BRIDGE REPLACEMENT - PPCB
BRF-065-8(65)--38-17
LETTING DATE 10-20-2020

CERRO GORDO COUNTY

CERRO GORDO COUNTY - DESIGN 221

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

CERRO GORDO COUNTY

BRIDGE REPLACEMENT - PPCB

US 65 OVER E. BRANCH BEAVERDAM CREEK
0.7 MI. SOUTH OF COUNTY RD. B60

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.

TOTAL SHEETS	58
PROJECT NUMBER	BRF-065-8(65)--38-17
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	16-17-065-030

REVISIONS

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET - DESIGN 221
2-22	DESIGN 221
SPS.1	SOIL PROFILE SHEET
C.1	ESTIMATE SHEET FOR ROADWAY
A.1-W.7	ROADWAY SHEETS

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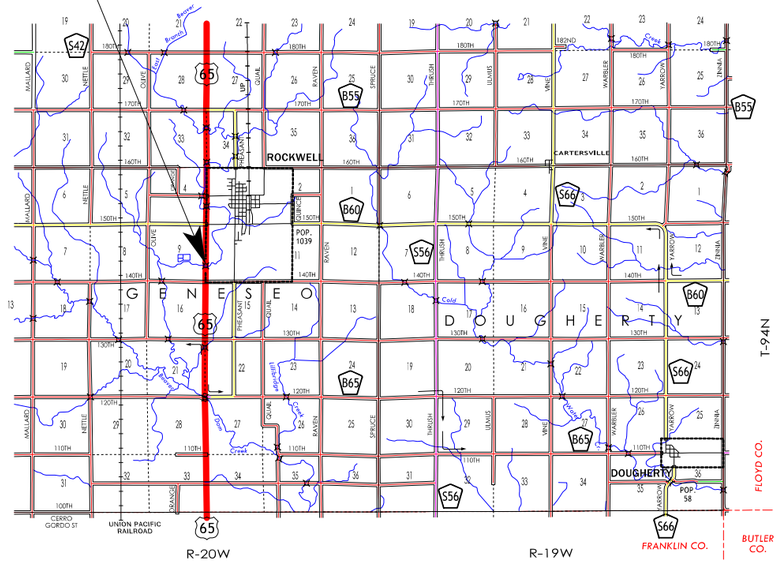
811 Know what's below. Call before you dig.

DESIGN 221
FHWA 18881

N



LOCATION MAP

STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED ON SHEET NUMBER C.3 & RC.2

DESIGN DATA RURAL

2021	AADT	3,100	V.P.D.
2041	AADT	3,600	V.P.D.
TRUCKS		11	%
Total Design ESALs		1,156,320	

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	HAIPING CHEN	STRUCTURAL DESIGN
1	PATRICIA G. SCHWARZ	HYDRAULIC DESIGN
SPS.1	DAVID J. HEER	GEOTECHNICAL DESIGN
A.1	YANXIAO JIA	ROADWAY DESIGN
CS.1	DAVID J. HEER	GEOTECHNICAL DESIGN
RC.1	SEANA K. GODBOLD	LANDSCAPE DESIGN

HYDRAULIC DESIGN

LICENSED PROFESSIONAL ENGINEER Patricia G. Schwarz 13170 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: Patricia G. Schwarz — Date: 08-04-2020

Printed or Typed Name: Patricia G. Schwarz

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: SHEET 5 THROUGH 6 OF 58

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER Haiping Chen 17377 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: Haiping Chen — Date: 08-04-2020

Printed or Typed Name: Haiping Chen

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: SHEETS 1 THRU 22 OF 58

PROJECT DIRECTORY NAME: 1706503016

ESTIMATED BRIDGE QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	1,047.9	
2	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1.00	
3	2402-2720000	EXCAVATION, CLASS 20	CY	251	
4	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	330.1	
5	2404-7775000	REINFORCING STEEL	LB	246	
6	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	77,684	
7	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	2,888	
8	2407-0564350	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTE150	EACH	6	
9	2408-7800000	STRUCTURAL STEEL	LB	5,779	
10	2414-6424110	CONCRETE BARRIER RAILING	LF	362.0	
11	2501-0201057	PILES, STEEL, HP 10 X 57	LF	780	
12	2501-6335010	PREBORED HOLES	LF	387	
13	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	30.0	
14	2507-3250005	ENGINEERING FABRIC	SY	1,685.7	
15	2507-6800061	REVETMENT, CLASS E	TON	1,763.6	
16	2507-8029000	EROSION STONE	TON	23.2	
17	2533-4980005	MOBILIZATION	LS	1.00	
18	2599-9999009	('LINEAR FEET' ITEM) CORING ROCK SOCKET	LF	213.2	

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2104-2710020	**EXCAVATION, CLASS 10, CHANNEL** - -
2	2401-6745625	**REMOVAL OF EXISTING BRIDGE** - -
3	2402-2720000	**EXCAVATION, CLASS 20** - -
4	2403-0100010	**STRUCTURAL CONCRETE (BRIDGE)** Includes all resilient joint filler required. Includes furnishing and placing subdrain (including excavation), floodable backfill, porous backfill, geotextile fabric, water flooding, and subdrain outlet at abutments and toe of berm. Includes furnishing and placing 3 inch diameter PVC plastic pipe and expanding foam in the abutment wings.
5	2404-7775000	**REINFORCING STEEL** - -
6	2404-7775005	**REINFORCING STEEL, EPOXY COATED** - -
7	2404-7775009	**REINFORCING STEEL, STAINLESS STEEL** - -
8	2407-0564350	**BEAMS, PRETENSIONED PRESTRESSED CONCRETE, BTE150** Includes abutment bearing material. Nonstandard stirrup lengths are used for this beam. Includes Contractor filling out beam numbers by location and beam seat elevations in "PPC Beam Data Spreadsheet" and forwarding electronic spreadsheet to the Engineer.
9	2408-7800000	**STRUCTURAL STEEL** Includes 4 drains at 136 lb each.
10	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.
11	2501-0201057	**PILES, STEEL, HP 10 X 57** - -

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
12	2501-6335010	**PREBORED HOLES** Includes all costs associated with providing a 24-inch diameter prebore from the bottom of abutment footings to the anticipated top of rock elevation at both abutments as detailed on Design sheet 7. Includes all costs to furnish and install CMP as a casing and provide temporary blocking. Includes cost to furnish and install bentonite as detailed on Design sheet 7.
13	2507-2638650	**BRIDGE WING ARMORING - EROSION STONE** Includes furnishing and placing engineering fabric, erosion stone, and all required excavating, shaping and compacting for wing armoring.
14	2507-3250005	**ENGINEERING FABRIC** Engineering fabric shall be material as specified for embankment erosion control in accordance with Article 4196.01,B,3, of the Standard Specifications.
15	2507-6800061	**REVETMENT, CLASS E** Estimated at 1.6 ton/cu yd.
16	2507-8029000	**EROSION STONE** Estimated at 1.6 ton/cu yd.
17	2533-4980005	**MOBILIZATION** - -
18	2599-9999009	**('LINEAR FEET' ITEM) CORING ROCK SOCKET** Includes all costs to drill and core the 18" minimum diameter rock socket from the anticipated top of rock elevation and the required pile tip elevations as detailed on Design Sheet 7. Includes cost to clean the bottom of holes, place the Class C concrete, and seating the piles. For additional information, see the rock coring socket notes on the general notes sheet. The method of measurement and basis of payment for this item is linear feet of rock cored to the nearest tenth of a foot measured by the engineer. If the abutment piles are driven at least 27 feet (south) and 23 feet (north) below the bottom of abutment footings and approved by the engineer, no measurement or payment will be made for the "coring rock socket".

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

ESTIMATED QUANTITIES

STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 21 FILE NO. 31620 DESIGN NO. 221

SUMMARY OF CONCRETE QUANTITIES

LOCATION	STRUCTURAL CONCRETE	HPC STRUCTURAL CONCRETE
S. ABUT. FTG.	25.0	———
N. ABUT. FTG.	25.0	———
BRIDGE DECK + ABUT. DIAPHRAGMS	269.7	———
ABUTMENT WINGS	10.4	———
TOTAL (CU. YDS.)	330.1	

SUMMARY OF REINFORCING STEEL

LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
BRIDGE DECK + ABUT. FTG. **	246	———	70,144
ABUTMENT WINGS	———	———	1120
BARRIER RAIL - TWO RAILS	———	2120	5356
BARRIER RAIL END SECTIONS	———	768	1064
** INCLUDES ABUTMENT DIAPHRAGMS			
TOTAL (LBS.)	246	2888	77,684

SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION
S. ABUTMENT	124
N. ABUTMENT	127
TOTAL (CU. YDS.)	251

SUMMARY OF FOUNDATIONS

LOCATION	SUBSTRUCTURE TYP	FOUNDATION TYPE	NUMBER	LENGTH (LIN. FT.)	TOTAL (LIN. FT.)
S. ABUTMENT	INTEGRAL ABUTMENT	HP10x57	12	35	420
N. ABUTMENT	INTEGRAL ABUTMENT	HP10x57	12	30	360
				TOTAL (L.F.)	780

SUMMARY OF STRUCTURAL STEEL

LOCATION	TOTAL (LBS.)
BRIDGE DECK DRAINS	544
INTERMEDIATE DIAPHRAGMS	5235
TOTAL (LBS.)	5779

SUMMARY OF BEARINGS

LOCATION	BEARING TYPE	NUMBER	ASSOCIATED BID ITEM
S. ABUTMENT	3 x 3 BAR	6	INCIDENTAL ITEM
N. ABUTMENT	3 x 3 BAR	6	INCIDENTAL ITEM

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

SUMMARY QUANTITIES

STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 21 FILE NO. 31620 DESIGN NO. 221

GENERAL NOTES:

THIS DESIGN IS FOR REPLACEMENT OF THE EXISTING 89'-3 x 28'-0 PLATE GIRDER BRIDGE ON US 65 OVER E. BRANCH BEAVERDAM CREEK IN CERRO GORDO COUNTY (DES. NO. 531/655/782/401) WITH A YEAR OF CONSTRUCTION OF 1931 AND RECONSTRUCTION OF 1957. ELECTRONIC PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS.

THIS BRIDGE IS DESIGNED FOR HL-93 LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.
THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE ALL OF THE EXISTING 89'-3 X 28' PLATE DECK GIRDER BRIDGE, DESIGN NO. 531/655/782/401.

REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS.

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

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.

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

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

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

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

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

A SCRAPE SAMPLE WAS TAKEN FROM AN AREA OF THIS BRIDGE TO GET AN INDICATION OF THE EXISTENCE OF AND LEVEL OF TOTAL LEAD AND TOTAL CHROMIUM. ANALYSIS OF TOTAL LEAD ON THIS SAMPLE WAS 11000 PARTS PER MILLION (PPM). ANALYSIS OF TOTAL CHROMIUM ON THIS SAMPLE WAS 4800 PPM. THESE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER CONSTITUENTS WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE IOWA DOT $\frac{5}{32}$S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

BRIDGE DECK DIMENSIONS TABLE

NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	153.1
2	MINIMUM DECK WIDTH	L.F.	47.2
3	MAXIMUM DECK WIDTH	L.F.	47.2
4	DECK AREA	S.F.	7222.6

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

SOUTH ABUTMENT PILE DESIGN AND DRIVING NOTES:

THE CONTRACT LENGTH OF 35 FEET FOR THE SOUTH ABUTMENT PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 216 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR SOUTH ABUTMENT PILES IS 156 TONS. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IF THE PILE REACHES REFUSAL BEFORE DRIVEN APPROXIMATELY 27 FEET INTO LIMESTONE LAYER, THEN ROCK CORING IS REQUIRED AND THE PILES ARE TO BE SEATED IN CONCRETED ROCK SOCKETS. SEE ROCK CORING NOTES FOR ADDITIONAL INFORMATION. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

NORTH ABUTMENT PILE DESIGN AND DRIVING NOTES:

THE CONTRACT LENGTH OF 30 FEET FOR THE NORTH ABUTMENT PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 216 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A NON-COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.55 FOR SOIL AND 0.7 FOR ROCK END BEARING. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR NORTH ABUTMENT PILES IS 157 TONS. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. IF THE PILE REACHES REFUSAL BEFORE DRIVEN APPROXIMATELY 23 FEET INTO LIMESTONE LAYER, THEN ROCK CORING IS REQUIRED AND THE PILES ARE TO BE SEATED IN CONCRETED ROCK SOCKETS. SEE ROCK CORING NOTES FOR ADDITIONAL INFORMATION. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

PREBORE NOTES:

THE BRIDGE CONTRACTOR SHALL BE PREBORE 24-INCH DIAMETER HOLES FOR ALL ABUTMENT PILES TO THE DEPTH ESTIMATED AS TOP OF ROCK SURFACE (ELEVATION 1071.00 @ SOUTH AND ELEVATION 1062.00 @ NORTH ABUTMENT). A 24-INCH CORRUGATED METAL PIPE SHALL BE USED FOR THE PREBORE CASING. THE PREBORE SHALL BE FILLED WITH BENTONITE PER THE STANDARD SPECIFICATIONS. THE CONTRACTOR WILL BE REQUIRED TO BRACE THE CMP ACCORDING TO PLAN DETAILS. ALL COST FOR THIS WORK SHALL BE INCLUDED IN THE LINEAR FOOT BID ITEM, "PREBORED HOLES.".

CORING ROCK SOCKET:

IF THE ABUTMENT PILES CANNOT BE DRIVEN MORE THAN 27 FEET (SOUTH) AND 23 FEET (NORTH) BELOW THE BOTTOM OF ABUTMENT FOOTINGS, ROCK SOCKETS SHALL BE CONSTRUCTED BY CORING THE PILES INTO BED ROCK FOR THE RESPECTIVE ABUTMENTS, AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL CONSTRUCT THE ROCK SOCKET IN THE FOLLOWING MANNER.

1. BELOW THE PREBORED HOLE DEPTH AT EACH PILE, CORE AN 18 INCH MINIMUM DIAMETER HOLE FROM THE ANTICIPATED TOP OF ROCK ELEVATION 1071.00 FEET (SOUTH) AND 1062.00 FEET (NORTH) DOWN TO AN ELEVATION 1057.77 FEET (SOUTH) AND 1057.46 FEET (NORTH). THE CONTRACTOR SHALL CLEAN THE BOTTOM OF THE HOLES BEFORE INSERTING PILES OR PLACING CONCRETE.
2. THE PILES SHALL BE SEATED INTO THE CORED HOLES WITH A PILE DRIVING HAMMER TO THE SPECIFIED NOMINAL BEARING RESISTANCE GIVEN IN THE ABUTMENT PILE DRIVING NOTES EACH ABUTMENT RESPECTIVELY.
3. AFTER THE PILES ARE SEATED, THE CORED HOLES SHALL BE FILLED WITH CLASS C CONCRETE FROM THE BOTTOM OF THE HOLE TO THE TOP OF THE ROCK SOCKET. IF THE CONTRACTOR CHOOSES TO PLACE CONCRETE BEFORE SEATING AND DRIVING THE PILE TO BEARING, A RETARDING AGENT IS REQUIRED TO DELAY THE CURE OF THE CONCRETE UNTIL BEARING CAN BE ACHIEVED. PILES SHALL BE BRACED IN THE CORRECT POSITION UNTIL CONCRETE HAS REACHED 4 KSI COMPRESSIVE STRENGTH.
4. THE REMAINING PORTION OF THE PREBORED HOLES SHALL BE FILLED WITH BENTONITE ACCORDING TO PLAN DETAILS AND ELEVATIONS.

THE COST OF CORING THE 18-INCH MINIMUM DIAMETER ROCK SOCKETS, FURNISHING AND PLACING THE CONCRETE IN THE ROCK SOCKETS, AND SEATING AND BRACING THE PILES, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "CORING ROCK SOCKET". IF THE PILES ARE DRIVEN AT LEAST 27 FEET (SOUTH) AND AT LEAST 23 FEET (NORTH) BELOW THE BOTTOM OF ABUTMENT FOOTINGS AND APPROVED BY THE ENGINEER, THEN THE BID ITEM FOR "CORING ROCK SOCKET" SHALL BE DELETED AND NOT BE MEASURED FOR PAYMENT. IN THIS CASE, THE PILES SHALL BE DRIVEN IN ACCORDANCE WITH THE STANDARD SPECIFICATION AND THE ABUTMENT PILE DESIGN NOTES.

SPECIFICATIONS:

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

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8th Ed, SERIES OF 2017, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.

REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60.

CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 4.0 KSI, EXCEPT PRESTRESSED BEAM CONCRETE AS NOTED.

PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEET 15.

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

NOTE:
POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN ON THE ROAD PLAN IN THESE PLANS.

DESIGN HISTORY AT THIS SITE

DES. NO.	TYPE OF WORK
531	ORIGINAL DESIGN
655	WIDENING
782	OVERLAY
401	RAIL
221	NEW REPLACEMENT BRIDGE

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 DRAINS
2	STEEL INTERMEDIATE DIAPHRAGM

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

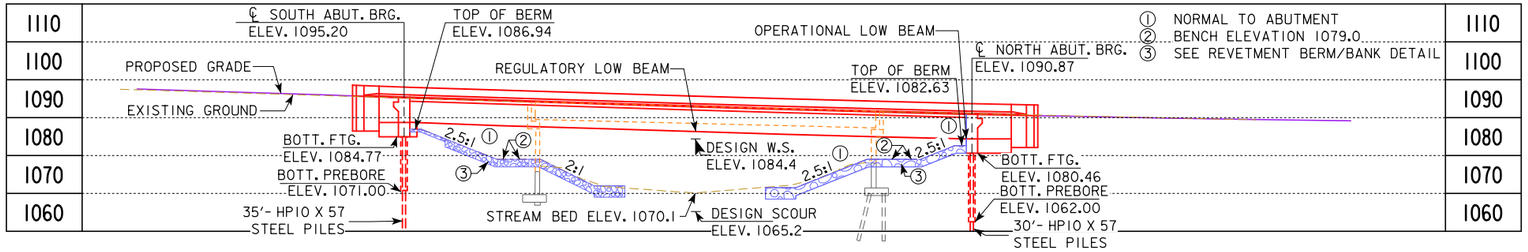
GENERAL NOTES

STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

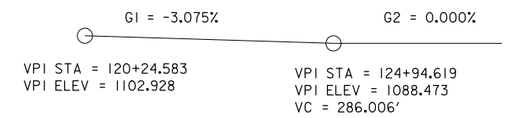
DESIGN SHEET NO. 3 OF 21 FILE NO. 31620 DESIGN NO. 221



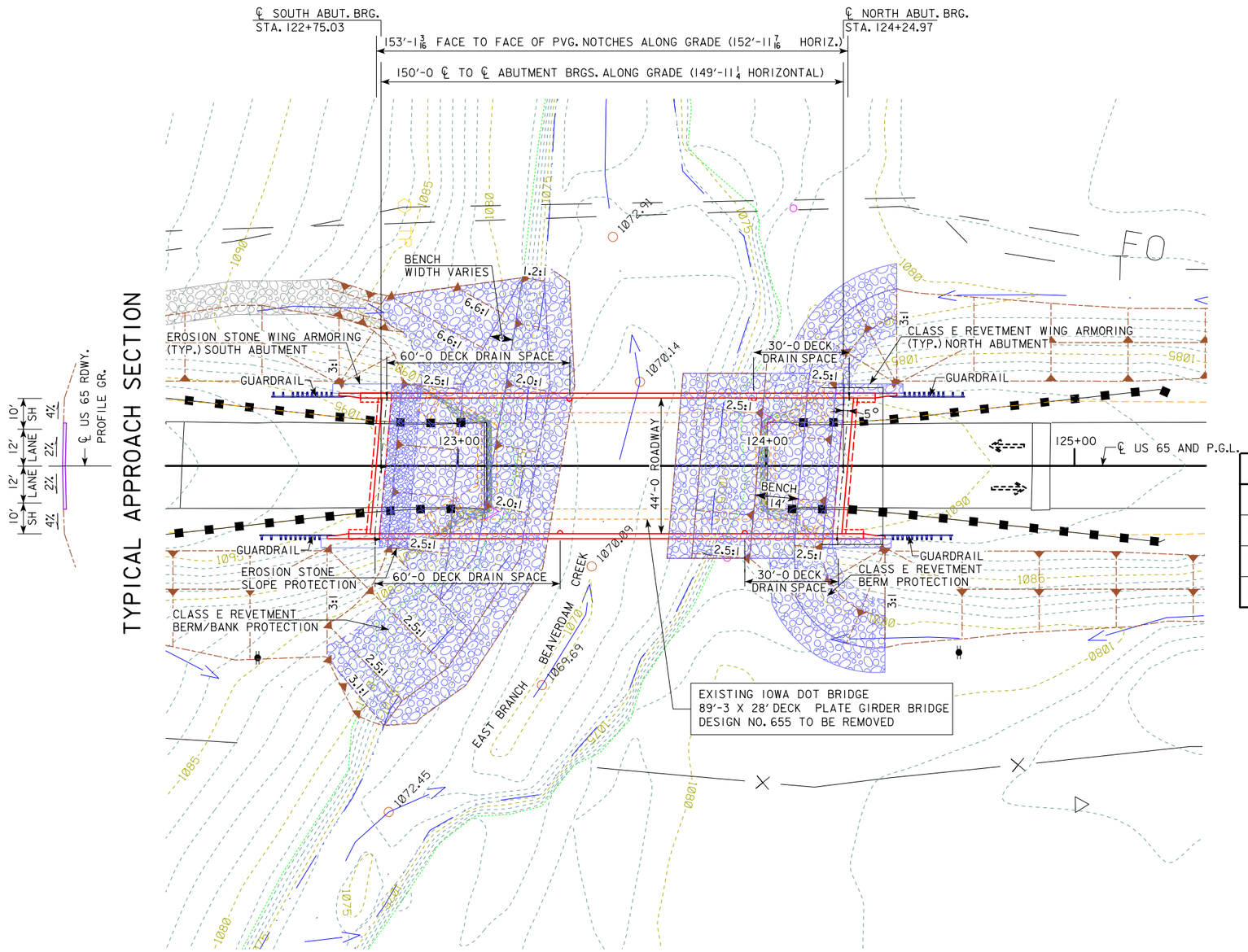
LONGITUDINAL SECTION ALONG ℄ APPROACH ROADWAY

MINIMUM BOTTOM CORING ELEVATIONS:
SOUTH ABUT. 1057.77'
NORTH ABUT. 1057.46'

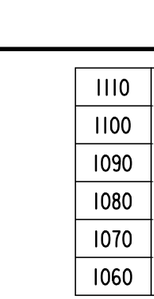
BENCH MARK NO. CP1 Northing: 9728949.58 Easting: 12378905.40 Elevation: 1087.15,
DESCRIPTION: SET FENO MON W/BRASS CAP STAMPED IA DOT CP1 - 3" BELOW GRADE - MON IS 0.36 MI N OF INTERSECTION US HWY 65 & 140TH ST 56' W OF CL US HWY 65 & 14' N OF CENTER DRIVE ENT TO WEST.



