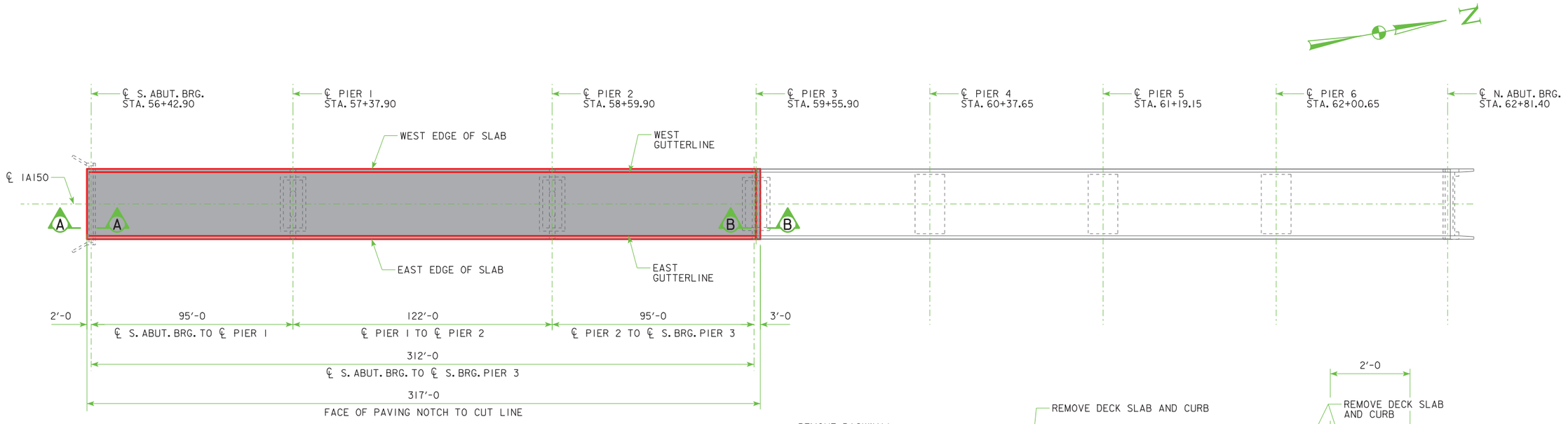
STATION 59+62.15 JAN 2015

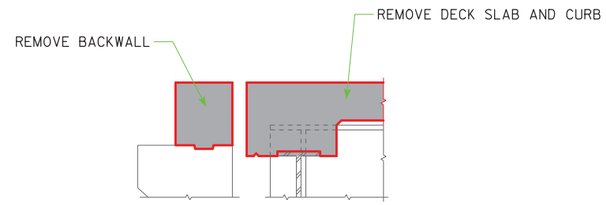
BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

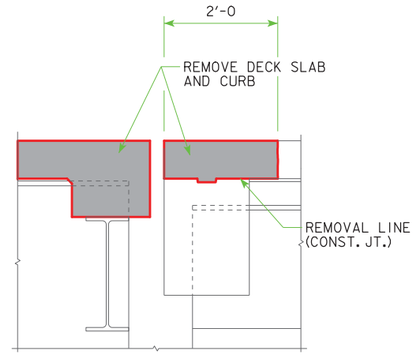
DESIGN SHEET NO. 3 OF 15 FILE NO. 31121 DESIGN NO. 315

BENCH MARK NO. 10284 - STA 56+41.41, 16.052' RT., CUT 'X' TOP OF SE BRIDGE BARRIER/ABUTMENT ℄ 1A150 BRIDGE - ELEV.=793.43
BENCH MARK NO. 10161 - STA 62+82.95, 16.174' LT., CUT 'X' TOP OF NW BRIDGE BARRIER/ABUTMENT ℄ 1A150 BRIDGE - ELEV.=792.95





SECTION A-A



SECTION B-B

REMOVAL NOTES

THIS SHEET SHOWS DETAILS OF THE SUPERSTRUCTURE REMOVAL ON THE EXISTING BRIDGE. ALL REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS. ALL SUCH REMOVALS SHALL BE TO NEAT SAW CUTS TO PROVIDE CLEAN STRAIGHT SURFACES AT INTERFACES BETWEEN NEW CONCRETE AND REMAINING CONCRETE. THE REMOVAL SHALL BE DONE IN A MANNER WHICH WILL PREVENT ANY DAMAGE TO THE EXISTING STRUCTURE TO REMAIN. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY DAMAGE CAUSED, AND SHALL REPAIR ANY DAMAGED AREA TO ITS ORIGINAL CONDITION, AS DIRECTED BY THE ENGINEER, AT THE CONTRACTOR'S EXPENSE. ANY REINFORCING STEEL WHICH IS TO BE "SAVED" THAT IS EXPOSED DURING REMOVAL OPERATIONS IS TO BE CAREFULLY PROTECTED, CLEANED AND INCORPORATED INTO NEW WORK UNLESS NOTED OTHERWISE.

THE BRIDGE CONTRACTOR IS TO USE EXTREME CARE WHEN REMOVING THE DECK CONCRETE AT THE GIRDER LOCATIONS TO AVOID DAMAGING THE TOP FLANGE AND SHEAR CONNECTORS OF THE GIRDER. PRIOR TO COMMENCING ANY DECK REMOVAL WORK, THE CONTRACTOR SHALL SUBMIT A DEMOLITION PLAN TO THE ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF THE START DATE FOR DECK REMOVAL WORK IN ORDER TO DEMONSTRATE THE REMOVAL PROCEDURE ON A SMALL PORTION OF THE DECK WHILE THE INSPECTOR IS PRESENT. DAMAGE MAY REQUIRE THE CONTRACTOR TO MODIFY THE REMOVAL PROCESS PRIOR TO APPROVAL TO PROCEED.

ONCE THE DECK CONCRETE OVER THE GIRDER IS REMOVED, ALL REMAINING DEBRIS SHALL BE CLEANED FROM THE GIRDERS TO PROVIDE A SUITABLE BOND TO THE CONCRETE DECK.

THE EXISTING SHEAR CONNECTORS ARE AN INTEGRAL PART OF THE EXISTING GIRDER TOP FLANGE. ALL DAMAGE SUSTAINED TO THE TOP FLANGE AND/OR SHEAR CONNECTORS SHALL BE IDENTIFIED AND REPAIRED. IN ADDITION TO BEING REPAIRED, ANY DAMAGE LOCATED IN A NEGATIVE MOMENT REGION SHALL UNDERGO MAGNETIC PARTICLE TESTING FOR CRACKS.

ACCEPTABLE REPAIR METHODS:

GIRDER TOP FLANGE:
- GOUGES - GRIND OUT ON A 10:1 TAPER
- BENDS OR TEARS - TO BE EVALUATED BY THE ENGINEER.

ANGLE AND BAR SHEAR LUGS:
- MINOR GOUGES - GRIND SMOOTH
- BENDS AND GOUGES TO ANGLE - GRIND SHARP CORNERS AND, IF IN NEGATIVE MOMENT REGION, MAGNETIC PARTICLE TEST ANGLE TO FLANGE WELD. ANY CRACK DETECTED WILL NECESSITATE THE REMOVAL OF THE ANGLE AS NOTED BELOW.
- TEARS TO ANGLE - IF IN A NEGATIVE MOMENT REGION, REMOVE ANGLE BY MECHANICALLY CUTTING TO JUST ABOVE THE TOP OF FLANGE, GRIND SURFACE OF FLANGE SMOOTH AND PERFORM MAGNETIC PARTICLE TESTING ON REPAIR AREA. IF IN A POSITIVE MOMENT REGION, REMOVE ANGLE BY MECHANICALLY CUTTING TO LOCATION OF TEAR AND GRIND SHARP EDGES SMOOTH.
- BEND OR TEAR TO BAR - REMOVE BAR AND GRIND TOP OF ANGLE SMOOTH.

MAGNETIC PARTICLE TESTING IS TO BE DONE AT THE CONTRACTOR'S EXPENSE BY AN APPROVED THIRD PARTY. ANY CRACKS IDENTIFIED SHALL BE REPAIRED OR THE SECTION OF DAMAGED GIRDER REPLACED AT THE ENGINEER'S DIRECTION AT NO ADDITIONAL COST TO THE STATE.

EXISTING ANGLE AND BAR SHEAR LUGS ARE CONSIDERED FOR FUTURE STRUCTURAL CAPACITY. ANY DAMAGED SHEAR LUGS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE WITH TWO ROWS OF 3 -7#8" DIAMETER SHEAR STUDS. REFER TO PLAN DETAILS FOR DIMENSIONS.

IN THE EVENT THAT ONE OR MORE OF THE EXISTING GIRDERS ARE DAMAGED DURING THE DECK REMOVAL, THE CONTRACTOR SHALL REPAIR OR REPLACE THE DAMAGED GIRDER OR GIRDERS DEEMED UNACCEPTABLE. ADJACENT BEARINGS SHALL ALSO BE REPLACED. ALL MATERIAL, LABOR, EQUIPMENT AND TRAFFIC CONTROL REQUIRED FOR THE REMOVAL AND REPLACEMENT OR REPAIR OF THE DAMAGED GIRDER OR GIRDERS AND BEARINGS SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID FOR "REMOVALS, AS PER PLAN". ANY DAMAGED GIRDERS, WHICH ARE NOT TO BE REUSED, SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS 122'-0 CENTER SPAN

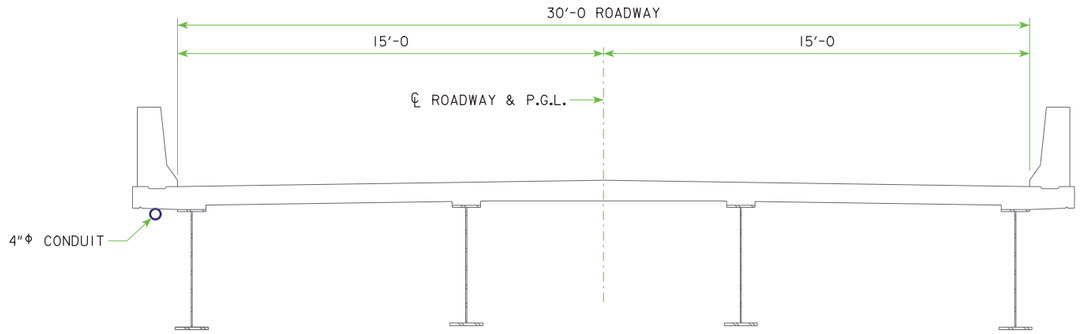
SLAB REMOVAL DETAILS

STATION 59+62.15 JAN 2015

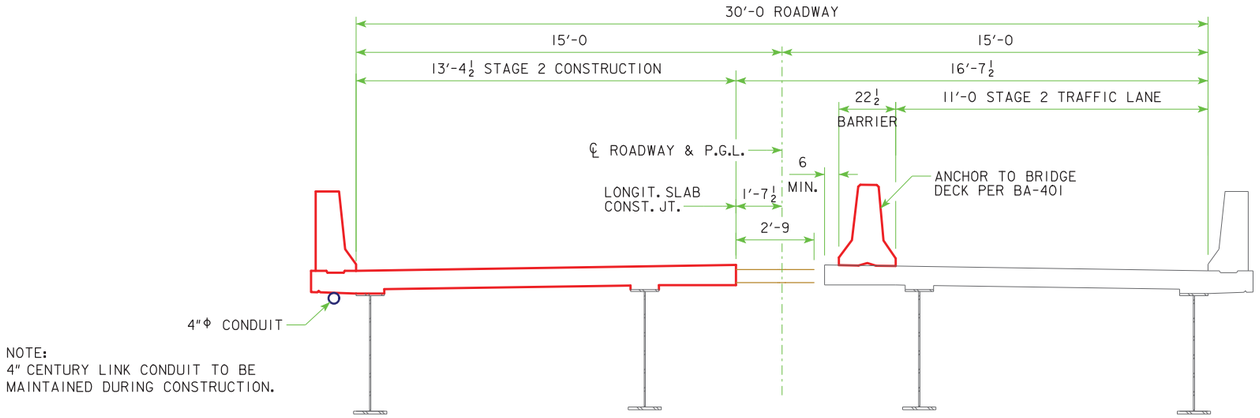
BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 4 OF 15 FILE NO. 31121 DESIGN NO. 315

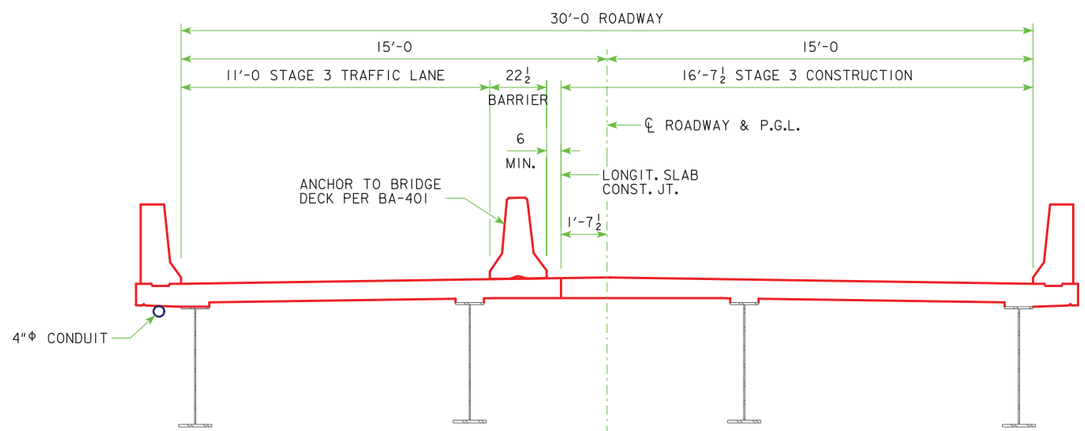


BEFORE CONSTRUCTION
(LOOKING NORTH)



NOTE:
4" CENTURY LINK CONDUIT TO BE
MAINTAINED DURING CONSTRUCTION.

STAGE 2 CONSTRUCTION
(LOOKING NORTH)



STAGE 3 CONSTRUCTION
(LOOKING NORTH)

SEE ROAD PLANS FOR
ADDITIONAL STAGING
INFORMATION.

NOTE:
REFER TO STANDARD ROAD PLAN BA-401
FOR TEMPORARY BARRIER RAIL (PRECAST CONCRETE).

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS 122'-0 CENTER SPAN

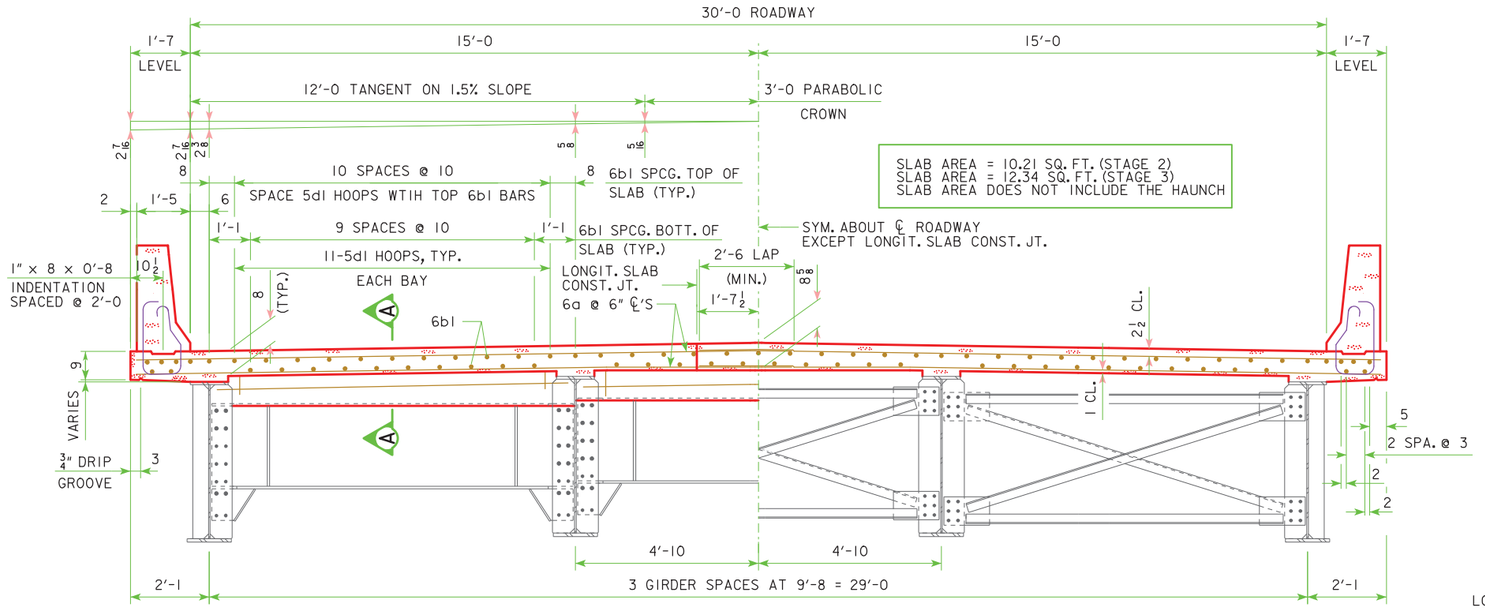
STAGED CONSTRUCTION DETAILS

STATION 59+62.15 JAN 2015

BENTON COUNTY

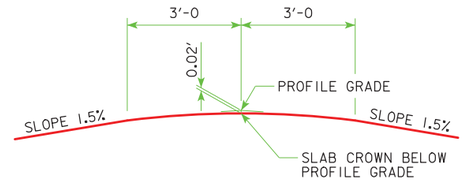
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 5 OF 15 FILE NO. 31121 DESIGN NO. 315

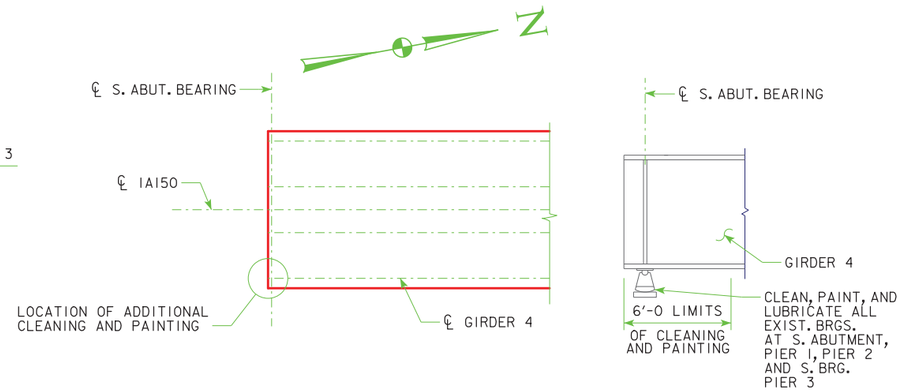


HALF SECTION NEAR ABUTMENT AND PIER

HALF SECTION NEAR INTERMEDIATE DIAPHRAGM

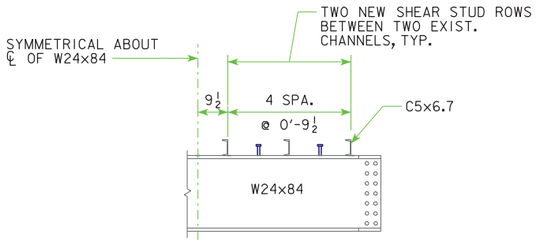


CROWN TEMPLATE

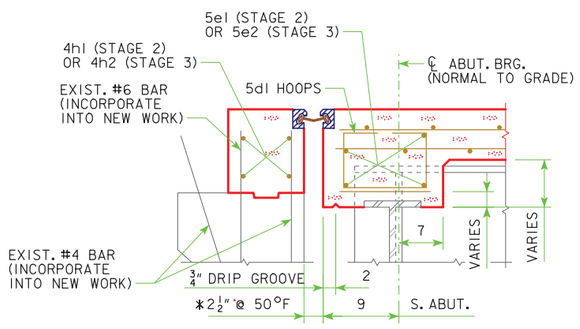


LIMITS OF CLEANING AND PAINTING

THE LUMP SUM BID FOR "PAINTING STRUCTURAL STEEL" SHALL INCLUDE THE COST OF FIELD PAINTING EXISTING STRUCTURAL STEEL AS NOTED IN THESE PLANS. CLEANING AND PAINTING SHALL BE IN ACCORDANCE WITH SECTION 2508 OF THE STANDARD SPECIFICATIONS.



