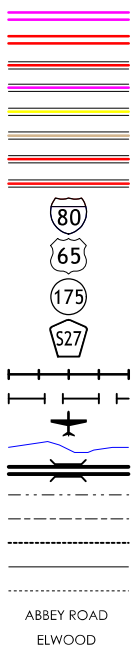


LEGEND

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

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



PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

CASS COUNTY

STRUCTURES - MISCELLANEOUS
US 71 OVER LONE TREE CREEK
0.1 MI. S. OF CO. RD. G35

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.

ENGLISH STANDARD
BRIDGE PLANS

STANDARD	ISSUED	REVISED

TOTAL SHEETS
75

PROJECT NUMBER

NHSN-071-3(59)--2R-15

R.O.W. PROJECT NUMBER

PROJECT IDENTIFICATION NUMBER

17-15-071-010-01

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET - DESIGN NO. 218
2-29	DESIGN NO. 218
SPS.1-SPS.10	SOIL PROFILE SHEETS
C.1	ESTIMATE SHEET FOR ROADWAY
A.1-W.8	ROADWAY SHEETS

REVISIONS

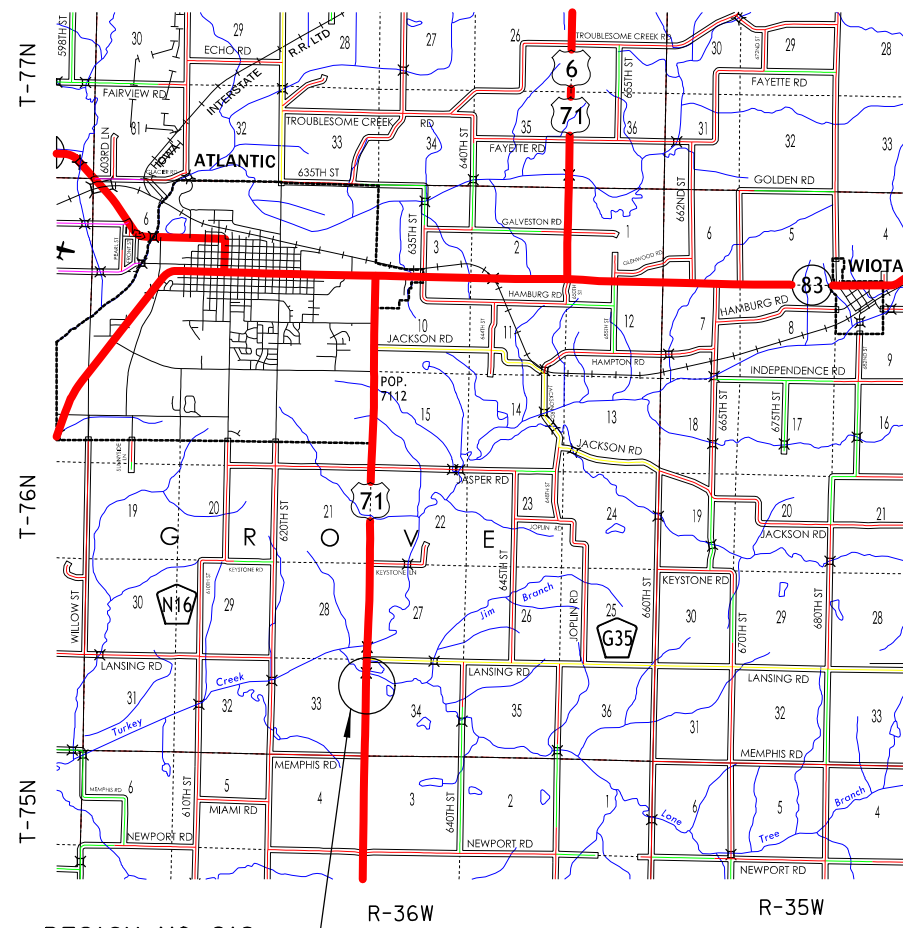
STANDARD ROAD
PLANSSTANDARD ROAD PLANS ARE LISTED
ON SHEET NUMBER C.3

DESIGN DATA RURAL

2015	AADT	2,920	V.P.D.
20--	AADT	--	V.P.D.
20--	DHV	--	V.P.H.
TRUCKS		13	%
Total			
Design	ESALs	--	

INDEX OF SEALS

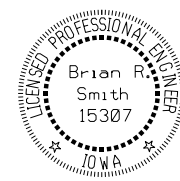
SHEET NO.	NAME	TYPE
1	ROBERT A. MAGLIOLA	STRUCTURAL DESIGN
CS.1	MARK A. DELL	GEOTECHNICAL DESIGN
A.1	JACOB BONDHUS	ROADWAY DESIGN



DESIGN NO. 218

LOCATION MAP

PROJECT DIRECTORY NAME: I507101017



I hereby certify that this project was constructed in accordance with the contract documents, the 'as-built' plan were prepared under my supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

1/04/2021

Project Engineer

Date

My license renewal date is December 31, 2021

2019
YearCohron Construction
ContractorJeff King
Project Inspector

STRUCTURAL DESIGN

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

08/21/18
Date

Printed or Typed Name

My license renewal date is December 31, 2019

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

ESTIMATED BRIDGE QUANTITIES							
ITEM NO.	ITEM CODE	ITEM	UNIT	QUANTITY RE-USED FROM PREVIOUS BID	ADDITIONAL QUANTITY	TOTAL	AS BUILT QUANTITY
1	2401-6750001	REMOVALS, AS PER PLAN	LS	1.0		1.0	~~\$20,000.000~~
2	2402-2720000	EXCAVATION, CLASS 20	CY	81		81	~~81.000~~
3	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	262.7	182.2	444.9	~~444.900~~
4	2404-7775000	REINFORCING STEEL	LB	18495	5680	24175	~~24,175.000~~
5	2404-7775005	REINFORCING STEEL,EPOXY COATED	LB	54884	35850	90734	~~90,734.000~~
6	2404-7775009	REINFORCING STEEL,STAINLESS STEEL	LB	1974	1050	3024	~~3,024.000~~
7	2407-0550000	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, SD105	EACH	7		7	~~7.000~~
8	2408-7800000	STRUCTURAL STEEL	LB	4375	(-) 910	3465	~~3,465.000~~
9	2414-6425420	CONCRETE BARRIER, PARAPET	LF	264.0	167.4	431.4	~~431.400~~
10	2433-0001042	CONCRETE DRILLED SHAFT, 42 IN. DIAMETER	LF	171	57	228	~~228.000~~
11	2433-0003000	DEMONSTRATION SHAFT	LF	57	(-) 57	0	~~0.000~~
12	2501-0201057	PILES, STEEL, HP 10 X 57	LF	910		910	~~910.000~~
13	2501-6335010	PREBORED HOLES	LF	130		130	~~130.000~~
14	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	14.7		14.7	~~14.700~~
15	2526-8285000	CONSTRUCTION SURVEY	LS	1.0		1.0	~~\$3,500.000~~
16	2533-4980005	MOBILIZATION	LS	1.0		1.0	~~\$115,000.000~~
17	2599-9999003	STRUCTURAL CONCRETE (LINK SLAB)	CY	24.3	1.6	25.9	~~25.900~~

ITEM NO.	ESTIMATE REFERENCE INFORMATION
1	INCLUDES REMOVAL OF WINGS, RAIL END SECTIONS, PAVING NOTCH AND PORTIONS OF DECK, INCLUDING CURB AND PARAPETS AT EXISTING SOUTH ABUTMENT. INCLUDES REMOVAL OF EXISTING ABUTMENT 1' BELOW GROUND AT CREEK BANK SHOWN ON DESIGN SHEET 4. INCLUDES CLEANING THE EXISTING EXPOSED BARS THAT ARE TO BE INCORPORATED INTO NEW CONSTRUCTION. INCLUDES CUTTING OF EXISTING EXPOSED BARS. INCLUDES PAINTING EXISTING BARS THAT ARE CUT OFF WITH TWO COATS OF ZINC RICH PAINT. REMOVAL OF SCHEDULED ITEMS SHALL BE IN ACCORDANCE WITH SECTION 2401, OF THE STANDARD SPECIFICATIONS. ANY DAMAGE TO MATERIAL NOT TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT NO EXTRA COST TO THE STATE.
3	INCLUDES THE CONCRETE FOR THE SLAB, ABUTMENT, ABUTMENT DIAPHRAGM, PIER DIAPHRAGM, CAP AND COLUMNS OF THE PIER. INCLUDES CLEANING AND SEALING TOP AND INTERIOR FACES OF THE EXISTING BARRIER RAILS. INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING AND SUBDRAIN OUTLET AT ABUTMENT AND TOE OF BERM. INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WINGS.
7	INCLUDES CURVED SOLE PLATES, STUDS, LAMINATED NEOPRENE PADS AT PIER AND COIL TIES. NONSTANDARD STIRRUP LENGTHS ARE USED FOR THIS BEAM. NONSTANDARD BEAM LENGTHS ARE USED FOR THIS BEAM. 7 BEAMS AT 107'-1. INCLUDES CONTRACTOR FILLING OUT BEAM NUMBERS BY LOCATION AND BEAM SEAT ELEVATIONS IN "PPC BEAM DATA SPREADSHEET" AND FORWARDING ELECTRONIC SPREADSHEET TO THE ENGINEER.
8	INCLUDES DECK FLOOR DRAINS, INTERMEDIATE DIAPHRAGMS, PINTLE PLATES, KEEPER BARS AND PINTLES.
9	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.
10	INCLUDES COST OF C.S.L. TESTING AT EACH SHAFT. SUBMITTAL OF A DRILLED SHAFT INSTALLATION PLAN SHALL BE REQUIRED. LENGTH MEASURED FROM BOTTOM OF DRILLED SHAFT TO CONSTRUCTION JOINT.
11	THE DEMONSTRATION SHAFT SHALL BE AS DETAILED ON DESIGN SHEET 9. INCLUDES ALL COSTS OF MATERIALS AND LABOR INCLUDING CONCRETE, REINFORCING STEEL, EXCAVATION AND EXCAVATION INCIDENTALS INCLUDING CASING AND C.S.L. TESTING OF THE SHAFT. ITEM MAY BE DELETED IF CONTRACTOR CAN DEMONSTRATE SUFFICIENT EXPERIENCE PER ARTICLE 2433.03, K, 6 OF THE STANDARD SPECIFICATIONS.
12	INCLUDES FURNISHING AND INSTALLING STEEL PILE POINTS AT ABUTMENT.
14	EROSION STONE SHALL BE IN ACCORDANCE WITH SECTION 4130 OF THE STANDARD SPECIFICATIONS. INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, EROSION STONE, AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING ARMORING.
17	INCLUDES THE CONCRETE FOR THE LINK SLAB OVER PIER. SEE SPECIAL PROVISIONS FOR "CONCRETE STRUCTURES (LINK SLAB)". INCLUDES 2 LAYERS OF 90 LB. ROOFING FELT ON TOP OF DIAPHRAGMS AND BEAMS AS SHOWN ON DESIGN SHEET 14. INCLUDES GRIND SMOOTHING TOP OF TOP FLANGE OF EXISTING BEAMS AND TOP SURFACE OF EXISTING SOUTH ABUTMENT DIAPHRAGM.

NOTE:
ROADWAY QUANTITIES SHOWN
ELSEWHERE IN THESE PLANS.

DESIGN FOR 15° SKEW (L.A.)
**310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
105'-0 NEW S. END SPAN
ESTIMATED QUANTITIES
STATION 565+36.18
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 28 FILE NO. 31548 DESIGN NO. 218

AUGUST, 2018

SUMMARY OF CONCRETE QUANTITIES

LOCATION	STRUCTURAL CONCRETE	STRUCTURAL CONCRETE (LINK SLAB)
NEW SOUTH ABUT.FTG.	33.8	_____
BRIDGE DECK + NEW S. ABUT. & NEW PIER DIAPHRAGMS	330.7	_____
NEW SOUTH ABUTMENT WINGS	5.2	_____
NEW PIER	75.2	_____
LINK SLAB	_____	25.9
TOTAL (CU. YDS.)	444.9	25.9

SUMMARY OF REINFORCING STEEL

LOCATION	NON-COATED REINFORCING STEEL	STAINLESS STEEL REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
BRIDGE DECK + NEW S. ABUT. FTG. **	134		83020
NEW SOUTH ABUTMENT WINGS			508
BARRIER RAIL - WEST RAIL		1316	3424
BARRIER RAIL - EAST RAIL		1316	3424
BARRIER RAIL END SECTION		392	358
NEW PIER	24041		
** INCLUDES ABUTMENT AND PIER DIAPHRAGMS			
TOTAL (LBS.)	24175	3024	90734

SUMMARY OF EXCAVATION

LOCATION	CLASS 20 EXCAVATION	CLASS --- EXCAVATION
NEW SOUTH ABUTMENT	81	_____
TOTAL (CU. YDS.)	81	_____

SUMMARY OF FOUNDATIONS

[illegible]

SUMMARY OF STRUCTURAL STEEL

LOCATION	TOTAL (LBS.)
BRIDGE DECK DRAINS	720
INTERMEDIATE DIAPHRAGMS	1666
NEW PIER BEARINGS	1079
TOTAL (LBS.)	3465

SUMMARY OF BEARINGS

[illegible]

* CURVED SOLE PLATES AND LAMINATED NEOPRENE PADS ARE INCIDENTAL TO PPC BEAMS.

DESIGN FOR 15° SKEW (L.A.)

310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

105'-0" NEW S. END SPAN

SUMMARY QUANTITIES SHEET

STATION 565+36.18

AUGUST, 2018

8 CASS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 2 OF 28 FILE NO. 31548 DESIGN NO. 218

SPECIFICATIONS (NEW CONSTRUCTION):

DESIGN: AASHTO SERIES OF 2002.

CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2015, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS, AND SPECIAL PROVISIONS INCLUDING SPECIAL PROVISIONS FOR "CONCRETE STRUCTURES (LINK SLAB)" SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN STRESSES (NEW CONSTRUCTION):

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

REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60.

CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 4.0 KSI.

PRESTRESSED CONCRETE BEAM, SEE D BEAM DATA TABLE ON D BEAM DETAILS SHEET.

DECK f'c = 4.0 KSI.

DRILLED SHAFTS f'c = 4.0 KSI.

STRUCTURAL STEEL IN ACCORDANCE WITH AASHTO SECTION 10. ASTM A709 GRADE 36, GRADE 50, AND GRADE 50W. (AASHTO M270 GRADE 36, GRADE 50, AND GRADE 50W.)

DESIGN HISTORY AT THIS SITE (INCLUDES THIS DESIGN)	
DES. NO.	TYPE OF WORK
369	ORIGINAL CONSTRUCTED IN 1969
1189	RETROFIT BARRIER RAIL IN 1989
207	PAVING NOTCH REPLACEMENT IN 2007
312	BRIDGE DECK REPAIR AND OVERLAY IN 2012
218	LENGTHEN PPCB BRIDGE

GENERAL NOTES:

THIS DESIGN IS FOR LENGTHENING 201'-2 X 44'-0 EXISTING PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE TO 310'-8 X 44'-0 ON US 71 OVER LONE TREE CREEK.

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

ELECTRONIC COPIES OF ORIGINAL DESIGN AND REPAIR PLANS ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS. DIMENSIONS SHOWN ON THESE PLANS ARE BASED ON DESIGN PLANS (ORIGINAL DESIGN NO. 369, RETROFIT BARRIER RAIL DESIGN NO. 1189, PAVING NOTCH REPLACEMENT DESIGN NO. 207 AND BRIDGE DECK REPAIR AND OVERLAY DESIGN NO. 312.)

ALL ALIGNMENT, STATIONING, AND CONNECTING DIMENSIONS USED IN THE NEW DETAILS IN THESE PLANS WERE DEVELOPED BASED ON THE EXISTING BRIDGE PLANS. THE BRIDGE CONTRACTOR SHALL FIELD VERIFY THESE DETAILS BEFORE STARTING CONSTRUCTION.

FAINT LINES ON PLANS INDICATE EXISTING PORTION OF THE BRIDGE.

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 LENGTHEN PORTION OF THE BRIDGE IS DESIGNED FOR HS20-44 LOADING. THE EXISTING DECK CONSIST OF 7½" SLAB PLUS 1½" OVERLAY. THE NEW DECK THICKNESS OF 9" IS USED TO MATCH EXISTING WHICH INCLUDES THE OVERLAY THEREFORE, NO PROVISION IS MADE FOR FUTURE WEARING SURFACE.

THE LUMP SUM BID FOR "REMOVALS, AS PER PLAN" SHALL INCLUDE ALL COSTS ASSOCIATED WITH REMOVING THE ABUTMENT CONCRETE INCLUDING WINGS, RAIL END SECTIONS, AND DIAPHRAGMS, ABUTMENT PILES TO ONE FOOT BELOW EXISTING GRADE, EXISTING SPAN 1 AND APPROXIMATELY 21'-0" OF EXISTING SPAN 2 DECK CROSS SECTION INCLUDING CURBS AND PARAPETS, AND EXISTING PIER 2 DIAPHRAGM. REMOVAL OF SCHEDULED ITEMS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS. ANY DAMAGE TO ANY STEEL OR CONCRETE NOT TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND REPAIRED AT NO EXTRA COST TO THE STATE.

THE BRIDGE CONTRACTOR IS TO PROVIDE A METHOD OF REMOVAL THAT WILL PREVENT FEATHER EDGING AT THE BOTTOM OF THE EXISTING SLAB. CARE SHALL BE TAKEN WHEN EXPOSING EXISTING REINFORCING SO THE BOND TO EXISTING CONCRETE IS NOT BROKEN AT THE CONCRETE BREAK LINES.

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 NEW SOUTH ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE US 71" ON DESIGN SHEET 4. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING.

CAST IN-ONE-PIECE STEEL POINTS ARE REQUIRED FOR THE NEW SOUTH ABUTMENT PILES IN ACCORDANCE WITH ARTICLE 4167.02 OF THE CURRENT STANDARD SPECIFICATIONS AND MATERIALS IM 468.

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

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5a1 IS 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

GENERAL NOTES (CONTINUED):

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

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

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

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

STAINLESS STEEL REBAR SHALL BE SHIPPED, HANDLED AND PLACED SUCH THAT CARBON STEEL DOES NOT COME IN CONTACT WITH THE STAINLESS STEEL REBAR. PADDING SHALL BE USED TO SEPARATE CARBON STEEL BUNDLING BANDS OR LIFTING DEVICES FROM THE STAINLESS STEEL REBAR. WIRE ROPE SHALL NOT BE USED IN LIFTING OR HANDLING THE STAINLESS STEEL REINFORCING. COVER STAINLESS STEEL REBAR WITH TARPS DURING OUTSIDE STORAGE. USE WOODEN SPACERS TO SEPARATE BUNDLES OF STAINLESS STEEL REBAR FROM OTHER TYPES OF REBAR. USE WOODEN SUPPORTS TO STORE STAINLESS STEEL REBAR OFF THE GROUND OR SHOP FLOOR.

THE BRIDGE CONTRACTOR IS THE ONLY CONTRACTOR AT THE SITE AND IS RESPONSIBLE FOR THE COMPLETION OF ALL WORK AS DETAILED AND NOTED ON 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_SubmittalDescription.pdf
Example: (059).Cass.Design218-SteelDiaphragms.pdf

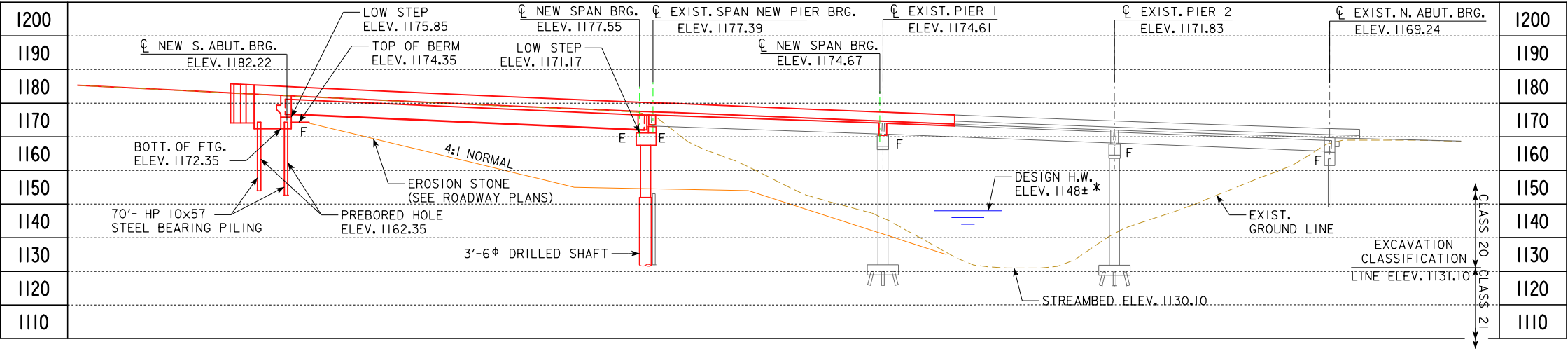
1	INTERMEDIATE STEEL DIAPHRAGMS
2	STEEL PILE BRACING
3	LAMINATED NEOPRENE PAD/CURVED SOLE PLATE ASSEMBLY
4	DECK DRAINS

NOTE:
POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

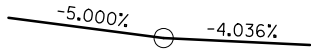
TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. AN OFF-SITE DETOUR ROUTE WILL BE PROVIDED BY THE IOWA DOT.

DESIGN FOR 15° SKEW (L.A.)
310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE
105'-0 NEW S. END SPAN
GENERAL NOTES
STATION 565+36.18 AUGUST, 2018
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 3 OF 28 FILE NO. 31548 DESIGN NO. 218



BM# 593 Iowa D.O.T. Brass Plug In top of Concrete Barrier Rail South East Corner of U.S. 71 Bridge over Lone Tree Creek Station 583+70 +/- 23' +/- right Elevation 1185.52



VPI STA = 564+24 VC = 132'
VPI ELEV = 1180.06

PROPOSED PROFILE GRADE

NOTE:
THE PROPOSED PROFILE GRADE IS BASED ON THE SURVEY. THE EXISTING PROFILE GRADE ON ORIGINAL PLAN DESIGN 369 IS APPROXIMATELY 2 FEET HIGHER THAN THE PROPOSED PROFILE GRADE.

LONGITUDINAL SECTION ALONG CL US 71

* FROM ORIGINAL DESIGN 369 AND ADJUSTED FOR DATUM DIFFERENCE OF APPROXIMATELY 2 FEET.

BERM SLOPE LOCATION TABLE

NEW SOUTH ABUTMENT			
POINT	STATION	OFFSET	ELEVATION
A1	565+44.19	26.67' LT.	1148.00
A2	565+29.93	26.67' RT.	1148.00
A3	565+25.60	26.67' LT.	1154.00
A4	565+10.15	26.67' RT.	1154.00
A5	564+73.74	26.67' LT.	1155.00
A6	564+59.45	26.67' RT.	1155.00
B1	563+92.64	26.67' LT.	1174.35
B2	563+78.35	26.67' RT.	1174.35
W1	563+70.31	26.67' LT.	1182.27
W2	563+58.37	26.67' RT.	1182.86

NOTES:
FOR DECK DRAIN LOCATIONS, SEE DESIGN SHEET 15.
FOR REMOVAL DETAILS, SEE DESIGN SHEET 6.
TOP OF BRIDGE DECK CROWN 0.02' BELOW PROFILE GRADE.

UTILITIES LEGEND:

— F0 — FIBER OPTIC

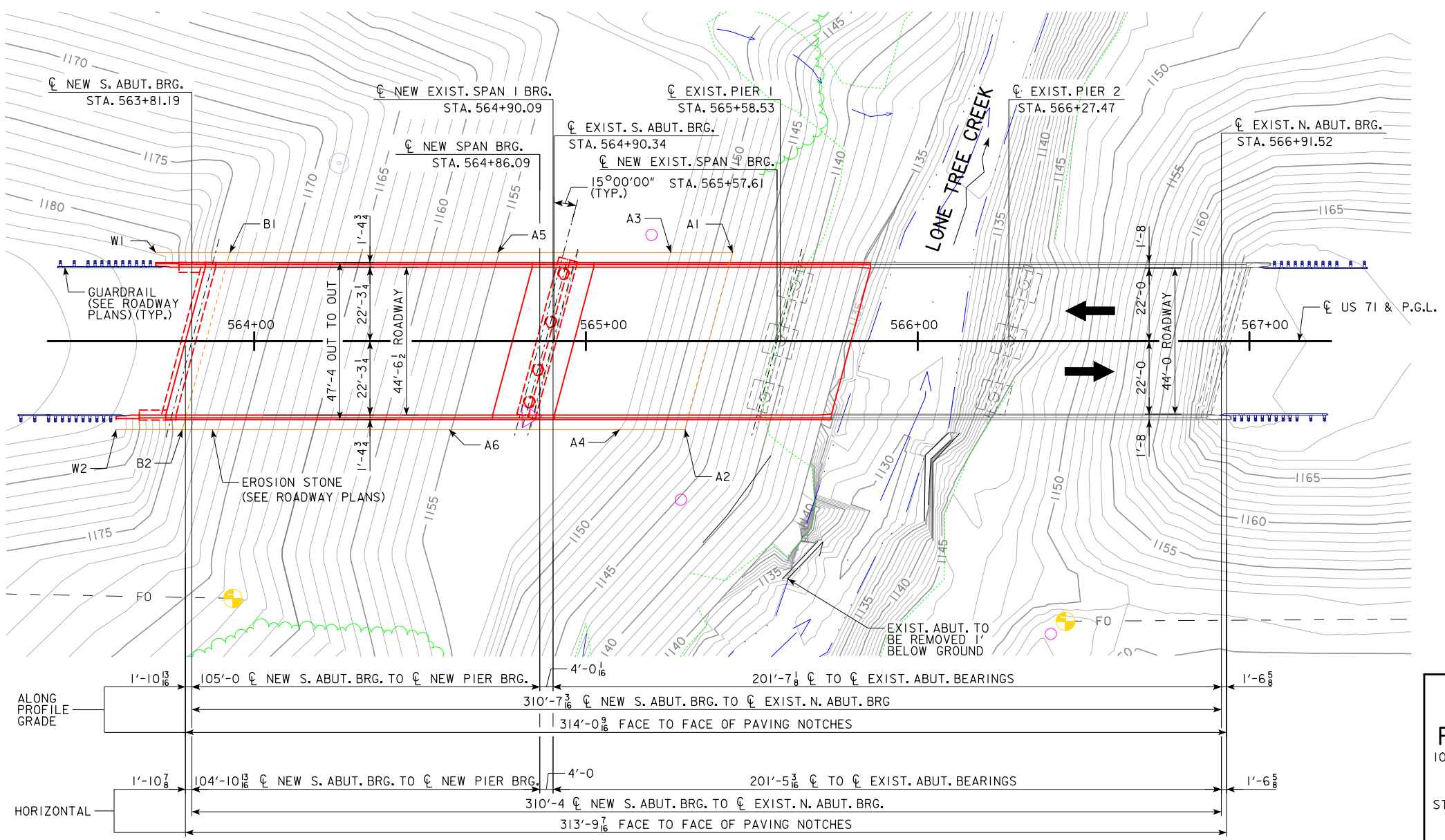
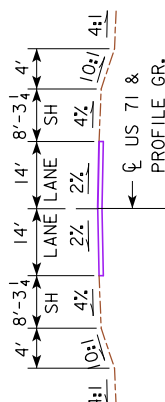
TRAFFIC ESTIMATE

2015 AADT 2,920 V.P.D.
TRUCKS 13 %

LOCATION

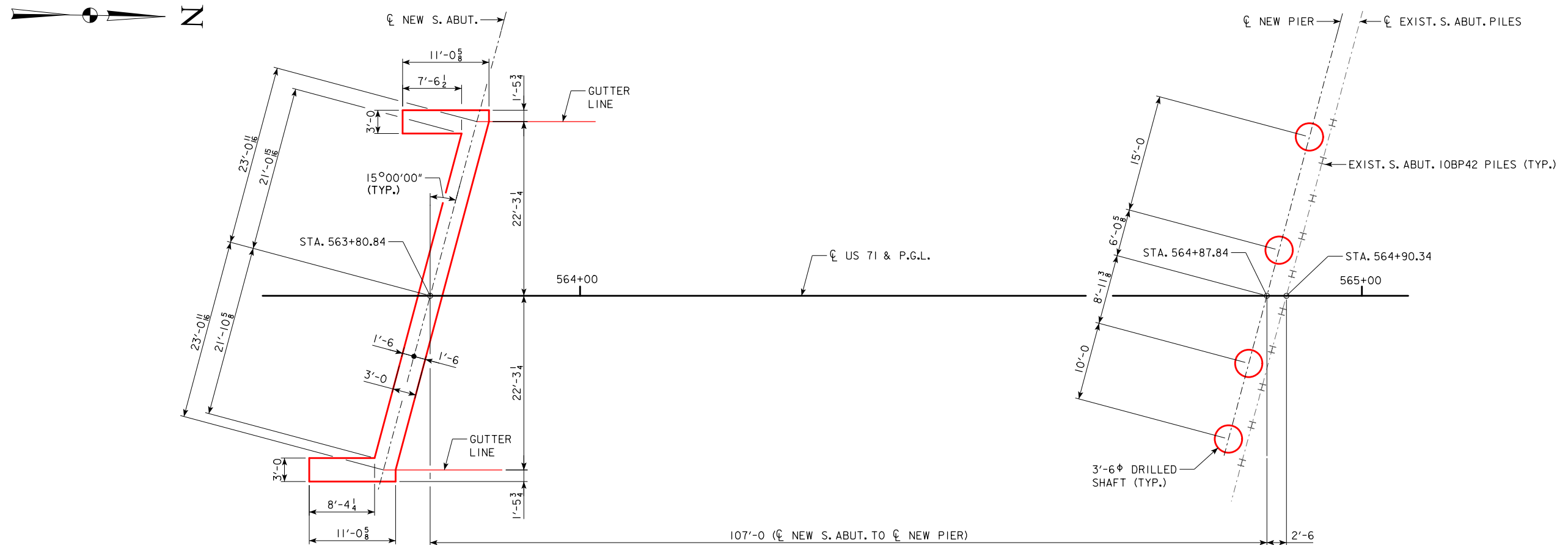
US 71 OVER LONE TREE CREEK
T-76N R-36W
SECTIONS 33-34
GROVE TOWNSHIP
CASS COUNTY
BRIDGE MAINT. NO. 1554.95071
FHWA NO. 17550
LATITUDE 41.343719°
LONGITUDE -94.984549°

TYPICAL APPROACH SECTION



SITUATION PLAN

DESIGN FOR 15° SKEW (L.A.)
310'-8 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
105'-0 NEW S. END SPAN
SITUATION PLAN
STATION 565+36.18 AUGUST, 2018
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 4 OF 28 FILE NO. 31548 DESIGN NO. 218

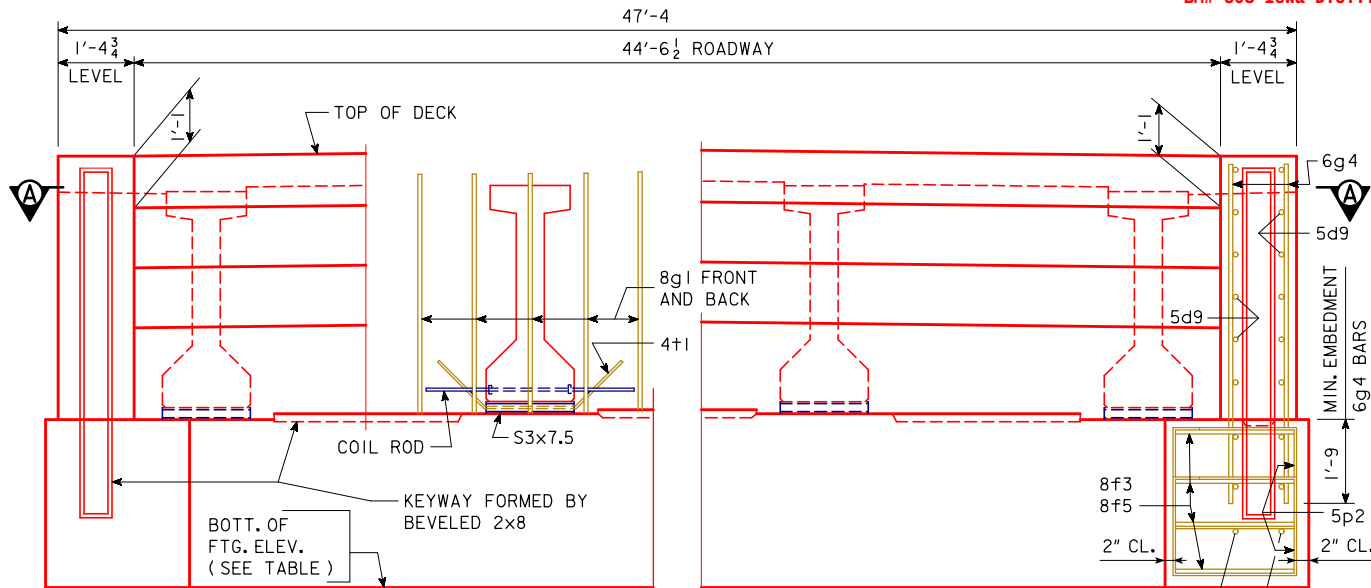


SUBSTRUCTURE LAYOUT

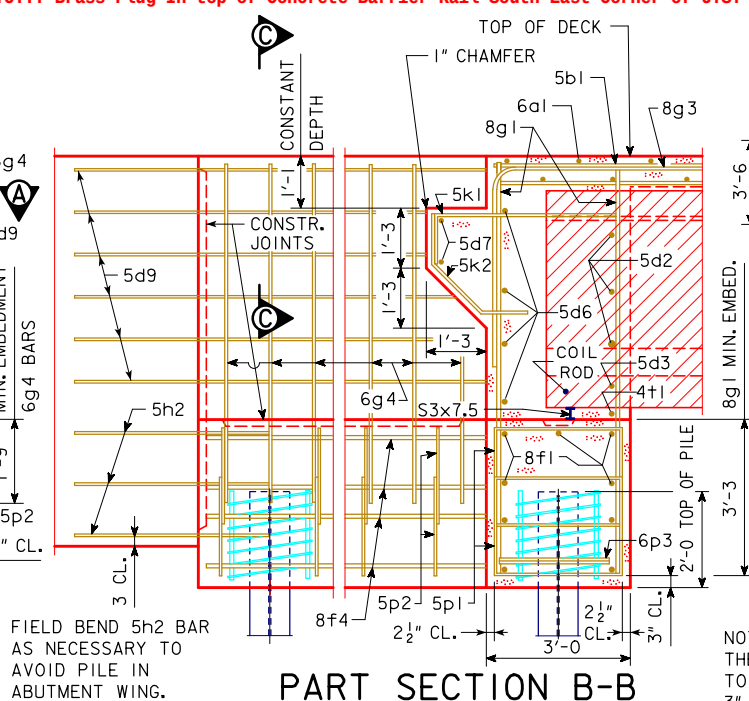
DESIGN FOR 15° SKEW (L.A.)
**310'-8 X 44'-0 PRETENSIONED
 PRESTRESSED CONCRETE BEAM BRIDGE**
 105'-0 NEW S. END SPAN
SUBSTRUCTURE LAYOUT
 STATION 565+36.18 AUGUST, 2018
CASS COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 5 OF 28 FILE NO. 31548 DESIGN NO. 218

CORRECTION 04-14 - ADDED CONCRETE QUANTITY TABLE & REFERRAL NOTE TO SUMMARY QUANTITY SHEET. REMOVED DESIGN BEARING NOTE FOR ABUT. PILING FROM ABUTMENT NOTES. ENGLISHINTEGRALBRIDGES.DGN 2087 - THIS SHEET REDRAWN 9-8-88

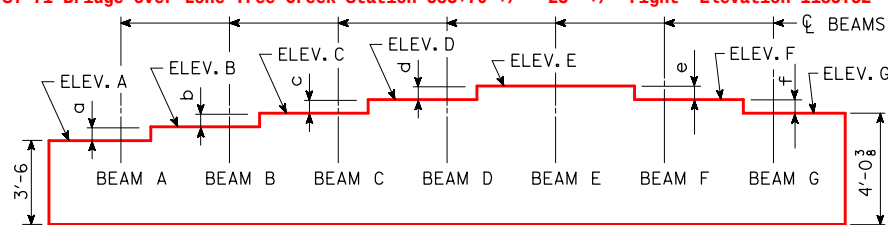
BM# 503 Iowa D.O.T. Brass Plug In top of Concrete Barrier Rail South East Corner of U.S. 71 Bridge over Lone Tree Creek Station 583+70 +/- 23' +/- right Elevation 1185.52



PART REAR ELEVATION AT ABUTMENT
(WINGS NOT SHOWN)



PART SECTION B-B
('D' BEAM SHOWN)



ABUTMENT STEP DIAGRAM
(REAR ELEVATION)