PROPOSED PROFILE GRADE US 65



SITUATION PLAN



TYPICAL APPROACH SECTION

UTILITIES LEGEND:

TI - TELEPHONE LINE
FO - FIBER OPTIC
POWER POLE

REFER TO ROAD DESIGN SHEETS FOR FINAL UTILITY INFORMATION.

HYDRAULIC DATA

DRAINAGE AREA = 31.1 SQ. MI.
STREAM SLOPE = 6.9 FT./MI.
AVG. LOW WATER STAGE = 1074.0

Q_{50} = 6650 CFS
STAGE = 1084.4
REGULATORY LOW BEAM = 1086.38
BACKWATER = 0.6 FT.
AVG. BRIDGE VELOCITY = 5.5 FPS

Q_{100} = 7830 CFS
STAGE = 1085.0
OPERATIONAL LOW BEAM = 1084.38
BACKWATER = 0.8 FT.
AVG. BRIDGE VELOCITY = 6.2 FPS

Q_{200} = 10,100 CFS
STAGE = 1086.0
CALCULATED DESIGN SCOUR = 1065.2

Q_{500} = 11,100 CFS
STAGE = 1086.4
CALCULATED CHECK SCOUR = 1064.8

ROADWAY OVERTOP 1088.47
STA. 126+50

BRIDGE COORDINATES

LOCATION	℄ S. ABUT. BRG.	℄ N. ABUT. BRG.
LEFT EDGE OF DECK	E=12378927.867 N=9728435.858	E=12378930.721 N=9728585.771
℄ APPROACH ROADWAY	E=12378951.409 N=9728433.484	E=12378954.263 N=9728583.397
RIGHT EDGE OF DECK	E=12378974.952 N=9728431.111	E=12378977.805 N=9728581.024

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

LOCATION

US 65 OVER EAST BR. BEAVERDAM CREEK
T-94N R-20W
SECTIONS 9&10
GENESEO TOWNSHIP
CERRO GORDO COUNTY
FHWA NO. 18881
BRIDGE MAINT. NO. 1783.8S065
LATITUDE 42.969540°
LONGITUDE -93.202206°

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

SITUATION PLAN

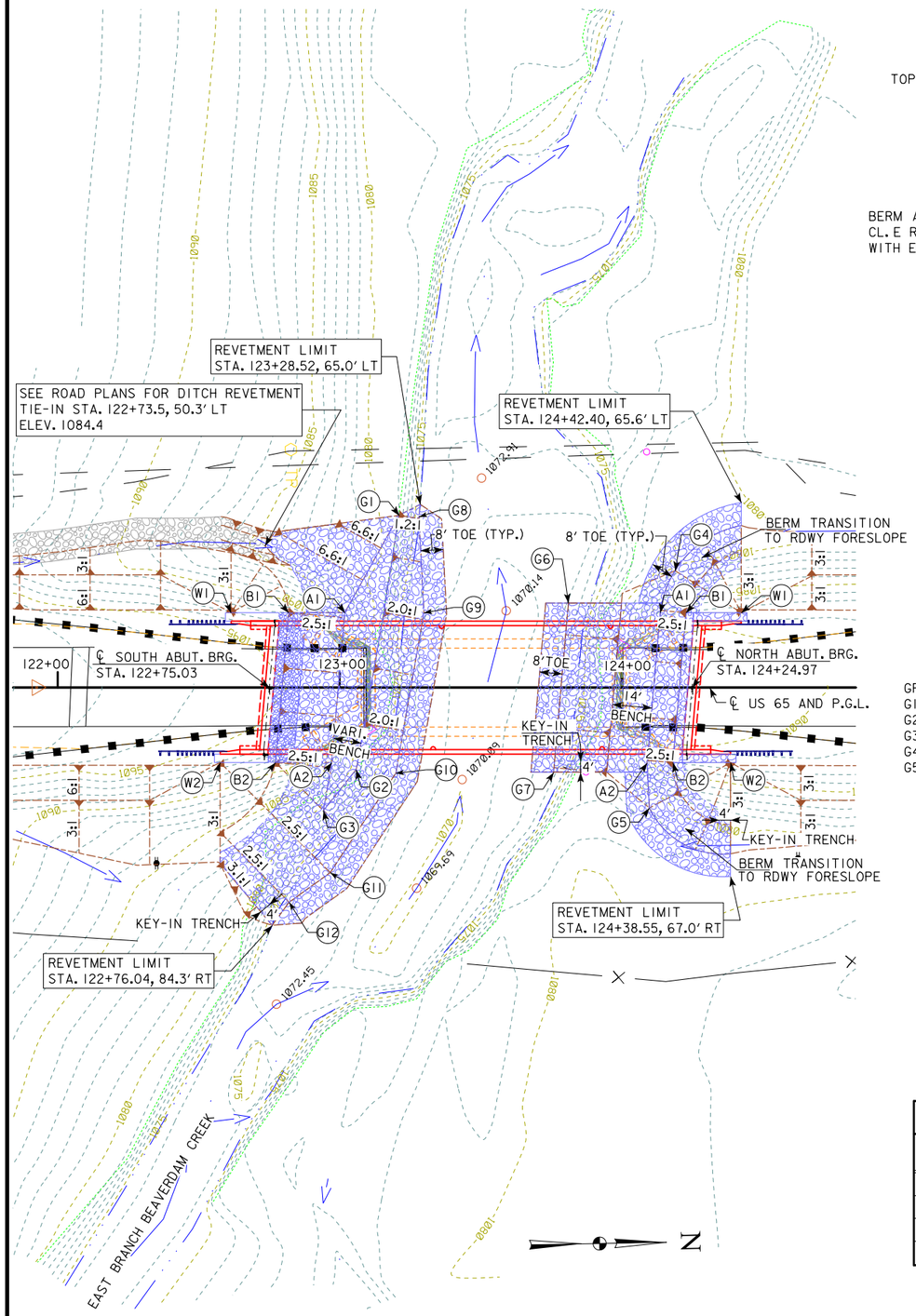
STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

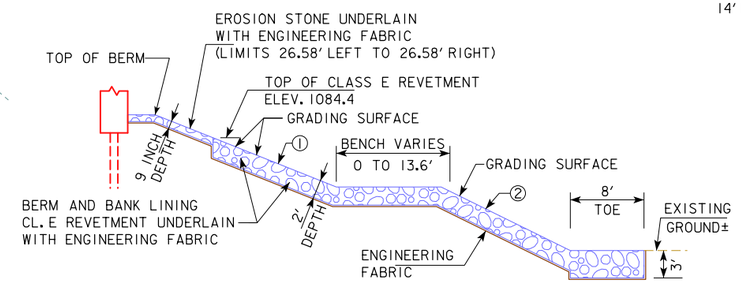
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 4 OF 21 FILE NO. 31620 DESIGN NO. 221

BENCH MARK NO. CP1 Northing: 9728949.58 Easting: 12378905.40 Elevation: 1087.15,
DESCRIPTION: SET FENO MON W/BRASS CAP STAMPED IA DOT CP1 - 3" BELOW GRADE - MON IS 0.36 MI N OF INTERSECTION US HWY 65 & 140TH ST 56' W OF CL US HWY 65 & 14' N OF CENTER DRIVE ENT TO WEST.

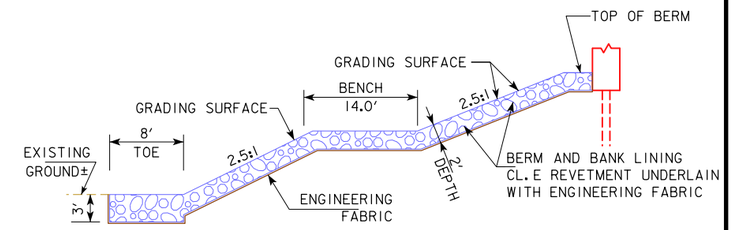


SITE PLAN



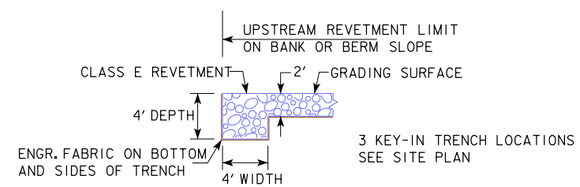
① SLOPE 2.5:1 NORMAL TO THE ABUTMENT, VARIES OUTSIDE THE BRIDGE LIMITS
② SLOPE 2:1 NORMAL TO THE CHANNEL, VARIES OUTSIDE THE BRIDGE LIMITS

SECTION THRU EMBEDDED SOUTH REVETMENT BERM/BANK

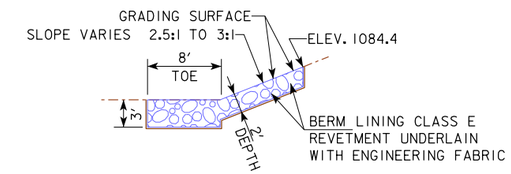


DIMENSIONS AND SLOPES NORMAL TO THE ABUTMENT

SECTION THRU EMBEDDED NORTH REVETMENT BERM/BANK



SECTION THRU KEY-IN IN TRENCH



SECTION THRU EMBEDDED NORTH REVETMENT BERM TRANSITION TO ROADWAY FORESLOPE

GRADING CONTROL POINTS:

G1 = BENCH LIMIT 123+20.99, 61.08' LT
G2 = BENCH LIMIT 123+05.80, 29.08' RT
G3 = BENCH LIMIT 122+94.20, 43.56' RT
G4 = BENCH LIMIT 124+18.53, 41.45' LT
G5 = BENCH LIMIT 124+09.78, 42.66' RT
G6 = TOE OF SLOPE 123+81.09, 30.00' LT, ELEV. 1071.5
G7 = TOE OF SLOPE 123+75.84, 30.00' RT, ELEV. 1071.5
G8 = TOE OF SLOPE 123+28.15, 60.61' LT, ELEV. 1073.0
G9 = TOE OF SLOPE 123+29.87, 26.58' LT, ELEV. 1072.0
G10 = TOE OF SLOPE 123+19.91, 30.32' RT, ELEV. 1072.0
G11 = TOE OF SLOPE 122+96.65, 65.63' RT, ELEV. 1072.5
G12 = TOE OF SLOPE 122+82.05, 76.12' RT, ELEV. 1073.0

BERM SLOPE LOCATION TABLE

POINTS	SOUTH ABUTMENT			NORTH ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	123+01.80	26.58' LT	1079.0	124+13.67	26.58' LT	1079.0
A2	122+97.15	26.58' RT	1079.0	124+09.01	26.58' RT	1079.0
B1	122+81.87	26.58' LT	1086.94	124+22.78	26.58' LT	1082.63
B2	122+77.22	26.58' RT	1086.94	124+18.13	26.58' RT	1082.63
W1	122+61.46	26.58' LT	1095.05	124+42.40	26.58' LT	1089.93
W2	122+57.61	26.58' RT	1095.17	124+38.55	26.58' RT	1090.01

BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE

ESTIMATED BERM ARMORING QUANTITIES

LOCATION	REVETMENT CL. E (TON)	EROSION STONE (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
BERM/BANK LINING - SOUTH ABUT.	1038.0	23.2	957.2	594.4
BERM LINING - NORTH ABUT.	711.2	0.0	704.7	444.5
NORTH ABUT. WING ARMORING	14.4	0.0	23.8	9.0
TOTALS	1763.6	23.2	1685.7	1047.9

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE.

TRADITIONAL WING ARMORING IS PROPOSED FOR THE SOUTH ABUTMENT. DETAILS AND QUANTITIES FOR THE SOUTH ABUTMENT WING ARMORING SHALL BE INCLUDED ELSEWHERE IN THE BRIDGE PLANS. DUE TO THE POTENTIAL FOR INUNDATION AT THE NORTH ABUTMENT, IT IS PROPOSED TO EXTEND THE EMBEDDED CLASS E REVETMENT UNDERLAIN WITH ENGINEERING FABRIC FOR A 3' WIDTH ADJACENT TO THE WINGS AND 2' BEYOND THE END OF WINGS IN LIEU OF TRADITIONAL WING ARMORING.

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

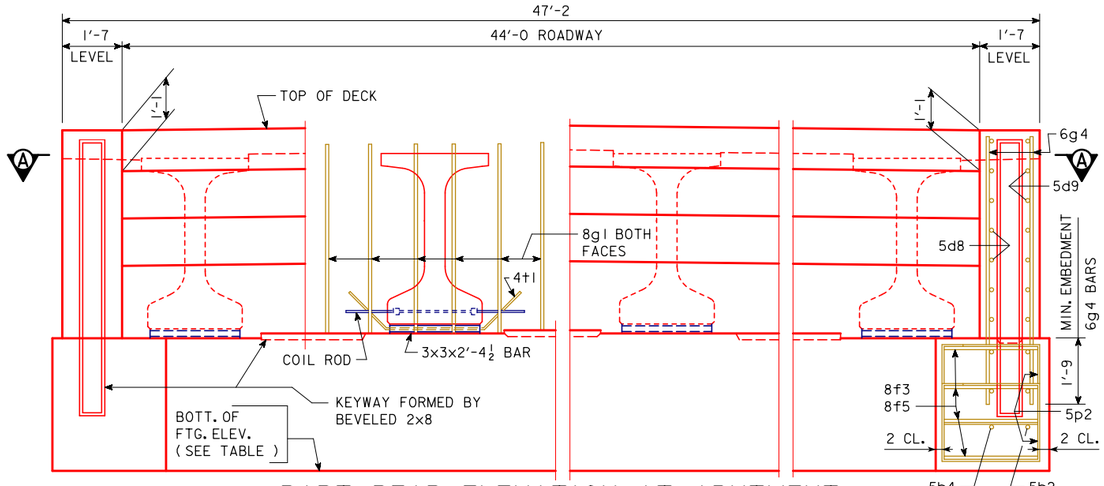
SITE PLAN

STATION 123+50.00 (US 65) AUGUST, 2020

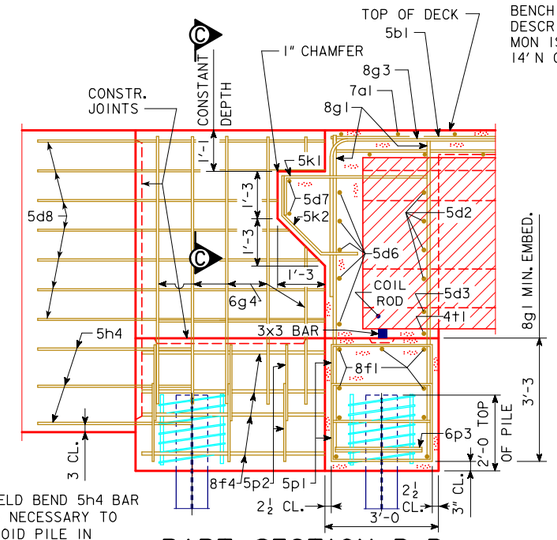
CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 5 OF 21 FILE NO. 31620 DESIGN NO. 221



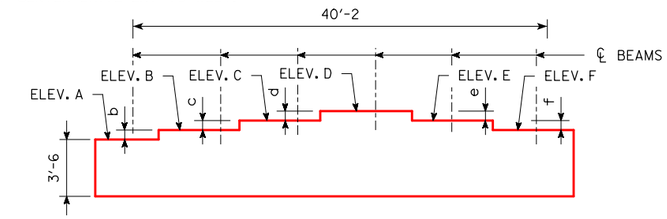
PART REAR ELEVATION AT ABUTMENT
(WINGS NOT SHOWN)



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

PART SECTION B-B

BENCH MARK NO. CP1 Northing: 9728949.58 Easting: 12378905.40 Elevation: 1087.15, DESCRIPTION: SET FENO MON W/BRASS CAP STAMPED IA DOT CP1 - 3" BELOW GRADE - MON IS 0.36 MI N OF INTERSECTION US HWY 65 & 140TH ST 56' W OF CL US HWY 65 & 14' N OF CENTER DRIVE ENT TO WEST.



SOUTH ABUTMENT STEP DIAGRAM
(NORTH ABUTMENT SIMILAR)

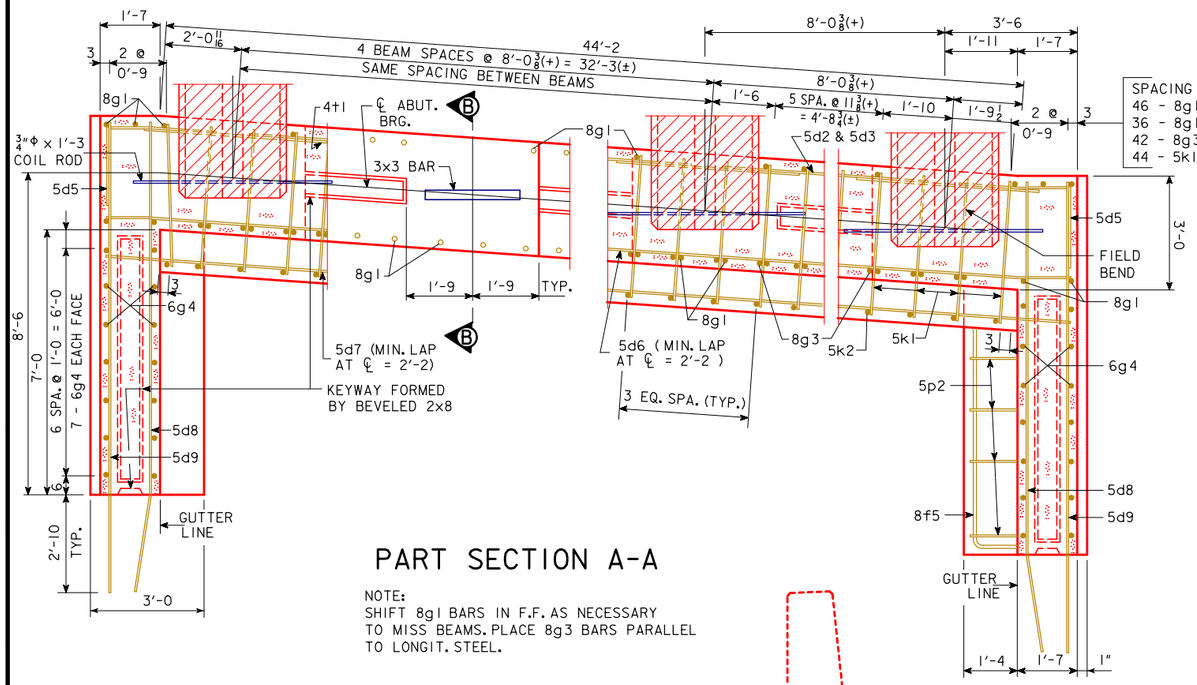
TABLE OF ABUTMENT STEPS

STEP	S. ABUT.	N. ABUT.
a	LOW	LOW
b	2 3/16	2 1/8
c	2 3/16	2 1/8
d	1/4	3/16
e	1 11/16	1 3/4
f	1 11/16	1 3/4

TABLE OF ABUTMENT ELEVATIONS

POINT	S. ABUT.	N. ABUT.
ELEV. A	1088.27	1083.96
ELEV. B	1088.45	1084.14
ELEV. C	1088.64	1084.31
ELEV. D	1088.66	1084.33
ELEV. E	1088.52	1084.19
ELEV. F	1088.38	1084.04
BOTT. FTG. ELEV.	1084.77	1080.46

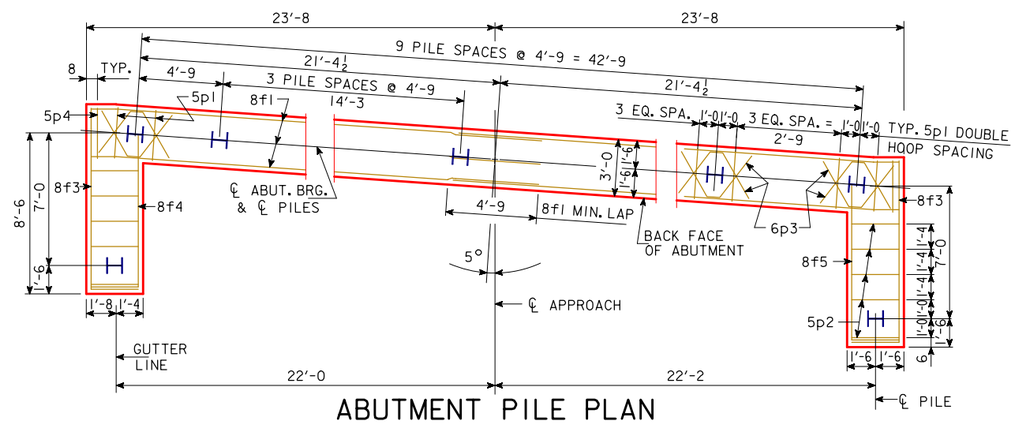
NOTE:
THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 21" DIAMETER, 3" PITCH WITH 3 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.



SPACING FOR:
46 - 8g1 BACK FACE
36 - 8g1 FRONT FACE
42 - 8g3 BACK FACE
44 - 5k1 & 5k2 BACK FACE

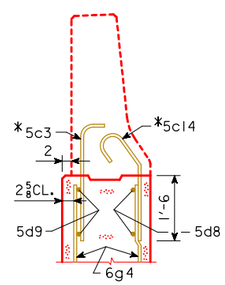
PART SECTION A-A

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



ABUTMENT PILE PLAN

* NOTE: SEE DESIGN SHEET 17 FOR DETAILS OF BARRIER RAIL. REINFORCING BARS 5c3 AND 5c14 ARE INCLUDED IN SUPERSTRUCTURE QUANTITIES.