DIAPHRAGM DETAIL



SECTION A-A
(NORMAL TO ABUTMENT)

NOTE: PLACE 5d HOOPS PARALLEL TO LONGIT. 6b1 BARS.

SUPERSTRUCTURE NOTES:

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

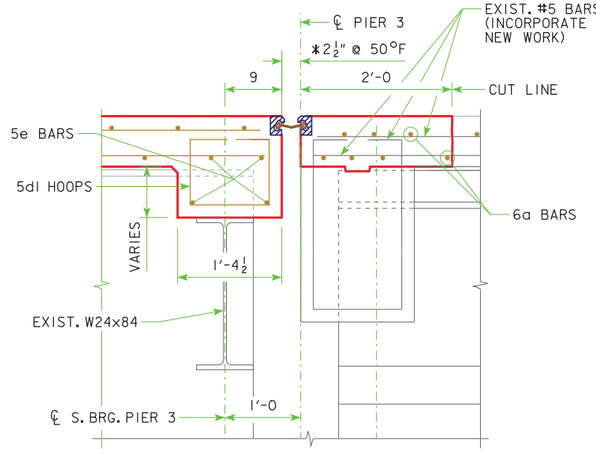
FORMS FOR THE BRIDGE SLAB AND BARRIER RAIL ARE TO BE SUPPORTED BY THE GIRDERS.

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

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2½" CLEAR BELOW TOP OF SLAB. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF SLAB. 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 SLAB BOLSTERS SPACED 4'-0 APART. I.M.451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, HIGH BAR CHAIRS, AND SLAB BOLSTERS.

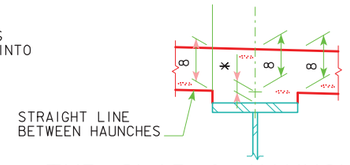
MINIMUM LAP LENGTHS: #4 BARS - 20"
#5 BARS - 25"
#6 BARS - 30"

*SEE DESIGN SHEET 13 FOR SETTINGS AT OTHER TEMPERATURES.



SECTION A-A
(NORMAL TO PIER 3)

NOTE: PLACE 5d HOOPS PARALLEL TO LONGIT. 6b1 BARS.



TYP. SLAB & HAUNCH DETAIL

* CONCRETE HAUNCH DIMENSION MEASURED BETWEEN BOTTOM OF SLAB AND TOP OF TOP FLANGE PLATE AS SHOWN ON THE "THEORETICAL CONCRETE HAUNCH DIAGRAM" SHOWN ON DESIGN SHEET 9.

THE MAXIMUM EMBEDMENT OF THE EDGE OF THE TOP FLANGE IN THE SLAB SHALL BE ½ INCH. SHEAR STUDS ARE TO HAVE A MINIMUM PENETRATION OF 2 INCHES INTO THE SLAB AND BE AT LEAST 2½ INCHES CLEAR OF THE TOP OF THE SLAB. THESE REQUIREMENTS WERE USED IN SETTING THE MAXIMUM AND MINIMUM ALLOWABLE FIELD HAUNCH VALUES SHOWN IN THE "MISCELLANEOUS DATA TABLE" SHOWN ON DESIGN SHEET 9.

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS 122'-0 CENTER SPAN

SUPERSTRUCTURE DETAILS

STATION 59+62.15 JAN 2015

BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

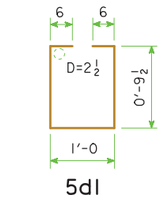
DESIGN SHEET NO. 6 OF 15 FILE NO. 31121 DESIGN NO. 315

CONC. PLACEMENT QUANTITIES

LOCATION	QUANTITY
SECTION 1, SLAB	26.7
SECTION 2, SLAB	24.7
SECTION 3, SLAB	27.0
SECTION 4, SLAB	23.4
SECTION 5, SLAB	23.4
SECTION 6, SLAB	32.1
SECTION 7, SLAB	29.7
SECTION 8, SLAB	32.5
SECTION 9, SLAB	28.0
SECTION 10, SLAB	28.0
TOTAL (CU. YDS.)	275.5

ESTIMATED QUANTITIES SUPRSTR.

ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (BRIDGE)	CU. YD.	275.5
REINFORCING STEEL EPOXY COATED	LBS.	117,980
REINFORCING STEEL STAINLESS STEEL	LBS.	3,968
STRUCTURAL STEEL	LBS.	5,047
STEEL EXTRUSION JOINT WITH NEOPRENE	L.F.	62
NEOPRENE GLAND INSTALLATION & TESTING	L.F.	92.5



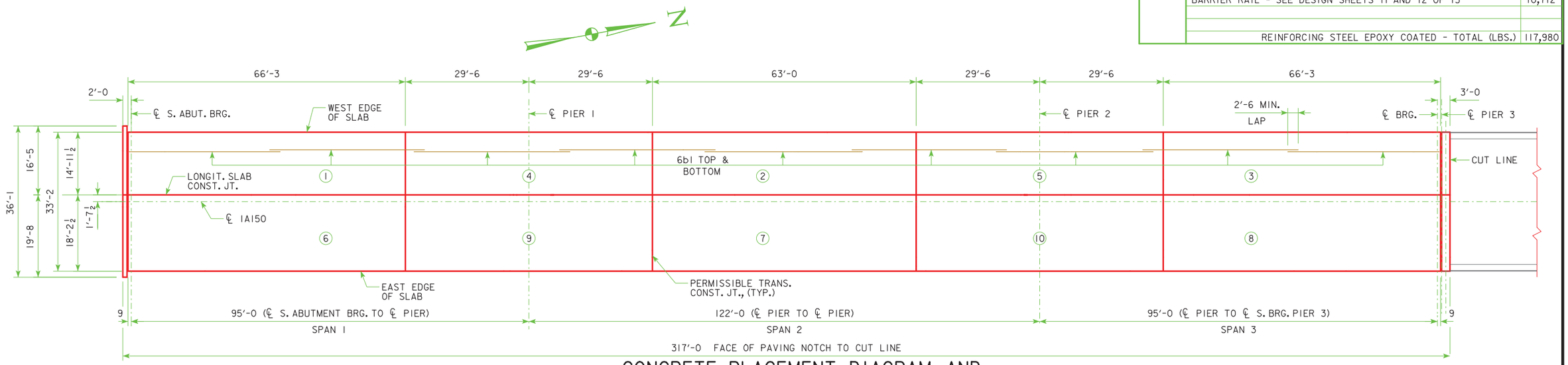
BENT BAR DETAILS

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

REINFORCING BAR LIST-SUPERSTRUCTURE

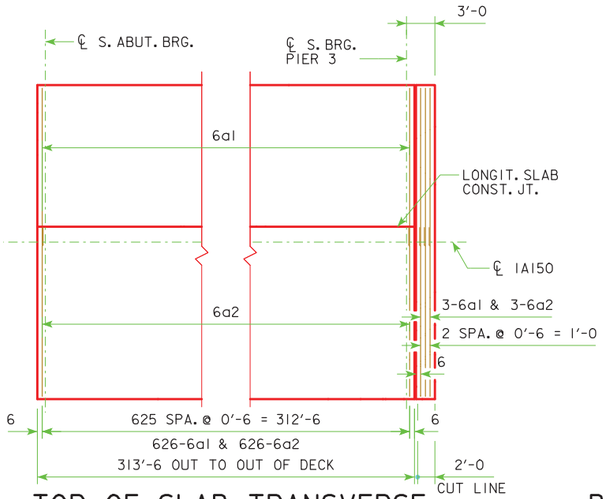
EPOXY COATED REINFORCING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6a1	SLAB TRANSV. TOP & BOTT.	—	1260	17'-7	33,277
6a2	SLAB TRANSV. TOP & BOTT.	—	1260	17'-10	33,750
6b1	SLAB LONGIT. TOP & BOTT.	—	711	37'-1	39,602
5d1	ABUT. & PIER DIAPH. HOOPS	□	66	3'-7	247
5e1	ABUT. & PIER DIAPH.	—	8	17'-7	147
5e2	ABUT. & PIER DIAPH.	—	8	17'-5	145
4h1	BACKWALL, TRANSV.	—	4	17'-11	48
4h2	BACKWALL, TRANSV.	—	4	19'-6	52
	BARRIER RAIL - SEE DESIGN SHEETS 11 AND 12 OF 15				10,712
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				117,980

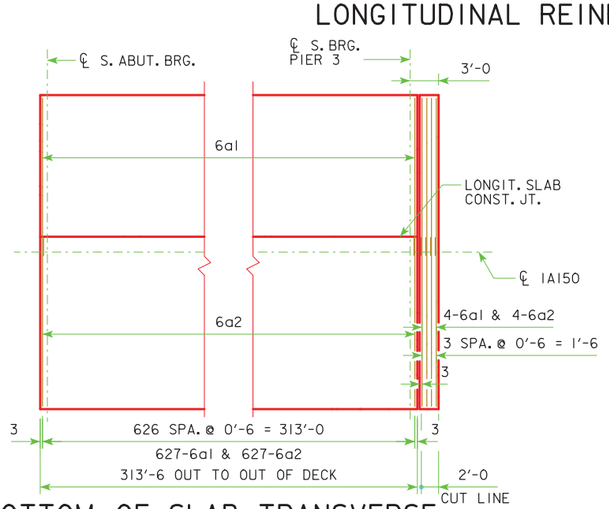


CONCRETE PLACEMENT DIAGRAM AND LONGITUDINAL REINFORCING LAYOUT

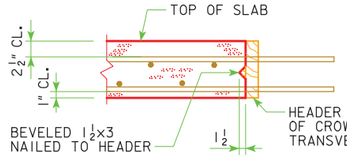
NOTE: CONCRETE DECK SLAB SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. ALTERNATE PROCEDURES FOR PLACING SLAB CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS.



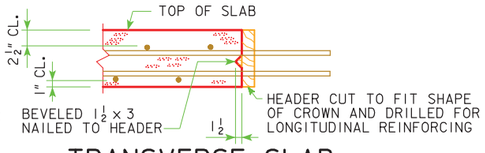
TOP OF SLAB TRANSVERSE REINFORCING LAYOUT



BOTTOM OF SLAB TRANSVERSE REINFORCING LAYOUT



LONGITUDINAL SLAB CONSTRUCTION JOINT



TRANSVERSE SLAB CONSTRUCTION JOINT

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS — 122'-0 CENTER SPAN

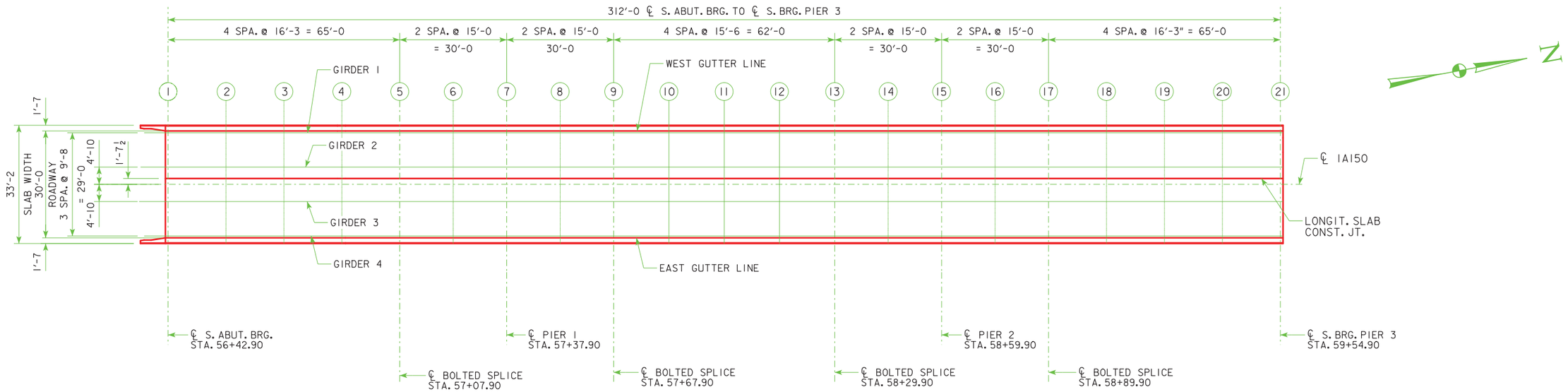
CONCRETE PLACEMENT DIAGRAM

STATION 59+62.15 — JAN 2015

BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

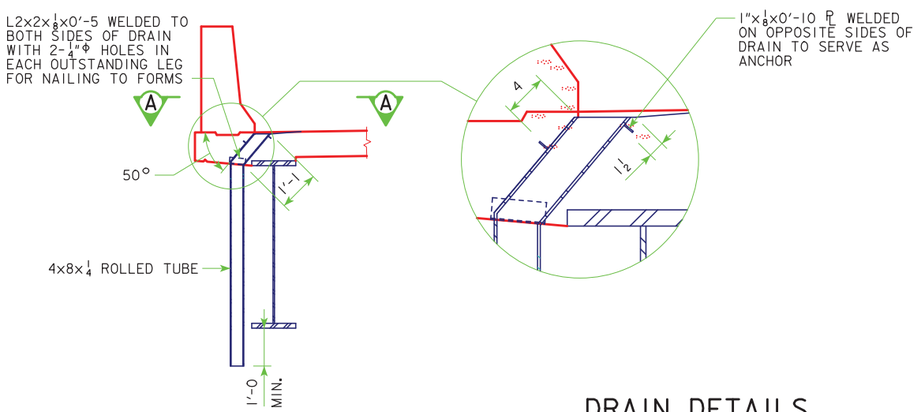
DESIGN SHEET NO. 7 OF 15 — FILE NO. 31121 — DESIGN NO. 315



SLAB PLAN

SLAB ELEVATIONS

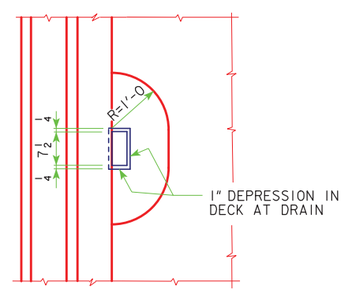
	℄ S. ABUT. BEARING				℄ BOLTED SPLICE		℄ PIER 1		℄ BOLTED SPLICE				℄ BOLTED SPLICE		℄ PIER 2		℄ BOLTED SPLICE				℄ S. BRG. PIER 3
LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
WEST GUTTERLINE	790.56	790.77	790.97	791.15	791.33	791.48	791.62	791.75	791.87	791.98	792.09	792.18	792.27	792.34	792.40	792.45	792.49	792.53	792.55	792.56	792.56
GIRDER LINE 1	790.57	790.78	790.98	791.16	791.33	791.48	791.62	791.76	791.88	791.99	792.10	792.19	792.27	792.34	792.41	792.46	792.50	792.53	792.56	792.57	792.57
GIRDER LINE 2	790.72	790.92	791.12	791.31	791.48	791.63	791.77	791.90	792.02	792.14	792.24	792.33	792.42	792.49	792.55	792.60	792.64	792.68	792.70	792.71	792.71
LONGIT. SLAB CONST. JT.	790.76	790.97	791.16	791.35	791.52	791.67	791.81	791.94	792.07	792.18	792.28	792.38	792.46	792.53	792.59	792.65	792.69	792.72	792.75	792.76	792.76
℄ 1A150	790.77	790.97	791.17	791.36	791.53	791.68	791.82	791.95	792.07	792.19	792.29	792.38	792.47	792.54	792.60	792.65	792.69	792.73	792.75	792.76	792.76
GIRDER LINE 3	790.72	790.92	791.12	791.31	791.48	791.63	791.77	791.90	792.02	792.14	792.24	792.33	792.42	792.49	792.55	792.60	792.64	792.68	792.70	792.71	792.71
GIRDER LINE 4	790.57	790.78	790.98	791.16	791.33	791.48	791.62	791.76	791.88	791.99	792.10	792.19	792.27	792.34	792.41	792.46	792.50	792.53	792.56	792.57	792.57
EAST GUTTERLINE	790.56	790.77	790.97	791.15	791.33	791.48	791.62	791.75	791.87	791.98	792.09	792.18	792.27	792.34	792.40	792.45	792.49	792.53	792.55	792.56	792.56



ELEVATION

DRAIN DETAILS

(REQUIRED AT 8 LOCATIONS)



SECTION A-A

NOTE:
DRAINS ARE TO BE GALVANIZED. 8 DRAINS REQUIRED. SEE SITUATION PLAN ON DESIGN SHEET 3 FOR LOCATIONS. WEIGHT = 109 LBS. PER DRAIN IS BASED ON ROLLED TUBE. COST OF DRAINS TO BE INCLUDED IN "STRUCTURAL STEEL".

