BRIDGE NEW - PPCB LETTING DATE 07-19-2022

POLK COUNTY

LEGEND

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

IOWA DOT

PLANS OF PROPOSED IMPROVEMENTS ON THE

INTERSTATE ROAD SYSTEM

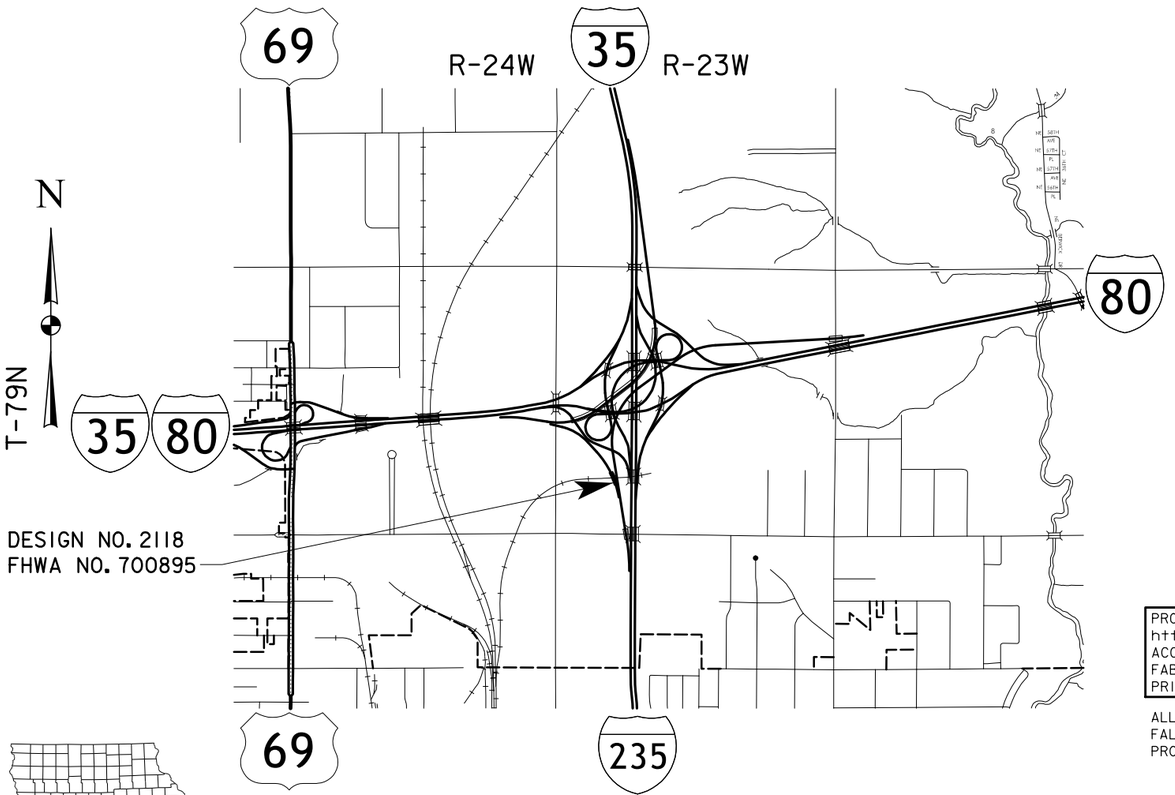
POLK COUNTY

BRIDGE NEW - PPCB

RAMP B OVER UPRR

FRA NO. X

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



LOCATION MAP
PART OF CITY OF DES MOINES

PROJECT DIRECTORY NAME: [redacted]

ENGLISH STANDARD BRIDGE PLANS

STANDARD	ISSUED	REVISED

PRELIMINARY
NOT FOR CONSTRUCTION

REVISIONS

	TOTAL SHEETS
	53
PROJECT NUMBER	
IM-035-3(203)87--13-77	
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	
10-77-035-010-03	

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET - DESIGN NO. 2118
2-35	DESIGN NO. 2118
SPS.1-SPS.2	SOIL PROFILE SHEET
C.1	ESTIMATE SHEET FOR ROADWAY
A.1-U.1	ROADWAY SHEETS

IOWA ONE CALL
1-800-292-8989 | 811
www.iowaonecall.com
Know what's below. Call before you dig.

STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED ON SHEET NUMBER C.1

DESIGN DATA URBAN

2022	AADT	5,300	V.P.D.
2050	AADT	6,400	V.P.D.
2050	DHV	1,030	V.P.H.
TRUCKS		8	%
Total Design ESALs		-	

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	RYAN R. PARADIS	STRUCTURAL DESIGN
SPS.1	BRIAN T. HAVENS	SOILS DESIGN
A.1	CHRISTOPHER M. MALMBERG	ROADWAY DESIGN

PROJECT WEBSITE:
http://www.e-Builder.net
ACCESS TO THE PROJECT WEBSITE FOR SUBCONTRACTORS, FABRICATORS, AND SUPPLIERS SHALL BE GRANTED BY THE PRIME CONTRACTOR.

ALL WORKING DRAWINGS INCLUDING SHOP DRAWINGS AND FALSEWORK DRAWINGS SHALL BE SUBMITTED THROUGH THE PROJECT WEBSITE AND WILL BE REVIEWED BY:
HDR ENGINEERING
BRIDGE SECTION
1917 S. 67TH STREET
OMAHA, NE 68106

STRUCTURAL DESIGN

[redacted]

DESIGN TEAM [redacted]	ENGLISH	IOWA DOT * OFFICE OF BRIDGES AND STRUCTURES	[redacted]	POLK COUNTY	PROJECT NUMBER [redacted]	SHEET NUMBER

ESTIMATED BRIDGE QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUANTITY
1	2402-2720000	EXCAVATION, CLASS 20	CY	430	
2	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	88.0	
3	2403-7000210	HIGH PERFORMANCE STRUCTURAL CONCRETE	CY	322.0	
4	2404-7775000	REINFORCING STEEL	LB	22,849	
5	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	7,969	
6	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	66,724	
7	2407-0562865	BEAM, PPC, BTB65	EACH	4	
8	2407-0562870	BEAM, PPC, BTB70	EACH	4	
9	2407-0562875	BEAM, PPC, BTB75	EACH	4	
10	2408-7800000	STRUCTURAL STEEL	LB	3,780	
11	2414-6424038	CONCRETE BARRIER RAIL, 3'-8"	LF	462.0	
12	2501-0201057	PILES, STEEL, HP 10 X 57	LF	4,070	
13	2501-6335010	PREBORED HOLES	LF	160	
14	2507-2638620	MACADAM STONE SLOPE PROTECTION	SY	390	
15	2507-2638660	BRIDGE WING ARMORING - MACADAM STONE	SY	20	
16	2526-8285000	CONSTRUCTION SURVEY	LS	1.0	
17	2533-4980005	MOBILIZATION	LS	1.0	
18	2595-0005150	RR PROT LIAB INSUR FOR UPRR	LS	1.0	

ITEM NO.	ESTIMATE REFERENCE INFORMATION
1	EXCAVATION QUANTITIES FOR PIER NO. 1 HAVE BEEN COMPUTED ASSUMING THE PROPOSED GRADING FOR PROJECT NUMBER IM-035-3(194)87--13-77 IS COMPLETED PRIOR TO BRIDGE CONSTRUCTION. IN ALL OTHER LOCATIONS PIER EXCAVATION QUANTITIES ARE BASED ON EXISTING GROUND CONDITIONS.
2	ALL ABUTMENT FOOTING AND PIER FOOTING CONCRETE IS TO BE CLASS "C".
3	THIS BID ITEM INCLUDES THE CONCRETE FOR THE DECK, ABUTMENT DIAPHRAGMS, PIER DIAPHRAGMS AND WINGWALLS. REFER TO THE "DEVELOPMENTAL SPECIFICATIONS FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES" FOR ADDITIONAL INFORMATION. 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. INCLUDES COST FOR MATERIALS AND LABOR TO PROVIDE CONCRETE RUSTICATION LINES.
7-9	INCLUDES PIER AND ABUTMENT BEARING MATERIAL AND COIL TIES. INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC SPREADSHEET TO THE ENGINEER.
11	INCLUDES MATERIAL AND LABOR ASSOCIATED WITH PROVIDING AND INSTALLING THE RIGID STEEL CONDUIT, JUNCTION BOXES, AND FITTINGS. INCLUDES 462 L.F. OF 2" DIAMETER RIGID STEEL CONDUIT. IF PLACEMENT OF CONCRETE IS DONE BY THE SLIPFORMING METHOD, CLASS BR CONCRETE IS REQUIRED. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. PRICE BID FOR THIS ITEM SHALL INCLUDE THE COST OF CAST-IN-PLACE FORMS IF REQUIRED FOR PLACEMENT OF THE CONCRETE.
12	PILING SHALL BE GRADE 50. FOR ADDITIONAL NOTES, SEE DESIGN SHEETS 9 - 11.
14	INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, MACADAM STONE, 4" x 6" TREATED TIMBERS, $\frac{1}{2}$" DIAMETER STEEL PINS (OR REBARS), POROUS BACKFILL OR GRANULAR SUBBASE BACKFILL AT FRONT FACE OF ABUTMENT FOOTING AND ALL REQUIRED EXCAVATING, SHAPING, AND COMPACTING.
15	INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, MACADAM STONE, 4" x 6" TREATED TIMBERS, $\frac{1}{2}$" DIA. STEEL PINS (OR REBARS), AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING ARMORING.

INDEX OF SHEETS

ROADWAY QUANTITIES ARE SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

ESTIMATED QUANTITIES

STA. 3259+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

SUMMARY OF CONCRETE QUANTITIES

LOCATION	STRUCTURAL CONCRETE	HPC STRUCTURAL CONCRETE
NORTH ABUT. FTG.	14.4	-
SOUTH ABUT. FTG.	14.4	-
BRIDGE DECK + ABUT. & PIER DIAPHAGM	-	228.0
ABUTMENT WINGS	-	7.6
PIER NO. 1	29.6	43.2
PIER NO. 2	29.6	43.2
TOTAL (CU. YDS.)	88.0	322.0

SUMMARY OF REINFORCING STEEL

LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
BRIDGE DECK + ABUTMENT FOOTING *	165	49,849	7,011
ABUTMENT WINGS	-	-	792
BARRIER RAILS	-	15,043	166
BARRIER RAIL END SECTIONS	-	1,832	-
PIER NO. 1	11,342	-	-
PIER NO. 2	11,342	-	-
* INCLUDES ABUTMENT DIAPHRAGMS			
AND PIER DIAPHRAGMS			
TOTAL (LBS.)	22,849	66,724	7,969

SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION
NORTH ABUTMENT	65
SOUTH ABUTMENT	65
PIER NO. 1	160
PIER NO. 2	140
TOTAL (CU. YDS.)	430

SUMMARY OF FOUNDATIONS

LOCATION	SUBSTRUCTURE TYPE	FOUNDATION TYPE	NUMBER	LENGTH (LIN. FT.)	TOTAL (LIN. FT.)
NORTH ABUTMENT	INTEGRAL ABUTMENT	HP 10x57	8	75	600
SOUTH ABUTMENT	INTEGRAL ABUTMENT	HP 10x57	8	75	600
PIER NO. 1	FRAME PIER	HP 10x57	14	105	1,470
PIER NO. 2	FRAME PIER	HP 10x57	14	100	1,400
				TOTAL HP 10x57 (LIN. FT.)	4,070

SUMMARY OF PREBORED HOLES

LOCATION	NUMBER	LENGTH (LIN. FT.)	TOTAL
NORTH ABUTMENT	8	10	80
SOUTH ABUTMENT	8	10	80
		TOTAL (LIN. FT.)	160

SUMMARY OF STRUCTURAL STEEL

LOCATION	TOTAL (LBS.)
DIAPHRAGMS	3,780
TOTAL (LBS.)	3,780

SUMMARY OF BEARINGS

LOCATION	BEARING TYPE	NUMBER	ASSOCIATED BID ITEM
NORTH ABUTMENT	3 x 3 BAR	4	PPC BEAMS
SOUTH ABUTMENT	3 x 3 BAR	4	PPC BEAMS
PIER NO. 1	PLAIN NEOPRENE 1"	8	PPC BEAMS
PIER NO. 2	PLAIN NEOPRENE 1"	8	PPC BEAMS

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

SUMMARY QUANTITIES

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

[redacted]

[redacted]

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, INCLUDING THE FOLLOWING SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT:

- "DEVELOPMENTAL SPECIFICATIONS FOR HIGH PERFORMANCE CONCRETE FOR STRUCTURES",
- "DEVELOPMENTAL SPECIFICATIONS FOR MAINTENANCE WORK ON RAILROAD RIGHT-OF-WAY (UNION PACIFIC RAILROAD)",
- "SPECIAL PROVISIONS FOR E-BUILDER".

DESIGN STRESSES:

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

- -REINFORCING STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 5, GRADE 60 FOR EPOXY COATED AND NON-COATED, AND GRADE 60 OR 75 FOR STAINLESS.
- -CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 4.0 KSI, EXCEPT PRESTRESSED BEAM CONCRETE AS NOTED.
- -PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEET 19.
- -STRUCTURAL STEEL IN ACCORDANCE WITH AASHTO LRFD SECTION 6, ASTM A709 GRADE 50 (AASHTO M270 GRADE 50), EXCEPT AS NOTED.

GENERAL NOTES:

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

THE CITY AND 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 CONSTRUCTION STARTING DATE.

THE BRIDGE CONTRACTOR SHALL WORK IN SUCH A MANNER THAT EQUIPMENT AND MATERIALS SHALL NOT BE ALLOWED TO INTERFERE WITH TRAIN TRAFFIC OR BE ALLOWED TO FALL ON THE RAILROAD TRACKS. INTERFERENCE ABOVE THE RAILROAD TRACK AREA SHALL BE COORDINATED WITH THE RAILROAD.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

EXCAVATION QUANTITIES FOR THE PIERS ARE BASED ON THE ASSUMPTION THAT ABUTMENT FILLS ARE IN PLACE PRIOR TO STARTING CONSTRUCTION OF THE PIERS.

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

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

ABUTMENT PILES SHALL NOT BE DRIVEN FOR A MINIMUM OF 75 DAYS FOLLOWING COMPLETION OF APPROACH FILLS. THE TIME PERIOD BETWEEN COMPLETION OF FILLS AND DRIVING PILES MAY BE CHANGED AS ORDERED BY THE ENGINEER BASED UPON REVIEW OF SETTLEMENT PLATES.

THE APPROACH FILLS AS SHOWN ARE TO BE DONE AS PART OF THE TIED PROJECT IM-035-3(194)87--13-77 AND ARE TO BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

CONCRETE BARRIER RAILS PLACED USING THE SLIPFORM METHOD WILL REQUIRE THE USED 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).

ALL REINFORCING IS TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS POURED.

ALL EXPOSED CONCRETE CORNERS, 90 DEGREES OR SHARPER TO BE FILLETED WITH A $\frac{3}{4}$" DRESSED AND BEVELED STRIP, UNLESS NOTED OTHERWISE.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5a1 is $\frac{5}{8}$ inch diameter bar). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

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

[redacted]

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

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

DURING CONSTRUCTION OF THIS PROJECT THE BRIDGE CONTRACTOR WILL BE REQUIRED TO COORDINATE OPERATIONS WITH THOSE OF OTHER CONTRACTORS WORKING WITHIN THE SAME AREA. OTHER WORK IN PROGRESS DURING THE SAME PERIOD OF TIME IS SHOWN ON SHEET J.1 OF THESE PLANS.

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

LONGITUDINAL GROOVING SHOWN ELSEWHERE IN THESE PLANS.

SHOP DRAWING SUBMITTALS

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

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

SHOP DRAWINGS SHALL BE SUBMITTED WITH THE FOLLOWING NAMING CONVENTION:
(Paren)_County_DesignNumber_Submittal Description.pdf
Example: (70)_Polk_Design2218_SteelDiaphragms.pdf

1	STEEL DIAPHRAGMS

BRIDGE DECK DIMENSIONS TABLE

	ITEM	UNITS	QUANTITY
1	DECK LENGTH	L.F.	217.0
2	MINIMUM DECK WIDTH	L.F.	31.2
3	MAXIMUM DECK WIDTH	L.F.	31.2
4	DECK AREA	S.F.	6,763

1. DECK LENGTH IS MEASURED FROM FACE-TO-FACE OF PAVING NOTCHES ALONG THE BRIDGE BASELINE.

2, 3. DECK WIDTHS ARE MEASURED FROM OUT-TO-OUT OF DECK PERPENDICULAR TO THE BRIDGE BASELINE.

4. DECK AREA IS TO BE BASED ON THE FACE-TO-FACE PAVING NOTCH DISTANCE AND OUT-TO-OUT DECK DIMENSIONS.

FORMS FOR PIER CAPS ON PIER NOS. 1 AND 2 MAY BE REMOVED WITH THE APPROVAL OF THE ENGINEER WHEN THE FOLLOWING TWO CONDITIONS HAVE BEEN MET:

- PIER CAP CONCRETE HAS BEEN IN PLACE FOR A MINIMUM OF 2 CALENDAR DAYS EXCLUDING DAYS THAT THE CONCRETE SURFACE IS SUBJECTED TO TEMPERATURES AT OR BELOW 40°F AND
- THE PIER CAP CONCRETE STRENGTH IS AT LEAST 2.50 KSI.

CONCRETE STRENGTH SHALL BE VERIFIED BY FLEXURAL STRENGTH ACCORDING TO MATERIALS I.M. 316 WITH A MINIMUM FLEXURAL STRENGTH OF 0.343 KSI OR BY THE MATURITY METHOD ACCORDING TO MATERIALS I.M. 383. CURING OF PIER CAP CONCRETE SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. PIER CAP CONCRETE SHALL ATTAIN A MINIMUM CONCRETE STRENGTH OF 4.00 KSI BEFORE BEING SUBJECTED TO EXTERIOR LOADS. PIER CAP CONCRETE SHALL BE SUBJECTED TO EXTERIOR LOADS IN ACCORDANCE WITH ARTICLE 2403.03, N, OF THE STANDARD SPECIFICATIONS.

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

GENERAL NOTES FOR CONCRETE RUSTICATION:

STRIPS AND PANELS USED AS INSERTS WITHIN CONCRETE FORMS TO CREATE THE RUSTICATION FEATURES MAY BE MADE OF WOOD, STEEL, PLASTIC OR OTHER NONPOROUS MATERIAL CAPABLE OF WITHSTANDING ANTICIPATED CONCRETE POUR PRESSURES WITHOUT PHYSICAL DEFECTS. WOOD INSERTS, IF USED, SHALL BE FREE OF WARP, TWIST, CHECKS OR CRACKS, AND SHALL BE PRESOAKED PRIOR TO PLACEMENT OF CONCRETE IN THE FORMS.

RUSTICATION INSERTS SHALL EASILY ATTACH TO FORMS AND SHALL NOT ALLOW LEAKAGE OF CONCRETE BETWEEN THE FORM AND THE INSERT. WHEN STEEL FORMS ARE USED, RUSTICATION STRIPS MAY BE RIGIDLY ATTACHED TO THE INSIDE SURFACES OF THE FORMS. WHEN STEEL FORMS ARE NOT USED, RUSTICATION STRIPS AND OTHER INSERTS FOR SMALL RECESSES ON EXPOSED CONCRETE SURFACES SHALL BE FASTENED TO THE FORMS IN A MANNER THAT WILL PERMIT THEM TO REMAIN IN PLACE WHEN THE FORMS ARE REMOVED. LEAVE INSERTS IN PLACE UNTIL THEY CAN BE REMOVED WITHOUT DAMAGE TO THE SURROUNDING CONCRETE.

THE INSERTS SHALL BE DESIGNED TO FORM SURFACES AND FEATURES CONFORMING TO THE DESIGN INTENT INCLUDING THE SHAPE, LINES, DEPTHS AND DIMENSIONS SHOWN IN THE PLANS. CREATE INSERTS USING A MINIMUM NUMBER OF SPLICE JOINTS IN THEIR LENGTH. SPLICES, IF USED, SHALL BE TIGHTLY JOINED SO AS NOT TO ALLOW GAPS OR LEAKS, AND SHALL NOT CREATE ANY CHANGE IN ALIGNMENT OR SHAPE OF THE RUSTICATION FEATURE. DO NOT LOCATE FORM TIES WITHIN CONCRETE RUSTICATIONS.

FOR RUSTICATION FEATURES FOLLOWING THE PERIMETER OF ROUNDED SURFACES, IT MAY BE NECESSARY TO USE MULTIPLE LAYERS OF INSERT MATERIAL IN ORDER TO ACHIEVE THE RADIUS CURVE. THIS IS ACCEPTABLE, PROVIDED THAT THE FINAL SHAPE, LINE, DEPTH, AND DIMENSION OF THE FEATURES ARE MAINTAINED IN THE FINAL RESULT.

DURING LOADING OF FORMS WITH CONCRETE, TAKE EXTRA CARE TO ENSURE PROPER CONSOLIDATION OF CONCRETE AROUND ALL RUSTICATION INSERTS TO PRESERVE THE SHAPE, LINE AND DEPTH OF ALL INTENDED FEATURES IN THE FINAL CONCRETE SURFACE. FOLLOWING REMOVAL OF FORMS, REPAIR ALL DEFECTS TO ACHIEVE THE RUSTICATION FEATURES AS SPECIFIED IN THE PLANS. PATCH VOIDS, HONEYCOMB AREAS, ETC., IN ACCORDANCE WITH THE STANDARED SPECIFICATIONS. IF SURFACES WILL NOT RECEIVE A COLORED SEALER COATING, ADD WHITE CEMENT TO THE PATCHING MORTAR TO LIGHTEN IT IN ORDER TO MATCH OR BE SLIGHTLY LIGHTER THAN SURROUNDING CONCRETE WHEN DRY. COMPLETED SURFACE SHALL BE FREE FROM BLEMISHES, SURFACE VOIDS AND CONSPICUOUS FORM MARKS TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL CORRECT ANY SURFACE DEFECTS TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST TO THE PROJECT.

ALL COSTS ASSOCIATED WITH CONCRETE RUSTICATION ARE TO BE INCLUDED IN THE BID ITEM "HIGH PERFORMANCE STRUCTURAL CONCRETE".

ALL PLAN DIMENSIONS ARE HORIZONTAL UNLESS NOTED OTHERWISE.

THE TIED ROAD PLANS, PROJECT NO. IM-035-3(194)87--13-77 CONTAIN THE POLLUTION PREVENTION PLAN.

TRAFFIC CONTROL PLAN:
THE STRUCTURE IS BEING CONSTRUCTED ON A RELOCATION AND THE ROAD WILL NOT BE OPEN TO TRAFFIC UNTIL AFTER COMPLETION OF CONSTRUCTION. SEE TIED PROJECT IM-035-3(194)87--13-77 FOR THE TRAFFIC CONTROL PLAN.

NO CONSTRUCTION ACTIVITY IS ALLOWED IN THE AREA SOUTH OF THE EXISTING UPRR TRACK UNTIL AFTER JANUARY 1ST, 2023. THIS INCLUDES GRADING AND ANY WORK RELATED TO THE CONSTRUCTION OF THE SOUTH ABUTMENT AND PIER NO. 2.

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

GENERAL NOTES

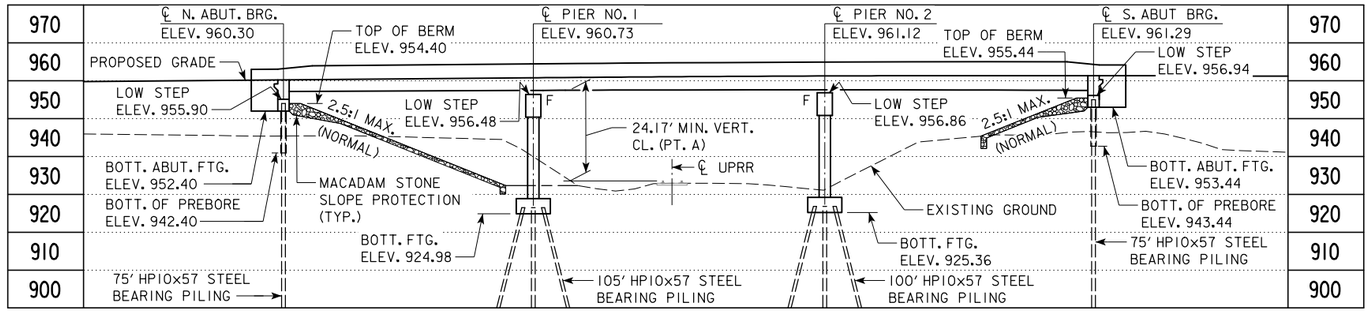
STA. 3259+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

[redacted]

BENCH MARK NO. 26: NORTHING: 604283.735, EASTING: 1624489.540, ELEV. 886.700, FENO. MONUMENT, W/CAP STAMPED "026", 6" DEEP, IN THE NORTH ROW/SHOULDER OF NE 54TH AVE., 9' NORTH OF EDGE AC SLAB; 128' FROM P.I. OF NE 54TH AVE. WITH OF RR CROSSING.