PART SECTION C-C

ABUTMENT NOTES:

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

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

ABUTMENT CONCRETE QUANTITY

LOCATION	QUANTITY
S. ABUTMENT FOOTING	25.0
N. ABUTMENT FOOTING	25.0
TOTAL (CU. YDS.)	50.0

NOTE: CONCRETE QUANTITIES ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.
NOTE: 12 - HP 10 x 57 STEEL BEARING PILING REQUIRED AT EACH ABUTMENT.

NOTE: BARRIER RAIL NOT SHOWN IN DETAILS.

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

ABUTMENT DETAILS

STATION 123+50.00 (US 65) AUGUST, 2020

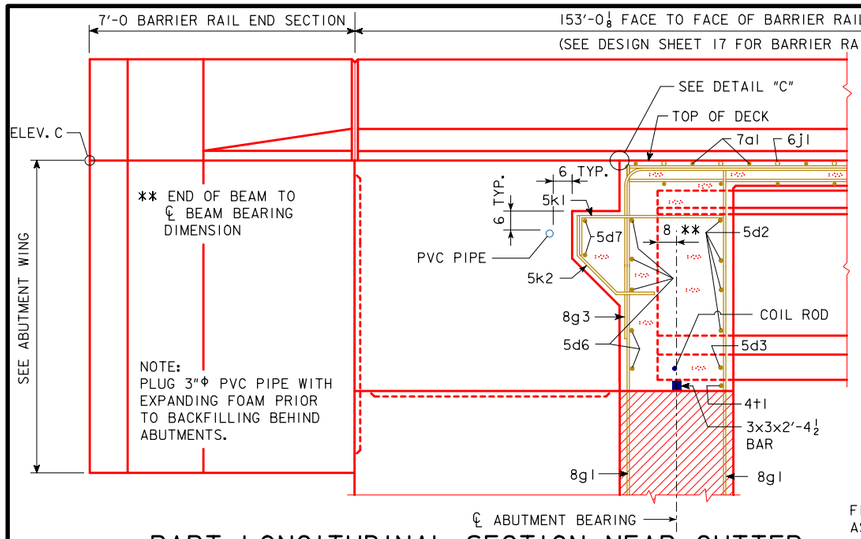
CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 6 OF 21 FILE NO. 31620 DESIGN NO. 221

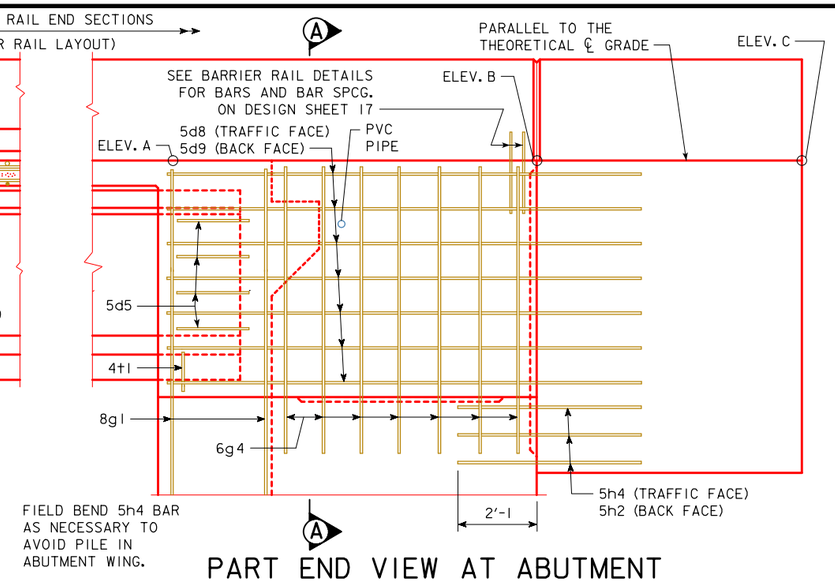
CORRECTION 04-14 - ADDED CONCRETE QUANTITY TABLE & REFERRAL NOTE TO SUMMARY QUANTITY SHEET. REMOVED DESIGN BEARING NOTE FOR ABUT. PILING FROM ABUTMENT NOTES.
ENGLISHBTINTEGRALBRIDGES.DGN - 2086-BTE - THIS SHEET ISSUED 02-08.

BENCH MARK NO. CP1 Northing: 9728949.58 Easting: 12378905.40 Elevation: 1087.15, DESCRIPTION: SET FENO MON W/BRASS CAP STAMPED IA DOT CP1 - 3" BELOW GRADE - MON IS 0.36 MI N OF INTERSECTION US HWY 65 & 140TH ST 56' W OF CL US HWY 65 & 14' N OF CENTER DRIVE ENT TO WEST.

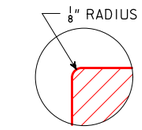


PART LONGITUDINAL SECTION NEAR GUTTER

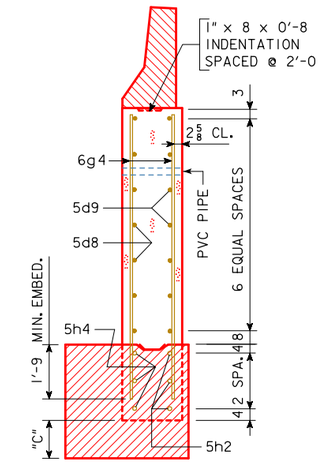
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE DESIGN SHEET 14)



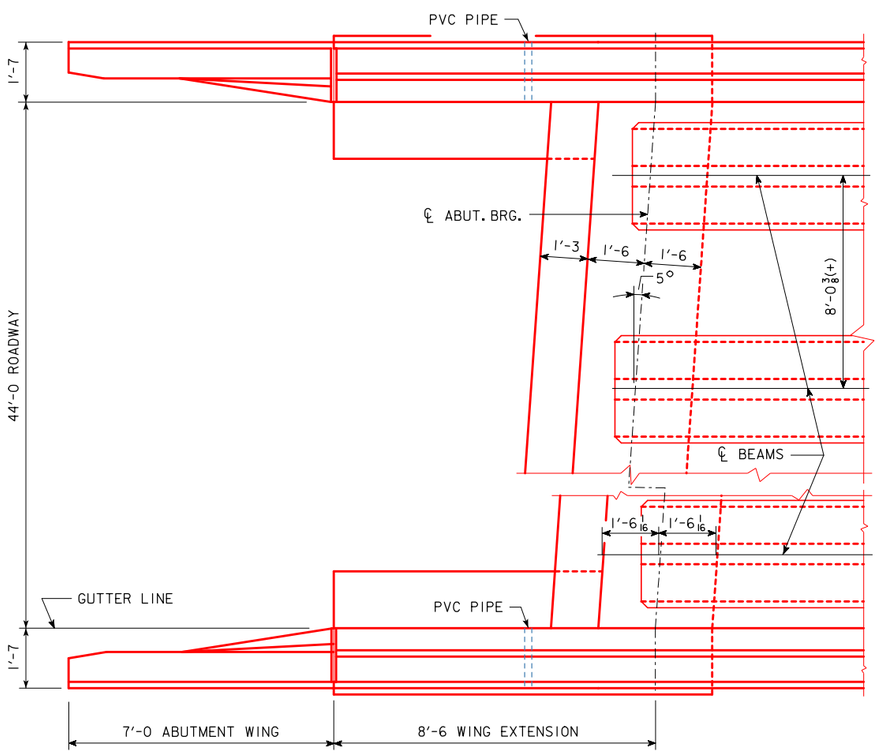
PART END VIEW AT ABUTMENT



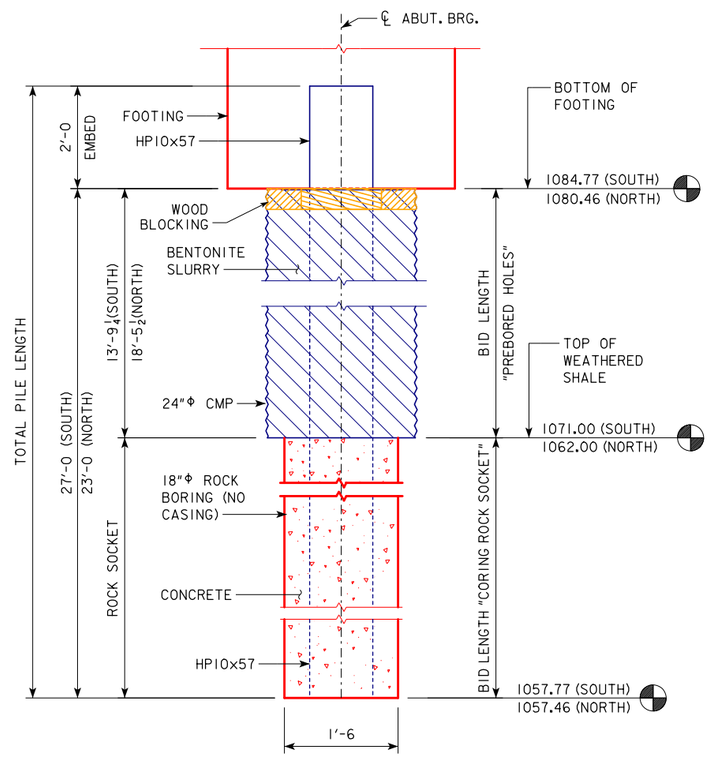
DETAIL "C"



SECTION A-A



PART PLAN

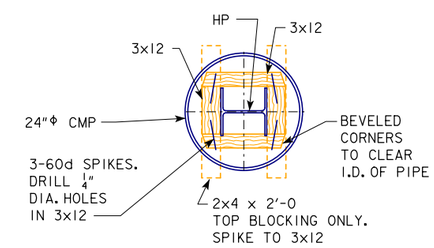


CORED ROCK SOCKET PILE

ALL ELEVATIONS AND DIMENSIONS ARE ESTIMATED BASED ON SOIL BORINGS, AND ARE SUBJECT TO ADUSTMENT AT THE TIME OF CONSTRUCTION.

TABLE OF WINGWALL ELEVATIONS

LOCATION	DIM "C"	ELEV. A	ELEV. B	ELEV. C
S.W. CORNER	1'-8 1/8	1094.68	1094.99	1095.20
N.W. CORNER	10 3/8	1090.45	1090.23	1090.08
S.E. CORNER	1'-9 5/8	1094.80	1095.10	1095.08
N.E. CORNER	11 3/8	1090.54	1090.31	1090.16



CMP BLOCKING DETAIL

ONE REQUIRED AT TOP AND BOTTOM OF CMP (CORRUGATED METAL PIPE). BOTTOM BLOCKING SHALL BE TREATED MATERIAL AND SHALL REMAIN IN PLACE. TOP BLOCKING SHALL BE REMOVED PRIOR TO BACK FILLING INSIDE THE CMP. COST FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR PREBORE HOLES. ALTERNATE DETAIL MAY BE APPROVED BY ENGINEER.

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

ABUTMENT DIAPHRAGM DETAILS

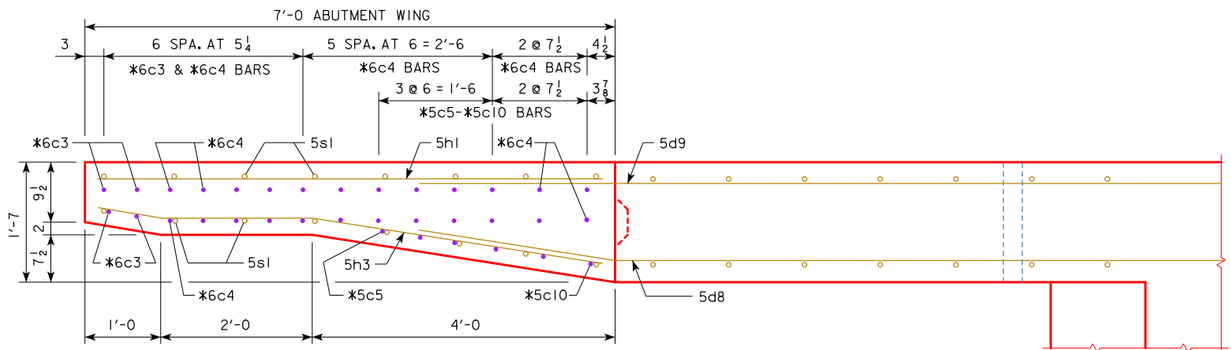
STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

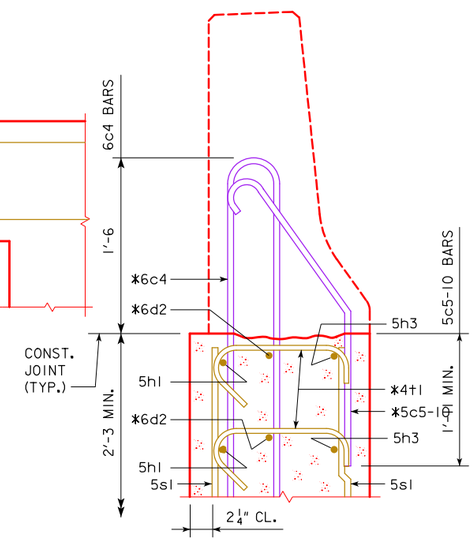
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 7 OF 21 FILE NO. 31620 DESIGN NO. 221

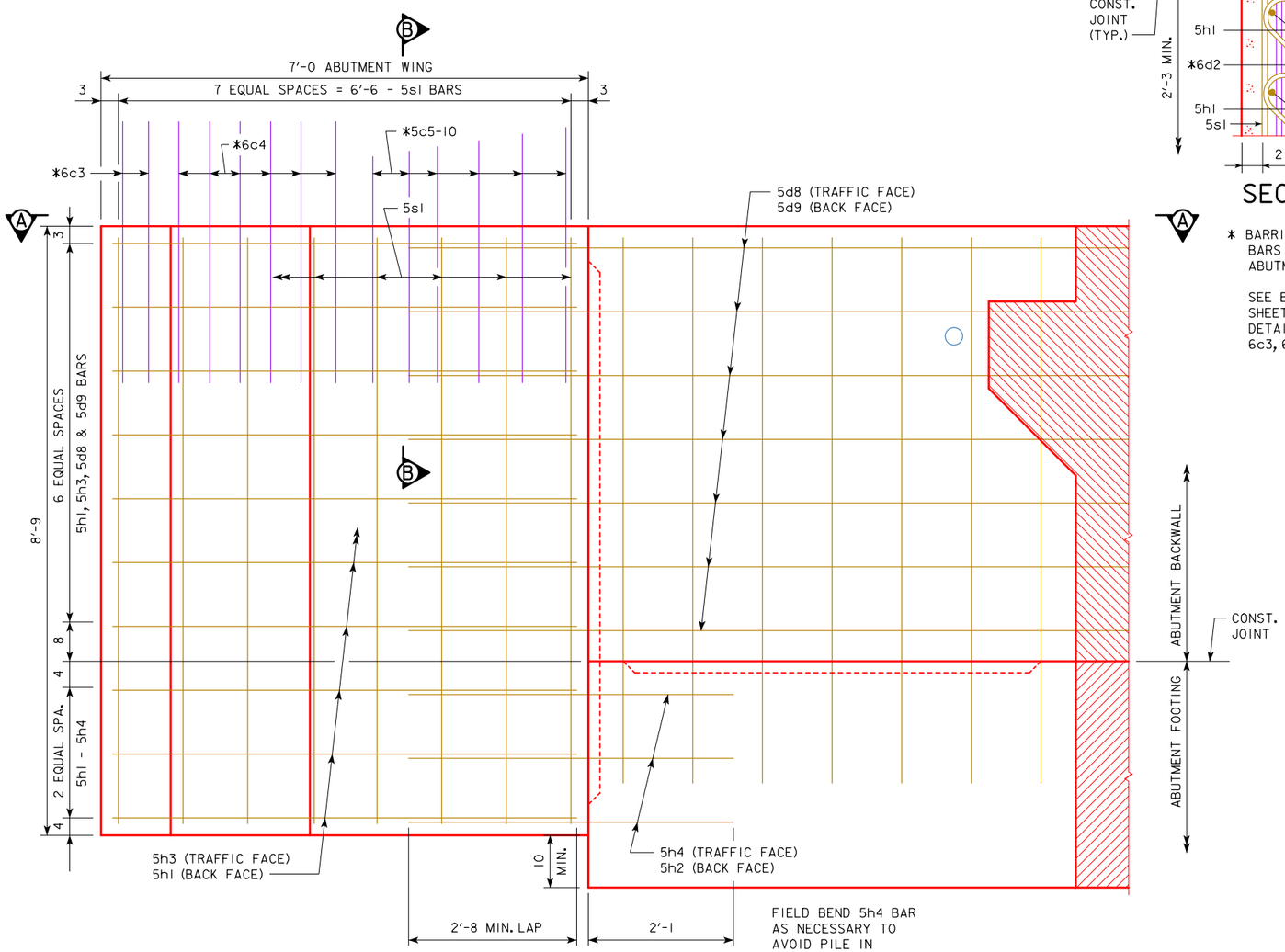
REVISED 01-12 - ADDED FIELD BEND 5h4 BAR TO AVOID PILE IN ABUTMENT WING NOTE.
ENGLISHBTINTEGRALBRIDGES.DGN - 4507-BTE - THIS SHEET ISSUED 02-08.



VIEW A-A



SECTION B-B



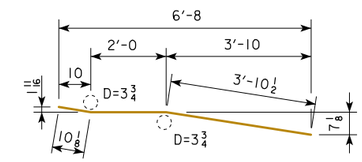
ABUTMENT WING - ELEVATION VIEW

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

SEE BARRIER RAIL END SECTION SHEET IN THESE PLANS FOR DETAILS OF REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4t1.

EPOXY-COATED REINF. BAR LIST- ONE ABUT. WING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5h1	HORIZONTAL BACK FACE		10	6'-8	70
5h3	HORIZONTAL TRAFFIC FACE		10	6'-9	70
5s1	VERTICAL BOTH FACES		16	8'-5	140
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				280



5h3

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

BENT BAR DETAILS

CONCRETE PLACEMENT SUMMARY

CONCRETE	TOTAL
ONE ABUTMENT WING	2.6
TOTAL (CU. YDS.)	2.6

NOTE:

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

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

ABUTMENT WING DETAILS

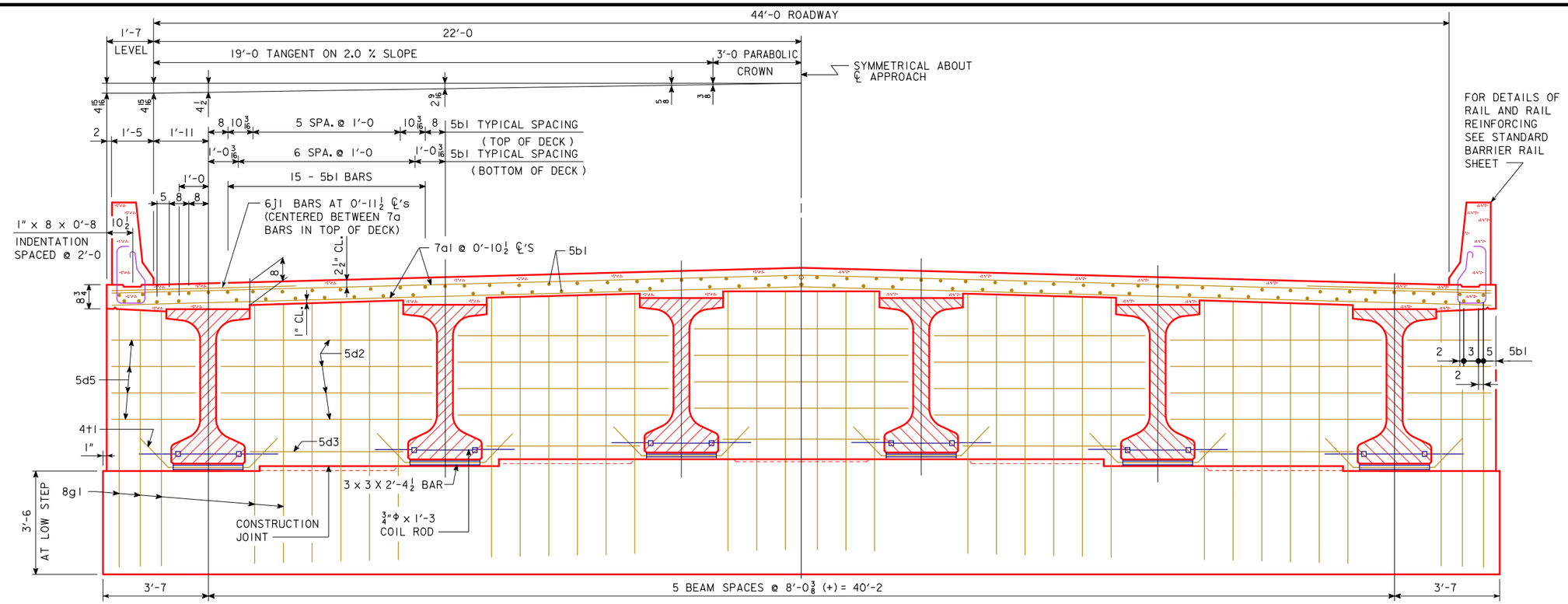
STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

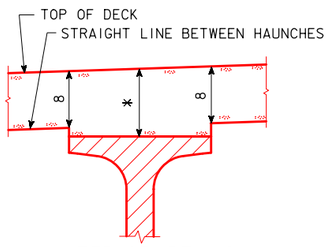
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 8 OF 21 FILE NO. 31620 DESIGN NO. 221

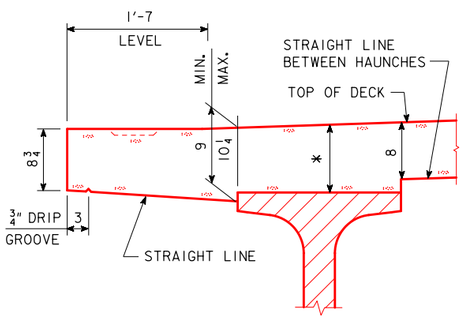
CORRECTION 04-14 - ADDED REFERRAL NOTE TO SUMMARY QUANTITIES SHEET.
ENGLISHMISCELLANEOUSBRIDGES.DGN - 2114 - THIS SHEET ISSUED 02-08.