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS — 122'-0 CENTER SPAN

TOP OF SLAB ELEVATIONS

STATION 59+62.15 — JAN 2015

BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

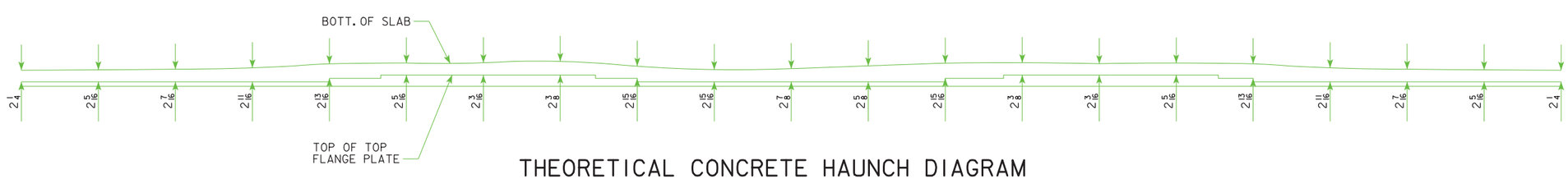
DESIGN SHEET NO. 8 OF 15 FILE NO. 31121 DESIGN NO. 315

TABLE OF BEAM LINE SLAB HAUNCH ELEVATIONS

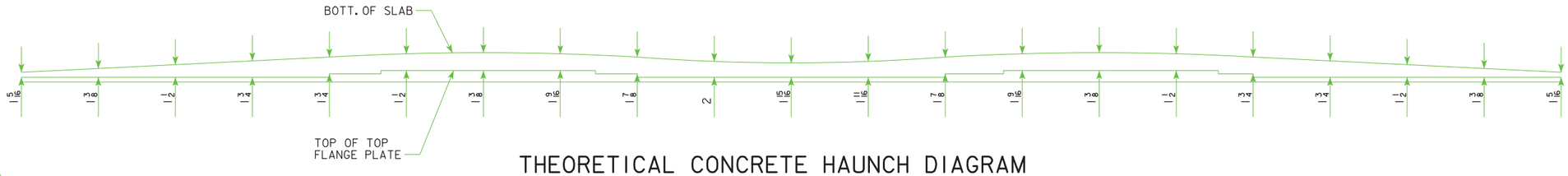
GIRDER LINE	℄ S. ABUT. BEARING				℄ BOLTED SPLICE		℄ PIER 1		℄ BOLTED SPLICE				℄ BOLTED SPLICE		℄ PIER 2		℄ BOLTED SPLICE			℄ S. BRG. PIER 3
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21
GIRDER LINE 1	789.91	790.16	790.38	790.56	790.71	790.83	790.96	791.11	791.26	791.40	791.52	791.60	791.66	791.70	791.74	791.81	791.88	791.94	791.96	791.95	791.90
GIRDER LINE 2	790.05	790.31	790.53	790.71	790.86	790.98	791.10	791.25	791.40	791.55	791.67	791.75	791.80	791.84	791.88	791.95	792.02	792.08	792.11	792.09	792.05
GIRDER LINE 3	790.05	790.31	790.53	790.71	790.86	790.98	791.10	791.25	791.40	791.55	791.67	791.75	791.80	791.84	791.88	791.95	792.02	792.08	792.11	792.09	792.05
GIRDER LINE 4	789.91	790.16	790.38	790.56	790.71	790.83	790.96	791.11	791.26	791.40	791.52	791.60	791.66	791.70	791.74	791.81	791.88	791.94	791.96	791.95	791.90

MISCELLANEOUS DATA TABLE

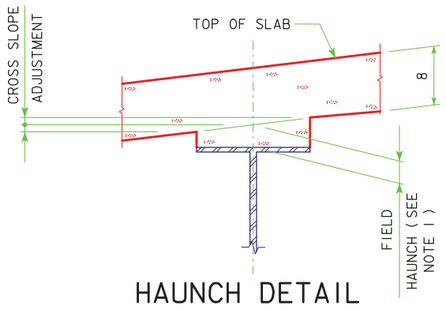
	GIRDER LINE	℄ S. ABUT. BEARING				℄ BOLTED SPLICE		℄ PIER 1		℄ BOLTED SPLICE				℄ BOLTED SPLICE		℄ PIER 2		℄ BOLTED SPLICE			℄ S. BRG. PIER 3
		LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19	LINE 20	LINE 21
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL	0	9/16	7/8	13/16	1/2	3/16	0	3/16	9/16	15/16	1 1/8	15/16	9/16	3/16	0	3/16	1/2	13/16	7/8	9/16	0
CROSS SLOPE ADJUSTMENTS (IN.)	1 & 4	1/16	1/16	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/16	1/16	1/16	1/8	1/8	1/8	1/8	1/8	1/16	1/16	1/16	1/16
	2 & 3	1/16	1/16	1/16	1/16	1/8	1/8	3/16	1/8	1/8	1/16	1/16	1/16	1/8	1/8	3/16	1/8	1/8	1/16	1/16	1/16	1/16
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX. ALL	4 (0.333)																				
	MIN. ALL	1/2 (0.042)																				



THEORETICAL CONCRETE HAUNCH DIAGRAM
GIRDERS 1 AND 4



THEORETICAL CONCRETE HAUNCH DIAGRAM
GIRDERS 2 AND 3

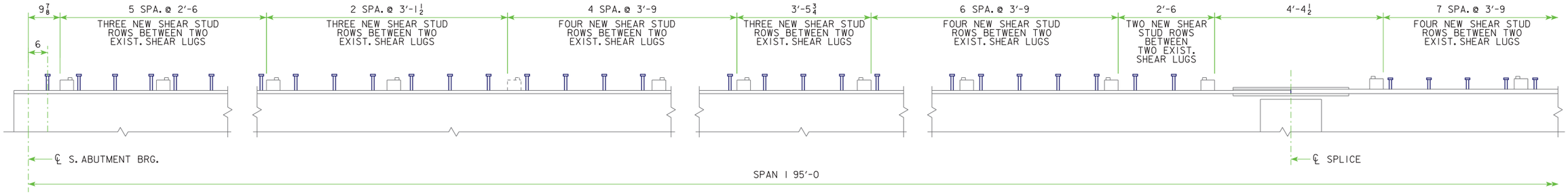


HAUNCH DETAIL

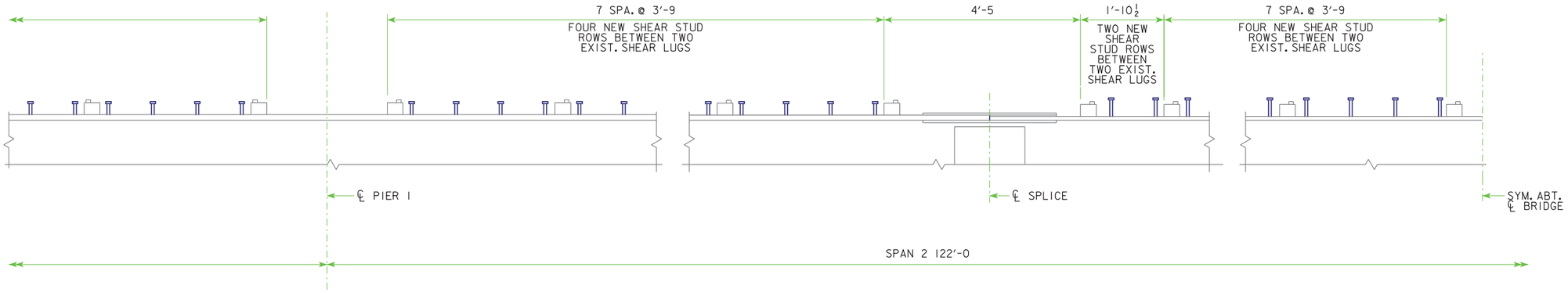
NOTE 1:
TO CALCULATE FIELD HAUNCH NEEDED AT EACH LOCATION, SURVEY THE GIRDER TOPS CONSISTENT WITH THE SPACINGS SHOWN ON THE "SLAB PLAN" DIAGRAM ON DESIGN SHEET NO. 8. SUBTRACT THE SURVEYED GIRDER SHOT FROM THE "BEAM LINE HAUNCH ELEVATION". THIS VALUE WILL BE THE HAUNCH NEEDED (SEE "FIELD HAUNCH" IN HAUNCH DETAIL). THE "BEAM LINE HAUNCH ELEVATION" INCLUDES ADJUSTMENTS FOR SLAB THICKNESSES AND ANTICIPATED DEFLECTIONS. NO ADDITIONAL CALCULATIONS ARE REQUIRED. IF THE FIELD HAUNCH EXCEEDS THE MAXIMUMS AND MINIMUMS INDICATED IN THE MISC. DATA TABLE, ADJUSTMENTS TO THE GRADE OR ADDITIONAL HAUNCH REINFORCEMENT WILL BE REQUIRED.

NOTES:
FIELD HAUNCHES ARE DETERMINED USING SURVEYED TOP OF GIRDER 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.
SHEAR STUD CLEARANCE FROM TOP OF SLAB SHALL NOT BE LESS THAN 2 1/2".
SHEAR STUD EMBEDMENT INTO SLAB SHALL BE AT LEAST 2".

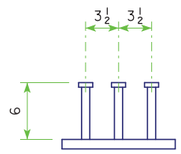
DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW
643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE
95'-0 END SPANS 122'-0 CENTER SPAN
BEAM LINE HAUNCH
STATION 59+62.15 JAN 2015
BENTON COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 9 OF 15 FILE NO. 31121 DESIGN NO. 315



PARTIAL ELEVATION



PARTIAL ELEVATION



3 STUDS PER ROW

SHEAR STUD DETAILS

NOTE: ALL STUDS TO BE $\frac{7}{8}$"Φ

NOTES:
AS BUILT EXIST. SHEAR STUD SPACING MAY VARY FROM CONSTRUCTION DETAILS. CONTRACTOR SHOULD VERIFY ALL DIMENSIONS IN THE FIELD. SEE ORIGINAL CONSTRUCTION DRAWINGS FOR ADDITIONAL DETAILS.
CONTRACTOR SHALL ADJUST THE SHEAR STUD HEIGHTS AS NECESSARY TO FIT WITHIN THE HAUNCH, CLEARANCE, AND EMBEDMENT LIMITS.
FOR HAUNCH CLEARANCE AND EMBEDMENT LIMITS, SEE DESIGN SHEET 9.

CONTRACTOR SHOULD PAY ATTENTION TO NUMBERS OF NEW SHEAR STUDS BETWEEN EXIST. SHEAR LUGS.

SHEAR STUDS ARE TO BE OF AN APPROVED TYPE LISTED IN MATERIALS I.M.453.10. APPENDIX A.

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS 122'-0 CENTER SPAN

SHEAR STUD SPACING

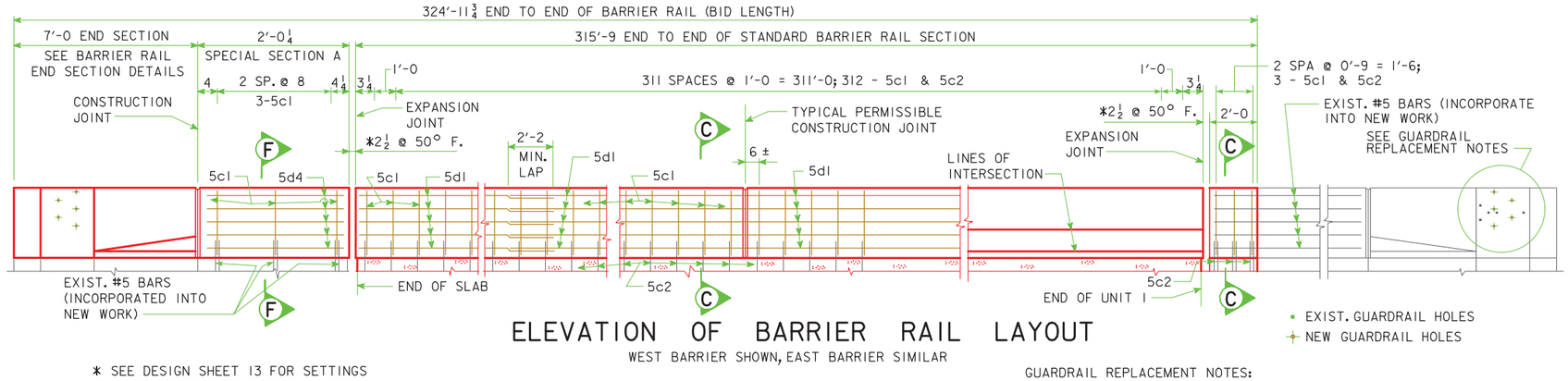
STATION 59+62.15 JAN 2015

BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 10 OF 15 FILE NO. 31121 DESIGN NO. 315

DESIGN TEAM HNTB | BENTON COUNTY | PROJECT NUMBER BRFN-150-2(15)--39-06 | SHEET NUMBER 11



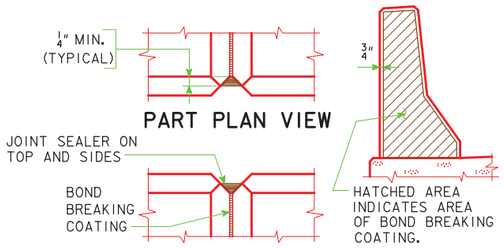
ELEVATION OF BARRIER RAIL LAYOUT

WEST BARRIER SHOWN, EAST BARRIER SIMILAR

* SEE DESIGN SHEET 13 FOR SETTINGS AT OTHER TEMPERATURES.

EXIST. GUARDRAIL HOLES
NEW GUARDRAIL HOLES

GUARDRAIL REPLACEMENT NOTES:
1. REMOVE EXIST. GUARDRAIL AT NORTH ABUTMENT.
2. DRILL HOLES AS REQUIRED TO ACCOMMODATE STANDARD THRIE-BEAM GUARDRAIL PER STANDARD ROAD PLAN BA-202 STEEL BEAM GUARDRAIL.
3. REMOVE DEBRIS FROM AND CLEAN ORIGINAL BOLT HOLES. GROUT ORIGINAL HOLES WITH APPROVED EPOXY.
4. INSTALL NEW GUARDRAIL PER STANDARD ROAD PLAN BA-202 STEEL BEAM GUARDRAIL.



BARRIER RAIL JOINT DETAILS

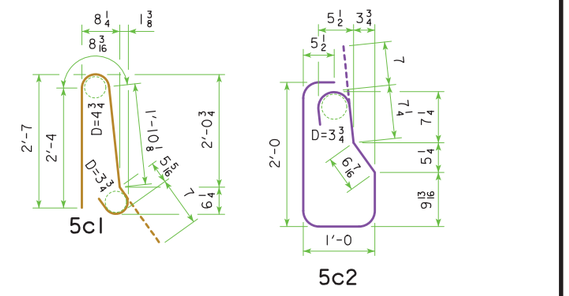
EPOXY COATED REINF. STEEL - TWO RAILS

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL		634	5'-11	3912
	5d1	RAIL, LONGITUDINAL		162	36'-9	6210
SPECIAL SECTIONS	5c1	RAIL, VERTICAL		6	5'-11	37
	5d4	RAIL, LONGIT.- SPECIAL SECTION A		18	1'-8	31
					EPOXY STEEL TOTAL (LBS.)	10,190

STAINLESS STEEL REINF. STEEL - TWO RAILS

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STD. SECTS.	5c2	RAIL, VERTICAL		634	6'-0	3968
SPECIAL SECTIONS						
					STAINLESS STEEL TOTAL (LBS.)	3,968

BENT BAR DETAILS



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

CONCRETE PLACEMENT SUMMARY

SECTION		TOTAL
STANDARD SECTION	631.50 @ 0.1052 CU. YD. PER FT.	66.4
SPECIAL SECTION A	4.04 @ 0.1052 CU. YD. PER FT.	0.4
	TOTAL (CU. YD.)	66.8

CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	L.F.	650.0

BARRIER RAIL NOTES:

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

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

COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.

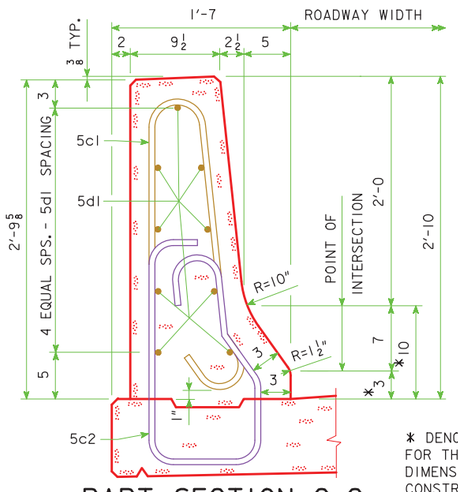
ALL BARRIER RAIL REINFORCING STEEL IS TO BE EITHER EPOXY COATED OR STAINLESS STEEL AS SHOWN. THE STAINLESS STEEL REINFORCING STEEL SHALL BE DEFORMED BAR GRADE 60 MEETING THE REQUIREMENTS OF MATERIALS I.M. 452.

THE CONCRETE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS. THE NUMBER OF LINEAL FEET OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES. PRICE BID FOR CONCRETE BARRIER RAILING SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.

THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.

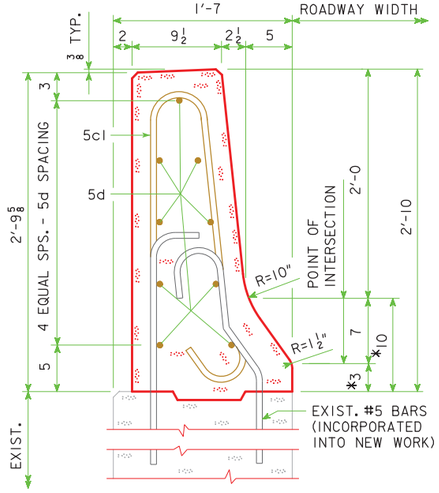
TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL ℄ GRADE.

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



PART SECTION C-C

* DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.