TABLE OF
ABUTMENT STEPS

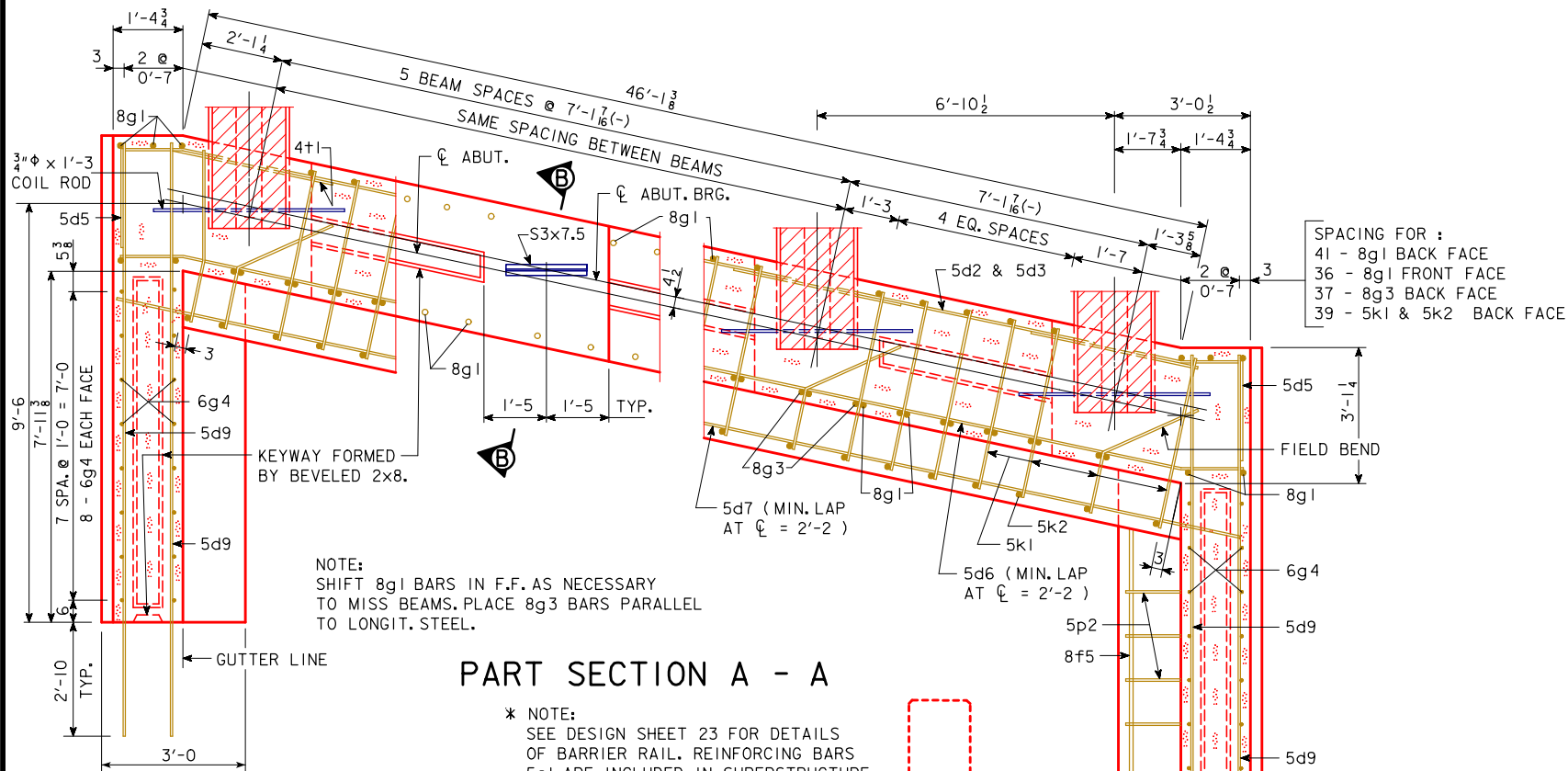
STEP	NEW SOUTH ABUT.
a	2 1/4
b	2 1/4
c	2 1/6
d	1/8
e	1/8
f	1/4

TABLE OF ABUTMENT
ELEVATIONS

POINT	NEW SOUTH ABUT.
ELEV. A	** 1175.85
ELEV. B	1176.04
ELEV. C	1176.23
ELEV. D	1176.40
ELEV. E	1176.41
ELEV. F	1176.40
ELEV. G	1176.38
BOTT. FTG. ELEV.	1172.35

** LOW STEP ELEVATION

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

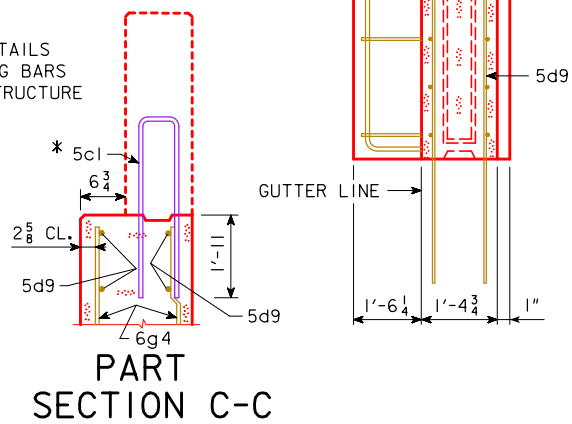


PART SECTION A - A

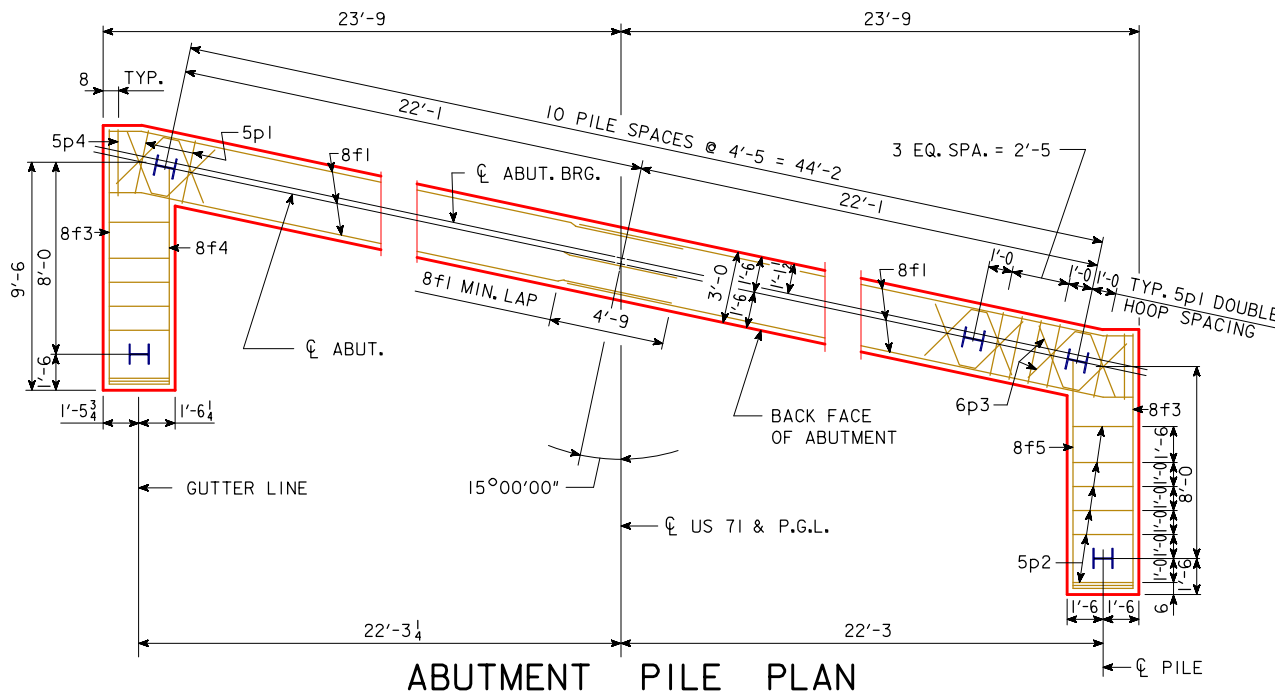
* NOTE:
SEE DESIGN SHEET 23 FOR DETAILS
OF BARRIER RAIL. REINFORCING BARS
5c1 ARE INCLUDED IN SUPERSTRUCTURE
QUANTITIES.

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 AND 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.
13 - HP 10 X 57 STEEL BEARING PILING REQUIRED AT NEW SOUTH ABUTMENT.
THE DESIGN BEARING FOR THE ABUTMENT PILES IS 47 TONS.
THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE (LRFD) FOR ABUTMENT PILES IS 98 TONS AT END OF DRIVE. THE PILE CONTRACT LENGTH SHALL BE DRIVEN AS PER PLAN UNLESS PILES REACH REFUSAL. CONSTRUCTION CONTROL REQUIRES A WEAP ANALYSIS WITH BEARING GRAPH.
STEEL PILE POINTS ARE REQUIRED FOR THE STEEL H-PILES AT THE ABUTMENT.



PART
SECTION C-C



ABUTMENT CONCRETE QUANTITY

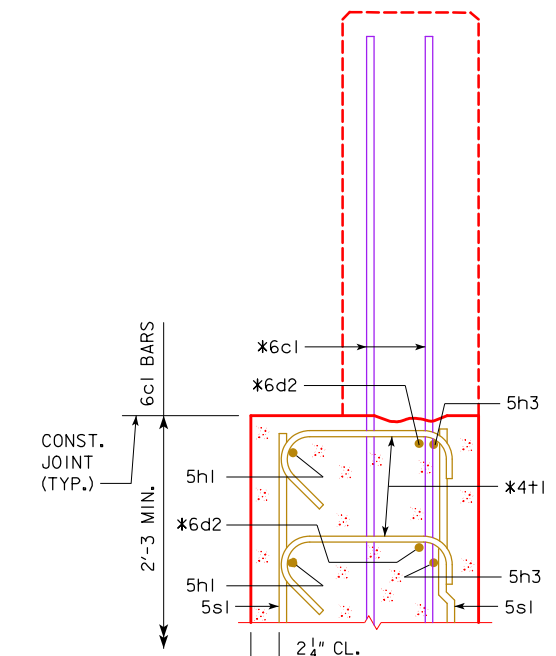
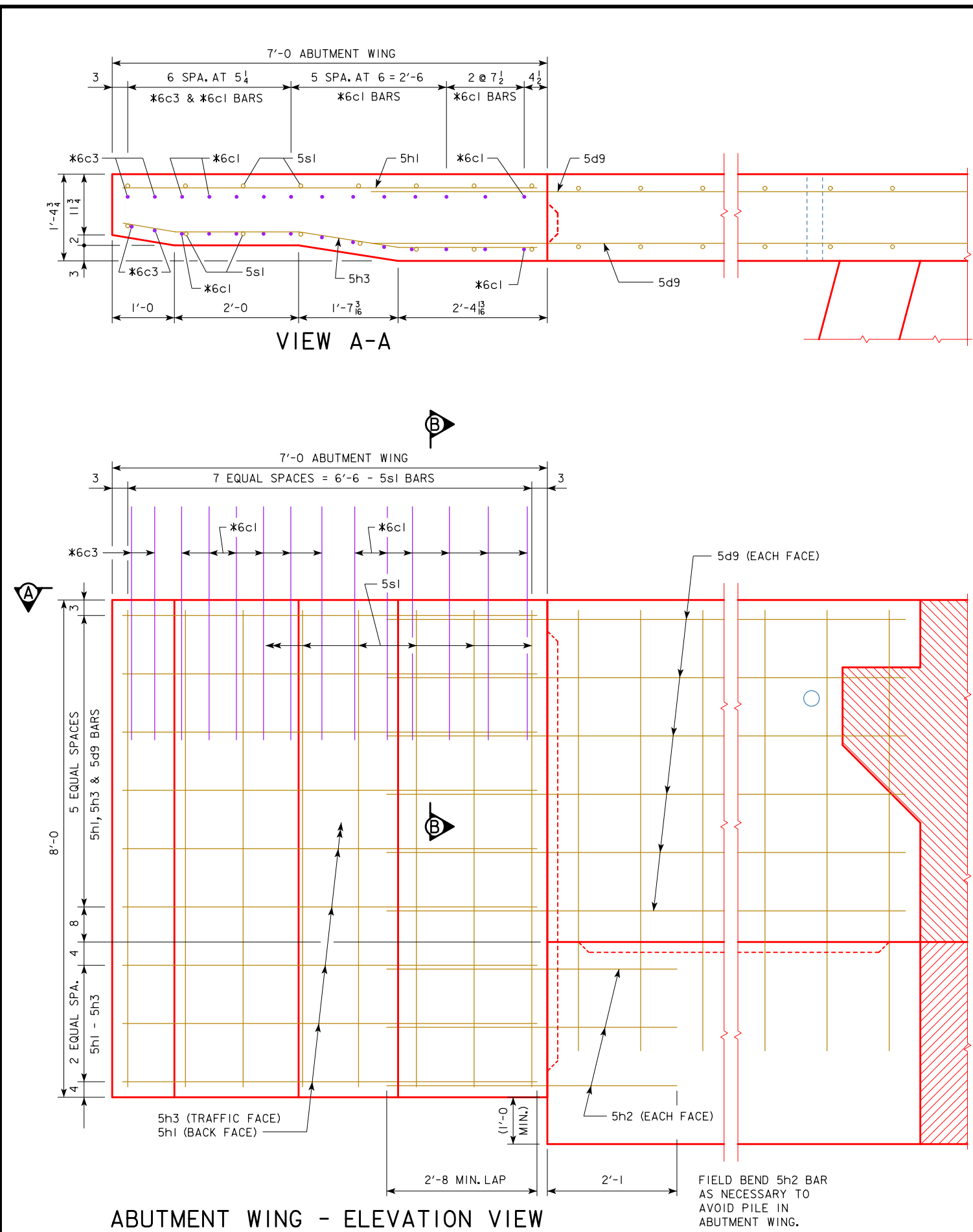
LOCATION	QUANTITY
NEW SOUTH ABUTMENT FOOTING	33.8
TOTAL (CU. YDS.)	33.8

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

NOTE: BARRIER RAIL NOT SHOWN IN DETAILS.

DESIGN FOR 15° SKEW (L.A.)
310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE
105'-0 NEW S. END SPAN
NEW SOUTH ABUTMENT DETAILS
STATION 565+36.18
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 6 OF 28 FILE NO. 31548 DESIGN NO. 218

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



* 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 6cl, 6c3, 6d2 & 4t1.

REINFORCING BAR LIST - ONE ABUT. WING					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5hl	HORIZONTAL BACK FACE		9	6'-8	63
5h3	HORIZONTAL TRAFFIC FACE		9	6'-9	63
5sl	VERTICAL BOTH FACES		16	7'-8	128
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					254

5h3

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

BENT BAR DETAILS

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

NOTE:

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

DESIGN FOR 15° SKEW (L.A.)

310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

105'-0 NEW S. END SPAN

NEW S. ABUTMENT WING DETAILS

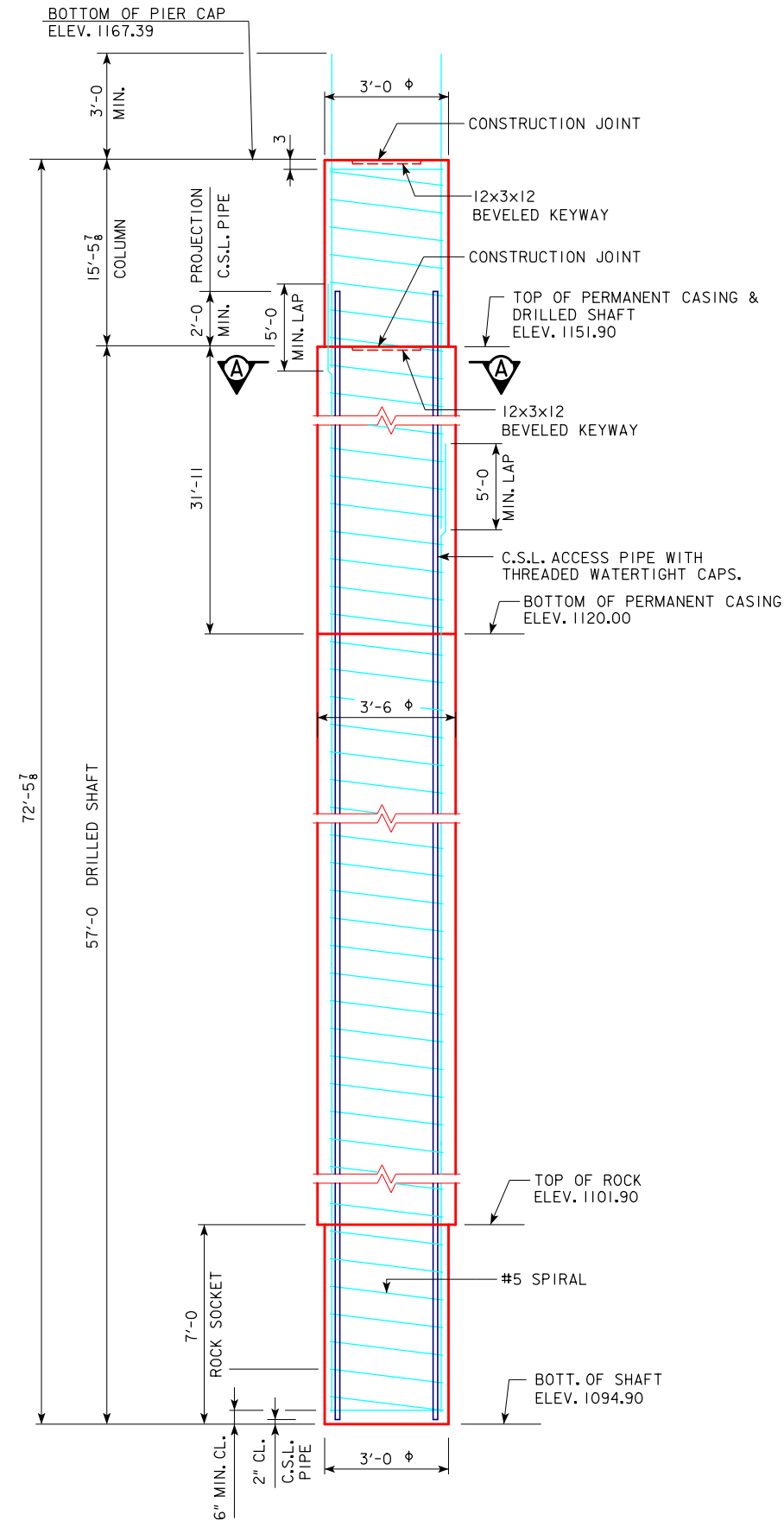
STATION 565+36.18

AUGUST, 2018

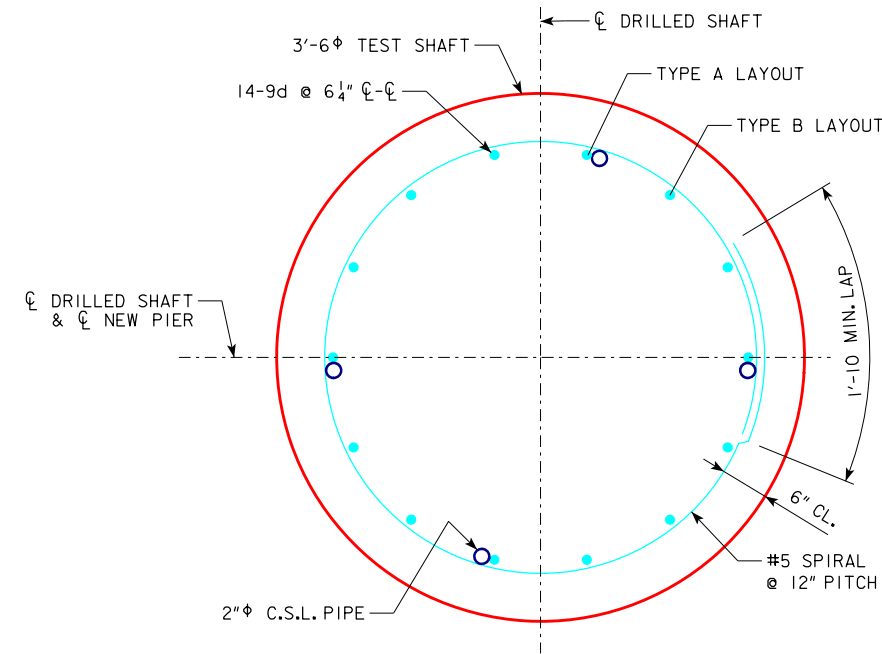
CASS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

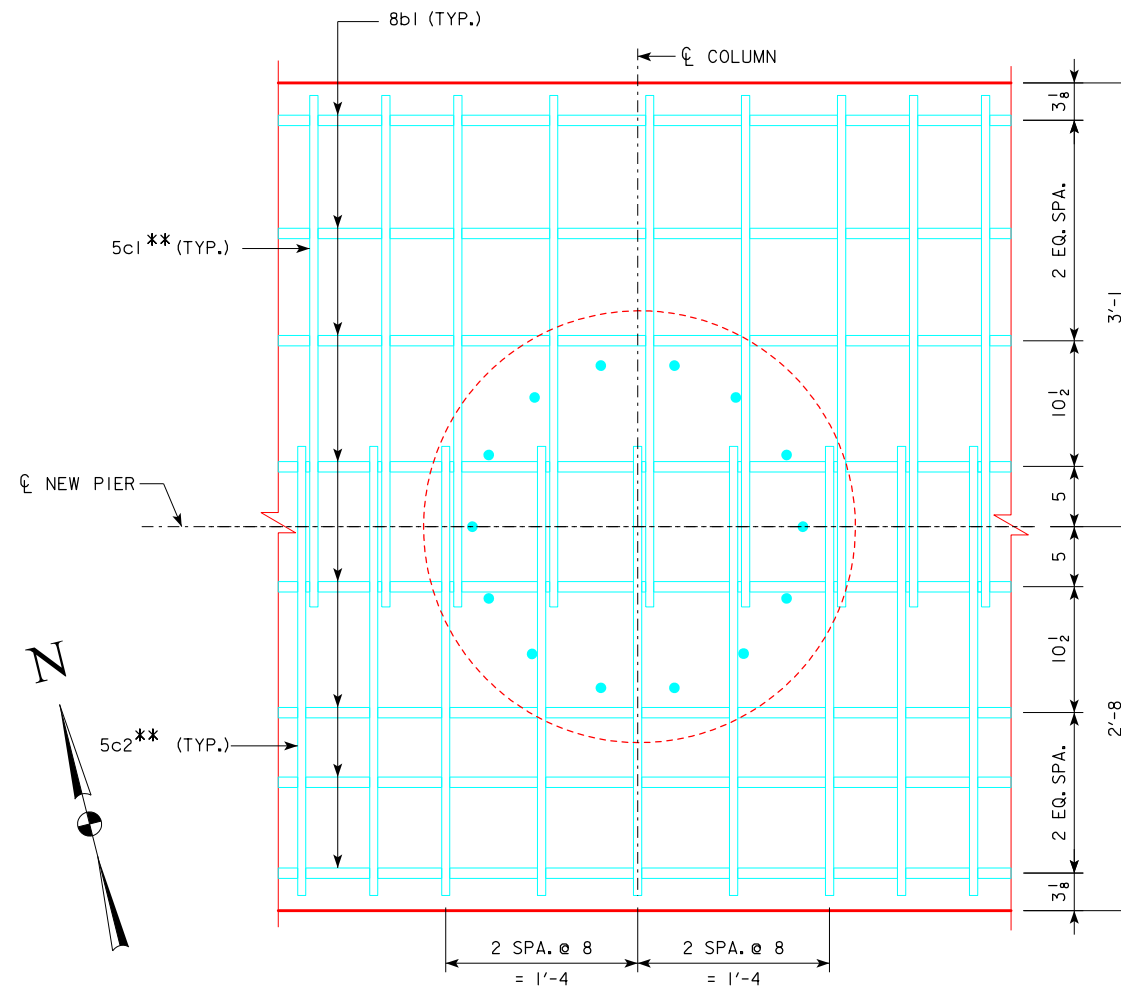
DESIGN SHEET NO. 7 OF 28 FILE NO. 31548 DESIGN NO. 218



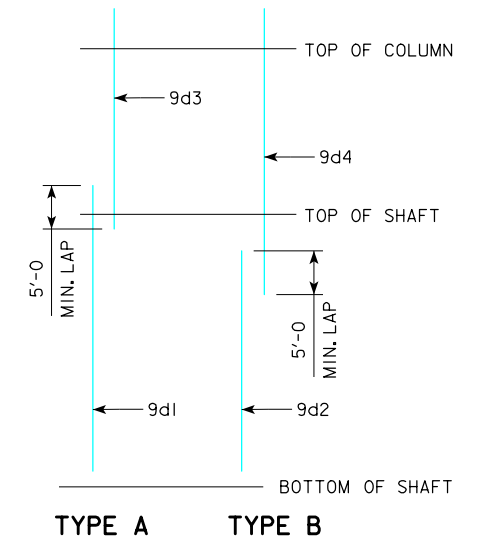
DRILLED SHAFT
REINFORCING DETAILS



SECTION A-A



PART PLAN SHOWING TIGHT CLEARANCE
BETWEEN COLUMN AND CAP REINFORCING



LONGITUDINAL BAR LAYOUT

NOTE:
SPIRAL REINFORCING IS TO BE NO. 5 BAR WITH 2'-6 O.D., 12" PITCH WITH 4 EQUALLY SPACED $L \frac{7}{8} \times \frac{7}{8} \times \frac{1}{8}$ SPACERS PUNCHED TO HOLD SPIRALS. SPIRALS ARE TO HAVE $1 \frac{1}{2}$ EXTRA TURNS AT TOP AND BOTTOM COLUMNS OR DRILLED SHAFT.
THE SPIRAL REINFORCING MAY BE SPLICED BY LAPPING 1'-10. 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 AND DRILLED SHAFT 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 ALTERNATE TIE ON DESIGN SHEET 9.

PERMANENT STEEL CASING SHALL BE ACCORDING TO ASTM A 252, GRADE 2, PRODUCED BY ELECTRIC SEAM, BUTT, OR SPIRAL WELDING. THE MINIMUM WALL THICKNESS SHALL BE AS REQUIRED TO RESIST THE ANTICIPATED INSTALLATION AND DEWATERING STRESSES, AS DETERMINED BY THE CONTRACTOR, BUT SHALL BE A MINIMUM OF $\frac{1}{4}$ IN.

** FOR 5c SPACING IN REMAINDER OF CAP, SEE DESIGN SHEET 9.

DESIGN FOR 15° SKEW (L.A.)
**310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
105'-0 NEW S. END SPAN
DRILLED SHAFT DETAILS
STATION 565+36.18 CASS COUNTY JANUARY, 2018
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 8 OF 28 FILE NO. 31548 DESIGN NO. 218

REINFORCING BAR LIST - NEW PIER						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
8a1	CAP, LONGIT., TOP		8	48'-8	1040	*
8a2	CAP, LONGIT., TOP		4	26'-8	285	
8a3	CAP, LONGIT., SIDES		6	48'-8	780	*
8a4	CAP, LONGIT., TOP		3	26'-8	214	*
8a5	CAP, LONGIT., TOP		3	24'-0	192	*
8b1	CAP, LONGIT., BOTTOM		8	43'-0	918	*
8b2	CAP, LONGIT., CANTILEVER, BOTTOM		16	5'-8	242	*
5c1	CAP, HOOP		58	14'-10 1/4	899	*
5c2	CAP, HOOP		58	15'-8 1/4	949	*
5c3	CAP, HOOP, CANTILEVER		12	VARIES	174	*
5c4	CAP, HOOP, CANTILEVER		12	VARIES	184	*
9d1	DRILLED SHAFT, VERTICAL		21	60'-0	4284	
			7	60'-0	1428	*
9d2	DRILLED SHAFT, VERTICAL		21	50'-0	3570	
			7	50'-0	1190	*
9d3	COLUMN, VERTICAL		21	20'-0	1428	
			7	20'-0	476	*
9d4	COLUMN, VERTICAL		21	30'-0	2142	
			7	30'-0	714	*
5m1	CAP, LONGIT., STEP (BEAMS B & C)		8	3'-0	25	
			6	3'-0	19	*
5n1	CAP, TRANSV., STEP (NEW BEAMS B, C & D THRU G)		36	6'-2	232	*
5n2	CAP, TRANSV., STEP (STEP FOR EXISTING BEAMS)		49	7'-6	383	*
#5	COLUMN & DRILLED SHAFT, SPIRAL		3	592'-0	1852	
			1	592'-0	617	*
	COLUMN & DRILLED SHAFT, SPIRAL SPACERS L 7/8 x 7/8 (0.7 LB/FT)		12	71'-9	603	
			4	71'-9	201	*
PREVIOUSLY BID REINFORCING STEEL - TOTAL (LBS.)					14189	
NEW REINFORCING STEEL - TOTAL (LBS.)					10852	*
REINFORCING STEEL - TOTAL (LBS.)					24041	

* INDICATES NEW REINFORCEMENT

CONCRETE PLACEMENT QUANTITIES	
LOCATION	NEW PIER
CAP	59.0
COLUMNS	16.2
TOTAL (C.Y.)	75.2

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

PIER NOTES:

ALL EXPOSED CORNERS 90° OR SHARPER ARE TO BE FILLETED
WITH A 3/4" DRESSED AND BEVELED STRIP.

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

FORMS FOR PIER CAP 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.

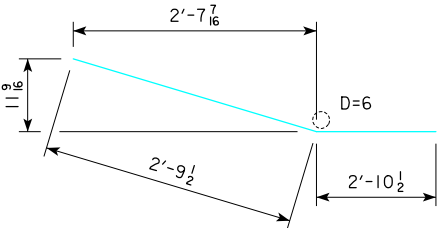
CONCRETE STRENGTH SHALL BE VERIFIED BY FLEXURAL STRENGTH
ACCORDING TO MATERIALS I.M. 316 WITH A MINIMUM FLEXURAL
STRENGTH OF 0.343 KSI OR BY THE MATURITY METHOD ACCORDING
TO MATERIALS I.M. 383. CURING OF PIER CAP CONCRETE SHALL
BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. PIER
CAP CONCRETE SHALL 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.

NOTE TO CONTRACTOR:

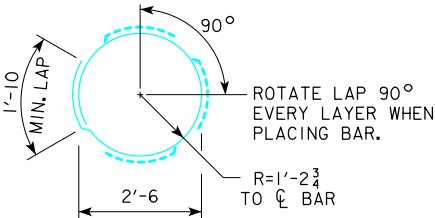
IF APPROVED BY IOWA DOT, CONTRACTOR MAY SALVAGE
SOME OF 8a1, 8a2, AND 8b1 BARS FROM PRIOR PIER
DESIGN BY CUTTING AND LAPPING BARS TO OBTAIN
LENGTHS REQUIRED ON THIS LIST. SPLICES MAY ONLY
BE INTRODUCED AT LOCATIONS APPROVED BY THE
RESIDENT ENGINEER.

REQUIRED LAP LENGTH FOR #8 BAR = 6'-0"

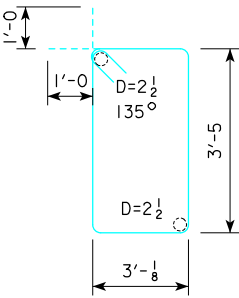
BENT BAR DETAILS



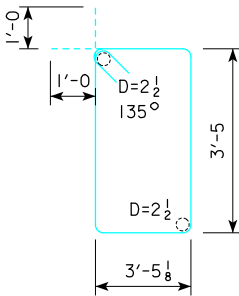
8b2



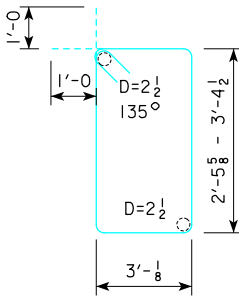
ALTERNATE TIE
(SIZE #5)



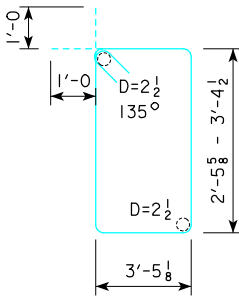
5c1



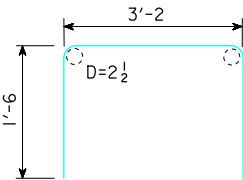
5c2



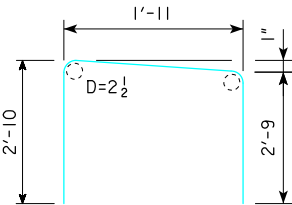
5c3



5c4



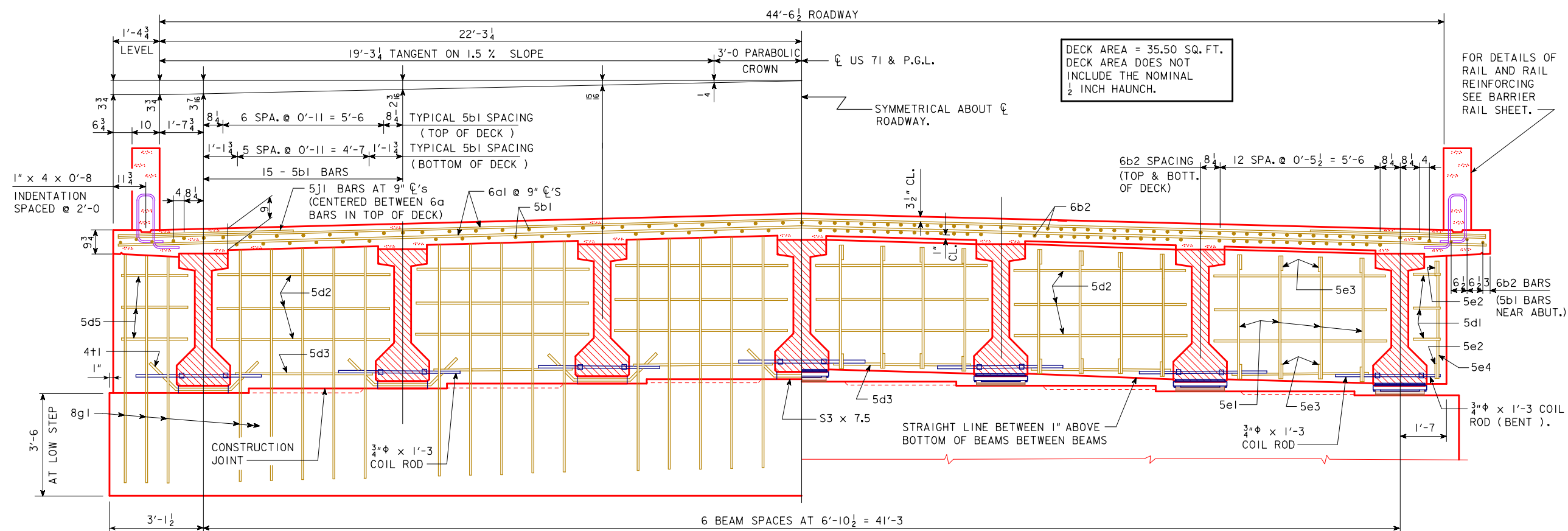
5n1



5n2

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

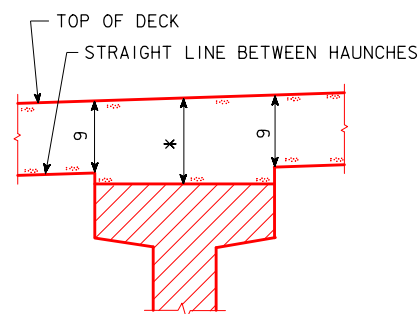
DESIGN FOR 15° SKEW (L.A.)
310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE
105'-0 NEW S. END SPAN
NEW PIER REBAR LIST & DETAILS
STATION 565+36.18
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 10 OF 28 FILE NO. 31548 DESIGN NO. 218
AUGUST, 2018



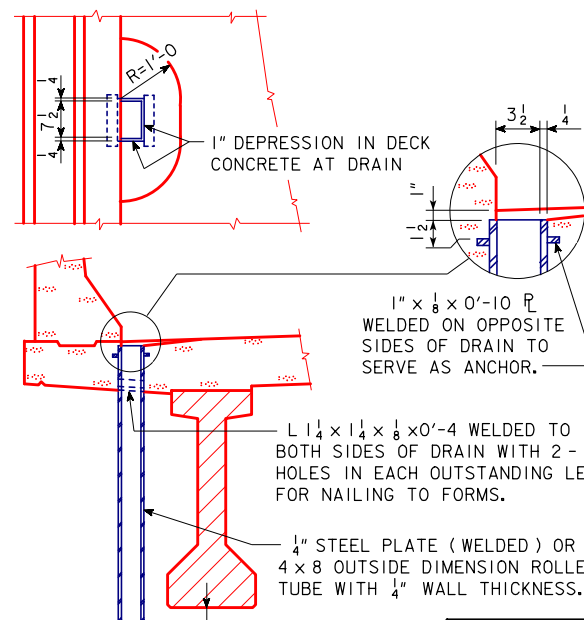
HALF SECTION NEAR ABUTMENT

HALF SECTION NEAR NEW PIER (NEW BEAMS)

NOTE : FOR DETAILS OF INTERMEDIATE DIAPHRAGMS SEE DESIGN SHEET 21.