SECTION NEAR ABUTMENT



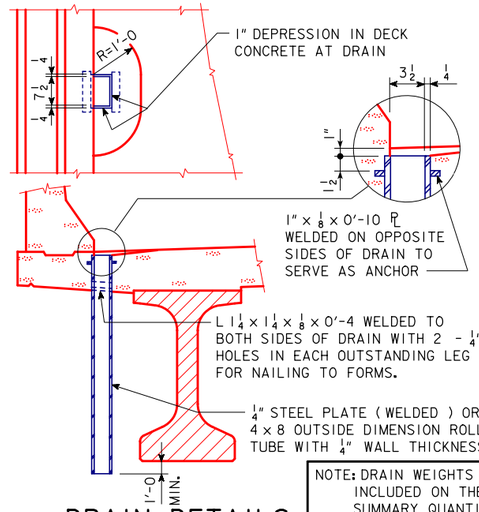
INTERIOR BEAMS



EXTERIOR BEAMS

TYPICAL DECK AND HAUNCH DETAIL

* FOR DECK THICKNESS OVER BEAMS SEE HAUNCH AND CAMBER DETAILS ON DESIGN SHEET 13.



DRAIN DETAILS

NOTE: DRAIN WEIGHTS ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.

NOTE:
DRAINS ARE TO BE GALVANIZED. 4 DRAINS REQUIRED. SEE "SITUATION PLAN" FOR LOCATION. WEIGHT OF DRAINS IS INCLUDED IN THE QUANTITY FOR "STRUCTURAL STEEL". WEIGHT IS BASED ON ROLLED TUBE.

DATA FOR ONE DRAIN	
BEAM SIZE	BTE
DRAIN WEIGHT (LBS.)	136
DRAIN LENGTH (FT.)	6'-11¾

NOTE: FOR DETAILS OF INTERMEDIATE DIAPHRAGMS SEE DESIGN SHEET 14.

SUPERSTRUCTURE NOTES:

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

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

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

ALL BEAMS ARE TO BE SET VERTICAL.

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

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

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

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2½" CLEAR BELOW TOP OF DECK. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF DECK. TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF BAR HIGH CHAIRS OR DECK BOLSTERS SPACED 4'-0 APART. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, BAR HIGH CHAIRS, AND DECK BOLSTERS.

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

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

TOP BAR - LAP MIDWAY BETWEEN BEAMS (MIN. LAP = 1'-10).
BOTTOM BARS - LAP OVER BEAMS (MIN. LAP = 1'-10).

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

DECK AREA = 31.93 SQ. FT.
DECK AREA DOES NOT INCLUDE THE HAUNCH

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

BRIDGE DECK CROSS SECTION

STATION 123+50.00 (US 65) AUGUST, 2020

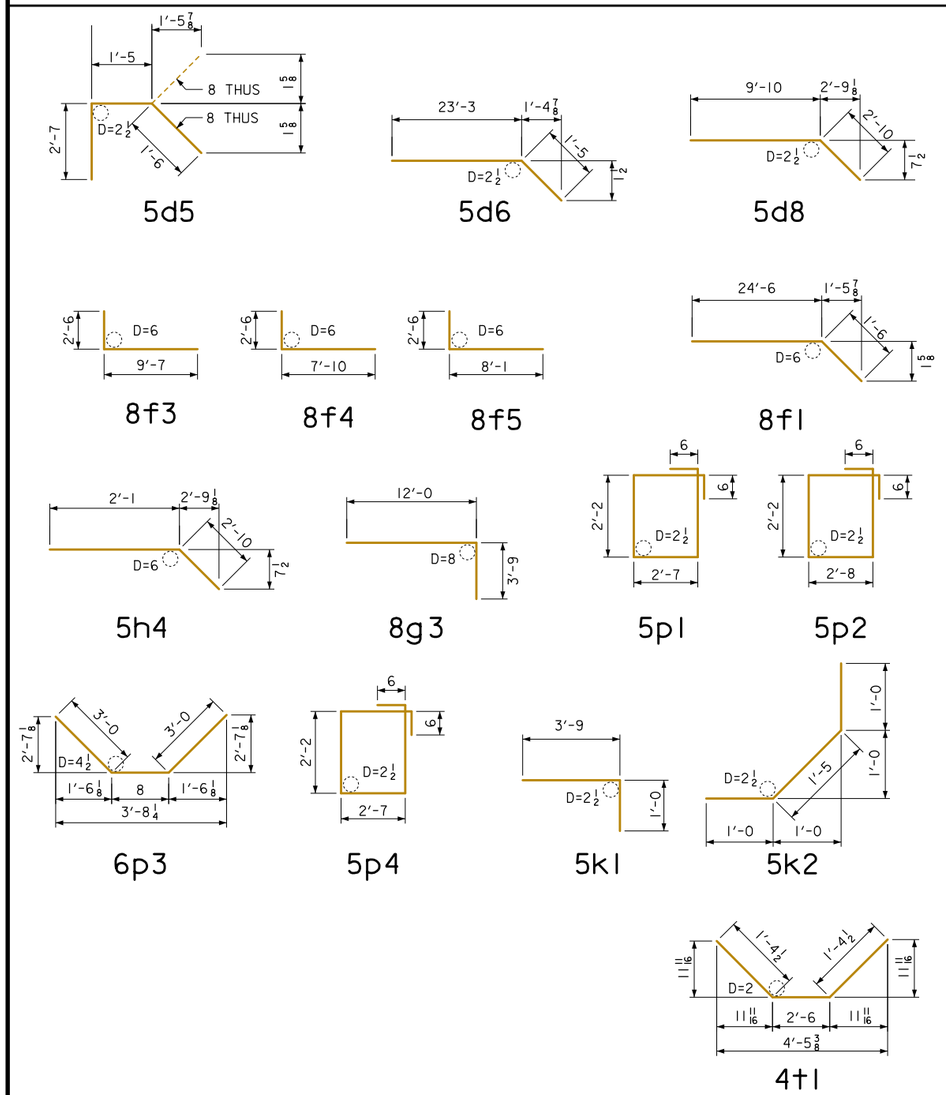
CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 9 OF 21 FILE NO. 31620 DESIGN NO. 221

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

BENT BAR DETAILS



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

REINFORCING BAR LIST - EPOXY COATED

(ONE SUPERSTRUCTURE AND TWO ABUTMENTS)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
7a1	SLAB TRANSV. TOP & BOTT.		349	47'-0	33,528
5b1	SLAB LONGITUDINAL, TOP & BOTT.		388	39'-9	16,086
5d2	ABUT. DIAPH. LONGIT.		40	7'-4	306
5d3	ABUT. DIAPH. LONGIT.		10	5'-4	56
5d5	ABUT. DIAPH. ENDS		16	5'-6	92
5d6	ABUT. DIAPH. LONGIT. B.F.		20	24'-8	515
5d7	PAVING NOTCH LONGIT.		8	24'-7	205
5d8	ABUT. DIAPH. WING EXT. LONGIT.		28	12'-8	370
5d9	ABUT. DIAPH. WING EXT. LONGIT.		28	12'-8	370
8f1	ABUT. FOOTING LONGIT.		36	26'-0	2,499
8f3	ABUT. EXTENSION LONGIT.		16	12'-1	516
8f4	ABUT. EXTENSION LONGIT.		8	10'-4	221
8f5	ABUT. EXTENSION LONGIT.		8	10'-7	226
8g1	ABUT. VERT.		164	9'-6	4,160
8g3	ABUT. DIAPH. VERT. B.F.		84	15'-9	3,532
6g4	ABUT. DIAPH. WING EXT. VERT.		56	8'-1	680
5h2	ABUT. TO WING ANCHOR		12	4'-11	62
5h4	ABUT. TO WING ANCHOR		12	4'-11	62
6j1	TOP OF SLAB TRANSV. (AT RAIL)		348	6'-3	3,267
5k1	PAVING NOTCH TRANSV.		88	4'-9	436
5k2	PAVING NOTCH TRANSV.		88	3'-5	314
5p1	ABUTMENT HOOPS		152	10'-6	1,665
5p2	ABUT. EXTENSION HOOPS		40	10'-8	445
6p3	ABUT. BOTT. AT PILES		40	6'-8	401
5p4	ABUT. HOOPS AT ENDS		8	10'-6	88
4t1	UNDER BEAMS AT ABUTMENTS		12	5'-3	42
	REINFORCING STEEL (EPOXY COATED) - TOTAL (LBS.)				70,144

CONCRETE PLACEMENT QUANTITIES - C.Y.

(ONE SUPERSTRUCTURE AND TWO ABUTMENTS)

SECTION	TOTAL
SLAB, ABUT. DIAPH.'S, WINGWALLS	269.7

REINFORCING BAR LIST - NON-COATED

(ONE SUPERSTRUCTURE AND TWO ABUTMENTS)

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
#2	PILE SPIRAL		24	38'-6	154
	SPIRAL SPACERS, L 7/8 x 7/8 x 1/8 x 0.70		72	1'-10	92
					246

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

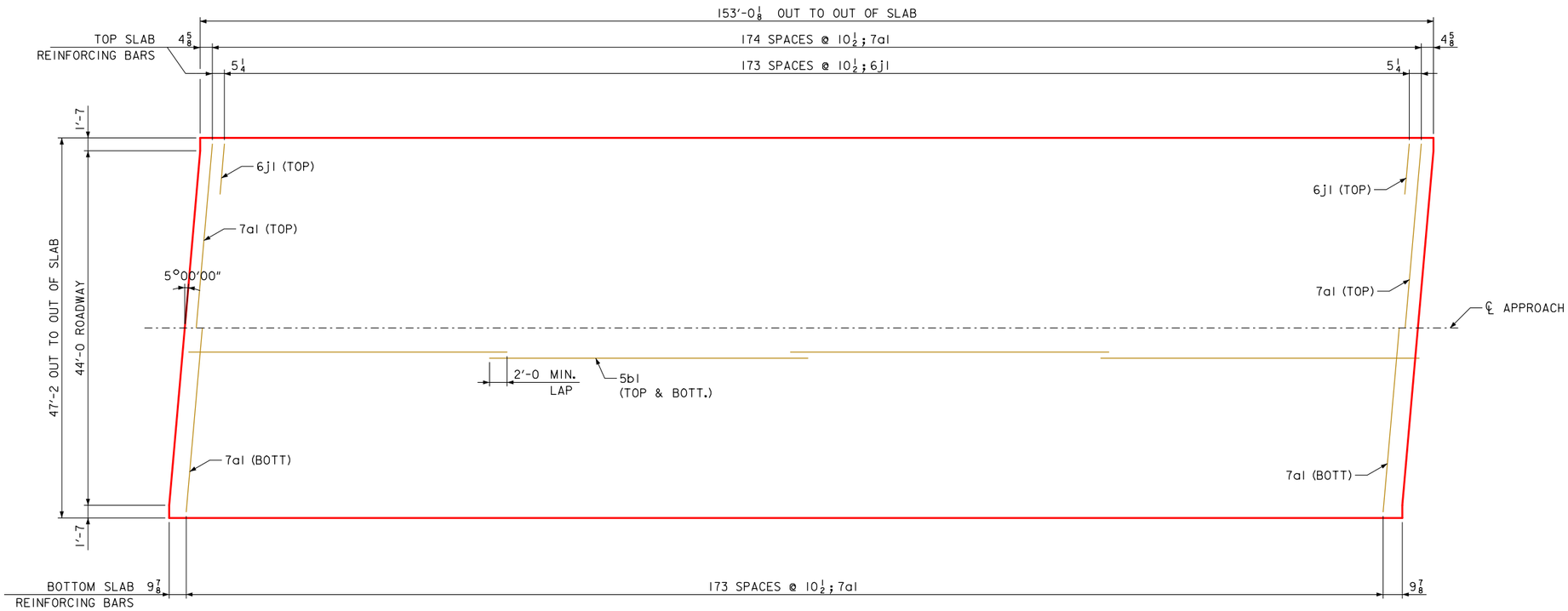
SUPERSTRUCTURE QUANTITIES

STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 10 OF 21 FILE NO. 31620 DESIGN NO. 221



CONCRETE REINFORCING LAYOUT AND CONCRETE PLACEMENT DIAGRAM

N

CONCRETE PLACEMENT NOTE:

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

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

DECK DETAILS

STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

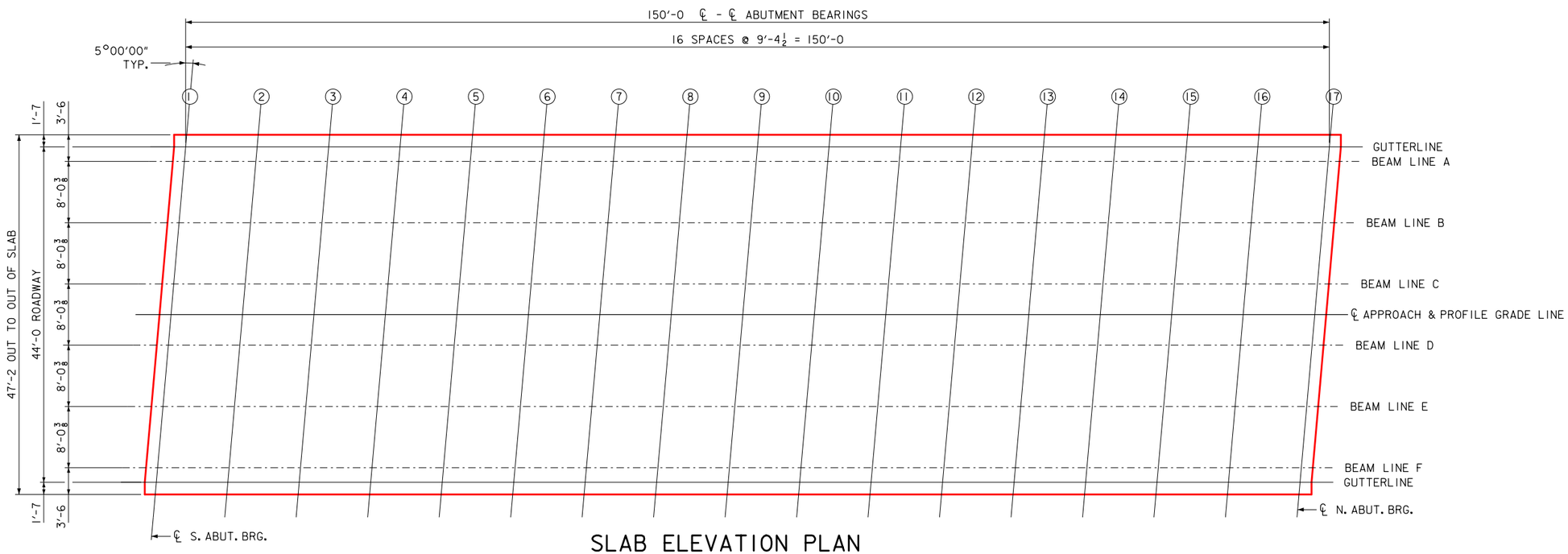
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 11 OF 21 FILE NO. 31620 DESIGN NO. 221

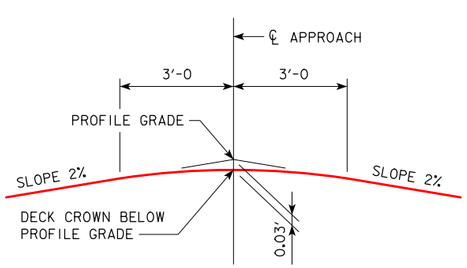
TOP OF SLAB ELEVATIONS

LOCATION	℄ S. ABUT. BRG. 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	℄ N. ABUT. BRG. LINE 17
WEST GUTTER LINE	1094.73	1094.44	1094.15	1093.86	1093.57	1093.28	1093.00	1092.71	1092.42	1092.14	1091.86	1091.60	1091.34	1091.10	1090.86	1090.64	1090.42
BEAM LINE A	1094.77	1094.48	1094.19	1093.90	1093.62	1093.33	1093.04	1092.75	1092.46	1092.18	1091.91	1091.64	1091.39	1091.14	1090.90	1090.68	1090.46
BEAM LINE B	1094.95	1094.66	1094.38	1094.09	1093.80	1093.51	1093.22	1092.93	1092.65	1092.36	1092.09	1091.82	1091.57	1091.32	1091.08	1090.86	1090.64
BEAM LINE C	1095.13	1094.85	1094.56	1094.27	1093.98	1093.69	1093.40	1093.12	1092.83	1092.54	1092.27	1092.00	1091.75	1091.50	1091.26	1091.03	1090.81
APPROACH CENTER LINE	1095.20	1094.91	1094.62	1094.33	1094.04	1093.75	1093.47	1093.18	1092.89	1092.60	1092.33	1092.06	1091.81	1091.56	1091.32	1091.09	1090.87
BEAM LINE D	1095.16	1094.87	1094.58	1094.29	1094.00	1093.71	1093.43	1093.14	1092.85	1092.56	1092.29	1092.02	1091.76	1091.52	1091.28	1091.05	1090.83
BEAM LINE E	1095.02	1094.73	1094.44	1094.15	1093.86	1093.58	1093.29	1093.00	1092.71	1092.42	1092.15	1091.88	1091.62	1091.37	1091.14	1090.91	1090.69
BEAM LINE F	1094.88	1094.59	1094.30	1094.01	1093.72	1093.44	1093.15	1092.86	1092.57	1092.29	1092.01	1091.74	1091.48	1091.23	1090.99	1090.76	1090.54
EAST GUTTER LINE	1094.84	1094.56	1094.27	1093.98	1093.69	1093.40	1093.11	1092.83	1092.54	1092.25	1091.97	1091.71	1091.45	1091.20	1090.96	1090.73	1090.51

BENCH MARK NO. CP1 Northing: 9728949.58 Easting: 12378905.40 Elevation: 1087.15,
DESCRIPTION: SET FENO MON W/BRASS CAP STAMPED IA DOT CP1 - 3" BELOW GRADE - MON IS 0.36 MI N OF INTERSECTION US HWY 65 & 140TH ST 56' W OF CL US HWY 65 & 14' N OF CENTER DRIVE ENT TO WEST.



SLAB ELEVATION PLAN



CROWN TEMPLATE

N

NOTE:
THE TOP OF DECK ELEVATIONS, AS SHOWN ON THE TOP SLAB ELEVATIONS DETAIL SHEET, FOR THE HIGH POINT ON THE BRIDGE DECK ARE 0.03 FEET BELOW THE HIGH POINT ON THE APPROACH ROADWAY TO ACCOUNT FOR THE ROUNDING OF THE DECK WITH A PARABOLIC TEMPLATE AT THE CROSS SLOPE INTERSECTION.

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

TOP SLAB ELEVATIONS DETAILS

STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 12 OF 21 FILE NO. 31620 DESIGN NO. 221

BEAM LINE HAUNCH ELEVATIONS

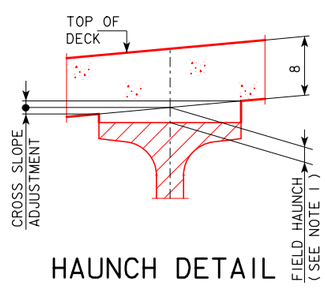
LOCATION	℄ S. ABUT. BRG.															℄ N. ABUT. BRG.
	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17
BEAM LINE A	1094.10	1093.89	1093.68	1093.46	1093.23	1092.99	1092.74	1092.47	1092.19	1091.90	1091.60	1091.30	1091.00	1090.70	1090.39	1090.09	1089.79
BEAM LINE B	1094.29	1094.07	1093.86	1093.64	1093.41	1093.17	1092.92	1092.65	1092.37	1092.08	1091.78	1091.48	1091.18	1090.87	1090.57	1090.27	1089.97
BEAM LINE C	1094.47	1094.26	1094.04	1093.82	1093.59	1093.35	1093.10	1092.84	1092.55	1092.26	1091.97	1091.66	1091.36	1091.05	1090.75	1090.44	1090.15
BEAM LINE D	1094.49	1094.28	1094.07	1093.85	1093.62	1093.38	1093.12	1092.86	1092.58	1092.28	1091.99	1091.68	1091.38	1091.07	1090.76	1090.46	1090.16
BEAM LINE E	1094.35	1094.14	1093.93	1093.71	1093.48	1093.24	1092.98	1092.72	1092.44	1092.14	1091.85	1091.54	1091.24	1090.93	1090.62	1090.32	1090.02
BEAM LINE F	1094.21	1094.00	1093.79	1093.57	1093.34	1093.10	1092.85	1092.58	1092.30	1092.00	1091.70	1091.40	1091.09	1090.79	1090.48	1090.17	1089.87

BENCH MARK NO. CP1 Northing: 9728949.58 Easting: 12378905.40 Elevation: 1087.15, DESCRIPTION: SET FENO MON W/BRASS CAP STAMPED IA DOT CP1 - 3" BELOW GRADE - MON IS 0.36 MI N OF INTERSECTION US HWY 65 & 140TH ST 56' W OF CL US HWY 65 & 14' N OF CENTER DRIVE ENT TO WEST.