LONGITUDINAL SECTION ALONG ℄ RAMP B

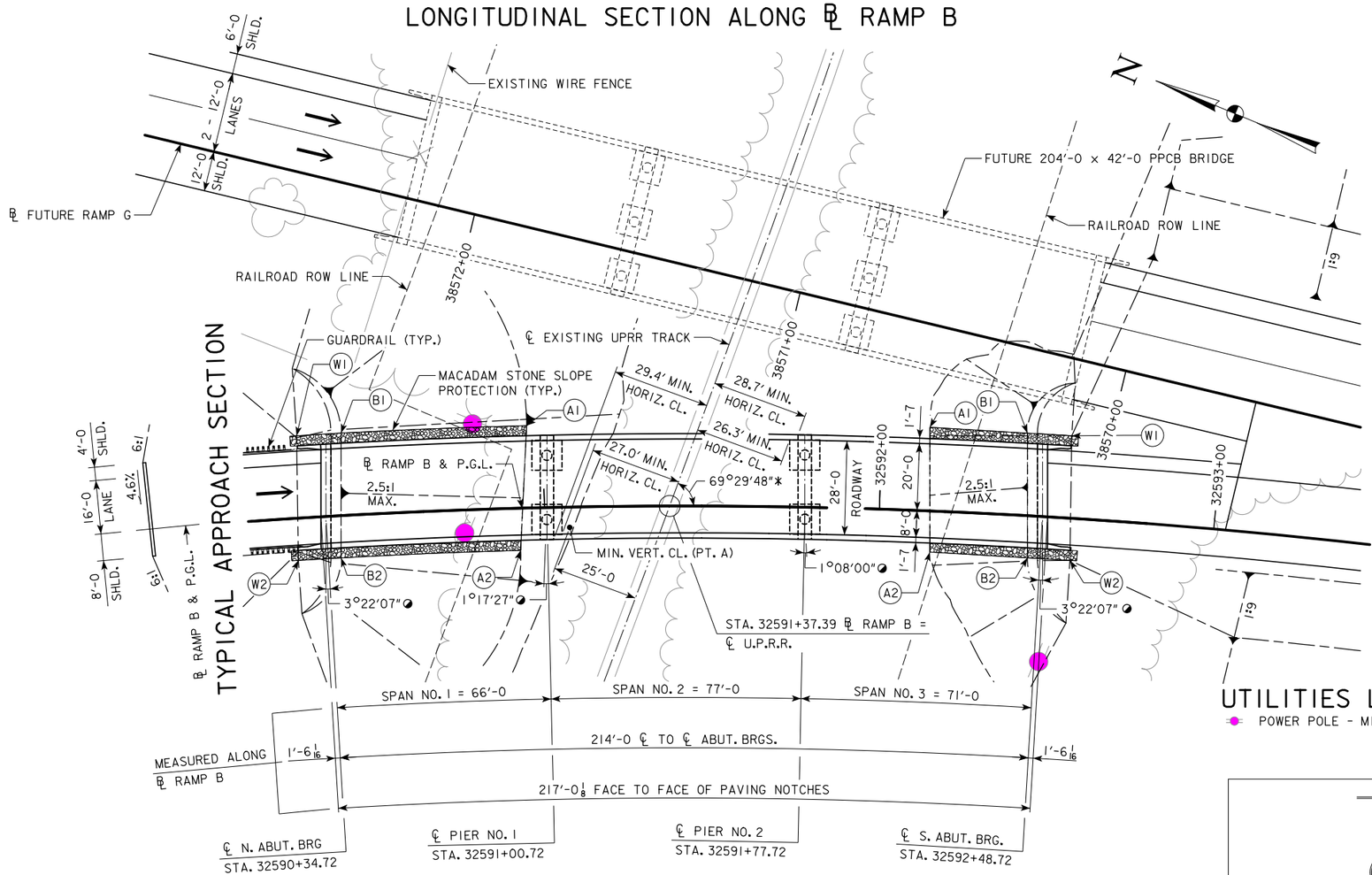
LOCATION

RAMP B (E.B. TO S.B.)
OVER UPRR
T-79N R-23W
SECTION 18
DELAWARE TOWNSHIP
POLK COUNTY
FHWA NO. 700895
LATITUDE: 41.647150°
LONGITUDE: -93.577130°

G1 = +0.652% ○ G2 = -0.070%

VPI STA. = 32592+00.00
VPI ELEV. = 961.37
VC = 200'

RAMP B PROPOSED GRADE



SITUATION PLAN

℄ RAMP B CURVE DATA

PI STA. 32590+41.99
Δ = 31°51'07.08" (RT.)
T = 519.33'
L = 1,011.78'
E = 72.65'
R = 1,820.00'
PC STA. 32585+22.66
PT STA. 32595+34.44

MINIMUM VERTICAL CLEARANCE (PT. A)

OVERHEAD STATION = 32591+08.26, 6.06' RT. (℄ RAMP B)
OVERHEAD ELEVATION = 960.50
DEPTH OF SUPERSTRUCTURE = 3.83'
UNDERPASS ELEVATION = 932.50
PROVIDED MIN. VERTICAL CLEARANCE = 24.17'

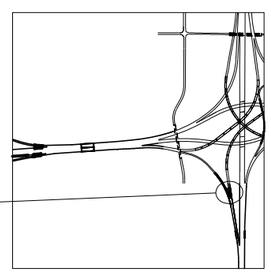
BERM SLOPE LOCATION TABLE

POINTS	NORTH ABUTMENT			SOUTH ABUTMENT		
	STATION	OFFSET	ELEV.	STATION	OFFSET	ELEV.
A1	32590+93.40	24.58' LT.	933.04	32592+14.11	24.58' LT.	943.64
A2	32590+92.54	12.58' RT.	933.00	32592+15.59	12.58' RT.	944.58
B1	32590+40.59	24.58' LT.	954.40	32592+42.84	24.58' LT.	955.44
B2	32590+38.51	12.58' RT.	954.40	32592+44.93	12.58' RT.	955.44
W1	32590+27.48	24.58' LT.	961.12	32592+55.96	24.58' LT.	962.17
W2	32590+25.70	12.58' RT.	959.75	32592+57.74	12.58' RT.	960.81

BERM SLOPE ELEVATIONS REFLECT THE GRADING SURFACE

UTILITIES LEGEND:

POWER POLE - MIDAMERICAN



INTERCHANGE KEY PLAN

NOTES:
ALL UNITS ARE IN FEET UNLESS NOTED OTHERWISE.
* MEASURED TO LOCAL TANGENT OF ℄ RAMP B.
◕ MEASURED PERPENDICULAR TO LOCAL TANGENT OF ℄ RAMP B.

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

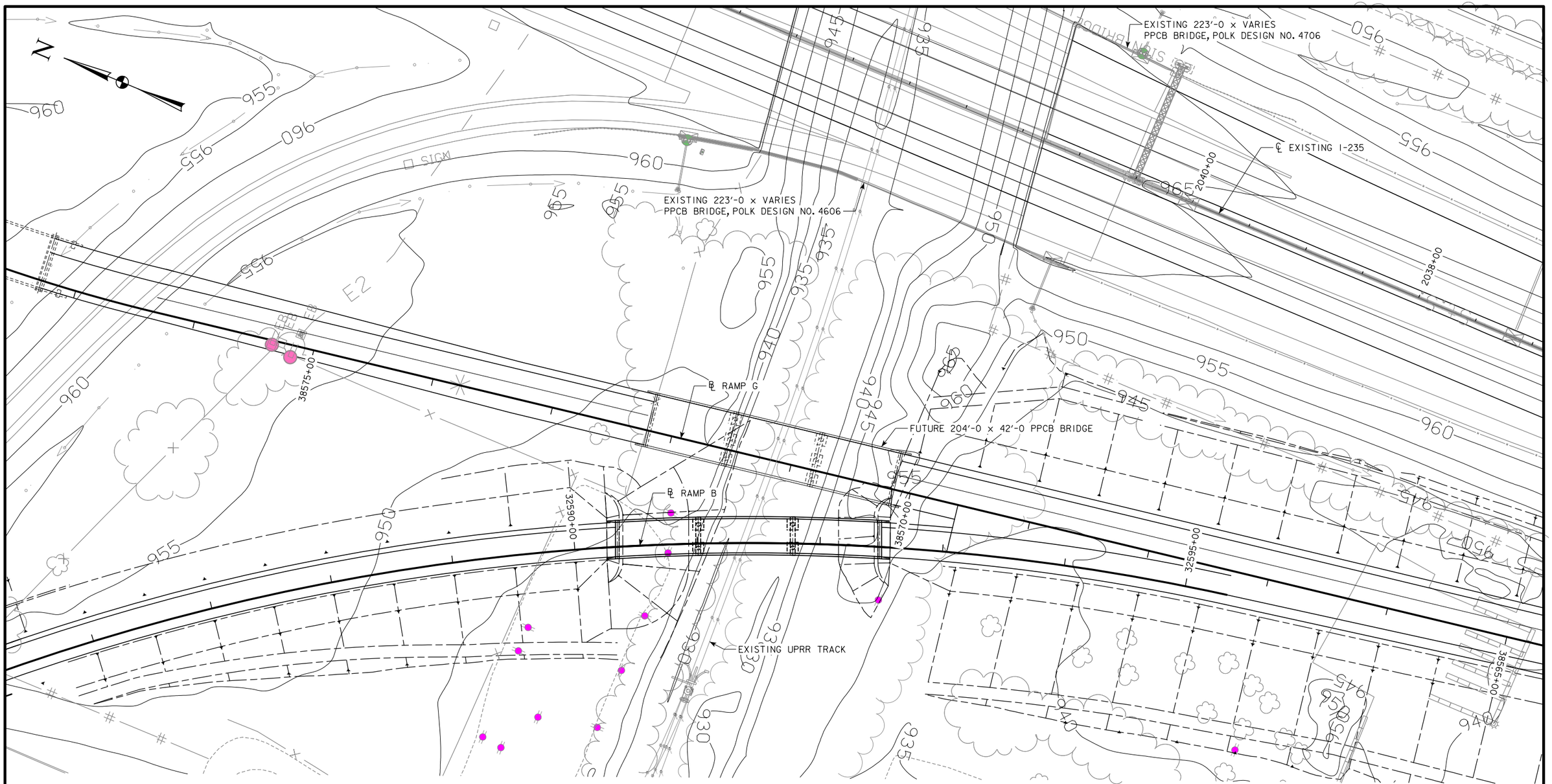
SITUATION PLAN

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

DESIGN TEAM [redacted] POLK COUNTY PROJECT NUMBER [redacted] SHEET NUMBER 5



SITE PLAN

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

SITUATION PLAN - SITE

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

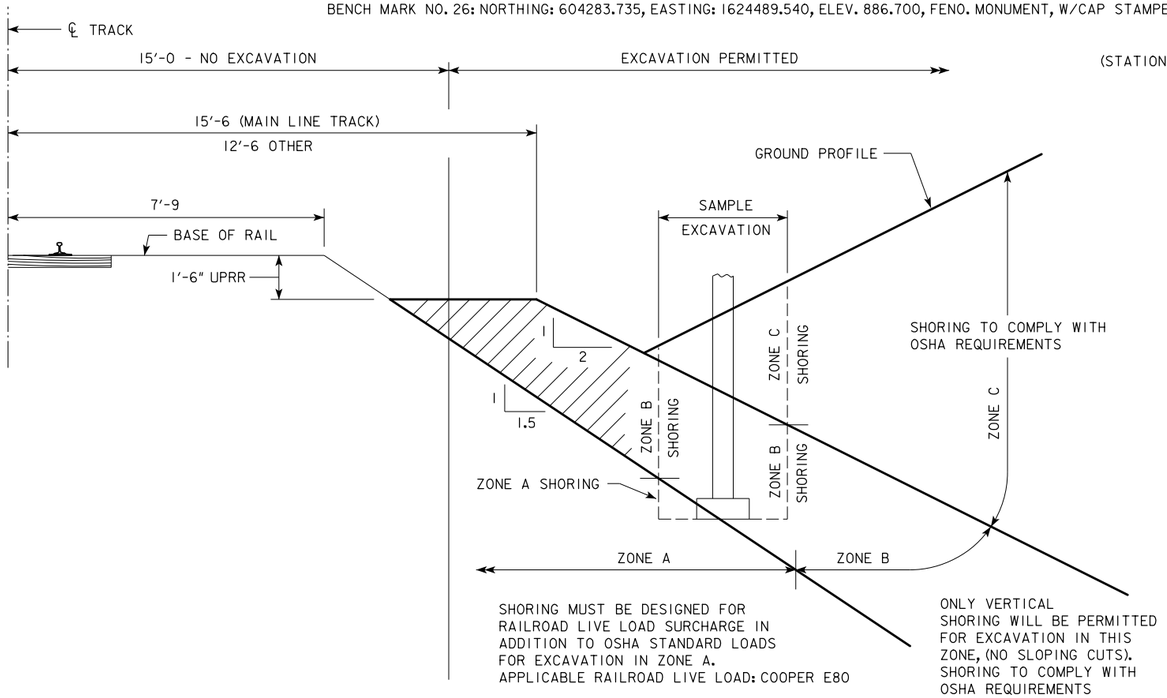
POLK COUNTY

[redacted]

[redacted]

DESIGN TEAM [redacted] POLK COUNTY PROJECT NUMBER [redacted] SHEET NUMBER 6

BENCH MARK NO. 26: NORTHING: 604283.735, EASTING: 1624489.540, ELEV. 886.700, FENO. MONUMENT, W/CAP STAMPED "026", 6" DEEP, IN THE NORTH ROW/SHOULDER OF NE 54TH AVE., 9' NORTH OF EDGE AC SLAB; 128' FROM P.I. OF NE 54TH AVE. WITH OF RR CROSSING.



GENERAL EXCAVATION ZONES

TOP OF RAIL ELEVATIONS

(STATIONS INCREASE WITH MILEPOST INCREASE. MILEPOSTS INCREASE TO THE EAST.)

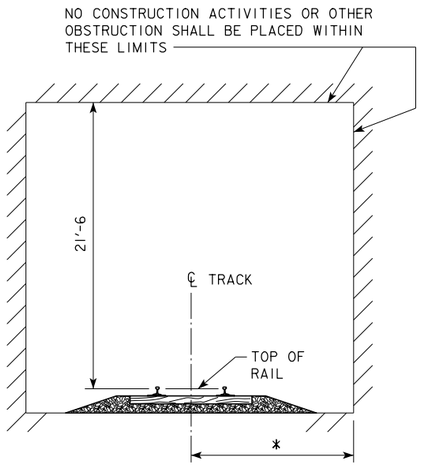
MAIN LINE UPRR			
ALIGNMENT: LEFT RAIL		ALIGNMENT: RIGHT RAIL	
STATION	ELEVATION	STATION	ELEVATION
03+77.02	926.94	03+75.41	926.92
04+25.71	927.58	04+23.95	927.52
04+73.02	928.15	04+71.26	928.02
05+16.50	928.79	05+15.05	928.70
05+69.44	929.26	05+67.59	929.35
06+32.30	929.76	06+30.50	929.69
06+81.56	930.13	06+79.77	930.14
07+30.59	930.60	07+28.66	930.61
07+80.50	930.89	07+78.70	930.90
08+03.03	931.08	08+01.10	931.09
08+23.34	931.25	08+21.06	931.26
08+50.47	931.47	08+48.68	931.47
08+85.15	931.73	08+83.34	931.73
09+35.24	932.13	09+33.34	932.17
09+87.12	932.53	09+85.29	932.60
(1) 10+00.00	932.65	(2) 10+00.00	932.75
10+40.71	933.03	10+39.06	933.14
10+90.64	933.50	10+88.97	933.61
11+36.11	933.88	11+34.18	934.04
11+86.69	934.34	11+85.24	934.58
12+37.31	934.77	12+35.68	935.00
12+87.08	935.13	12+85.79	935.32
13+38.50	935.32	13+36.96	935.63
13+91.30	935.66	13+89.90	936.01
14+40.28	936.26	14+38.98	936.41
14+63.06	936.44	14+60.58	936.55

(1) EXISTING TRACK STA. 10+00 = STA. 32591+34.79 ℄ RAMP B

(2) EXISTING TRACK STA. 10+00 = STA. 32591+39.99 ℄ RAMP B

RAILROAD GENERAL NOTES:

1. ALL PERMANENT CLEARANCES SHALL BE VERIFIED BEFORE PROJECT CLOSING.
2. THE CONTRACTOR MUST SUBMIT A PROPOSED METHOD OF EROSION AND SEDIMENT CONTROL AND HAVE THE METHOD APPROVED BY THE RAILROAD.
3. REGARDLESS OF UNDERLYING LAND OWNERSHIP, ALL SHORING SYSTEMS WITHIN RAILROAD RIGHT-OF-WAY OR THAT MAY IMPACT THE RAILROAD'S OPERATIONS AND/OR SUPPORTS THE RAILROAD'S EMBANKMENT SHALL BE DESIGNED AND CONSTRUCTED PER CURRENT RAILROAD GUIDELINES FOR TEMPORARY SHORING.
4. THE CONTRACTOR SUBMIT AND PROVIDE SUFFICIENT SAFETY MEASURES TO PROTECT UNATTENDED EXCAVATIONS TO THE RAILROAD FOR APPROVAL.
5. ALL DEMOLITIONS/REMOVALS WITHIN THE RAILROAD'S RIGHT-OF-WAY AND/OR THAT MAY IMPACT THE RAILROAD'S TRACKS OR OPERATIONS SHALL BE IN COMPLIANCE WITH THE CURRENT RAILROAD'S DEMOLITION GUIDELINES.
6. RAILROAD REQUIREMENTS DO NOT ALLOW WORK WITHIN 50 FEET OF TRACK CENTERLINE WHEN A TRAIN PASSES THE WORK SITE AND ALL PERSONNEL MUST CLEAR THE AREA WITHIN 25 FEET OF THE TRACK CENTERLINE AND SECURE ALL EQUIPMENT.
7. CALL BEFORE YOU DIG. PRIOR TO EXCAVATION, DISRUPTING, OR WORKING ON THE RAILROAD PROPERTY THE CONTRACTOR SHALL LOCATE AND PROTECT UPRR FACILITIES BY CALLING THE UPRR "CALL BEFORE YOU DIG" (CBYD) PHONE NUMBER: 1-800-336-9193.
8. CONSTRUCTION ACTIVITIES, INCLUDING FALSEWORK/FORMWORK, ARE NOT ALLOWED WITHIN THE "MINIMUM CONSTRUCTION CLEARANCE ENVELOPE" AS THEY WOULD OTHERWISE DISRUPT RAILROAD OPERATIONS.
9. RAILROAD REVIEW AND APPROVAL OF SHORING, ERECTION, DEMOLITION, AND FALSEWORK IS REQUIRED. ALLOW A MINIMUM OF FOUR WEEKS FOR THE REVIEW AND APPROVAL OF EACH SUBMITTAL.
10. THE PROPOSED GRADE SEPARATION PROJECT SHALL NOT INCREASE THE QUANTITY AND/OR CHARACTERISTICS OF THE FLOW IN THE RAILROAD'S DITCHES AND/OR DRAINAGE STRUCTURES.
11. THE ELEVATION OF THE EXISTING TOP-OF-RAIL PROFILE SHALL BE VERIFIED BEFORE BEGINNING CONSTRUCTION. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE RAILROAD PRIOR TO CONSTRUCTION.
12. ERECTION OVER THE RAILROAD'S RIGHT-OF-WAY SHALL BE DESIGNED TO CAUSE NO INTERRUPTION TO THE RAILROAD'S OPERATION, ENABLING THE TRACK(S) TO REMAIN OPEN TO TRAFFIC PER THE RAILROAD'S REQUIREMENTS.
13. ALL CONSTRUCTION PHASING THAT MAY IMPACT THE RAILROAD OPERATIONS SHALL BE DESIGNED TO CAUSE NO INTERRUPTION TO THE RAILROAD'S OPERATION, ENABLING THE TRACK(S) TO REMAIN OPEN TO TRAFFIC PER THE RAILROAD'S REQUIREMENTS.
14. FALSE-WORK CLEARANCES SHALL COMPLY WITH MINIMUM CONSTRUCTION CLEARANCES.
15. FOR RAILROAD COORDINATION PLEASE REFER TO THE RAILROAD COORDINATION REQUIREMENTS AS PART OF SPECIAL PROVISIONS.



MINIMUM CONSTRUCTION CLEARANCE ENVELOPE

(NORMAL TO RAILROAD)

* 15'-0" FOR UPRR

GENERAL SHORING NOTES:

1. ALL DIMENSIONS ARE MEASURED PERPENDICULAR TO TRACK.
2. PRIOR TO COMMENCING ANY WORK, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE RAILROAD DETAILED PLANS INDICATING THE NATURE AND EXTENT OF THE TRACK PROTECTION SHORING PROPOSED. THE CONTRACTOR SHALL INSTALL THE TEMPORARY SHORING SYSTEM PER THE APPROVED PLANS. DESIGN OF THE TEMPORARY SHORING SYSTEM TO COMPLY WITH GUIDELINES FOR TEMPORARY SHORING.
3. FOR EXCAVATIONS WHICH ENCROACH INTO ZONE A OR B, SHORING PLANS SHALL BE ACCOMPANIED BY DESIGN CALCULATIONS. PLANS AND CALCULATIONS MUST BE SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF IOWA.

NOTE:
UPRR = UNION PACIFIC RAILROAD

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

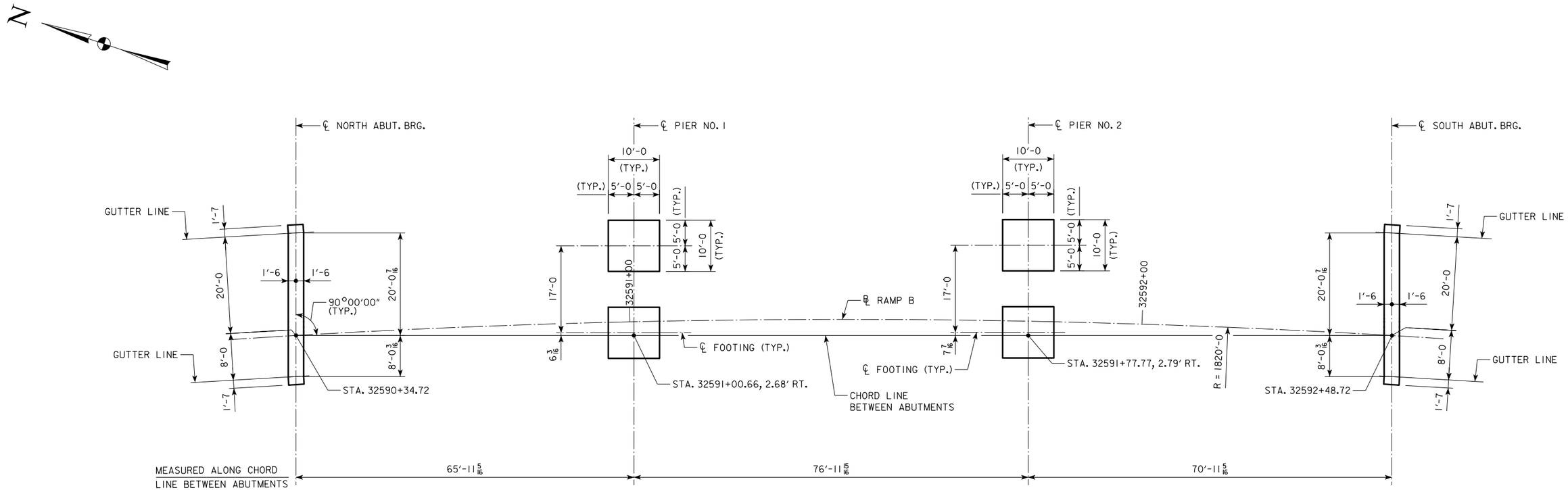
66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

UPRR SHORING DETAILS

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]



STAKING DIAGRAM

BRIDGE COORDINATES

LOCATION	℄ N. ABUT. BRG.	℄ PIER NO. 1	℄ PIER NO. 2	℄ S. ABUT. BRG.
LEFT EDGE OF DECK	E = 1619312.373 N = 600237.421	E = 1619340.094 N = 600177.530	E = 1619369.700 N = 600106.456	E = 1619394.343 N = 600039.876
℄ RAMP B	E = 1619292.404 N = 600229.135	E = 1619320.154 N = 600169.256	E = 1619349.761 N = 600098.182	E = 1619374.374 N = 600031.589
RIGHT EDGE OF DECK	E = 1619283.536 N = 600225.455	E = 1619311.300 N = 600165.582	E = 1619340.907 N = 600094.508	E = 1619365.507 N = 600027.910

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.

[redacted]

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

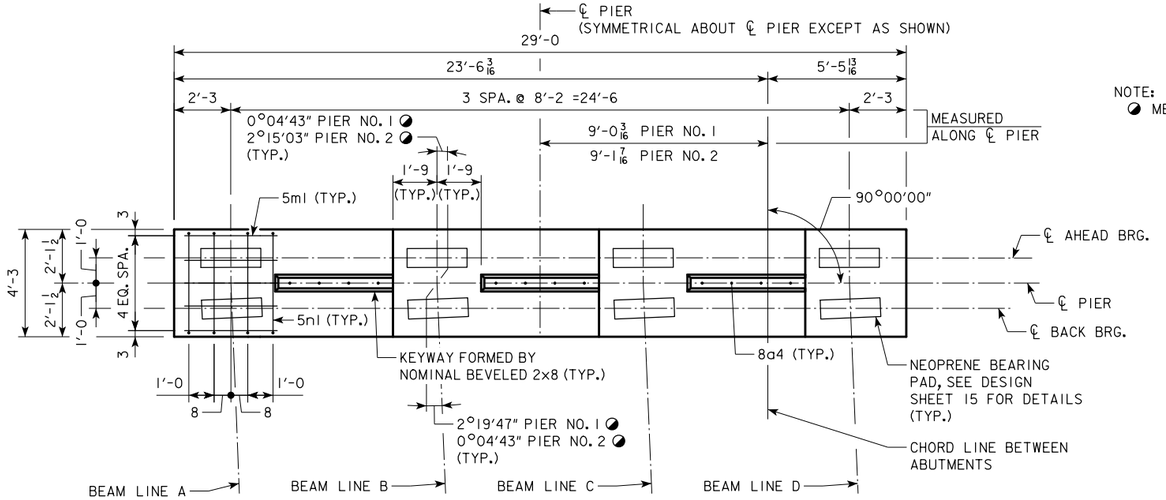
STAKING DIAGRAM

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

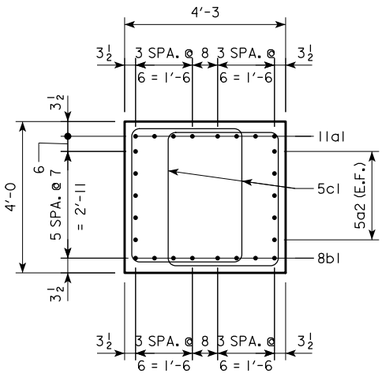
[redacted]

BENCH MARK NO. 26: NORTHING: 604283.735, EASTING: 1624489.540, ELEV. 886.700, FENO. MONUMENT, W/CAP STAMPED "026", 6" DEEP, IN THE NORTH ROW/SHOULDER OF NE 54TH AVE., 9' NORTH OF EDGE AC SLAB; 128' FROM P.I. OF NE 54TH AVE. WITH OF RR CROSSING.



PLAN OF PIER CAP

NOTE:
◒ MEASURED PERPENDICULAR TO ℄ OF PIER.