INTERIOR BEAMS



DRAIN DETAILS

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

LENGTH OF S3 x 7.5 (ABUTMENT BEAM SEAT)	
BEAM BOTTOM FLANGE WIDTH	LENGTH OF S3 x 7.5
1'-10	1'-8½

SUPERSTRUCTURE NOTES:

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

THE NEW SOUTH ABUTMENT DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHICALLY WITH THE BRIDGE DECK.

ALL BEAMS ARE TO BE SET VERTICAL.

FORMS FOR THE BRIDGE 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 $3\frac{1}{2}$ " 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.

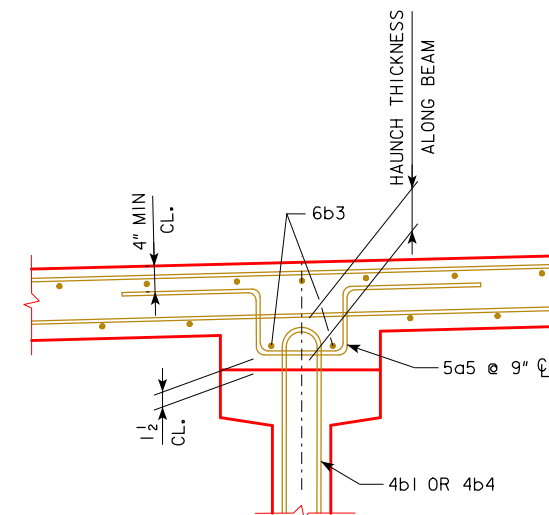
TRANSVERSE DECK REINFORCING MAY BE SPLICED WITH ONE LAP LOCATED AS FOLLOWS:

TOP BAR - LAP MIDWAY BETWEEN BEAMS (MIN. LAP = 3'-1).

BOTTOM BARS - LAP OVER BEAMS (MIN. LAP = 3'-1).

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

CLEAN ALL EXISTING EXPOSED BARS THAT ARE TO BE INCORPORATED INTO NEW CONSTRUCTION. COST INCLUDED WITH "REMOVALS, AS PER PLAN". BADLY DETERIORATED EXISTING REINFORCING SHALL BE REPLACED AS DIRECTED BY THE ENGINEER.



HAUNCH DETAIL
(REQUIRED WHERE HAUNCH EXCEEDS 3".
SEE DESIGN SHEET 20 FOR LOCATIONS.)

DESIGN FOR 15° SKEW (L.A.)

310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

105'-0 NEW S.END SPAN

BRIDGE DECK CROSS SECTION (NEW SPAN)

STATION 565+36.18

AUGUST, 2018

CASS COUNTY

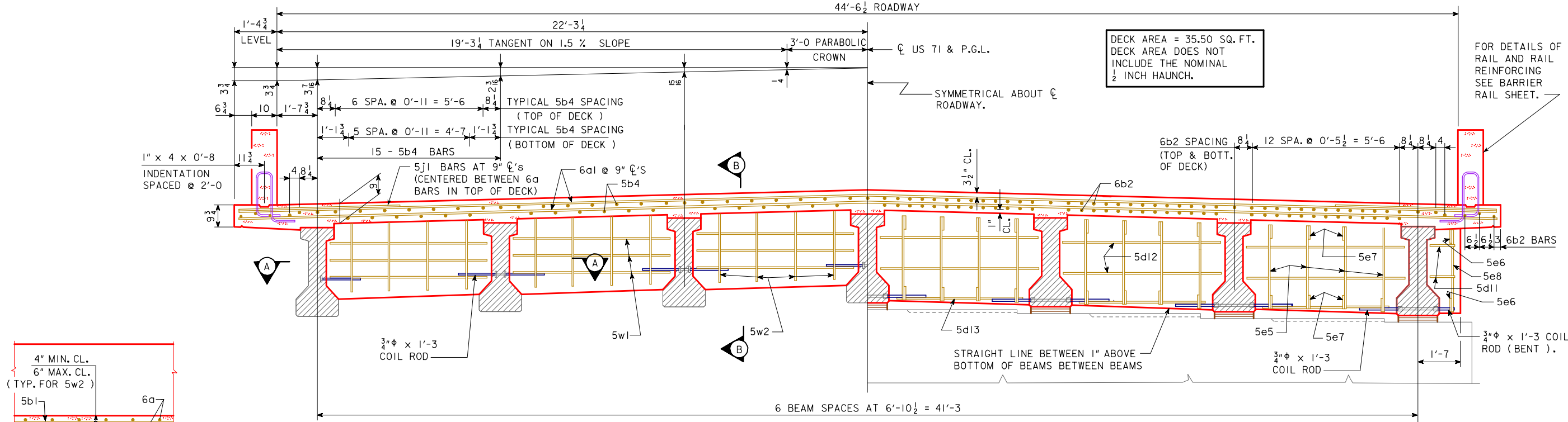
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 11 OF 28 FILE NO. 31548 DESIGN NO. 218

* FOR DECK THICKNESS OVER BEAMS SEE
" DECK THICKNESS DETAILS " ON DESIGN
SHEET NO. 18.

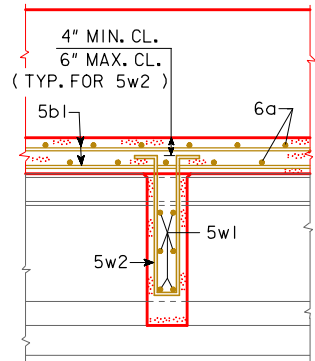
DATA FOR ONE DRAIN	
BEAM SIZE	D
DRAIN WT. (LBS.)	120
DRAIN LENGTH (FT.)	6'-2 ³ / ₄

CORRECTION 04-14 - ADDED REFERRAL NOTE TO SUMMARY QUANTITIES SHEET FOR THE DRAIN WEIGHT. NOTE ABOUT CHOICE OF EPOXY OR STAINLESS STEEL DECK TO BARRIER RAIL BARS.
REVISED 07-2018; CHANGED NOTE STATING "1" RESILIENT JOINT FILLER" (WAS PERFORMED EXPANSION JOINT FILLER).
ENGLISHSTUBABUTMENTBRIDGES.DGN 4560 - THIS SHEET ISSUED 11-06. LRFD DESIGNED DECK.

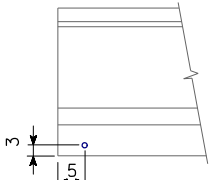


HALF SECTION SHOWING INTERMEDIATE DIAPHRAGM REPLACED EXISTING SPAN I

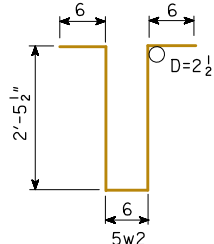
HALF SECTION NEAR NEW PIER I REPLACED EXISTING SPAN I



SECTION B-B



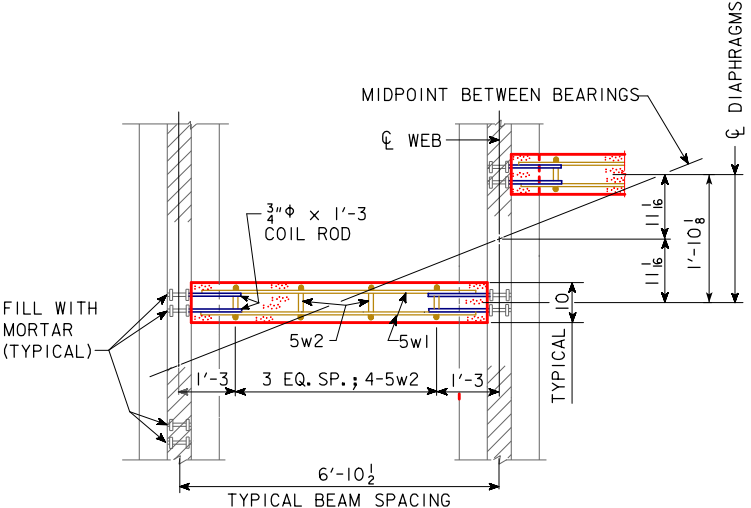
EXISTING FIXED PIER I
EXISTING BEAM COIL TIE
LOCATIONS AT ENDS OF
EXISTING BEAMS



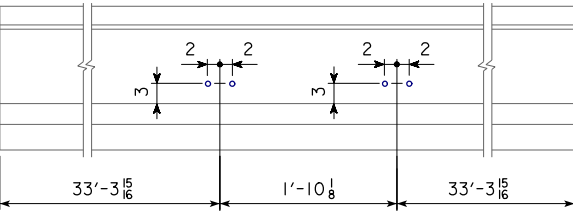
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D=PIN DIAMETER.

EPOXY COATED REINFORCING BAR LIST INTERMEDIATE DIAPHRAGMS					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5w1	INTERMEDIATE DIAPH. LONGIT.		36	5'-10"	219
5w2	INTERMEDIATE DIAPH. HOOPS		24	6'-5"	161
EPOXY COATED REINFORCING STEEL-TOTAL (LBS.)					380

CONCRETE PLACEMENT QUANTITIES INTERMEDIATE DIAPHRAGMS	
QUANTITY	TOTAL
6 @ 0.51 CU.YDS.	3.06 CU. YDS.



SECTION A-A



EXISTING INTERMEDIATE DIAPHRAGM
BEAM COIL TIE LOCATIONS
EXISTING BEAMS

NOTE:
FOR SUPERSTRUCTURE NOTES, SEE DESIGN SHEET 11.
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
ALL INTERMEDIATE DIAPHRAGM QUANTITIES FOR STRUCTURAL CONCRETE AND EPOXY COATED REINFORCING STEEL ARE INCLUDED ON THE SUMMARY QUANTITIES SHEET.
AT LOCATIONS UNDER LONGITUDINAL BRIDGE FLOOR CONSTRUCTION JOINTS THE INTERMEDIATE CONCRETE DIAPHRAGM IS TO BE OMITTED.
LOCATIONS OF EXISTING COIL TIE ROD LOCATIONS ARE PROVIDED FOR INFORMATION ONLY AND SHALL MATCH EXISTING LOCATIONS.
IF APPROVED BY THE ENGINEER, CONTRACTOR MAY KEEP, CLEAN AND REUSE THE EXISTING COIL TIE RODS.

DESIGN FOR 15° SKEW (L.A.)

310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

105'-0 NEW S. END SPAN

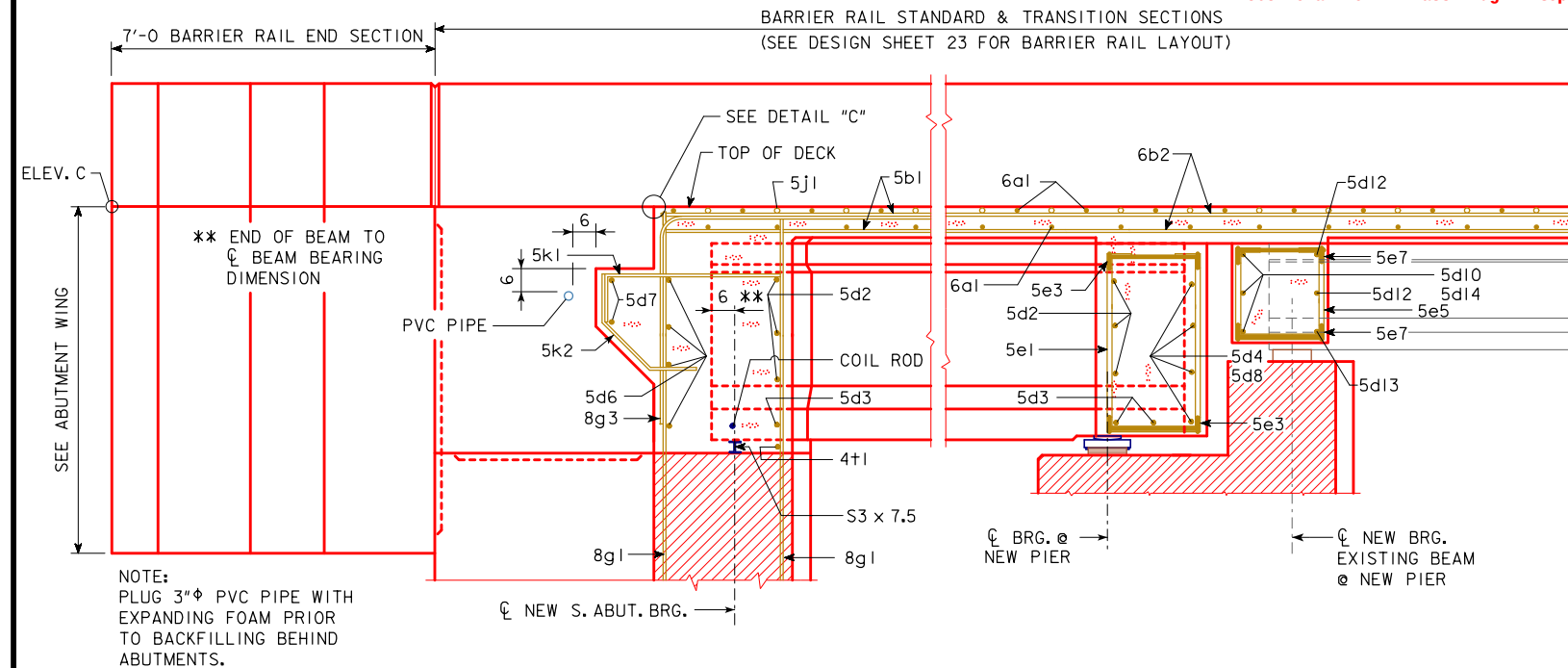
BRIDGE DECK CROSS SECTION (EXIST. SPAN I)

STATION 565+36.18

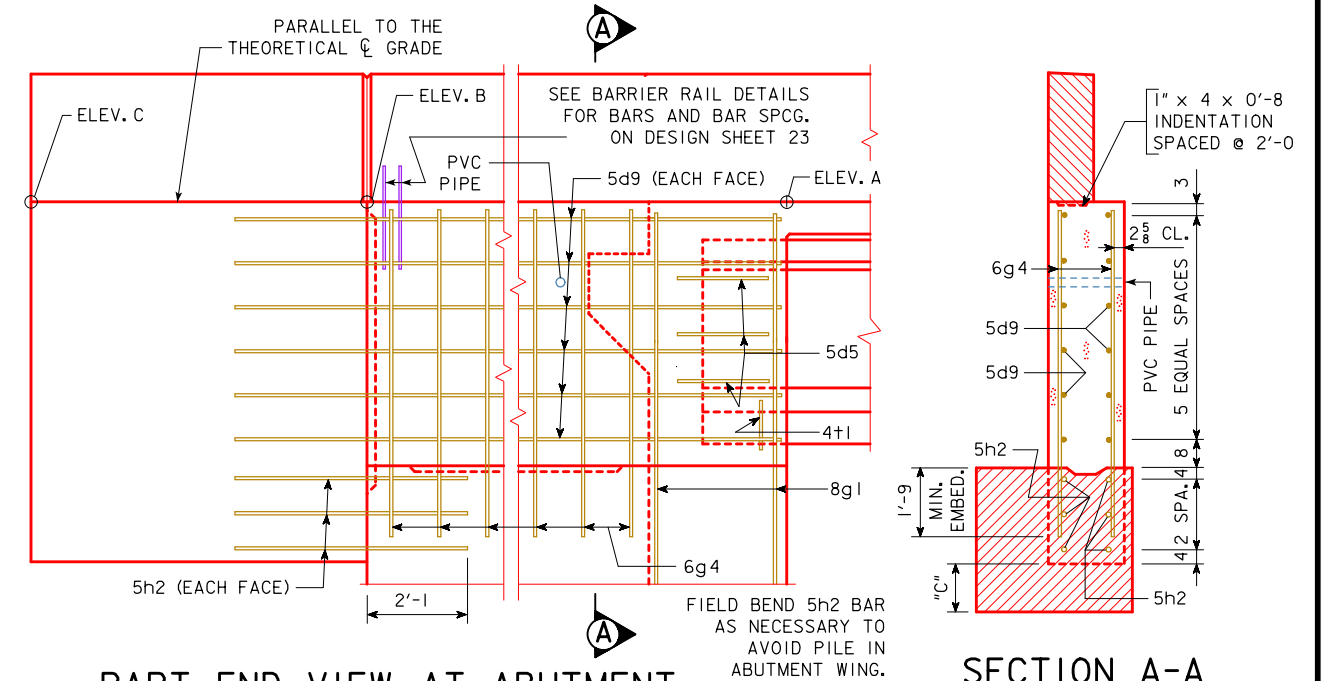
CASS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 12 OF 28 FILE NO. 31548 DESIGN NO. 218



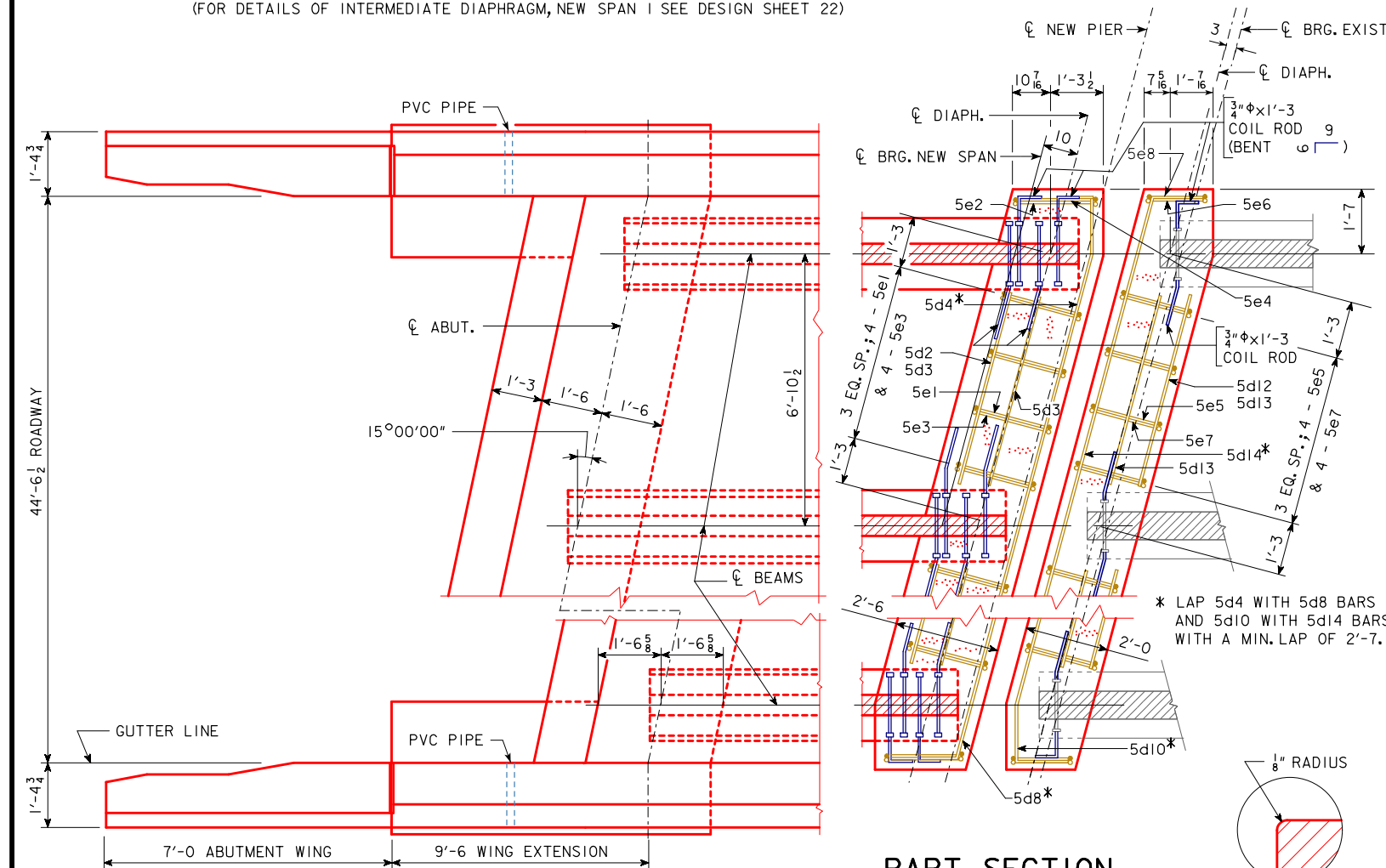
PART LONGITUDINAL SECTION NEAR GUTTER
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM, NEW SPAN I SEE DESIGN SHEET 22)



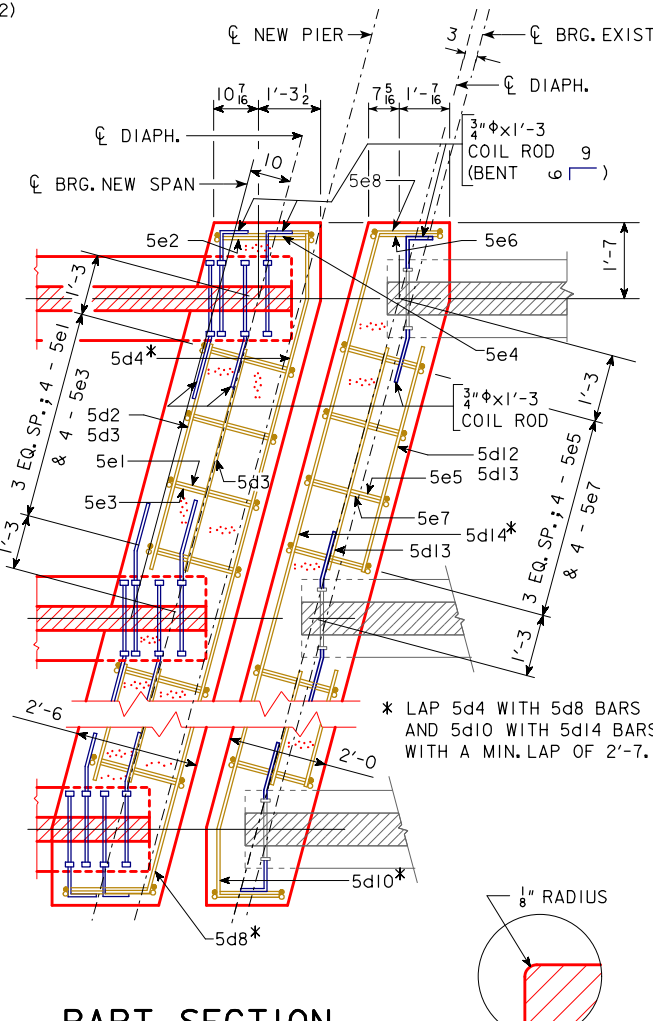
PART END VIEW AT ABUTMENT

SECTION A-A

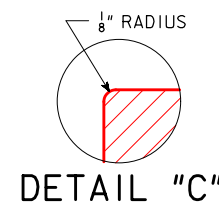
TABLE OF WINGWALL ELEVATIONS				
LOCATION	DIM "C"	ELEV. A	ELEV. B	ELEV. C
S.W. CORNER	1'-8 5/8"	1181.54	1182.07	1182.42
S.E. CORNER	2'-3 3/4"	1182.12	1182.66	1183.01



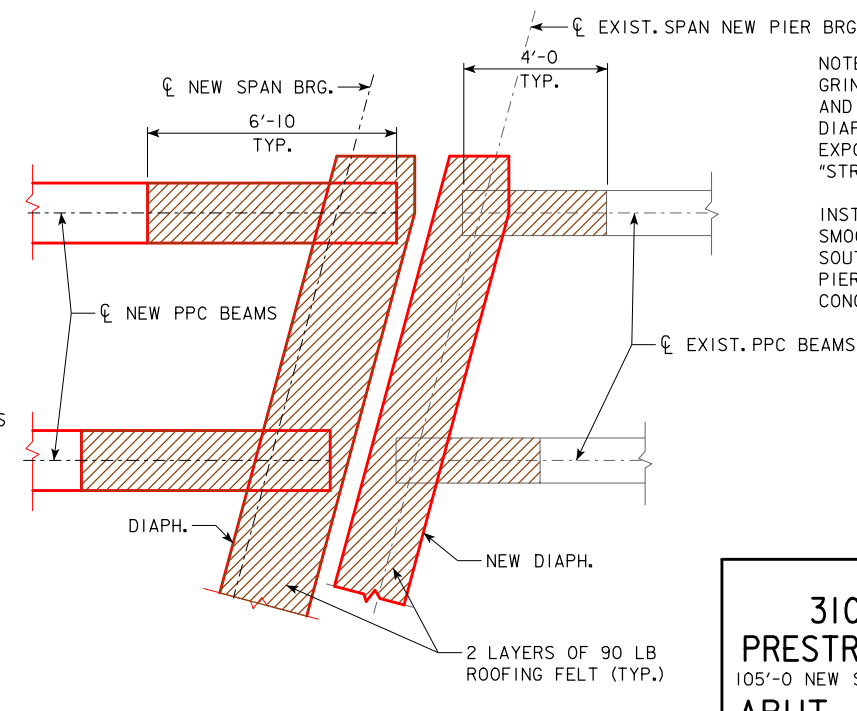
PART PLAN



PART SECTION AT PIER



DETAIL "C"



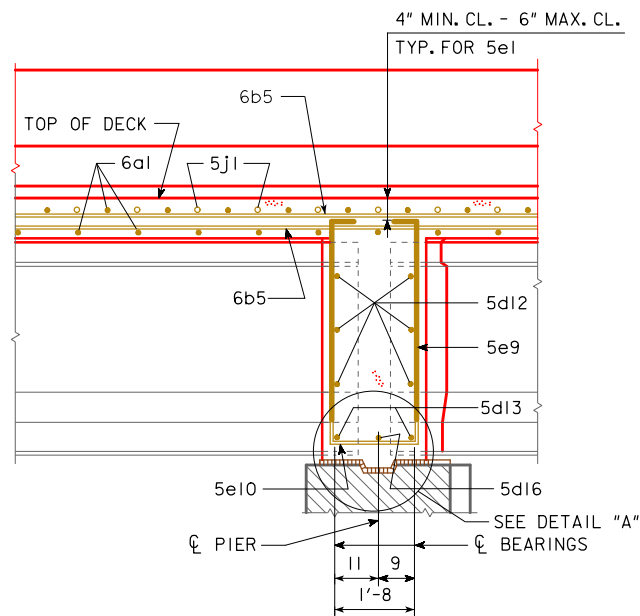
PART PLAN AT PIER
(SHOWING ROOFING FELT LAYOUT)

NOTES:
GRIND SMOOTH TOP OF TOP FLANGE OF EXISTING BEAMS AND TOP SURFACE OF EXISTING SOUTH ABUTMENT DIAPHRAGM. APPLY TWO COATS OF ZINC RICH PAINT TO EXPOSED ENDS OF EXISTING BARS. COST INCLUDED WITH "STRUCTURAL CONCRETE (LINK SLAB)".

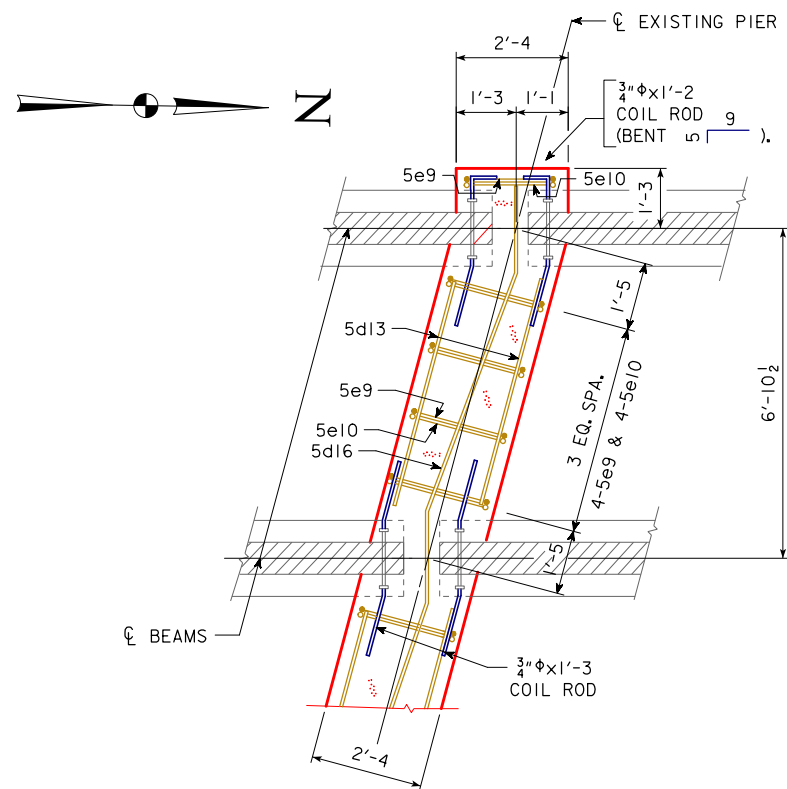
INSTALL TWO LAYERS OF 90 LB ROOFING FELT ON SMOOTHENED TOP SURFACES OF EXISTING BEAMS AND SOUTH ABUTMENT DIAPHRAGM AND NEW BEAMS & PIER DIAPHRAGM. COST INCLUDED WITH "STRUCTURAL CONCRETE (LINK SLAB)".

DESIGN FOR 15° SKEW (L.A.)
310'-8 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
105'-0 NEW S. END SPAN
ABUT. & PIER DIAPHRAGM DETAILS
STATION 565+36.18
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 13 OF 28 FILE NO. 31548 DESIGN NO. 218
AUGUST, 2018

CORRECTION 10-10 - CHANGED CONCRETE SEALER ARTICLE 2403.21, D TO ARTICLE 2403.03, P. 3.
REVISED 07-2018: ADDED "WASH SURFACES" AND LEADER LINE TO "CONCRETE SEALER LIMITS" DETAIL.
ENGLISH SUBMITMENT BRIDGES.DGN 4544 - THIS SHEET REDRAWN 9-8-88.

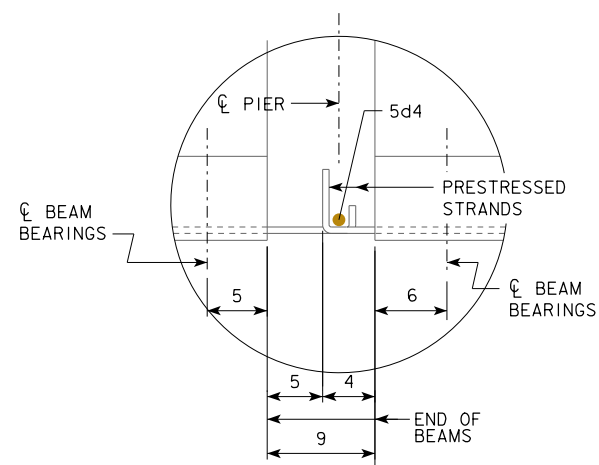


PART LONGITUDINAL SECTION NEAR GUTTER
EXISTING FIXED PIER I
(FOR DETAILS OF INTERMEDIATE DIAPHRAGM EXISTING SPAN I SEE DESIGN SHEET 12).

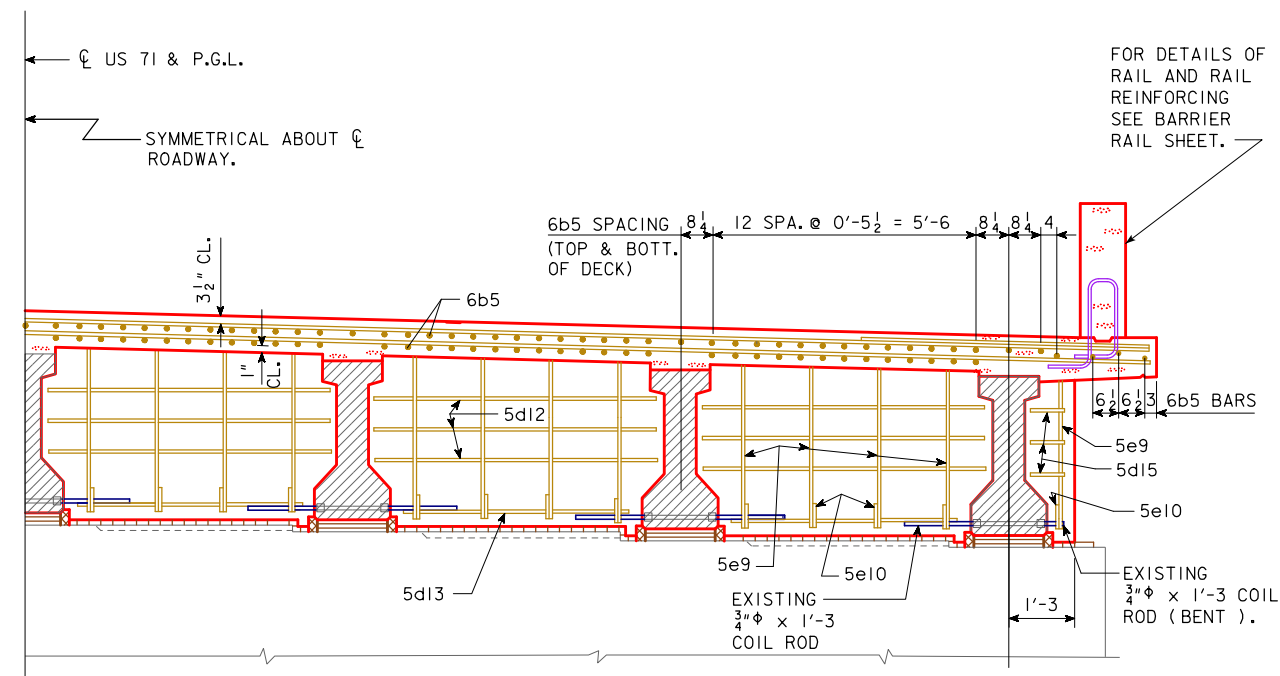


PART SECTION
EXISTING FIXED PIER I

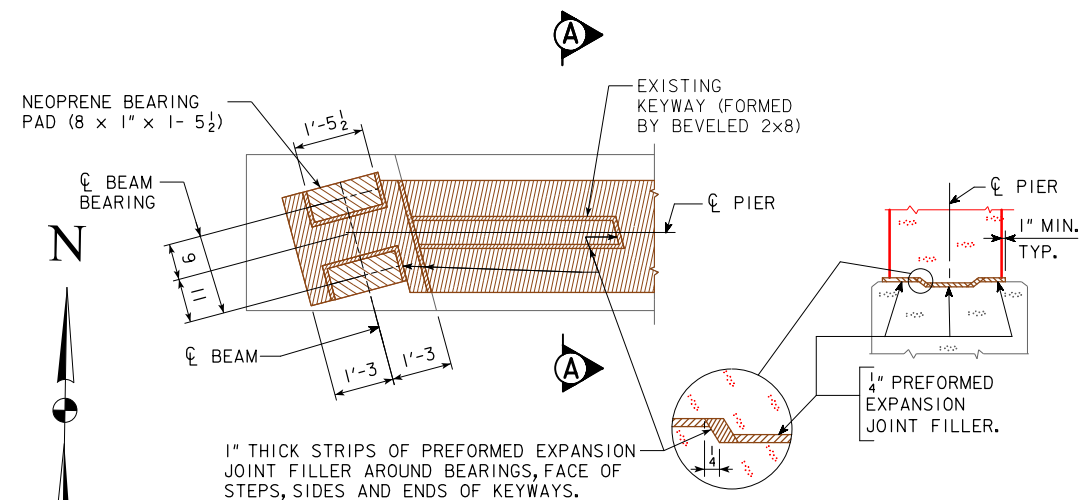
NOTE:
IF APPROVED BY THE
ENGINEER, CONTRACTOR MAY
KEEP, CLEAN AND REUSE THE
EXISTING COIL TIE RODS.