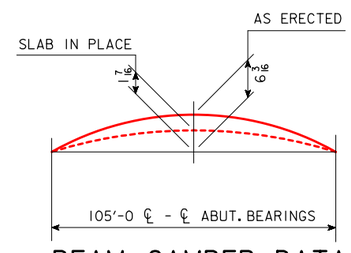
MISCELLANEOUS DATA TABLE

	BEAM LINE		S. ABUT. BRGS.															N. ABUT. BRGS.
			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
ANTICIPATED DEFLECTION DUE TO DECK (IN.)	ALL		0	$\frac{15}{16}$	$1\frac{13}{16}$	$2\frac{5}{8}$	$3\frac{3}{8}$	$3\frac{15}{16}$	$4\frac{3}{8}$	$4\frac{5}{8}$	$4\frac{11}{16}$	$4\frac{5}{8}$	$4\frac{3}{8}$	$3\frac{15}{16}$	$3\frac{3}{8}$	$2\frac{5}{8}$	$1\frac{13}{16}$	$\frac{15}{16}$	0
CROSS SLOPE ADJUSTMENTS in.	ALL		$\pm\frac{5}{16}$																
ALLOWABLE FIELD HAUNCH in. (ft.) AT ℄ BEAM	MAX	ALL	$4\frac{1}{2}$ (0.375)	$3\frac{1}{2}$ (0.292)			$2\frac{1}{2}$ (0.208)										$3\frac{1}{2}$ (0.292)		$4\frac{1}{2}$ (0.375)
	MIN	ALL	$1\frac{1}{2}$ (0.125)	$\frac{1}{2}$ (0.042)			$-\frac{3}{16}$ (-0.013)										$\frac{1}{2}$ (0.042)		$1\frac{1}{2}$ (0.125)

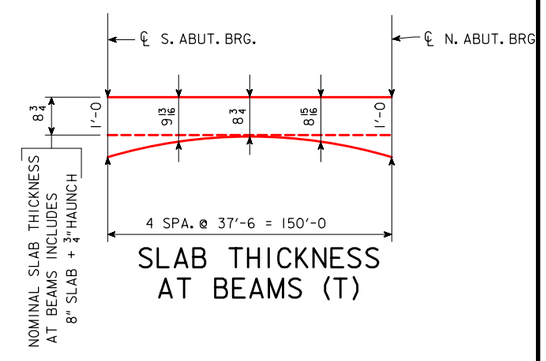
NOTE :
BRIDGE SEAT ELEVATIONS ARE SET BASED ON THEORETICAL CAMBER AND BEAM DEFLECTIONS. THESE BRIDGE SEATS WILL PROVIDE A THEORETICAL BEAM HAUNCH WITHIN DESIGN PARAMETERS. FIELD HAUNCHES ARE DETERMINED USING SURVEYED TOP OF BEAM ELEVATIONS AND "BEAM LINE HAUNCH ELEVATION" DATA. ALLOWABLE MAXIMUM AND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



HAUNCH DETAIL



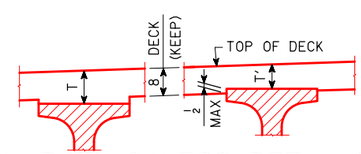
BEAM CAMBER DATA



SLAB THICKNESS AT BEAMS (T)

NOTE:
HAUNCH LOCATIONS ARE AT THE SAME LOCATIONS AS THE BEAM LINES AND ENCIRCLED NUMBERS SHOWN ON DESIGN SHEET 12.

NOTE 1 :
TO CALCULATE FIELD HAUNCH REQUIRED AT EACH LOCATION, SURVEY THE BEAM TOPS CONSISTENT WITH THE SPACING'S SHOWN ON THE "TOP OF DECK ELEVATIONS LAYOUT" ON DESIGN SHEET 12. SUBTRACT THE SURVEYED BEAM SHOT FROM THE "BEAM LINE HAUNCH ELEVATION". THIS VALUE WILL BE THE HAUNCH NEEDED (SEE "FIELD HAUNCH" IN HAUNCH DETAIL). THE "BEAM LINE HAUNCH ELEVATIONS" INCLUDES ADJUSTMENT FOR DECK THICKNESS AND ANTICIPATED DEFLECTIONS. NO ADDITIONAL CALCULATIONS ARE REQUIRED. IF THE FIELD HAUNCH EXCEEDS THE MAXIMUMS AND MINIMUMS INDICATED IN THE MISCELLANEOUS DATA TABLE, ADJUSTMENTS TO THE GRADE OR ADDITIONAL HAUNCH REINFORCEMENT WILL BE REQUIRED.



SLAB THICKNESS DETAILS

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

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

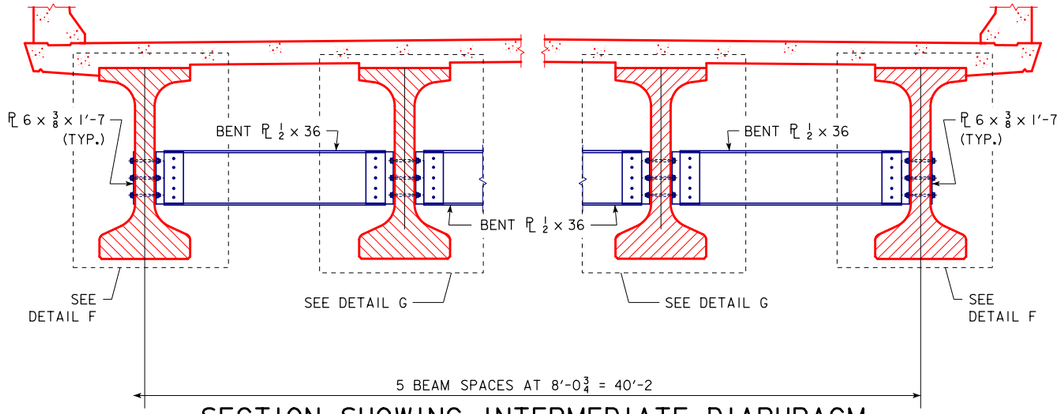
HAUNCH AND CAMBER DETAILS

STATION 123+50.00 (US 65) AUGUST, 2020

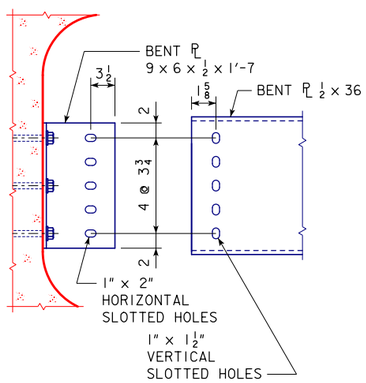
CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

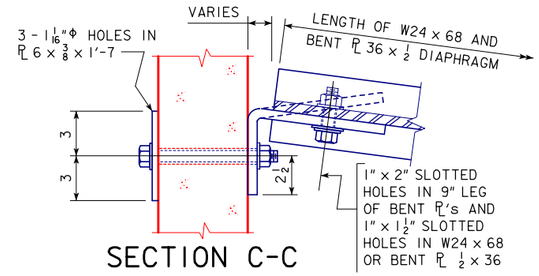
DESIGN SHEET NO. 13 OF 21 FILE NO. 31620 DESIGN NO. 221



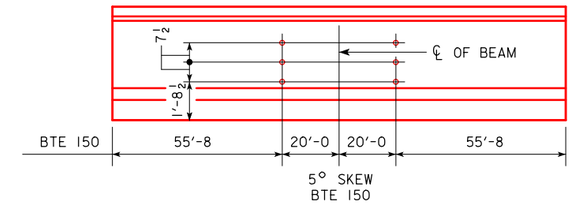
SECTION SHOWING INTERMEDIATE DIAPHRAGM



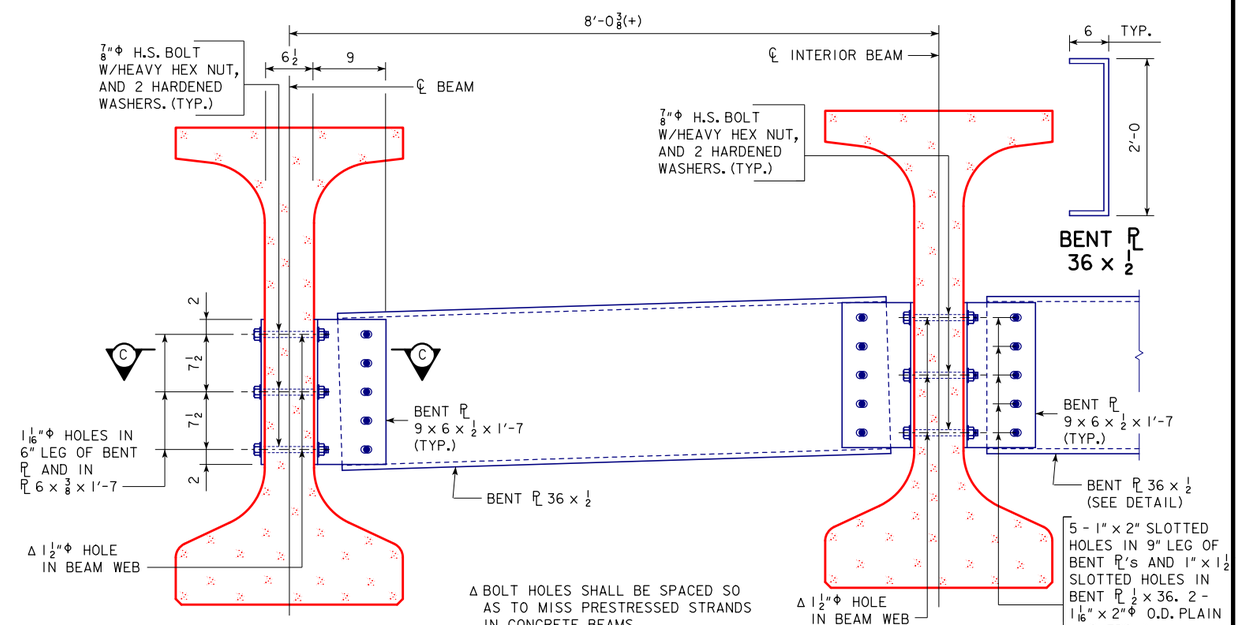
SLOTTED HOLE DETAILS



SECTION C-C



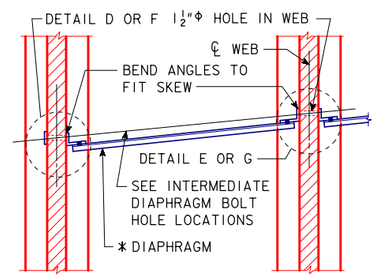
NTERMEDIATE DIAPHRAGM BOLT HOLE LOCATIONS



DETAIL F

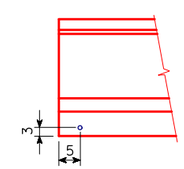
Δ BOLT HOLES SHALL BE SPACED SO AS TO MISS PRESTRESSED STRANDS IN CONCRETE BEAMS.

DETAIL G



PART SECTION A-A

FOR BRIDGES SKEWED LESS THAN OR EQUAL TO 7°30'



ALL SKEWS

INTEGRAL ABUT.

BEAM COIL TIE LOCATIONS

BULB TEE "E" BEAM INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL

ONE BEAM CONNECTION (DETAIL "F" AND/OR DETAIL "G")		NO. OF BEAM CONNECTIONS	WEIGHT
3 - 7/8"Φ x 9 1/4" H.S. BOLTS WITH NUTS & WASHERS = 7.2 LBS.		12	86
ONE DETAIL "G"	2 - BENT PL 9 x 6 x 1/2 x 1'-7 = 80.8 LBS.	8	646
ONE DETAIL "F"	1 - BACKING PL 6 x 3/8 x 1'-7 = 12.1 LBS.	4	48
	1 - BENT PL 9 x 6 x 1/2 x 1'-7 = 40.4 LBS.	4	162
ONE DIAPHRAGM			
		NUMBER OF DIAPHRAGMS	
10 - 7/8"Φ x 2 1/4" H.S.BOLTS WITH NUTS & WASHERS = 9.7 LBS.		10	97
	LENGTH OF MEMBER		
1 - BENT PL 36 x 1/2 = 61.3 LBS./FT.	6'-10 1/8	10	4195
INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL - TOTAL (LBS.)			5235

STRUCTURAL STEEL	
WEIGHT	5235 LBS.

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

NOTES:

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

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

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

THE 1 1/2"Φ HOLES FOR THE 7/8"Φ H.S. BOLTS SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.

THE 7/8"Φ H.S. BOLTS THROUGH THE WEB SHALL HAVE A THREAD LENGTH OF 3" MIN. AND 4" MAX. AND SHALL MEET THE REQUIREMENTS OF ASTM A449.

ALL BOLTS ARE TO BE TIGHTENED PRIOR TO PLACING BRIDGE FLOOR CONCRETE WITH THE FOLLOWING EXCEPTION: BOLTS IN DIAPHRAGMS LOCATED UNDER LONGITUDINAL BRIDGE FLOOR CONSTRUCTION JOINTS SHALL NOT BE TIGHTENED UNTIL STAGE TWO OF THE BRIDGE FLOOR HAS BEEN PLACED.

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

STEEL INTERMEDIATE DIAPHRAGMS

STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 14 OF 21 FILE NO. 31620 DESIGN NO. 221

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

BEAM NOTES:

THESE BEAMS ARE DESIGNED FOR AASHTO LIVE LOADS AS INDICATED IN ABOVE TABLE WITH AN ALLOWANCE OF 20 LBS PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

ALL PPC BEAMS SHALL USE HIGH PERFORMANCE CONCRETE (HPC) IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

HOLD DOWN POINTS FOR DEFLECTED STRANDS MAY BE MOVED TOWARD ENDS OF BEAM A DISTANCE OF 0.05 L MAXIMUM AT PRODUCER'S OPTION.

ALL PRESTRESSING STRANDS EXCEPT LIFTING LOOP STRANDS SHALL BE 0.60 in. NOMINAL DIAMETER (NOMINAL STEEL AREA = 0.217 in^2) AND CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS. MINIMUM STRAND BREAKING STRENGTH SHALL BE 58.6 kips.

TOPS OF BEAMS ARE TO BE STRUCK OFF LEVEL AND FINISHED AS PER MATERIALS IM570.

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.

BEAMS TO BE USED IN BRIDGES MADE CONTINUOUS BY THE POURED IN PLACE FLOOR, ARE TO BE AT LEAST 28 DAYS OLD BEFORE THE FLOOR IS PLACED UNLESS A SHORTER CURING TIME IS APPROVED BY THE BRIDGE ENGINEER.

THE PORTIONS OF THE PRESTRESSED BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT AND PIER DIAPHRAGMS SHALL BE ROUGHENED FOR A DISTANCE OF 10" FROM THE BEAM END BY SANDBLASTING OR OTHER APPROVED METHODS TO PROVIDE SUITABLE BOND BETWEEN THE BEAM AND THE DIAPHRAGM IN ACCORDANCE WITH ARTICLE 2403.03, I, OF THE STANDARD SPECIFICATIONS.

ALL BEAMS ARE TO BE INCREASED IN LENGTH TO COMPENSATE FOR ELASTIC SHORTENING, CREEP AND SHRINKAGE.

FOR TRANSPORTING, THE ALLOWABLE OVERHANG IS SHOWN IN THE LIFTING LOOP AND OVERHANG TABLE.

THE CONTRACTOR SHALL ASSURE THE LATERAL STABILITY OF THE BEAMS DURING HANDLING, TRANSPORTING AND ERECTION BY PROVIDING TEMPORARY BRACING AS NEEDED.

HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

IF SOLE PLATE IS REQUIRED FOR BEARING, SOLE PLATE IS TO BE SET IN FORMS WHEN BEAM IS CAST AND FORMED OUT BELOW TO EXCLUDE CONCRETE AS DETAILED ON THE BEARING SHEET.

IF STUB ABUTMENTS ARE USED, ALL STRANDS AT THE ENDS OF BEAMS AT STUB ABUTMENTS SHALL BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.

WHEN EXPANSION JOINTS ARE USED, CONCRETE SEALER SHALL BE APPLIED TO THE PRESTRESSED BEAM END SECTIONS. THE SEALING SHALL BE IN ACCORDANCE WITH MATERIALS I.M. 570 (FABRICATOR APPLICATION) AND I.M. 491.12 (CONTRACTOR APPLICATION).

MINIMUM CONCRETE f'c (AT 28 DAYS) AND MINIMUM f'ci AT RELEASE ARE LOCATED IN THE BTE BEAM DATA TABLE ABOVE.

FOUR 0.60 IN. DIAMETER STRANDS STRESSED TO NOT MORE THAN 5000 lbs. EACH MAY BE USED IN LIEU OF BARS 5a1 AND 5a2 IN THE TOP FLANGE.

ALTERNATE BAR NOTES:

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

DESIGN STRESSES:

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

SPECIFICATIONS:

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

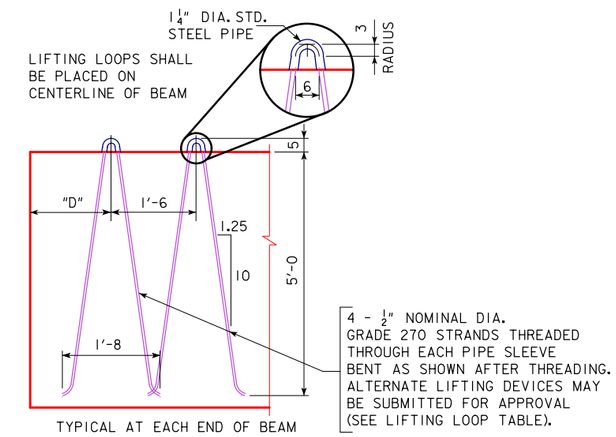
NOTE: NON-STANDARD STIRRUP LENGTHS HAVE BEEN USED FOR THE BEAMS.

BTE BEAM DATA

	BTE BEAM	SPAN LENGTH ℄-℄ BEARING	OVERALL BEAM LENGTH (L)	CONCRETE STRENGTH f'ci (ksi)	CONCRETE STRENGTH f'c (ksi)	STRAND SIZE DIA. (in)	NO. OF STRAND STRAIGHT	NO. OF STRAND DEFLECTED	TOTAL INITIAL PRESTRESS ③ kips	HOLD DOWN FORCE-kips	CAMBER (in) AT RELEASE	CAMBER (in) AFTER LOSSES	DEFLECTION (in) Δ_D IMMEDIATE ① (ELASTIC) Δ_I STEEL DIAPHRAGM	DEFLECTION (in) Δ_D TIME ② (PLASTIC) Δ_T STEEL DIAPHRAGM	PERMISSIBLE MAXIMUM SPACING HL-93 LOADING STEEL DIAPHRAGM	WEIGHT (TONS)	CONCRETE (CU YD.)	REINFORCING STEEL (WEIGHT-LBS)
④	BTE150	150'-0	151'-4	8.00	9.00	0.60	44	12	2383	33.7	3.52	6.17	4.34	1.09	9'-3	63.6	31.4	4264

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A SLAB (8 in) AND HAUNCH (1.5 in) WEIGHT OF:
0.98 kips/ft FOR 9'-3 BEAM SPACING AND ONE STEEL DIAPHRAGM (0.500 kips) AT ℄ OF SPAN FOR BTE60 TO BTE120, AND TWO STEEL DIAPHRAGMS (0.500 kips) PLACED 20'-0, ON EITHER SIDE, OF THE BEAM CENTERLINE FOR BTE125 TO BTE150. FOR DIFFERENT SLAB AND DIAPHRAGM WEIGHTS, DEFLECTIONS WILL BE DIRECTLY PROPORTIONAL.
② DEFLECTIONS DUE TO THE COMBINED EFFECT OF CREEP DUE TO WEIGHT OF SLAB AND SHRINKAGE OF SLAB.
TOTAL BEAM DEFLECTIONS AT ℄ OF SPAN, Δ_D, DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:
(A) $\Delta_D = \Delta_I + \Delta_T$ FOR SIMPLE SPAN.
(B) $\Delta_D = \Delta_I + \frac{3}{4}\Delta_T$ FOR END SPANS OF CONTINUOUS BRIDGE.
(C) $\Delta_D = \Delta_I + \frac{1}{2}\Delta_T$ FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.
③ TOTAL INITIAL PRESTRESS IS BASED ON 72.6% f's, f's. = 270 ksi. AND As = 0.217 in^2.
④ REQUIRES A 4000 psi, 28 DAY COMPRESSIVE STRENGTH FOR CAST-IN-PLACE SLAB CONCRETE.

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



TYPICAL AT EACH END OF BEAM

LIFTING LOOP DETAIL

LIFTING LOOP AND OVERHANG TABLE

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

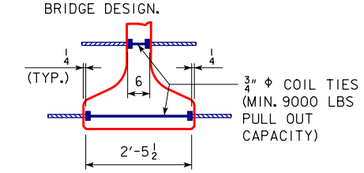
LIFTING LOOPS SHALL CARRY LOADS EQUALLY.

REINFORCING BAR LIST

	BEAM		BTE150			
	BAR	SHAPE	NO.	LENGTH		
	5a1		12	38'-10		
	5a2		12	40'-0		
ΔΔ	5b1		61	12'-2		
ΔΔ *	6b3		52	6'-10		
*	6b4		20	5'-10		
	5b6		36	12'-4		
	5b7		18	12'-6		
	4c1		183	2'-7		
	4d1		147	6'-5		
	4e1		36	3'-2		
	4h1		8	8'-0		

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

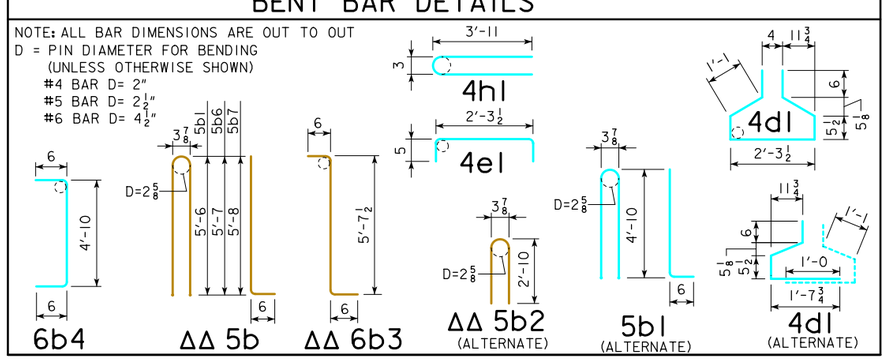
NUMBER AND EXACT LOCATION OF COIL TIES TO BE AS DETAILED ON SPECIFIC BRIDGE DESIGN.