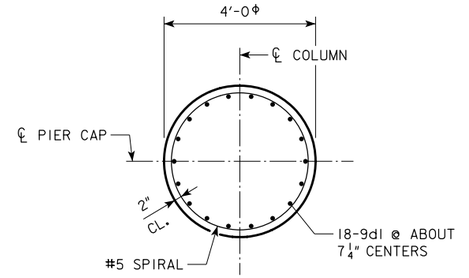


SECTION A-A

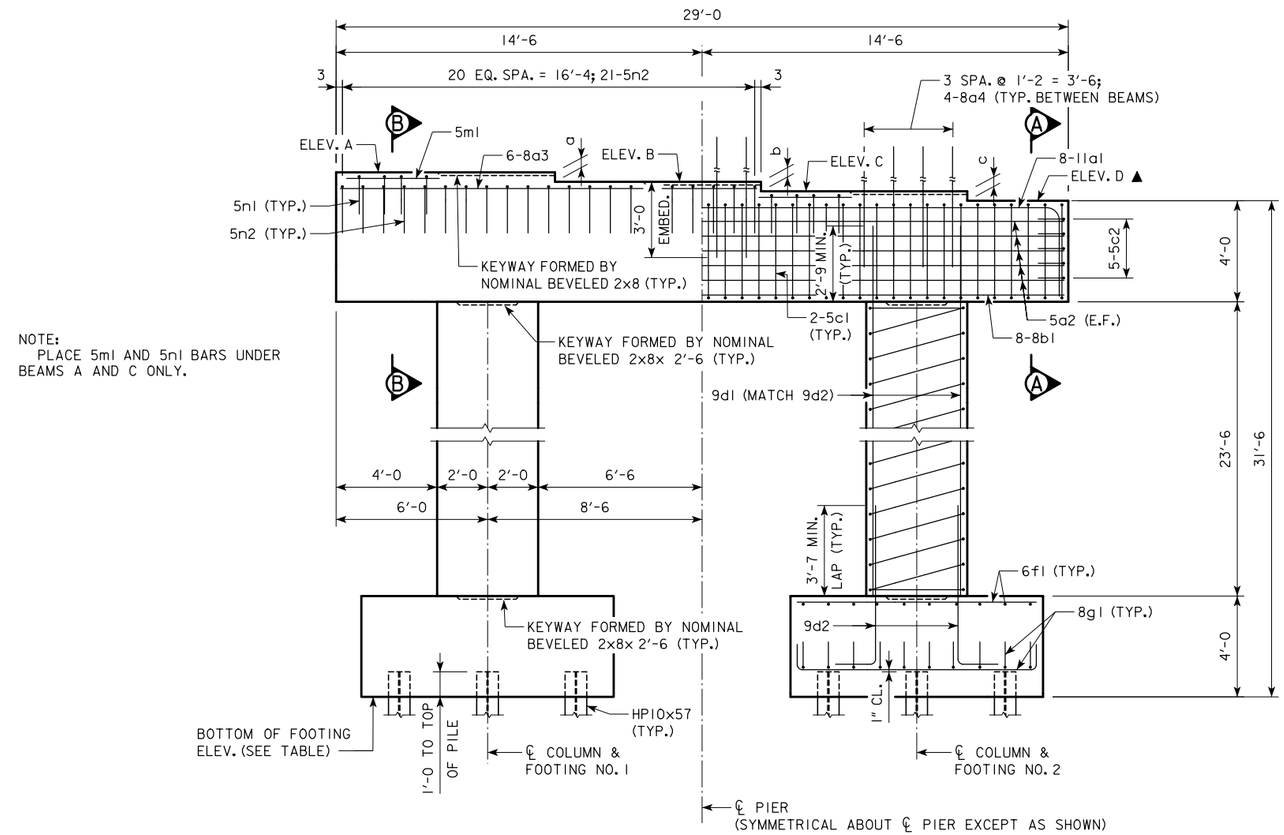
TABLE OF PIER ELEVATIONS		
ELEVATION	PIER NO. 1	PIER NO. 2
ELEV. A	957.61	957.99
ELEV. B	957.23	957.61
ELEV. C	956.86	957.24
ELEV. D	▲ 956.48	▲ 956.86
BOTTOM OF FOOTING	924.98	925.36

▲ LOW STEP ELEVATION

TABLE OF PIER STEPS		
STEP	PIER NO. 1	PIER NO. 2
a	4 1/2	4 1/2
b	4 1/2	4 1/2
c	4 1/2	4 1/2

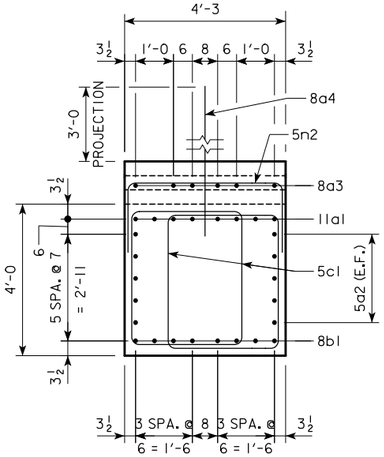


TYPICAL SECTION THRU COLUMN



NOTE:
PLACE 5m1 AND 5n1 BARS UNDER BEAMS A AND C ONLY.

PIER ELEVATION
(LOOKING SOUTH)



SECTION B-B

PIER NOTES:

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

SPIRAL REINFORCING IS TO BE NO. 5 BAR WITH 3'-7 3/8" DIAMETER, 12" PITCH WITH 4 EQUALLY SPACED L 1/2 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRALS. SPIRALS ARE TO HAVE 1 1/2 EXTRA TURNS AT TOP AND BOTTOM COLUMNS.

THE SPIRAL REINFORCING MAY BE SPLICED BY LAPPING 22". THE LENGTH OF THE SPIRAL SHOWN DOES NOT INCLUDE THE LAPPED LENGTH OF THE SPLICES. THE COST OF THE LAPS AT SPLICES IS TO BE INCLUDED IN THE PRICE BID FOR OTHER REINFORCEMENT.

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

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

PIER DETAILS

STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

PIER PILE NOTES:

THE CONTRACT LENGTH OF 105 FEET FOR THE PIER NO. 1 PILES, AND 100 FEET FOR THE PIER NO. 2 PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 204 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65. THE FACTORED AXIAL LOAD INCLUDES A FACTORED DEAD LOAD OF 6 KIPS PER PILE TO ACCOUNT FOR FUTURE RAILROAD PIER PROTECTION.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.76. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF FOOTING.

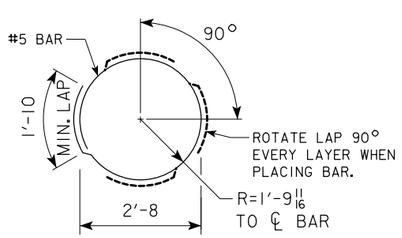
THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER PILES IS 134 TONS AT END OF DRIVE. IF RETAPS ARE NECESSARY TO ACHIEVE BEARING THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE IS 157 TONS AT ONE-DAY RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

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

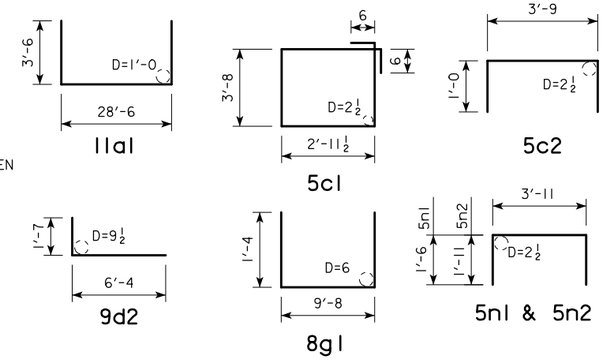
ALL BATTERED PILE SHALL BE TRIMMED TO A HORIZONTAL LINE TO AID IN THE PLACEMENT OF REINFORCING.

7 - HP10x57 STEEL BEARING PILING ARE REQUIRED FOR EACH FOOTING AT PIER NOS. 1 AND 2.

BENT BAR DETAILS



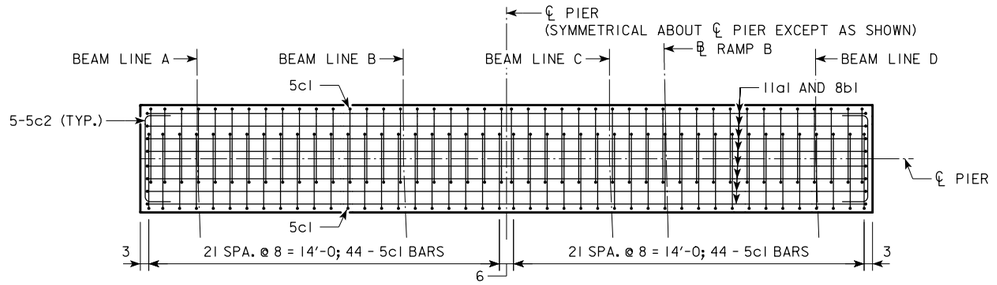
ALTERNATE COLUMN TIE



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

REINFORCING BAR LIST - ONE PIER

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
11a1	CAP, TOP, LONGITUDINAL	⌊⌋	8	35'-6	1,509
5a2	CAP, SIDE, LONGITUDINAL	——	10	28'-8	299
8a3	CAP, TOP, LONGITUDINAL	——	6	16'-6	264
8a4	CAP TO DIAPHRAGM DOWEL	——	12	6'-0	192
8b1	CAP, BOTTOM, LONGITUDINAL	——	8	28'-8	612
5c1	CAP, HOOPS	□	88	14'-3	1,308
5c2	CAP, ENDS	⌊⌋	10	5'-9	60
9d1	COLUMN, VERTICAL	——	36	26'-3	3,213
9d2	FOOTING TO COLUMN DOWEL	⌊	36	7'-11	969
6f1	FOOTING, TOP	——	40	9'-8	581
8g1	FOOTING, BOTTOM	⌊⌋	40	12'-4	1,317
5m1	CAP, PEDESTAL, LONGITUDINAL	——	10	3'-8	38
5n1	CAP, PEDESTAL, TRANSVERSE	⌊⌋	8	6'-11	58
5n2	CAP, PEDESTAL, TRANSVERSE	⌊⌋	21	7'-9	170
#5	COLUMN SPIRAL	∿∿	2	298'-2	622
	COLUMN SPIRAL SPACERS L 7/8 x 7/8 x 1/8	——	8	23'-2	130
	REINFORCING STEEL - TOTAL (LBS.)				11,342



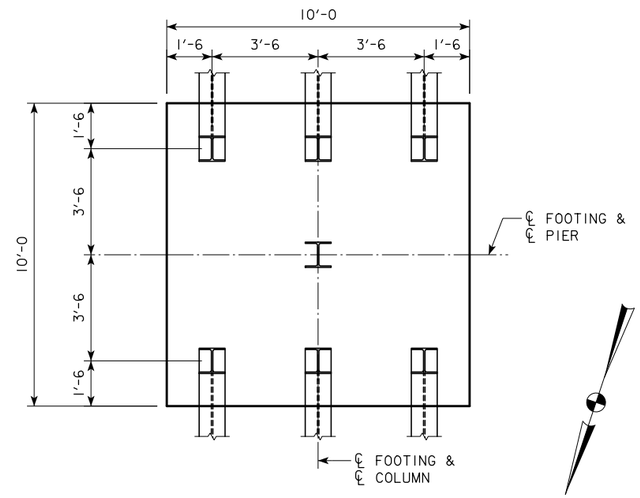
PIER CAP REINFORCING PLAN

NOTE:
8a3, 5m1,5n1 AND 5n2 BARS NOT SHOWN FOR CLARITY.

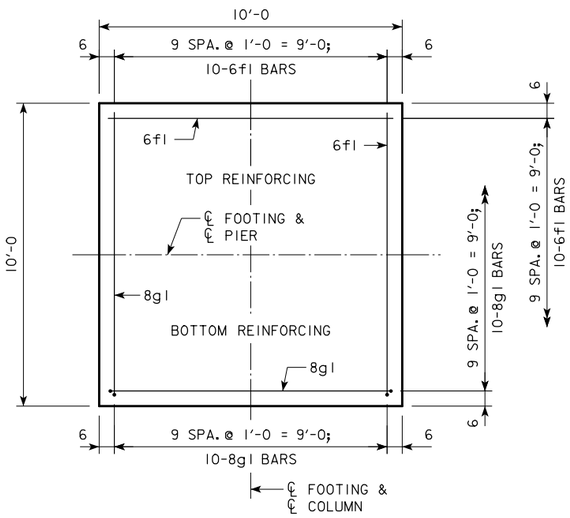
CONCRETE PLACEMENT QUANTITIES

LOCATION	PIER NO. 1	PIER NO. 2	QUANTITY
CAP & STEPS (HIGH PERFORMANCE CONCRETE)	21.3	21.3	42.6
COLUMNS (HIGH PERFORMANCE CONCRETE)	21.9	21.9	43.8
FOOTINGS	29.6	29.6	59.2
TOTAL CU. YDS.	72.8	72.8	145.6

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



PILE LAYOUT
(TYP. FOR ALL PIER FOOTINGS)



REINFORCING LAYOUT
(TYP. FOR ALL PIER FOOTINGS)

N

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

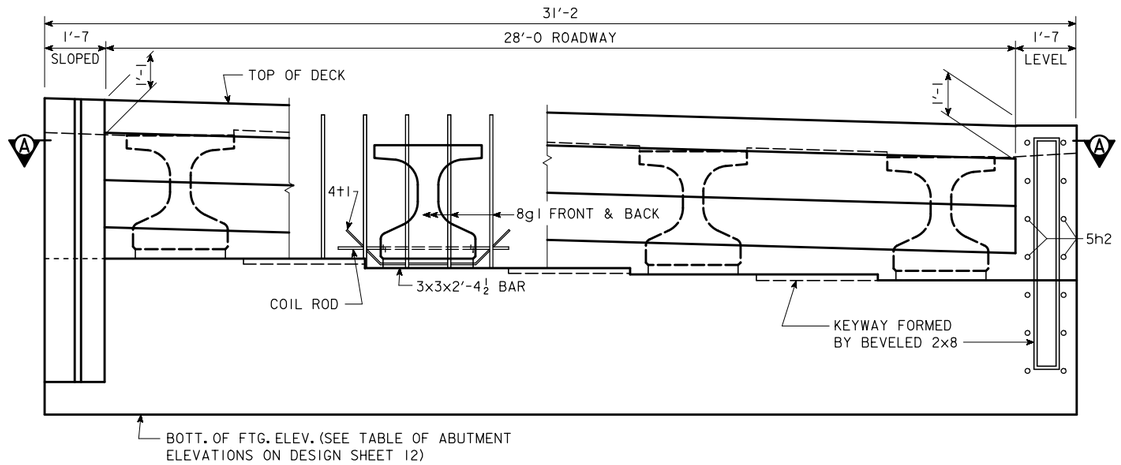
PIER DETAILS

STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

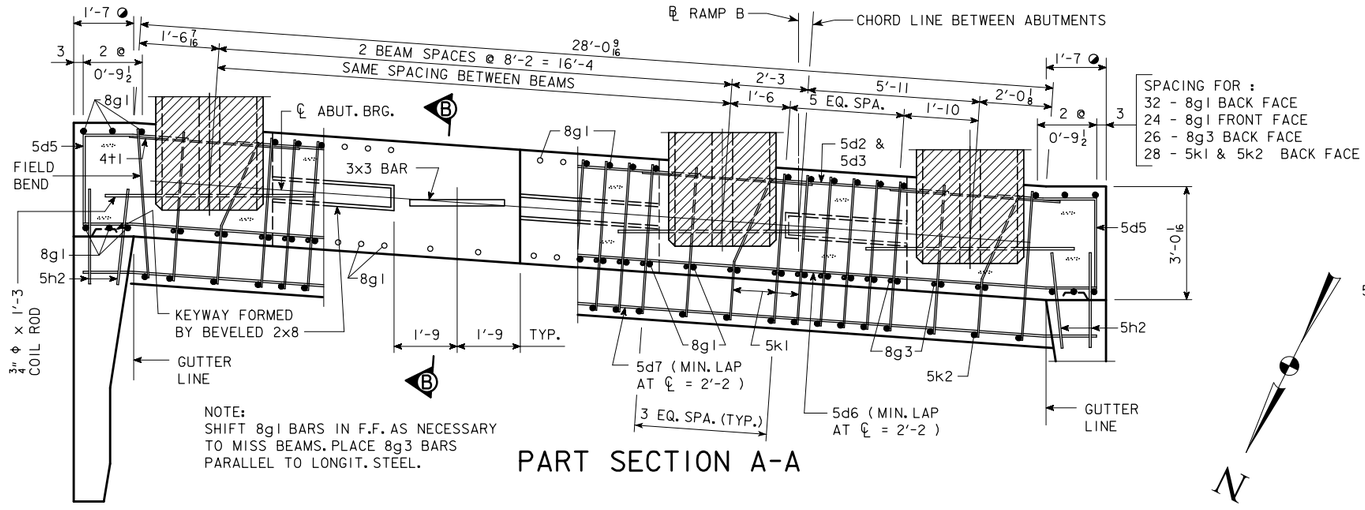
POLK COUNTY

[redacted]

DESIGN TEAM [redacted] | POLK COUNTY | PROJECT NUMBER [redacted] | SHEET NUMBER 10

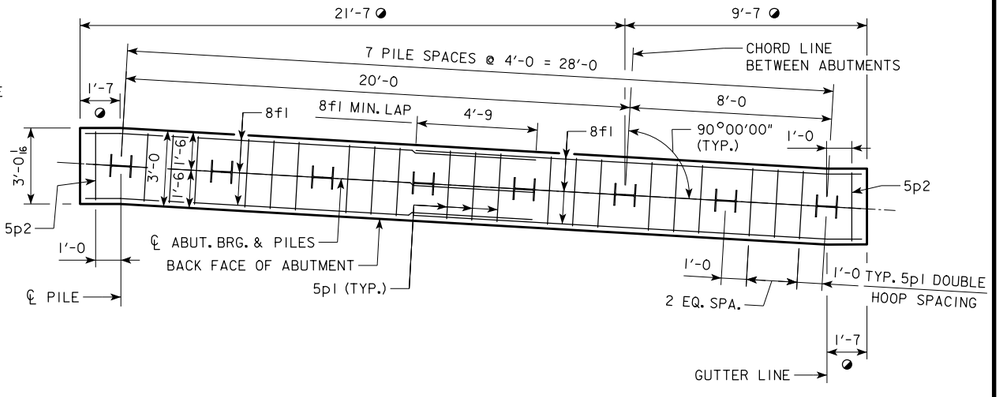


PART REAR ELEVATION AT NORTH ABUTMENT



PART SECTION A-A

NOTE: PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE (BOTH SIDES TYPICAL).



NORTH ABUTMENT PILE PLAN

NORTH ABUTMENT PILE NOTES:

THE CONTRACT LENGTH OF 75 FEET FOR THE NORTH ABUTMENT PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 113 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.78. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR NORTH ABUTMENT PILES IS 73 TONS AT END OF DRIVE. IF RETAPS ARE NECESSARY TO ACHIEVE BEARING THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE IS 87 TONS AT ONE-DAY RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

NOTES:
8 - HP10x57 STEEL BEARING PILING REQUIRED AT THE NORTH ABUTMENT.
FOR PART SECTION B-B AND ABUTMENT STEP DIAGRAM, SEE DESIGN SHEET 12.
◕ MEASURED RADIAL TO ℄ RAMP B.

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.

BARRIER RAIL NOT SHOWN IN DETAILS.

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

NORTH ABUTMENT DETAILS

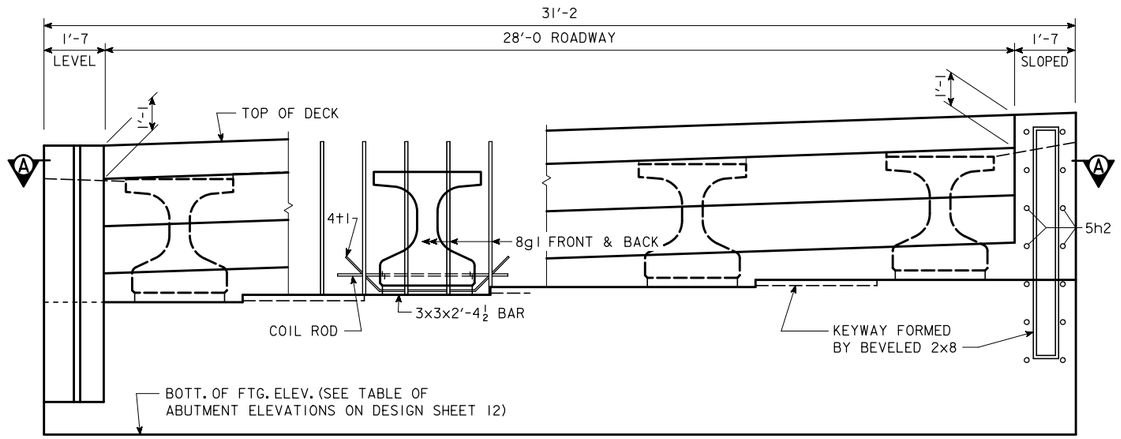
STA. 3259+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

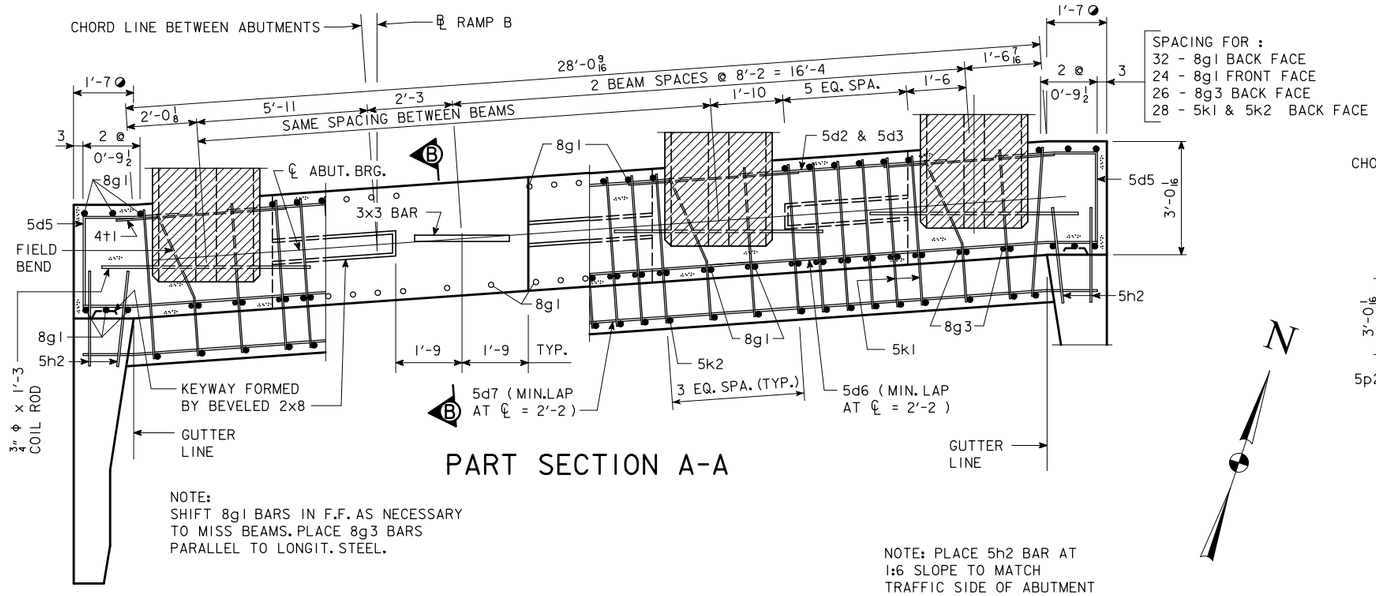
[redacted]

DESIGN TEAM [redacted]	"BTB" BEAMS - INTEGRAL ABUT. DETAILS - (L.A.) 0°01'-7°30' SKEWS	STANDARD SHEET 2079-BTB (MODIFIED)	POLK COUNTY	PROJECT NUMBER [redacted]	SHEET NUMBER 11

[redacted]



PART REAR ELEVATION AT SOUTH ABUTMENT



PART SECTION A-A

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

NOTE: PLACE 5h2 BAR AT 1:6 SLOPE TO MATCH TRAFFIC SIDE OF ABUTMENT WING FACE (BOTH SIDES TYPICAL).

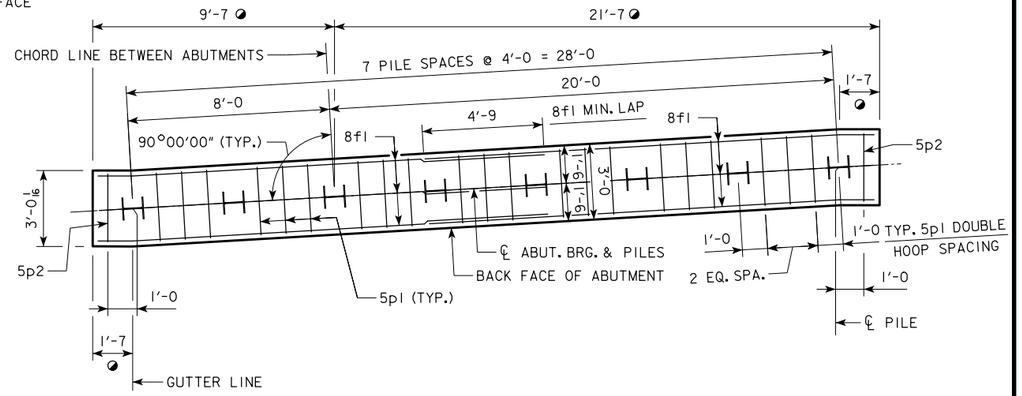
SOUTH ABUTMENT PILE NOTES:

THE CONTRACT LENGTH OF 75 FEET FOR THE SOUTH ABUTMENT PILES IS BASED ON A COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 113 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65.

THE NOMINAL AXIAL BEARING RESISTANCE FOR CONSTRUCTION CONTROL WAS DETERMINED FROM A COHESIVE SOIL CLASSIFICATION AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.78. PILES ARE ASSUMED TO BE DRIVEN FROM A START ELEVATION AT THE BOTTOM OF PREBORE.

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR SOUTH ABUTMENT PILES IS 73 TONS AT END OF DRIVE. IF RETAPS ARE NECESSARY TO ACHIEVE BEARING THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE IS 87 TONS AT ONE-DAY RETAP. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.

NOTES:
FOR ABUTMENT NOTES, SEE DESIGN SHEET 10.
8 - HP10x57 STEEL BEARING PILING REQUIRED AT THE SOUTH ABUTMENT.
FOR PART SECTION B-B AND ABUTMENT STEP DIAGRAM, SEE DESIGN SHEET 12.
◕ MEASURED RADIAL TO ℄ RAMP B.



SOUTH ABUTMENT PILE PLAN

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

SOUTH ABUTMENT DETAILS

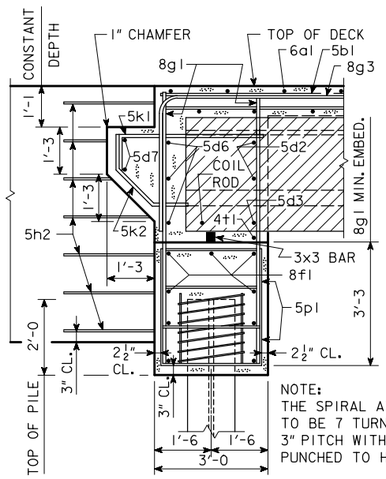
STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

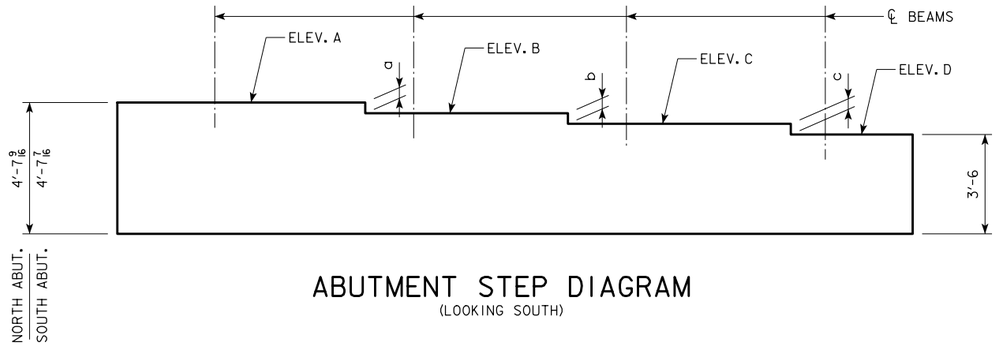
DESIGN TEAM [redacted]S	"BTB" BEAMS INTEGRAL ABUT. DETAILS - (R. A.) 0°01'-7°30' SKEW	STANDARD SHEET 2082-BTB (MODIFIED)	POLK COUNTY	PROJECT NUMBER [redacted]	SHEET NUMBER 12

BENCH MARK NO. 26: NORTHING: 604283.735, EASTING: 1624489.540, ELEV. 886.700, FENO. MONUMENT, W/CAP STAMPED "026", 6" DEEP, IN THE NORTH ROW/SHOULDER OF NE 54TH AVE., 9' NORTH OF EDGE AC SLAB; 128' FROM P.I. OF NE 54TH AVE. WITH OF RR CROSSING.