DETAIL "A"



HALF SECTION NEAR EXISTING FIXED PIER I
(REPLACED EXISTING SPAN I)

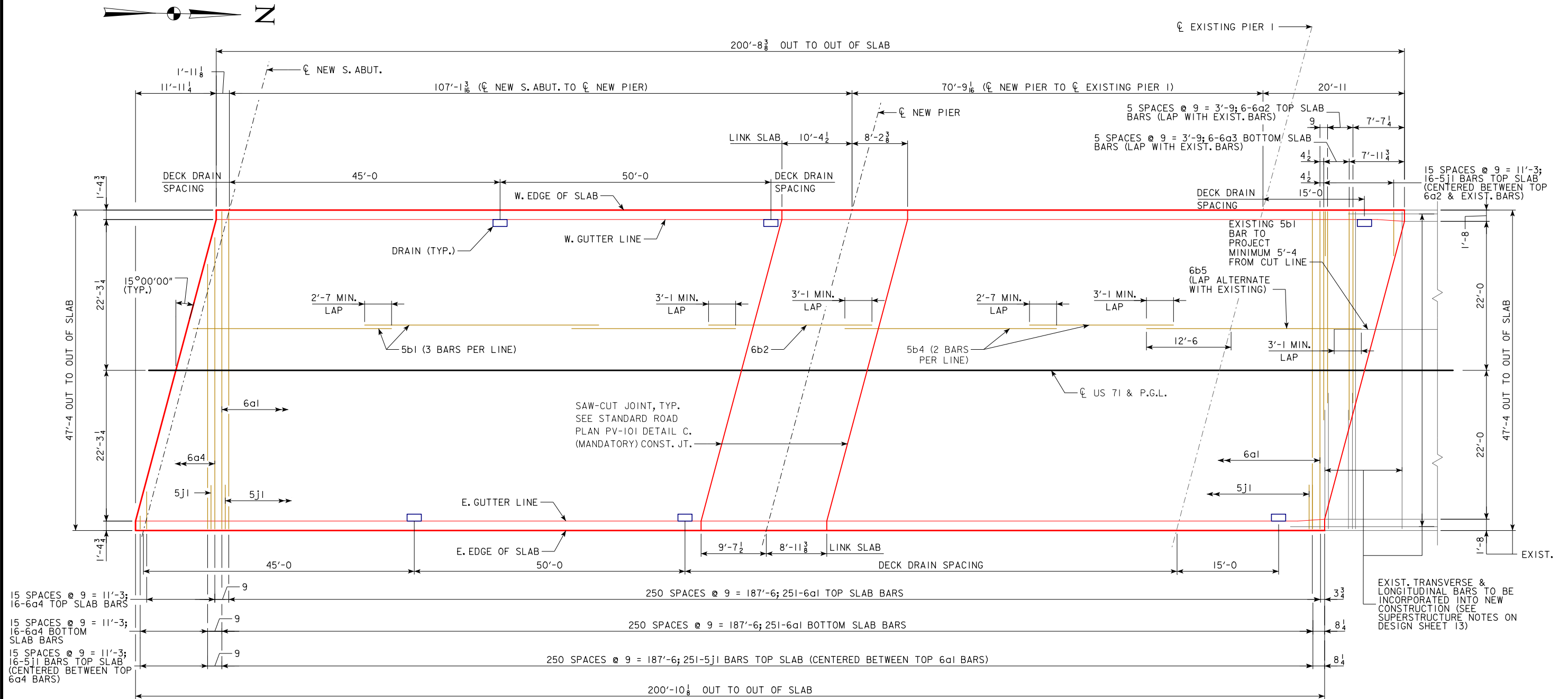


PART PLAN

SECTION A-A

TOP OF EXISTING FIXED PIER I DETAILS

DESIGN FOR 15° SKEW (L.A.)
310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE
105'-0 NEW S. END SPAN
EXIST. PIER I DIAPHRAGM DETAILS
STATION 565+36.18
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 14 OF 28 FILE NO. 31548 DESIGN NO. 218

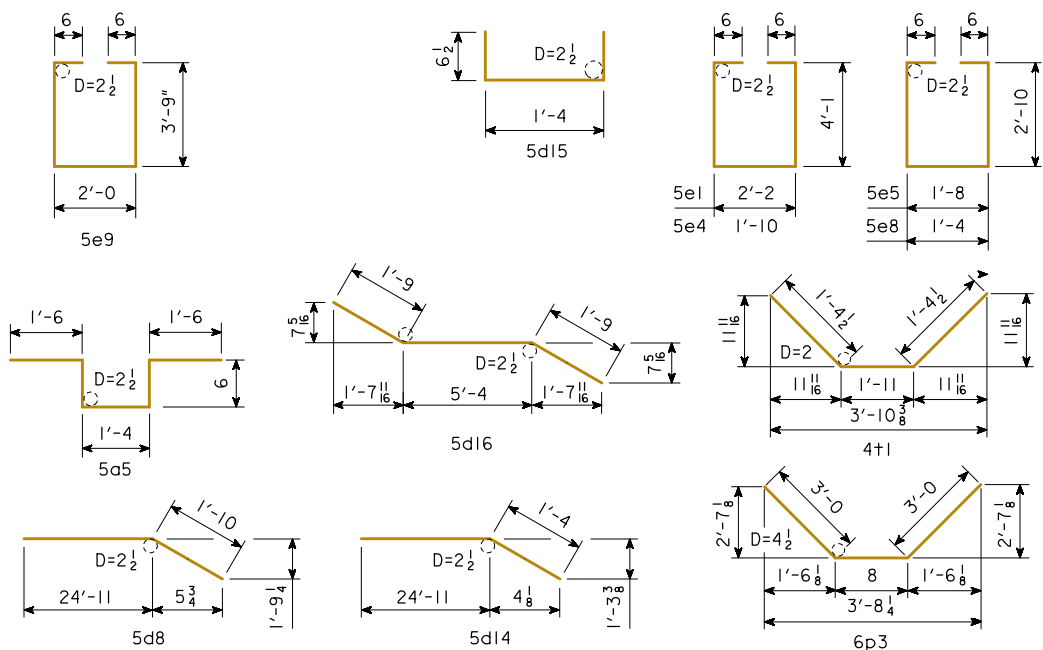


SLAB REINFORCING LAYOUT

NOTES:
FOR LONGITUDINAL BAR SPACING, SEE DESIGN SHEET 11 AND 12.
FOR CONCRETE PLACEMENT DIAGRAM, SEE DESIGN SHEET 16.

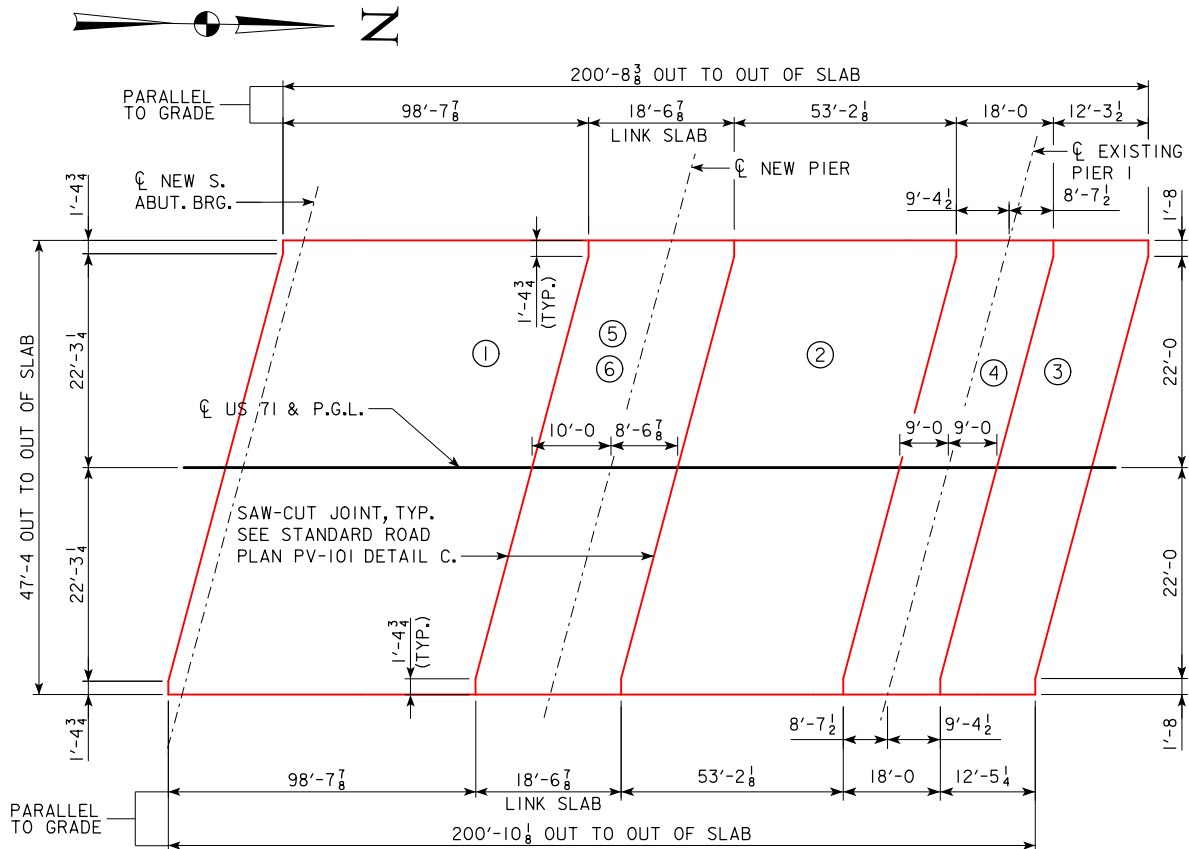
DESIGN FOR 15° SKEW (L.A.)
**310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
105'-0 NEW S. END SPAN
SLAB REINFORCING LAYOUT
STATION 565+36.18 AUGUST, 2018
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 15 OF 28 FILE NO. 31548 DESIGN NO. 218

REVISED 07-2015 - CHANGED CONCRETE PLACEMENT NOTE TO ACCOUNT FOR THE POSSIBLE ADDITION OF A RETARDING ADMIXTURE TO THE CONCRETE.
ENGLISHINTEGRALBRIDGES.DGN 4520 - THIS SHEET REDRAWN 9-8-88



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

BENT BAR DETAILS



CONCRETE PLACEMENT DIAGRAM

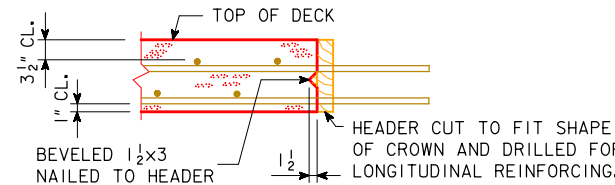
NOTE:
CONCRETE DECK SHALL BE PLACED IN SECTIONS AND SEQUENCES INDICATED. LINK SLAB IS REQUIRED TO BE A SEPARATE FINAL POUR.

EPOXY COATED REINFORCING	REINFORCING BAR LIST					
	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
EPOXY COATED REINFORCING	5p1	ABUT. HOOPS		84	10'-6	920
	5p2	ABUT. EXTENSION HOOPS		24	10'-8	267
	6p3	ABUT. BOTT. AT PILES		22	6'-8	220
	5p4	ABUT. HOOPS AT ENDS		4	10'-8	45
	4t1	UNDER BEAMS AT ABUTMENTS		7	4'-8	22
	PREV. BID REINFORCING STEEL EPOXY COATED - TOTAL (LBS.) 50020					
	NEW REINFORCING STEEL EPOXY COATED - TOTAL (LBS.) 33000 *					
	REINFORCING STEEL EPOXY COATED - TOTAL (LBS.) 83020					
	#2	PILE SPIRAL		13	38'-6	84
		SPIRAL SPACERS, 1 1/8 x 7/8 x 1/8 x 0.70		39	1'-10	50
NON-COATED REINFORCING	PREVIOUSLY BID REINFORCING STEEL - TOTAL (LBS.) 134					
	NEW REINFORCING STEEL - TOTAL (LBS.) 0 *					
	REINFORCING STEEL - TOTAL (LBS.) 134					
	* INDICATES NEW REINFORCEMENT					

STRUCTURAL CONCRETE (LINK SLAB) PLACEMENT QUANTITIES	
LOCATION	QUANTITY
SECTION 6, LINK SLAB	25.9
TOTAL (CU. YDS.)	25.9

STRUCTURAL CONCRETE PLACEMENT QUANTITIES	
LOCATION	QUANTITY
SECTION 1, DECK & ABUT. DIAPH.	171.0
SECTION 2, SLAB	72.1
SECTION 3, SLAB	16.5
SECTION 4, SLAB & PIER DIAPH.	40.7
SECTION 5, PIER DIAPH.	30.4
TOTAL (CU. YDS.)	330.7

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

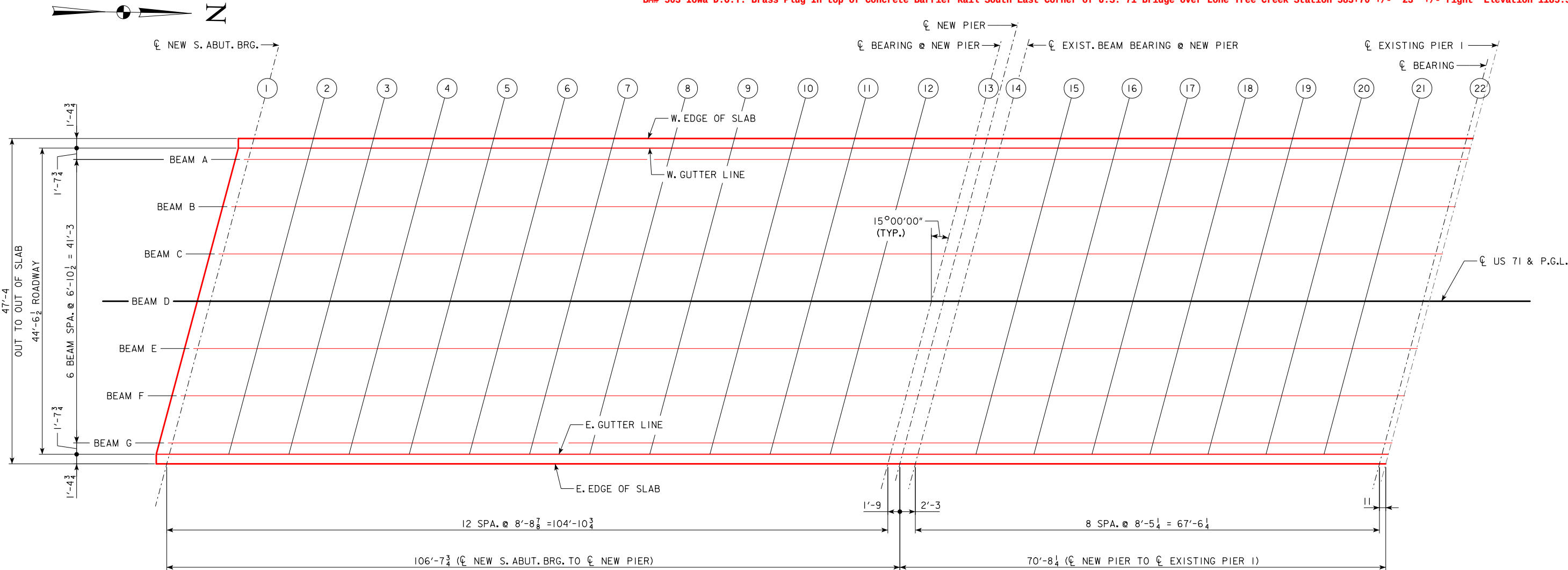


PERMISSIBLE TRANSVERSE DECK CONSTRUCTION JOINT

REINFORCING BAR LIST					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6a1	DECK TRANSV. TOP & BOTT.		280	47'-0	19766
			222	47'-0	15672 *
6a2	DECK TRANSV. TOP AT PIER		6	26'-9	241
6a3	DECK TRANSV. BOTT. AT PIER		6	33'-7	303
6a4	DECK TRANSV. TOP & BOTT. AT ABUT.		32	VARIES	1130
5a5	HAUNCH STIRRUP		182	5'-4	1012
5b1	DECK LONGIT. TOP & BOTT. (SPAN 1)		285	34'-6	10255
6b2	DECK LONGIT. TOP & BOTT. AT NEW PIER		173	22'-1	5738
6b3	HAUNCH LONGIT.		28	9'-0	379
5b4	DECK LONGIT. TOP & BOTT. (SPAN 2)		190	31'-4	6209 *
6b5	DECK LONGIT. TOP & BOTT. AT EXIST. PIER 1		173	31'-9	8205 *
5d1	PIER DIAPH. ENDS (D BEAMS)		6	3'-8	23
5d2	PIER & ABUT. DIAPH. LONGIT. (D BEAMS)		36	6'-2	232
5d3	PIER & ABUT. DIAPH. LONGIT. (D BEAMS)		18	4'-10	91
5d4	PIER DIAPH. LONGIT. (D BEAMS)		4	26'-8	111
5d5	ABUT. DIAPH. ENDS		6	4'-10	30
5d6	ABUT. DIAPH. LONGIT. B.F.		8	25'-5	212
5d7	PAVING NOTCH LONGIT.		4	25'-5	106
5d8	PIER DIAPH. LONGIT. (D BEAMS)		4	26'-9	112
5d9	ABUT. DIAPH. WING EXT. LONGIT.		24	13'-9	344
5d10	PIER DIAPH. LONGIT. (B BEAMS)		3	26'-1	82 *
5d11	PIER DIAPH. ENDS (NEW PIER B BEAMS)		4	3'-2	13 *
5d12	PIER DIAPH. LONGIT. (B BEAMS)		48	6'-1	305 *
5d13	PIER DIAPH. LONGIT. (B BEAMS)		24	5'-1	127 *
5d14	PIER DIAPH. LONGIT. (B BEAMS)		3	26'-3	82 *
5d15	PIER DIAPH. ENDS (EXIST. PIER 1)		6	2'-5	15 *
5d16	PIER DIAPH. LONGIT. (EXIST. PIER 1)		6	8'-10	55 *
5e1	PIER DIAPH. HOOPS (D BEAMS)		24	11'-4	284
5e2	PIER DIAPH. TIES ENDS (D BEAMS)		4	2'-11	12
5e3	PIER DIAPH. TIES (D BEAMS)		48	3'-3	163
5e4	PIER DIAPH. HOOPS ENDS (D BEAMS)		2	11'-0	23
5e5	PIER DIAPH. HOOPS (B BEAMS)		24	8'-4	209 *
5e6	PIER DIAPH. TIES ENDS (B BEAMS)		4	2'-5	10 *
5e7	PIER DIAPH. TIES (B BEAMS)		48	2'-9	138 *
5e8	PIER DIAPH. HOOPS ENDS (B BEAMS)		2	8'-0	17 *
5e9	PIER DIAPH. HOOPS (EXIST. PIER 1)		26	10'-6	285 *
5e10	PIER DIAPH. TIES (EXIST. PIER 1)		26	3'-1	84 *
8f1	ABUT. FOOTING LONGIT. BOTH F.		18	26'-9	1286
8f3	ABUT. EXTENSION LONGIT.		8	13'-3	283
8f4	ABUT. EXTENSION LONGIT.		4	11'-6	123
8f5	ABUT. EXTENSION LONGIT.		4	12'-2	130
8g1	ABUT. VERT. BOTH F.		77	8'-9	1799
8g3	ABUT. DIAPH. VERT. B.F.		37	15'-9	1556
6g4	ABUT. DIAPH. WING EXT. VERT.		32	7'-10	377
5h2	ABUT. TO WING ANCHOR		12	4'-11	62
5j1	TOP OF DECK TRANSV. (AT RAIL)		312	6'-3	2034
			222	6'-3	1447 *
5k1	PAVING NOTCH		39	4'-9	193
5k2	PAVING NOTCH		39	3'-5	139

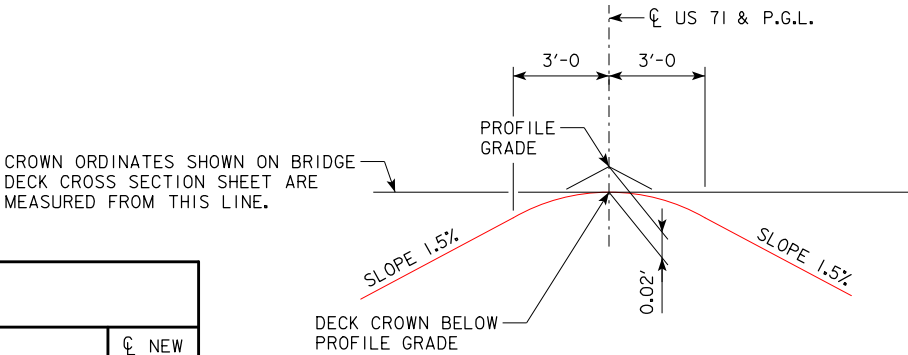
* INDICATES NEW REINFORCEMENT

DESIGN FOR 15° SKEW (L.A.)
310'-8 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
105'-0 NEW S. END SPAN
DECK, ABUT. & DIAPH. QUANTITIES
STATION 565+36.18
AUGUST, 2018
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 16 OF 28 FILE NO. 31548 DESIGN NO. 218



TOP OF SLAB AND HAUNCH ELEVATION LOCATIONS

TABLE OF TOP OF SLAB ELEVATIONS																							
	℄ NEW S. ABUT. BRG.	NEW SPAN I											℄ NEW PIER BEARINGS		EXISTING SPAN I								℄ NEW BRG. @ EXIST. PIER
LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
W. GUTTER LINE	1181.60	1181.19	1180.78	1180.37	1179.97	1179.58	1179.19	1178.81	1178.43	1178.06	1177.70	1177.34	1176.98	1176.82	1176.48	1176.14	1175.80	1175.46	1175.11	1174.77	1174.43	1174.09	
℄ BEAM A	1181.65	1181.23	1180.82	1180.42	1180.02	1179.63	1179.24	1178.85	1178.48	1178.11	1177.74	1177.38	1177.03	1176.86	1176.52	1176.18	1175.84	1175.50	1175.16	1174.82	1174.48	1174.13	
℄ BEAM B	1181.84	1181.42	1181.01	1180.61	1180.21	1179.81	1179.42	1179.04	1178.66	1178.29	1177.92	1177.56	1177.20	1177.04	1176.70	1176.36	1176.02	1175.68	1175.33	1174.99	1174.65	1174.31	
℄ BEAM C	1182.03	1181.61	1181.20	1180.79	1180.39	1180.00	1179.61	1179.22	1178.84	1178.47	1178.10	1177.74	1177.38	1177.22	1176.87	1176.53	1176.19	1175.85	1175.51	1175.17	1174.83	1174.49	
℄ BEAM D & ℄ US 71	1182.20	1181.78	1181.37	1180.96	1180.56	1180.16	1179.77	1179.38	1179.00	1178.63	1178.26	1177.89	1177.54	1177.37	1177.03	1176.69	1176.35	1176.01	1175.67	1175.33	1174.99	1174.64	
℄ BEAM E	1182.21	1181.79	1181.38	1180.97	1180.56	1180.16	1179.77	1179.38	1179.00	1178.63	1178.25	1177.89	1177.53	1177.36	1177.02	1176.68	1176.34	1176.00	1175.66	1175.32	1174.98	1174.64	
℄ BEAM F	1182.20	1181.78	1181.36	1180.95	1180.54	1180.14	1179.75	1179.36	1178.98	1178.60	1178.23	1177.86	1177.50	1177.34	1176.99	1176.65	1176.31	1175.97	1175.63	1175.29	1174.95	1174.61	
℄ BEAM G	1182.18	1181.76	1181.34	1180.93	1180.52	1180.12	1179.73	1179.34	1178.96	1178.58	1178.20	1177.84	1177.48	1177.31	1176.97	1176.62	1176.28	1175.94	1175.60	1175.26	1174.92	1174.58	
E. GUTTER LINE	1182.18	1181.76	1181.34	1180.93	1180.52	1180.12	1179.72	1179.33	1178.95	1178.57	1178.20	1177.83	1177.47	1177.30	1176.96	1176.62	1176.28	1175.94	1175.60	1175.26	1174.91	1174.57	



CROWN TEMPLATE

DESIGN FOR 15° SKEW (L.A.)

310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

105'-0 NEW S. END SPAN

TOP OF SLAB ELEVATIONS

STATION 565+36.18

CASS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 17 OF 28 FILE NO. 31548 DESIGN NO. 218

AUGUST, 2018

REVISED 06-12 - THE ALLOWABLE FIELD HAUNCH MAX. & MIN. WAS CHANGED TO INCHES & DECIMALS OF FEET. NOTE & NOTE 1 WERE CHANGED. THE SLAB HAUNCH LOCATIONS EXAMPLE WAS REPLACED WITH A NOTE.
ENGLISH\MISC\LANE\BRIDGES.DGN - 1066 - THIS SHEET ISSUED 02-08.

BM# 503 Iowa D.O.T. Brass Plug In top of Concrete Barrier Rail South East Corner of U.S. 71 Bridge over Lone Tree Creek Station 583+70 +/- 23' +/- right Elevation 1185.52

TABLE OF BEAM LINE HAUNCH ELEVATIONS																						
	CL NEW S. ABUT. BRG.	NEW SPAN											CL NEW PIER BEARINGS		EXISTING SPAN I							CL EXIST. PIER I BRG.
LOCATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
CL BEAM A	1180.90	1180.53	1180.16	1179.78	1179.41	1179.03	1178.65	1178.26	1177.87	1177.47	1177.07	1176.67	1176.28	1176.11	1175.81	1175.51	1175.19	1174.86	1174.51	1174.15	1173.77	1173.38
CL BEAM B	1181.09	1180.72	1180.34	1179.97	1179.60	1179.22	1178.83	1178.44	1178.05	1177.65	1177.25	1176.85	1176.45	1176.29	1175.99	1175.69	1175.37	1175.04	1174.69	1174.32	1173.95	1173.56
CL BEAM C	1181.28	1180.91	1180.53	1180.16	1179.78	1179.40	1179.02	1178.63	1178.23	1177.83	1177.43	1177.03	1176.63	1176.47	1176.17	1175.86	1175.55	1175.21	1174.86	1174.50	1174.12	1173.74
CL BEAM D	1181.45	1181.08	1180.70	1180.33	1179.95	1179.57	1179.18	1178.79	1178.39	1177.99	1177.59	1177.19	1176.79	1176.62	1176.32	1176.02	1175.70	1175.37	1175.02	1174.66	1174.28	1173.89
CL BEAM E	1181.46	1181.08	1180.71	1180.33	1179.95	1179.57	1179.18	1178.79	1178.39	1177.99	1177.59	1177.18	1176.78	1176.61	1176.32	1176.01	1175.69	1175.36	1175.01	1174.65	1174.27	1173.89
CL BEAM F	1181.45	1181.07	1180.69	1180.31	1179.93	1179.55	1179.16	1178.77	1178.37	1177.97	1177.56	1177.16	1176.75	1176.59	1176.29	1175.98	1175.67	1175.33	1174.98	1174.62	1174.24	1173.86
CL BEAM G	1181.43	1181.05	1180.68	1180.30	1179.92	1179.53	1179.14	1178.75	1178.35	1177.94	1177.54	1177.13	1176.73	1176.56	1176.26	1175.95	1175.64	1175.30	1174.96	1174.59	1174.21	1173.83

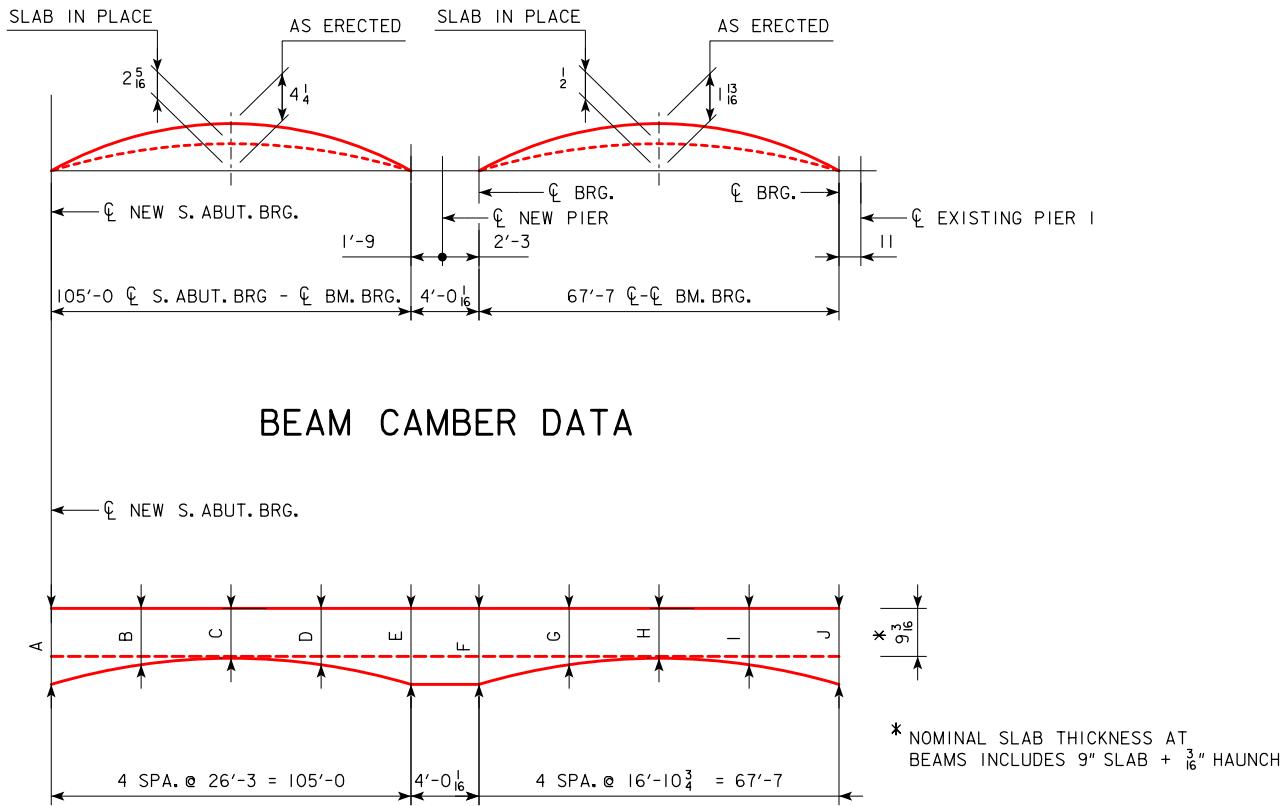


TABLE OF SLAB THICKNESS AT BEAMS										
BEAM LINE	CL NEW S. ABUT. BRG.				CL NEW PIER BEARINGS					CL EXIST. PIER I BRG.
	A	B	C	D	E	F	G	C	D	J
ALL	1'- ⁵ / ₈	9' ¹⁵ / ₁₆	9' ¹ / ₈	10	1'- ³ / ₄	11	10' ⁵ / ₁₆	9' ⁷ / ₈	9' ¹¹ / ₁₆	9' ³ / ₄

DESIGN FOR 15° SKEW (L.A.)

310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

105'-0 NEW S. END SPAN

SLAB HAUNCH DATA DETAILS

STATION 565+36.18

AUGUST, 2018

CASS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 18 OF 28 FILE NO. 31548 DESIGN NO. 218

BM# 503 Iowa D.O.

MISCELLANEOUS DATA						
	BEAM LINE		C. NEW S. ABUT. BRG.			
			I	2	3	5
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL		0	$\frac{1}{2}$	1	$1\frac{3}{8}$
CROSS SLOPE ADJUSTMENTS (IN.)	A-C, E-G		$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
	D		0	0	0	0
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	$4\frac{1}{2}$ (0.375)	$4\frac{1}{2}$ (0.375)	$4\frac{1}{2}$ (0.375)	2 (0.167)
	MIN.	A-C, E-G	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$-\frac{3}{8}$ (-0.029)
		D	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$-\frac{1}{2}$ (-0.040)

MISCELLANEOUS DATA							
	BEAM LINE		EXISTING SPAN I				
			15	16	17	18	19
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL		$\frac{1}{2}$	$1\frac{5}{16}$	$1\frac{1}{4}$	$1\frac{15}{16}$	$1\frac{1}{4}$
CROSS SLOPE ADJUSTMENTS (IN.)	A-C, E-G		$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
	D		0	0	0	0	0
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)
	MIN.	A-C, E-G	$-\frac{3}{8}$ (-0.034)	$-\frac{3}{8}$ (-0.034)	$-\frac{3}{8}$ (-0.034)	$-\frac{3}{8}$ (-0.034)	$-\frac{3}{8}$ (-0.034)
		D	$-\frac{1}{2}$ (-0.041)	$-\frac{1}{2}$ (-0.041)	$-\frac{1}{2}$ (-0.041)	$-\frac{1}{2}$ (-0.041)	$-\frac{1}{2}$ (-0.041)

The diagram illustrates the cross-section of a bridge haunch. It shows the 'TOP OF SLAB' and the 'FIELD HAUNCH (SEE NOTE 1)'. The 'CROSS SLOPE ADJUSTMENT' is indicated on the left. The haunch is shown with a width of 9 feet. The diagram includes various dimension lines and labels for the haunch and slab.

HAUNCH DETAIL

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

NOTE 1:
TO CALCULATE FIELD HAUNCH REQUIRED AT EACH LOCATION, SURVEY THE CONSISTENT WITH THE SPACINGS SHOWN ON THE "TOP OF SLAB ELEVATION" SUBTRACT THE SURVEYED BEAM SHOT FROM THE "BEAM LINE HAUNCH ELEVATION" THIS VALUE WILL BE THE HAUNCH NEEDED (SEE "FIELD HAUNCH" IN HAUNCH DATA). THE "BEAM LINE HAUNCH ELEVATION" INCLUDES ADJUSTMENTS FOR SLAB DEFLECTIONS 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 HAUNCH OR ADDITIONAL HAUNCH REINFORCEMENT WILL BE REQUIRED.

DESIGN TEAM **PARSONS** RL/TMB/JSB/TSB SLAB HAUNCH DATA DETAILS STANDARD SHEET IO66 MODIFIED
8/16/2018 4:57:10 PM untitled c:\pw_working\iowa\parsons_p0037047\dms00878\15071059.brg 150218s019 11x17_pdf.pltcf

MISCELLANEOUS DATA TABLE																
	BEAM LINE		℄ NEW S. ABUT. BRG.	NEW SPAN											℄ NEW PIER BEARINGS	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14
ANTICIPATED DEFLECTION DUE TO SLAB (IN.)	ALL		0	$\frac{1}{2}$	1	$1\frac{3}{8}$	$1\frac{11}{16}$	$1\frac{7}{8}$	$1\frac{15}{16}$	$1\frac{7}{8}$	$1\frac{11}{16}$	$1\frac{3}{8}$	1	$\frac{1}{2}$	0	0
CROSS SLOPE ADJUSTMENTS (IN.)	A-C, E-G		$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$
	D		0	0	0	0	0	0	0	0	0	0	0	0	0	0
ALLOWABLE FIELD HAUNCH (IN. & FT.)	MAX.	ALL	4 $\frac{1}{2}$ (0.375)	4 $\frac{1}{2}$ (0.375)	4 $\frac{1}{2}$ (0.375)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	2 (0.167)	4 $\frac{1}{2}$ (0.375)	4 $\frac{1}{2}$ (0.375)	4 $\frac{1}{2}$ (0.375)	2 (0.167)
	MIN.	A-C, E-G	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$-\frac{3}{8}$ (-0.029)	$-\frac{3}{8}$ (-0.029)	$-\frac{3}{8}$ (-0.029)	$-\frac{3}{8}$ (-0.029)	$-\frac{3}{8}$ (-0.029)	$-\frac{3}{8}$ (-0.029)	$-\frac{3}{8}$ (-0.029)	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)
		D	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$-\frac{1}{2}$ (-0.040)	$-\frac{1}{2}$ (-0.040)	$-\frac{1}{2}$ (-0.040)	$-\frac{1}{2}$ (-0.040)	$-\frac{1}{2}$ (-0.040)	$-\frac{1}{2}$ (-0.040)	$-\frac{1}{2}$ (-0.040)	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)	$\frac{1}{2}$ (0.042)

[illegible]

NOTE 1:
TO CALCULATE FIELD HAUNCH REQUIRED AT EACH LOCATION, SURVEY THE BEAM TOPS
CONSISTENT WITH THE SPACINGS SHOWN ON THE "TOP OF SLAB 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 SLAB 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 15° SKEW (L.A.)

310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

105'-0 NEW S. END SPAN

SLAB HAUNCH DATA DETAILS 2

STATION 565+36.18

AUGUST, 2018

CASS COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 19 OF 28 FILE NO. 31548 DESIGN NO. 218

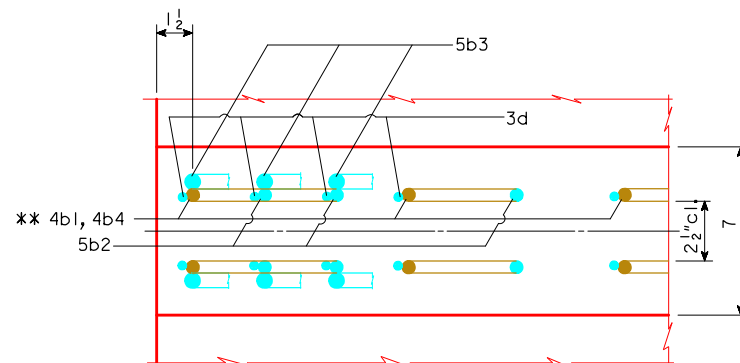


NUMBER AND EXACT LOCATION OF COIL
TIES TO BE AS DETAILED ON DESIGN SHEET 22.



SPECIFICATIONS:

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA
DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH
CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLE-
MENTAL SPECIFICATIONS.
DESIGN: AASHTO SERIES OF 2002, WITH MINOR MODIFICATIONS.