PART SECTION F-F

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS — 122'-0 CENTER SPAN

BARRIER RAIL

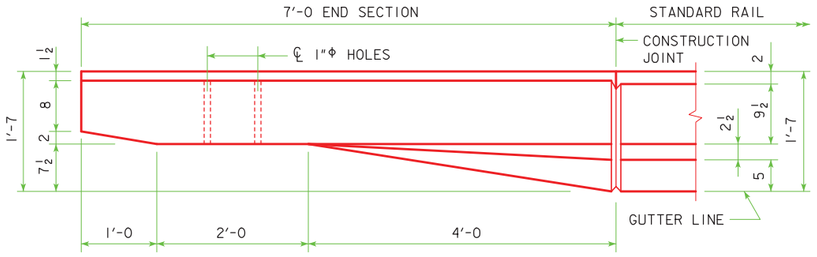
STATION 59+62.15 — JAN 2015

BENTON COUNTY

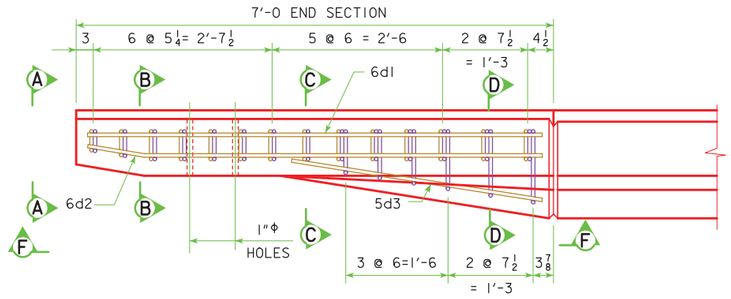
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 11 OF 15 FILE NO. 31121 DESIGN NO. 315

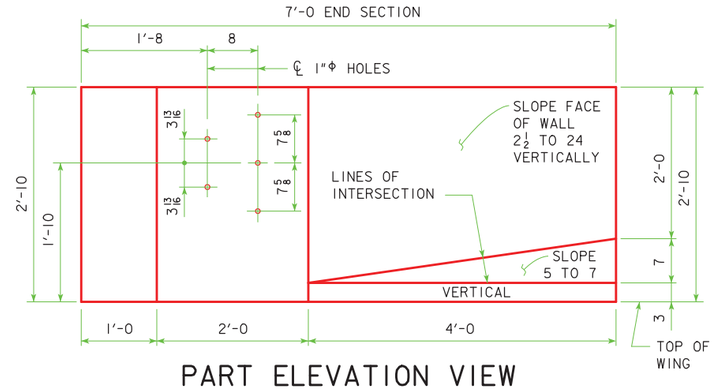
THIS NOTE ISSUED 4-14 - ADDED STAINLESS STEEL BAR LIST AND CHANGED 5d2, 5c3, 5c14 BARS TO STAINLESS STEEL



PART PLAN VIEW

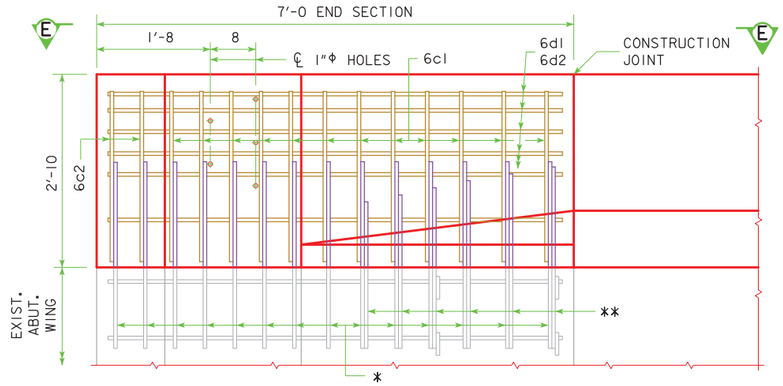


PART VIEW E-E



PART ELEVATION VIEW

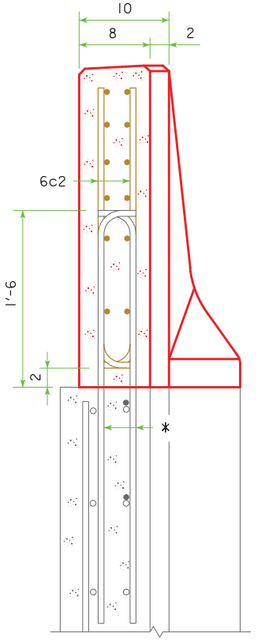
PROVIDE 5 HOLES FORMED WITH 1"Φ PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



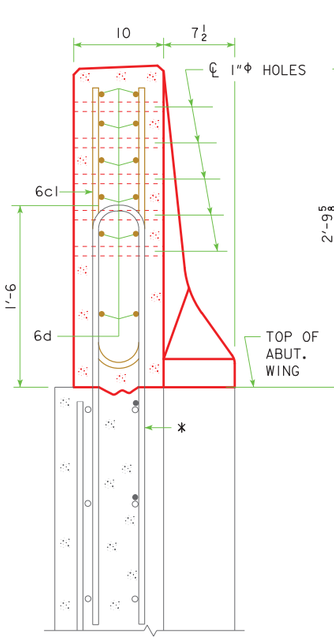
PART VIEW F-F

* EXIST. #6 BARS (INCORPORATE INTO NEW WORK)

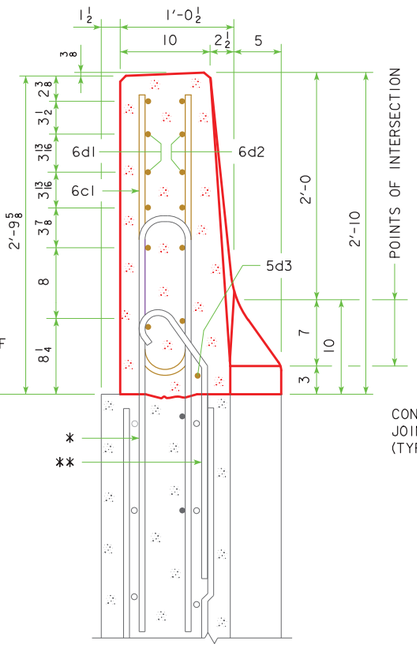
** EXIST. #5 BARS (INCORPORATE INTO NEW WORK)



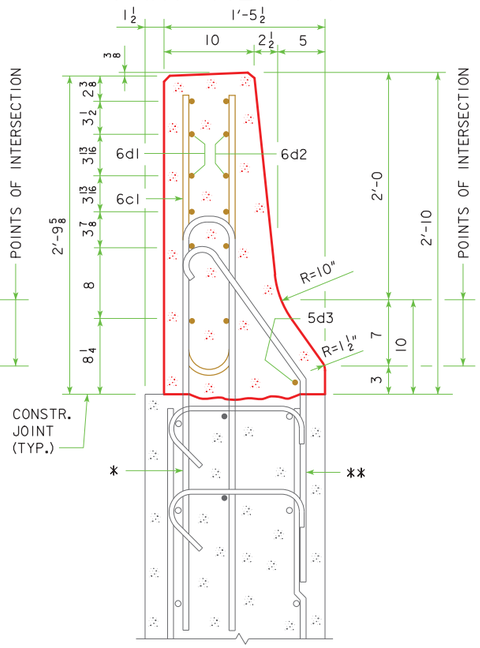
VIEW A-A



SECTION B-B



SECTION C-C



SECTION D-D

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:
CONTRACTOR TO VERIFY NUMBER OF BARS TO BE INCORPORATED INTO NEW WORK AND REPORT FINDINGS TO THE ENGINEER.

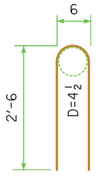
EPOXY COATED REINF. STEEL - ONE END SECT.

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
	EPOXY REINF. TOTAL WEIGHT (LBS.)				261

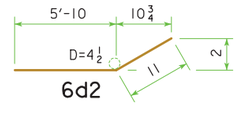
CONCRETE PLACEMENT SUMMARY

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

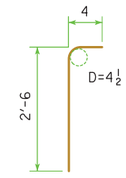
BENT BAR DETAILS



6c1



6d2



6c2

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

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS 122'-0 CENTER SPAN

BARRIER RAIL

STATION 59+62.15 JAN 2015

BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 12 OF 15 FILE NO. 31121 DESIGN NO. 315

THIS SHEET ISSUED 4-14 - ADDED STAINLESS STEEL REINFORCING

DESIGN TEAM HNTB	BARRIER RAIL END SECTION DETAILS WITH 7'-0 WING	MODIFIED STANDARD SHEET I017S	BENTON COUNTY	PROJECT NUMBER BRFN-150-2(15)--39-06	SHEET NUMBER 13

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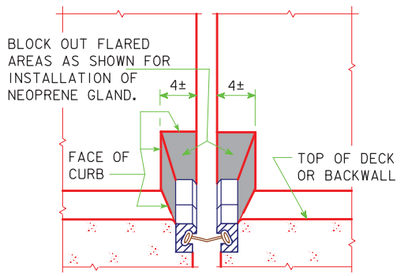
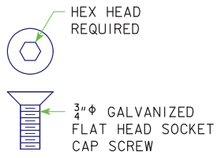
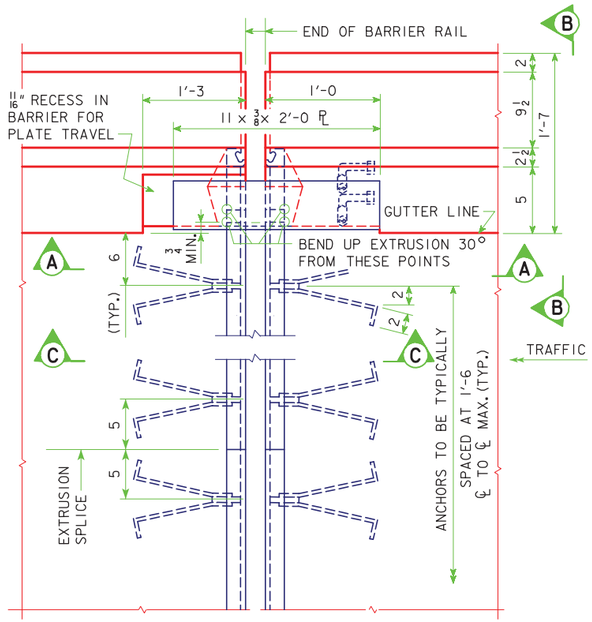


BLOCKOUT DETAIL

CONTRACTOR TO NOTE THAT THE CAP SCREW ANCHORAGE SYSTEM FOR THE $\frac{3}{8}$" BARRIER PLATES ARE ALWAYS TO BE PLACED ON THE ONCOMING TRAFFIC SIDE.



CAP SCREW DETAIL

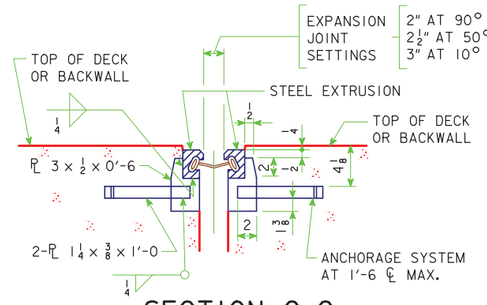


PART PLAN VIEW OF EXPANSION DEVICE 0° SKEW

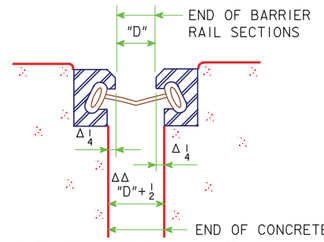
BARRIER PLATE NOTE:

THE MATERIAL USED FOR THE BARRIER PLATES IS TO BE ASTM A36 STEEL. THE BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A307. THE PLATES, BOLTS, NUTS AND CAP SCREWS ARE TO BE GALVANIZED IN ACCORDANCE WITH ARTICLE 4100.07 OF THE STANDARD SPECIFICATIONS.

NOTE: JOINT SETTINGS FOR OTHER TEMPERATURES ARE PROPORTIONAL. TEMPERATURES SHOWN ARE CONCRETE DECK TEMPERATURES ON THE UNDERSIDE OR SHADED PORTION OF THE DECK.



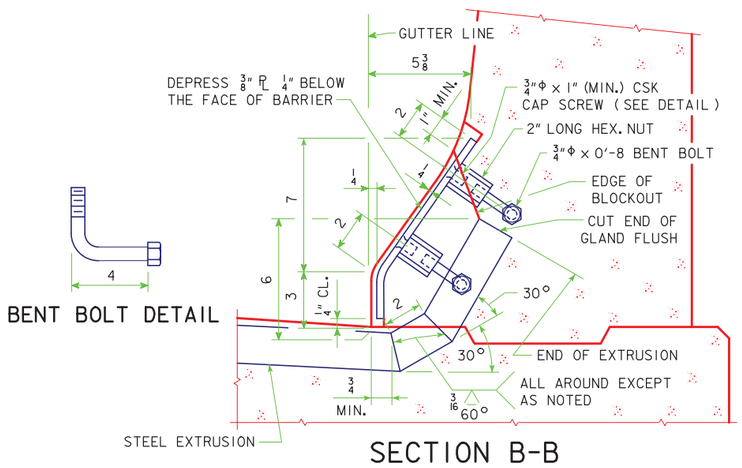
SECTION C-C



EXPANSION OPENING DETAIL

Δ THIS DIMENSION MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER FURNISHING THE JOINT.

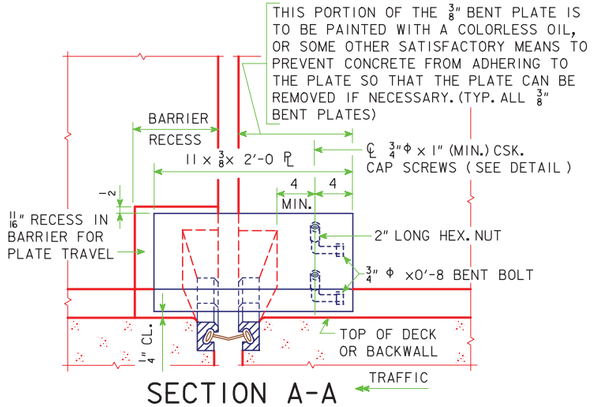
ΔΔ USED FOR ALL OUT TO OUT DIMENSIONS OF SLAB. THE DIMENSION MAY VARY SLIGHTLY DEPENDING ON MANUFACTURER FURNISHING THE JOINT.



SECTION B-B

BENT BOLT DETAIL

NOTE: IT IS INTENDED THAT THE $\frac{11}{16}$ INCH RECESSED AREA BE FORMED SO THAT WHEN THE $\frac{3}{8}$" BENT PLATE IS INSTALLED THE PLATE WILL BE ABLE TO MOVE FREELY IN THIS RECESSED AREA.



SECTION A-A

TABLE OF APPROVED EXPANSION DEVICES

MANUFACTURER	TYPE OF STEEL EXTRUSION	NEOPRENE GLAND	MINIMUM OPENING FOR GLAND INSTALLATION	CORRESPONDING MAXIMUM DECK TEMPERATURE
WATSON-BOWMAN & ACME CORP.	A	SE-400	1½"	70° F.
D.S. BROWN CO.	SSA2	A2R-400	2"	60° F.
APPROVED EQUAL				

NOTE:
SEE DESIGN SHEET 14 OF 15 FOR EXPANSION DEVICE NOTES CONTAINING THE STEEL EXTRUSION NOTES, NEOPRENE GLAND NOTES, AND WATERTIGHT INTEGRITY TESTING AND REPAIR NOTES.

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS 122'-0 CENTER SPAN

EXPANSION DEVICE DETAILS

STATION 59+62.15 JAN 2015

BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 13 OF 15 FILE NO. 31121 DESIGN NO. 315

REVISION 8-13 - ADDED CORRESPONDING MAXIMUM DECK TEMPERATURE COLUMN TO EXPANSION DEVICE TABLE. ADDED SPLICE DETAIL TO THE PART PLAN VIEWS

STEEL EXTRUSION NOTES:

THE CONTRACTOR SHALL SUBMIT FOR APPROVAL SHOP DRAWINGS OF THE EXPANSION DEVICES SHOWING LAYOUT, MATERIAL TO BE USED, AND PROVISIONS FOR THE HOLDING DEVICE DURING PLACEMENT OF CONCRETE.

THE EXPANSION DEVICE SHALL BE GALVANIZED AFTER WELDING. ALL CURB PLATES INCLUDING THEIR ANCHORAGES SHALL BE GALVANIZED.

THE EXPANSION DEVICE IS TO BE PARALLEL TO GRADE.

CAP SCREWS SHALL BE COUNTERSUNK $\frac{1}{16}$" BELOW TOP OF THE PLATE. THE MINIMUM GRADE OF STRUCTURAL STEEL FOR THE EXPANSION DEVICE SHALL BE ASTM A36.

BLOCKOUT DETAILS MAY BE ALTERED FROM THOSE SHOWN PROVIDED THE GLAND MAY BE INSTALLED AND REMOVED IF NECESSARY AND THE CURB AREA REMAINS WATERTIGHT.

SHOP SPLICES OF THE STEEL EXTRUSION WILL BE PERMITTED. PRIOR TO MAKING SHOP SPLICES STEEL EXTRUSION PIECES SHALL HAVE A MINIMUM LENGTH OF 15 FEET. THE INDIVIDUAL LENGTH OF PIECES SHALL BE CHOSEN SO THAT A MINIMUM NUMBER OF SPLICES IS REQUIRED. ALL PIECES SHALL BE JOINED WITH A PREQUALIFIED PARTIAL PENETRATION SINGLE GROOVE WELD DETAILED ON THE SHOP DRAWING. ALL SURFACES NOT IN CONTACT WITH CONCRETE ARE TO BE GROUND FLUSH. NO WELD SHALL BE PERMITTED IN THE INTERNAL SECTION OF THE EXTRUSION WHERE THE NEOPRENE GLAND IS TO BE INSTALLED.

THE NUMBER OF FEET OF STEEL EXTRUSION INSTALLED SHALL BE PAID FOR AT THE CONTRACT PRICE PER FOOT BASED ON PLAN QUANTITIES. THE PRICE BID FOR "STEEL EXTRUSION JOINT W/NEOPRENE" SHALL INCLUDE THE COST OF FURNISHING BUT NOT THE COST OF INSTALLING THE NEOPRENE GLAND. THE CONTRACT PRICE BID FOR "STEEL EXTRUSION JOINT W/NEOPRENE" SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING STEEL EXTRUSIONS. THIS WORK WILL CONSIST OF FURNISHING ALL REQUIRED MATERIALS, (INCLUDING THE $\frac{3}{8}$" PLATES AT THE CURBS AND THEIR ANCHORAGE SYSTEMS), AND THE INSTALLATION AND ADJUSTMENT OF THE EXPANSION JOINTS IN ACCORDANCE WITH THE DETAILS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER. THE FURNISHING AND INSTALLATION OF ALL NECESSARY HARDWARE AND ACCESSORIES AS SUPPLIED BY THE EXPANSION JOINT MANUFACTURER ARE TO BE INCLUDED IN THIS WORK, INCLUDING THE ANCHORAGE SYSTEM AND ANY TEMPORARY ERECTION MATERIAL. ALL WORK AND MATERIALS FOR THE INSTALLATION OF THE EXPANSION JOINTS ARE TO COMPLY WITH THE WRITTEN RECOMMENDATIONS OF THE EXPANSION JOINT MANUFACTURER.

NEOPRENE GLAND NOTES:

THE NEOPRENE GLAND IS TO BE PLACED AS ONE CONTINUOUS PIECE FROM END TO END OF THE STEEL EXTRUSION.

THE NEOPRENE GLAND SHALL CONFORM TO ASTM-2628 MODIFIED TO EXCLUDE RECOVER TEST AND COMPRESSION SET.

THE CONTRACTOR SHALL INSTALL THE GLAND ABOVE THE MINIMUM TEMPERATURE OF 45° AND THE MINIMUM JOINT OPENING AND CORRESPONDING MAXIMUM DECK TEMPERATURE SHOWN IN THESE PLANS. THE DECK TEMPERATURE SHALL BE MEASURED BY RECORDING THE SURFACE TEMPERATURES ON THE UNDERSIDE OF THE DECK ADJACENT TO THE JOINTS. IF THE DECK TEMPERATURE DOES NOT FALL WITHIN THE SPECIFIED TEMPERATURE RANGE BEFORE THE CONTRACTOR HAS COMPLETED ALL OTHER REQUIRED WORK, IT WILL BE NECESSARY FOR THE CONTRACTOR TO RETURN TO THE PROJECT SITE TO COMPLETE INSTALLATION AND TESTING OF THE NEOPRENE GLAND. IF THE CONTRACTOR IS REQUIRED TO RETURN TO THE PROJECT SITE AFTER ALL OTHER REQUIRED WORK HAS BEEN COMPLETED, THE CONTRACTOR SHALL COMPLETE INSTALLATION AND TESTING OF NEOPRENE GLAND AT NO EXTRA CHARGE TO THE STATE.