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

PART SECTION B-B



ABUTMENT STEP DIAGRAM
(LOOKING SOUTH)

TABLE OF ABUTMENT STEPS		
STEP	NORTH ABUT.	SOUTH ABUT.
a	$4\frac{9}{16}$	$4\frac{1}{2}$
b	$4\frac{9}{16}$	$4\frac{1}{2}$
c	$4\frac{9}{16}$	$4\frac{1}{2}$

TABLE OF ABUTMENT ELEVATIONS		
POINT	NORTH ABUT.	SOUTH ABUT.
ELEV. A	957.03	958.06
ELEV. B	956.65	957.69
ELEV. C	956.28	957.31
ELEV. D	955.90 ▲	956.94 ▲
BOTT. FTG. ELEV.	952.40	953.44

▲ LOW STEP

ABUTMENT CONCRETE QUANTITY	
LOCATION	QUANTITY
NORTH ABUTMENT FOOTING	14.4
SOUTH ABUTMENT FOOTING	14.4
TOTAL (CU. YDS.)	28.8

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

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

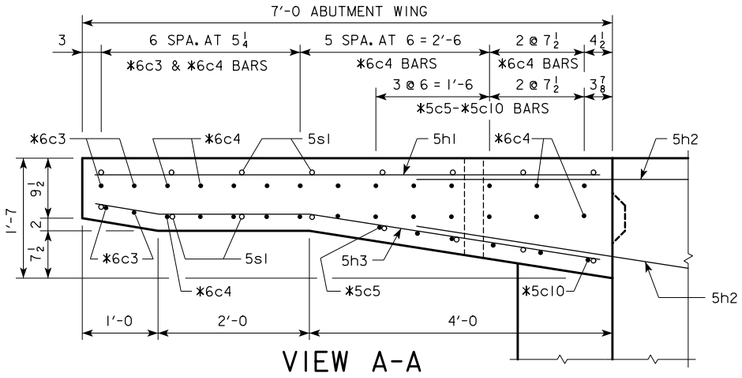
66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

ABUTMENT DETAILS

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

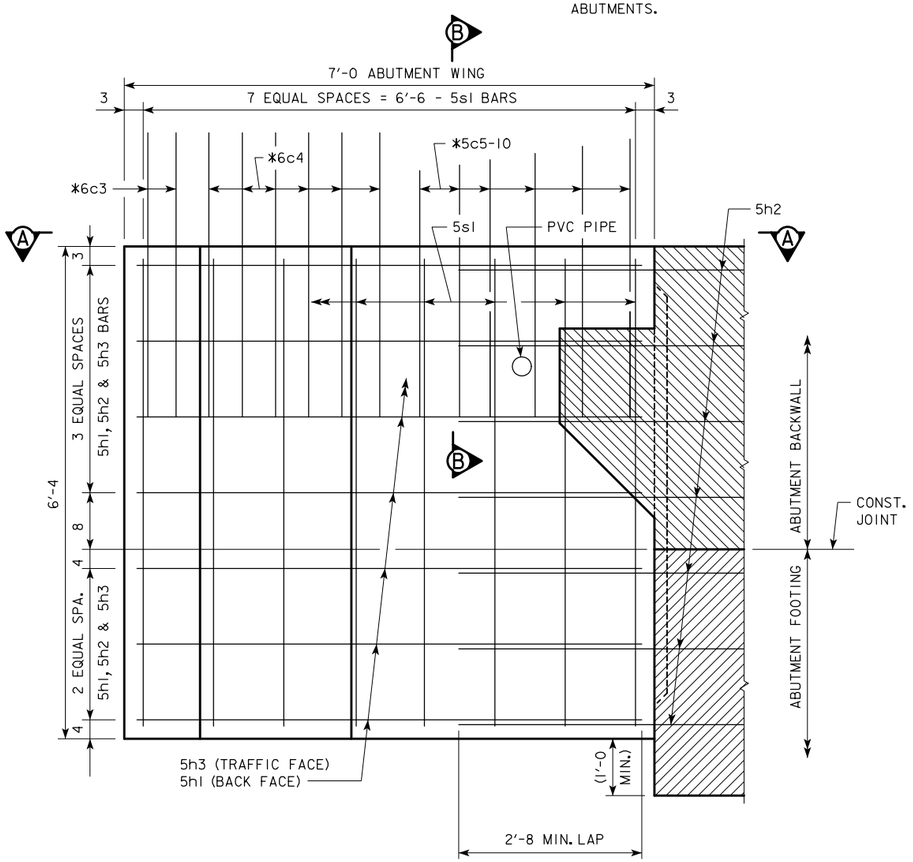
POLK COUNTY

[redacted]

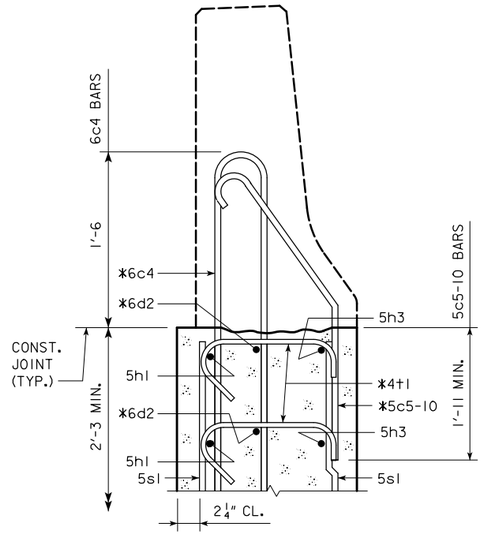


VIEW A-A

NOTE:
PLUG 3"Φ PVC PIPE WITH EXPANDING FOAM PRIOR TO BACKFILLING BEHIND ABUTMENTS.



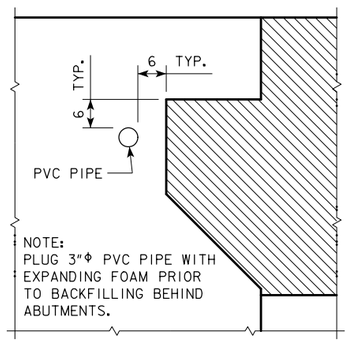
ABUTMENT WING - ELEVATION VIEW



SECTION B-B

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

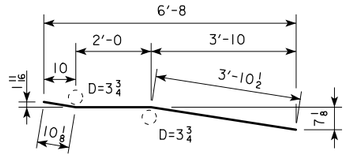
SEE BARRIER RAIL END SECTION SHEET IN THESE PLANS FOR DETAILS OF REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4t1.



PVC PIPE LOCATION

REINFORCING BAR LIST - ONE ABUT. WING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5h1	HORIZONTAL BACK FACE	——	7	6'-8	49
5h3	HORIZONTAL TRAFFIC FACE	——	7	6'-9	49
5s1	VERTICAL BOTH FACES	——	16	6'-0	100
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				198



5h3

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

BENT BAR DETAILS

CONCRETE PLACEMENT SUMMARY

CONCRETE	TOTAL
ONE ABUTMENT WING	1.9
TOTAL (CU. YDS.)	1.9

NOTE:

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

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

ABUTMENT WING DETAILS

STA. 3259+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

SUPERSTRUCTURE NOTES:

THE BRIDGE DECK AS SHOWN INCLUDES $\frac{3}{4}$" INTEGRAL WEARING SURFACE.

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

COST OF ALL RESILIENT JOINT FILLER MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "HIGH PERFORMANCE STRUCTURAL CONCRETE".

ALL BEAMS ARE TO BE SET VERTICAL.

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

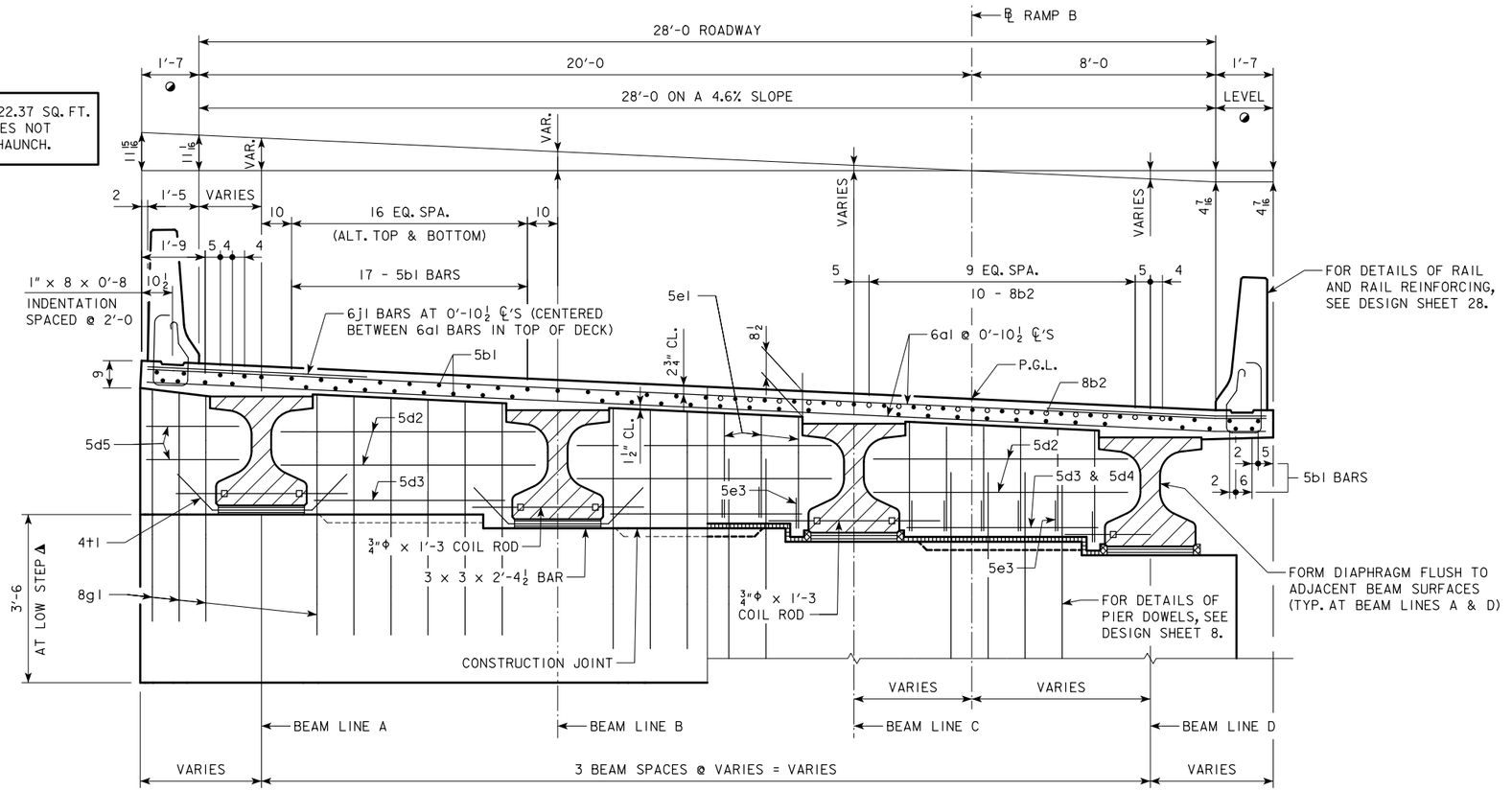
CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED OR SHOWN.

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

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND $2\frac{3}{4}$" CLEAR BELOW TOP OF DECK. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND $1\frac{1}{2}$" 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".

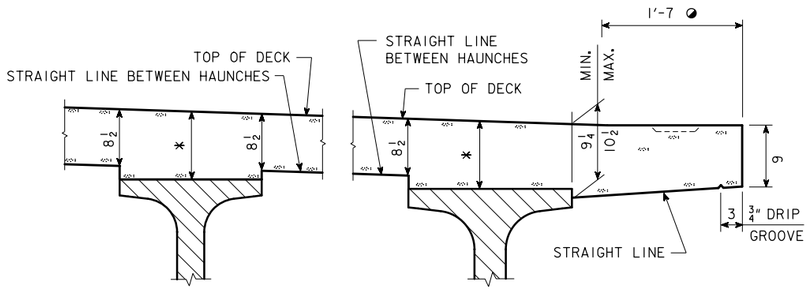
DECK AREA = 22.37 SQ. FT.
DECK AREA DOES NOT INCLUDE THE HAUNCH.



HALF SECTION NEAR ABUTMENT
(LOOKING AHEAD STATION)

HALF SECTION NEAR PIER
(LOOKING AHEAD STATION)

NOTES:
FOR DETAILS OF INTERMEDIATE DIAPHRAGMS, SEE DESIGN SHEETS 23 AND 24.
▲ LOW STEP IS ON WEST SIDE OF BRIDGE.

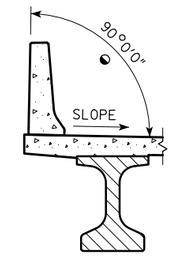


INTERIOR BEAMS

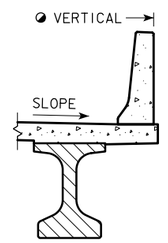
EXTERIOR BEAMS

TYPICAL DECK AND HAUNCH DETAIL

* FOR DECK THICKNESS OVER BEAMS SEE HAUNCH AND CAMBER DETAILS ON DESIGN SHEET 18.



BARRIER RAIL ORIENTATION DETAIL
(SHOWING "DECK SLOPES AWAY FROM THE BARRIER RAIL")



BARRIER RAIL ORIENTATION DETAIL
(SHOWING "DECK SLOPES TOWARDS THE BARRIER RAIL")

◕ WHERE THE DECK SLOPES TOWARDS THE BARRIER RAIL, THE DECK UNDER THE BARRIER RAIL SHALL BE PLACED LEVEL AND THE BARRIER RAIL SHALL BE PLACED VERTICAL. WHERE THE DECK SLOPES AWAY FROM THE BARRIER RAIL, THE DECK UNDER THE BARRIER RAIL SHALL BE PLACED ALONG THE SAME CROSS SLOPE AS THE DECK AND THE BARRIER RAIL SHALL BE PLACED PERPENDICULAR TO THE TOP OF THE DECK. SEE BARRIER RAIL ORIENTATION DETAILS, THIS SHEET.

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

SUPERSTRUCTURE DETAILS

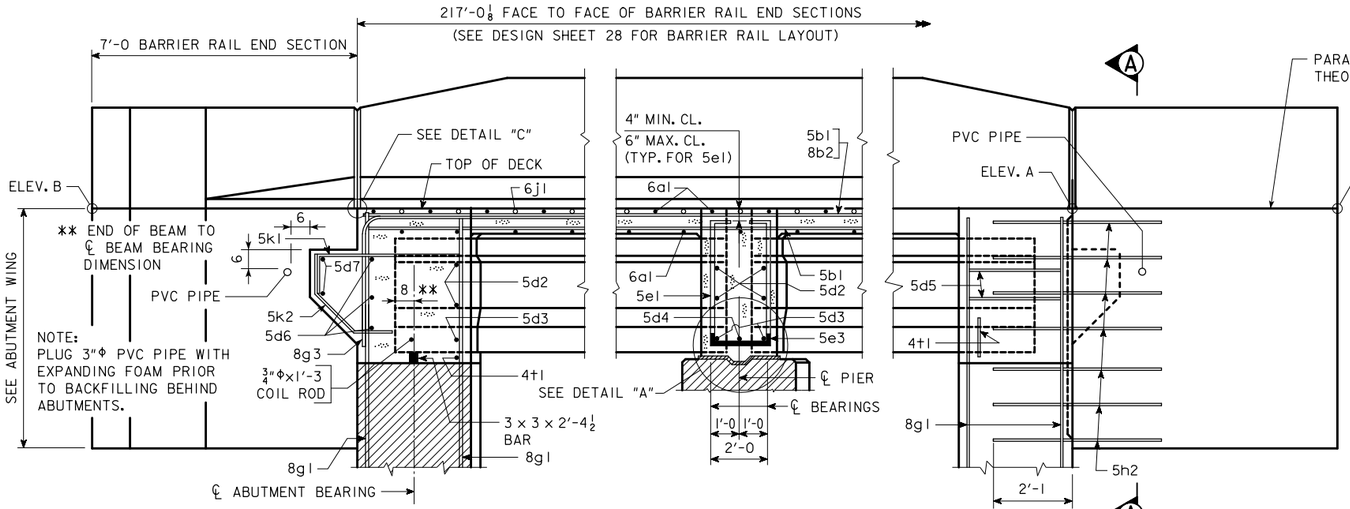
STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

DESIGN TEAM [redacted] | POLK COUNTY | PROJECT NUMBER [redacted] | SHEET NUMBER 15

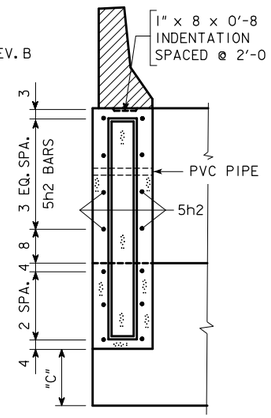
BENCH MARK NO. 26: NORTHING: 604283.735, EASTING: 1624489.540, ELEV. 886.700, FENO. MONUMENT, W/CAP STAMPED "026", 6" DEEP, IN THE NORTH ROW/SHOULDER OF NE 54TH AVE., 9' NORTH OF EDGE AC SLAB; 128' FROM P.I. OF NE 54TH AVE. WITH OF RR CROSSING.



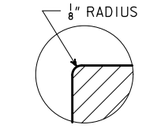
PART LONGITUDINAL SECTION NEAR GUTTER

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE DESIGN SHEETS 23 & 24)

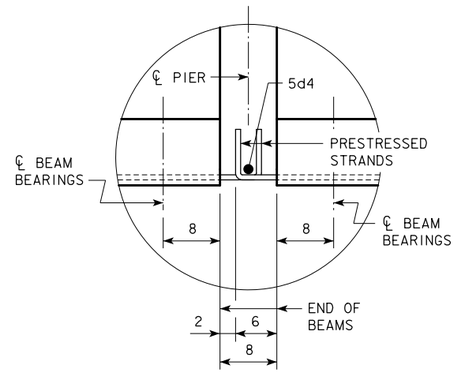
PART END VIEW AT ABUTMENT



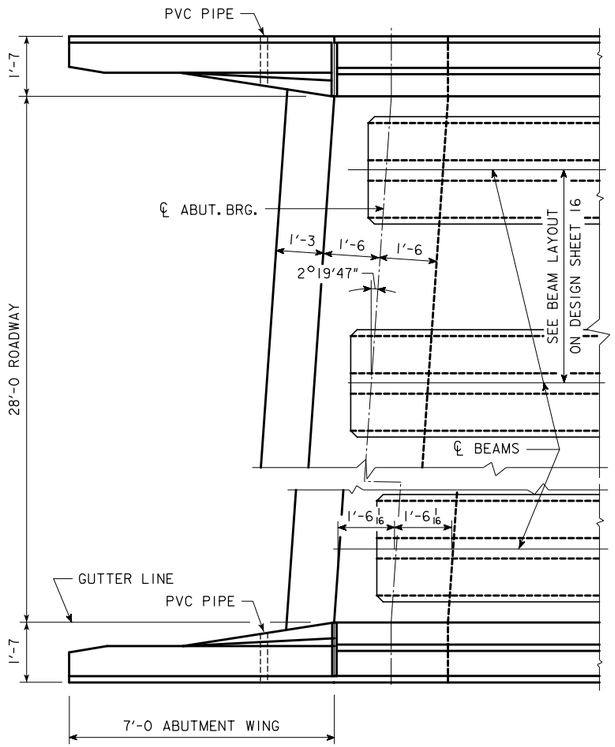
SECTION A-A



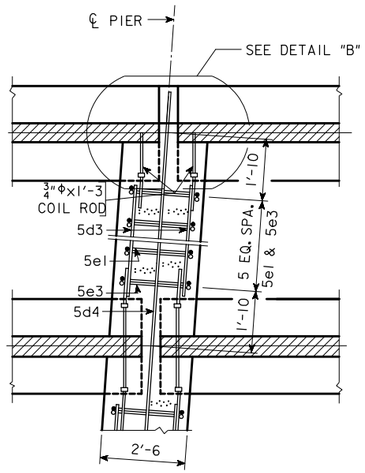
DETAIL "C"



DETAIL "A"



PART PLAN

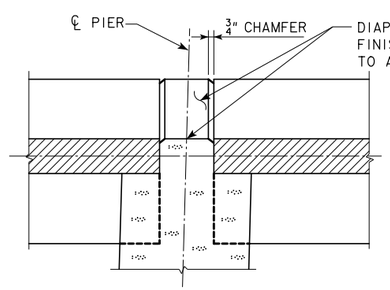


PART SECTION AT PIER

TABLE OF WING ELEVATIONS

LOCATION	DIM "C"	ELEV. A	ELEV. B
SOUTH ABUT. @ WEST GUTTER LINE	1'-1 7/8	960.93	960.93
NORTH ABUT. @ WEST GUTTER LINE	1'-1 5/8	959.92	959.87
SOUTH ABUT. @ EAST GUTTER LINE	2'-5 3/8	962.21	962.22
NORTH ABUT. @ EAST GUTTER LINE	2'-5 1/4	961.21	961.17

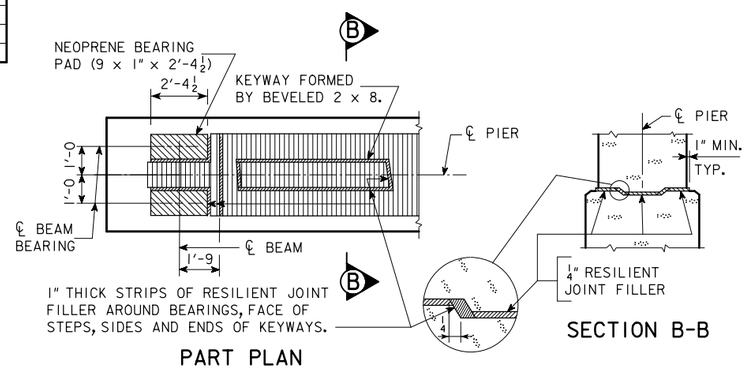
DETAILS SHOWN ON THIS SHEET ARE APPLICABLE TO THE NORTH ABUTMENT AND PIER NO. 1. THE SOUTH ABUTMENT AND PIER NO. 2 ARE SIMILAR BUT OPPOSITE HAND.



DETAIL "B"

PART PLAN AT ENDS OF PIER DIAPHRAGM

NOTE:
THE EXTERIOR SURFACES OF THE EXTERIOR BEAM ENDS OVER THE PIER SHALL NOT BE ROUGHENED.



PART PLAN

SECTION B-B

TOP OF PIER DETAILS

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

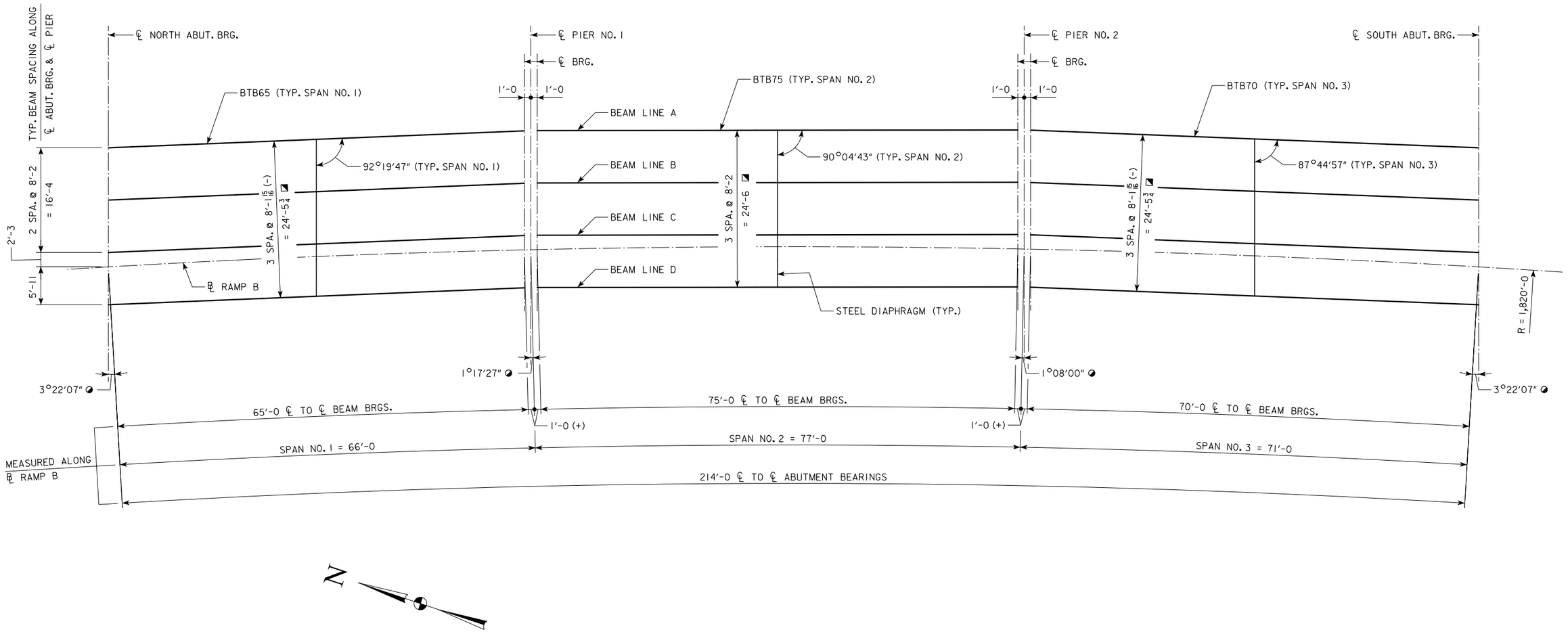
ABUT. & PIER DIAPHRAGM DETAILS

STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

DESIGN TEAM	"BTB" BEAMS - PART PLAN & LONGIT. SECTION - (L.A.) 0°01' - 7°30' SKEW	STANDARD SHEET 450I-BTB (MODIFIED)	POLK COUNTY	PROJECT NUMBER	SHEET NUMBER 16



BEAM LAYOUT

NOTES:
- ◕ MEASURED PERPENDICULAR TO LOCAL TANGENT OF ℄ RAMP B.
- ◪ MEASURED PERPENDICULAR TO ℄ BEAM.