SECTION A-A SHOWING PLACEMENT
OF STIRRUPS NEAR END OF BEAM

** REPLACE 4b1, 4b4 BARS WITH 5b2 BARS AT PIER END
OF BEAMS AS SHOWN ON DESIGN SHEET 21.

D BEAM DATA																							
BEAM	SPAN LENGTH ℓ-BEARING	OVERALL BEAM LENGTH (L)	STRAND SIZE D/A. (inches)	NO. OF STRANDS		TOTAL INITIAL PRESTRESS KIPS ③	HOLD DOWN FORCE-KIPS	CAMBER (in.)		DEFLECTION (in.) Δ _b				PERMISSIBLE SPACING				WEIGHT (TONS)	CONCRETE (C.Y.)	REINFORCING STEEL - (lbs.)			
				STRAIGHT	DEFLECTED			AT RELEASE	AFTER LOSSES	IMMEDIATE ^① (ELASTIC) Δ _E		TIME ^② (PLASTIC) Δ _T		HS20 LOADING									
												CONC. DIAPH.	STEEL DIAPH.			CONC. DIAPH.	STEEL DIAPH.						
*SD105	105'-0	107'-1	0.60	26	6	1362	22.2	2.42		4.27		—	1.70	—	0.42			—	7'-6	35.7		17.6	1685

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A SLAB WEIGHT OF 760 #/FT. (8" SLAB AND 7'-6 BEAM SPACING) AND ONE STEEL DIAPHRAGM (285 #) AT $\frac{1}{4}$ 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 $\frac{L}{4}$ OF SPAN, Δ_D , DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:

(A) $\Delta_D = \Delta_1 + \Delta_T$ FOR SIMPLE SPAN.
 (B) $\Delta_D = \Delta_1 + \frac{3}{4}\Delta_T$ FOR END SPANS OF CONTINUOUS BRIDGE.
 (C) $\Delta_D = \Delta_1 + \frac{1}{2}\Delta_T$ FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.

③ TOTAL INITIAL PRESTRESS IS BASED ON 72.6% f'_s ,
 $f'_s = 270$ ksi AND $A_s = 0.217$ sq. in.

* MINIMUM CONCRETE f'_c (AT 28 DAYS) SHALL BE 7500 psi.
MINIMUM f'_c AT RELEASE SHALL BE 6000 psi.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE TO BE
IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS
FOR HIGHWAY BRIDGES, SERIES OF 2002:
REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60.
CONCRETE IN ACCORDANCE WITH SECTION 8, $f'_c = 7500$ psi
PRESTRESSING STEEL IN ACCORDANCE WITH
SECTION 9, $f'_s = 270,000$ psi.

BEAM NOTES:

THESE BEAMS ARE DESIGNED FOR AASHTO LIVE LOADS AS INDICATED IN ABOVE TABLE WITH AN ALLOWANCE OF 20 lb. 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 SHALL CONFORM TO ASTM A416
GRADE 270 LOW RELAXATION STRANDS.

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 PRESTRESS BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT AND PIER DIAPHRAGMS (EXCEPT TOP OF TOP FLANGE AT PIER) 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, 1, OF THE STANDARD SPECIFICATIONS.

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

FOR TRANSPORTING, THE OVERHANG SHALL BE IN ACCORDANCE WITH ARTICLE 2407.03, K, OF THE STANDARD SPECIFICATIONS, EXCEPT THE OVERHANG MAY BE INCREASED TO A MAXIMUM OF 12 FEET FOR THE SD105 BEAM.

THE CONTRACTOR SHALL ASSURE THE LATERAL STABILITY OF THE SD105 BEAMS DURING HANDLING, TRANSPORTING AND ERECTION BY PROVIDING TEMPORARY BRACING AS NEEDED.

0.6" DIAMETER STRANDS STRESSED TO NOT MORE THAN 5,000 LBS. EACH MAY BE USED IN LIEU OF THE α BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

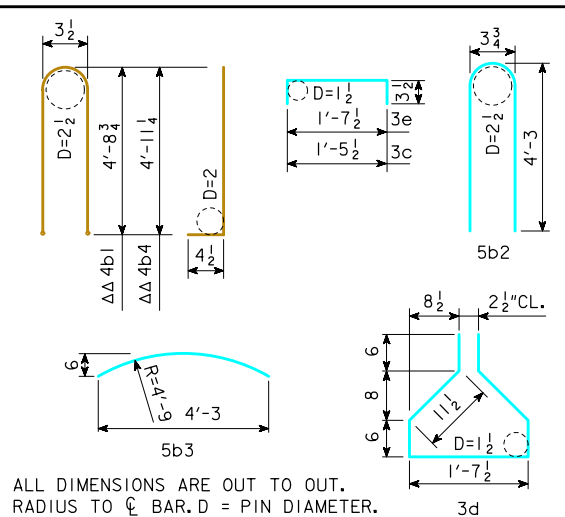
HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

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

ALL STRANDS AT THE ENDS OF BEAMS AT PIER SHALL BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.

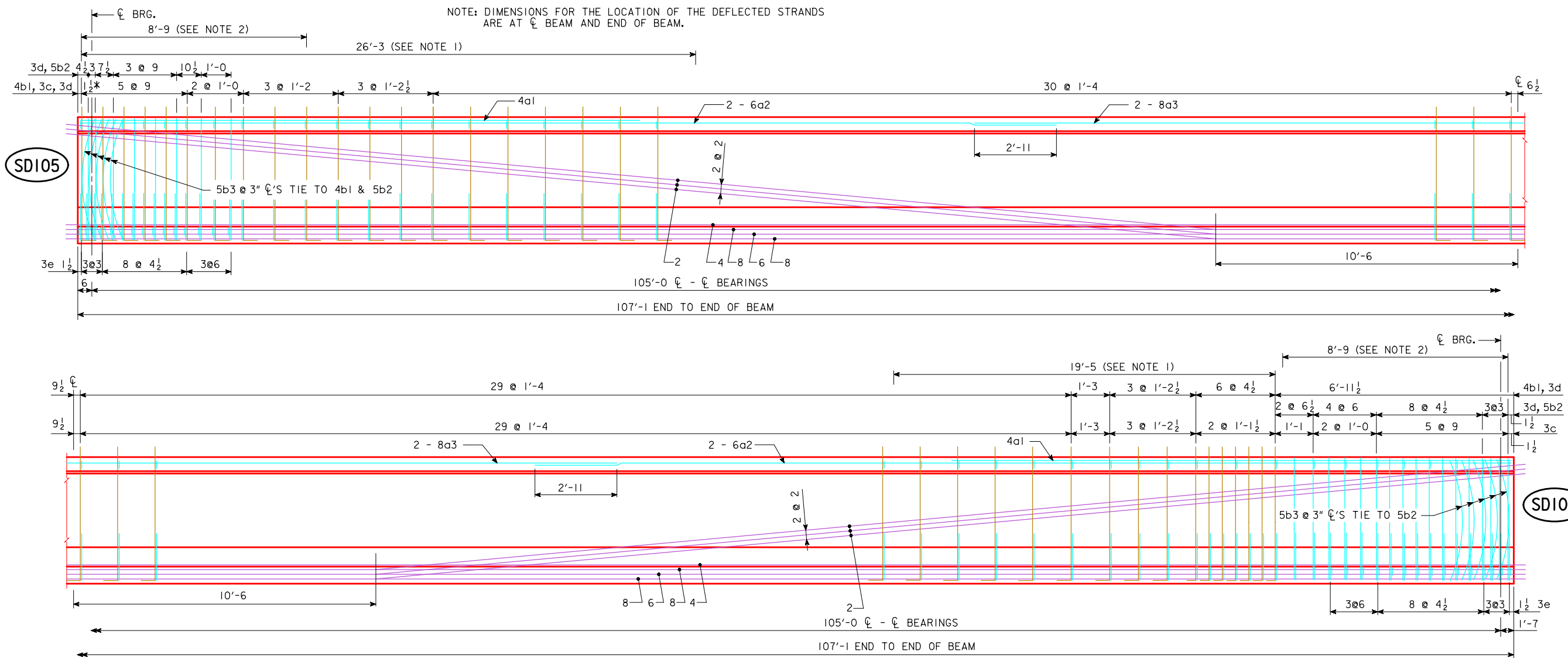
REINFORCING BAR LIST

BEAM		SPAN		D105	
				105'-0	
BAR	SHAPE	NO.	LENGTH		
4a1		2	24'-0		
6a2		4	37'-4 1/2		
8a3		2	38'-0		
ΔΔ4b1		39	10'-4		
ΔΔ4b4		45	10'-6 1/2		
5b2		25	8'-8		
5b3		20	4'-4		
3c		88	2'-1		
3d		109	5'-7		
3e		30	2'-3		



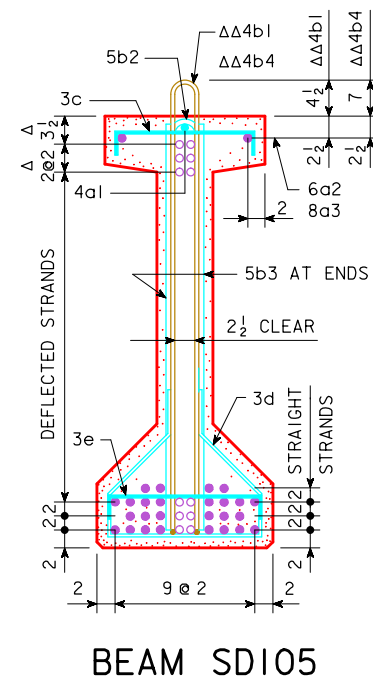
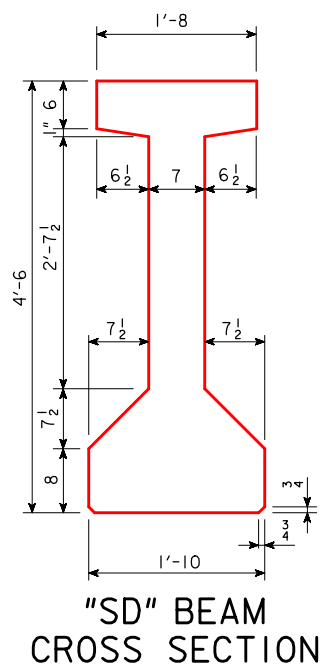
ALL DIMENSIONS ARE OUT TO OUT.
RADIUS TO ϕ BAR. D = PIN DIAMETER.

ENGLISHBEAMS.DGN - 4635 - LRFD - THIS SHEET RE-ISSUED 09-06.



○ DEFLECTED STRANDS
* KEEP
△△ EPOXY COATED BARS
△ DIMENSIONS AT END OF BEAM

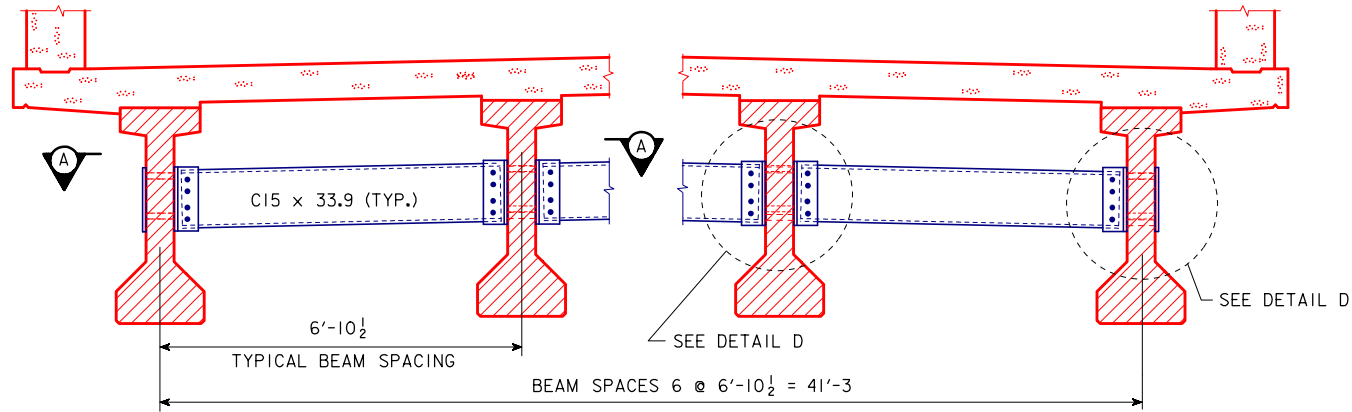
AREA = 638.75 in²
Y_b = 24.37 in
I = 214,974 in⁴



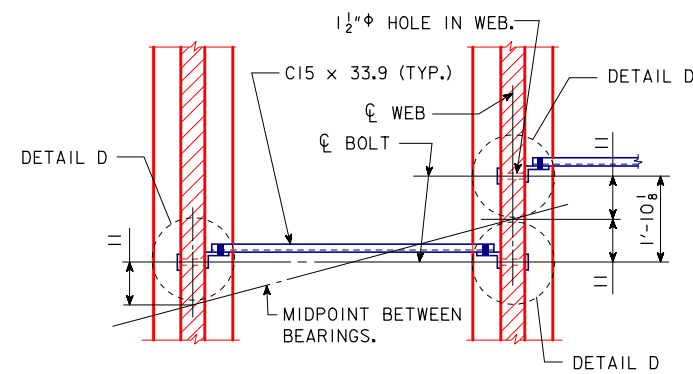
NOTE 1:
USE 4b4 BARS INSTEAD OF 4b1 BARS IN THIS RANGE.

NOTE 2:
EXTRA HAUNCH REINFORCEMENT REQUIRED, SEE HAUNCH
DETAIL ON DESIGN SHEET 11.

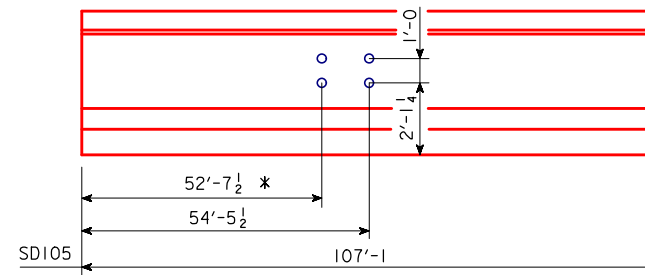
DESIGN FOR 15° SKEW (L.A.)
**310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
105'-0 NEW S. END SPAN
SD105 BEAM DETAILS
STATION 565+36.18
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 21 OF 28 FILE NO. 31548 DESIGN NO. 218
AUGUST, 2018



SECTION SHOWING INTERMEDIATE DIAPHRAGM

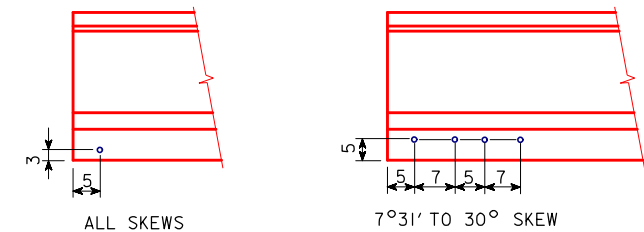


SECTION A-A

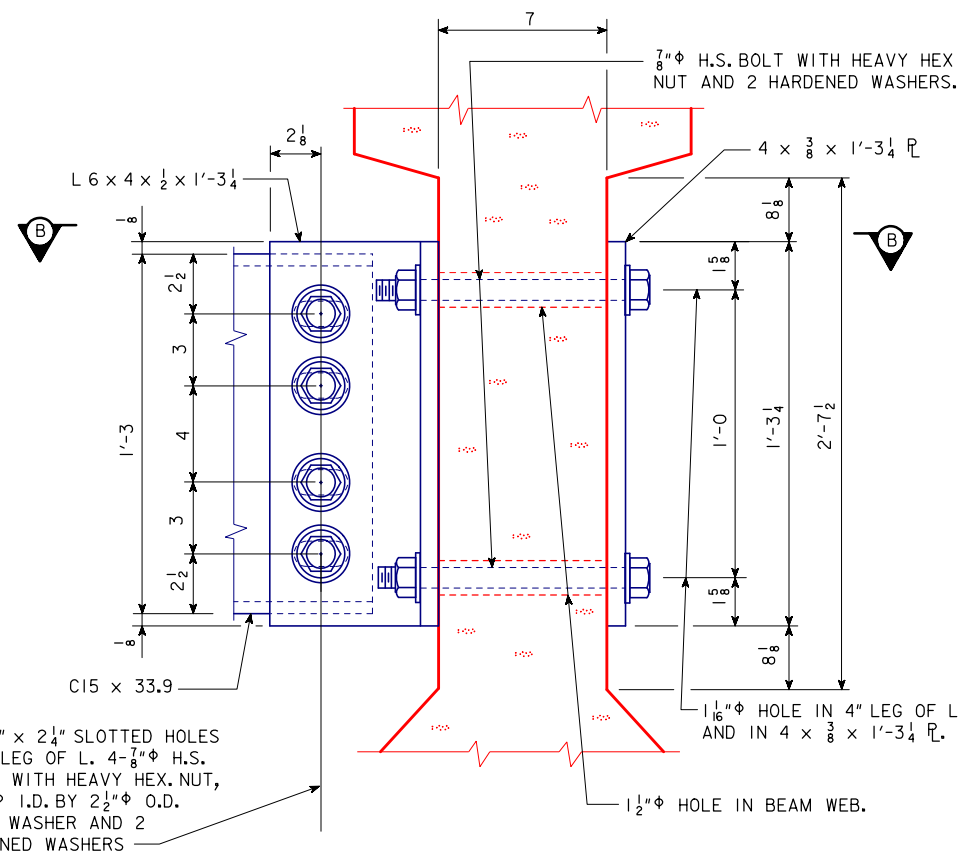


INTERMEDIATE DIAPHRAGM BOLT LOCATIONS

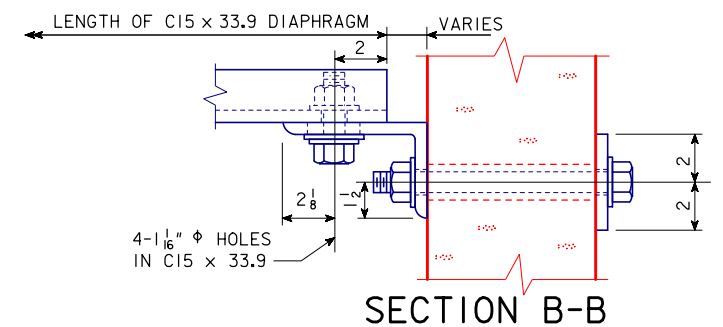
NOTES:
ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.
SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.
ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE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



INTEGRAL ABUTMENT EXPANSION PIER
BEAM COIL TIE LOCATIONS



DETAIL D



SECTION B-B

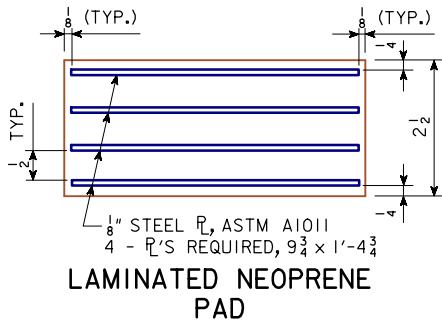
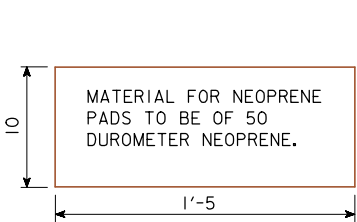
INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL				
ONE CONNECTION DETAIL "D"				WEIGHT
2 - 7/8" x LENGTH H.S. BOLTS WITH NUTS AND WASHERS				
WEB THICKNESS	LENGTH OF H.S. BOLTS	WEIGHT PER DETAIL "D"	NUMBER OF DETAIL "D"	
7"	10"	4.66 LBS.	12	56
1 - BACKING PL 4 x 3/8 x 1'-3 1/4 = 6.5 LBS.				78
1 - L 6 x 4 x 1/2 x 1'-3 1/4 = 20.6 LBS.				247
ONE C15 x 33.9 DIAPHRAGM				
WEB THICKNESS	BEAM SPACING	6'-10 1/2"		
	* LENGTH		UNIT WEIGHT (LBS.)	
7"		6'-0 1/8"	203.8	
DIAPHRAGM WEIGHTS				
UNIT WEIGHT		NUMBER OF DIAPHRAGMS		
203.8 LBS.		6		1223
DIAPHRAGM CONNECTION BOLTS				
8 - 7/8" x 0'-2 3/4" H.S. BOLTS WITH NUTS AND WASHERS, PER UNIT DIAPHRAGM			NUMBER OF DIAPHRAGMS	
10.3 LBS.			6	62
INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL (TOTAL LBS.)				1666

* THE LENGTH OF THE C15 x 33.9 SHOWN IN THE TABLE IS BASED ON A VARIABLE CLEARANCE OF 1 1/16" TO 2 1/16" BETWEEN THE FACE OF BEAM WEB AND END OF C15 x 33.9.

DESIGN FOR 15° SKEW (L.A.)
310'-8 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
105'-0 NEW S. END SPAN
INTERMEDIATE DIAPHRAGM DETAILS
STATION 565+36.18 AUGUST, 2018
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 22 OF 28 FILE NO. 31548 DESIGN NO. 218

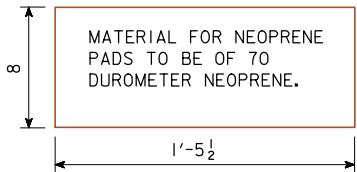
REVISION 09-12 - ALTERNATE SECTION B-B ADDED OUTSIDE OF BORDER SHEET.
ENGLISHBEAMS.DGN 1036 - THIS SHEET ISSUED 9-8-88

CORRECTION 04-14 - ADDED WEIGHT TABLE & TITLES/DESCRIPTIONS TO AGREE WITH SUMMARY QUANTITY SHEET. ADDED NOTE REFERRING TO SUMMARY QUANTITIES SHEET. ENGLISHBEAMS.DGN - 454IG - THIS SHEET ISSUED 03-08.

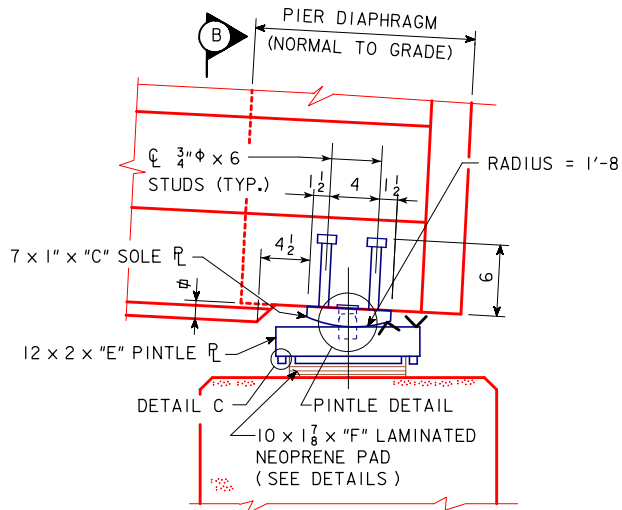


NOTE:
THE NEOPRENE PADS SHALL BE BONDED TO THE BEARING SEAT AND BOTTOM OF BEAM WITH AN EPOXY ADHESIVE IN ACCORDANCE WITH THE BEARING MANUFACTURER'S RECOMMENDATIONS FOR BONDING NEOPRENE TO CONCRETE TO PREVENT SLIDING.

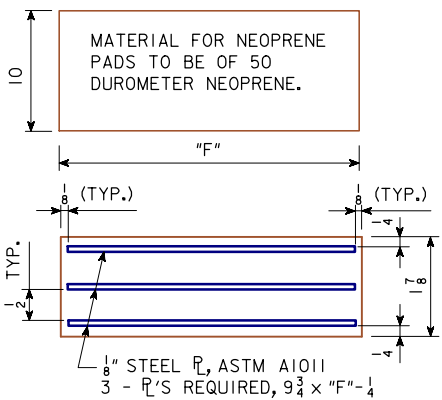
NEW EXPANSION PIER (EXISTING B67 BEAM)



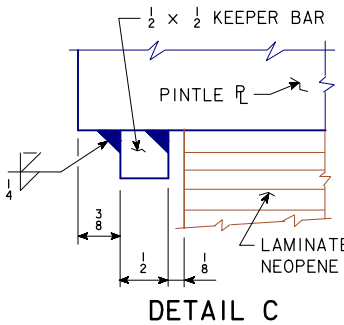
EXISTING FIXED PIER I (EXISTING B67 BEAM)



PART ELEVATION (LOOKING WEST)
NOTCH BEAM END TO SOLE PLATE THICKNESS MAXIMUM 1"

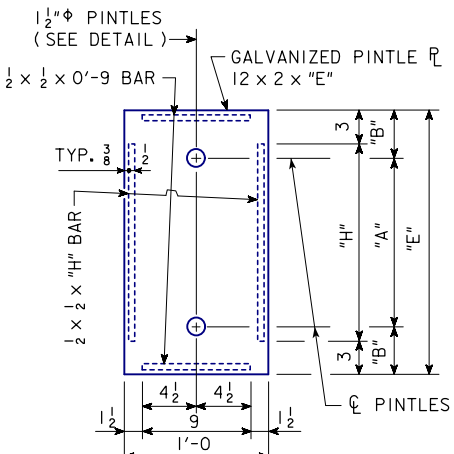


LAMINATED NEOPRENE PAD

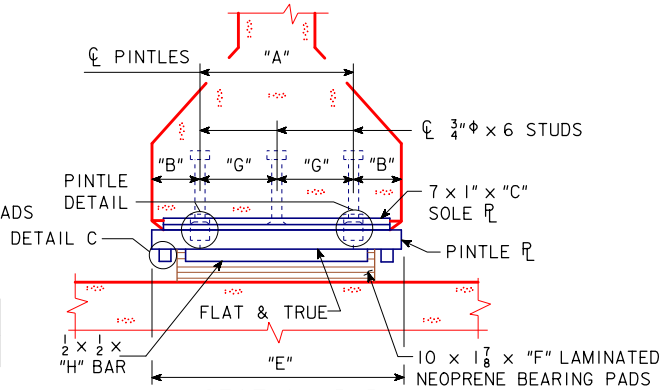


DETAIL C

STRUCTURAL STEEL	
WEIGHT	1079 LBS.
DOES NOT INCLUDE CURVED SOLE PLATE	



PLAN OF PINTLE PLATE



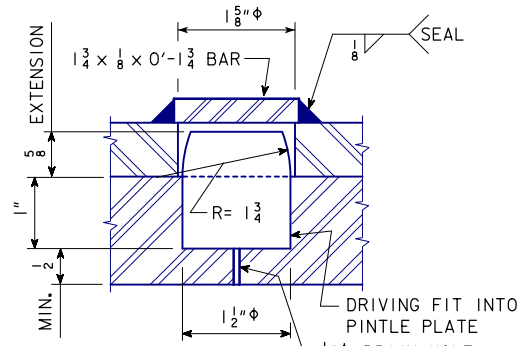
SECTION B-B

(DIAPHRAGM CONCRETE NOT SHOWN)

EXPANSION PIER BEARING NOTES:

SURFACES MARKED "V" SHALL BE FINISHED ANSI 250.
PINTLE PLATES ARE A PART OF THE SUPERSTRUCTURE STRUCTURAL STEEL QUANTITY.
COST OF ANCHORED CURVED SOLE PLATES IS TO BE INCLUDED IN THE PRICE BID FOR PRETENSIONED PRESTRESSED CONCRETE BEAMS. COST FOR NEOPRENE PADS SHALL BE CONSIDERED INCIDENTAL TO THE PRETENSIONED PRESTRESSED CONCRETE BEAM BID ITEM.
THE SOLE PLATES AND PINTLE PLATES SHALL BE GALVANIZED. ALL WELDING SHALL BE COMPLETED PRIOR TO GALVANIZING. THE SURFACE OF THE PINTLE PLATE IN CONTACT WITH THE LAMINATED NEOPRENE PADS SHALL BE FREE OF PROJECTIONS DUE TO THE GALVANIZING.
SOLE PLATES ARE TO BE SET IN FORMS WHEN BEAMS ARE CAST AND THE BOTTOM OF BEAMS FORMED OUT AS SHOWN TO EXCLUDE CONCRETE.
SOLE PLATES SHALL COMPLY WITH ONE OF THE FOLLOWING:
ASTM A514 GRADE B
ASTM A709 GRADE HPS 70W

NEW EXPANSION PIER (D BEAMS)
LAMINATED NEOPRENE PAD / CURVED SOLE PLATE ASSEMBLY



PINTLE DETAIL

VARIABLE DIMENSIONS

BEARING DIMENSION	BEAM BOTTOM FLANGE WIDTH
	1'-10
"A"	1'-0
"B"	5
"C"	1'-8 1/2
"D"	4 1/4
"E"	1'-10
"F"	1'-8
"G"	6
"H"	1'-4

ALLOWABLE PINTLE PLATE THICKNESS

ALLOW THICKNESS INCHES	MAXIMUM SERVICE VERTICAL LOAD, k
	1'-10 FLANGE
1.5	112
2.0	200
2.5	300

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

DESIGN FOR 15° SKEW (L.A.)

310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE

105'-0 NEW S. END SPAN

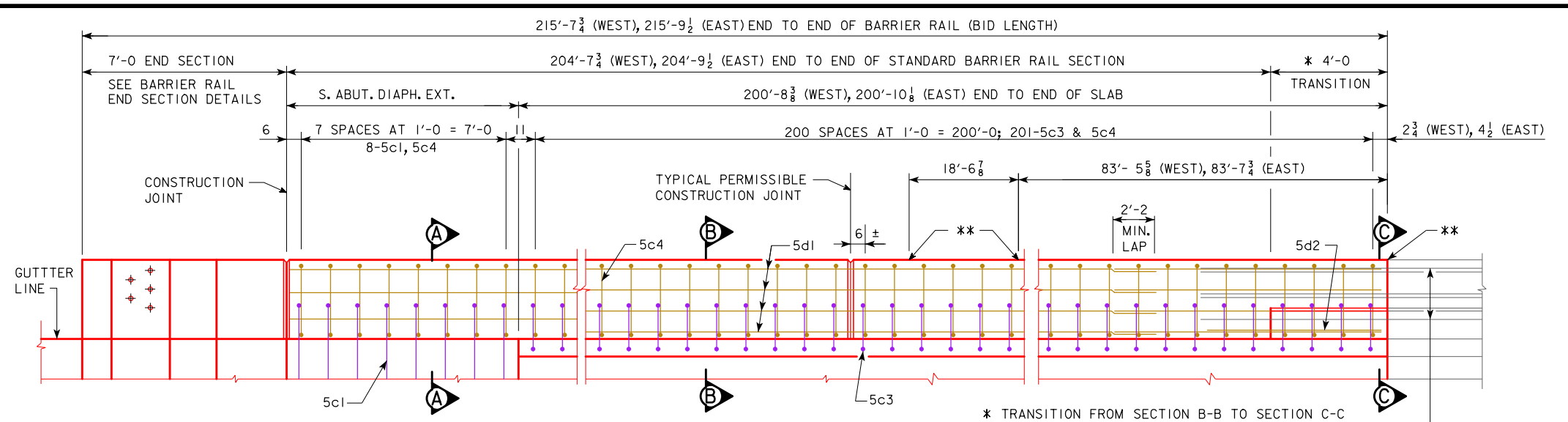
BEARING DETAILS AT NEW PIER

STATION 565+36.18

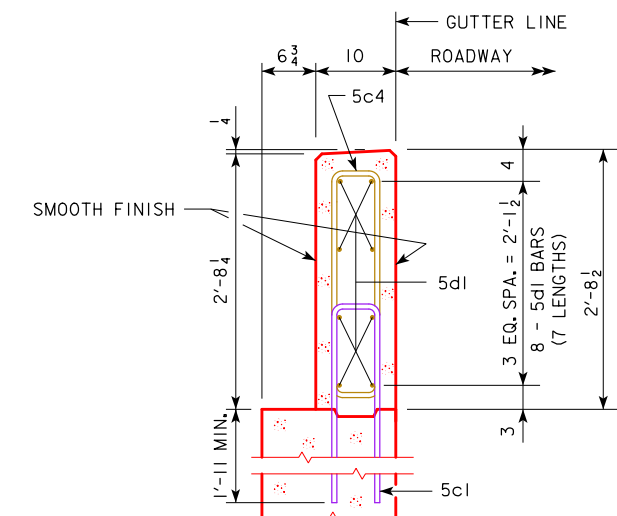
AUGUST, 2018

CASS COUNTY

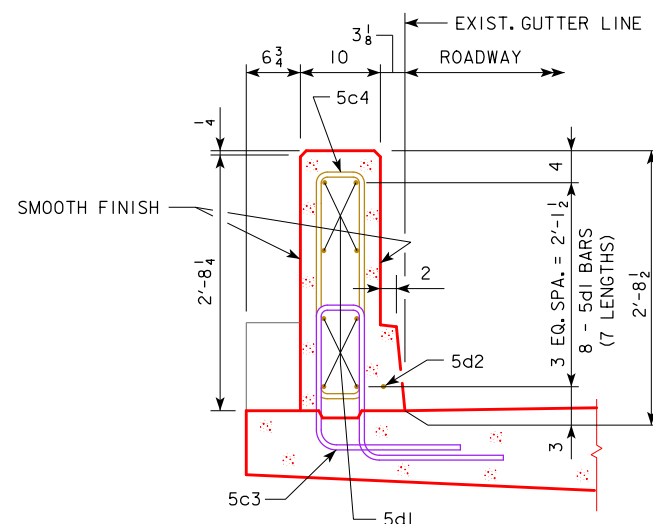
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 23 OF 28 FILE NO. 31548 DESIGN NO. 218



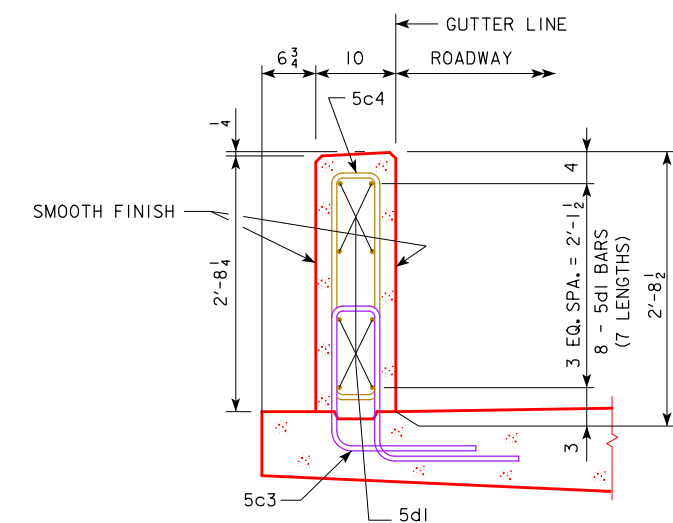
ELEVATION OF BARRIER RAIL LAYOUT
(LOOKING WEST AT WEST GUTTER LINE)



PART SECTION A-A



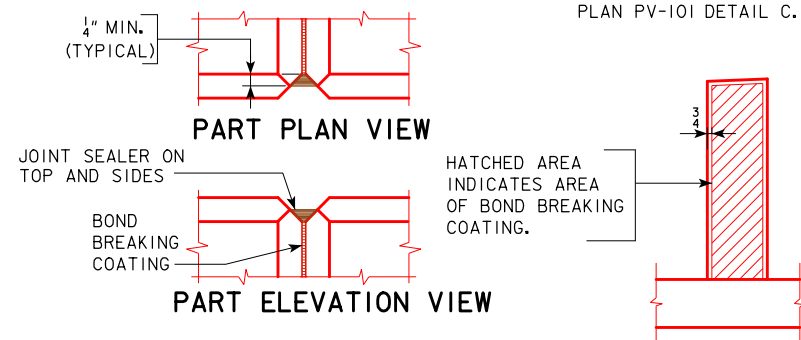
PART SECTION C-C
(EXISTING BARS NOT SHOWN)



PART SECTION B-B

WHERE EXIST. EXPOSED BARS FIT, THEY ARE TO BE INCORPORATED INTO NEW CONSTRUCTION. BARS OUTSIDE OF NEW CONSTRUCTION SHALL BE CUT OFF AT FACE OF CONCRETE AND TWO COATS OF ZINC RICH PAINT SHALL BE APPLIED TO EXPOSED ENDS.

** SAW-CUT JOINT, TYP. SEE STANDARD ROAD PLAN PV-101 DETAIL C.



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 MATERIAL I.M. 452.
ALL EXPOSED CORNERS 90° OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.
THE CONCRETE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS. THE NUMBER OF LINEAL FEET OF CONCRETE BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES. PRICE BID FOR "CONCRETE BARRIER, PARAPET" SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.
THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETING FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.
TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL C GRADE.
CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 2.25 SQUARE FEET.
CLEAN ALL EXISTING EXPOSED BARS THAT ARE TO BE INCORPORATED INTO NEW CONSTRUCTION. COST INCLUDED WITH "REMOVALS, AS PER PLAN".