THE NUMBER OF FEET OF NEOPRENE GLAND INSTALLED SHALL BE PAID FOR AT THE CONTRACT PRICE PER FOOT BASED ON PLAN QUANTITIES. THE PRICE FOR "NEOPRENE GLAND INSTALLATION AND TESTING" SHALL BE FULL COMPENSATION FOR INSTALLING AND TESTING OF THE NEW NEOPRENE GLAND. THIS WORK WILL CONSIST OF CLEANING THE EXTRUSION, INSTALLATION OF THE NEOPRENE GLAND AND WATER TIGHT TESTING OF THE EXPANSION JOINT SYSTEM. ALL WORK AND MATERIALS NECESSARY FOR THE INSTALLATION OF THE NEOPRENE GLAND SHALL COMPLY WITH THE RECOMMENDATIONS OF THE EXPANSION JOINT MANUFACTURER. THE PRICE BID FOR "NEOPRENE GLAND INSTALLATION AND TESTING" SHALL INCLUDE ALL WATERTIGHT INTEGRITY TESTING, LEAK REPAIRS AS DIRECTED BY THE ENGINEER, AND SUBSEQUENT WATERTIGHT TESTING UNTIL A LEAK FREE INSTALLATION IS ACHIEVED.

WATERTIGHT INTEGRITY TESTING AND REPAIR NOTES:

AFTER INSTALLATION OF EACH NEOPRENE GLAND, THE CONTRACTOR SHALL PERFORM WATERTIGHT INTEGRITY TESTS AT THE DECK LEVEL TO DETECT ANY LEAKAGE. THE TESTS ARE TO CHECK FOR LEAKAGE AT THE UPTURNED ENDS OF THE EXPANSION DEVICE AND FOR LEAKAGE ALONG THE EXPANSION DEVICE ACROSS THE DECK AND ANY MEDIANS OR SIDEWALKS. THE CONTRACTOR MAY CONDUCT A SINGLE TEST OF THE ENTIRE DEVICE INCLUDING UPTURNED ENDS OR MAY CONDUCT SEPARATE TESTS OF UPTURNED ENDS AND ONE OR MORE TESTS OF OVERLAPPING LENGTHS BETWEEN THE UPTURNED ENDS.

AT EACH UPTURNED END OF THE EXPANSION DEVICE, THE CONTRACTOR SHALL BLOCK OUT ON THE DECK AT LEAST 3 FEET OF THE EXPANSION DEVICE LEADING TO THE UPTURNED END AND FLOOD THE AREA. A MINIMUM WATER DEPTH OF 3" SHALL BE MAINTAINED AT THE GUTTERLINE FOR AT LEAST 30 MINUTES. DURING THE TEST, THE INSPECTOR SHALL OBSERVE FOR ANY OVERFLOW AT THE UPTURNED END. AT THE CONCLUSION OF THE TEST THE INSPECTOR WILL EXAMINE THE UNDERSIDE OF THE JOINT FOR LEAKAGE. THE EXPANSION DEVICE IS CONSIDERED WATERTIGHT IF THE INSPECTOR OBSERVES NO OVERFLOW DURING THE TEST AND IF NO DRIPPING WATER OR WATER DROPLETS ARE VISIBLE IN THE UNDERDECK AREAS NEAR THE UPTURNED END.

THE CONTRACTOR SHALL TEST THE EXPANSION DEVICE BETWEEN UPTURNED ENDS BY BLOCKING OUT AND COVERING THE DEVICE WITH PONDED OR FLOWING WATER TO A DEPTH OF AT LEAST 1" AT ALL POINTS, FOR AT LEAST 30 MINUTES. VERTICAL CURB SURFACES MAY BE TESTED WITH AN UNNOZZLED HOSE DELIVERING APPROXIMATELY ONE GALLON PER MINUTE DIRECTED TO FLOW OVER THE ENTIRE CURB HEIGHT FOR 30 MINUTES. AT THE CONCLUSION OF THE TEST, THE INSPECTOR WILL EXAMINE THE UNDERSIDE OF THE JOINT FOR LEAKAGE. THE EXPANSION DEVICE IS CONSIDERED WATERTIGHT IF NO DRIPPING WATER OR WATER DROPLETS ARE VISIBLE IN THE UNDERDECK AREAS ALONG THE FULL LENGTH OF THE EXPANSION JOINT. DAMP CONCRETE THAT DOES NOT SHOW DRIPPING WATER OR WATER DROPLETS IS NOT CONSIDERED A SIGN OF LEAKAGE.

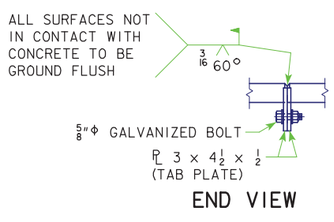
IF THE EXPANSION DEVICE LEAKS AT AN UPTURNED END OR ALONG ITS LENGTH, THE CONTRACTOR SHALL LOCATE THE LEAK(S) AND TAKE REPAIR MEASURES TO STOP THE LEAKAGE. THE REPAIR MEASURES SHALL BE AS RECOMMENDED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER PRIOR TO BEGINNING CORRECTIVE WORK.

IF MEASURES TO ELIMINATE LEAKAGE ARE TAKEN, THE CONTRACTOR SHALL PERFORM SUBSEQUENT WATERTIGHT INTEGRITY TESTS SUBJECT TO THE SAME CONDITIONS AS THE ORIGINAL TEST.

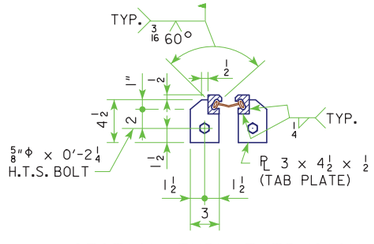
FIELD CONSTRUCTION NOTES:

IF THE STEEL EXTRUSION IS SPLICED IN THE FIELD, THE SPLICE LOCATION SHALL BE DETAILED ON THE SHOP DRAWINGS. THE CONNECTION DETAILS SHALL INCLUDE TAB PLATES AND PREPARED ENDS TO ACCOMMODATE THE NECESSARY WELDING. SEE DETAILS IN THESE PLANS.

GALVANIZED COATING DAMAGE BY FIELD WELDING SHALL BE REPAIRED IN ACCORDANCE WITH MATERIALS I.M. 410.



END VIEW



SECTION THRU EXTRUSION

FIELD SPLICE DETAIL

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS 122'-0 CENTER SPAN

EXPANSION DEVICE DETAILS

STATION 59+62.15 JAN 2015

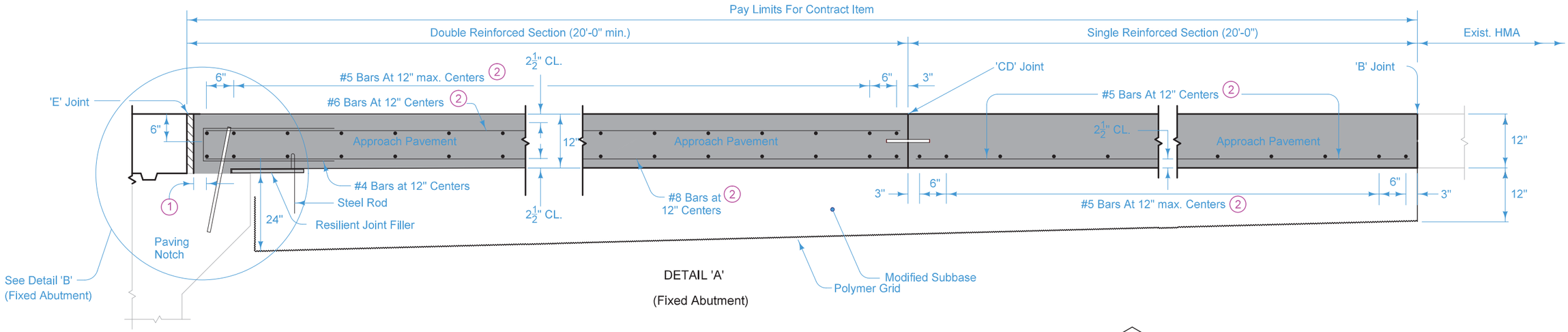
BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 14 OF 15 FILE NO. 31121 DESIGN NO. 315

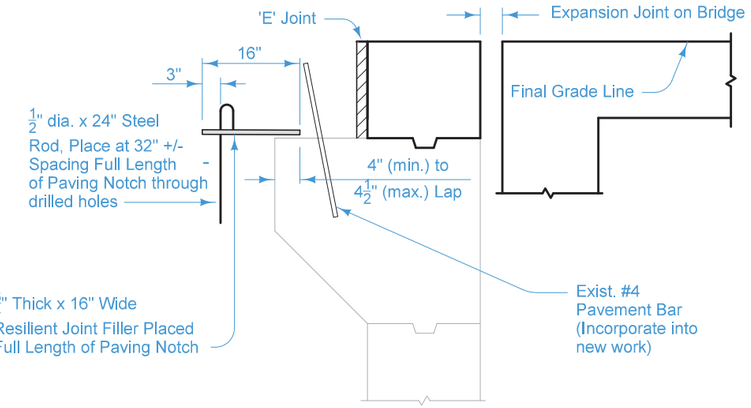
REVISION 8-13 - STEEL EXTRUSION NOTE WAS ADDED TO SHOW A WELD DETAIL ON THE SHOP DRAWINGS FOR SPLICES. AN ADDITIONAL NEOPRENE GLAND NOTE ABOUT THE CORRESPONDING MAXIMUM DECK TEMPERATURE WAS ADDED.

DESIGN TEAM HNTB	F-SHAPE EXPANSION DEVICE DETAILS STEEL EXTRUSION WITH NEOPRENE GLAND (2 OF 2)	STANDARD SHEET 1026s2	BENTON COUNTY	PROJECT NUMBER BRFN-150-2(15)--39-06	SHEET NUMBER 15

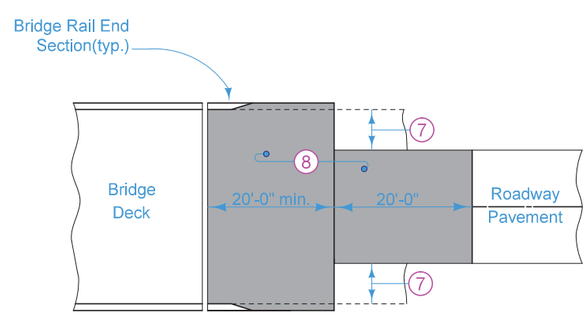


DETAIL 'A'

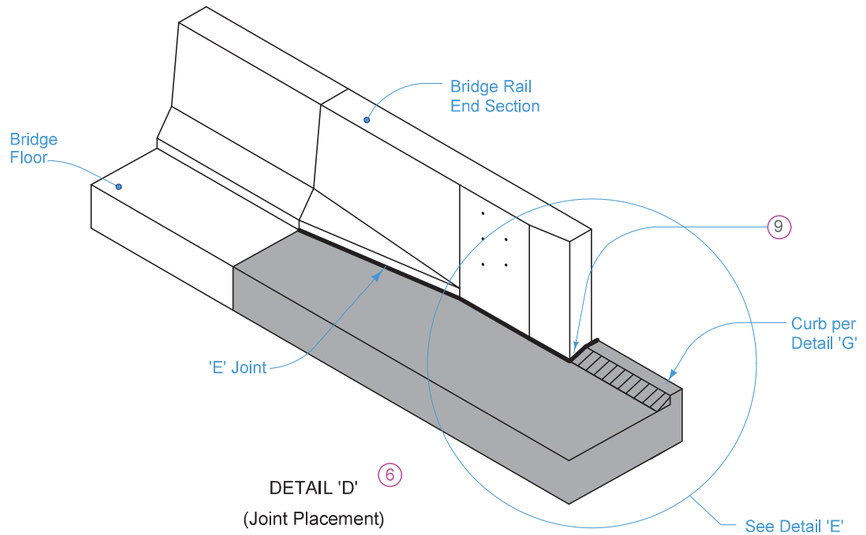
(Fixed Abutment)



DETAIL 'B' (Fixed Abutment)

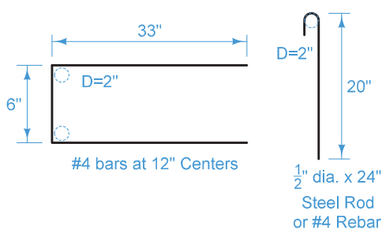


APPROACH PAVEMENT LAYOUT

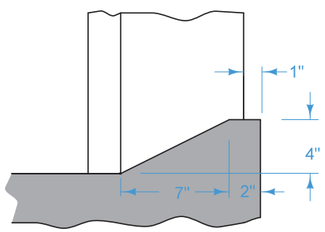


DETAIL 'D'

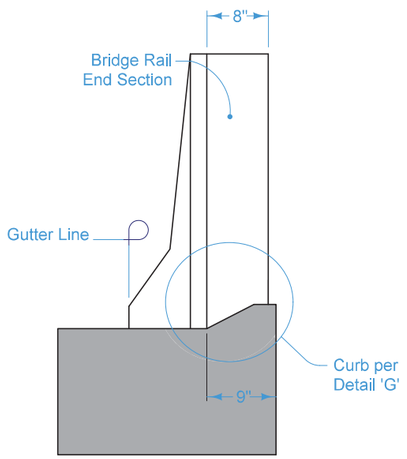
(6) (Joint Placement)



BENT BAR SHAPES



DETAIL 'G'



DETAIL 'E'

(Back of Curb Placement)

(1) 2" min. to 2 1/2" max. clear to bent bar.

(2) Minimum lap length: #5 Bars - 18"
#6 Bars - 27"
#8 Bars - 48"

(5) Longitudinal Joint: (PV-101)
Single pour - Saw cut joint per Detail B.
Two pours - Use 'KS-2' Joint (Double Reinforced Section)
Use 'KS-1' Joint (Single Reinforced Section)

(6) Refer to BR-211, BR-212 or BR-231.

(7) Design shoulder width.

(8) Reinforced bridge approach section.

(9) Expansion joint at end of Bridge Rail End Section: Place joint filler the full depth of the bridge approach pavement. In areas with curb, place full depth of pavement plus curb and shape material to fit the shape of the curb per Section B-B of PV-101. Seal joint per Detail F of PV-101.

- Fixed Abutment Bridges: Type 'E' joint.

For joint details, refer to PV-101.
For curb details, see Detail 'G'.

All transverse bars are #5.

Possible Contract Item:

Bridge Approach, BR-203

Possible Tabulation: 112-6

DESIGN FOR PARTIAL BRIDGE DECK REPLACEMENT 0° SKEW

643'-0 x 30'-0 CONTINUOUS WELDED GIRDER BRIDGE

95'-0 END SPANS 122'-0 CENTER SPAN

APPROACH SLAB

STATION 59+62.15 JAN 2015

BENTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 15 OF 15 FILE NO. 31121 DESIGN NO. 315

STANDARD SYMBOLS

- Interstate Highway Symbol
- U.S. Highway Symbol
- Iowa Highway Symbol
- County Road Highway Symbol
- Evergreen Tree
- Deciduous Tree
- Fruit Tree
- Shrub (Bushes)
- Timber
- Hedge
- Stump
- Swamp
- Rock Outcrop
- Broken Concrete
- Revetment (Rip Rap)
- Cemetery
- Grave
- Cave
- Sink Hole
- Board Fence
- Chain Link or Security Fence
- Wire Fence
- Terrace
- Earth Dam or Dike (Existing)
- Earth Dam or Dike (Proposed)
- Tile Outlet
- Edge of Water
- Existing Drainage
- Proposed Drainage
- Right of Way Rail or Lot Corner
- Concrete Monument
- Well
- Windmill
- Beehive Intake
- Existing Intake
- Proposed Intake
- Existing Utility Access (Manhole)
- Proposed Utility Access (Manhole)
- Fire Hydrant
- WH Water Hydrant (Rural)

- ST Septic Tank
- C Cistern
- LP L.P. Gas Tank (No Footing)
- UST Underground Storage Tank
- Latrine
- Luminaire
- Traffic Signal
- Traffic Signal with Luminaire
- TP Telephone Pedestal
- TVP Television Pedestal
- Telephone Pole
- Telephone Pole (Second Company)
- Telephone Pole (Third Company)
- Telephone Pole (Fourth Company)
- Telephone Pole (Fifth Company)
- Power Pole
- Power Pole (Second Company)
- Power Pole (Third Company)
- Power Pole (Fourth Company)
- Power Pole (Fifth Company)
- Electrical Highline Tower (Metal or Concrete)
- Telephone Riser Pole
- Power Riser Pole
- Telegraph Pole
- Satellite TV Dish
- W Existing Water Line
- W2 Existing Water Line (Second Company)
- San. Existing Sanitary Sewer Line
- T Existing Telephone Line
- T2 Existing Telephone Line (Second Company)
- FO-1 Existing Fiber Optics Telephone Line
- St. S. Existing Storm Sewer Line
- G Existing Gas Line
- G-HP Existing High Pressure Gas Line
- G2 Existing Gas Line (Second Company)
- G2-HP Existing High Pressure Gas Line (Second Company)
- E Existing Power Line
- E2 Existing Power Line (Second Company)
- TV Cable Television Line

- Guardrail (Beam or Cable)
- GP Guard Post (one or two)
- Guard Post (over two)
- FP Filler Pipe
- GV Gas Valve
- WV Water Valve
- SL Speed Limit Sign
- MM Mile Marker Post
- SIGN Sign
- WHU Water Hook Up
- RT Radio Tower
- TA Tower Anchor
- EB Electric Box
- TCB Traffic Signal Control Box
- RRB Rail Road Signal Control Box
- TSB Telephone Switch Box

04-30-02	IA 150	101-4
DESIGN DATA RURAL		
2013 AADT	4270	V.P.D.
20 AADT	-	V.P.D.
20 DHV	-	V.P.H.
TRUCKS	6	%
Total Design ESALs		

- Shading - Proposed Paved Shoulder
- Shading - Proposed Bridge Approach
- Shading - Rock Flume

IOWA 1-CALL# 1-800-292-8989

INDEX OF SHEETS

*Color Plan Sheets

ROADWAY DESIGN

PROFESSIONAL CIVIL ENGINEER — MARC ADRIAN WHITMORE — 20982 — 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.