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

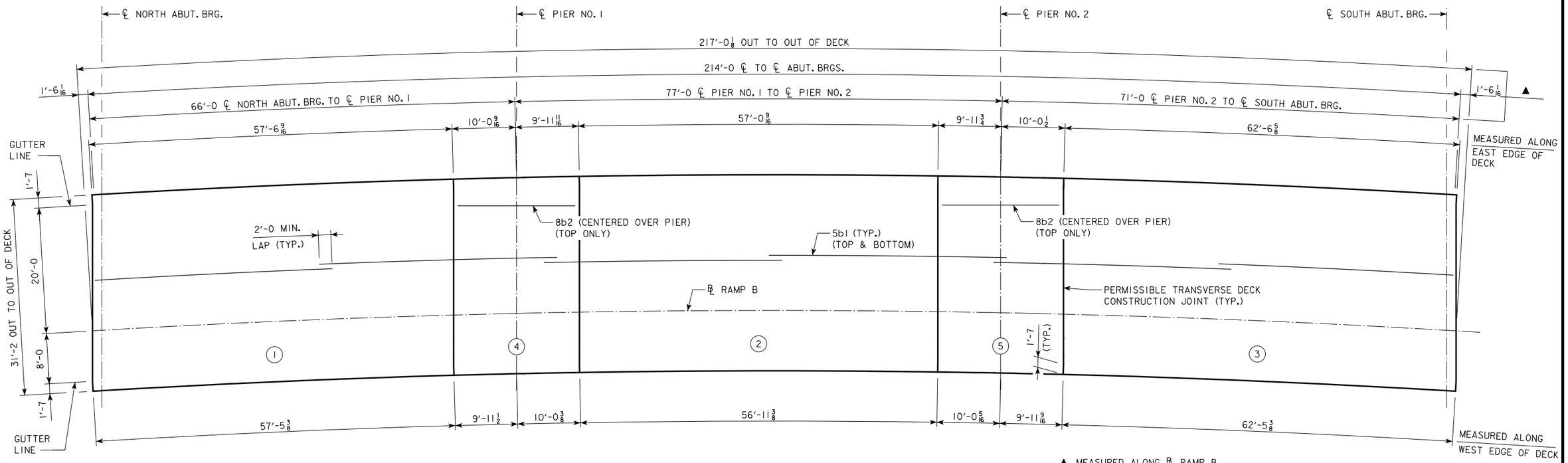
BEAM LAYOUT

STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

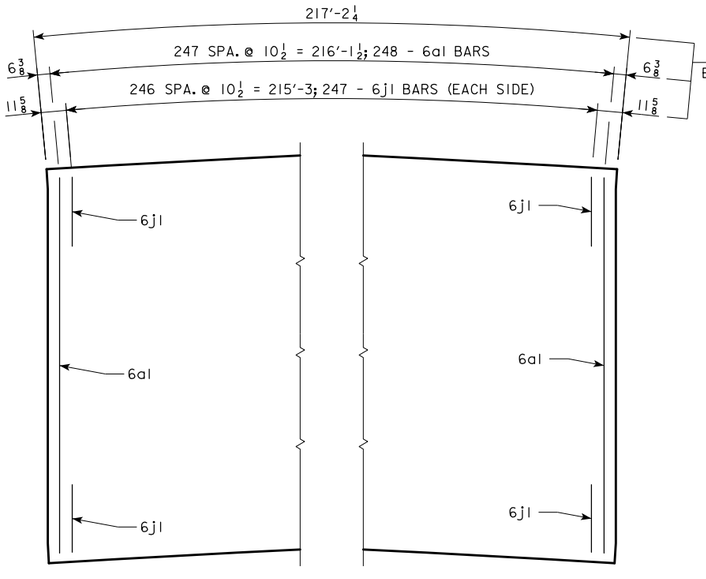
POLK COUNTY

[redacted]

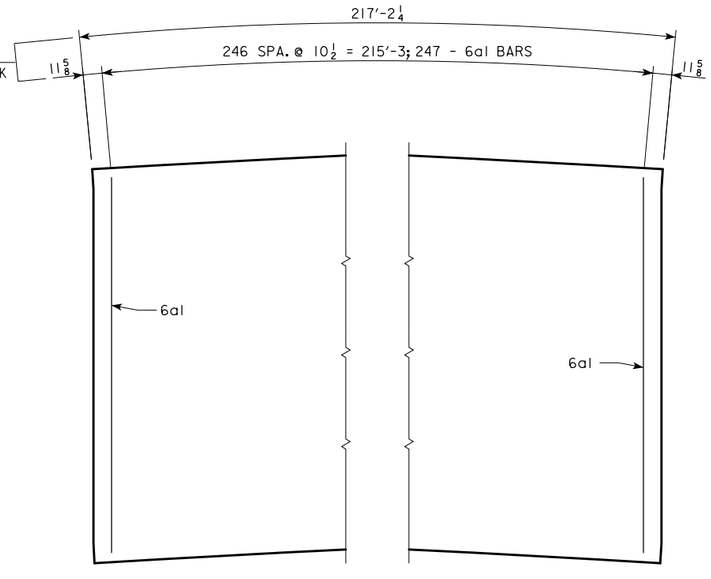
DESIGN TEAM [redacted] POLK COUNTY PROJECT NUMBER [redacted] SHEET NUMBER 17



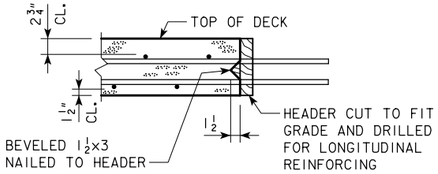
CONCRETE PLACEMENT DIAGRAM & LONGITUDINAL REINFORCING LAYOUT



TOP TRANSVERSE REINFORCING LAYOUT



BOTTOM TRANSVERSE REINFORCING LAYOUT



PERMISSIBLE TRANSVERSE DECK CONSTRUCTION JOINT

NOTES:

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

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

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

DECK PLAN & REINFORCING

STA. 3259+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

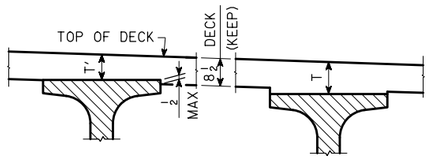
[redacted]

DESIGN TEAM [redacted] POLK COUNTY PROJECT NUMBER [redacted] SHEET NUMBER 18

CONCRETE PLACEMENT QUANTITIES

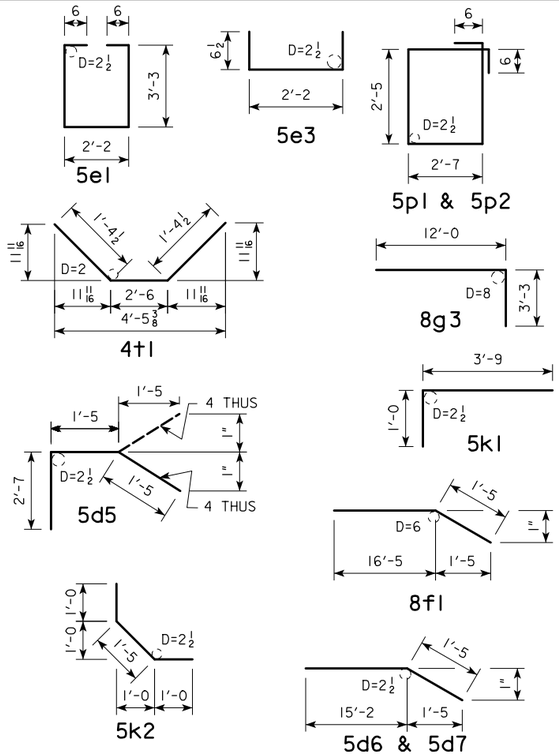
LOCATION	QUANTITY
SECTION 1, DECK & ABUT. DIAPH.	63.0
SECTION 2, DECK	49.5
SECTION 3, DECK & ABUT. DIAPH.	67.0
SECTION 4, DECK & PIER DIAPH.	24.2
SECTION 5, DECK & PIER DIAPH.	24.3
TOTAL (CU. YDS.)	228.0

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



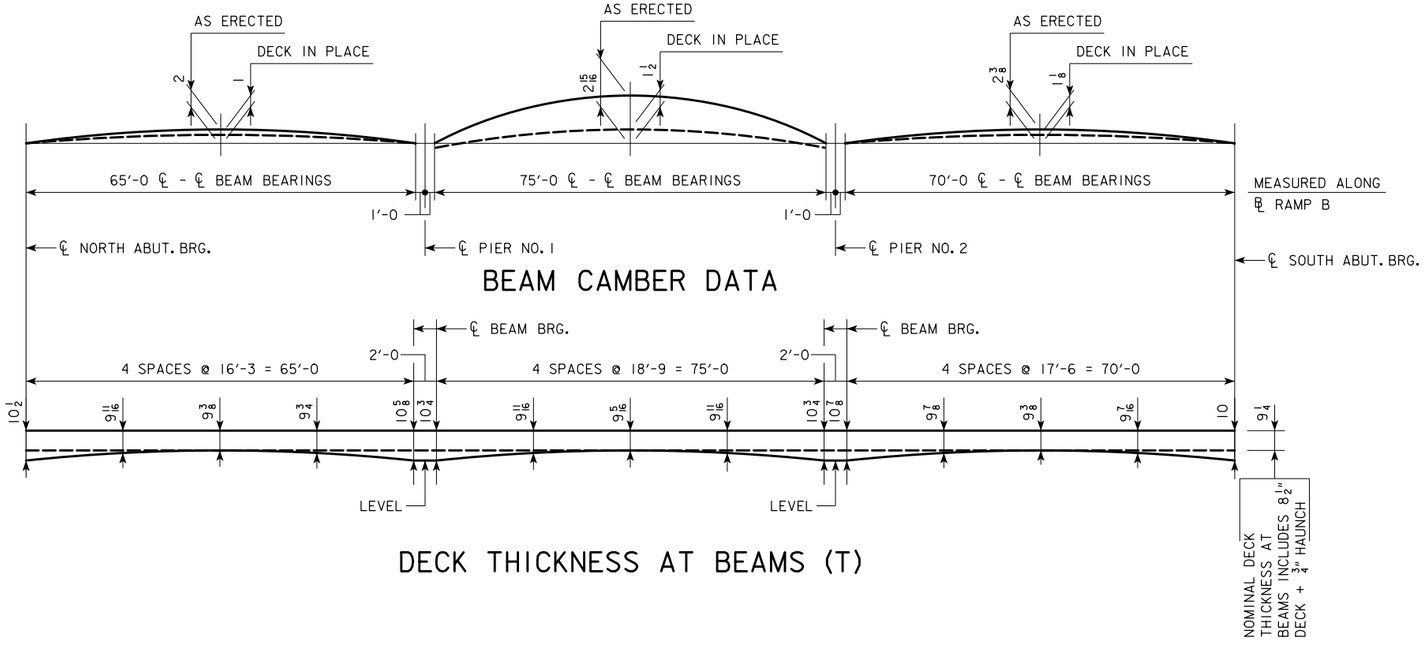
DECK THICKNESS DETAILS

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



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

BENT BAR DETAILS



BEAM CAMBER DATA

DECK THICKNESS AT BEAMS (T)

REINFORCING BAR LIST

	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STAINLESS	6a1	DECK TRANSV. TOP & BOTT.	——	495	30'-10	22,924
	5b1	DECK LONGIT. TOP & BOTT.	——	426	37'-10	16,810
	8b2	DECK LONGIT. TOP AT PIERS	——	64	19'-8	3,361
	8g3	ABUT. DIAPH. VERT. B.F.	⌐	52	15'-3	2,117
	6j1	TOP OF DECK TRANSV. (AT RAIL)	——	494	6'-3	4,637
		REINFORCING STEEL STAINLESS - TOTAL (LBS.)				49,849
EPOXY COATED REINFORCING	5d2	PIER & ABUT. DIAPH. LONGIT.	——	36	7'-3	272
	5d3	PIER & ABUT. DIAPH. LONGIT.	——	18	5'-5	102
	5d4	PIER DIAPH. LONGIT.	——	2	26'-8	56
	5d5	ABUT. DIAPH. ENDS	⌐	8	5'-5	45
	5d6	ABUT. DIAPH. LONGIT. B.F.	⌐	12	16'-7	208
	5d7	PAVING NOTCH LONGIT.	⌐	8	16'-7	138
	5e1	PIER DIAPH. HOOPS	⊏	36	9'-8	363
	5e3	PIER DIAPH. TIES	⌐	36	3'-3	122
	8f1	ABUT. FOOTING LONGIT. BOTH F.	⌐	36	17'-10	1,714
	8g1	ABUT. VERT. BOTH F.	——	112	7'-2	2,143
	5h2	ABUT. TO WING ANCHOR	——	56	4'-11	287
	5k1	PAVING NOTCH	⌐	56	4'-9	277
	5k2	PAVING NOTCH	⌐	56	3'-5	200
	5p1	ABUT. HOOPS	□	84	11'-0	964
	5p2	ABUT. HOOPS AT ENDS	□	8	11'-0	92
	4t1	UNDER BEAMS AT ABUTMENTS	⌐	8	5'-3	28
		REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)				7,011
NON-COATED	#2	PILE SPIRAL	⌀	16	38'-6	103
		SPIRAL SPACERS, L ⅞ × ⅞ × ⅛ × 0.70	——	48	1'-10	62
		REINFORCING STEEL - TOTAL (LBS.)				165

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

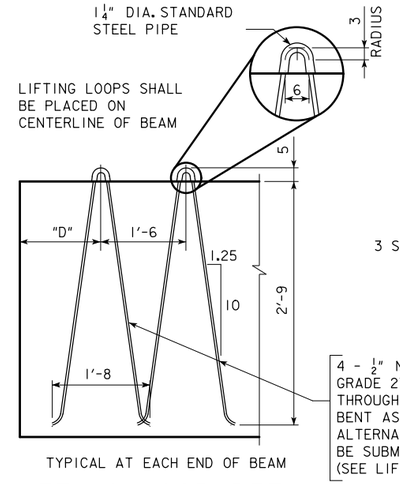
66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

SUPERSTRUCTURES DETAILS

STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

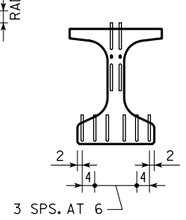
[redacted]



TYPICAL AT EACH END OF BEAM

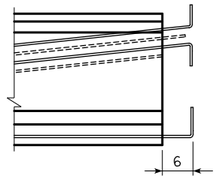
4 - ½" NOMINAL DIA. GRADE 270 STRANDS THREADED THROUGH EACH PIPE SLEEVE BENT AS SHOWN AFTER THREADING. ALTERNATE LIFTING DEVICES MAY BE SUBMITTED FOR APPROVAL (SEE LIFTING LOOP TABLE).

LIFTING LOOP DETAIL



3 SPS. AT 6

THE TOP AND BOTTOM FOR 2 ROWS OR THE TOP AND 3rd ROWS OF DEFLECTED STRANDS ARE TO BE CUT WITH 1'-6 PROJECTIONS WHICH ARE TO BE SHOP BENT AS SHOWN. THE SECOND ROW IS TO BE CUT WITH A 5" PROJECTION AND THE REMAINING TOP DEFLECTED STRANDS IN ROWS 4 AND BELOW ARE TO BE CUT FLUSH WITH BEAM FACE. 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

LIFTING LOOP AND OVERHANG TABLE

BEAMS	LIFTING LOOPS EACH END	# OF STRANDS PER LOOP	D	BEAM OVERHANG (FT)
BTB65-BTB75	1	4	2'-0	**

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

LIFTING LOOPS SHALL CARRY LOADS EQUALLY.

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.

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.

BTB BEAM DATA

BTB 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)
BTB65	65'-0	66'-4	4.5	5.0	0.60	18	2	851	8.0	1.13	2.01	0.83	0.21	8'-2	21.8	10.8	1586
BTB70	70'-0	71'-4	5.0	5.5	0.60	20	2	936	7.4	1.32	2.35	1.06	0.26	8'-2	23.5	11.6	1674
BTB75	75'-0	76'-4	5.5	6.5	0.60	22	4	1106	13.0	1.65	2.92	1.28	0.32	8'-2	25.1	12.4	1764

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A SLAB (8.5 in) AND HAUNCH (1.5 in) WEIGHT OF:
0.92 kips/ft FOR 8'-2 BEAM SPACING
AND ONE STEEL DIAPHRAGM (0.500 kips) AT ℄ OF SPAN.
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 in².

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

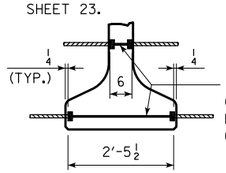
NOTE:
THE EXTERIOR SURFACES OF THE EXTERIOR (FASCIA) BEAM ENDS OVER THE PIER SHALL NOT BE ROUGHEND.

NOTE:
FOR MODIFIED STIRRUP EXTENSIONS, SEE "BENT BAR DETAILS" AND BEAM DETAILS SHEET FOR DIMENSIONS AND LOCATIONS.

BEAM NOTES:

THESE BEAMS ARE DESIGNED FOR AASHTO LIVE LOADS AS INDICATED IN ABOVE TABLE WITH AN ALLOWANCE OF 20 LBS PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.
ALL PPC BEAMS SHALL USE HIGH PERFORMANCE CONCRETE (HPC) IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
HOLD DOWN POINTS FOR DEFLECTED STRANDS MAY BE MOVED TOWARD ENDS OF BEAM A DISTANCE OF 0.05 L MAXIMUM AT PRODUCER'S OPTION.
ALL PRESTRESSING STRANDS EXCEPT LIFTING LOOP STRANDS SHALL BE 0.60 in. NOMINAL DIAMETER (NOMINAL STEEL AREA = 0.217 in²) AND CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS. MINIMUM STRAND BREAKING STRENGTH SHALL BE 58.6 kips.
TOPS OF BEAMS ARE TO BE STRUCK OFF LEVEL AND FINISHED AS PER MATERIALS IM570.
BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.
BEAMS TO BE USED IN BRIDGES MADE CONTINUOUS BY THE POURED IN PLACE FLOOR, ARE TO BE AT LEAST 28 DAYS OLD BEFORE THE FLOOR IS PLACED UNLESS A SHORTER CURING TIME IS APPROVED BY THE BRIDGE ENGINEER.
THE PORTIONS OF THE PRESTRESSED BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT AND PIER DIAPHRAGMS SHALL BE ROUGHENED FOR A DISTANCE OF 10" FROM THE BEAM END BY SANDBLASTING OR OTHER APPROVED METHODS TO PROVIDE SUITABLE BOND BETWEEN THE BEAM AND THE DIAPHRAGM IN ACCORDANCE WITH ARTICLE 2403.03, I, OF THE STANDARD SPECIFICATIONS.
ALL BEAMS ARE TO BE INCREASED IN LENGTH TO COMPENSATE FOR ELASTIC SHORTENING, CREEP AND SHRINKAGE.
FOR TRANSPORTING, THE ALLOWABLE OVERHANG IS SHOWN IN THE LIFTING LOOP AND OVERHANG TABLE.
HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.
MINIMUM CONCRETE f'c (AT 28 DAYS) AND MINIMUM f'ci AT RELEASE ARE LOCATED IN THE BTB 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.

NUMBER AND EXACT LOCATION OF COIL TIES TO BE AS DETAILED ON DESIGN SHEET 23.



COIL TIE DETAIL

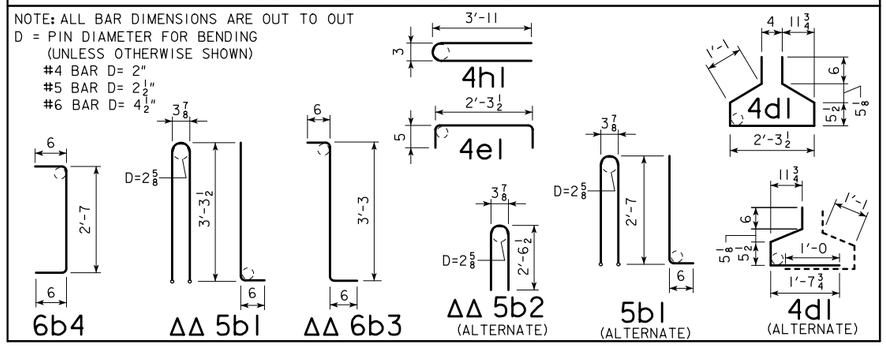
ΔΔ 5b1 AND 6b3 BARS TO BE EPOXY COATED
✱ 6b3 AND 6b4 BARS TO BE USED IN PAIRS
◕ STANDARD BAR LENGTH WAS INCREASED TO SATISFY THE REQUIRED PROJECTION INTO THE DECK.

REINFORCING BAR LIST

	BEAM		BTB65		BTB70		BTB75		
	BAR	SHAPE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	
	5a1	—	12	34'-2	12	36'-8	12	39'-2	
	5a2	—	—	—	—	—	—	—	
ΔΔ ◕	5b1	⊂⊃	49	7'-9	53	7'-9	57	7'-9	◕ ΔΔ
ΔΔ ✱ ◕	6b3	⊓	36	4'-3	32	4'-3	32	4'-3	◕ ΔΔ ✱
✱	6b4	⊓	4	3'-7	8	3'-7	8	3'-7	✱
	4c1	—	83	2'-7	89	2'-7	95	2'-7	
	4d1	◺	69	6'-5	73	6'-5	77	6'-5	
	4e1	⊓	24	3'-2	24	3'-2	24	3'-2	
	4h1	⊂⊃	4	8'-0	4	8'-0	4	8'-0	

BENT BAR DETAILS

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



DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

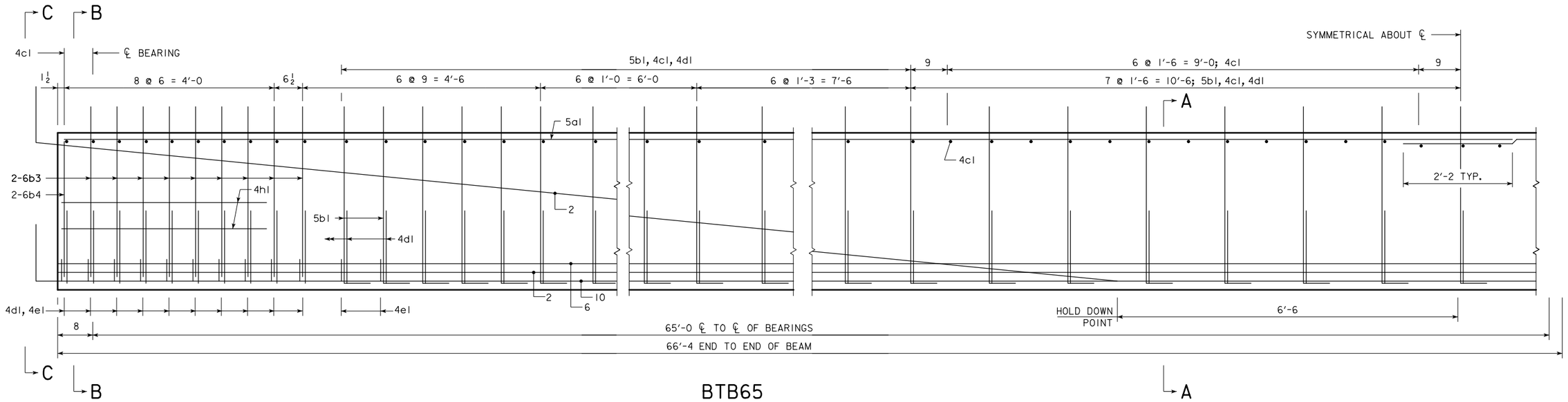
214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

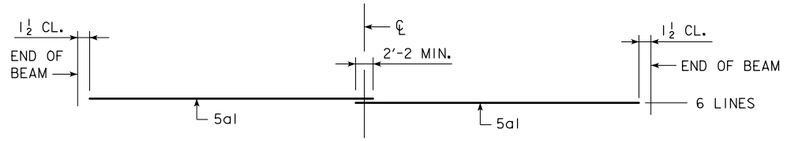
BTB BEAM DETAILS

STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY



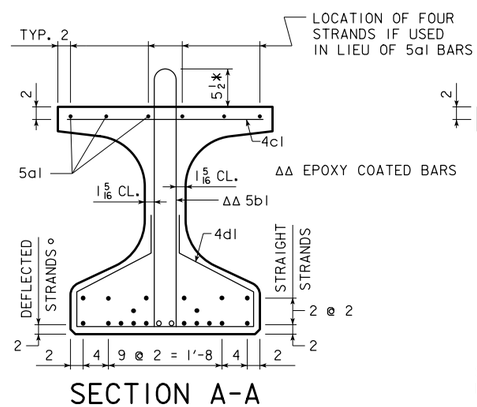
BTB65



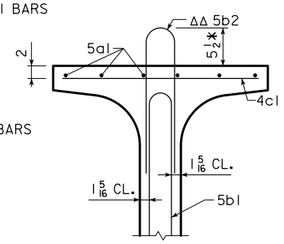
TOP FLANGE LONGITUDINAL BAR LAYOUT

NOTE: STIRRUP EXTENSION

* THE STANDARD 5″ PROJECTION HAS BEEN INCREASED.

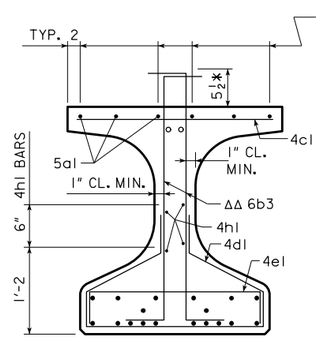


SECTION A-A



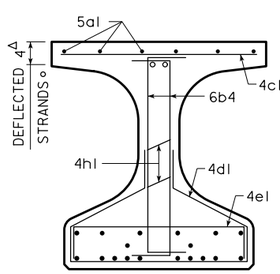
SECTION A-A (ALTERNATE)

SEE ALTERNATE BAR NOTE ON DESIGN SHEET 19.