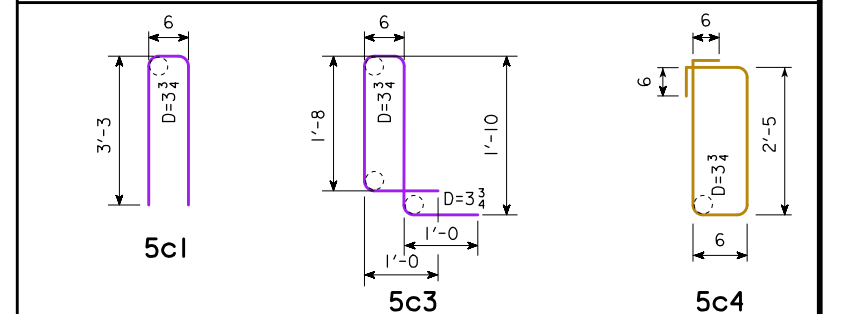
EPOXY COATED REINF. STEEL - TWO RAILS							
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
STANDARD & TRANSITION SECTIONS	5c4	RAIL, VERTICAL		250	6'-10"	1782	
				168	6'-10"	1198	*
	5d1	RAIL, LONGITUDINAL		64	33'-0"	2203	
				48	33'-0"	1652	*
	5d2	RAIL, LONGITUDINAL		2	6'-0"	13	
PREVIOUSLY BID EPOXY STEEL - TOTAL (LBS.)						3998	
NEW EPOXY STEEL - TOTAL (LBS.)						2850	*
EPOXY STEEL - TOTAL (LBS.)						6848	

STAINLESS STEEL REINF. STEEL - TWO RAILS							
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
STANDARD & TRANSITION SECTIONS	5c1	RAIL, VERTICAL		16	7'-0"	117	
	5c3	RAIL, VERTICAL		234	6'-0"	1464	
				168	6'-0"	1051	*
PREVIOUSLY BID STAINLESS STEEL TOTAL WEIGHT (LBS.)						1581	
NEW STAINLESS STEEL - TOTAL (LBS.)						1051	*
STAINLESS STEEL - TOTAL (LBS.)						2632	

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

* INDICATES NEW REINFORCEMENT

BENT BAR DETAILS



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

CONCRETE PLACEMENT SUMMARY

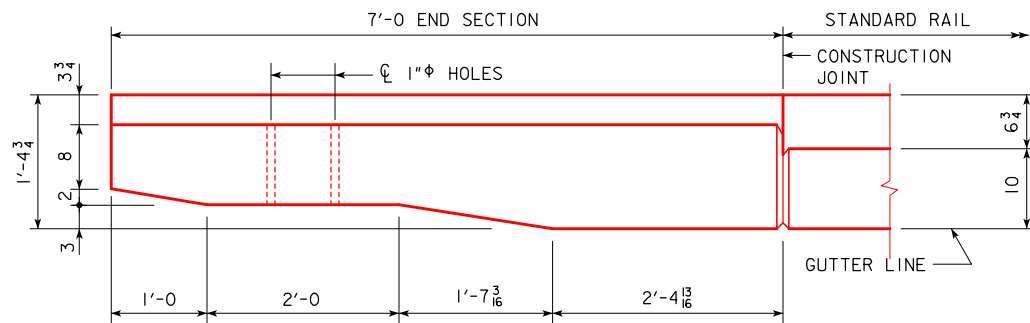
SECTION		TOTAL
STANDARD SECTION	409'-5 1/4" AT 0.083 CU. YD. PER FOOT	34.6
TRANSITION SECTION	8'-0" AT 0.087 CU. YD. PER FOOT	0.7
BARRIER RAIL END SECTION	2 AT 0.66 CU. YD.	1.3
TOTAL (CU. YD.)		36.6

CONCRETE BARRIER RAIL QUANTITIES

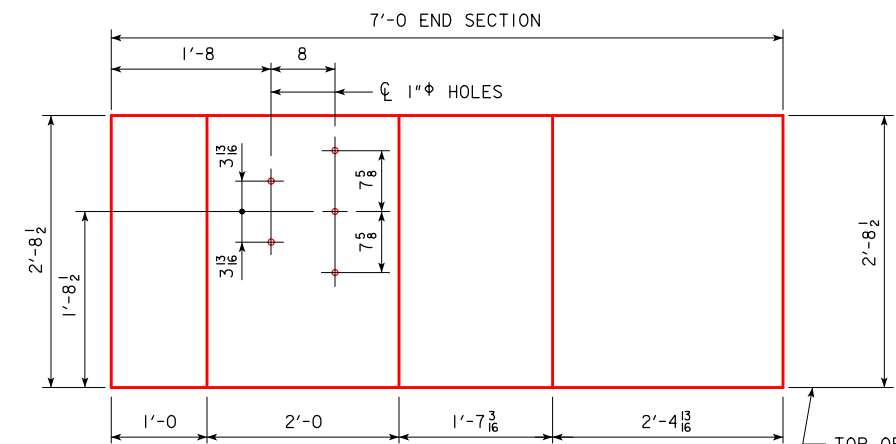
ITEM	UNIT	QUANTITY
CONCRETE BARRIER, PARAPET	L.F.	431.4

DESIGN FOR 15° SKEW (L.A.)
310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE
105'-0 NEW S. END SPAN
BARRIER RAIL DETAILS
STATION 565+36.18 AUGUST, 2018
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 24 OF 28 FILE NO. 31548 DESIGN NO. 218

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

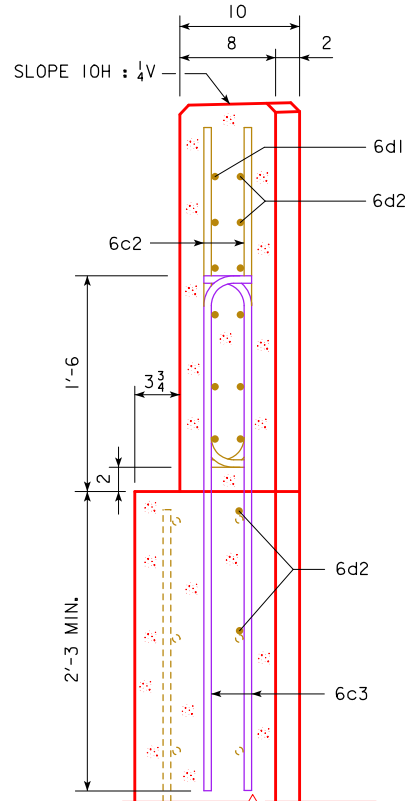


PART PLAN VIEW

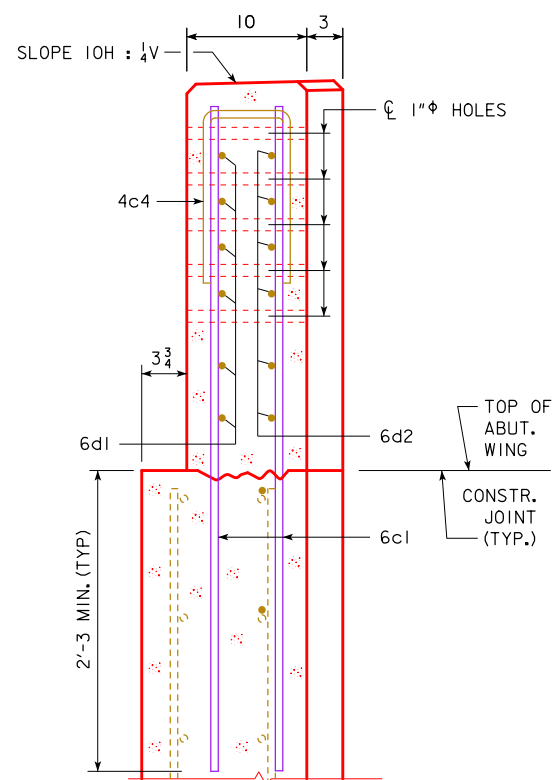


PART ELEVATION VIEW

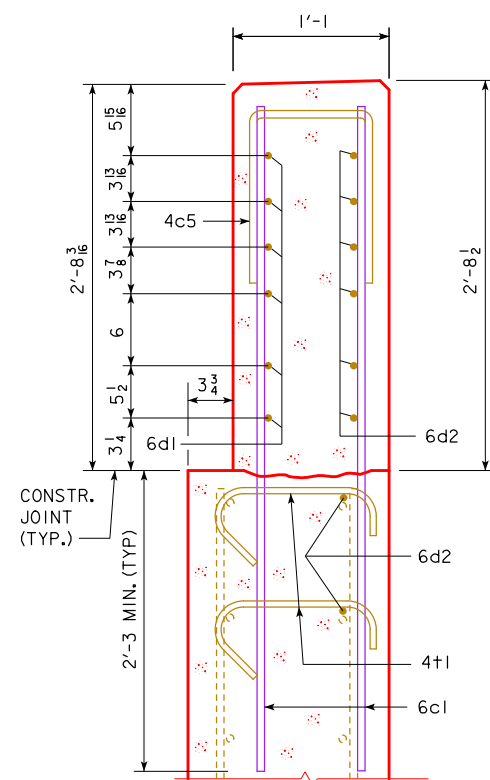
PROVIDE 5 HOLES FORMED WITH 1" ϕ PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER, PARAPET.



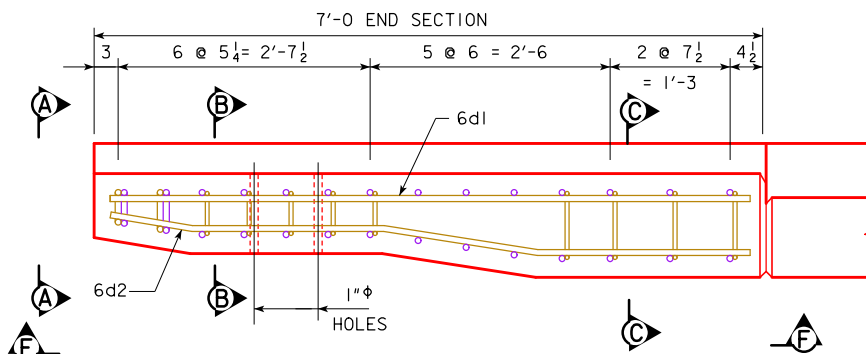
VIEW A-A



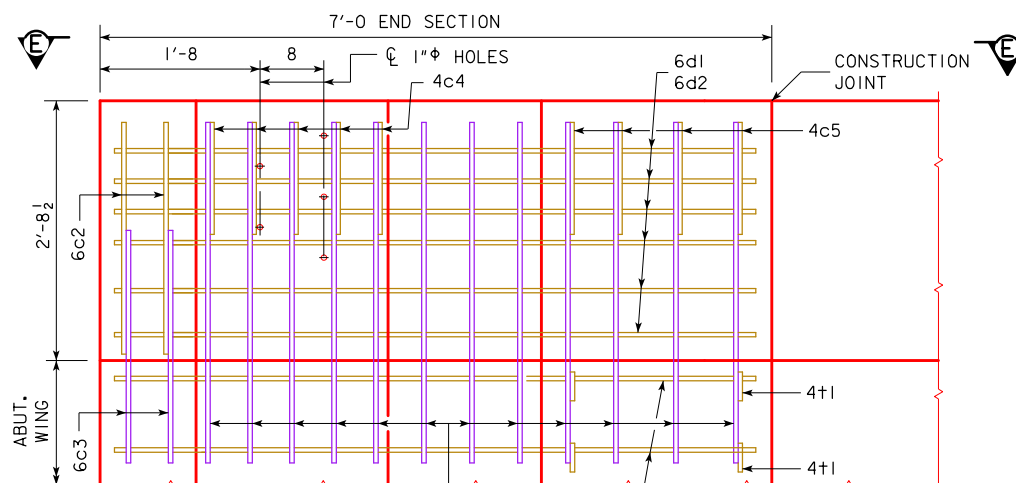
SECTION B-B



SECTION C-C



PART VIEW E-E



PART VIEW F-F

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

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

NOTE:
THE 6c1, 6c3, 2 - 6d2 AND
4+1 BARS ARE TO BE PLACED
WITH THE ABUTMENT WING. THE
DETAILS FOR PLACEMENT ARE
SHOWN ON THE WING ABUTMENT
SHEET.

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

EPOXY COATED REINF. STEEL - ONE END SECT.

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c2	RAIL, VERTICAL		4	2'-8	16
4c4	RAIL, VERTICAL, HOOPS		5	2'-10	9
4c5	RAIL, VERTICAL, HOOPS		4	3'-1	8
6d1	RAIL, HORIZONTAL, BACK FACE		6	6'-8	60
6d2	RAIL, HORIZONTAL, TRAFFIC FACE		8	6'-9	81
4+1	RAIL, ABUTMENT WING TIE BARS		4	1'-10	5
EPOXY STEEL TOTAL WEIGHT (LBS.)					179

STAINLESS STEEL REINF. STEEL - ONE END SECT.

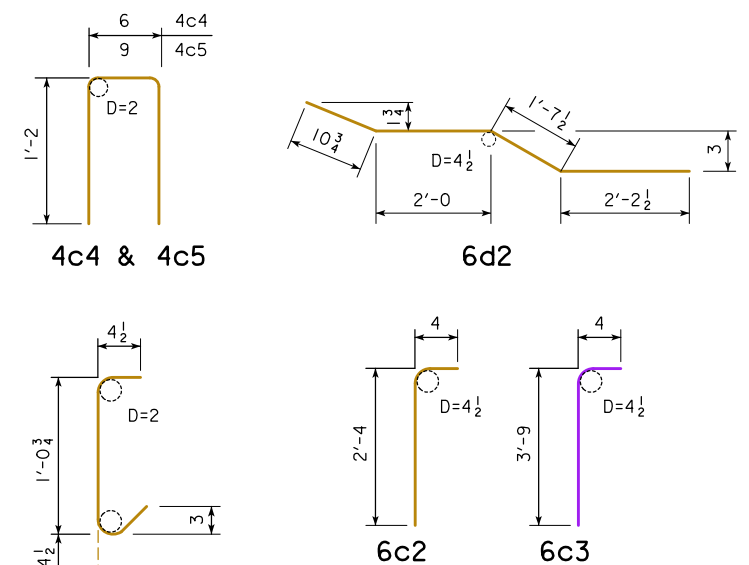
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	RAIL, VERTICAL		24	4'-9	171
6c3	RAIL, VERTICAL		4	4'-1	25
STAINLESS STEEL TOTAL WEIGHT (LBS.)					196

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

CONCRETE PLACEMENT SUMMARY

SECTION	TOTAL
BARRIER RAIL ONE END SECTION	0.66 CU. YD.

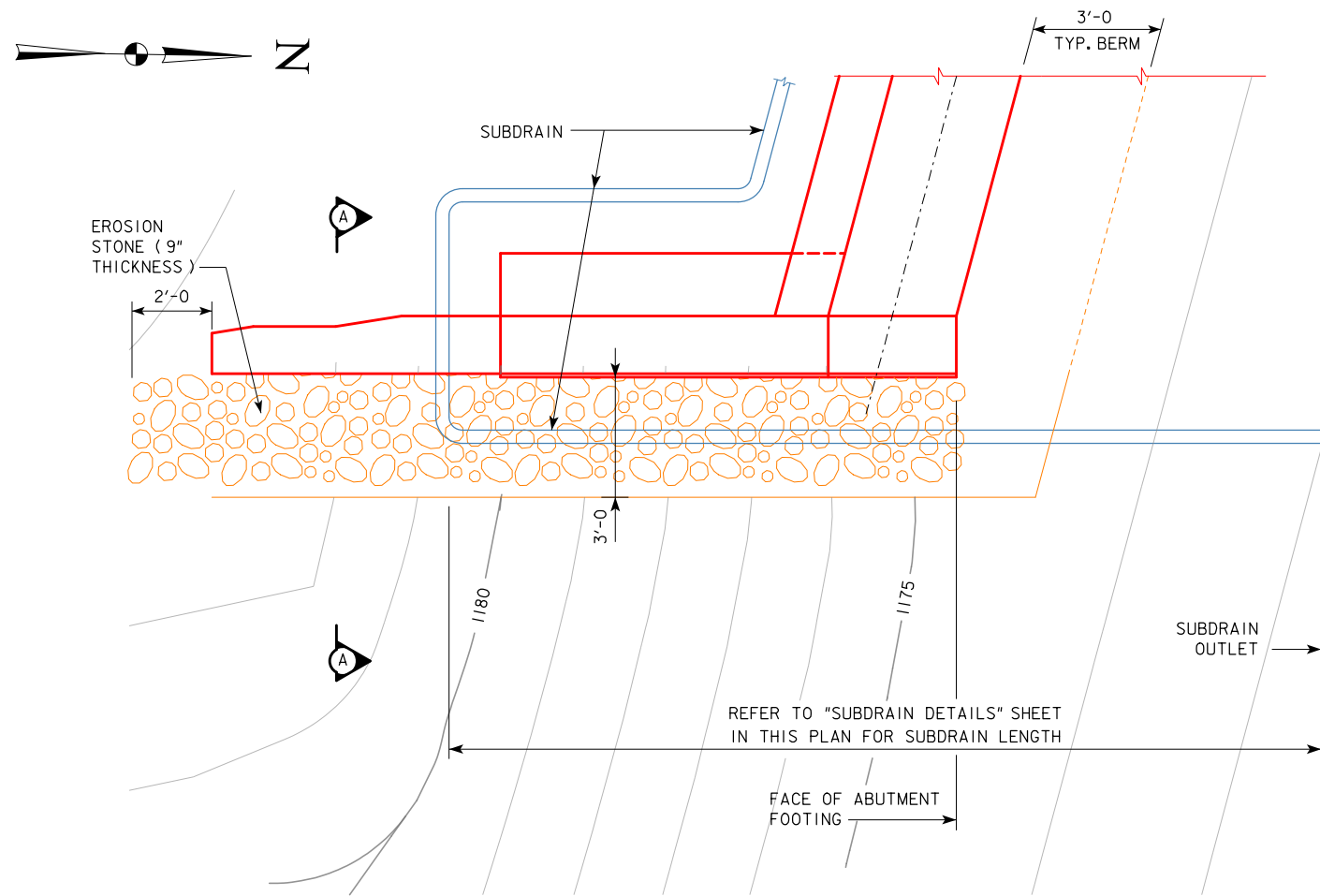
BENT BAR DETAILS



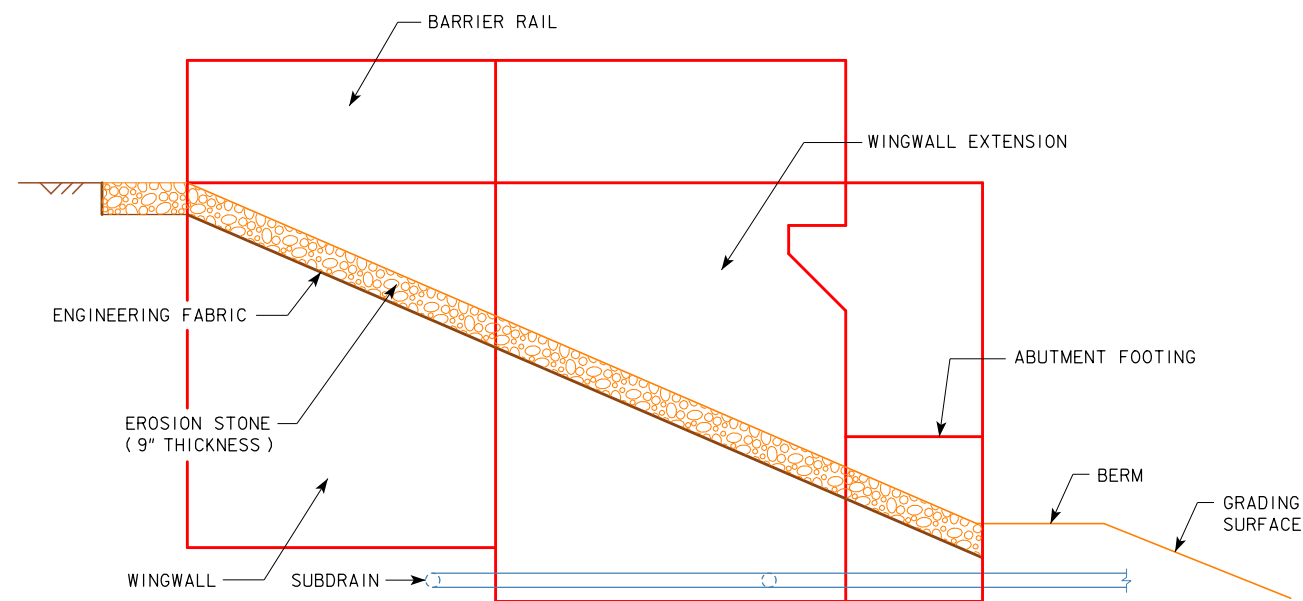
NOTE: ALL DIMENSIONS ARE OUT TO OUT.
D = PIN DIAMETER.

DESIGN FOR 15° SKEW (L.A.)
**310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
105'-0 NEW S. END SPAN
RAIL END SECTION DETAILS
STATION 565+36.18
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 25 OF 28 FILE NO. 31548 DESIGN NO. 218
AUGUST, 2018

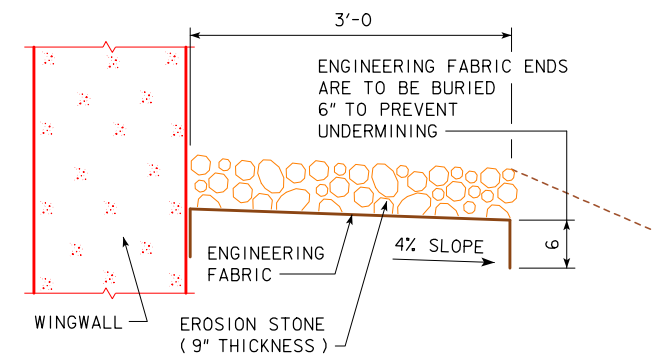
REVISED 06-14 - ADDED 2 FEET OF LENGTH OF EROSION STONE IN FRONT OF THE BRIDGE WING.
ENGLISHFORENSLOPEPROTECTIONBRIDGES.DGN 1005A - THIS SHEET ISSUED 06-02.



TOP VIEW OF WING ARMORING WITH WING EXTENSION



PROFILE VIEW OF WING ARMORING WITH WING EXTENSION
(INTEGRAL ABUTMENT WITH WING EXTENSIONS)



SECTION A-A

GENERAL NOTES:

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

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

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

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

DESIGN FOR 15° SKEW (L.A.)	
310'-8 X 44'-0 PRETENSIONED	
PRESTRESSED CONCRETE BEAM BRIDGE	
105'-0 NEW S. END SPAN	
BRIDGE WING ARMORING	
STATION 565+36.18	AUGUST, 2018
CASS COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. 26 OF 28	FILE NO. 31548 DESIGN NO. 218



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.

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.

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.

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

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.

SUBDRAIN SHALL SLOPE DOWNWARD 2% FROM C 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.

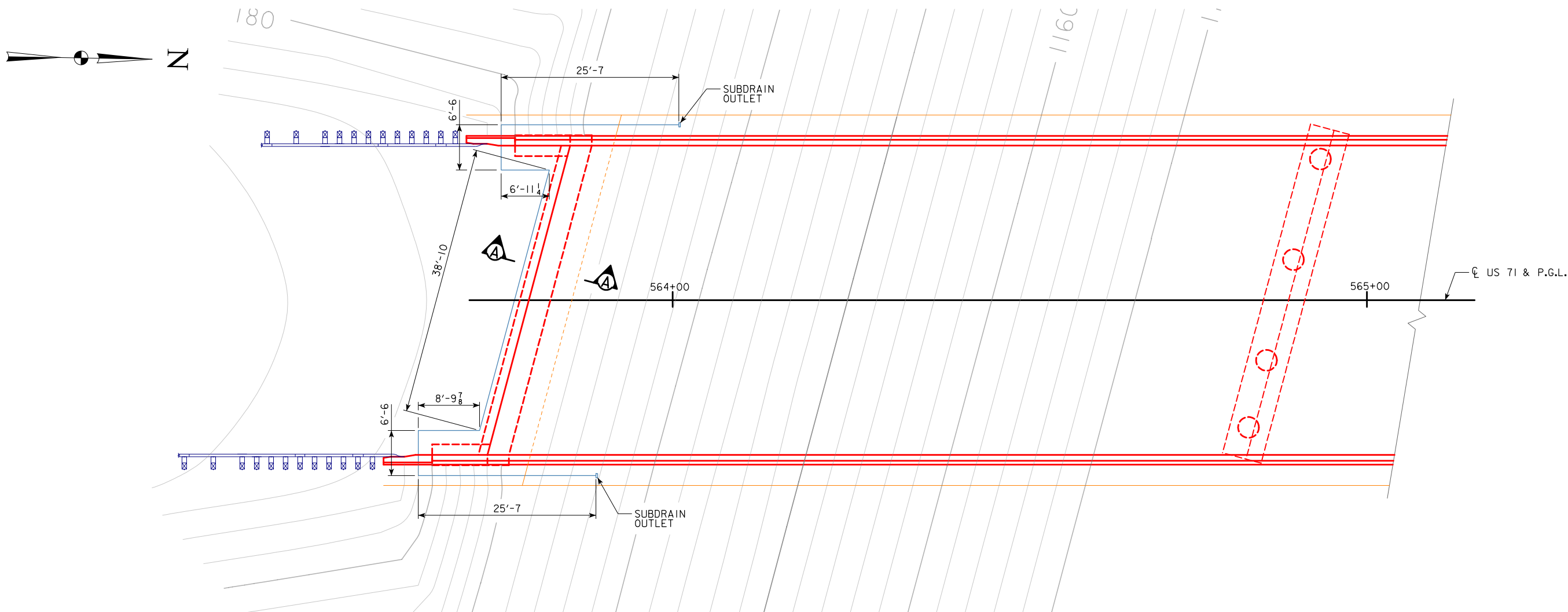


NOTE:
SEE SUBDRAIN DETAILS SHEET FOR DETAILS NOT
SHOWN ON THIS SHEET WHICH ARE PERTINENT TO
THIS STRUCTURE.

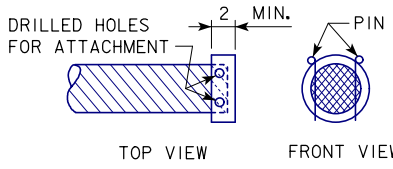
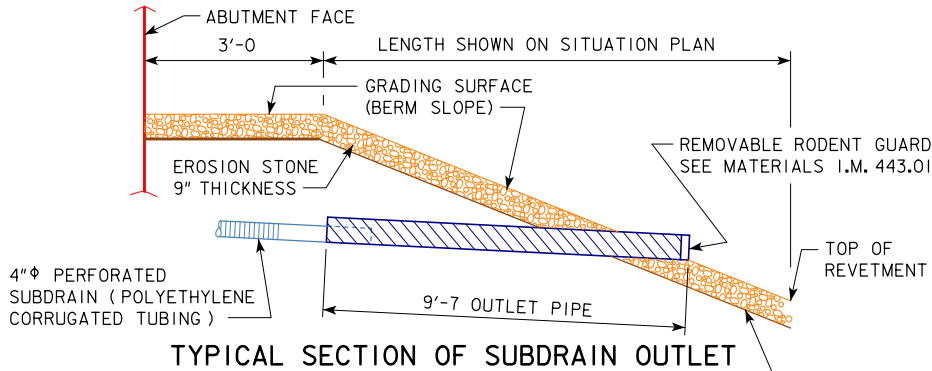
71 3/50 2D 15	SHEET NUMBER 39
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REVISED 10-14 - TWO ADDITIONAL FORESLOPE PROTECTION DETAILS WERE ADDED OUTSIDE OF THE BORDER TO SHOW REVETMENT UP TO BACK OF ABUTMENT FOOTING.
ENGLISH FORESLOPE PROTECTION BRIDGE.DGN 1007C - THIS SHEET ISSUED 06-02 FOR WATER CROSSINGS.

BM# 503 Iowa D.O.T. Brass Plug In top of Concrete Barrier Rail South East Corner of U.S. 71 Bridge over Lone Tree Creek Station 583+70 +/- 23' +/- right Elevation 1185.52



SITUATION PLAN
SHOWING SUBDRAIN LOCATIONS



REMOVABLE RODENT GUARD DETAILS
EROSION STONE (EMBEDDED) OUTLET DETAILS

SUBDRAIN NOTES :

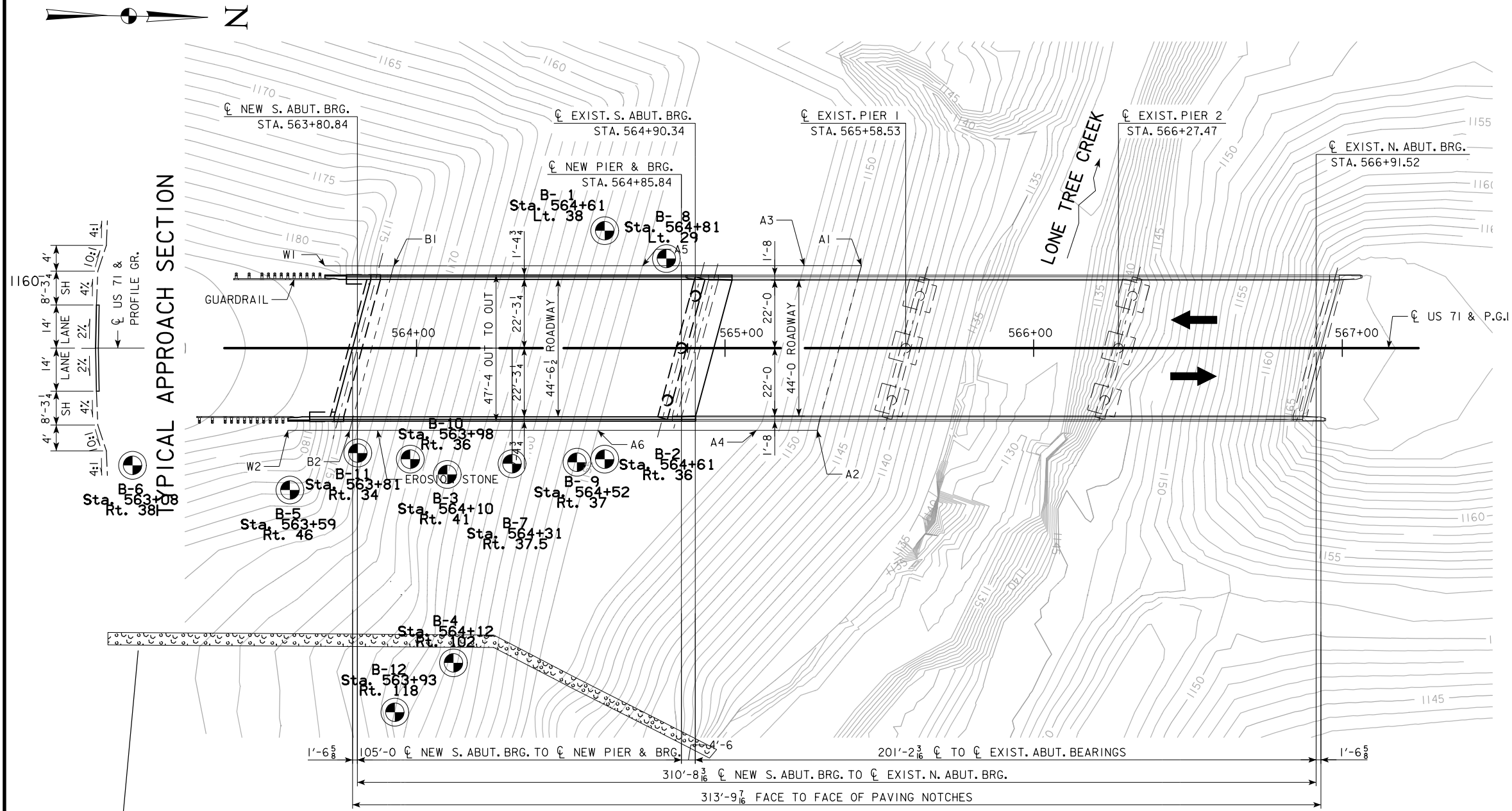
THIS PLAN SHEET SHOWS DETAILS FOR PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.
THE SUBDRAINS SHALL BE 4" IN DIAMETER AND SHALL BE IN ACCORDANCE WITH ARTICLE 4143.01, B, OF THE STANDARD SPECIFICATIONS.
THE SUBDRAIN OUTLET SHALL CONSIST OF A LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET. THE LENGTH OF THE OUTLET PIPE SHALL BE DETERMINED BY THE REVETMENT AND IT'S PLACEMENT LOCATION. THE CONTRACTOR IS TO INSURE THE OUTLET PIPE IS ADEQUATELY STRONG ENOUGH AND WILL NOT BE DAMAGED WHEN REVETMENT IS PLACED. A CHECK WILL BE MADE AT THE SUBDRAIN OUTLET TO INSURE THAT THE SUBDRAIN IS NOT DAMAGED AND IS DRAINING PROPERLY DURING THE BACKFILL FLOODING PROCESS. IF A METAL OUTLET PIPE IS USED, IT SHALL BE 6 INCHES IN DIAMETER AND COUPLED TO THE 4 INCH DIAMETER SUBDRAIN IN ONE OF THE TWO FOLLOWING WAYS.
1. USE AN INSIDE FIT REDUCER COUPLER (COUPLER MUST BE INSERTED A MINIMUM OF 1'-0 INTO THE METAL OUTLET PIPE).
2. INSERT 1'-0 OF THE 4" SUBDRAIN INTO THE 6" METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.
THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE.
THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

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

SUBDRAIN OUTLET ELEVATIONS	
LOCATION	ELEVATION
S. ABUTMENT	1171.98

DESIGN FOR 15° SKEW (L.A.)
**310'-8 X 44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE**
105'-0 NEW S. END SPAN
SUBDRAIN DETAILS
STATION 565+36.18
CASS COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 28 OF 28 FILE NO. 31548 DESIGN NO. 218
AUGUST, 2018

LONGITUDINAL SECTION ALONG C US 71



Trench drain to be installed as part of IA DOT Project No. NHSN-071-3(57)--2R-15. This drain shall be maintained and protected during construction and repaired if damaged.