Signature 1/25/16 Date

Marc A. Whitmore
Printed or Typed Name

My license renewal date is December 31, 2017

Pages or sheets covered by this seal: A.1, B.1-B.2, C.1-C.5, D.1, G.1-G.3, J.1-J.3, U.1-U.2

RIGHT OF WAY LEGEND

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

CONVENTIONAL SIGNS

- Survey Line (Station, Reference Point)
- Section Corner
- Proposed Profile Grade
- Railroad
- Field Tile (Existing, Proposed)
- Culverts (Existing, Proposed)
- Stream

Legend And Symbol Information Sheet

(Symbols are Typical Only)

ENGLISH	IOWA DOT	DESIGN TEAM HNTB	BENTON COUNTY	PROJECT NUMBER BRFN-150-2(15)--39-06	SHEET NUMBER A.1

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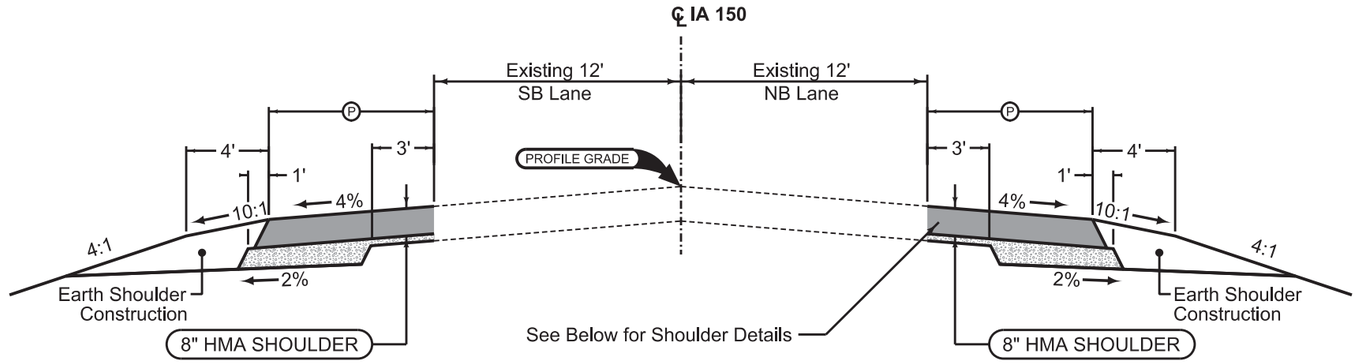
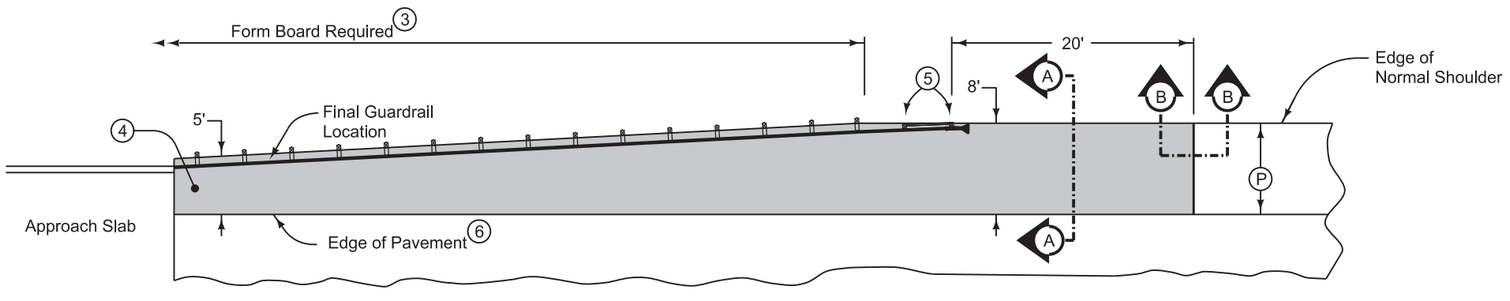


IOWA 150
Sta. 55+30.00 to Sta. 56+00.90

7156
Modified

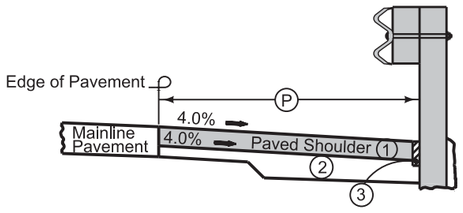


8" HMA Paved Shoulder at guardrail.

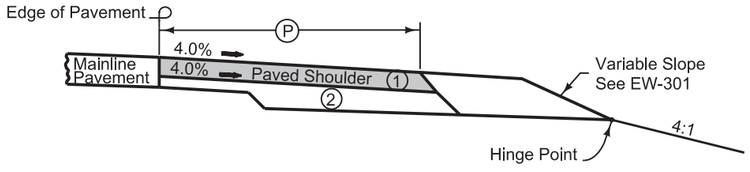
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal & reinstallation of guardrail will be allowed with no additional payment.

Refer to Shoulder tabulation (112-9) for quantities.

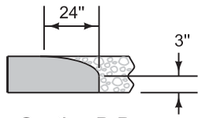
(1) 8" HMA Paved Shoulder
(2) 6" Modified Subbase
(3) When guardrail posts are installed prior to construction of paved shoulder, nail 1" x 6" untreated form boards along the face of guardrail posts for the length shown. This board is to prevent shoulder material from contacting the sides of the posts and altering the function of the guardrail. Form board not required for final 2 posts.
(4) Continue paved shoulder to existing paved shoulder or 20' beyond the end of guardrail.
(5) Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement.
(6) 'B' joint for HMA shoulder.



Typical Section with Form Board



Section A-A

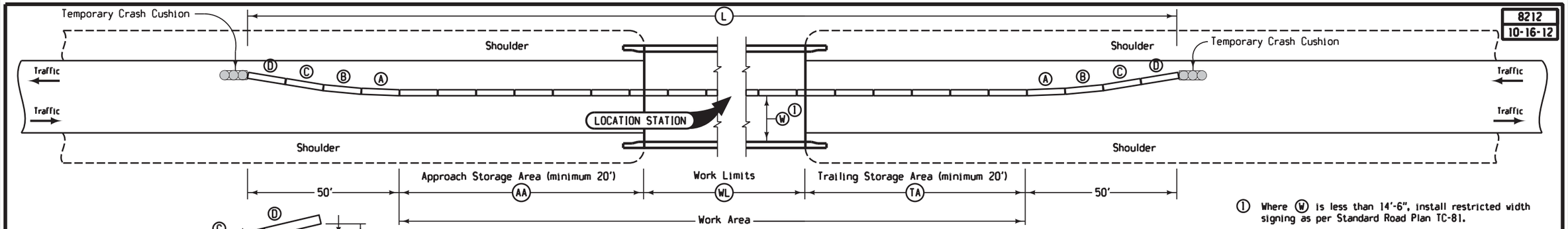


Section B-B
Roll down at granular shoulder or earth.

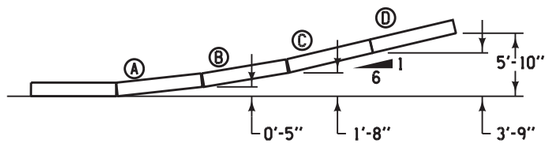
Location				P Feet	Subgrade Treatment		Paved Shoulder	Remarks
Road Identification	Station to Station		Side		Special Backfill Tons	Modified Subbase CY	SY	
IA 150	55+30.00	56+20.90	LT	Varies		10.9	65.5	
IA 150	55+30.00	56+20.90	RT	Varies		10.9	65.5	

PAVED SHOULDER AT GUARDRAIL

8212
10-16-12



1 Where W is less than 14'-6", install restricted width signing as per Standard Road Plan TC-81.



BARRIER OFFSETS FOR FLARE SECTIONS

Station	Side	AA	WL	TA	L	Anchored	W 1	Remarks
		Feet	Feet	Feet	Feet	X	Ft-Inches	
55+30.00 to 62+14.50	Rt.	0	427.90'	0	684.50'	X	11.00'	Stage 2
55+30.00 to 62+14.50	Lt.	0	427.90'	0	684.50'	X	11.00'	Stage 3

TEMPORARY CONCRETE BARRIER LAYOUT for Two-Way Traffic

2:21:10 PM 1/21/2016 dmgreen \\kcow00\jobs4\61317\Benton\Roadway\CD\61317 - B Sheets.dgn

ESTIMATED PROJECT QUANTITIES
(1 DIVISION PR0JECT)

Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2102-2713070	EXCAVATION, CLASS 13, ROADWAY AND BORROW	CY	34.4	
2	2105-8425005	TOPSOIL, FURNISH AND SPREAD	CY	309.1	
3	2115-0100000	MODIFIED SUBBASE, 6 IN.	CY	21.8	
4	2122-5500080	PAVED SHOULDER, HMA, 8 IN.	SY	131.0	
5	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	1.82	
6	2301-0690203	BRIDGE APPROACH, BR-203	SY	120	
7	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS	1	
8	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE	SY	1063.5	
9	2503-0500402	BRIDGE END DRAIN - DR-402	EA	4	
10	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	288.0	
11	2505-4008400	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION	EA	4	
12	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EA	4	
13	2505-4021721	STEEL BEAM GUARDRAIL FLARED END TERMINAL, BA-206	EA	4	
14	2510-6745850	REMOVAL OF PAVEMENT	SY	257.4	
15	2510-6750600	REMOVAL OF INTAKES AND UTILITY ACCESSES	EA	4	
16	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	31.67	
17	2527-9263131	WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS	STA	5.80	
18	2527-9263180	PAVEMENT MARKINGS REMOVED	STA	31.67	
19	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE	LF	1370.0	
20	2528-8400256	TEMPORARY TRAFFIC SIGNALS	EA	2	
21	2528-8445110	TRAFFIC CONTROL	LS	1	
22	2528-8445113	FLAGGERS	EA	See Proposal	
23	2551-0000110	TEMP CRASH CUSHION	EA	4	
24	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING	ACRE	0.4	
25	2602-0000020	SILT FENCE	LF	440.0	
26	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	440.0	
27	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	220.0	
28	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EA	1	
29	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL	EA	1	

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	2102-2713070	EXCAVATION, CLASS 13, ROADWAY AND BORROW
		See Tab 112-9 for locations.
2	2105-8425005	TOPSOIL, FURNISH AND SPREAD
		See Tab 103-4 for locations.
3	2115-0100000	MODIFIED SUBBASE, 6 IN.
		See Sheet B.1 Typical 7156 for location details.
4	2122-5500080	PAVED SHOULDER, HMA, 8 IN.
		See Sheet B.1, Tab 112-9, and Typical 7156 for location details.
5	2123-7450000	SHOULDER CONSTRUCTION, EARTH
		See Tab 112-9 for locations.
6	2301-0690203	BRIDGE APPROACH, BR-203
		See Tab 112-6 for locations and details.
7	2401-6745650	REMOVAL OF EXISTING STRUCTURES
		See Tab 110-2 for locations and details.
8	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE
		See Tab. 100-28 for locations and details.
9	2503-0500402	BRIDGE END DRAIN - DR-402
		See Tab. 104-8A for locations.
10	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL
		See Tab. 100-7A for locations.
11	2505-4008400	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION
12	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED
13	2505-4021721	STEEL BEAM GUARDRAIL FLARED END TERMINAL, BA-206
		See Tab. 108-8A for locations and details.
14	2510-6745850	REMOVAL OF PAVEMENT
		See Tab 110-1 and Sheet U.1 for locations and pavement type.
15	2510-6750600	REMOVAL OF INTAKES AND UTILITY ACCESSES
		See Tab 110-15 for location and details.
16	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED
		See Tab 108-22 and Sheet U.2 for locations and details.
17	2527-9263131	WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS
		See Sheets J.2 and J.3 for locations.
18	2527-9263180	PAVEMENT MARKINGS REMOVED
		See Tab 108-22R for locations.

100-4A
10-29-02

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
19	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE
		See Sheets J.2 and J.3 for locations.
20	2528-8400256	TEMPORARY TRAFFIC SIGNALS
		See Tab. 108-28 and Sheets J.2 and J.3 for locations.
21	2528-8445110	TRAFFIC CONTROL
		See J Sheets for Traffic Control plans.
22	2528-8445113	FLAGGERS
		See Standard Road Plan TC-213 for details.
23	2551-0000110	TEMP CRASH CUSHION
		See Tab. 108-30 and Sheets J.2 and J.3 for locations and
		Standard Road Plan BA-500 for details.
24	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING
		Included for all rural disturbed areas. This item may be deleted if permanent seeding is
		accomplished by May 31.
		Seed Mixture
		Spring--March 1 to May 20
		Oats 2 bu. per acre
		Grain Rye 25 lbs. per acre
		Red Clover 5 lbs. per acre
		Timothy 5 lbs. per acre
		Summer--May 21 to July 20
		Oats 3 bu. per acre
		Grain Rye 35 lbs. per acre
		Red Clover 5 lbs. per acre
		Timothy 5 lbs. per acre
		Fall--July 21 to September 30
		Oats 2 bu. per acre
		Grain Rye 35 lbs. per acre
		Red Clover 5 lbs. per acre
		Timothy 5 lbs. per acre
		Fertilizer: Rate--450 lbs. of 13-13-13 or equivalent commercial fertilizer per acre.
25	2602-0000020	SILT FENCE
		See Tab. 100-17
		Item includes 25% more than tab quantity for additional quantity for field adjustments
		and replacements.
26	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECK
		Same quantity as Silt Fence.
27	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK
		This item is included for maintaining the silt fence during the grading project.
28	2602-0010010	MOBILIZATIONS, EROSION CONTROL
		The quantity will be paid for at the unit price of $500.00 each, which is full compensation
		for staged movement of labor, equipment, and materials; and labor, tools, equipment, and
		incidentals necessary to complete the movement.
29	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL
		The quantity will be paid for at the unit price of $1000.00 each, which is full compensation
		for movement of labor, equipment and materials; and for labor, tools, equipment, and
		incidentals necessary to complete the movement.

105-4
10-18-11

STANDARD ROAD PLANS

The following Standard Road Plans shall be considered applicable to construction work on this project.

Number	Date	Title
BA-200	04-19-16	Steel Beam Guardrail Components
BA-201	04-19-16	Steel Beam Guardrail Barrier Transition Section
BA-202	10-20-15	Steel Beam Guardrail Bolted End Anchor
BA-205	04-19-16	Steel Beam Guardrail End Terminal
BA-250	04-19-16	Steel Beam Guardrail Installation at Concrete Barrier or Bridge Rail End Section
BA-401	04-16-13	Temporary Barrier Rail (Precast Concrete)
BA-500	04-19-16	Temporary Crash Cushions Sand Barrel
DR-402	04-19-16	Rock Flume for Bridge End Drain
EC-201	04-21-15	Silt Fence
EW-301	10-20-15	Guardrail Grading
PM-110	04-16-13	Line Types
PV-101	04-19-16	Joints
SI-173	04-19-16	Object Markers
SI-211	10-19-10	Object Marker and Delineator Placement with Guardrail
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-81	04-20-10	Restricted Width Signing (Less than 14.5 Feet)
TC-202	04-21-15	Work Within 15 Ft of Traveled Way
TC-213	04-17-12	Lane Closure with Flaggers
TC-215	10-21-14	Lane Closure with Signals (Up to Three Days)
TC-217	10-21-14	Lane Closure with Signals and TBR

111-25
10-18-11

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103-4	Tabulation of Spreading Topsoil	C.4
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232-3A
10-20-15

EROSION CONTROL
(RURAL SEEDING)

Following the completion of work in a disturbed area, place seed, fertilizer, and mulch on the disturbed area lying 8 feet adjacent to shoulder and median as follows:

Use seed mix and fertilizer meeting the requirements of Article 2601.03,C,3 and Section 4169 of the Standard Specifications.

Use mulch meeting the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed and furnishing and applying seed, fertilizer, and mulch is incidental to mobilization and will not be paid for separately.

232-3C
10-20-15

EROSION CONTROL
(NATIVE GRASS SEEDING)

Following the completion of work in a disturbed area, place seed and mulch on the disturbed area lying 8 feet or more beyond the shoulder as follows:

SEED MIX:

Big bluestem (Andropogon geradii)	6 lbs. PLS/Acre (7.0 kg/ha)
Indiangrass (Sorghastrum nutans)	6 lbs. PLS/Acre (7.0 kg/ha)
Little bluestem (Schizachyrium scoparium)	6 lbs. PLS/Acre (7.0 kg/ha)
Partridge Pea (Chamaecrista fasciculata)	4 lbs. PLS/Acre (4.5 kg/ha)
Sideoats grama (Bouteloua curtipendula)	4 lbs. PLS/Acre (4.5 kg/ha)
Canada wildrye (Elymus canadensis)	2 lbs. PLS/Acre (2.2 kg/ha)
Switchgrass (Panicum virgatum)	1 lbs. PLS/Acre (1.1 kg/ha)
Oats (Avena sativa)	32 lbs./Acre (36.0 kg/ha)

Furnish Big bluestem, Indiangrass, Canada wildrye and Little bluestem that is debearded or equal to facilitate the application of seed.

Furnish seed certified as Source Identified Class (Yellow Tag) Source G0-Iowa. Oats are excluded from this requirement.

Use seed meeting requirements of Article 4169.02 of the Standard Specifications.

Use mulch meeting the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed and furnishing and applying seed and mulch is incidental to mobilization and will not be paid for separately.

254-1
10-02-01

INCIDENT MAMAGEMENT

An incident management plan, provided by the District Office, will be discussed at the pre-construction conference.

232-11
10-20-15

EROSION CONTROL
(STABILIZING CROP SEEDING)

Following the completion of work in a disturbed area, place stabilizing crop, fertilizer, and mulch on the disturbed area as follows:

Use seed mix and fertilizer meeting the requirements of Article 2601.03,C,1 and Section 4169 of the Standard Specifications.

Use mulch meeting the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

Preparing the seedbed and furnishing and applying seed, fertilizer, and mulch is incidental to mobilization and will not be paid for separately.

281-1
10-15-13

SECTION 404 PERMIT AND CONDITIONS

Construct this project according to the requirements of U.S. Army Corps of Engineers Nationwide, Permit No. 3. A copy of this permit is available from the Iowa DOT website (http://envpermits.iowadot.gov/CMEPortalENV/Home.aspx). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.

112-9
10-15-13

SHOULDERS

① Lane(s) to which the shoulder is adjacent.
② Bid Item
③ Applies only for Paved Shoulders constructed on project with existing granular shoulders.
④ Does not include shrink.

Calculations assume a HMA unit weight (lbs/cf) of 145.

Location					Quantities																		
Road ID	① Direction of Traffic	Station to Station		Side	P Width	G Width	L Length	③ Class 13 Excavation	FT Hot Mix Asphalt		Binder	Paved Shoulder	Reinforced Paved Shoulder	Special Backfill HMA Alternate		Special Backfill PCC Alternate		Modified Subbase	Granular Shoulder		Earth Shoulder Construction Alternates			Remarks
					FT	FT	FT	CY ②	TON	TON/STA	TONS	SY ②	SY ②	TON ②	TON/STA	TON ②	TON/STA	CY ②	TON ②	TON/STA	STA ②	HMA CY ②	PCC CY ④	
IA 150	SB	55+30.00	56+20.90	LT	Varies		90.9	16.6	28.5	0.3		65.5						10.9			0.91			8 Depth
IA 150	NB	55+30.00	56+20.90	RT	Varies		90.9	17.8	28.5	0.3		65.5						10.9			0.91			8 Depth

112-6
10-20-15

BRIDGE APPROACH SECTION

Refer to the BR-Series.