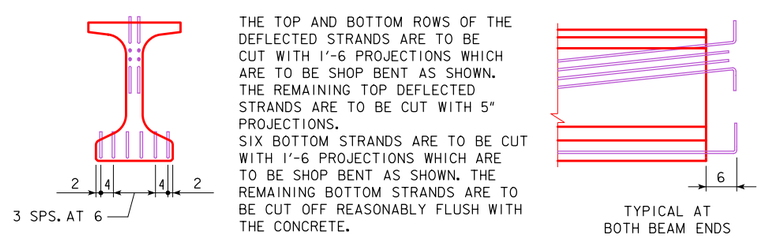


COIL TIE DETAIL

BENT BAR DETAILS

NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT
D = PIN DIAMETER FOR BENDING (UNLESS OTHERWISE SHOWN)
#4 BAR D= 2"
#5 BAR D= 2 1/2"
#6 BAR D= 4 1/2"





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

TYPICAL AT BOTH BEAM ENDS

STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

BTE150 BEAM DETAILS

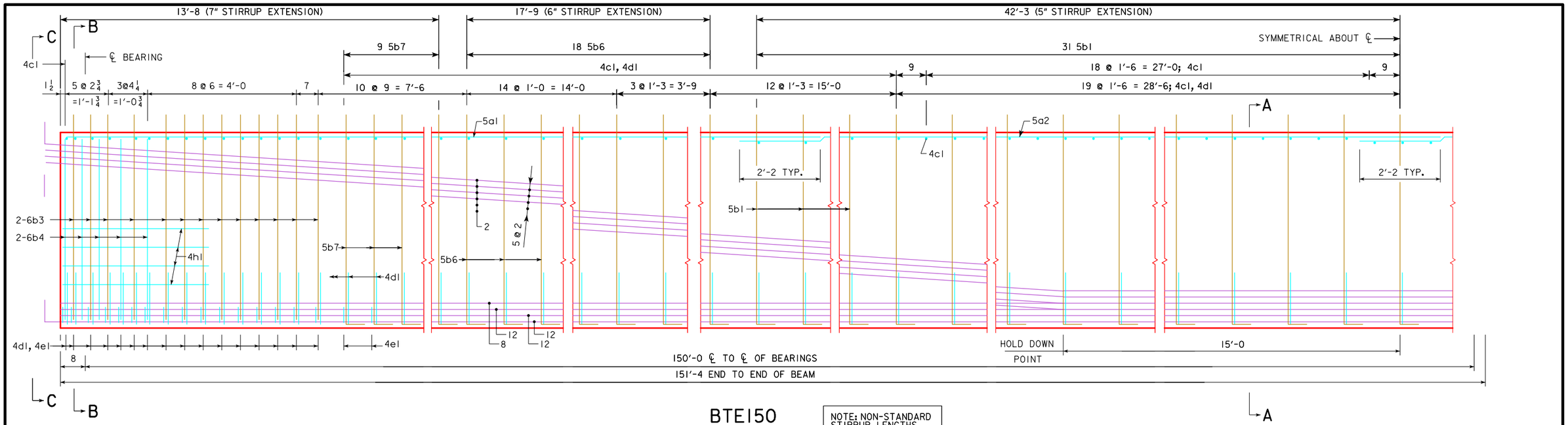
STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

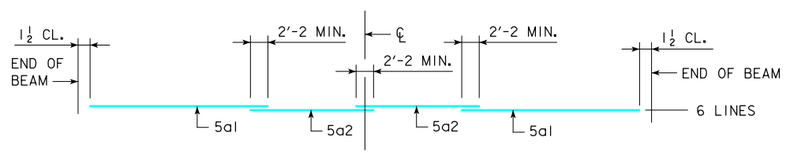
DESIGN SHEET NO. 15 OF 21 FILE NO. 31620 DESIGN NO. 221

CORRECTION 12-13 - COIL TIE DETAIL WAS CHANGED TO REFLECT THE DISTANCE BETWEEN COIL TIE ANCHORS EMBEDDED 1/4 INCH.
ENGLISHBEAMS.DGN - 4770s2 - THIS SHEET ISSUED 02-08. ENDS DISTINGUISHES BETWEEN THE FABRICATOR AND CONTRACTOR. DECK PANEL OPTION NOTE WAS DELETED.
REVISION 08-12 - I.M. REFERENCE NOTE FOR SEALING BEAM
ENGLISHBEAMS.DGN - 4770s1 - THIS SHEET ISSUED 02-08.

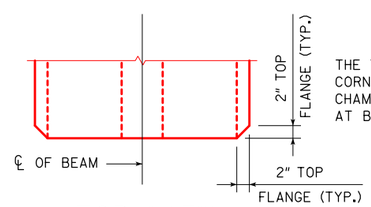


BTE150

NOTE: NON-STANDARD STIRRUP LENGTHS HAVE BEEN USED FOR THE BEAMS.

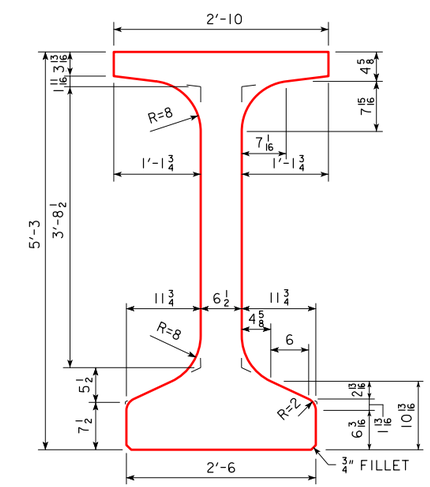


TOP FLANGE LONGITUDINAL BAR LAYOUT



TOP VIEW

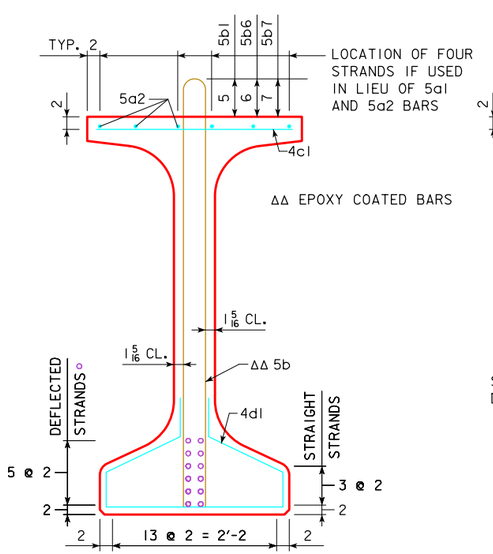
THE TOP FLANGE BEAM CORNERS ARE TO BE CHAMFERED 2" AS SHOWN AT BOTH ENDS OF THE BEAM.



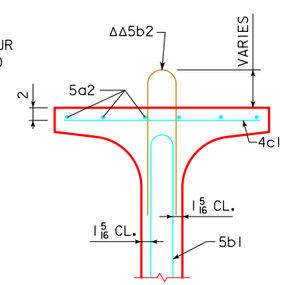
AREA = 807.4 in²
$\bar{y}_b$ = 28.75 in
I = 422,790 in⁴

BEAM SECTION PROPERTIES

BTE BEAM CROSS SECTION

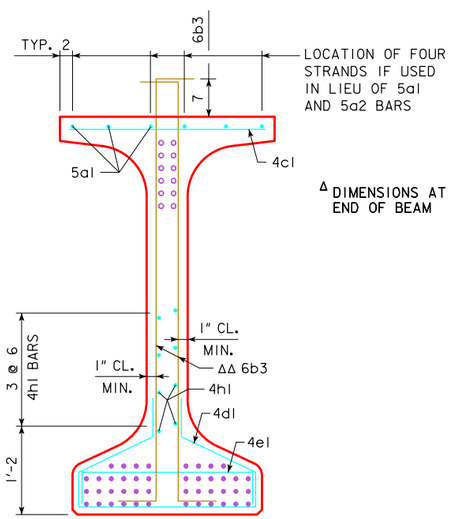


SECTION A-A

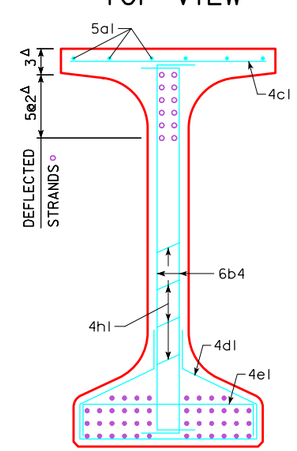


SECTION A-A (ALTERNATE)

SEE ALTERNATE BAR NOTE ON DESIGN SHEET 15.



SECTION B-B



SECTION C-C

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

BTE150 BEAM DETAILS

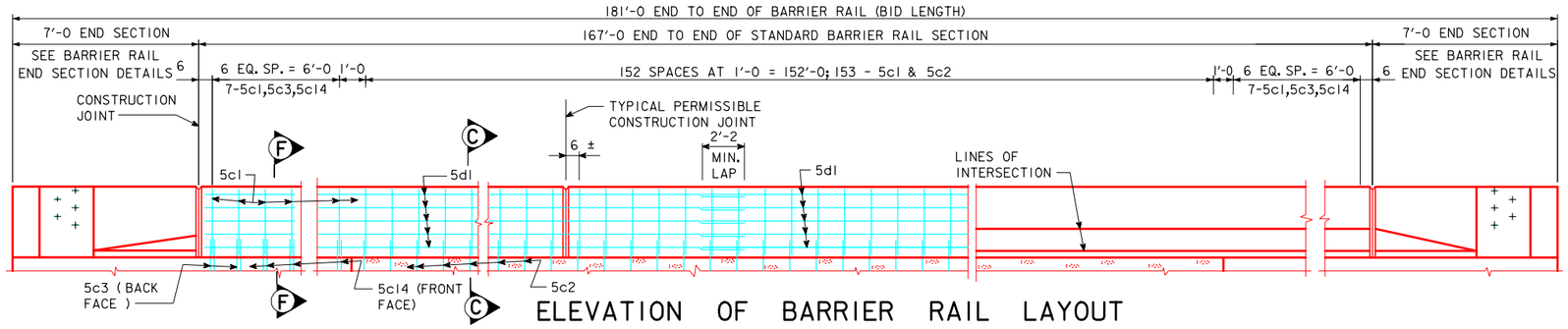
STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

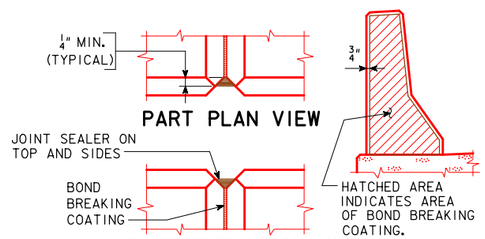
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 16 OF 21 FILE NO. 31620 DESIGN NO. 221

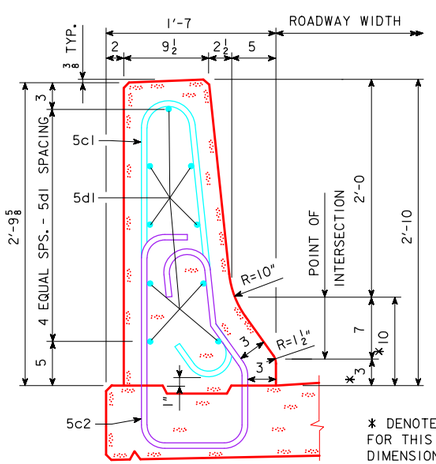
REVISED 05-12 - ALTERNATE SECTION A-A 5a1 BAR CHANGED TO 5a2.
ENGLISHBEAMS.DGN - 4789 - THIS SHEET ISSUED 02-08.



ELEVATION OF BARRIER RAIL LAYOUT

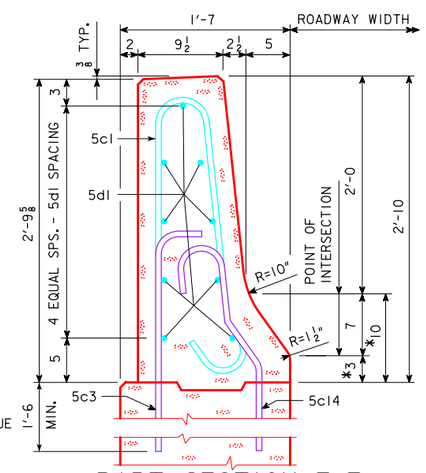


BARRIER RAIL JOINT DETAILS



PART SECTION C-C

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



PART SECTION F-F

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 EPOXY COATED.

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

ALL BARRIER RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.

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.

EPOXY COATED REINF. STEEL - ONE RAIL

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL		167	5'-11	1031
	5d1	RAIL, LONGITUDINAL		45	35'-1	1647
					EPOXY STEEL TOTAL (LBS.)	2678

STAINLESS STEEL REINF. STEEL - ONE RAIL

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c2	RAIL, VERTICAL		153	6'-0	957
	5c3	RAIL, VERTICAL		14	3'-3	47
	5c14	RAIL, VERTICAL		14	3'-10	56
					STAINLESS STEEL TOTAL (LBS.)	1060

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

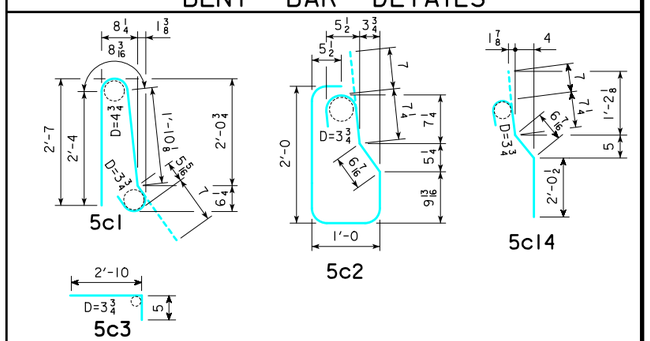
CONCRETE PLACEMENT SUMMARY-ONE RAIL

SECTION		TOTAL
STANDARD SECTION	167'-0 @ 0.1052 CU.YD. PER FT.	17.6
	TOTAL (CU. YD.)	17.6

CONCRETE BARRIER RAIL QUANTITIES-ONE RAIL

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	L.F.	181.0

BENT BAR DETAILS



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

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

BARRIER RAIL DETAILS

STATION 123+50.00 (US 65) AUGUST, 2020

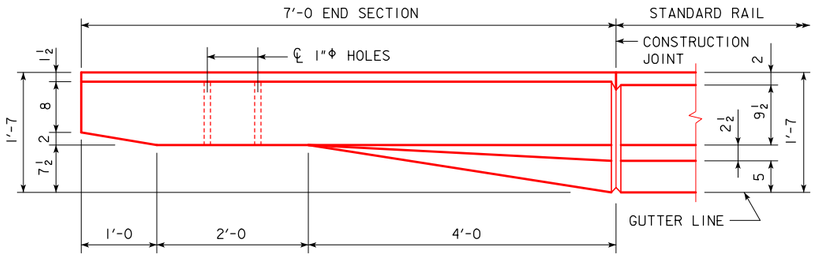
CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

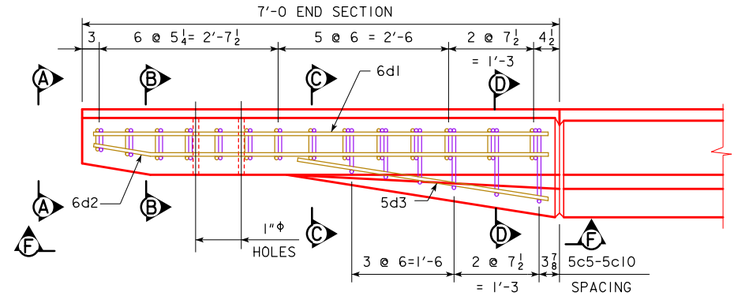
DESIGN SHEET NO. 17 OF 21 FILE NO. 31620 DESIGN NO. 221

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

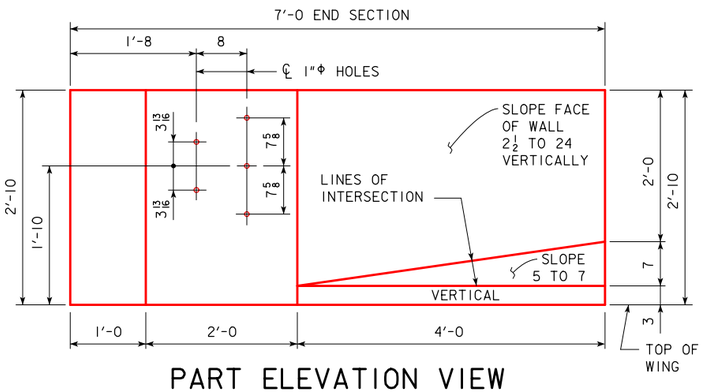
ENGLISHDECKRAILBRIDGES.DGN 1017S - THIS SHEET ISSUED 04-14 - ADDED STAINLESS STEEL REINFORCING BAR LIST AND CHANGED 6c3, 6c4 & 5c5-10 BARS TO STAINLESS STEEL.



PART PLAN VIEW

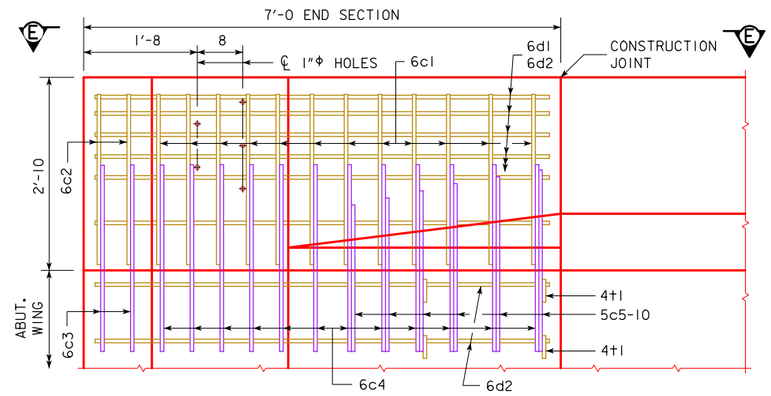


PART VIEW E-E

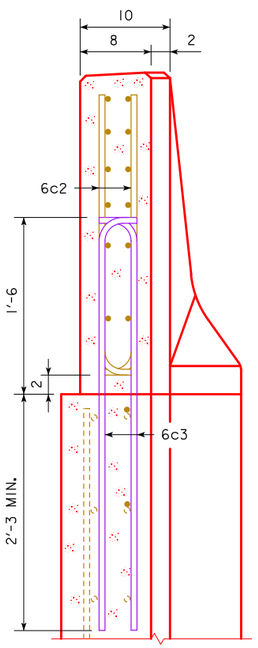


PART ELEVATION VIEW

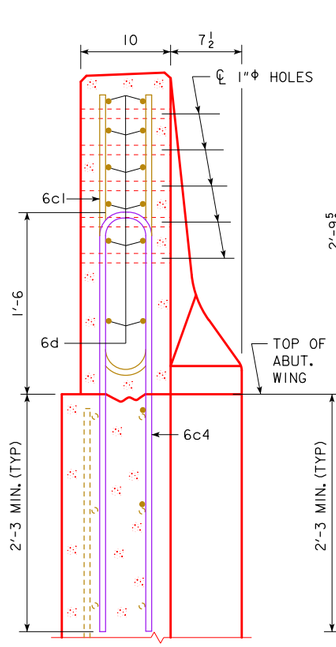
PROVIDE 5 HOLES FORMED WITH 1"Φ PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



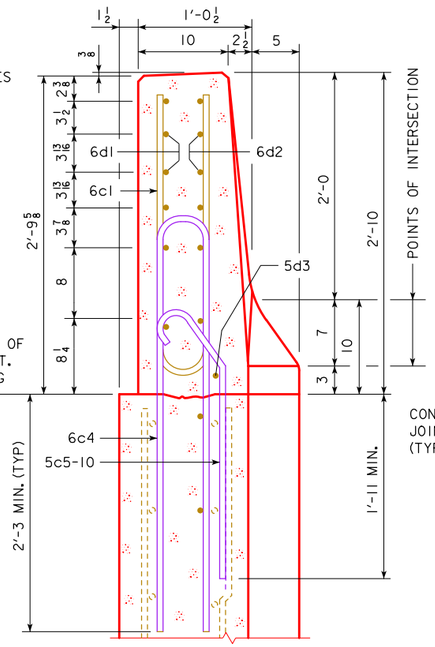
PART VIEW F-F



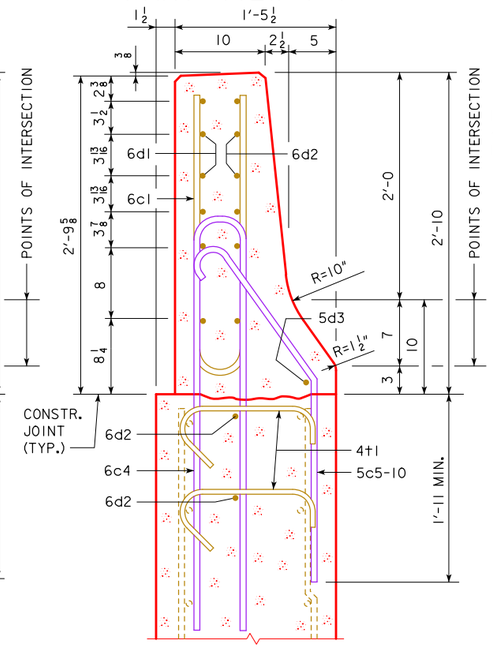
VIEW A-A



SECTION B-B



SECTION C-C



SECTION D-D

NOTE:
4t1 PLACEMENT- 2 BARS EACH LEVEL OF 6d2 IN WING FOOTING.

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

NOTE:
THE 10" RADIUS AND 1½" RADIUS ARE TYPICAL AND SHALL BE USED WHEN CONSTRUCTING THE CORNERS FOR VIEW A-A, SECTION B-B, SECTION C-C AND SECTION D-D.

NOTE:
THE 6c4, 6c3, 5c5-10, 2 - 6d2 AND 4t1 BARS ARE TO BE PLACED WITH THE ABUTMENT WING. THE DETAILS FOR PLACEMENT ARE SHOWN ON THE WING ABUTMENT SHEET.

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

EPOXY COATED REINF. STEEL - ONE END SECT.

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	RAIL, VERTICAL		12	5'-6	99
6c2	RAIL, VERTICAL		4	2'-10	17
6d1	RAIL, HORIZONTAL		6	6'-8	60
6d2	RAIL, HORIZONTAL		8	6'-9	81
5d3	RAIL, HORIZONTAL		1	3'-9	4
4t1	RAIL, ABUTMENT WING TIE BARS		4	VARIES	5
			EPOXY REINF. TOTAL WEIGHT (LBS.)		266

STAINLESS STEEL REINF. STEEL - ONE END SECT.