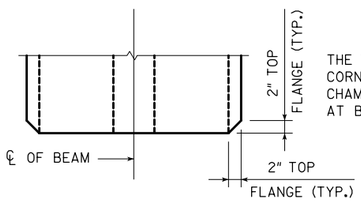


SECTION B-B

Δ DIMENSIONS AT END OF BEAM



SECTION C-C

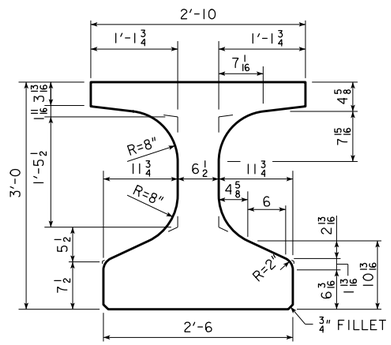


TOP VIEW

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

AREA = 631.7 in²
$\bar{y}_b$ = 17.14 in.
I = 99,980 in⁴

BEAM SECTION PROPERTIES



BTB BEAM CROSS SECTION

DESIGN FOR VARIABLE SKEW RADIUS = 1,820′

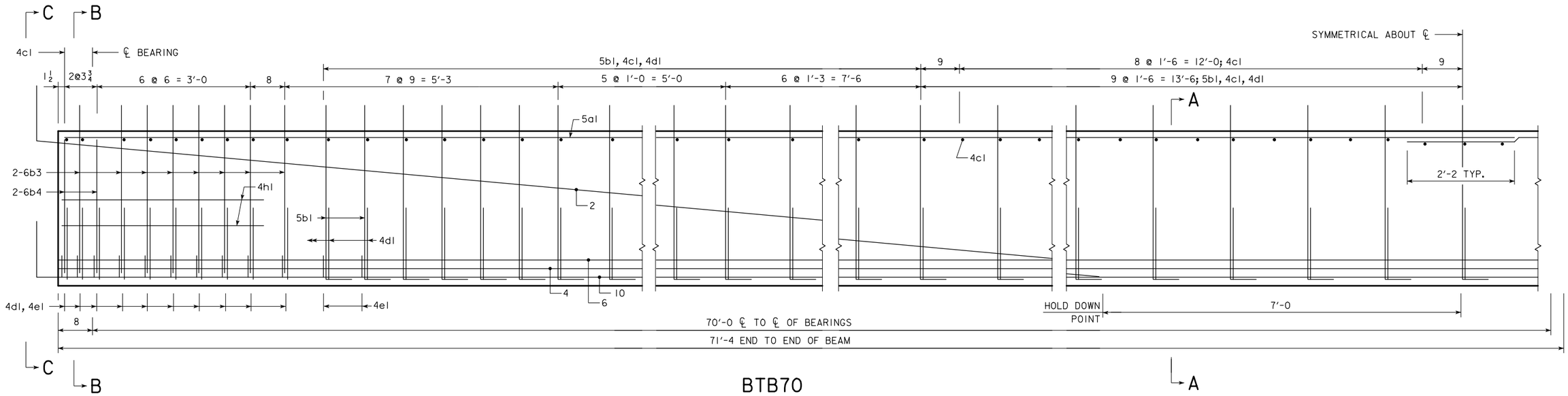
214′-0 X 28′-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66′-0 & 71′-0 END SPANS 77′-0 INTERIOR SPAN

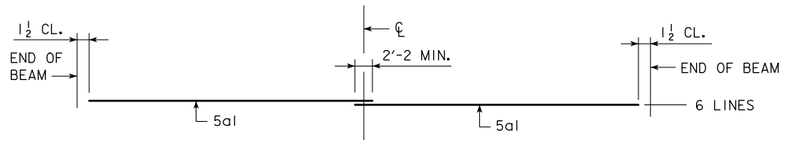
BTB65 BEAM DETAILS

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY



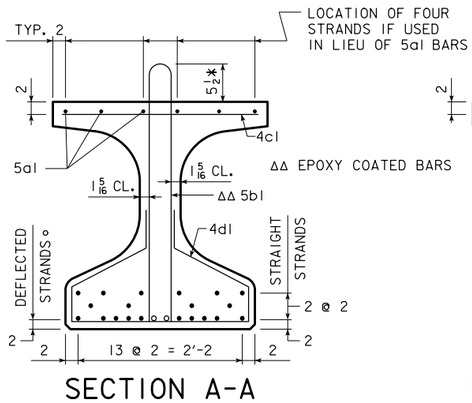
BTB70



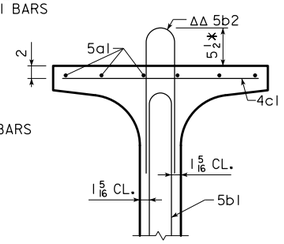
TOP FLANGE LONGITUDINAL BAR LAYOUT

NOTE: STIRRUP EXTENSION

* THE STANDARD 5" PROJECTION HAS BEEN INCREASED.

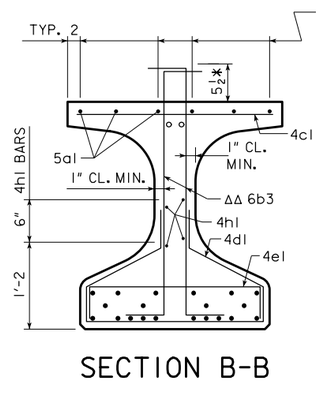


SECTION A-A



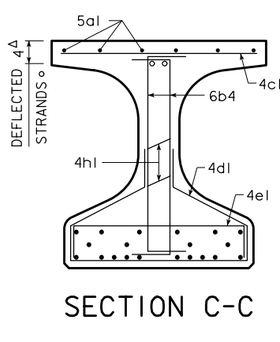
SECTION A-A (ALTERNATE)

SEE ALTERNATE BAR NOTE ON DESIGN SHEET 19.

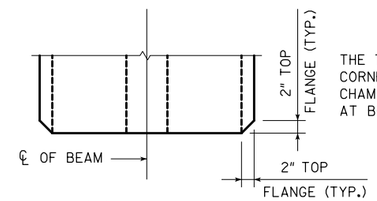


SECTION B-B

Δ DIMENSIONS AT END OF BEAM



SECTION C-C

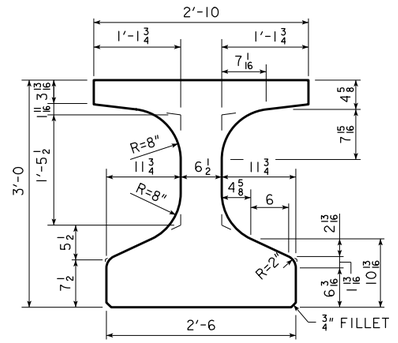


TOP VIEW

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

AREA = 631.7 in²
ȳb = 17.14 in.
I = 99,980 in⁴

BEAM SECTION PROPERTIES



BTB BEAM CROSS SECTION

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

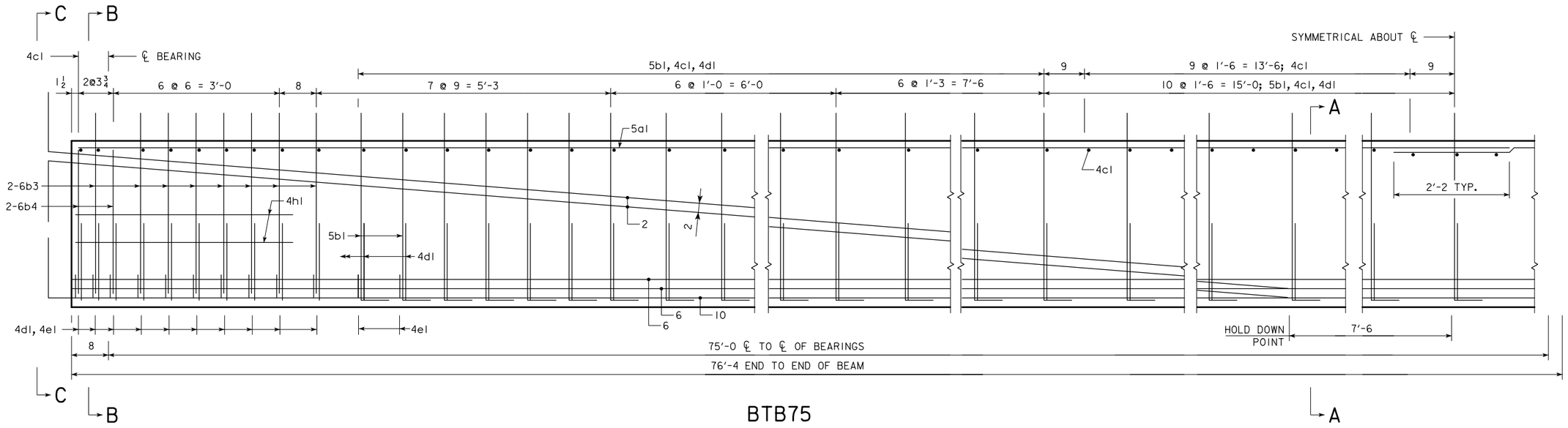
66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

BTB70 BEAM DETAILS

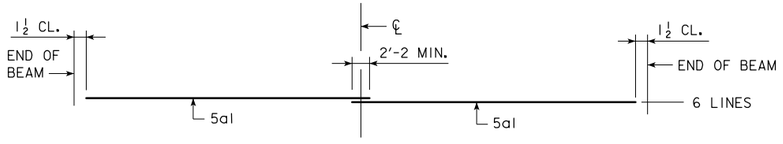
STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]



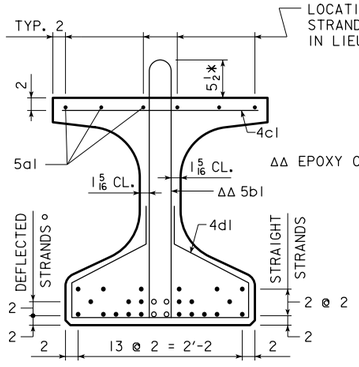
BTB75



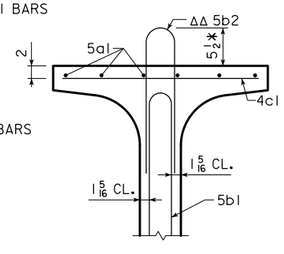
TOP FLANGE LONGITUDINAL BAR LAYOUT

NOTE: STIRRUP EXTENSION

* THE STANDARD 5" PROJECTION HAS BEEN INCREASED.

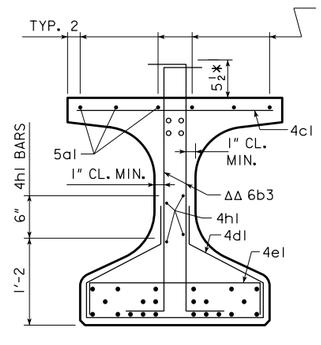


SECTION A-A



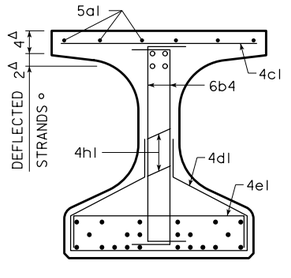
SECTION A-A (ALTERNATE)

SEE ALTERNATE BAR NOTE ON DESIGN SHEET 19.

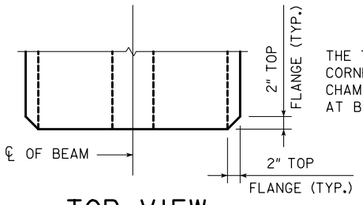


SECTION B-B

Δ DIMENSIONS AT END OF BEAM



SECTION C-C

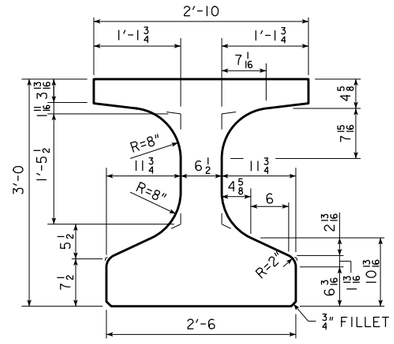


TOP VIEW

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

AREA = 631.7 in²
$\bar{y}_b$ = 17.14 in.
I = 99,980 in⁴

BEAM SECTION PROPERTIES



BTB BEAM CROSS SECTION

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

BTB75 BEAM DETAILS

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

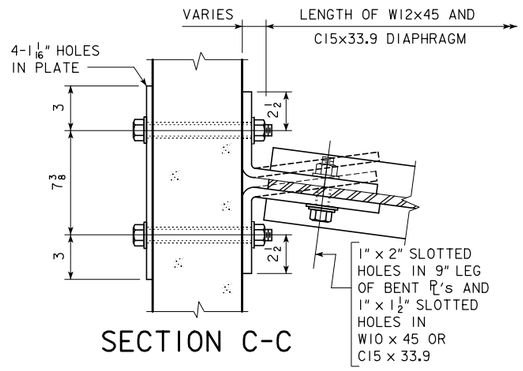
DESIGN TEAM [redacted]	BULB TEE "B" BEAM - 75'-0 SPAN	STANDARD SHEET 4760 (MODIFIED)	POLK COUNTY	PROJECT NUMBER [redacted]	SHEET NUMBER 23

BULB TEE "B" BEAM INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL

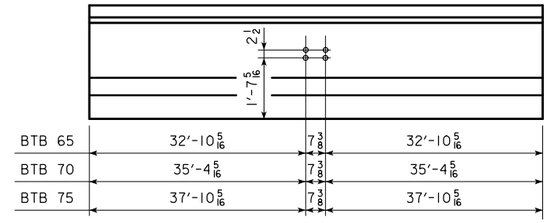
ONE BEAM CONNECTION (DETAIL "D", "E", "F", OR "G")		NO. OF BEAM CONNECTIONS	WEIGHT
$4 - \frac{7}{8}"\Phi \times 9\frac{1}{4}$ H.S. BOLTS WITH NUTS & WASHERS = 9.6 LBS.		12	115
ONE DETAIL "E"	2 - BENT PL $9 \times 6 \times \frac{1}{2} \times 0'\text{-}11$ = 46.8 LBS.	2	94
	2 - BENT PL $9 \times 6 \times \frac{1}{2} \times 0'\text{-}5$ = 21.3 LBS.	2	43
ONE DETAIL "D"	1 - BACKING PL $5 \times \frac{3}{8} \times 1'\text{-}1\frac{3}{8}$ = 7.1 LBS.	2	14
	2 - BENT PL $9 \times 6 \times \frac{1}{2} \times 0'\text{-}5$ = 21.3 LBS.	2	43
ONE DETAIL "G"	4 - BENT PL $9 \times 6 \times \frac{1}{2} \times 0'\text{-}11$ = 93.6 LBS.	4	374
ONE DETAIL "F"	1 - BACKING PL $5 \times \frac{3}{8} \times 1'\text{-}1\frac{3}{8}$ = 7.1 LBS.	4	28
	2 - BENT PL $9 \times 6 \times \frac{1}{2} \times 0'\text{-}11$ = 46.8 LBS.	4	187
ONE DIAPHRAGM			
		NUMBER OF DIAPHRAGMS	
$6 - \frac{7}{8}"\Phi \times 3"$ H.S.BOLTS WITH NUTS & WASHERS = 7.8 LBS.		7	55
$4 - \frac{7}{8}"\Phi \times 3"$ H.S.BOLTS WITH NUTS & WASHERS = 5.2 LBS.		2	10
$18 - \frac{7}{8}"\Phi \times 2"$ H.S.BOLTS WITH NUTS & WASHERS = 16.8 LBS.		2	34
$4 - \frac{7}{8}"\Phi \times 2"$ H.S.BOLTS WITH NUTS & WASHERS = 4.0 LBS.		2	8
$2 - \text{PL } 6\frac{1}{2} \times \frac{3}{8} \times 1'\text{-}2$ = 19.3 LBS.		2	39
$4 - \text{PL } 6\frac{1}{2} \times \frac{1}{8} \times 1'\text{-}2$ = 12.9 LBS.		2	26
	LENGTH OF MEMBER		
1 - W12 x 45 = 45 LBS./FT.	$6'\text{-}11\frac{3}{4}$	2	628
1 - C15 x 33.9 = 33.9 LBS./FT.	$6'\text{-}11\frac{3}{4}$	7	1,656
1 - W14 x 38 = 38 LBS./FT.	$5'\text{-}7\frac{1}{4}$	2	426
INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL - TOTAL (LBS.)			3,780

STRUCTURAL STEEL	
WEIGHT	3,780 LBS.

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



SECTION C-C



BTB 65	32'-10 5/16	7 3/8	32'-10 5/16
BTB 70	35'-4 5/16	7 3/8	35'-4 5/16
BTB 75	37'-10 5/16	7 3/8	37'-10 5/16

INTERMEDIATE DIAPHRAGM BOLT HOLE LOCATIONS

NOTES:

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

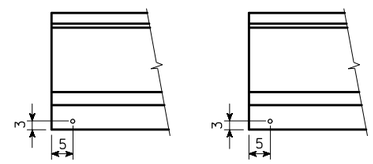
SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.

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

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

THE $\frac{7}{8}"\Phi$ H.S. BOLTS THROUGH THE WEB SHALL HAVE A THREAD LENGTH OF 3" MIN. AND 4" MAX. AND SHALL MEET THE REQUIREMENTS OF ASTM A449.

ALL BOLTS ARE TO BE TIGHTENED PRIOR TO PLACING BRIDGE FLOOR CONCRETE.



INTEGRAL ABUT. FIXED PIER

BEAM COIL TIE LOCATIONS

NOTE:
FOR LOCATION OF SECTION C-C, SEE DESIGN SHEET 24.

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

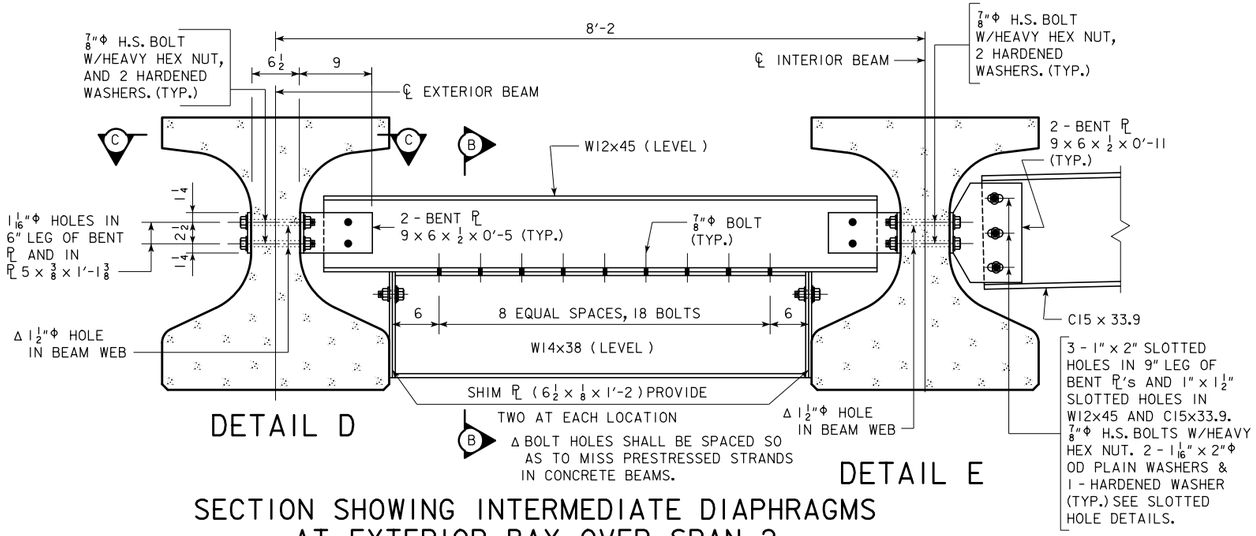
66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

STEEL DIAPHRAGM DETAILS

STA. 3259+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

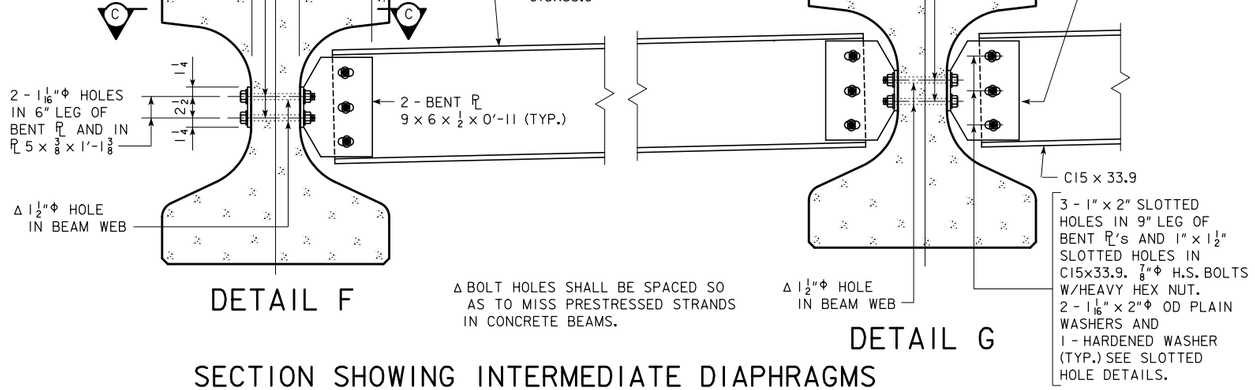


DETAIL D

DETAIL E

SECTION SHOWING INTERMEDIATE DIAPHRAGMS AT EXTERIOR BAY OVER SPAN 2

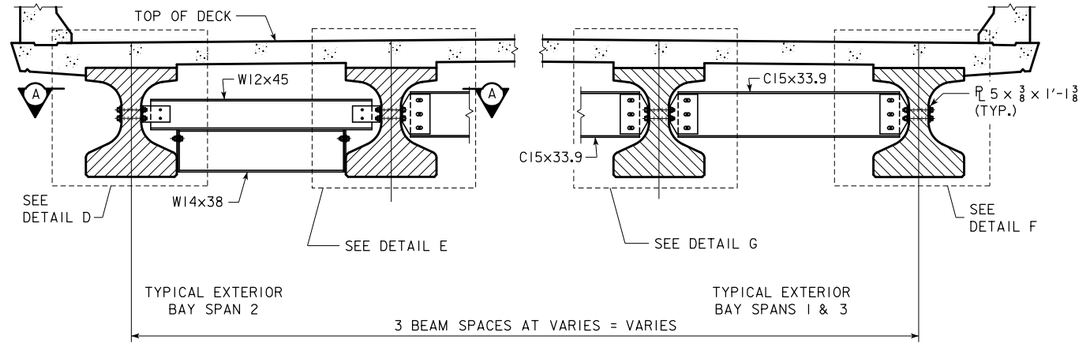
NOTE:
FOR SECTION C-C, SEE DESIGN SHEET 23.



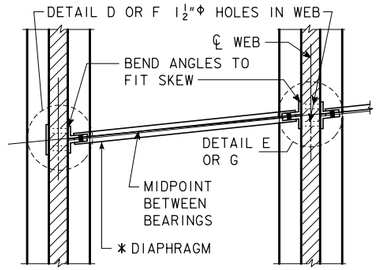
DETAIL F

DETAIL G

SECTION SHOWING INTERMEDIATE DIAPHRAGMS AT EXTERIOR BAY OVER SPANS 1 & 3

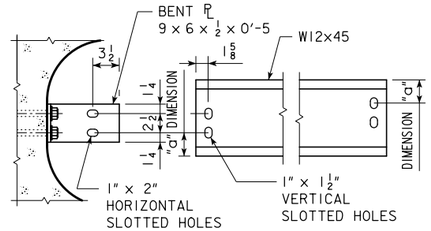


SECTION SHOWING INTERMEDIATE DIAPHRAGMS



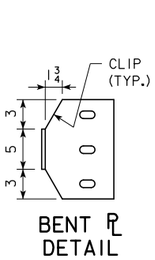
PART SECTION A-A

* NOTE: THE W 14 x 38 WILL REQUIRE BEVELED ENDS TO MATCH THE SKEW.

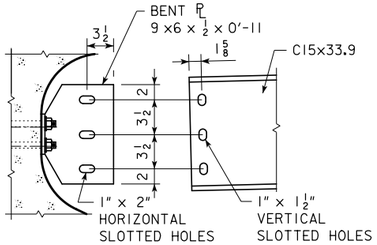


NOTE: "a" DIMENSION MUST BE EQUAL.

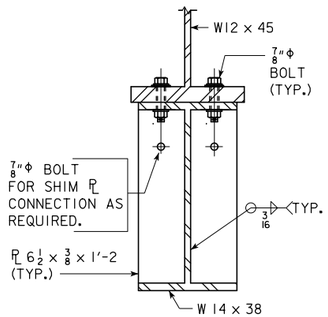
SLOTTED HOLE DETAILS



BENT PL DETAIL



SLOTTED HOLE DETAILS



SECTION B-B

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

STEEL DIAPHRAGM DETAILS

STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

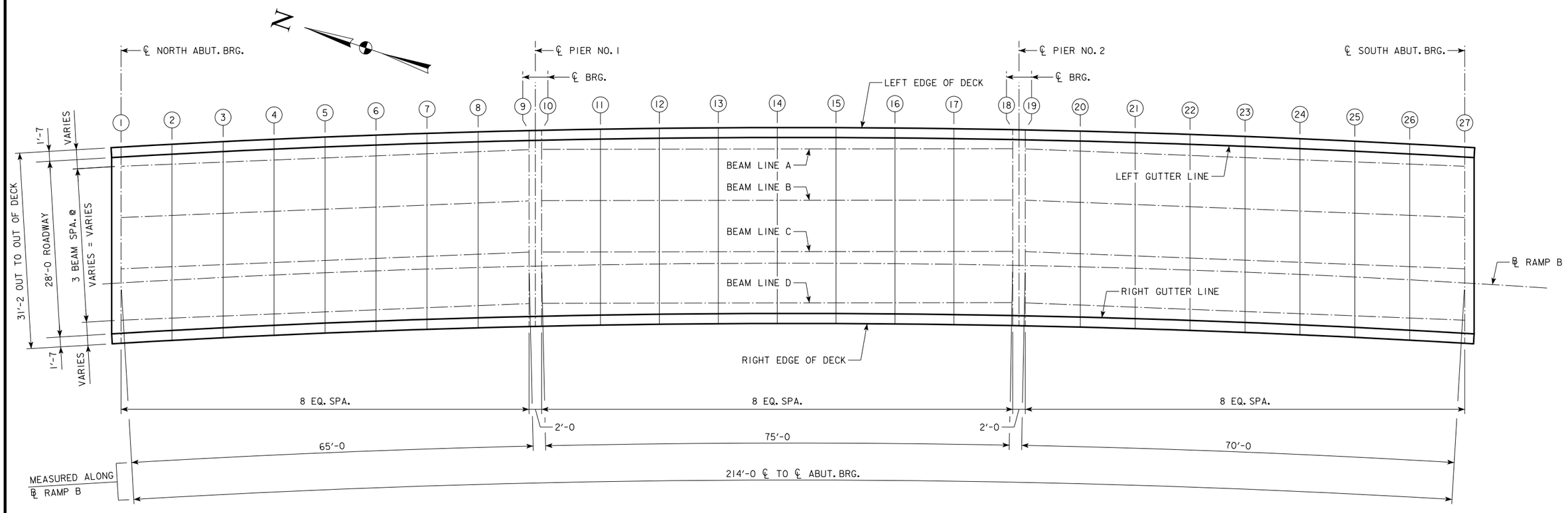
POLK COUNTY

[redacted]

BENCH MARK NO. 26: NORTHING: 604283.735, EASTING: 1624489.540, ELEV. 886.700, FENO. MONUMENT, W/CAP STAMPED "026", 6" DEEP, IN THE NORTH ROW/SHOULDER OF NE 54TH AVE., 9' NORTH OF EDGE AC SLAB; 128' FROM P.I. OF NE 54TH AVE. WITH OF RR CROSSING.