* Not a bid item

Location				Approach Pavement					Standard Road Plans BR Series			Subdrain					Bid Items		Remarks
Bridge Station	End	Skew Ahead Degrees LEFT	Skew Ahead Degrees RIGHT	T Thickness	Pay Length	Non-Reinf. Pavement Area	Single-Reinf. Pavement Area	Double-Reinf. Pavement Area	Approach	Fixed or Movable Abutment	Abutting Pavement	* Perforated Subdrain 4"	* Subdrain Outlet	Side	* Porous Backfill	* Class 'A' Crushed Stone Backfill	* Modified Subbase	* Polymer Grid	
				Inches	FT	SY	SY	SY				LF	SY		SY	SY	TON	SY	
56+00.90	S			12	40.0		53.3	66.7	Modified BR-203	Fixed	Existing						121.8	128.9	Unit Weight for Modified Subbase is 140 pcf

110-1
04-16-13

* Not a bid item

REMOVAL OF PAVEMENT

Location			Pavement Type	Area	* Saw Cut	Remarks
Station To Station		Side		Sq. Yds.	Lin. Ft.	
55+30.00	56+00.90	LT	HMA	59.8	79.4	
55+30.00	56+00.90	RT	HMA	59.8	79.4	
56+00.90	56+40.90	Both	Concrete	137.8	24.0	

100-28
10-19-10

LONGITUDINAL GROOVING

Location	Total SY	Remarks
South Approach Slab	120.0	
North Approach Slab	0.0	North Approach Slab to remain in place
Bridge from Sta. 56+40.90 to Sta. 59+57.90	943.5	

104-8A
04-21-15

ROCK FLUME FOR BRIDGE END DRAIN

Refer to Standard Road Plan DR-402

* Paid for as Brige End Drain-DR-402 (EA.)

Location				Rock Flume DR-402		
Road Identification	Station	Side	Distance DI-1 or DI-2	* Macadam Stone Base Material Tons	* Engineering Fabric Sq. Yds.	* Erosion Stone Tons
IA 150	56+17.15	LT	23.75	1.46	38.07	24.30
IA 150	56+17.15	RT	23.75	1.46	38.07	24.30
IA 150	63+15.56	LT	33.00	1.46	38.07	24.30
IA 150	63+15.56	RT	33.00	1.46	38.07	24.30

108-8A
04-19-16

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION

Refer to BA-200, BA-201, BA-202, BA-205, BA-206, BA-210, BA-211, BA-250, LS-625, LS-626, LS-630, SI-172, SI-173 and SI-211.

① Lane(s) to which the shoulder is adjacent.

Location				Offset	Layout Lengths BA-250 or LS-630				Long-Span System		Delineators and Object Markers				Bid Items						Remarks
No.	① Direction of Traffic	Side O=Outside M=Median	Station		VT1	VF	VT2	ET	BA-211 STATION	BA-211 TYPE	SI-211	Delineator SI-172 Type 1	Object Marker SI-173 Type 2	Object Marker SI-173 Type 3		Bolted End Anchor		Barrier Transition Section	Steel Beam Guardrail	End Terminal Standard	End Terminal Count	Post Adapter	
				FT	LF	LF	LF	LF			TYPE	White	OM2-2	OM-3L	OM-3R	BA-202 TYPE	BA-202 EACH	BA-201	BA-200			BA-210	
												EACH	EACH	EACH	EACH			EACH	LF		EACH	EACH	
1	SB	O	56+34.50	15.7	40.6	0	0	37.5					2	1		C	1	1		BA-206	1		
2	NB	O	56+34.50	15.7	40.6	0	0	37.5					2		1	C	1	1		BA-206	1		
3	SB	O	62+91.75	15.8	40.6	0	0	37.5					2		1	C	1	1		BA-206	1		
4	NB	O	62+91.75	15.8	40.6	0	0	37.5					2	1		C	1	1		BA-206	1		

TABULATION OF SILT FENCES

100-17
04-20-10

Refer to EC-201

Location			Length	Remarks
Begin Station	End Station	Side	LF	
55+30.00	56+50.00	LT	120	
55+30.00	56+50.00	RT	120	
62+80.00	63+80.00	LT	100	
62+80.00	63+80.00	RT	100	

REMOVAL OF EXISTING STRUCTURES

110-2
04-16-13

Location		Description	Disposal
Station	Side		
56+09	LT	Storm Pipe Outlet from South Intake	Remove along with the Intake
56+10	RT	Storm Pipe Outlet from South Intake	Remove along with the Intake

REMOVAL OF STEEL BEAM GUARDRAIL

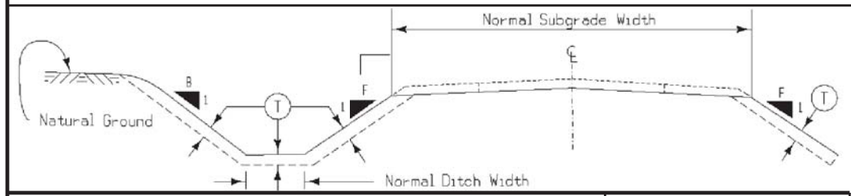
110-7A
04-17-12

① Lane(s) to which the installation is adjacent.
② Includes length of End Terminals and End Anchors.

Location					Removal of Guardrail ②
No.	① Direction of Traffic	Station to Station		Side	
					LF
1	SB	55+74.65	56+39.37	LT	72.0
2	NB	55+74.65	56+39.37	RT	72.0
3	SB	62+86.80	63+51.78	LT	72.0
4	NB	62+86.80	63+51.78	RT	72.0

TABULATION OF SPREADING TOPSOIL

103-4
04-19-11



Perform this work according to Section 2105. Prior to placing topsoil on any cohesive soil, scarify the area to be covered to a minimum depth of 3 inches.

Appropriate adjustments have been made in the template quantities to reflect the placement of topsoil on foreslope, backslope and ditch bottom as detailed hereon.

Type								Amount Reserved	Station to Station		Remarks
Area No.	Quantity CY	Location Station to Station		Side L. or R.	Slope B. or F.	Ⓣ IN	Remarks	CY			
1	87.7	55+30.00	56+40.90	L	F	8	SW Corner				
2	79.9	55+30.00	56+40.90	R	F	8	SE Corner				
3	70.0	62+85.00	63+75.00	L	F	8	NW Corner				
4	71.5	62+85.00	63+75.00	R	F	8	NE Corner				

PAVEMENT MARKING LINE TYPES

108-22
04-16-13

See PM-110

*BCY4 - Place on the same side of the roadway to match existing markings near the project.
**NPY4 - For estimating purposes only. No Passing Zone Lines will be located in the field.

BCY4: Broken Centerline (Yellow) @ 0.25
NPY4: No Passing Zone Line (Yellow) @ 1.25

Location							Painted Pavement Marking (Unfactored)			Pavement Markings Removed (Unfactored)			Wet Retroreflective Removable Tape Markings (Unfactored)		Remarks
Road Identification	Station to Station		Dir. of Travel	Marking Type	Side L	Side C	Side R	BCY4*	NPY4**	SLW4	BCY4	NPY4	SLW4	SLW2	SLW4	
								STA	STA	STA	STA	STA	STA	STA	STA	
Stage 2																
IA 150	53+44.50	53+44.50	NB				X							0.12		
IA 150	53+44.50	64+00.00	SB		X								10.56			
IA 150	53+44.50	64+00.00	NB				X						10.56			
IA 150	53+44.50	59+00.00	Center			X						5.56				
IA 150	55+30.00	56+00.00	NB				X								0.70	
IA 150	59+00.00	60+00.00	Center			X					1.00					
IA 150	60+00.00	64+00.00	Center			X						4.00				
IA 150	61+50.00	64+00.00	SB		X		X								2.51	
IA 150	64+00.00	64+00.00	SB		X									0.12		
Stage 3																
IA 150	53+44.50	55+09.50	NB				X								1.65	
IA 150	53+44.50	64+00.00	SB		X					10.56						
IA 150	53+44.50	64+00.00	NB				X			10.56						
IA 150	53+44.50	59+00.00	Center			X			5.56							
IA 150	55+30.00	56+00.00	SB		X										0.70	
IA 150	59+00.00	60+00.00	Center			X		1.00								
IA 150	60+00.00	64+00.00	Center			X			4.00							
TOTAL (Unfactored)								1.00	9.56	21.11	1.00	9.56	21.11	0.24	5.56	

REMOVAL OF INTAKES AND UTILITIES ACCESSES

110-15
04-16-13

No.	Location/Description	Type	Remarks
1	Sta. 56+09, 15' LT South Bridge End Intake	Intake	Remove Intake
2	Sta. 56+10, 15' RT South Bridge End Intake	Intake	Remove Intake
3	Sta. 63+16, 15' LT North Bridge End Intake	Intake	Fill Intake with Flowable Mortar
4	Sta. 63+17, 15' RT North Bridge End Intake	Intake	Fill Intake with Flowable Mortar

108-30
04-16-13

CRASH CUSHIONS

*Bid Item

① Lane(s) to which the shoulder is adjacent.

② Complete this section when using the Temporary Crash Cushion bid item and Earthwork is needed for Sand Barrel placement. Refer to BA-500.

No.	① Direction of Traffic	Location Station	Side	Obstacle Width	Crash Cushion (Select One)*					Sand Barrel Details ②					Earthwork*		Spare Parts Kit (Select One)*		Obstacle Description	Remarks
					Temporary	Temporary Redirective	Temporary Severe Use	Permanent	Permanent Severe Use	(V) Length	(W) Length	(X) Length	(Y) Length	(Z) Length	Excavation Class 10	Embankment in Place	Permanent	Permanent Severe Use		
				FT						FT	FT	FT	FT	FT	CY	CY	EACH	EACH		
1	NB	55+09.50	LT	2	X														Protecting Work Zone	Stage 2
2	SB	62+35.00	LT	2	X														Protecting Work Zone	Stage 2
3	NB	55+09.50	RT	2	X														Protecting Work Zone	Stage 3
4	SB	62+35.00	RT	2	X														Protecting Work Zone	Stage 3

108-33
04-19-16

TEMPORARY BARRIER RAIL

Possible Standards: BA-400, BA-401

*Not a bid item. Anchorage requirements are based on TBR locations shown in the plans. TBR alignments that vary from what is shown in the plans may result in additional TBR sections requiring anchorage.

No.	Station to Station		Length	(Select One)		Anchored*	Modular Glare Screen System	Remarks
				Steel BA-400	Concrete BA-401			
			LF			(Y/N)	(Y/N)	
1	55+30.00	62+14.50	685		X	Y	N	Stage 2 - TBR must be anchored on the bridge
2	55+30.00	62+14.50	685		X	Y	N	Stage 3 - TBR must be anchored on the bridge

108-28
08-01-08

TEMPORARY TRAFFIC SIGNALS

No.	Location Station	Type			Remarks
		One Lane Traffic	Haul Road	Intersection	
1	54+24.50	X			Stage 2
2	63+10.00	X			Stage 2
3	54+14.50	X			Stage 3
4	63+10.00	X			Stage 3
5	61+80.00	X			Stage 4
6	64+75.00	X			Stage 4
7	61+80.00	X			Stage 5
8	64+75.00	X			Stage 5

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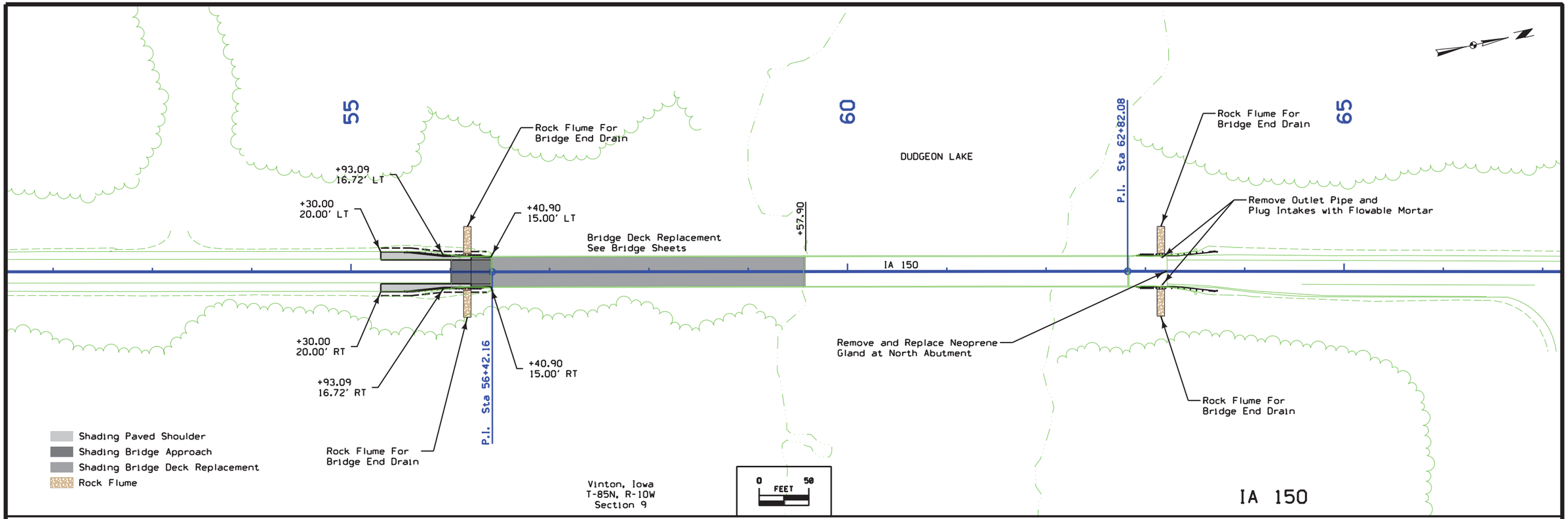
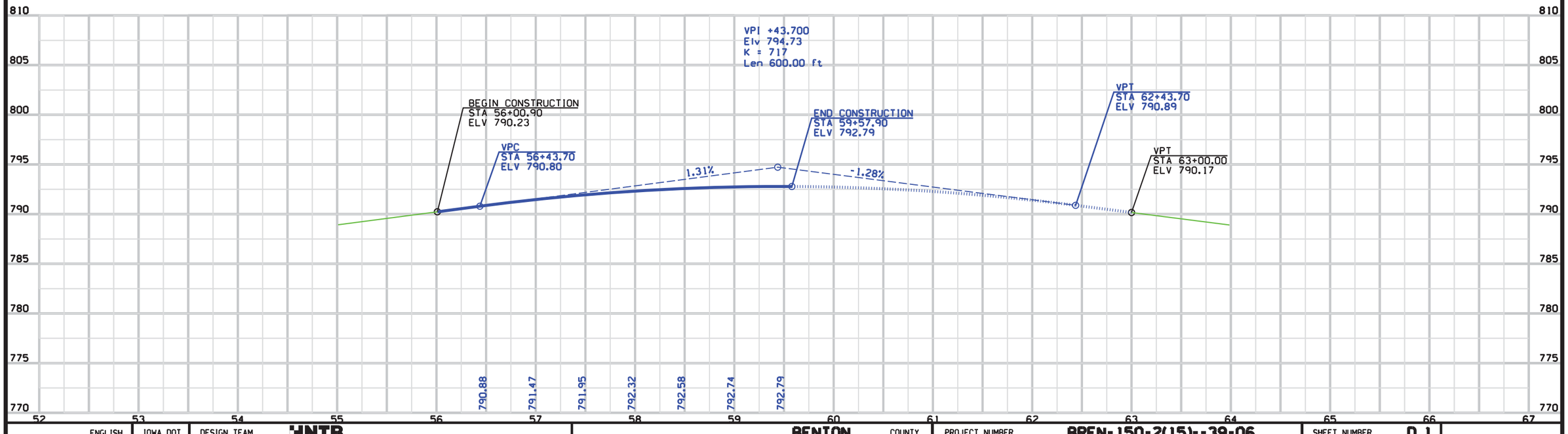




ENGLISH	IOWA DOT	DESIGN TEAM	HNTB	BENTON	COUNTY	PROJECT NUMBER	BRFN-150-2(15)--39-06	SHEET NUMBER	D.1

Survey Information

General Information

Measurement units for this survey are US Survey Feet. The survey consists of a topography survey for structure and roadway improvements at IA 150 over Cedar overflow in Benton County (north of the City of Vinton).

Horizontal Control

The control for this project is the state plane coordinate system using the Iowa North Zone. A 1 minute observation was made on both control points 700 and 701 based on a 1.0000000 scale factor.

Vertical Control

Vertical control is relative to the NAVD88 datum. Bench elevations on this survey relate to previous plans as follows:

Bm #10284 (found cut X) this survey EL= 793.43 (NAVD88)
=Bm No.8 (found cut X) BHF-101-1(15)21-06 EL= 793.59

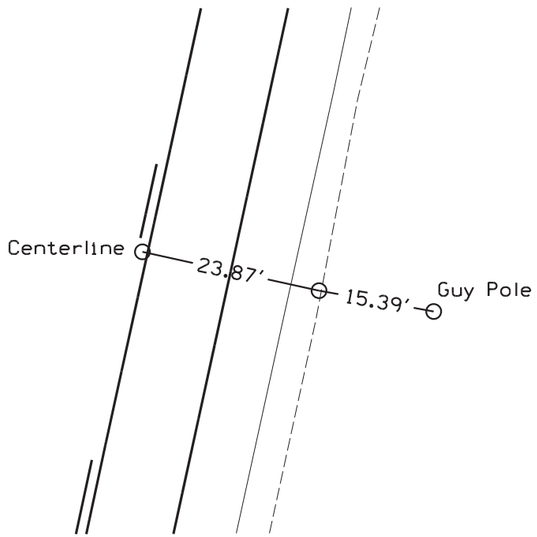
Bm #10161 (found cut X) this survey EL= 792.95 (NAVD88)
=Bm No.8A (found cut X) BHF-101-1(15)21-06 EL= 793.13

Horizontal Alignment Information

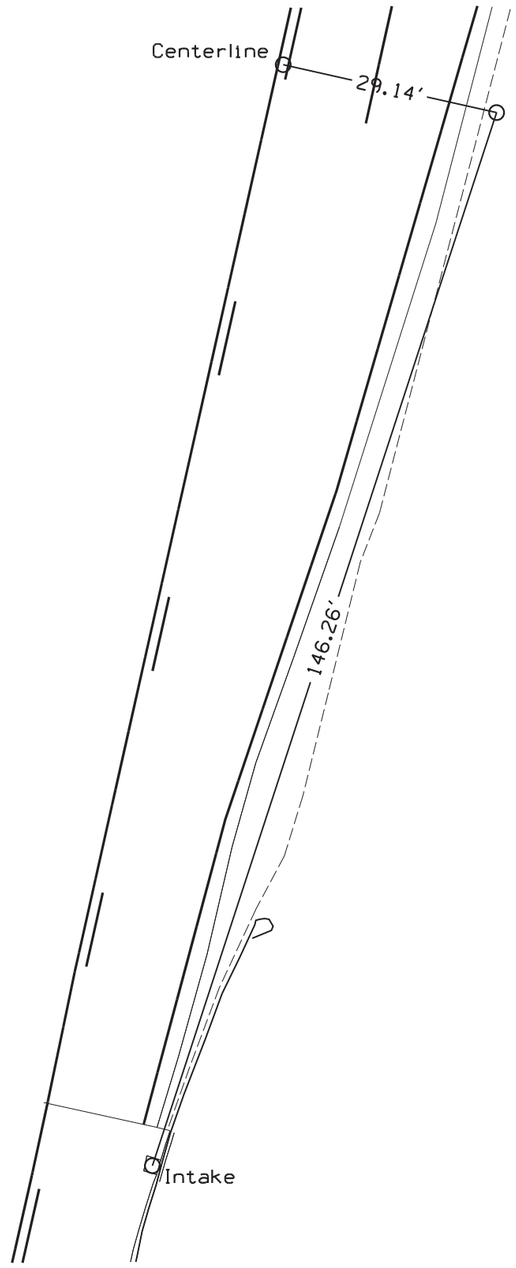
The horizontal alignment for this project was obtained by using the face of the curbs of the existing bridge at the gutter line. A best fit of the curb shots were utilized to determine the centerline of the existing bridge. This centerline was intersected with the ends of the bridge and stationing was determined based on the construction plans for the existing bridge. The south end of the bridge has a stationing of 56+43.70 (Construction Plans 1986) 56+42.90 (As-Builts Plans 1987) according to the plan set for the project. The north and east coordinate for this points is N=3532799.43 and E=5322255.58. This coordinate is in reference to the other control points shown on the Construction Plans from 1986 (revised in 1987 As-Built Plan) and documented in IDOT Project BHF-101-1(15)21-06 on Design Sheet No.1 & 2 of 31 File No.26970 Design No.984.