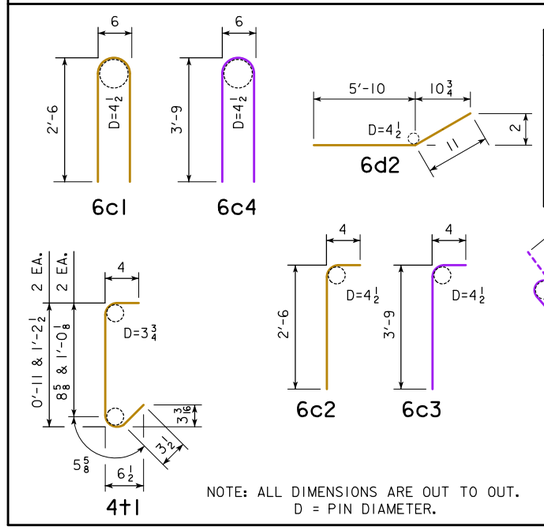
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c3	RAIL, VERTICAL		4	4'-1	25
6c4	RAIL, VERTICAL		12	8'-0	144
5c5-10	RAIL, VERTICAL		6	VARIES	23
			STAINLESS STEEL TOTAL WEIGHT (LBS.)		192

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

CONCRETE PLACEMENT SUMMARY

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

BENT BAR DETAILS



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

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

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

BARRIER END SECTION DETAILS

STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 18 OF 21 FILE NO. 31620 DESIGN NO. 221

SUBDRAIN NOTES :

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

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

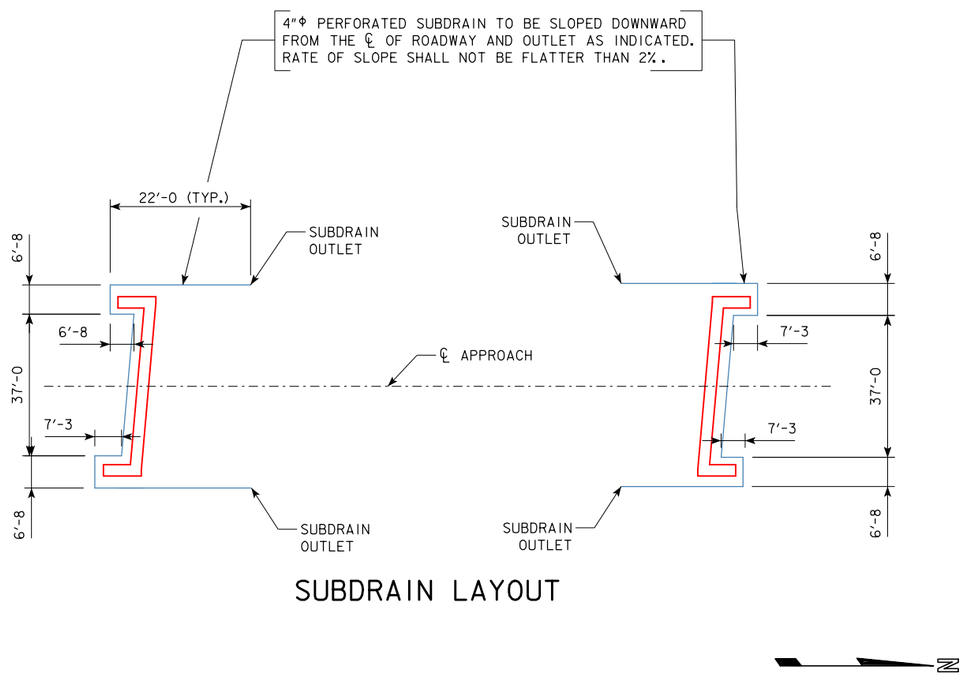
THE SUBDRAIN OUTLET SHALL CONSIST OF A LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET. THE LENGTH OF THE OUTLET PIPE SHALL BE DETERMINED BY THE REVETMENT AND IT'S PLACEMENT LOCATION. THE CONTRACTOR IS TO INSURE THE OUTLET PIPE IS ADEQUATELY STRONG ENOUGH AND WILL NOT BE DAMAGED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

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

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

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

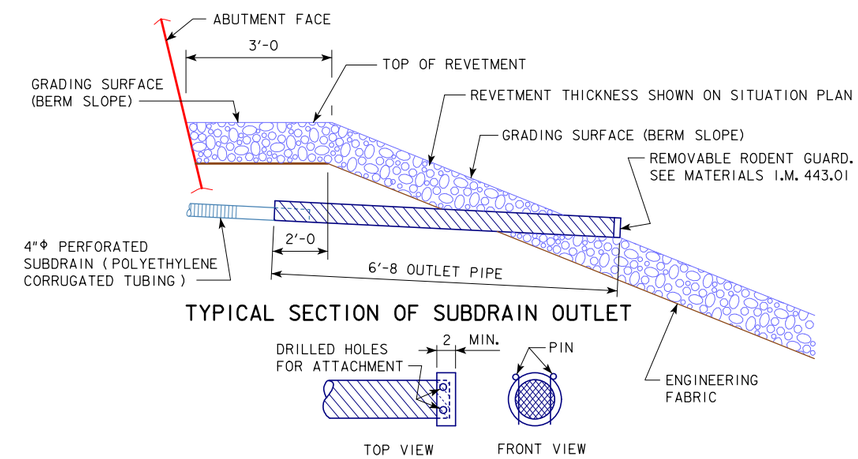
BENCH MARK NO. CP1 Northing: 9728949.58 Easting: 12378905.40 Elevation: 1087.15, DESCRIPTION: SET FENO MON W/BRASS CAP STAMPED IA DOT CP1 - 3" BELOW GRADE - MON IS 0.36 MI N OF INTERSECTION US HWY 65 & 140TH ST 56' W OF CL US HWY 65 & 14' N OF CENTER DRIVE ENT TO WEST.



SUBDRAIN LAYOUT

SUBDRAIN OUTLET ELEVATIONS

LOCATION	ELEVATION
SOUTH ABUTMENT	1084.41
NORTH ABUTMENT	1080.10



TYPICAL SECTION OF SUBDRAIN OUTLET

REMOVABLE RODENT GUARD DETAILS

REVETMENT STONE (EMBEDDED) OUTLET DETAILS

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

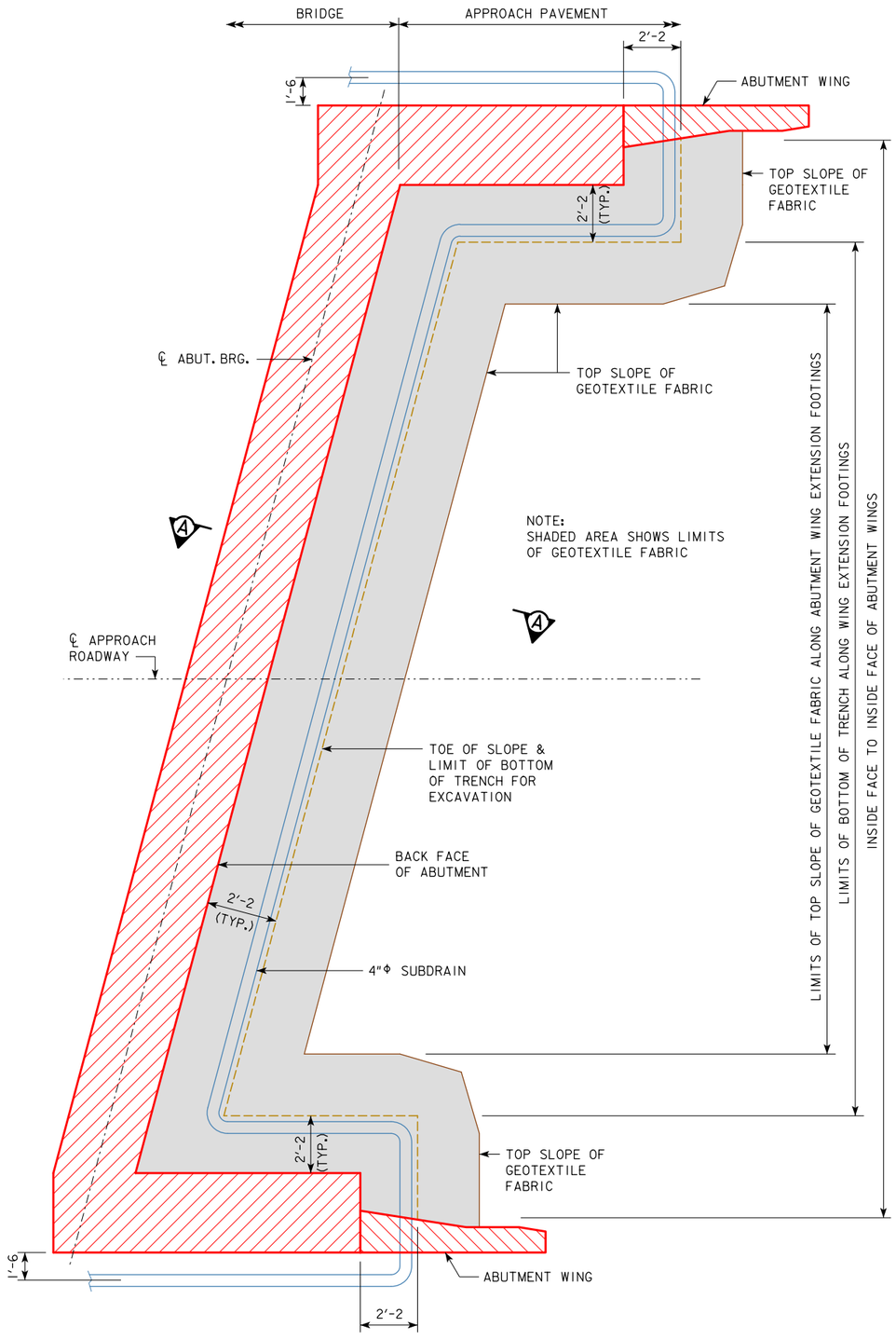
SUBDRAIN DETAILS

STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 19 OF 21 FILE NO. 31620 DESIGN NO. 221



ABUTMENT PLAN WITH WING EXTENSIONS

ABUTMENT BACKFILL PROCESS:

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

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

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

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

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

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

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

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

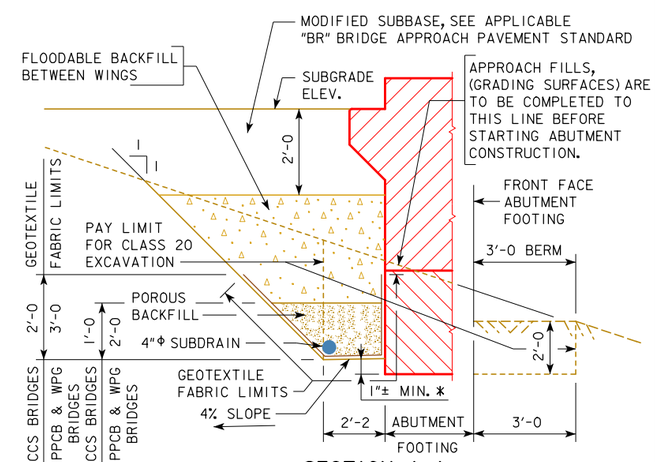
THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR STRUCTURAL CONCRETE.

NOTE:

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

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

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



SECTION A-A

BACKFILL DETAILS

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

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

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

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

ABUTMENT BACKFILL DETAILS

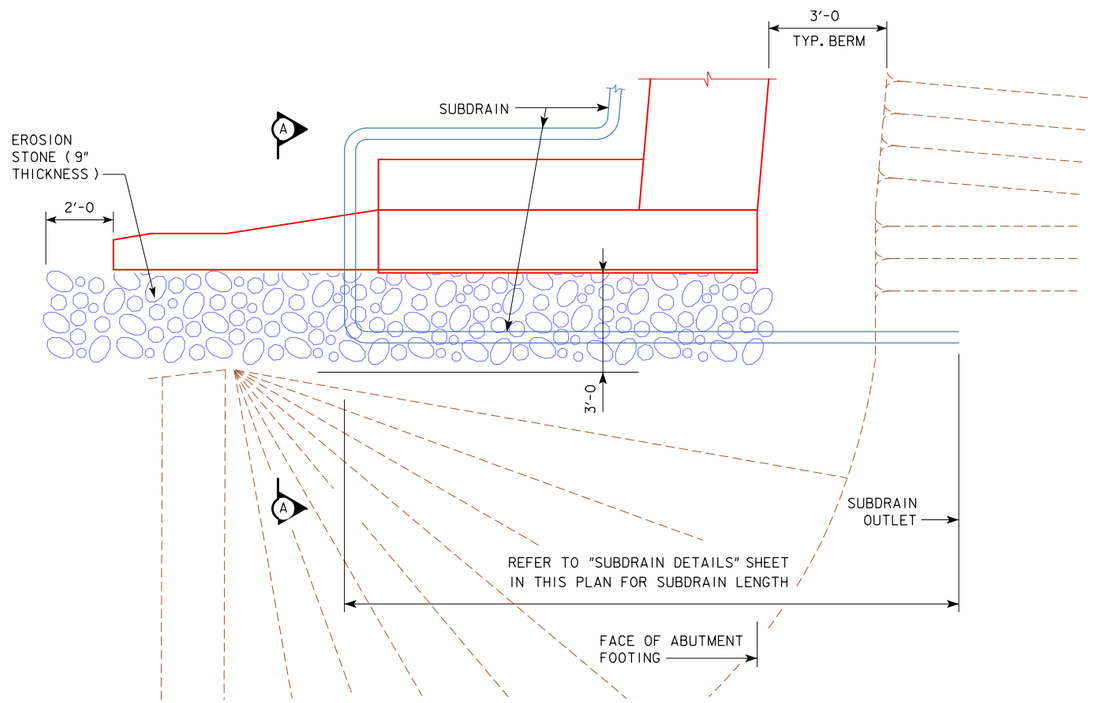
STATION 123+50.00 (US 65) AUGUST, 2020

CERRO GORDO COUNTY

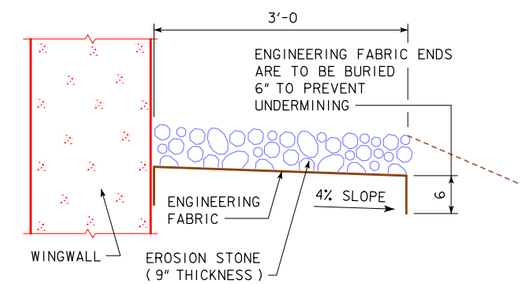
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 20 OF 21 FILE NO. 31620 DESIGN NO. 221

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

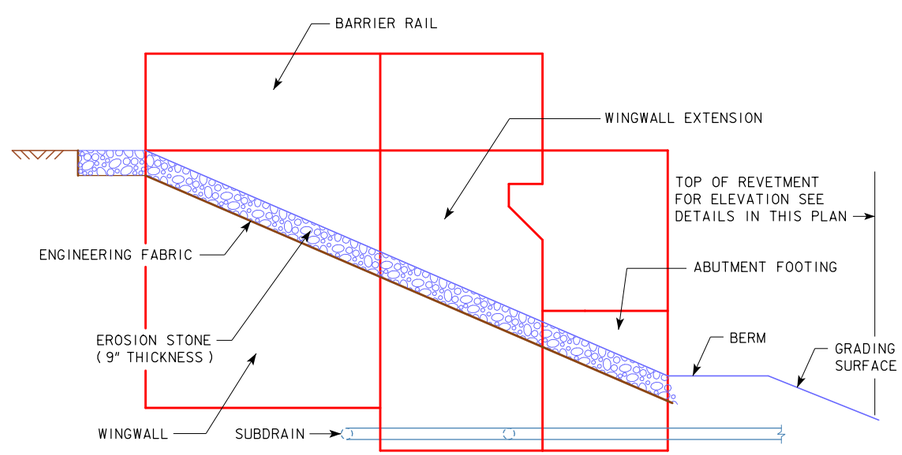


TOP VIEW OF WING ARMORING WITH WING EXTENSION



SECTION A-A

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



PROFILE VIEW OF WING ARMORING WITH WING EXTENSION

(INTEGRAL ABUTMENT WITH WING EXTENSIONS)

GENERAL NOTES:

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

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

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

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

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN

BRIDGE WING ARMORING

STATION 123+50.00 (US 65) AUGUST, 2020

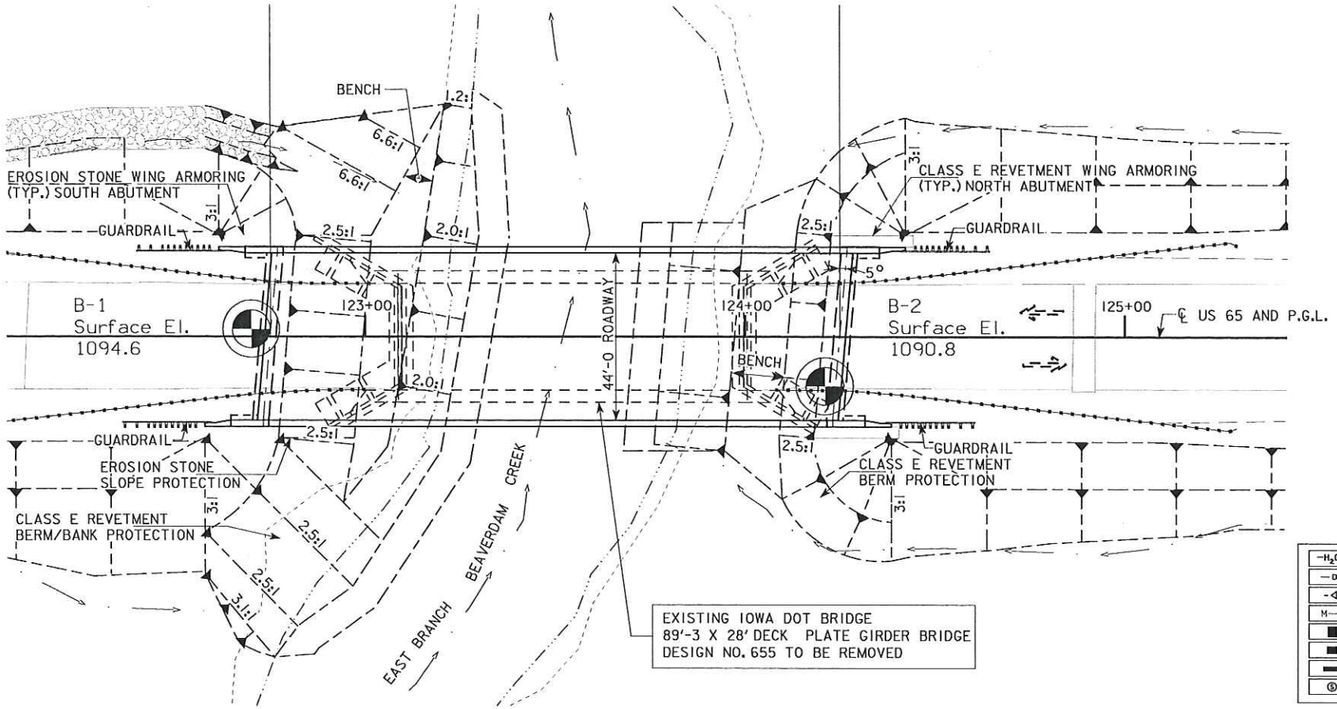
CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 21 OF 21 FILE NO. 31620 DESIGN NO. 221

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

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



N

0 ENGLISH 40
SCALE IN FEET

LOCATION

US 65 OVER EAST BR. BEAVERDAM CREEK
T-94N R-20W
SECTIONS 9&10
GENESEO TOWNSHIP
CERRO GORDO COUNTY
FHWA NO. 18881
BRIDGE MAINT. NO. 1783.8S065
LATITUDE 42.969633°
LONGITUDE -93.202232°

Water Level Observations (Ft.)			
Boring No.	Date Drilled	Immediately after Drilling	After Drilling
B-1	10/23/2018	--	17.5
B-2	10/24/2018	15.0	15.5

GEOTECHNICAL DESIGN

LICENSED PROFESSIONAL ENGINEER David J. Heer 12100 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.

David J. Heer 5-23-19
Signature Date
David J. Heer
Printed or Typed Name

My license renewal date is December 31, 2020.

Pages or sheets covered by this seal: SPS.1

DESIGN FOR 5° SKEW (L.A.)