TABLE OF TOP OF DECK ELEVATIONS

	℄ NORTH ABUT. BRG.								℄ PIER NO. 1 BEARINGS									℄ PIER NO. 2 BEARINGS								℄ SOUTH ABUT. BRG.
POINT / LINE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
LEFT EDGE OF DECK	961.30	961.35	961.40	961.45	961.51	961.56	961.61	961.66	961.72	961.73	961.79	961.84	961.89	961.94	961.99	962.03	962.07	962.11	962.11	962.15	962.17	962.20	962.22	962.24	962.26	962.27	962.28
LEFT GUTTER LINE	961.22	961.28	961.33	961.38	961.43	961.49	961.54	961.59	961.64	961.66	961.71	961.77	961.82	961.87	961.92	961.96	962.00	962.03	962.04	962.07	962.10	962.13	962.15	962.17	962.19	962.20	962.21
BEAM LINE A	961.16	961.20	961.25	961.30	961.35	961.41	961.46	961.52	961.58	961.59	961.64	961.69	961.74	961.79	961.83	961.88	961.92	961.97	961.98	962.00	962.02	962.05	962.07	962.09	962.11	962.13	962.14
BEAM LINE B	960.78	960.83	960.87	960.92	960.98	961.03	961.08	961.14	961.20	961.21	961.26	961.31	961.36	961.41	961.46	961.50	961.55	961.59	961.60	961.62	961.65	961.67	961.69	961.71	961.73	961.75	961.77
BEAM LINE C	960.40	960.45	960.50	960.55	960.60	960.65	960.71	960.76	960.82	960.84	960.89	960.94	960.99	961.03	961.08	961.13	961.17	961.22	961.23	961.25	961.27	961.30	961.32	961.34	961.36	961.38	961.40
℄ RAMP B	960.30	960.35	960.40	960.46	960.51	960.56	960.61	960.67	960.72	960.73	960.79	960.85	960.90	960.95	961.00	961.04	961.08	961.12	961.12	961.15	961.18	961.21	961.23	961.25	961.27	961.28	961.29
BEAM LINE D	960.02	960.07	960.12	960.17	960.22	960.27	960.33	960.39	960.45	960.46	960.51	960.56	960.61	960.66	960.71	960.75	960.80	960.84	960.85	960.88	960.90	960.92	960.94	960.96	960.98	961.00	961.02
RIGHT GUTTER LINE	959.92	959.98	960.03	960.08	960.14	960.19	960.24	960.30	960.35	960.36	960.42	960.48	960.53	960.58	960.63	960.67	960.71	960.75	960.76	960.79	960.81	960.84	960.86	960.88	960.90	960.91	960.93
RIGHT EDGE OF DECK	959.92	959.98	960.03	960.08	960.14	960.19	960.24	960.30	960.35	960.36	960.42	960.48	960.53	960.58	960.63	960.67	960.71	960.75	960.76	960.79	960.82	960.84	960.86	960.88	960.90	960.91	960.93



TOP OF DECK ELEVATIONS & HAUNCH LOCATIONS

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

TOP OF DECK ELEVATIONS

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

DESIGN TEAM [redacted] POLK COUNTY PROJECT NUMBER [redacted] SHEET NUMBER 26

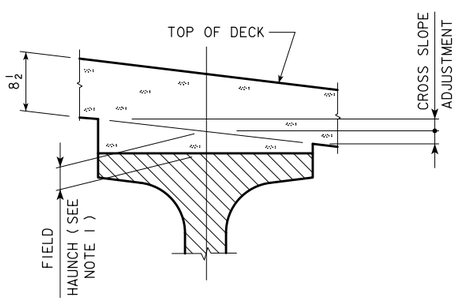
BENCH MARK NO. 26: NORTHING: 604283.735, EASTING: 1624489.540, ELEV. 886.700, FENO. MONUMENT, W/CAP STAMPED "026", 6" DEEP, IN THE NORTH ROW/SHOULDER OF NE 54TH AVE., 9' NORTH OF EDGE AC SLAB; 128' FROM P.I. OF NE 54TH AVE. WITH OF RR CROSSING.

TABLE OF BEAM LINE HAUNCH ELEVATIONS

	℄ NORTH ABUT. BRG.								℄ PIER NO. 1 BEARINGS									℄ PIER NO. 2 BEARINGS								℄ SOUTH ABUT. BRG.
BEAM LINE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
A	960.45	960.53	960.60	960.67	960.73	960.77	960.81	960.84	960.87	960.88	960.98	961.07	961.14	961.20	961.24	961.26	961.26	961.26	961.27	961.33	961.39	961.43	961.46	961.48	961.47	961.46	961.44
B	960.07	960.15	960.22	960.29	960.35	960.40	960.43	960.46	960.49	960.50	960.60	960.69	960.77	960.82	960.86	960.88	960.89	960.88	960.89	960.96	961.01	961.06	961.09	961.10	961.10	961.08	961.06
C	959.69	959.77	959.85	959.91	959.97	960.02	960.06	960.09	960.11	960.13	960.23	960.31	960.39	960.45	960.48	960.51	960.51	960.51	960.52	960.58	960.64	960.68	960.71	960.73	960.72	960.71	960.69
D	959.31	959.39	959.47	959.54	959.59	959.64	959.68	959.71	959.74	959.75	959.85	959.94	960.01	960.07	960.11	960.13	960.14	960.13	960.14	960.21	960.26	960.31	960.34	960.35	960.35	960.34	960.31

MISCELLANEOUS DATA TABLE

	BEAM LINE		℄ NORTH ABUT. BRG.								℄ PIER NO. 1 BEARINGS									℄ PIER NO. 2 BEARINGS								℄ SOUTH ABUT. BRG.
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
ANTICIPATED DEFLECTION DUE TO DECK (IN.)	ALL		0	3/8	11/16	15/16	1	15/16	11/16	3/8	0	0	9/16	1	1 5/16	1 7/16	1 5/16	1	9/16	0	0	1/2	7/8	1 3/16	1 1/4	1 3/16	7/8	1/2	0
CROSS SLOPE ADJUSTMENTS (IN.)	ALL		13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16	13/16
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
			(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)	(0.250)
	MIN.	ALL	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16	5/16
			(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)



HAUNCH DETAIL

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

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

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

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

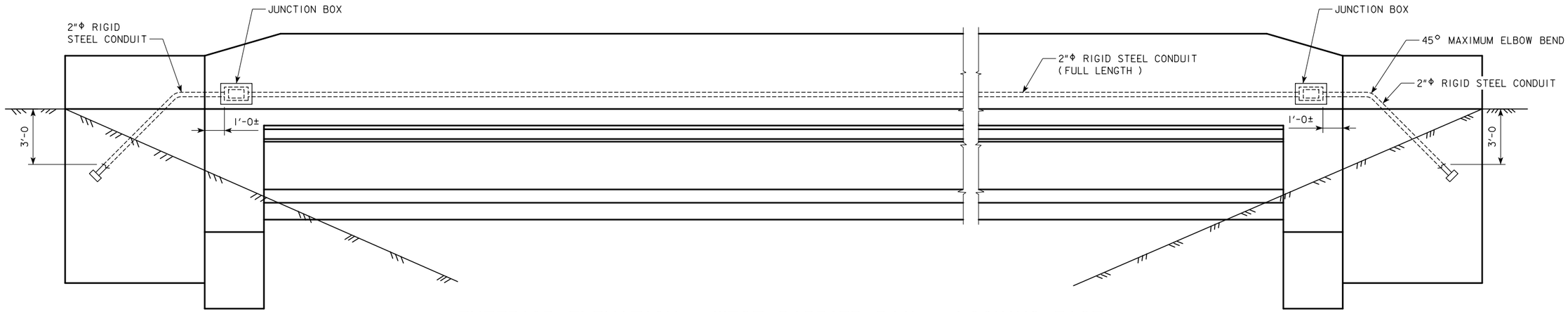
66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

HAUNCH DATA DETAILS

STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

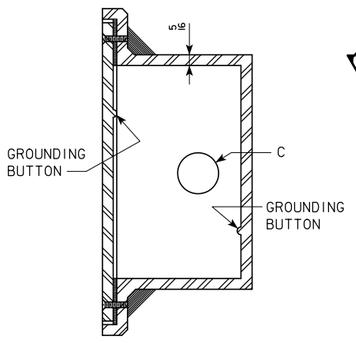
POLK COUNTY

[redacted]

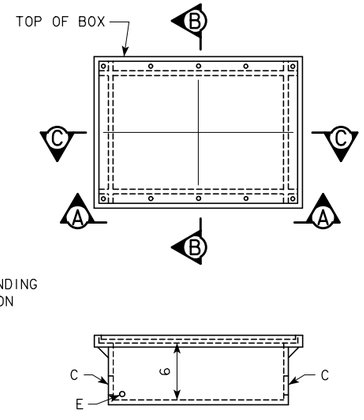


EXTERIOR ELEVATION - WEST BARRIER RAIL - LOOKING EAST

(EAST BARRIER RAIL SIMILAR)



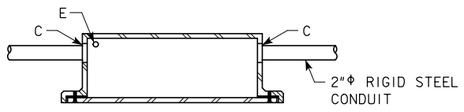
SECTION B-B



VIEW A-A

BOSSED FOR	HOLE	FOR CONDUIT SIZE
5 THREADS	C	2"Φ RIGID STEEL
NONE	E	$\frac{1}{2}$"Φ COPPER PIPE

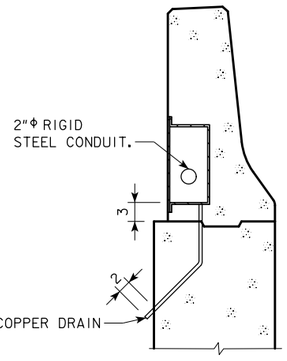
NOTE:
THE GROUNDING BUTTONS ARE TO BE BLIND DRILLED AND TAPPED FOR $\frac{3}{8}$"Φ x 0'-0$\frac{3}{4}$ BOLTS.



SECTION C-C

LI-104 JUNCTION BOX

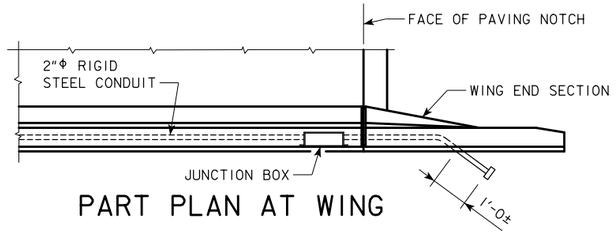
WATERTIGHT, CAST IRON - FLUSH MOUNT



SECTION THRU JUNCTION BOX

LIGHTING NOTES:

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



PART PLAN AT WING

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

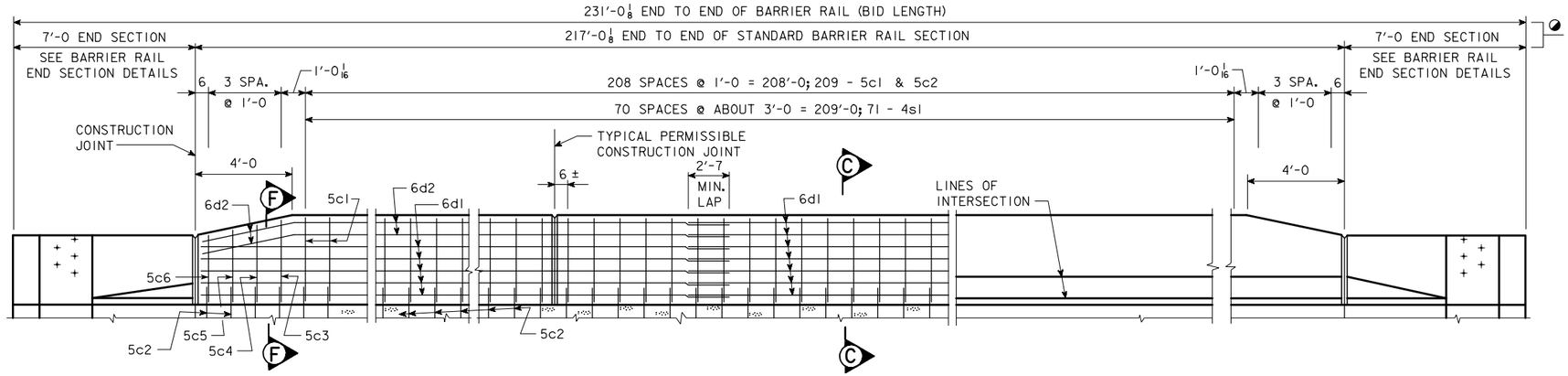
CONDUIT DETAILS

STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]

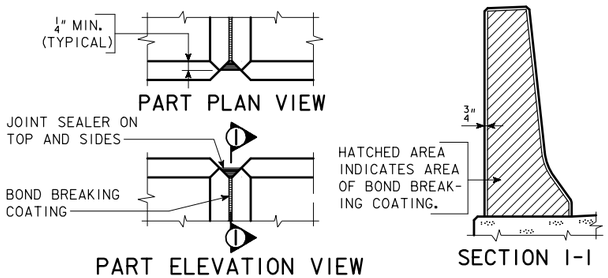
DESIGN TEAM [redacted] | POLK COUNTY | PROJECT NUMBER [redacted] | SHEET NUMBER 28



ELEVATION OF BARRIER RAIL

NOTE:
◒ MEASURED ALONG GUTTER LINE.

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



BARRIER RAIL JOINT DETAILS

BARRIER RAIL NOTES:

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

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

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

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

THE CONCRETE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS. THE NUMBER OF LINEAL FEET OF BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES. PRICE BID FOR 3'-8 CONCRETE BARRIER RAILING SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS. IF CONDUIT IS REQUIRED IN THIS PLAN THE RIGID STEEL CONDUIT, JUNCTION BOXES AND FITTINGS INCLUDING LABOR AND ANY ADDITIONAL WORK TO DO THE INSTALLATION IS CONSIDERED INCIDENTAL TO THE COST OF THE RAILING.

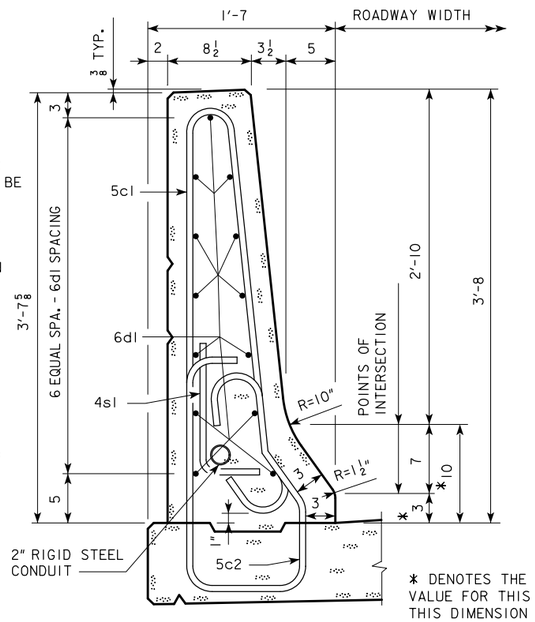
THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.

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

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

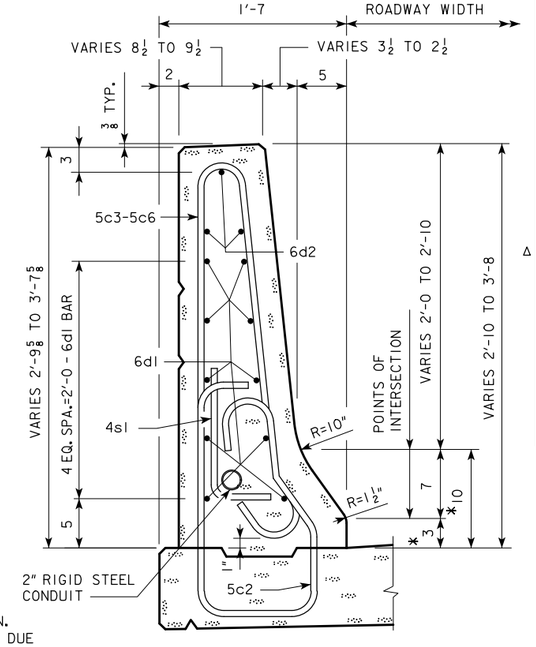
THE GALVANIZED STEEL CONDUIT SHALL BE SECURELY TIED AT EVERY 3'-0 INTERSECTION WITH THE 4s1 BARS TO AVOID CONTACT WITH THE STAINLESS STEEL REINFORCING.

NOTE:
SEE BARRIER RAIL RUSTICATION DETAILS ON DESIGN SHEET 30.



PART SECTION C-C

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



PART SECTION F-F

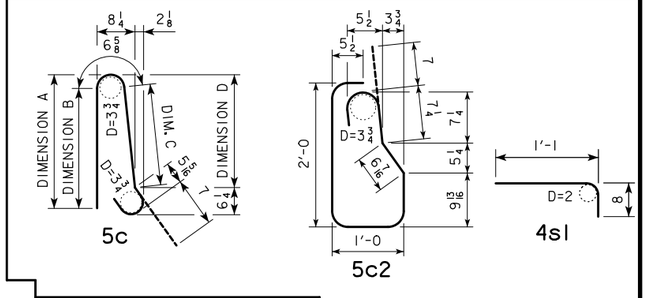
EPOXY COATED REINF. STEEL - TWO RAILS

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	4s1	RAIL, CONDUIT	⌊	142	1'-9	166
					EPOXY STEEL TOTAL (LBS.)	166

STAINLESS STEEL REINF. STEEL - TWO RAILS

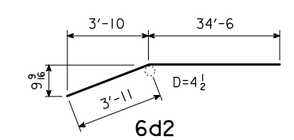
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTIONS	5c1	RAIL, VERTICAL	⌊	418	7'-5	3,233
	5c2	RAIL, VERTICAL	⌈	434	6'-0	2,716
	5c3	RAIL, VERTICAL, SLOPED ENDS	⌊	4	7'-3	30
	5c4	RAIL, VERTICAL, SLOPED ENDS	⌊	4	6'-10	29
	5c5	RAIL, VERTICAL, SLOPED ENDS	⌊	4	6'-5	27
	5c6	RAIL, VERTICAL, SLOPED ENDS	⌊	4	6'-0	25
	6d1	RAIL, LONGITUDINAL	—	144	38'-4	8,291
	6d2	RAIL, LONGIT., TOP SLOPED ENDS	⌒	12	38'-5	692
					STAINLESS STEEL TOTAL (LBS.)	15,043

BENT BAR DETAILS



5c BARS

BAR	DIM. A	DIM. B	DIM. C	DIM. D
5c1	3'-3 13/16	3'-1 5/16	2'-8 1/2	2'-10 9/16
5c3	3'-2 9/16	3'-0	2'-7 1/4	2'-9 5/16
5c4	3'-0 1/16	2'-9 9/16	2'-4 3/4	2'-6 7/8
5c5	2'-9 9/16	2'-7 1/16	2'-2 1/4	2'-4 3/8
5c6	2'-7 1/16	2'-4 9/16	1'-11 7/8	2'-1 7/8



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

CONCRETE PLACEMENT SUMMARY

	SECTION		TOTAL
Δ	STANDARD SECTION	434'-0 @ 0.1281 CU. YD. PER FT.	55.6
		TOTAL (CU. YD.)	55.6

CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING, 3'-8	L.F.	462.0

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

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

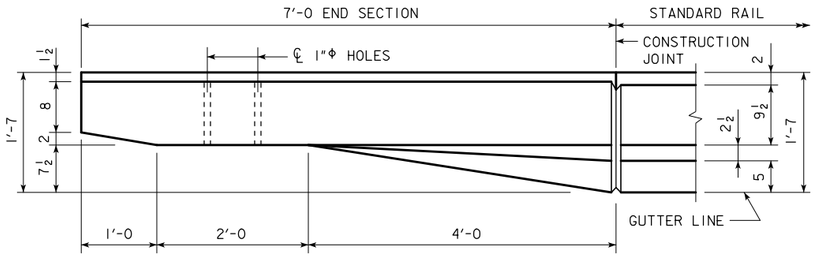
66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

BARRIER RAIL DETAILS

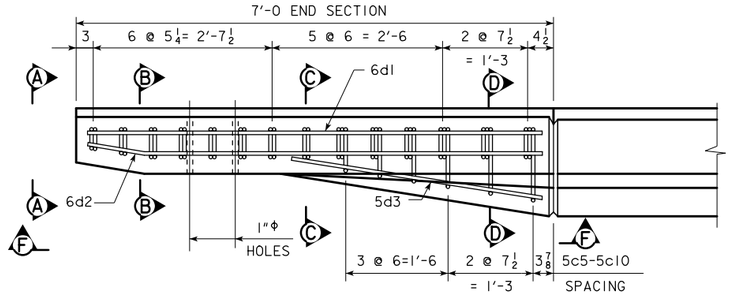
STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

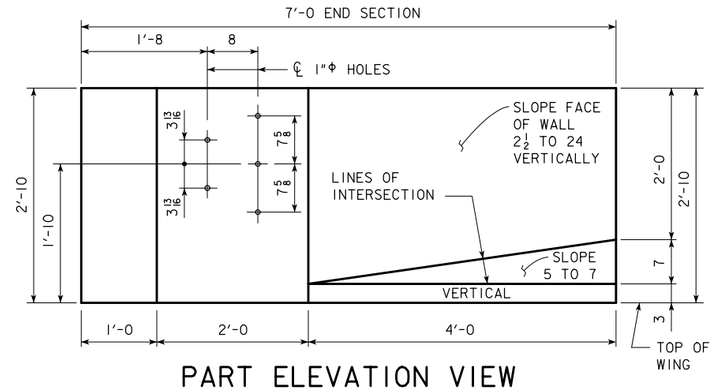
[redacted]



PART PLAN VIEW

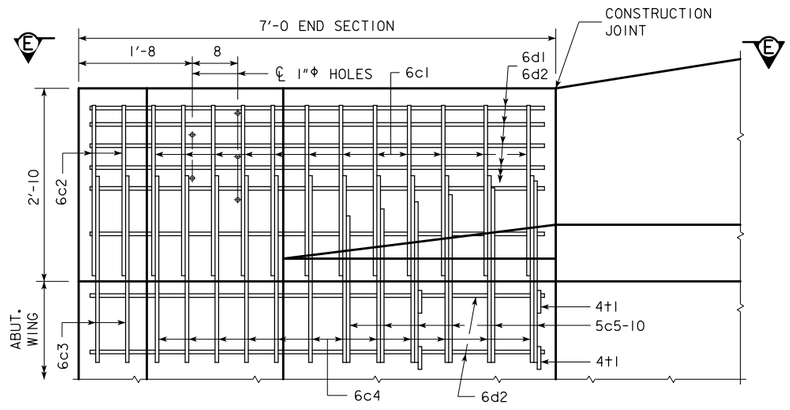


PART VIEW E-E

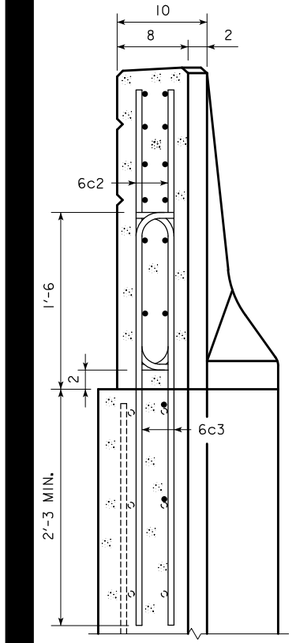


PART ELEVATION VIEW

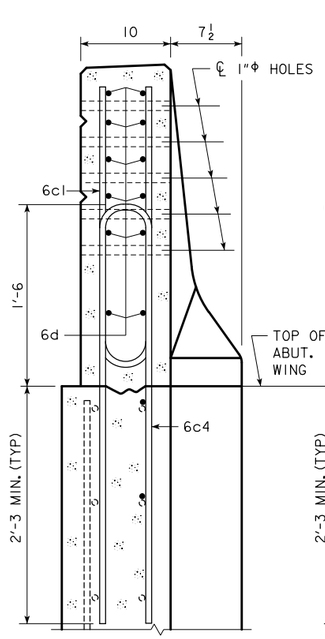
PROVIDE 5 HOLES FORMED WITH 1"Φ PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



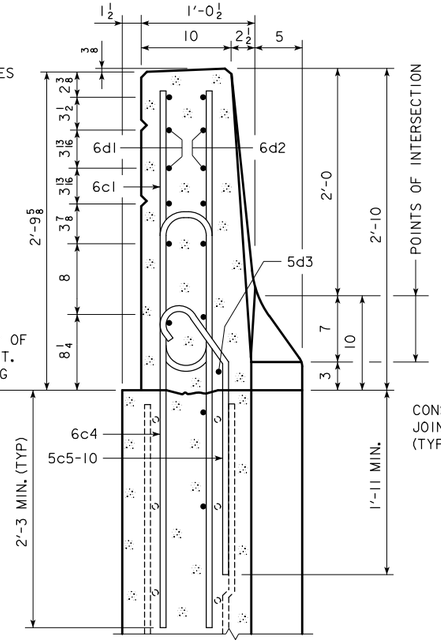
PART VIEW F-F



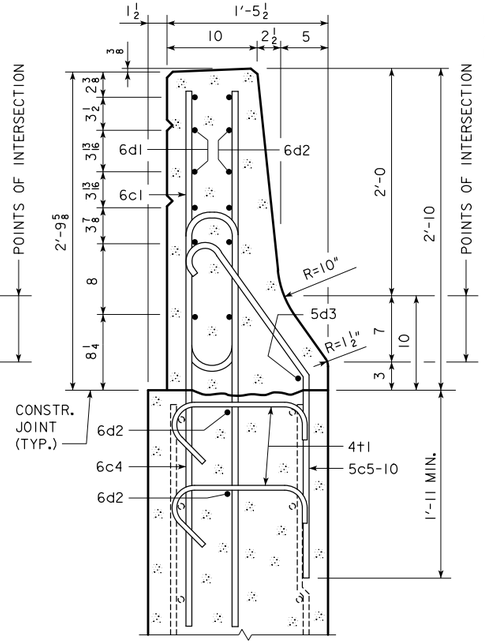
VIEW A-A



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.

NOTE:
SEE BARRIER RAIL RUSTICATION DETAILS ON DESIGN SHEET 30.

STAINLESS STEEL REINF. STEEL - ONE END SECT.

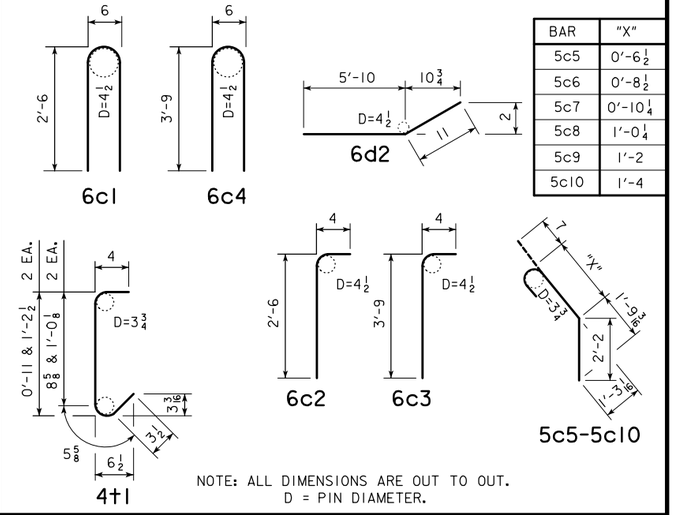
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	RAIL, VERTICAL	⊓	12	5'-6	99
6c2	RAIL, VERTICAL	⌐	4	2'-10	17
6c3	RAIL, VERTICAL	⌐	4	4'-1	25
6c4	RAIL, VERTICAL	⊓	12	8'-0	144
5c5-10	RAIL, VERTICAL	⌐	6	VARIES	23
6d1	RAIL, HORIZONTAL	—	6	6'-8	60
6d2	RAIL, HORIZONTAL	—	8	6'-9	81
5d3	RAIL, HORIZONTAL	—	1	3'-9	4
4t1	RAIL, ABUTMENT WING TIE BARS	⌐	4	VARIES	5
	STAINLESS STEEL TOTAL WEIGHT (LBS.)				458

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:
SEE BARRIER RAIL RUSTICATION DETAILS ON DESIGN SHEET 30.