VERTICAL CONTROL

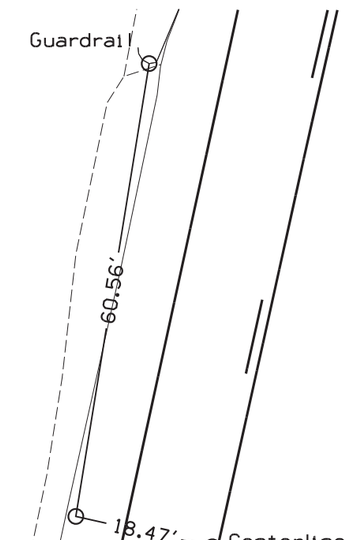
Point	North	East	Elevation	Station	Offset	Feature	Description
10284	3532794.54	5322270.95	793.43	56+41.41	16.052'	BM	Found Cut X on top of SE Bridge Barrier/abutment
10161	3533428.28	5322376.00	792.95	62+82.95	-16.174'	BM	Found Cut X on top of NW Bridge Barrier/abutment



CP #700
5/8" REBAR
N=3532536.36, E=5322222.04



CP #701
5/8" REBAR
N=3533593.79, E=5322458.77



CP #703
PK NAIL
N=3532677.77, E=5322209.42

ALIGNMENT COORDINATES

101-16
10-20-09

Name	Location	Point on Tangent			Begin Spiral			Begin Curve			Simple Curve PI or Master PI of SCS			End Curve			End Spiral		
		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates		Station	Coordinates	
			Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)		Y (Northing)	X (Easting)
IA 150																			
1		51+11.23	3532280.1130	5322141.8011															
2		56+42.16	3532798.7424	5322255.4304															
3		62+82.08	3533424.0085	5322391.6150															
4		68+00.00	3533929.8511	5322502.7925															

108-23A
08-01-08

TRAFFIC CONTROL PLAN

1. Traffic will be maintained on IA 150 at all times.

2. Traffic control on this project shall be found in accordance with the TC series of Standard Road Plans found in Tab. 105-4. For additional complementary information, refer to Part 6 of the Manual on Uniform Traffic Control devices and the current Standard Specifications.

108-26A
10-29-02

STAGING NOTES

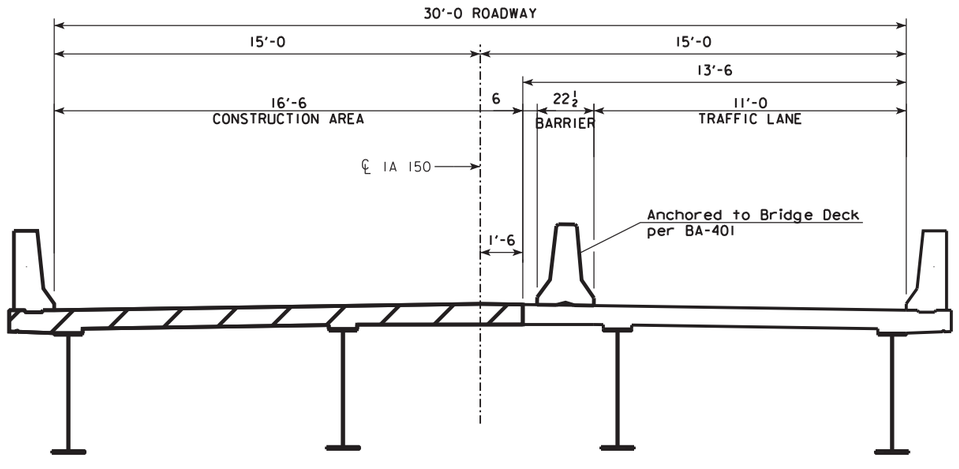
Stage 1
Close NB shoulder on IA 150 south of the bridge by using TC-202.
Remove existing NB shoulder.
Construct new NB shoulder pavement as shown on Sheets D.1 excluding the new approach slabs and guardrail.

Stage 2
Close the SB lane at the southern end of the IA 150 bridge by using TC-213 for setup of TC-217; see J.2 for details.
Shift traffic 4' to the east by utilitizing the new NB shoulder and reducing the lane width to 11'.
Replace bridge deck on the southern half of the SB side of the bridge. See Bridge plans for details.
Remove existing approach slabs, shoulder, guardrail, and inlet on the SB side of IA 150.
Construct new approach slabs, shoulder, guardrail, and flume on the SB side of IA 150.

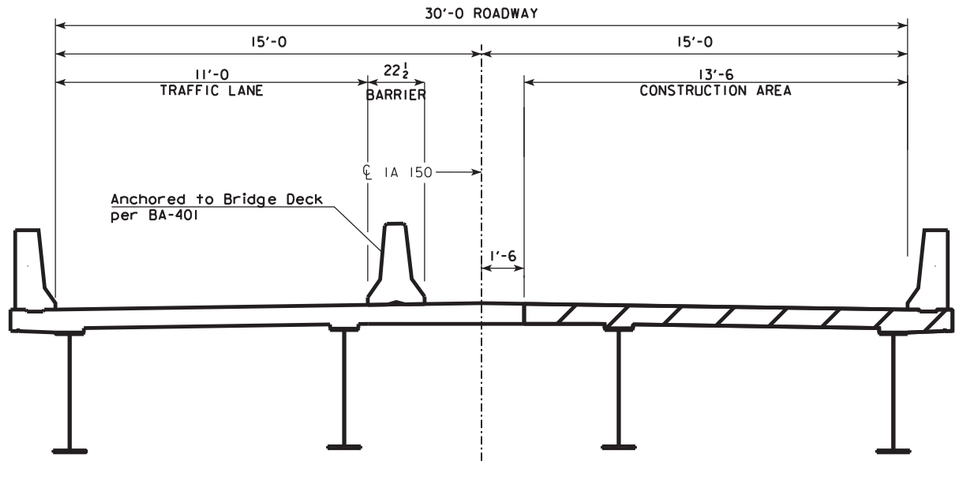
Stage 3
Close the NB lane at the southern end of the IA 150 bridge by using TC-213 for setup of TC-217; see J.3 for details.
Shift traffic 4' to the west by utilitizing the new SB shoulder and reducing the lane width to 11'.
Replace bridge deck on the southern half of the NB side of the bridge. See Bridge plans for details.
Remove existing approach slabs, shoulder, guardrail, and inlet on the NB side of IA 150.
Construct new approach slabs, shoulder, guardrail, and flume on the SB side of IA 150.

Stage 4
Close the SB lane at the northern end of the IA 150 bridge by using TC-213 for setup of TC-215.
Remove existing guardrail and cap the existing inlet with flowable mortar.
Construct new guardrail and flume.
Remove and replace neoprene gland at north abutment.

Stage 5
Close the NB lane at the northern end of the IA 150 bridge by using TC-213 for setup of TC-215.
Remove existing guardrail and cap the existing inlet with flowable mortar.
Construct new guardrail and flume.
Remove and replace neoprene gland at north abutment.



STAGE 2 CONSTRUCTION
(LOOKING NORTH)



STAGE 3 CONSTRUCTION
(LOOKING NORTH)

Traffic Control Signing Per
Standard Road Plan TC-217 (Lane Closure with Signals and TBR)

Traffic Control Signing Per
Standard Road Plan TC-217 (Lane Closure with Signals and TBR)

55

60

65

4' Shift
70'

550'

250'

55+30.00
℄ IA 150

56+00.00
4.00' RT

61+50.00
4.00' RT

SLW4

8'
12'
12'
8'

11'

IA 150

62+14.50
℄ IA 150

62+35.00
4.00' RT

SLW2

Sta. 64+00.00

Sta. 53+44.50

Sta. 54+75.00

55+30.00
12.00' RT

SLW4

56+00.00
15.00' RT

P.I. Sta 56+42.16

P.I. Sta 62+82.08

NB Soulder Constucted in Stage 1
Per Standard Road Plan TC-202 (Shoulder Closure - One Lane)

Notes:
Remove all existing pavement markings between temporary stop lines according to Standard Road Plan TC-217 before Stage 2.

Replace pavement markings when Stage 3 is completed.

Legend

- Construction Area
- Pvmt Previously Constructed
- Drum
- Temporary Traffic Signal
- Temporary Barrier Rail
- Temporary Crash Cushion

0 50
FEET

IA-150 Traffic Control
Stage 2

ENGLISH	IOWA DOT	DESIGN TEAM	HNTB	BENTON	COUNTY	PROJECT NUMBER	BRFN-150-2(15)--39-06	SHEET NUMBER	J.2

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Traffic Control Signing Per
Standard Road Plan TC-217 (Lane Closure with Signals and TBR)

Traffic Control Signing Per
Standard Road Plan TC-217 (Lane Closure with Signals and TBR)

55

60

65

4' Shift
70'

550'

250'

55+30.00
12.00' LT

56+00.00
15.00' LT

56+00.00
4.00' LT

61+50.00
4.00' LT

8'
12'
12'
8'

11'

15'
15'

IA 150

SLW2

SLW4

SLW4

SLW2

Sta. 53+44.50

55+30.00
℄ IA 150

P.I. Sta 56+42.16

62+14.50
℄ IA 150

P.I. Sta 62+82.08

Sta. 64+00.00

Notes:
Remove all existing pavement markings between temporary stop lines according to Standard Road Plan TC-217 before Stage 2.

Replace pavement markings when Stage 3 is completed.

Legend

- Construction Area
- Pvmt Previously Constructed
- Drum
- Temporary Traffic Signal
- Temporary Barrier Rail
- Temporary Crash Cushion

0 FEET 50

IA-150 Traffic Control
Stage 3

ENGLISH	IOWA DOT	DESIGN TEAM	HNTB	BENTON	COUNTY	PROJECT NUMBER	BRFN-150-2(15)--39-06	SHEET NUMBER	J.3

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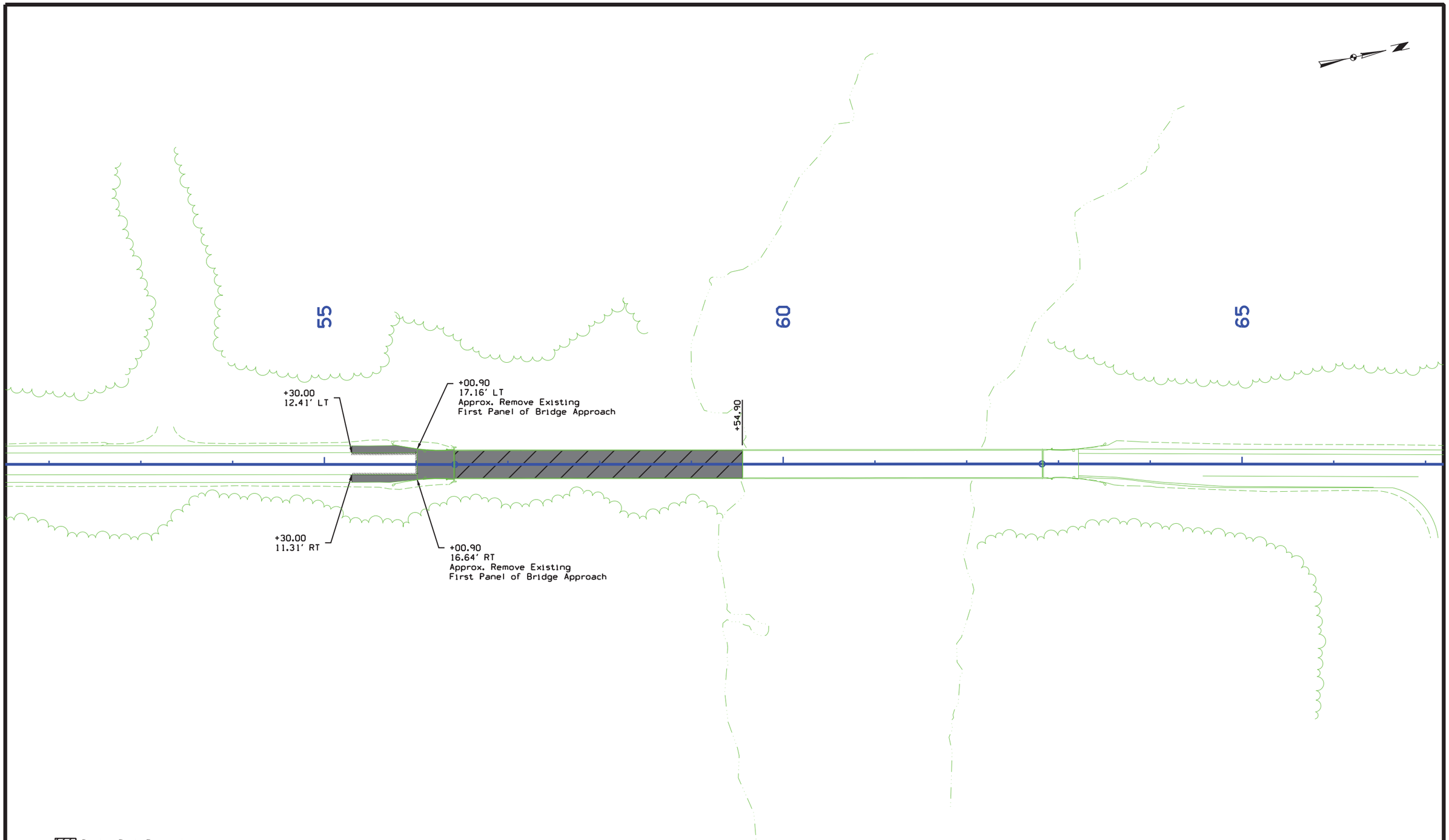

IA 150 Pavement Removal

ENGLISH	IOWA DOT	DESIGN TEAM HNTB	BENTON	COUNTY	PROJECT NUMBER	BRFN-150-2(15)--39-06	SHEET NUMBER	U.1

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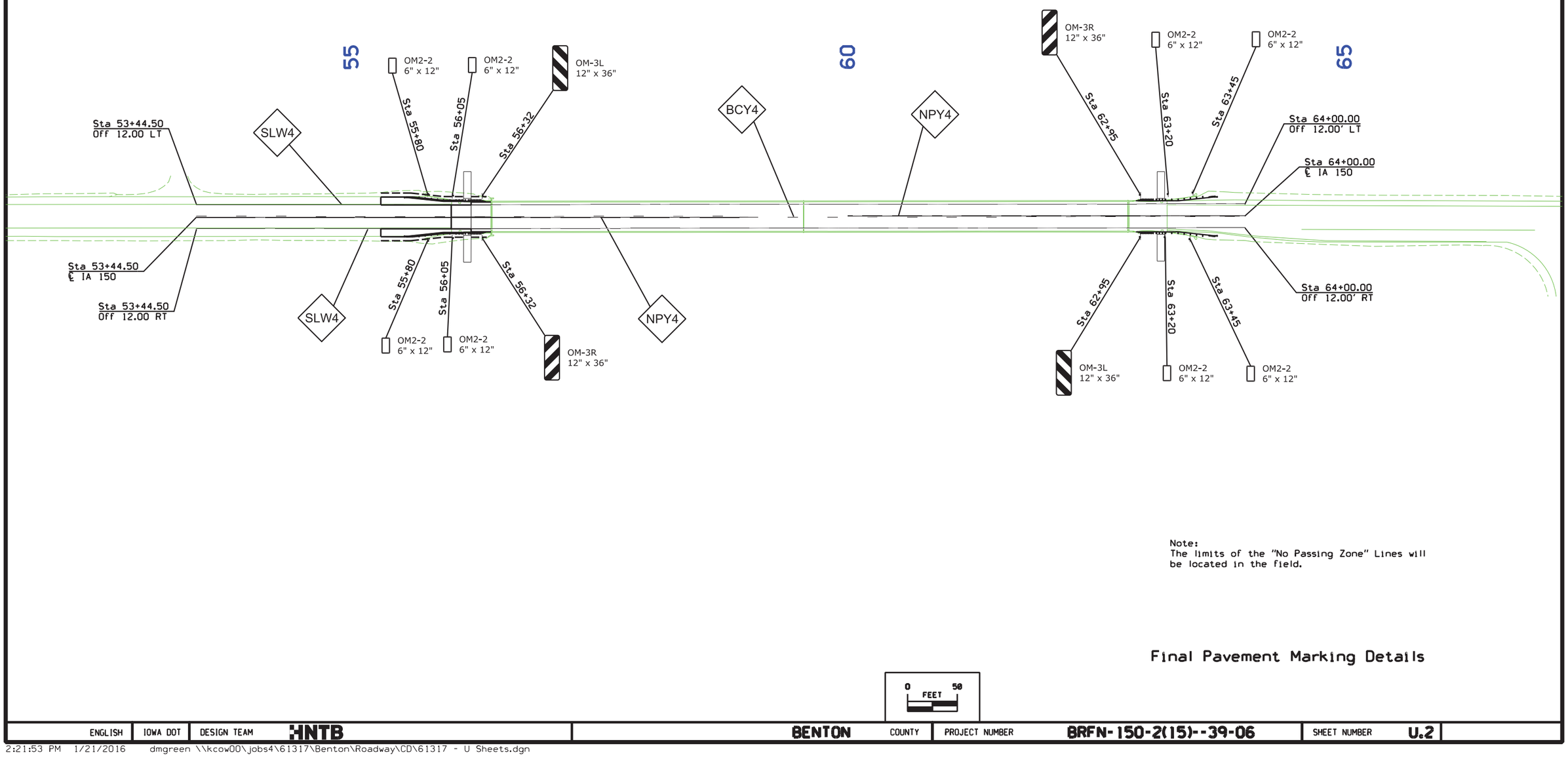

Note:
The limits of the "No Passing Zone" Lines will be located in the field.

Final Pavement Marking Details

0 FEET 50

ENGLISH	IOWA DOT	DESIGN TEAM HNTB	BENTON	COUNTY	PROJECT NUMBER	BRFN-150-2(15)--39-06	SHEET NUMBER	U.2

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