150'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

150'-0 SPAN (BULB TEE E BEAMS)

SOIL PROFILE SHEET

STATION 123+50.00 (US 65) NOVEMBER 2018

CERRO GORDO COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

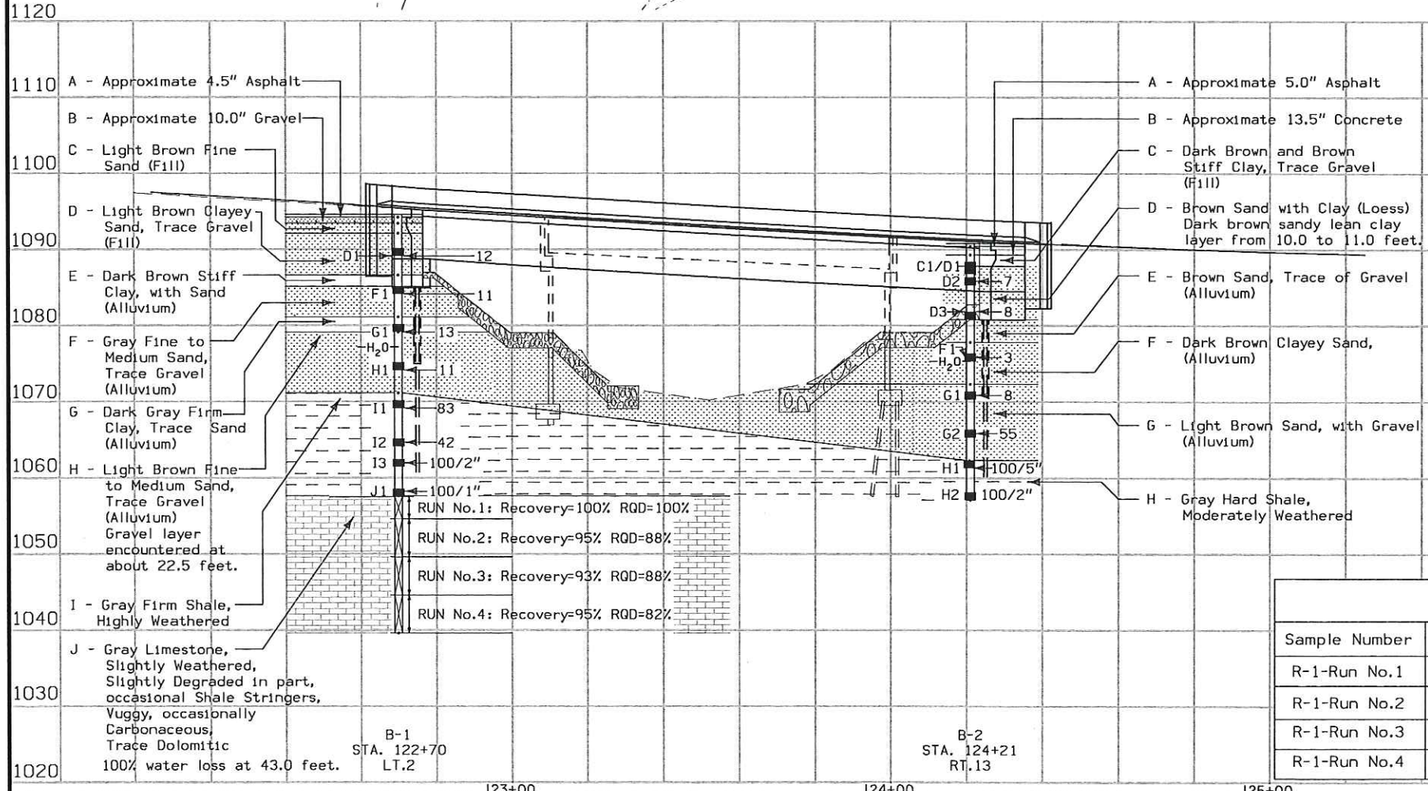
DESIGN SHEET NO. 1 OF 1 FILE NO. 31620 DESIGN NO. 221

LEGEND

$-H_2O-$	WATER
— DRY	DRY
-◁	PLUGGED
M—	MOISTURE
■	SHELBY
■	BLOW COUNT
▬	DENS. CORE
Ⓢ	SAMPLE

BLOW COUNT
LAYER - NO. BLOWS
B2 # 5

	DIAMOND CORE
	SAND
	GRAVELLY SAND
	BOULDERS
	SOIL REMEDIATION AREA
	LIMESTONE (LS.)
	BROKEN & WEATHERED LS.
	SANDSTONE
	SHALE
	SANDY SOIL



B-1	
Layer	Thickness
A	0.4
B	0.8
C	1.3
D	5.5
E	1.5
F	4.0
G	2.0
H	8.0
I	13.5
J	18.0

B-2	
Layer	Thickness
A	0.4
B	1.1
C	1.5
D	7.0
E	3.0
F	5.5
G	10.0
H	5.7

SHELBY TUBE CORE DATA

CORE NO.	B-2-D1
DEPTH IN FEET	3.0-4.0
CLASSIFICATION (AASHTO)	--
COEFF.CONSOL. (SQ.FT /DAY)	--
TRIAXIAL COMPRESSION	--
COHESION - PSF	--
FRICTION COEFF.	--
MOISTURE CONTENT %	23.0
DRY DENSITY - PCF	102

CU-CONSOLIDATED UNDRAINED
UU-UNCONSOLIDATED UNDRAINED
UC-UNCONFINED COMPRESSION (c=1/2 Qu)

NOTE: Not all samples were tested in the laboratory.

ROCK CORE INFORMATION

Boring	Approx.Surf.El.(ft)	Run No.	Interval(ft)	Recovery(%)	RQD(%)
B-1	1094.6	Run No.1	38.1-40.0	100	100
		Run No.2	40.0-45.0	95	88
		Run No.3	45.0-50.0	93	88
		Run No.4	50.0-55.0	95	82

ROCK CORE COMPRESSIVE STRENGTH TESTING REPORT

Sample Number	Elevation	Material Description	Compressive Strength (psi)	Moisture (%)	Dry Density (PCF)
R-1-Run No.1	1056.3	Gray Limestone, Slightly Weathered, Slightly Degraded in part, occasional Shale Stringers, Vuggy, occasionally Carbonaceous, Trace Dolomitic	6129	3.0	155
R-1-Run No.2	1051.3		6258	3.0	156
R-1-Run No.3	1046.1		4871	3.0	156
R-1-Run No.4	1041.2	100% water loss at 43.0 feet.	5429	3.0	157

100-0A
10-28-97

ESTIMATED ROADWAY QUANTITIES
(1 DIVISION PROJECT)

Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2102-0425070	SPECIAL BACKFILL	TON	140.4	
2	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	923.0	
3	2102-2710090	EXCAVATION, CLASS 10, WASTE	CY	1,025.0	
4	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS	CY	2.0	
5	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	941.0	
6	2107-0875100	COMPACTION WITH MOISTURE CONTROL	CY	710.0	
7	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	28.5	
8	2122-5500090	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 9 IN.	SY	407.0	
9	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	5.50	
10	2301-0690203	BRIDGE APPROACH, BR-203	SY	734.0	
11	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE	SY	1,417.8	
12	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.	LF	438.0	
13	2502-8221306	SUBDRAIN OUTLET, DR-306	EACH	5	
14	2503-0500402	BRIDGE END DRAIN, DR-402	EACH	2	
15	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	487.5	
16	2505-4008300	STEEL BEAM GUARDRAIL	LF	125.0	
17	2505-4008410	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201	EACH	4	
18	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EACH	4	
19	2505-4021720	STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205	EACH	4	
20	2507-3250005	ENGINEERING FABRIC	SY	275.6	
21	2507-6800061	REVETMENT, CLASS E	TON	184.8	
22	2510-6745850	REMOVAL OF PAVEMENT	SY	617.9	
23	2520-3350010	FIELD LABORATORY	EACH	1	
24	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	14.27	
25	2528-2518000	SAFETY CLOSURE	EACH	4	
26	2528-8445110	TRAFFIC CONTROL	LS	1.00	

100-1D
10-18-05

PROJECT DESCRIPTION

Bridge Replacement-CCS Maint. No. 1783.8S065. Over East Branch Beaverdam Creek 0.7 mi S of Co Rd B60 on U.S. 65.

SEE RC SHEETS FOR ADDITIONAL BID ITEMS AND QUANTITIES.

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
1	2102-0425070	**SPECIAL BACKFILL**
		Refer to B Sheets and Tab. 112-9 for location and additional information.
-	-	-
2	2102-2710070	**EXCAVATION, CLASS 10, ROADWAY AND BORROW**
		Refer to T Sheets for additional information.
		325 cy included for excavation of rock ditch.
-	-	-
3	2102-2710090	**EXCAVATION, CLASS 10, WASTE**
		Refer to T Sheets for additional information.
-	-	-
4	2102-2712015	**EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS**
		Refer to Tab. 103-7 in CS Sheets for additional information.
-	-	-
5	2105-8425015	**TOPSOIL, STRIP, SALVAGE AND SPREAD**
		Refer to Tab. 103-10 and T Sheets for additional information.
		159 cy of excess topsoil can be spread along foreslope.
-	-	-
6	2107-0875100	**COMPACTION WITH MOISTURE CONTROL**
		Refer to T Sheets and Tab. 103-6 in CS Sheets for additional information.
-	-	-
7	2121-7425020	**GRANULAR SHOULDERS, TYPE B**
		Refer to Tab. 112-9, B and D Sheets for locations and additional information.
-	-	-
8	2122-5500090	**PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 9 IN.**
		Refer to Tab. 112-9 for additional information.
-	-	-
9	2123-7450000	**SHOULDER CONSTRUCTION, EARTH**
		Refer to Tab. 112-9 and W Sheets for locations and additional information.

		Requires 80.5 cu. yds. of Class 10 for Earth Shoulder Fill. Excess of 159 cy of topsoil can be used.
		No payment for overhaul allowed for this material.

		Requires a minimum of 4 inches of topsoil. Place according to Article 2105.03,B
		of the Standard Specifications.
-	-	-
10	2301-0690203	**BRIDGE APPROACH, BR-203**
		Refer to Tab. 112-6 and U Sheets for additional information.
-	-	-
11	2412-0000100	**LONGITUDINAL GROOVING IN CONCRETE**
		Refer to Tab. 100-28 for additional information.
-	-	-
12	2502-8212034	**SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.**
		Refer to B Sheets and Tab. 104-9 in CS Sheets for location and additional information.
-	-	-
13	2502-8221306	**SUBDRAIN OUTLET, DR-306**
		Refer to Tab. 104-9 in CS Sheets for location and additional information.
-	-	-
14	2503-0500402	**BRIDGE END DRAIN, DR-402**
		Refer to Tab. 104-8A and D Sheets for location and additional information.
-	-	-
15	2505-4008120	**REMOVAL OF STEEL BEAM GUARDRAIL**
		Refer to Tab. 110-7A for locations and additional information.
-	-	-
16	2505-4008300	**STEEL BEAM GUARDRAIL**
17	2505-4008410	**STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201**
18	2505-4021010	**STEEL BEAM GUARDRAIL END ANCHOR, BOLTED**
19	2505-4021720	**STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205**
		Refer to Tab 108-8A, 107-23 and D Sheets for locations and additional information.
-	-	-
20	2507-3250005	**ENGINEERING FABRIC**
		Refer to Tab 100-23 for additional information.
-	-	-
21	2507-6800061	**REVETMENT, CLASS E**
		Refer to Tab. 100-23 for additional information.
-	-	-
22	2510-6745850	**REMOVAL OF PAVEMENT**
		Refer to Tab 110-1 and 102-5. Removal of Pavement includes 56 ft. of saw cut.
-	-	-
23	2520-3350010	**FIELD LABORATORY**
		- -
-	-	-
24	2527-9263109	**PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED**
		Refer to Tab. 108-22 for location and additional information.
-	-	-
25	2528-2518000	**SAFETY CLOSURE**
		Refer to Tab. 108-13A for additional information.
-	-	-

100-4A
10-29-02

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
26	2528-8445110	**TRAFFIC CONTROL**
		Refer to Traffic Control Plan on Sheet J.1 .
-	-	-

111-25
10-18-11

INDEX OF TABULATIONS

Tabulation	Tabulation Title	Sheet No.
C Sheets		
100-1D	PROJECT DESCRIPTION	C.1
100-0A	ESTIMATED ROADWAY QUANTITIES (1 DIVISION PROJECT)	C.1
100-4A	ESTIMATE REFERENCE INFORMATION	C.2
100-23	ROCK EROSION CONTROL	C.7
100-28	LONGITUDINAL GROOVING	C.5
102-5	EXISTING PAVEMENT	C.4
103-10	TOPSOIL STRIPPING AND PLACEMENT	C.7
104-8A	SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN	C.7
105-4	STANDARD ROAD PLANS	C.3
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108-22	PAVEMENT MARKING LINE TYPES	C.4
110-1	REMOVAL OF PAVEMENT	C.4
110-7A	REMOVAL OF STEEL BEAM GUARDRAIL	C.6
111-25	INDEX OF TABULATIONS	C.3
112-6	BRIDGE APPROACH SECTION	C.7
112-9	SHOULDERS	C.5

262-5
10-18-05

UTILITIES
(POINT 25 PROJECT)

This is a POINT 25 project and is subject to the provisions of IAC 761-115.25.

105-4
10-18-11

STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
BA-200	04-16-19	Steel Beam Guardrail Components
BA-201	04-18-17	Steel Beam Guardrail Barrier Transition Section (MASH TL-3)
BA-202	10-20-15	Steel Beam Guardrail Bolted End Anchor
BA-205	04-19-16	Steel Beam Guardrail Tangent End Terminal (MASH TL-3)
BA-250	10-18-16	Steel Beam Guardrail Installation at Concrete Barrier or Bridge End Post (MASH TL-3)
BR-203	10-17-17	Double Reinforced 12" Approach
DR-303	10-17-17	Subdrains (Longitudinal)
DR-306	10-16-18	Precast Concrete Headwall for Subdrain Outlets
DR-402	10-15-19	Rock Flume for Bridge End Drain
EC-301	10-18-16	Rock Erosion Control (REC)
EW-201	04-19-16	Bridge Berm Grading without Recoverable Slope (Barnroof Section)
EW-301	10-20-15	Guardrail Grading
PM-110	04-21-20	Line Types
PV-101	04-21-20	Joints
SI-172	04-19-16	Delineators
SI-173	04-19-16	Object Markers
SI-211	10-18-16	Object Marker and Delineator Placement with Guardrail
TC-1	10-15-19	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-202	04-21-15	Work Within 15 ft of Traveled Way
TC-252	04-21-20	Routes Closed to Traffic

112-6
04-18-17

BRIDGE APPROACH SECTION

Refer to the BR Series.

* Not a bid item

Location				Approach Pavement					Standard Road Plans BR Series			Subdrain								
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		* Porous Backfill	* Class 'A' Crushed Stone Backfill	* Modified Subbase	* Polymer Grid	* Special Backfill	Remarks
				Inches	FT	SY	SY	SY				LF	STA	Side	CY	CY	TON	SY	TON	
123+50.00	S	5		12.0	70.0	200.0	62.2	104.8	BR-203	Movable	BR-211	72.0	122+13.53	Left	4.2		267.7	391.7		
123+50.00	N	5		12.0	70.0	200.0	62.2	104.8	BR-203	Movable	BR-211	72.0	124+60.40	Left	4.2		267.7	391.7		
				Totals:	140.0	400.0	124.4	209.6				144.0			8.4		535.4	783.3		

100-23
04-17-18

ROCK EROSION CONTROL

Refer to EC-301 and Detail 570-8

Location				L	W	Rock Erosion Control (REC)					Material Bid Quantities			Remarks
Road Identification	Begin Station	End Station	Side			Type 1 Rock Ditch Check	Type 2 Rock Ditch	Type 3 Rock Flume	Type 4 Rock Splash Basin	Type 5 Rock Slope Protection	Eng. Fabric	Class E Revetment	Erosion Stone	
			Lt./Rt.	FT	FT						SY	TON	TON	
US 65														
	120+98.00	122+58.00	Lt.	160	11		X				275.6	184.8		SW side of bridge

104-8A
10-17-17

SCOUR PROTECTION OR ROCK FLUME FOR BRIDGE END DRAIN

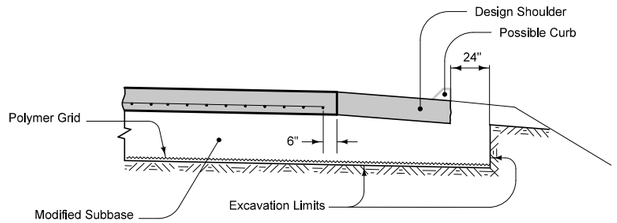
Refer to Standard Road Plan DR-401 and DR-402

Location			Bid Items		PCC Paved Shoulder			Scour Protection (DR-401)			Rock Flume (DR-402)			Remarks
Bridge Station	Bridge Corner	Distance DI-1 or DI-2	PCC Paved Shoulder	Bridge End Drain	Panels Required	Polymer Grid	Modified Subbase	Special Ditch Control, Wood Excelsior Mat EC-101	Turf Reinforced Mat (TRM), Type 2 EC-104	Transition Mat EC-105	Macadam Stone Base	Engineering Fabric	Erosion Stone	
		FT	SY	TYPE	A B C or D	SY	TONS	SQ	SQ	SF	TONS	SY	TONS	
124+75.54	NE	40.4	(1)	DR-402	D						1.5	47.8	32.5	
124+75.54	NW	43.5	(1)	DR-402	C						1.5	45.8	31.5	
(1) Included in Bridge Approach quantity.										Totals:	3.0	93.6	64.0	

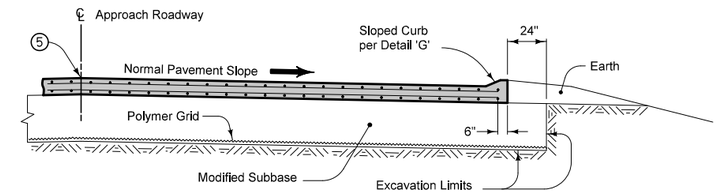
103-10
04-18-17

TOPSOIL STRIPPING AND PLACEMENT

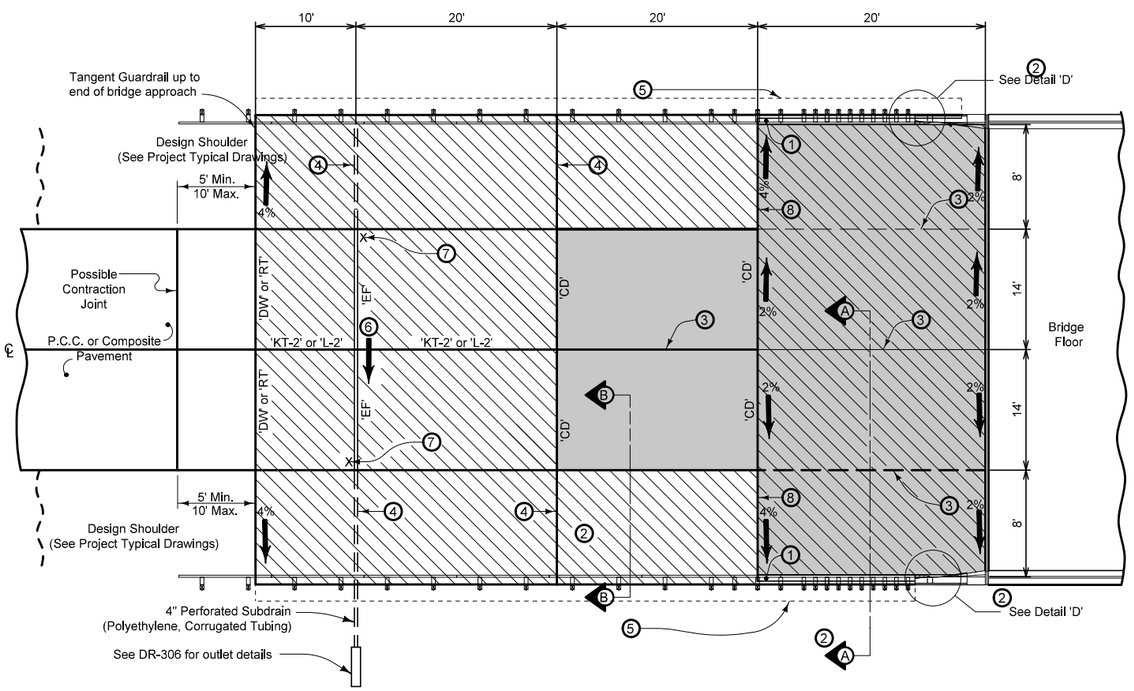
Location				Topsoil Stripping Thickness	Topsoil Placement Thickness	Remarks
Road Identification	Dir. of Traffic	Begin Station	End Station	IN	IN	
U.S. 65	Both	120+60.36	126+39.61	12.0	15.0	



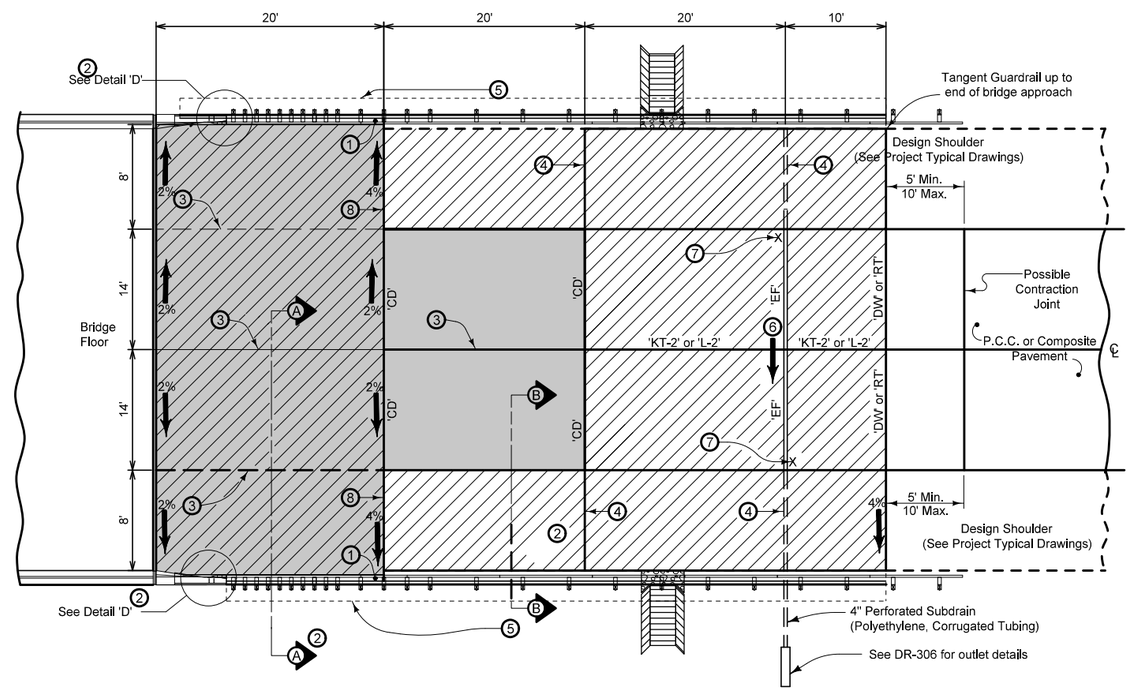
SECTION B-B 6



SECTION A-A 6



SOUTH APPROACH



NORTH APPROACH

For joint details, see PV-101.

Pay limits for contract item include the following areas:

- Double Reinforced Section
- Single Reinforced Section
- Non-Reinforced Section

1. Build 4 inch Sloped Curb to end of Double Reinforced Section.
2. See BR-201, BR-202, BR-203, or BR-204.
3. Longitudinal Joint (PV-101):
   Single Pour - Saw cut joint per Detail B .
   Two Pours - Use 'KS-1' joint (Single Reinforced Section).
   Use 'KS-2' joint (Double Reinforced Section).
4. Extend 'CD' and 'EF' joints where PCC Shoulder.
5. Polymer Grid and excavation limits of Modified Subbase 2 feet outside of pavement edge. See BR-201, BR-202, BR-203, or BR-204.
6. Slope subdrain to drain.
7. Place an "X" in the plastic concrete near the 'EF' joint at the outside edge of pavement.
8. Place 'RD' Joint where PCC shoulder. Place 'B' joint otherwise.

BRIDGE APPROACH