LOCATION

US 71 OVER LONE TREE CREEK
T-76N R-36W
SECTIONS 33-34
GROVE TOWNSHIP
CASS COUNTY
BRIDGE MAINT. NO. 1554.95071
FHWA NO. 17550
LATITUDE 41.343719°
LONGITUDE -94.984549°

DESIGN FOR LENGTHENING TO 15° SKEW (L.A.)
201'-2X44'-0 TO 310'-8X44'-0 PRETENSIONED
PRESTRESSED CONCRETE BEAM BRIDGE
105'-0 NEW END SPAN (D BEAM TYPE)
SOILS PLAN SHEET
CASS COUNTY
STATION 565+36.18

WATER	DRY	PLUGGED	MOISTURE	SHELBY	BLOW COUNT	DENS. CORE	SAMPLE	DIAMOND CORE	SAND	GRAVELLY SAND	BOULDERS	SOIL REMEDIATION AREA	LIMESTONE (L.S.)	BROKEN & WEATHERED L.S.	SANDSTONE	SHALE	SANDY SOIL
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FILE NO. 31548

ENGLISH

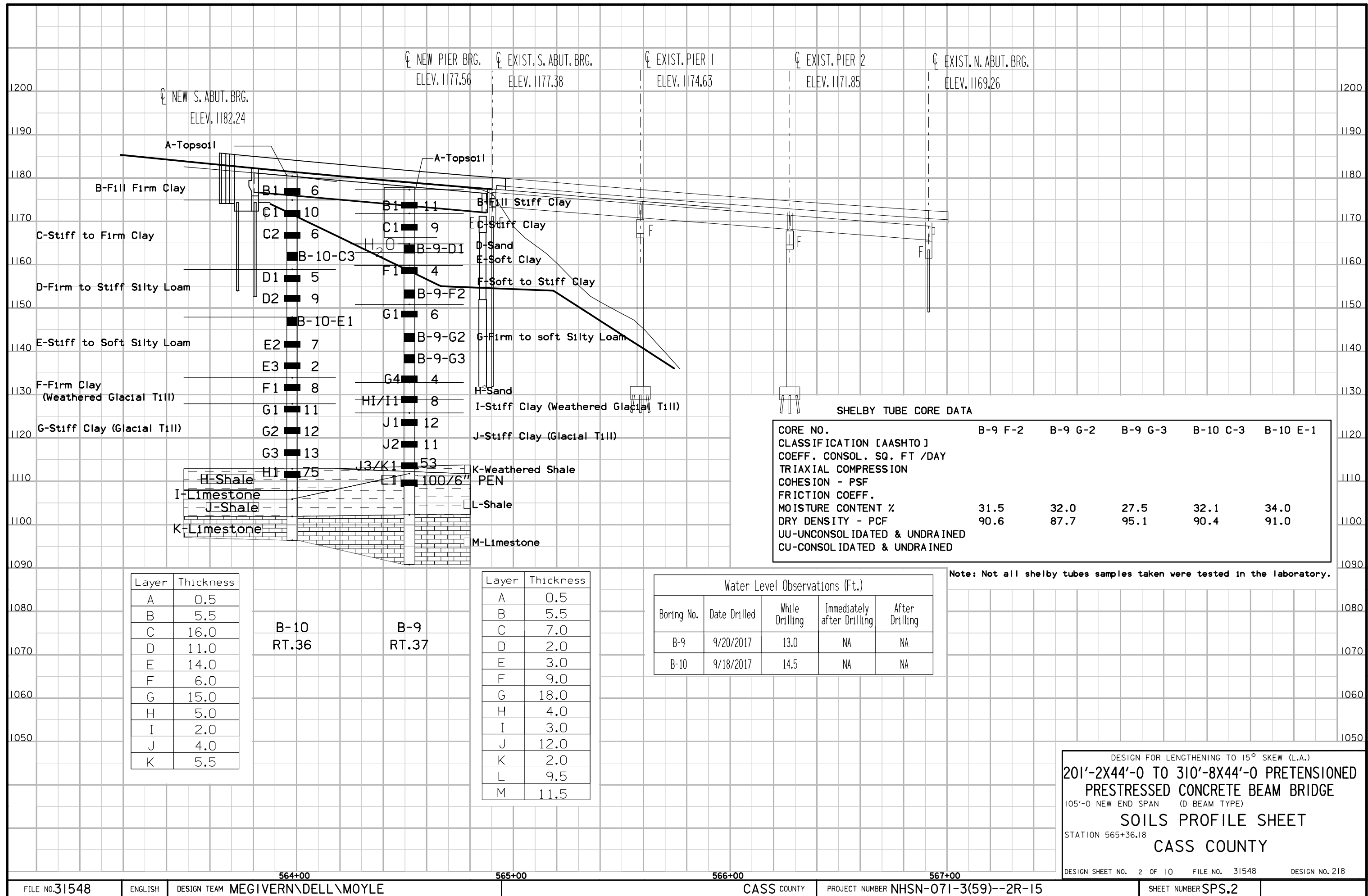
DESIGN TEAM MEGIVERN\DELL\MOYLE

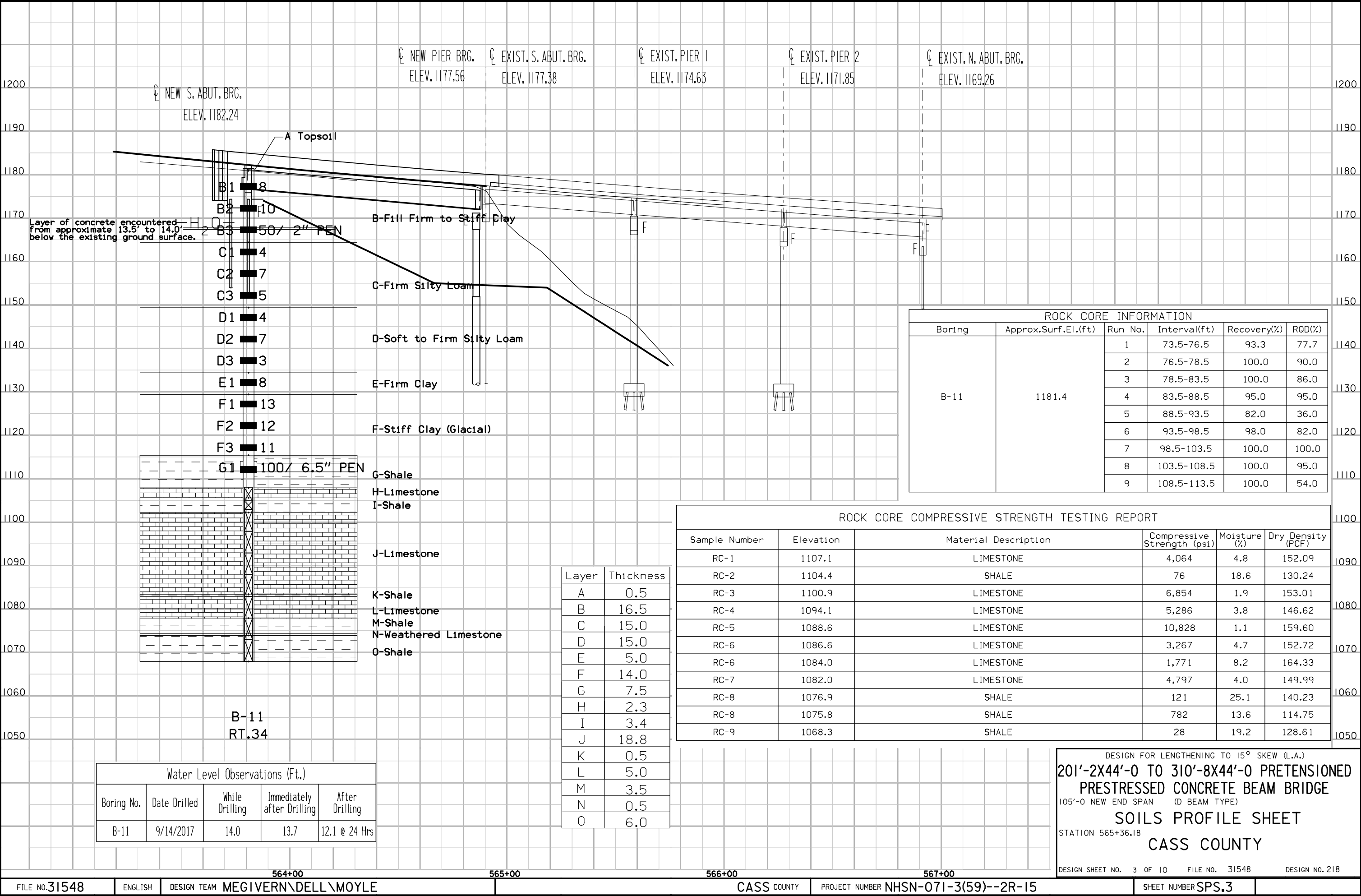
CASS COUNTY

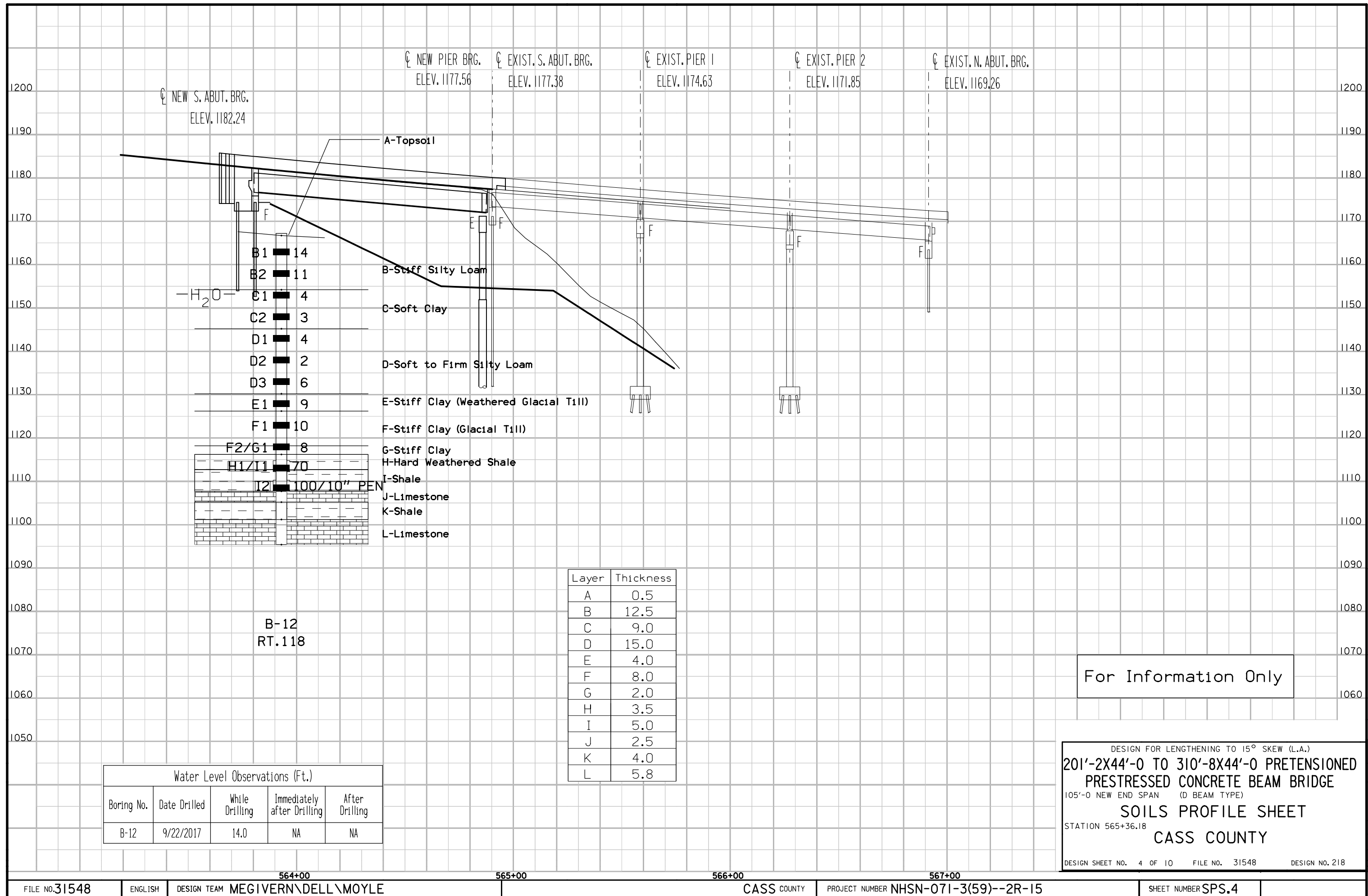
PROJECT NUMBER NHSN-071-3(59)--2R-15

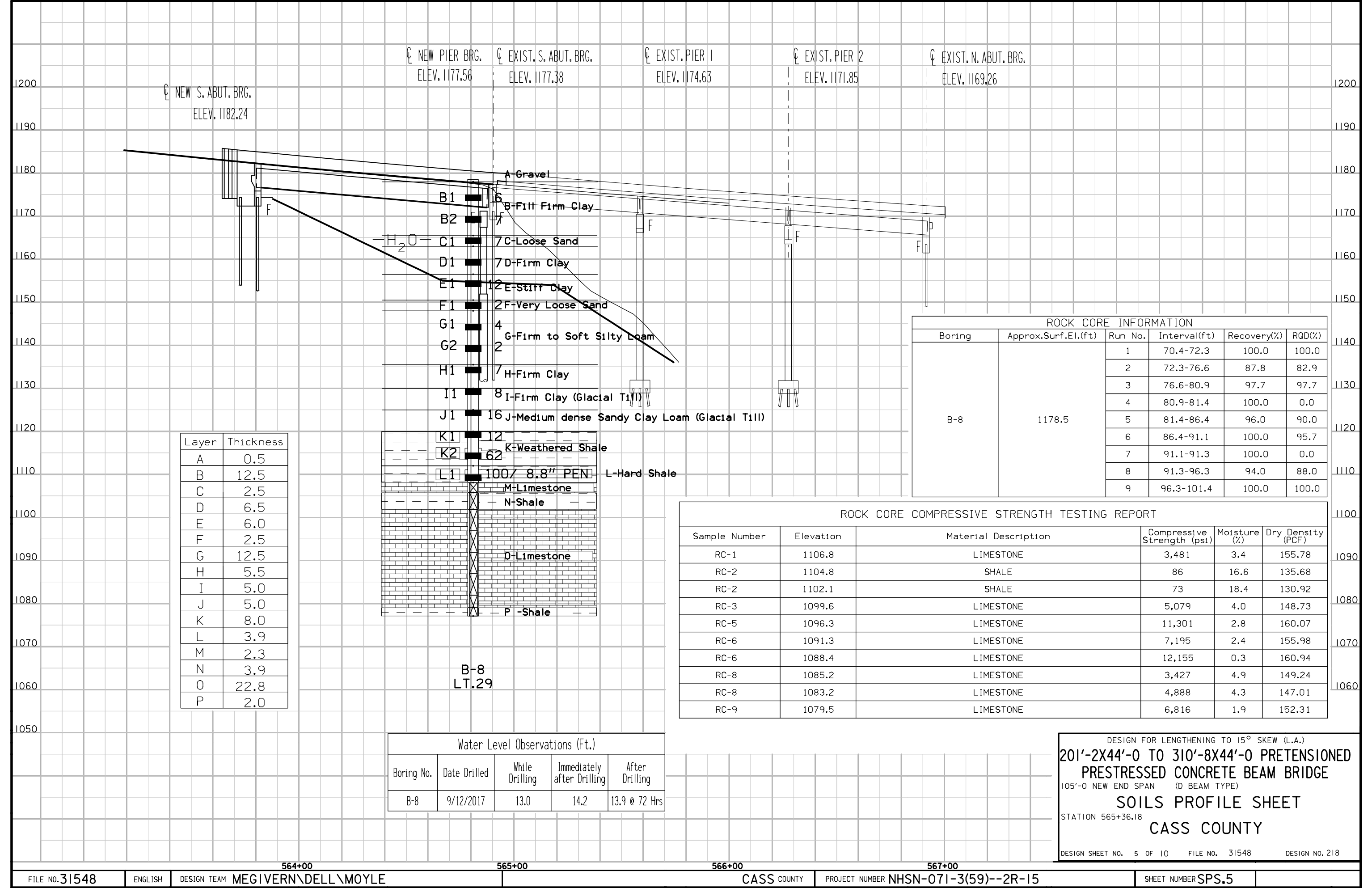
SHEET NUMBER SPS.1

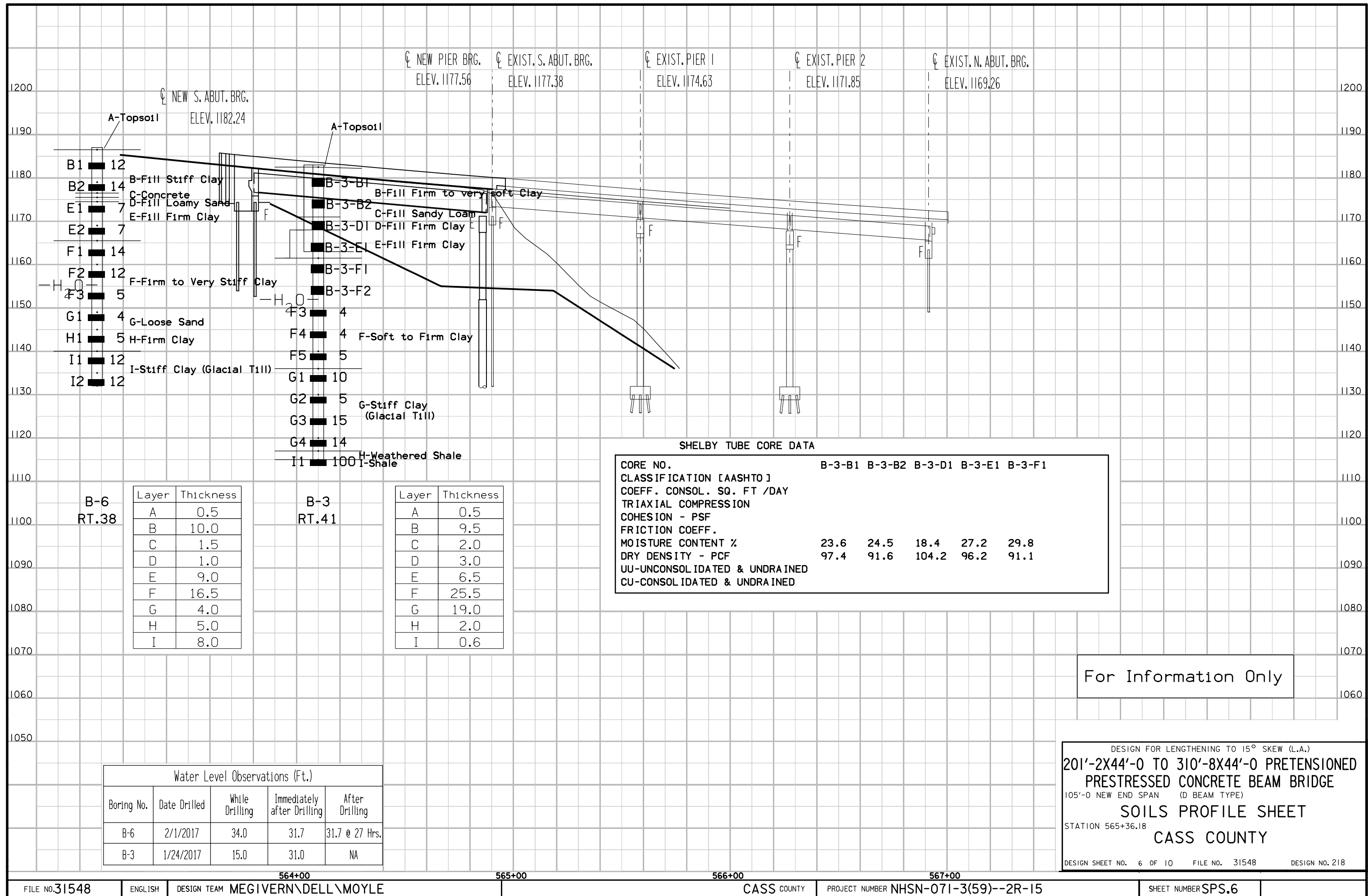
DESIGN NO. 218

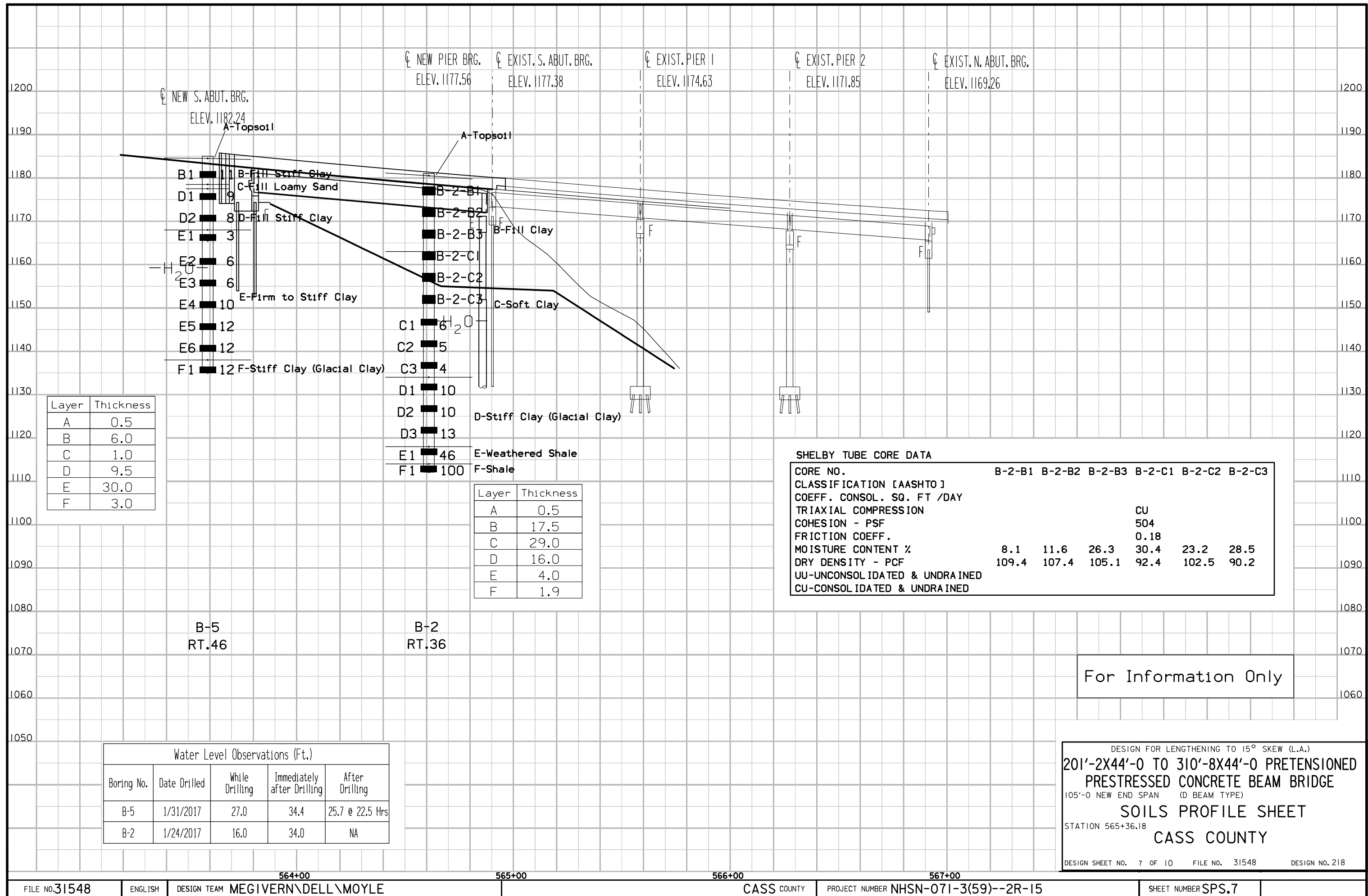


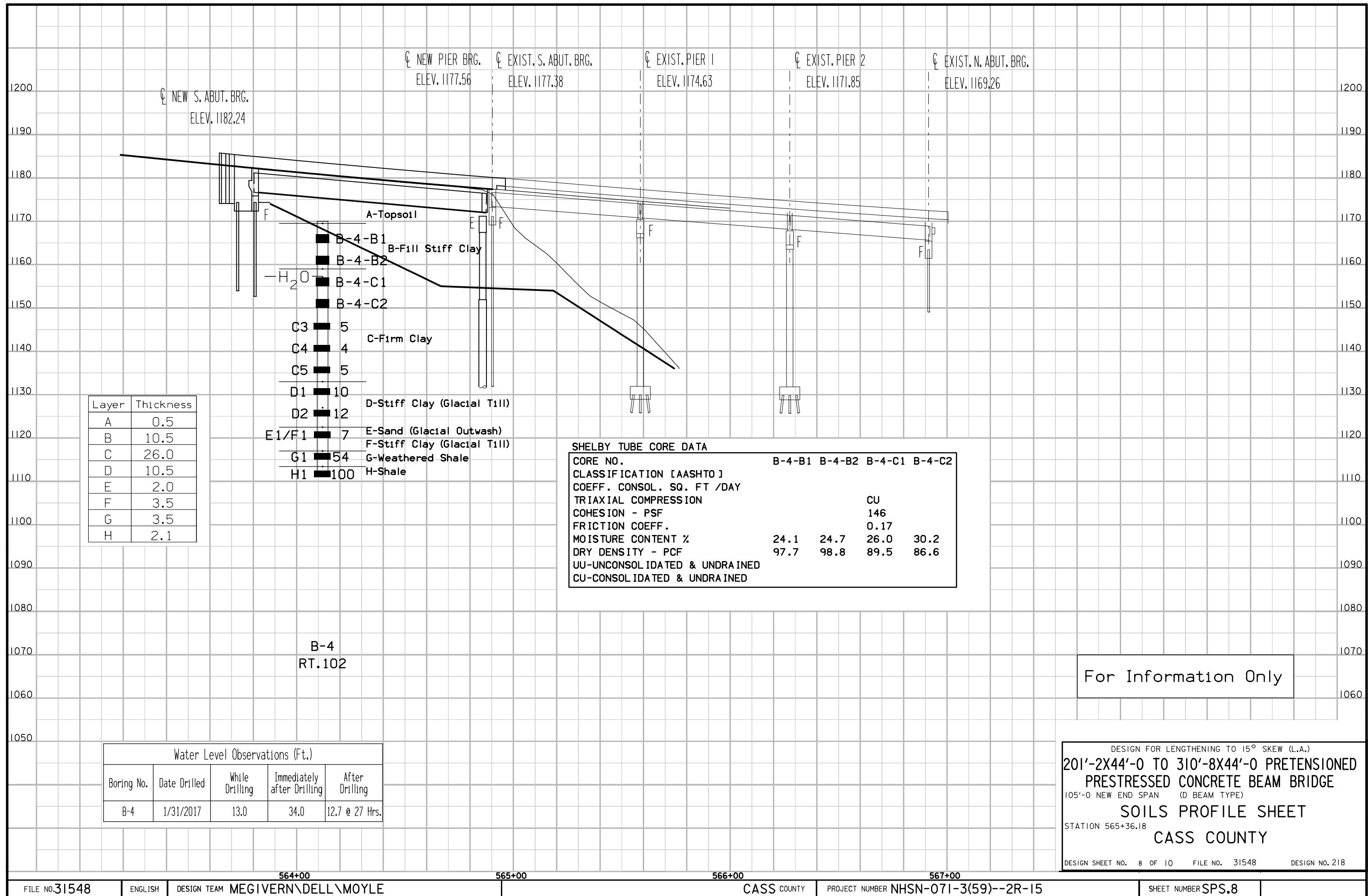


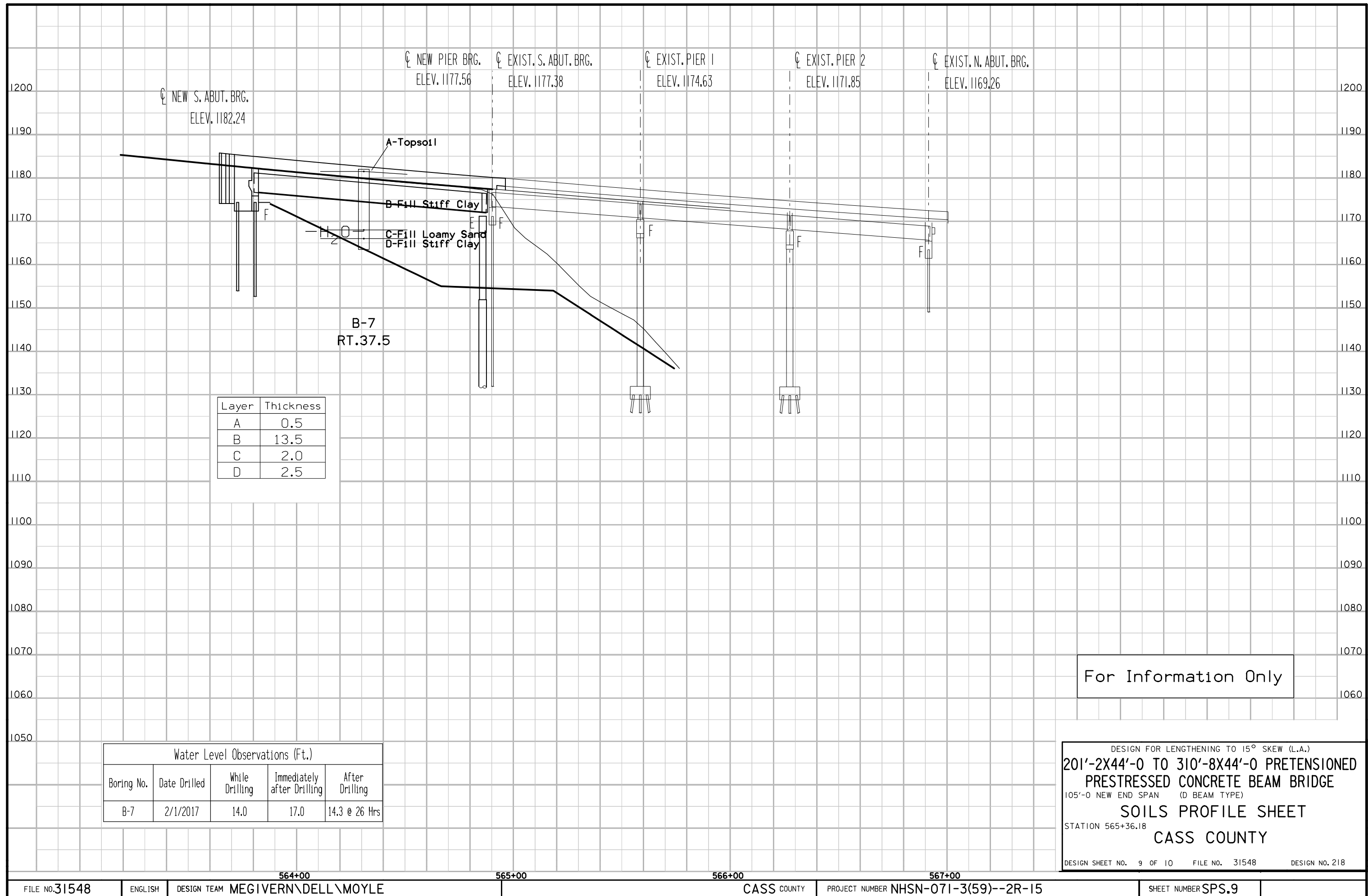


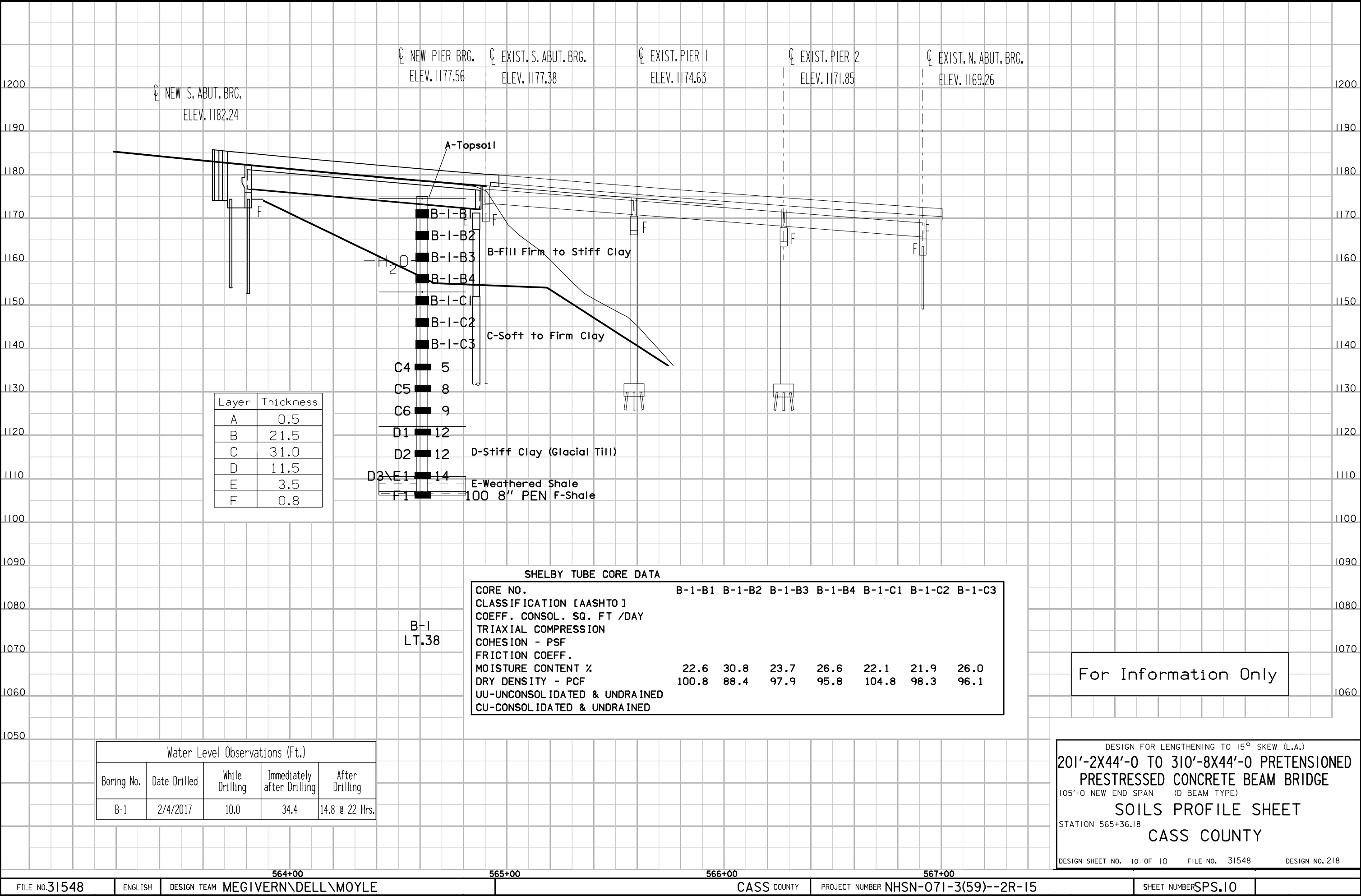












INDEX OF SHEETS	
No.	DESCRIPTION
A Sheets	Title Sheets
A.1	Title Sheet
B Sheets	Typical Cross Sections and Details
B.1 -3	Typical Cross Sections and Details
C Sheets	Quantities and General Information
C.1	Project Description
C.1	Estimated Project Quantities
C.2-3	Estimate Reference Information
C.3	Standard Road Plans
C.3	Index of Tabulations
C.4-5	Pollution Prevention Plan
C.6 - 10	Tabulations
CS Sheets	Soils Tabulations
CS.1	Soils Tabulations
D Sheets	Mainline Plan and Profile Sheets
* D.1	Plan & Profile Legend & Symbol Information Sheets
* D.2	U.S.71
* D.3	Proposed Contours / Revetment Berm
G Sheets	Survey Sheets
G.1 - 2	Reference Ties and Bench Marks
G.3	Horizontal Control Tab
J Sheets	Traffic Control and Staging Sheets
J.1	Traffic Control and Staging Notes
T Sheets	Earthwork Quantity Sheets
* T.1-3	Earthwork Quantity Sheets
U Sheets	500 Detail Sheets
U.1-3	Silt Fence Installation for Shallow or No Ditch
W Sheets	Mainline Cross Sections
W.1-8	U.S. 71 Cross Sections
	* Color Plan Sheets

DESIGN DATA URBAN

2015	AADT	<u>2,920</u>	V.P.D.
20	AADT	<u> </u>	V.P.D.
20	DHV	<u> </u>	V.P.H.
TRUCKS		<u>13</u>	%
Total			
Design	ESALs	<u> </u>	

ROADWAY DESIGN



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

Jacob Bondhus 12-11-2017
Signature Date
Jacob Bondhus
Printed or Typed Name
My license renewal date is December 31, 2018

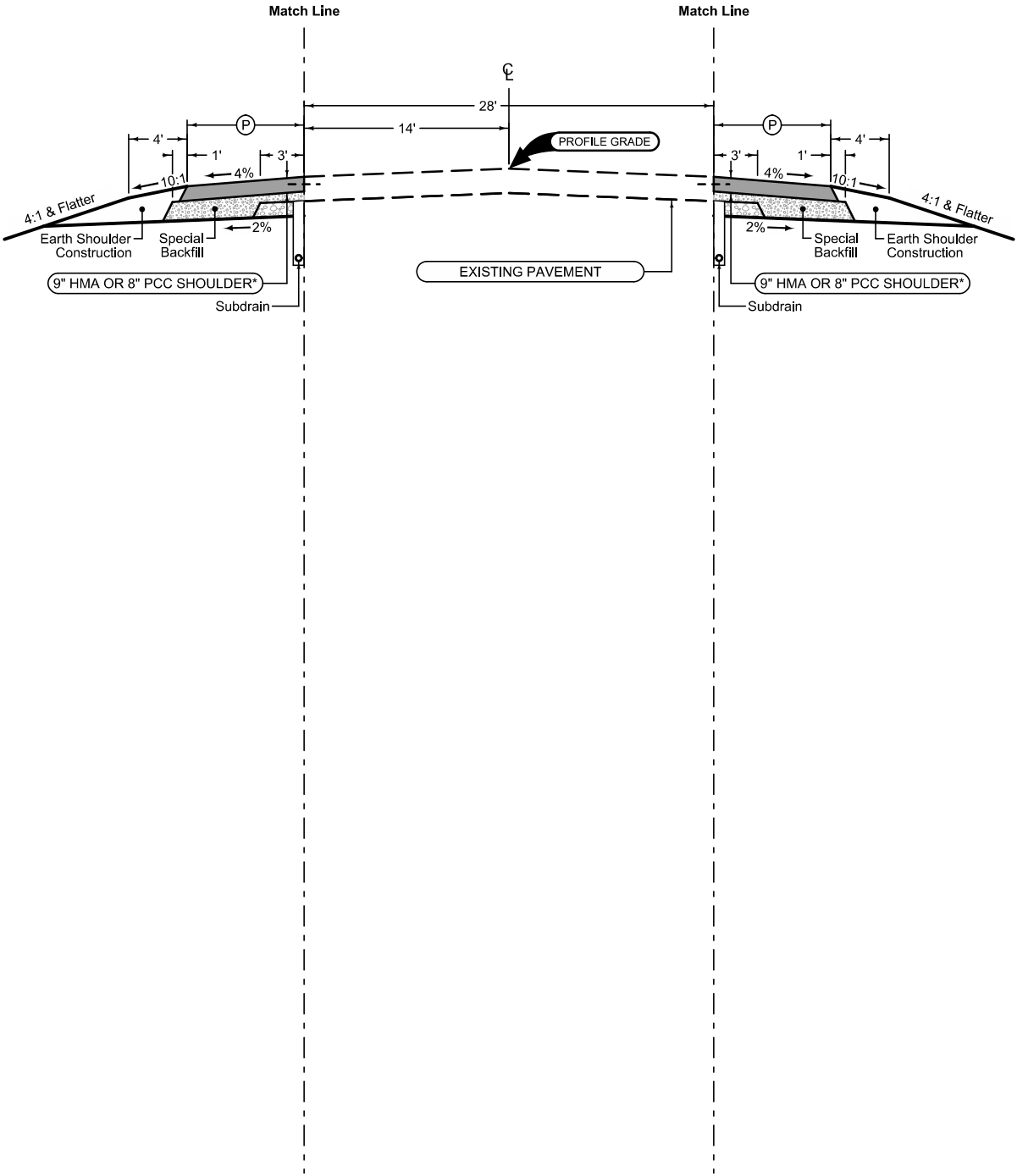
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Paved Shoulder at Guardrail

PCC Shoulder Jointing: BT-1 or BT-5
Longitudinal joint: C at 20' spacing
HMA Shoulder Jointing: B
Longitudinal joint: B

2_P_Guard_ 10-21-14		
STATION TO STATION		(P) Feet
562+65.59	563+07.95	*
567+53.88	568+49.71	*

* See typical 7156 and cross sections



Paved Shoulder at Guardrail

PCC Shoulder Jointing: BT-1 or BT-5
Longitudinal joint: C at 20' spacing
HMA Shoulder Jointing: B
Longitudinal joint: B

2_P_Guard_ 10-21-14		
STATION TO STATION		(P) Feet
562+25.65	563+07.95	*
567+53.88	568+00.67	*

* See typical 7156 and cross sections

See Tab 112-6 For Bridge Approach Section.
See Tab 112-9 for shoulder quantities.