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

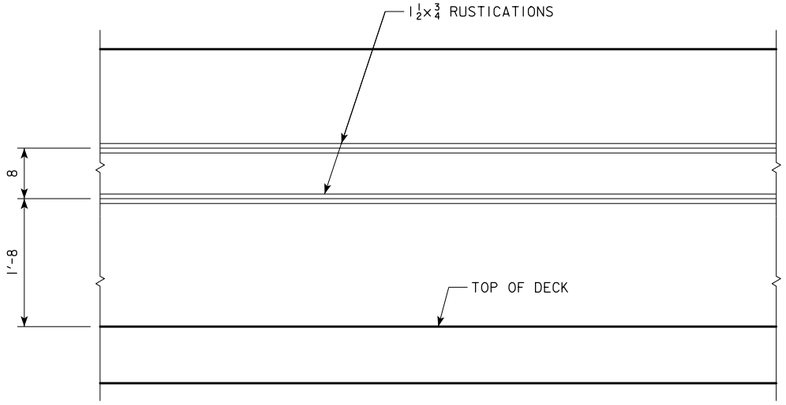
66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

BARRIER RAIL END SECTION DETAILS

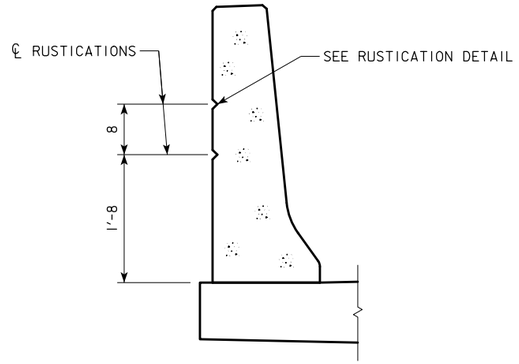
STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

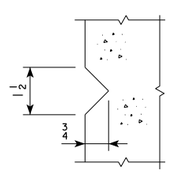
[redacted]



PART OUTSIDE ELEVATION OF
STANDARD BARRIER RAIL



PART SECTION THROUGH
STANDARD BARRIER RAIL



RUSTICATION DETAIL

NOTES:
SEE GENERAL NOTES SHEET FOR RUSTICATION NOTES.
RUSTICATIONS EXTEND THE FULL LENGTH OF BRIDGE BARRIER, INCLUDING BARRIER END SECTION.

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

BARRIER RAIL RUSTICATION DETAILS

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

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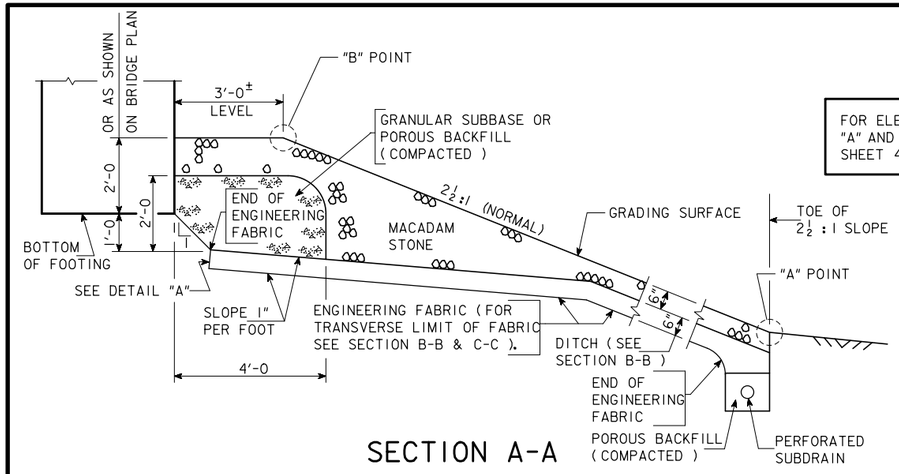
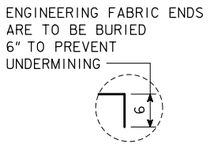
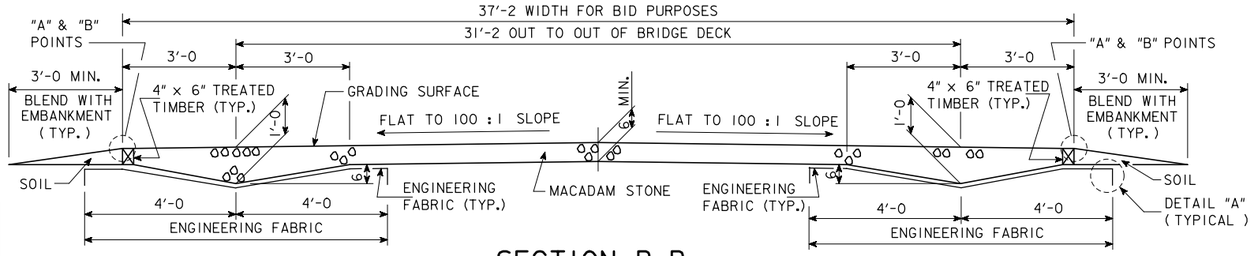


FOR ELEVATION AND LOCATION OF "A" AND "B" POINTS SEE DESIGN SHEET 4.

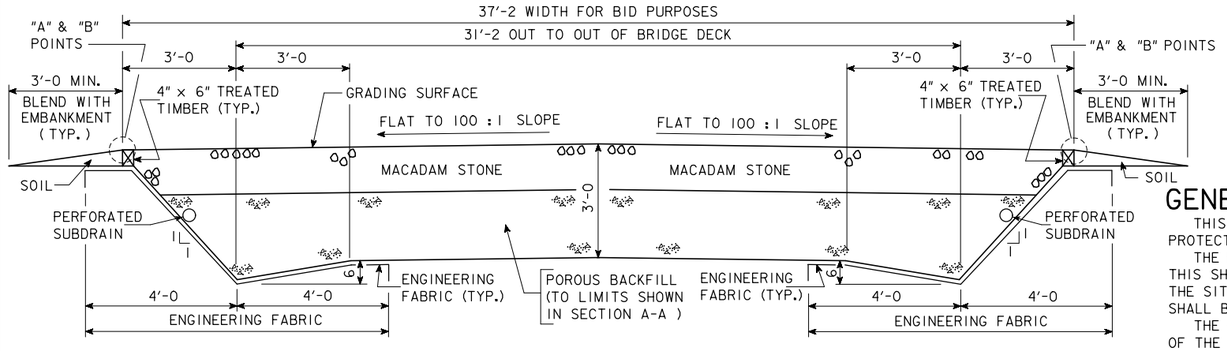
SECTION A-A



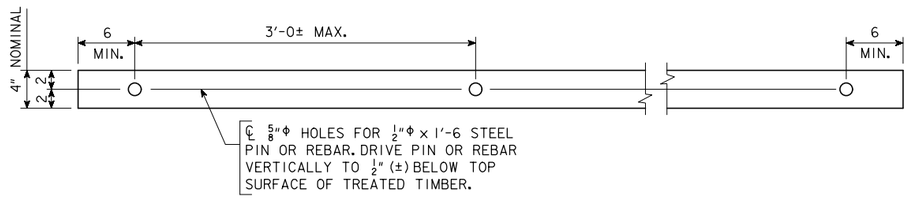
DETAIL "A"



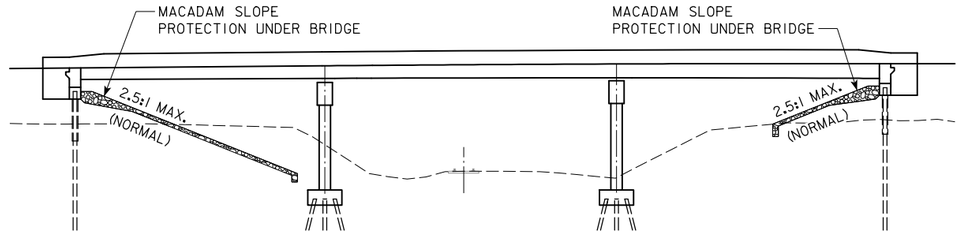
SECTION B-B



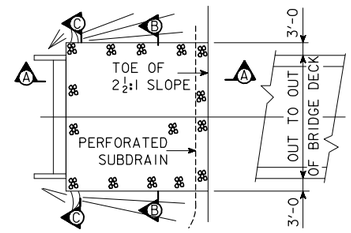
SECTION C-C



4 x 6 TREATED TIMBER EDGING DETAILS



LONGITUDINAL SECTION ALONG ℄ ROADWAY



SLOPE PROTECTION LAYOUT

GENERAL NOTES:

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

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

THE ENGINEERING FABRIC SHALL BE IN ACCORDANCE WITH ARTICLE 4196.01, B, 3, OF THE STANDARD SPECIFICATIONS. IF THE ENGINEERING FABRIC IS LAPPED, THE LAPS SHALL BE A MINIMUM OF ONE FOOT IN LENGTH, SHINGLE FASHION WITH UP SLOPE LAP PIECE ON TOP AND STAPLED FOR CONTINUITY.

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

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

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

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

THE BERM FORESLOPE SHAPING AND COMPACTING AND THE DISPOSAL OF EXCESS SOIL FROM SHAPING OR TRENCHING SHALL BE CONSIDERED INCIDENTAL TO PLACING THE SLOPE PROTECTION.

WHERE EROSION CONTROL WORK HAS BEEN COMPLETED THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PLANT MATERIALS DESTROYED ADJACENT TO THE SLOPE PROTECTION AREA. THE CONTRACTOR SHALL REPLANT, RESEED AND REMULCH ALL DISTURBED AREAS, DESIGNATED BY THE ENGINEER, IN ACCORDANCE WITH SECTION 2601, OF THE STANDARD SPECIFICATIONS, AT THE CONTRACTOR'S EXPENSE.

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

ESTIMATED QUANTITIES

DESCRIPTION	LOCATION	QUANTITY
MACADAM STONE SLOPE PROTECTION	SOUTH ABUT.	140 SQ. YDS.
MACADAM STONE SLOPE PROTECTION	NORTH ABUT.	250 SQ. YDS.
	TOTAL	390 SQ. YDS.

ITEMS TO BE INCLUDED IN "MACADAM STONE SLOPE PROTECTION":

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

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

MACADAM STONE SLOPE PROTRECTION

STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

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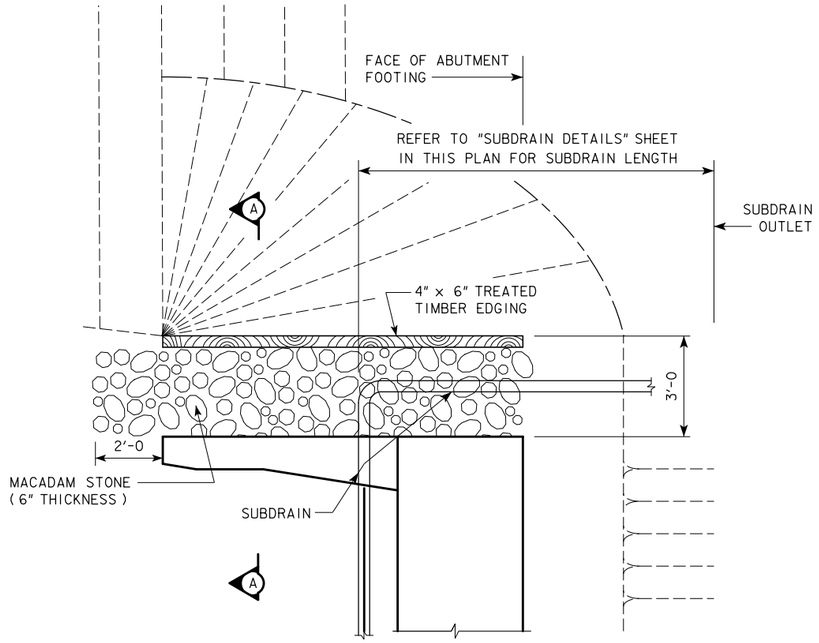
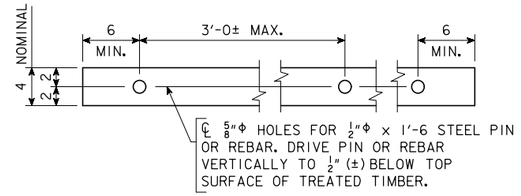
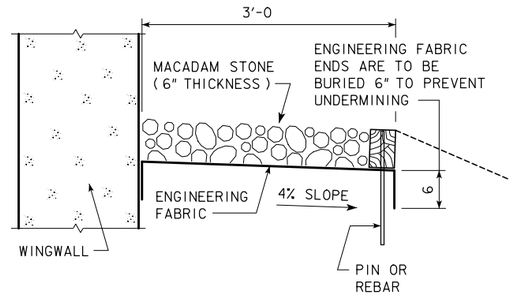


TOP VIEW OF WING ARMORING



4" x 6" TREATED TIMBER EDGING DETAILS



SECTION A-A

GENERAL NOTES:

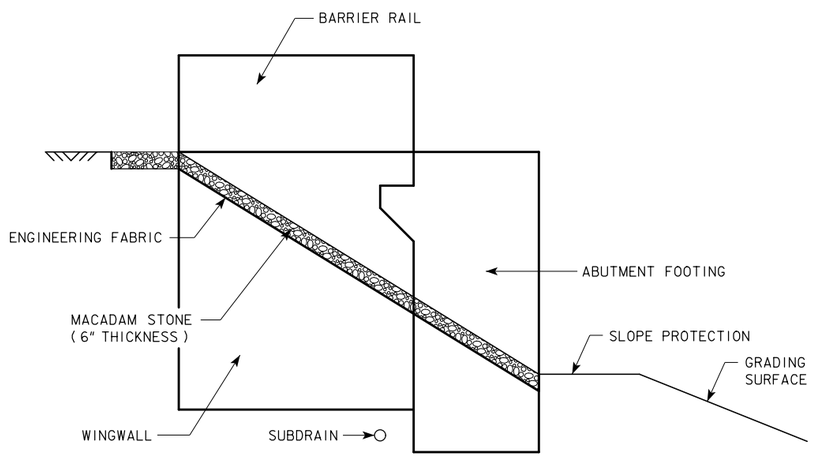
MACADAM STONE SHALL BE PLACED ALONG THE SIDE OF THE WING AND ABUTMENT FOOTING AS SHOWN IN SECTION A-A. THIS IS TYPICAL AT EACH CORNER OF THE BRIDGE UNLESS OTHERWISE NOTED IN THE PLANS. THE MACADAM STONE AT THESE LOCATIONS SHALL BE UNDERLAYED WITH ENGINEERING FABRIC IN ACCORDANCE WITH ARTICLE 4196.01,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

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

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

THE MACADAM STONE SHALL BE DEPOSITED, SPREAD, CONSOLIDATED AND SHAPED BY MECHANICAL OR HAND METHODS THAT WILL PROVIDE UNIFORM 6" DEPTH AND DENSITY AND PROVIDE UNIFORM SURFACE APPEARANCE.

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



PROFILE VIEW OF WING ARMORING

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

BRIDGE WING ARMORING

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

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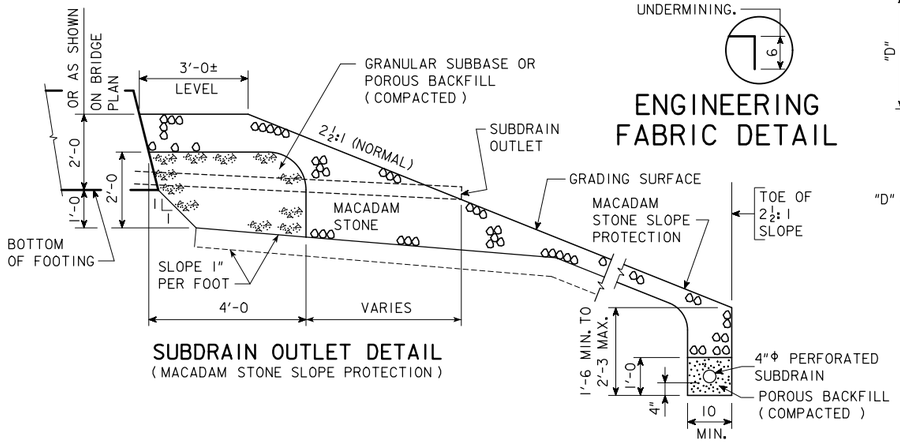
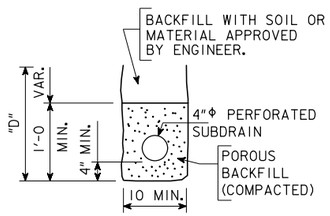
[redacted]

BENCH MARK NO. 26: NORTHING: 604283.735, EASTING: 1624489.540, ELEV. 886.700, FENO. MONUMENT, W/CAP STAMPED "026", 6" DEEP, IN THE NORTH ROW/SHOULDER OF NE 54TH AVE., 9' NORTH OF EDGE AC SLAB; 128' FROM P.I. OF NE 54TH AVE. WITH OF RR CROSSING.



SUBDRAIN OUTLET DETAIL
(MACADAM STONE SLOPE PROTECTION)

SECTION B-B



SECTION C-C
(TYPICAL)

"D" = DEPTH REQUIRED TO PROVIDE PROPER FLOW LINE FOR SUBDRAIN.

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

ENGINEERING FABRIC DETAIL

SUBDRAIN NOTES:

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

THE SUBDRAINS SHALL BE 4" IN DIAMETER AND SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS. THE SUBDRAIN OUTLET SHALL CONSIST OF A 6'-0 LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET.

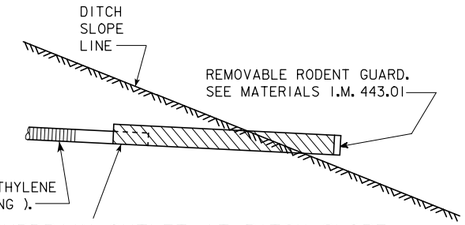
THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE.

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

THE UPHILL END OF THE PERFORATED SUBDRAIN AT THE TOE OF SLOPE PROTECTION SHALL BE CAPPED AS APPROVED BY ENGINEER.

SUBDRAIN OUTLET ELEVATIONS

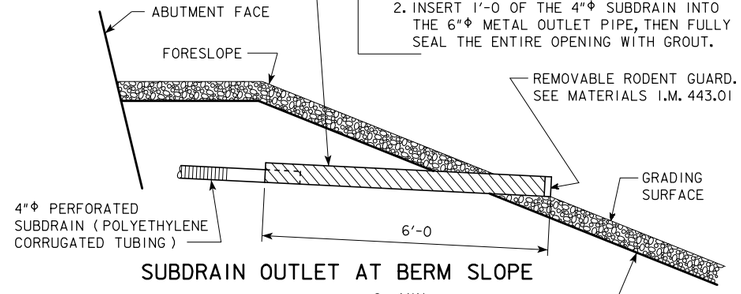
LOCATION	ELEVATION
NORTH ABUTMENT	952.12
TOE OF NORTH BERM	931.50
SOUTH ABUTMENT	953.16
TOE OF SOUTH BERM	942.50



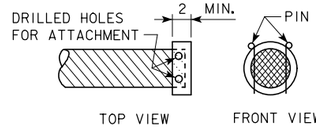
SUBDRAIN OUTLET AT DITCH SLOPE

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

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

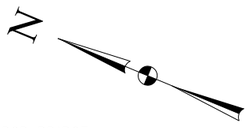


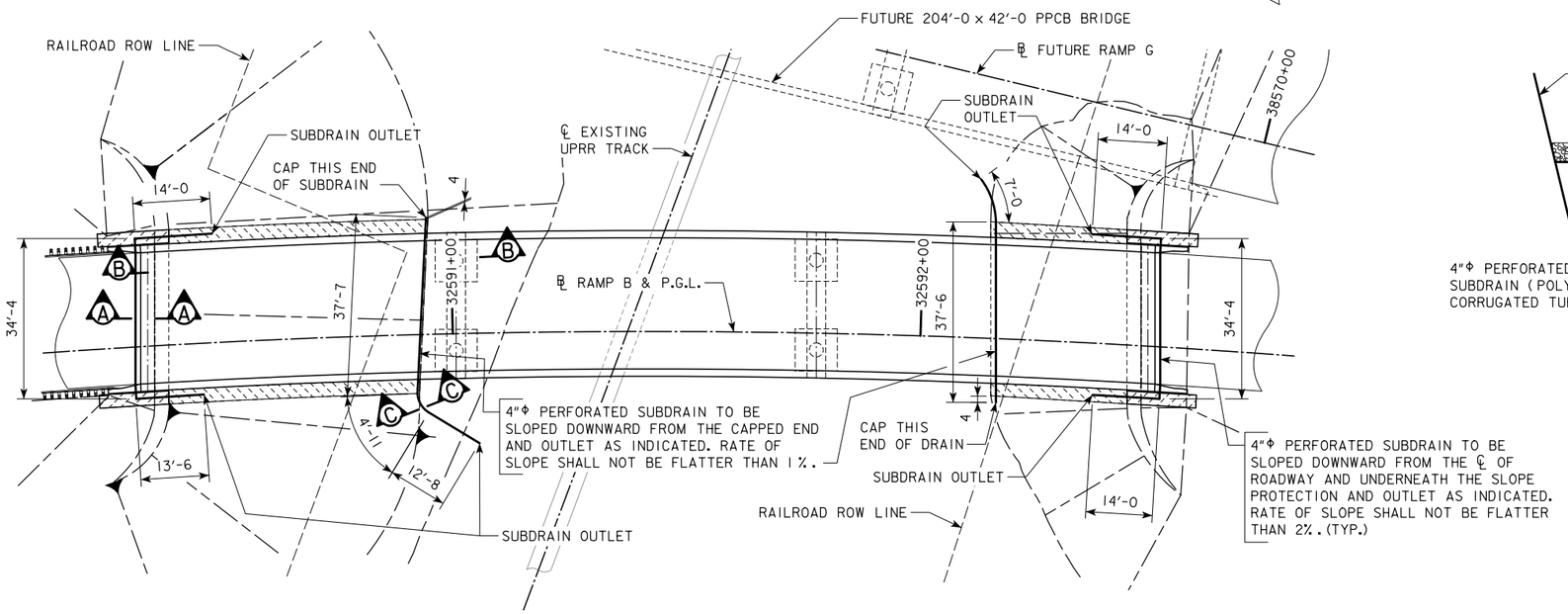
SUBDRAIN OUTLET AT BERM SLOPE



REMOVABLE RODENT GUARD DETAILS

OUTLET DETAILS





SITUATION PLAN
SHOWING SUBDRAIN LOCATIONS

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

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

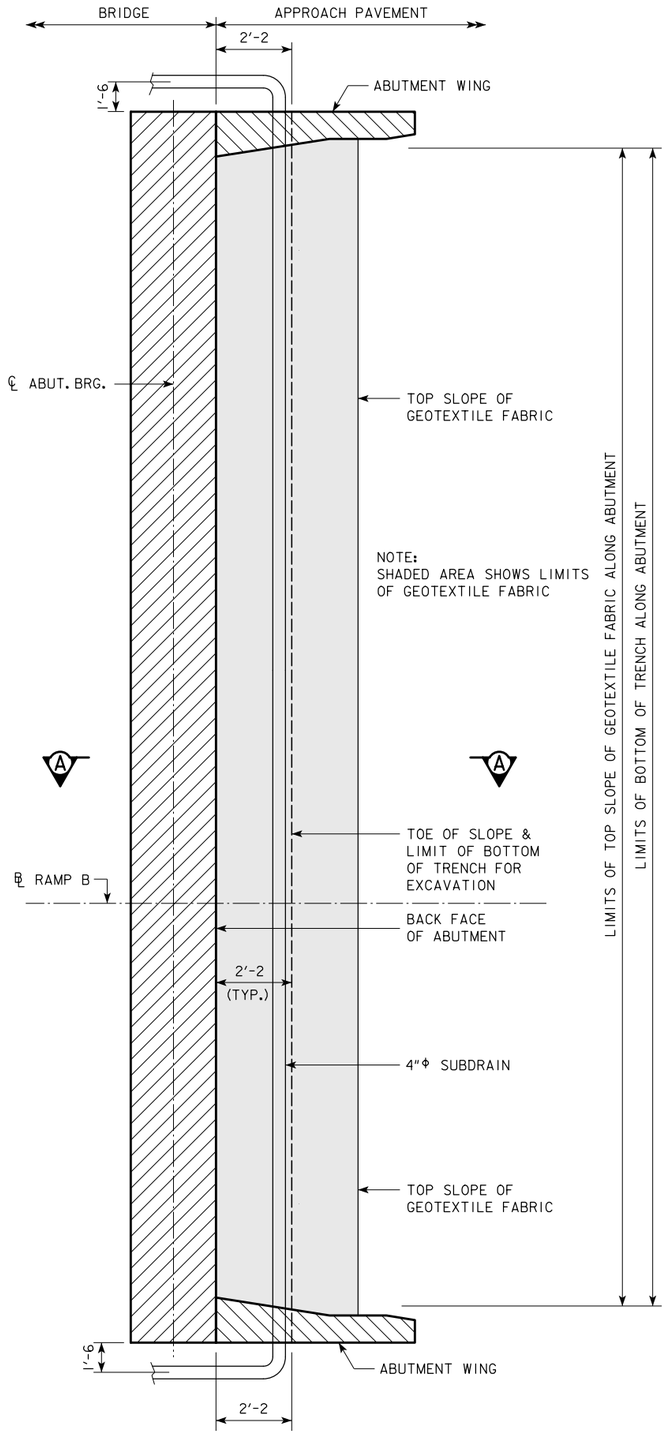
66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

SUBDRAIN DETAILS

STA. 32591+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]



ABUTMENT PLAN WITHOUT 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.

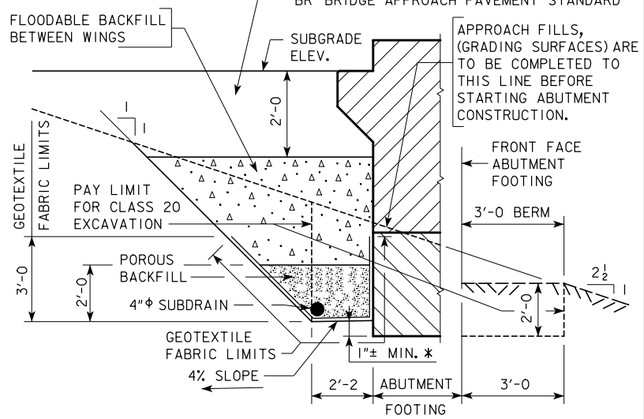
THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR STRUCTURAL CONCRETE.

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

NOTES:

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

DESIGN FOR VARIABLE SKEW RADIUS = 1,820'

214'-0 X 28'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

66'-0 & 71'-0 END SPANS 77'-0 INTERIOR SPAN

ABUTMENT BACKFILL DETAILS

STA. 3259I+41.72 (℄ RAMP B) APRIL, 2022

POLK COUNTY

[redacted]