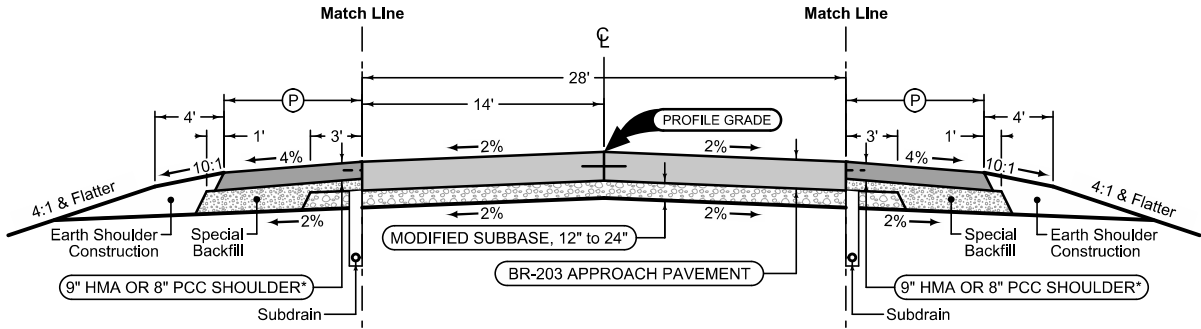
U.S. 71

Paved Shoulder at Guardrail

PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at 20' spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_Guard_ 10-21-14		(P) Feet
STATION TO STATION		
563+07.95	563+80.84	*

* See typical 7156 and cross sections



Mainline Jointing:
Transverse joints: CD at 20' spacing
Longitudinal joint: L-2

2P_ 10-19-10	
STATION TO STATION	
563+07.95	563+80.84

Paved Shoulder at Guardrail

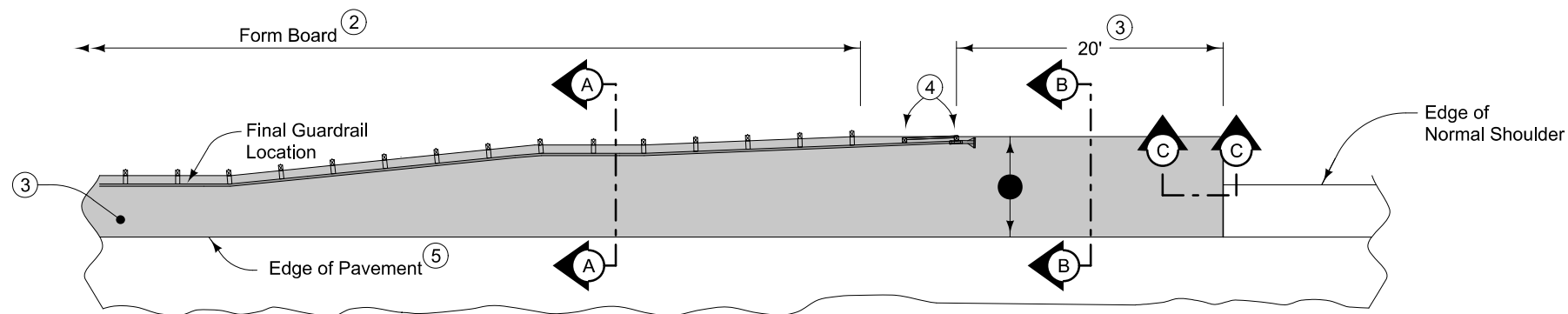
PCC Shoulder Jointing:
Longitudinal joint: BT-1 or BT-5
Transverse joints: C at 20' spacing
HMA Shoulder Jointing:
Longitudinal joint: B

2_P_Guard_ 10-21-14		(P) Feet
STATION TO STATION		
563+07.95	563+80.84	*

* See typical 7156 and cross sections

See Tab 112-6 For Bridge Approach Section.
See Tab 112-9 for shoulder quantities.

U.S. 71



PLAN VIEW

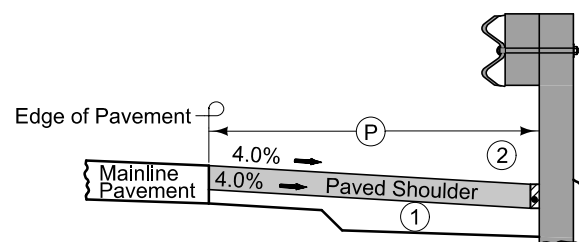
9" HMA Paved Shoulder at guardrail. 8" PCC may be substituted with the following jointing layout:

Match mainline pavement joint spacing. When mainline pavement is 8" or greater in thickness, place additional transverse 'C' joints in shoulder at mid-panel of the mainline pavement. Place longitudinal 'C' joint at P/2 from edge of mainline pavement when P is greater than 10' wide. Terminate longitudinal joint at transverse joint less than 10' in length.

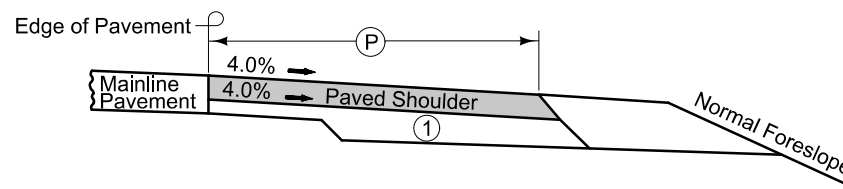
Compaction of HMA is required to face of guardrail post. Hand compaction will be allowed under guardrail. Removal and reinstallation of guardrail will be allowed with no additional payment.

Refer to Tabulation 112-9 for shoulder quantities.

- ① For subgrade treatment, refer to other details in the plan.
- ② PCC option only: When guardrail posts are installed prior to construction of PCC paved shoulder, fasten form board to the face of guardrail posts for the length shown. Refer to note 4 for final 2 posts.
- ③ Continue paved shoulder to existing paved shoulder or 20 feet beyond the center of the first post.
- ④ Shoulder may be notched for final 2 posts or post sleeves may be installed through pavement. Do not drive posts through pavement.
- ⑤ 'KT-1 joint for PCC shoulder.
'B' joint for HMA shoulder.

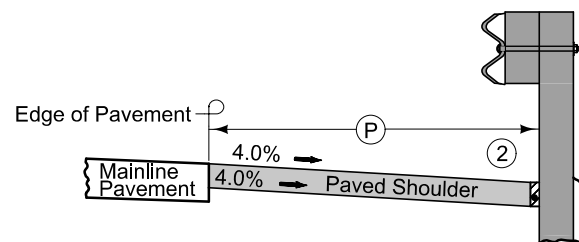


Section A-A

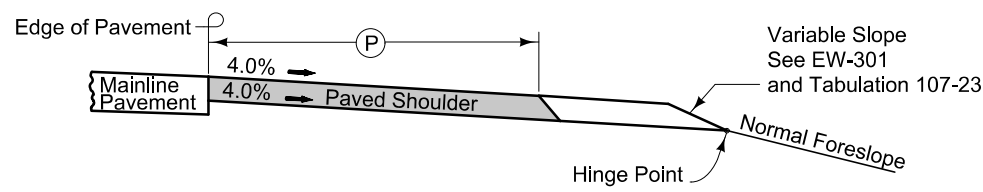


Section B-B

NEW CONSTRUCTION

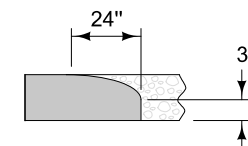


Section A-A



Section B-B

EXISTING SHOULDER



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

PAVED SHOULDER AT GUARDRAIL

ESTIMATED PROJECT QUANTITIES (1 DIVISION PROJECT)					
Item No.	Item Code	Item	Unit	Total	As Built Qty.
1	2101-0850001	CLEARING AND GRUBBING	ACRE	1.52	1.520
2	2102-0425070	SPECIAL BACKFILL	TON	298.5	257.530
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY	10,996.0	10.996
4	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS	CY	10.0	10.000
5	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD	CY	1,838.0	1,838.000
6	2121-7425020	GRANULAR SHOULDERS, TYPE B	TON	6.7	11.020
7	2122-5500090	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 9 IN.	SY	430.1	0.000
8	2123-7450000	SHOULDER CONSTRUCTION, EARTH	STA	3.9	3.900
9	2123-7450020	SHOULDER FINISHING, EARTH	STA	1.49	1.490
10	2301-0690203	BRIDGE APPROACH, BR-203	SY	264.8	264.800
11	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE	SY	723.4	723.400
12	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.	LF	65.0	42.000
13	2502-8221306	SUBDRAIN OUTLET, DR-306	EACH	2	2.000
14	2505-4000120	REMOVAL OF STEEL BEAM GUARDRAIL	LF	423.80	423.000
15	2505-4000300	STEEL BEAM GUARDRAIL	LF	62.5	62.500
16	2505-4000410	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201	EACH	4	4.000
17	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	EACH	4	4.000
18	2505-4021720	STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205	EACH	4	4.000
19	2507-3250005	ENGINEERING FABRIC	SY	2,604.8	2,603.330
20	2507-6799000	BANK SHAPING	LS	1.00	\$3,000.000
21	2507-6800061	REVEMENT, CLASS E	TON	1,533.6	1,591.700
22	2507-8029000	EROSION STONE	TON	363.7	397.200
23	2510-6745850	REMOVAL OF PAVEMENT	SY	1,078.7	1,078.700
24	2518-6910000	SAFETY CLOSURE	EACH	4	5.000
25	2526-8285000	CONSTRUCTION SURVEY	LS	1.00	\$3,500.000
26	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	23.88	28.350
27	2528-8445110	TRAFFIC CONTROL	LS	1.00	\$3,600.000
28	2555-0000010	DELIVER AND STOCKPILE SALVAGED MATERIALS	LS	1.00	\$500.000
29	2601-2634100	MULCHING	ACRE	1.52	1.640
30	2601-2634105	MULCHING, BONDED FIBER MATRIX	ACRE	0.5	0.000
31	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	1.52	1.640
32	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING	ACRE	1.52	1.640
33	2602-0000020	SILT FENCE	LF	1,156.3	654.000
34	2602-0000030	SILT FENCE FOR DITCH CHECKS	LF	315	0.000
35	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS	LF	1,471.3	0.000
36	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK	LF	147	0.000
37	2602-0000212	FLOATING SILT CURTAIN (HANGING)	LF	500.0	600.000
38	2602-0000240	MAINTENANCE OF FLOATING SILT CURTAIN	LF	250.0	400.000
39	2602-0000320	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA.	LF	1,000.0	1,360.000
40	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE	LF	1,000.0	1,240.000
41	2602-0010010	MOBILIZATIONS, EROSION CONTROL	EACH	1	8.000
42	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL	EACH	1	0.000

FILE NO. 31292	ENGLISH	DESIGN TEAM BONDHUS \ZAFAR\QURAISHI	CASS COUNTY	PROJECT NUMBER NHSN-071-3(59)--2R-15	SHEET NUMBER C.1
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ESTIMATE REFERENCE INFORMATION			100-4A 12-05-17
Item No.	Item Code	Description	
1	2101-0850001	CLEARING AND GRUBBING	
2	2102-0425070	SPECIAL BACKFILL Includes 186.8 tons for paved shoulders in front of guardrail. Refer to Tab.112-9 for location and details.	
3	2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW See T Sheets for details. 10,295 CY ARE TO BE WASTED.	
4	2102-2712015	EXCAVATION, CLASS 12, BOULDERS OR ROCK FRAGMENTS See Sheet CS.1 Tab 103-7 for details.	
5	2105-8425015	TOPSOIL, STRIP, SALVAGE AND SPREAD Refer to Tab. 107-28. Strip 12" of Topsoil and put 8" back. Spread remaining topsoil evenly over entire project.	
6	2121-7425020	GRANULAR SHOULDERS, TYPE B See Tab 112-9 for locations and details.	
7	2122-5500090	PAVED SHOULDER, HOT MIX ASPHALT MIXTURE, 9 IN. See Tab. 112-9 for locations and details	
8	2123-7450000	SHOULDER CONSTRUCTION, EARTH Refer to Tab. 112-9 for location and details.	
9	2123-7450020	SHOULDER FINISHING, EARTH For finishing behind approach curb.	
10	2301-0690203	BRIDGE APPROACH, BR-203 Refer to Tab. 112-6 for location and details.	
11	2412-0000100	LONGITUDINAL GROOVING IN CONCRETE Includes bridge approach and proposed bridge. Refer to Tab. 100-28 for location and details.	
12	2502-8212034	SUBDRAIN, LONGITUDINAL, (SHOULDER) 4 IN. DIA.	
13	2502-8221306	SUBDRAIN OUTLET, DR-306 See Sheet CS.1, Tab.104-9 for details and locations.	
14	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL Refer to Tab. 110-7A for location and details and Tab. 110-13 for disposal of existing guardrail.	
15	2505-4008300	STEEL BEAM GUARDRAIL	
16	2505-4008410	STEEL BEAM GUARDRAIL BARRIER TRANSITION SECTION, BA-201	
17	2505-4021010	STEEL BEAM GUARDRAIL END ANCHOR, BOLTED	
18	2505-4021720	STEEL BEAM GUARDRAIL TANGENT END TERMINAL, BA-205 Refer to Tab. 108-8A for location and details. Includes 4 object markers which are incidental to the bid item.	
19	2507-3250005	ENGINEERING FABRIC See Tab 100-23 and Sheet D.3 For Locations and Details.	
20	2507-6799000	BANK SHAPING Along South Side of Lone Tree Creek within ROW Limits.	
21	2507-6800061	REVEEMENT, CLASS E See Tab 100-23 and Sheet D.3 For Locations and Details.	
22	2507-8029000	EROSION STONE See Tab 100-23 and Sheet D.3 For Locations and Details.	
23	2510-6745850	REMOVAL OF PAVEMENT Refer to Tab. 110-1 for location and details. Includes 24' of sawcut. See also Tab 102-5.	
24	2518-6910000	SAFETY CLOSURE Includes 2 road closures and 2 hazard closures. Refer to Tab. 108-13A for location and details.	
25	2526-8285000	CONSTRUCTION SURVEY	
26	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED. Refer to Tab 108-22.	
27	2528-8445110	TRAFFIC CONTROL	
28	2555-0000010	DELIVER AND STOCKPILE SALVAGED MATERIALS See Tab 110-13 for location and details.	
FILE NO. 31292			ENGLISH DESIGN TEAM BONDHUS \ZAFAR\QURAISHI

ESTIMATE REFERENCE INFORMATION			100-4A 10-29-02
Item No.	Item Code	Description	
29	2601-2634100	MULCHING Mulching per Article 2601.03, E, 2. Anchor mulch into the soil using mulch anchoring equipment with a minimum of two passes. Included for areas requiring reshaping and seedbed preparation. Mulch shall be Certified Noxious Weed Seed Free Mulch as certified by the Iowa Crop Improvement Association or adjacent states Crop Improvement Associations. Mulch Rate: 1 1/2 tons of dry cereal straw or native grass straw per acre.	
30	2601-2634105	MULCHING, BONDED FIBER MATRIX A Bonded Fiber Matrix shall be applied as directed by the Engineer. The seed and fertilizer for the area to be covered shall be applied prior to the Bonded Fiber Matrix Hydraulic Mulch application. Application rate shall be a minimum of 3000 lbs per acre.	
31	2601-2636043	SEEDING AND FERTILIZING (RURAL) 1. For areas 8 foot adjacent to the shoulder shall be fertilized per Article 2601.03, C, 3, and seeded per the following: 109 lbs/acre Alkali grass 109 lbs/acre Turf-type Tall Fescue (at least two cultivars) 66 lbs/acre Perennial ryegrass 66 lbs/acre Crested wheatgrass 44 lbs/acre Hard fine fescue 44 lbs/acre Sheep fine fescue The mix may contain a 10% increase of any of the combinations of grasses listed above. Turf-type Tall Fescue will contain a minimum 36 lbs. of each cultivar Inferno and Quest. All seed and fertilizer shall be applied with ground driven equipment. Full seedbed preparation will be required. No broadcast seeding will be allowed. Seeder will have a maximum horizontal row spacing of 3.0 inches. 2. For areas beyond 8' adjacent to the shoulder shall be prepared, fertilized, and seeded according to Article 2601.03, C, 3.	
32	2601-2642100	STABILIZING CROP - SEEDING AND FERTILIZING Included for disturbed areas as directed by the Engineer. All rural disturbed areas shall be seeded and fertilizer per Article 2601.03, C, 1.	
33	2602-0000020	SILT FENCE Refer to Tab. 100-17. The tabulation includes estimated locations for placement of "Silt Fence" to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 25% additional quantity for field adjustments and replacements.	
34	2602-0000030	SILT FENCE FOR DITCH CHECKS Refer to Tab 100-18. The tabulation includes estimated locations for placement of "Silt Fence for Ditch Checks" to address erosion to be encountered during construction. Verify the specific locations with the Engineer prior to beginning placement. Bid item includes 50% additional quantity for field adjustments and replacements.	
35	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS This item is included for silt fence and silt fence for ditch check removal required for staging reasons, removal to allow for replacement (replacement to be paid separately), or for areas that have achieved 70% permanent growth.	
36	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK This item is included for clean-out and repair of the silt fence and silt fence for ditch checks during the grading project.	
37	2602-0000212	FLOATING SILT CURTAIN (HANGING) See Tab 100-10 for location.	
38	2602-0000240	MAINTENANCE OF FLOATING SILT CURTAIN See Tab 100-10 for location.	
CASS COUNTY PROJECT NUMBER NHSN-071-3(59) -- 2R-15			SHEET NUMBER C.2

Item No.	Item Code	Description
39	2602-0000320	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 20 IN. DIA. Refer to Standard Road Plan EC-204. Item is included for temporary perimeter sediment control, inlet protection, and water velocity reduction on slopes or ditches at locations to be determined during construction. Verify specific locations with the Engineer prior to beginning placement. Perimeter and Slope Sediment Control Devices will be required to be constructed out of wood excelsior.
40	2602-0000350	REMOVAL OF PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE Included for removal of perimeter and sediment control devices. All material shall become the property of the contractor and removed from the project within 24 hours.
41	2602-0010010	MOBILIZATIONS, EROSION CONTROL
42	2602-0010020	MOBILIZATIONS, EMERGENCY EROSION CONTROL

Construct this project according to the requirements of U.S. Army Corps of Engineers Nationwide Permit 14, Permit No. 2018-0077. A copy of this permit is available from the Iowa DOT website (<http://www.envpermits.iowadot.gov/>). The U.S. Army Corps of Engineers reserves the right to visit the site without prior notice.

This is NOT a POINT 25 project and is not subject to the provisions of IAC 761-115.25.

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

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

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

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

Any living, dead, cut or fallen material of the ash (*Fraxinus* spp.) including trees, nursery stock, logs, firewood, stumps, roots, branches, and composted or uncomposted ash chips can be freely moved within the yellow areas of the most recent Federal EAB Quarantine & Authorized Transit.

<https://www.aphis.usda.gov/plant-health/plant-pest-info/emerald-ash-b/download/cab-quarantine-map.pdf>.

Obtain appropriate Compliance Agreements from USDA APHIS PPQ prior to moving any of the above listed ash articles to areas outside the yellow zone on the map.

For questions, concerns, and general assistance, contact:

USDA APHIS PPQ, Iowa office, 515-414-3295

Or

Iowa Department of Agriculture & Land Stewardship
515-725-1470

The following Standard Road Plans apply to construction work on this project.		
Number	Date	Title
BA-200	10-18-16	Steel Beam Guardrail Components
BA-201	04-18-17	Steel Beam Guardrail Barrier Transition Section (MASH TL-3)
BA-202	10-20-15	Steel Beam Guardrail Bolted End Anchor
BA-205	04-19-16	Steel Beam Guardrail Tangent End Terminal (MASH TL-3)
BA-250	10-18-16	Steel Beam Guardrail Installation at Concrete Barrier or Bridge End Section (MASH TL-3)
BR-203	10-17-17	Double Reinforced 12" Approach
BR-211	10-17-17	Bridge Approach (Abutting PCC or Composite Pavement)
DR-303	10-17-17	Subdrains (Longitudinal)
DR-305	04-21-15	Subrain Outlets (Standard Subdrain, Pressure Release and Special)
DR-306	10-17-17	Precast Concrete Headwall for Subdrain Outlets
EC-201	10-18-16	Silt Fence
EC-202	10-21-14	Floating Silt Curtain
EC-204	04-17-18	Perimeter and Slope Sediment Control Devices
EC-301	10-18-16	Rock Erosion Control (REC)
EW-101	10-17-17	Embankment And Rebuilding Embankments
EW-102	10-20-15	Allowable Placement of Unsuitable Soil in Embankments
EW-202	04-19-16	Bridge Berm Grading without Recoverable Slope (Non-Barnroof Section)
EW-301	10-20-15	Guardrail Grading
EW-401	10-20-15	Temporary Stream Crossing, Causeway, or Equipment Pad.
PM-110	04-16-13	Line Types
PV-101	10-17-17	Joints
SI-173	04-19-16	Object Markers
SI-211	10-18-16	Object Marker and Delineator Placement with Guardrail
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-202	04-21-15	Work Within 15 ft of Traveled Way
TC-252	04-19-16	Routes Closed to Traffic

Standard Road Plan EW-401 is listed in Tabulation 105-4; however, it is included for information purposes only since it is an option. No quantities associated with constructing EW-401 are included in any bid items.

Tabulation	Tabulation Title	Sheet No.
C Sheets		
100-1A	ESTIMATED PROJECT QUANTITIES (1 DIVISION PROJECT)	C.1
100-1D	PROJECT DESCRIPTION	C.1
100-4A	ESTIMATE REFERENCE INFORMATION	C.2 - C.3
100-10	FLOATING SILT CURTAINS	C.10
100-17	TABULATION OF SILT FENCES	C.10
100-18	SILT FENCES FOR DITCH CHECKS	C.10
100-23	ROCK EROSION CONTROL	C.10
100-28	LONGITUDINAL GROOVING	C.6
102-5	EXISTING PAVEMENT	C.7
105-4	STANDARD ROAD PLANS	C.3
107-23	GRADING FOR GUARDRAIL INSTALLATIONS	C.6
108-8A	STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION	C.6
108-13A	SAFETY CLOSURES	C.7
108-22	PAVEMENT MARKING LINE TYPES	C.9
110-1	REMOVAL OF PAVEMENT	C.7
110-7A	REMOVAL OF STEEL BEAM GUARDRAIL	C.7
110-12A	POLLUTION PREVENTION PLAN	C.4 - C.5
110-13	DELIVERY AND STOCKPILING	C.7
111-25	INDEX OF TABULATIONS	C.3
112-6	BRIDGE APPROACH SECTION	C.6
112-9	SHOULDERS	C.8

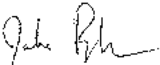
POLLUTION PREVENTION PLAN

110-12A
10-17-17

- B. Amended PPP - May include Plan Revisions or Contract Modifications for new items, storm water monitoring inspection reports, and fieldbook entries made by the inspector.
- C. IDR - Inspector's Daily Report - this contains the inspector's daily diary and bid item postings.
- D. Controls - Methods, practices, or measures to minimize or prevent erosion, control sedimentation, control storm water, or minimize contaminants from other types of waste or materials. Also called Best Management Practices (BMPs).
- E. Signature Authority - Representative from Designer, Contractor/Subcontractor, or RCE/Inspector authorized to sign various storm water documents.

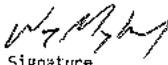
CERTIFICATION STATEMENT

With a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Signature

Jacob D. Bondhus



Signature

LES MAYBERRY

Printed or Typed Name

112-6

10-20-15

BRIDGE APPROACH SECTION

Refer to the BR Series.

* Not a bid item

Location			Approach Pavement						Standard Road Plans BR Series			Subdrain							Remarks
Bridge Station	End	Skew Ahead	T Thickness	Pay Length	Non-Reinf. Pavement Area	Single-Reinf. Pavement Area	Double-Reinf. Pavement Area	Approach	Fixed or Movable Abutment	Abutting Pavement	Perforated Subdrain 4"	Subdrain Outlet		Porous Backfill	Class 'A' Crushed Stone Backfill	Modified Subbase	Polymer Grid		
		Degrees																	
		LEFT	RIGHT	Inches	FT	SY	SY				SY	LF	STA	Side	CY	CY	TON	SY	
565+36.18	S	15	12.0	72.9	93.3	62.2	109.3	BR-203	Movable	BR-211	67.5	563+17.95	LT	1.9	0.2	293.516	305.6	Note 1	
TOTALS=					93.3	62.2	109.3												
Total Approach Pavement=				264.8															
Note 1 : Includes Modified Subbase Beyond Bridge Approach Limits.																			

100-28
10-19-10

LONGITUDINAL GROOVING

Location	Total	Remarks
	SY	
565+36.18	229.0	South Approach
565+36.18	494.4	Bridge
TOTALS=	723.4	

107-23
10-18-11

GRADING FOR GUARDRAIL INSTALLATIONS

Refer to EW-301

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

Location				Foreslope at Guardrail	Dimensions (Feet)									Earthwork		Remarks
No.	① Direction of Traffic	Station	Side		X1	Y1	X2	Y2	X3	Y3	X4	Y4	Z	Excavation Class 10	Embankment In Place	
														CY	CY	
1	SB	563+70.92	LT	4	40.0	5.0					90.6	7.0	47.0		Earthwork included with T sheets	
2	NB	563+58.97	RT	4	52.5	5.0	65.0	6.3			115.6	8.0	50.0		Earthwork included with T sheets	
3	SB	567+03.87	LT	4	75.5	5.0					126.1	7.0	47.0		Earthwork included with T sheets	
4	NB	566+92.34	RT	4	38.0	5.0					88.6	7.0	47.0		Earthwork included with T sheets	

108-8A
04-19-16

STEEL BEAM GUARDRAIL AT CONCRETE BARRIER OR BRIDGE RAIL END SECTION

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

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

Location				Layout Lengths BA-250 or LS-630				Long-Span System		Delineators and Object Markers				Bid Items							Remarks						
No.	Direction of Traffic	① Side O = Outside M = Median	Station	Offset	VT1	VF	VT2			ET	SI-211	Delineator		Object Marker		Bolted End Anchor	Barrier Transition Section	Steel Beam Guardrail	End Terminal			Post Adapter					
												SI-172	SI-173	Type 1	Type 2				Type 3	Standard			Count	BA-210			
																									SI-172	SI-173	BA-202
								White	OM2-2																OM3-L	OM3-R	BA-202
FT	LF	LF	LF	LF	STATION	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE						
1	SB	O	563+70.92		40.625			47.7			3			1	0	A	1		1	0.0	BA-205	1					
2	NB	O	563+58.97		53.125	12.50		47.7			3			0	1	A	1		1	25.0	BA-205	1					
3	SB	O	567+03.87		78.125			47.7			3			0	1	B	1		1	37.5	BA-205	1					
4	NB	O	566+92.34		40.625			47.7			3			1	0	B	1		1	0.0	BA-205	1					
TOTALS=														2	2		4		4	62.5		4					

EXISTING PAVEMENT

REMOVAL OF PAVEMENT

REMOVAL OF STEEL BEAM GUARDRAIL

DELIVERY AND STOCKPILING

SAFETY CLOSURES

FILE NO.	31292	ENGLISH	DESIGN TEAM	BONDHUS \ZAFAR\QURAIISHI
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CASS COUNTY PROJECT NUMBER **NHSN-071-3(59)--2R-15**

SHEET NUMBER **C.7**

SHOULDERS

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

Calculations assume a HMA unit weight (lbs/cf) of 145, a Special Backfill unit weight (lbs/cf) of 140, and a Granular Shoulder unit weight (lbs/cf) of 140.

Location				Quantities																		Remarks		
Road Identification	① Direction Of Traffic	Station to Station		Side	Ⓟ	ⓖ	Ⓛ	Class 13 Excavation	Hot Mix Asphalt		Binder	Paved Shoulder	Reinforced Paved Shoulder	Special Backfill				Modified Subbase	Granular Shoulder		Earth Shoulder Construction Alternates			
					Width	Width	Length							HMA Alternate		PCC Alternate					STA ②		HMA CY ④	PCC CY ④
					FT	FT	FT							CY	TON	TON/STA	TONS				SY ②		SY ②	TON ②
US 71	SB	562+62.59	562+92.65		11.0		30.1		18.0	59.8	1.1	36.7		25.9	86.1						0.3	13.9		Note 1, 3
		562+92.65	563+30.05		11 to 9.5		37.4		20.9	55.8	1.3	42.6		29.6	79.1						0.4	17.2		Note 1, 3
		563+30.05	563+57.95		9.5		27.9		14.4	51.7	0.9	29.4		20.3	72.8						0.3	12.9		Note 1, 3
US 71	NB	562+25.65	562+55.75		12.3		30.1		20.1	66.9	1.2	41.1		29.3	97.3						0.3	13.9		Note 1, 3
		562+55.75	562+93.72		12.3 to 10.8		38.0		23.8	62.8	1.4	48.7		34.3	90.3						0.4	17.5		Note 1, 3
		562+93.72	563+06.23		10.8 to 9.5		12.5		6.9	55.2	0.4	14.1		9.8	78.4						0.1	5.8		Note 1, 3
		563+06.23	563+57.95		9.5		51.7		26.7	51.7	1.6	54.6		37.7	72.8						0.5	23.8		Note 1, 3
US 71	SB	562+52.59	562+62.59	LT		4.1 to 6.8	10.0											2.5	19.4	0.1				Note 2
	NB	562+19.47	562+25.65	RT		7.4 to 20.4	6.2											4.2	19.4	0.1				Note 2
US 71	SB	567+53.88	567+82.24	LT	9.5		28.4		15.3	53.9	0.9	29.9		20.8	73.5						0.3	13.1		Note 1
		567+82.24	568+19.65	LT	9.5 to 11		37.4		21.2	56.8	1.3	42.6		27.5	73.5						0.4	17.3		Note 1
		568+19.65	568+49.71	LT	11.0		30.1		17.9	59.7	1.1	36.7		26.1	86.8						0.3	13.9		Note 1
US 71	NB	567+53.88	567+70.61	RT	9.7 to 10.4		16.7		9.4	56.4	0.6	18.7		12.9	77.0						0.2	7.7		Note 1
		567+70.61	568+00.67	RT	10.4		30.1		17.5	58.3	1.1	34.7		24.4	81.2						0.3	13.9		Note 1
Totals=								212.3		12.7	430.1		298.5					6.7		3.9	170.7			
Notes																								
1) See Typical 7156 for details.																								
2) Quantities assume a 8" thick granular shoulder.																								
3) Modified Subbase Included in Bridge Approach																								

100-10
12-05-17

FLOATING SILT CURTAINS					
Refer to EC-202					
Station	Hanging	Containment	Clean-out (Containment)	Maintenance of Floating Silt Curtain	Remarks
	LF	LF	LF	LF	
566+00.00	500.0			250.0	

100-23
04-21-15

ROCK EROSION CONTROL														
Refer to EC-301														
Location				Rock Erosion Control (REC)						Material Bid Quantities			Remarks	
Road Identification	Begin Station	End Station	Side	L	W	Type 1	Type 2	Type 3	Type 4	Type 5	Erosion Stone	Class E Revetment		Eng. Fabric
						Rock Ditch Check	Rock Ditch	Rock Flume	Rock Splash Basin	Rock Slope Protection	TON	TON		SY
						LT/RT	FT	FT						
U.S. 71	563+78.35	565+44.19	Lt/RT	151.6	53.33					X	363.7		925.3	120 pcf, 9" depth
U.S. 71	565+04.25	566+31.43	Lt/RT	278.2	52.5					X		1533.6	1679.5	105 pcf, 2' depth
										TOTAL	363.7	1533.6	2604.8	

100-17
12-05-17

TABULATION OF SILT FENCES				
Refer to EC-201				
Location			Length	Remarks
Begin Station	End Station	Side	LF	
562+25.00	566+10.00	LT	385.0	
562+25.00	564+85.00	RT	260.0	
567+00.00	568+60.00	LT	160.0	
566+00.00	568+10.00	RT	120.0	
	Total=		925.0	
	Extra 25%=		231.3	
	Total=		1156.3	

100-18
Modified

SILT FENCES FOR DITCH CHECKS										
Possible Standard: EC-201 Possible Detail: 570-4										
Functional Height FS:1 Ditch Width BS:1 Functional Height Slope Length Upstream device or ground Storage Volume Average Percent Slope										
* The functional height used in the volume equation is 85% of effective height. Effective height is 1.58 feet as shown on EC-201. * Volume equation: $[0.5 \times \text{Spacing} \times (0.5 \times H^2 \times FS + DW \times H + 0.5 \times H^2 \times BS)]$										
Basin No.	Type	Station	Side	Installation	Maintenance	Removal	Foreslope	Backslope	Ditch Width	Down Stream
				LF	LF	LF	FS:1	BS:1		
1	5	565+00.00	LT	45.0	4.5	45.0	10.0	4.0		
1	5	565+25.00	LT	45.0	4.5	45.0	10.0	4.0		
2	5	565+50.00	RT	60.0	6.0	60.0	4.0			
2	5	564+75.00	RT	60.0	6.0	60.0	4.0			
			Extra	105.0	11.0	105.0				
			TOTAL	315.0	32.0	315.0				

LONGITUDINAL SUBDRAIN SHOULDER AND BACKSLOPE

Refer to Soils Sheets

* Not a bid item. Bridge berm quantities assume a trench depth of 24 inches.

* Not a bid item. Bridge berm quantities assume a trench depth of 24 inches.																		
Location					Longitudinal Subdrain (DR-303)								Subdrain Outlet		Porous* Backfill	Class "A** Crushed Stone	Remarks	
Line No.	Road or Lane Identification	Station to Station	Side	Depth	Shoulder		Backslope		Bridge Berm (EW-203 or EW-204)			DR-303, DR-305 or DR-306						
				D	Size	Length	Size	Length	Standard Road Plan and Type	Size	Length	Station	Standard Road Plan and Type					
				IN	IN	FT	IN	FT		IN	FT							
1	US 71		LT	48.0	4.0	65.0							562+95.00	DR-306	3.2		Install new outlet into existing subdrain	

SHRINKAGE DATA

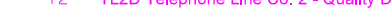
Material	%	Remarks
Topsoil	40%	
Class 10	30%	
Boulders		10 CY

GEOTECHNICAL DESIGN

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.	
	Signature	Date
	Mark A. Dell	12/11/17
	My license renewal date is December 31, 2027	

Pages or sheets covered by this seal: CS.1, SFS.1-10

SURVEY SYMBOLS

-  PPA Power Pole Co. 1
-  ENT Centerline BL of Entrance
-  EW Edge of Water
-  D Centerline Draw or Stream (Down)
-  BNK Stream Bank
-  GDL Guard Rail Steel
-  SNP Unpaved Shoulder
-  ENU Edge Unpaved Entrance & Parking
-  DU Centerline Draw or Stream (Up)
-  TLNL Tree Line Left
-  TLNR Tree Line Right
-  F0 - FO1D Fiber Optic Co. 1 - Quality D
-  T - TL1D Telephone Line Co. 1 - Quality D
-  W - WL1D Water Line Co. 1 - Quality D
-  T2 - TL2D Telephone Line Co. 2 - Quality D
-  F02 - FO2D Fiber Optic Co. 2 - Quality D
-  F03 - FO3D Fiber Optic Co. 3 - Quality D
-  TR Telephone Riser Pole
-  TDC Tree Deciduous
-  EG Edge of Gravel Road
-  FW Wire Fence
-  TEV Evergeen Tree
-  MH Utility Access (Manhole)
-  RET Retaining Walls
-  BL Topo Breakline
-  PR Electric Riser Pole
-  DIK Centerline of Dike or Dam
-  OUT Tile Outlet
-  TIL Tile Line
-  SI Sign
-  MM Mile Marker Post
-  WV Water Valve
-  WHD Water Hydrant
-  LP L.P. Tank
-  TPD Telephone Pedestal

UTILITY LEGEND

-  F0 - Century Link
Ed Krieger
ENGINEER II, Network Services
7404 N 78TH ST ,BLDG A
OMAHA,NE. 68122
OFFICE: 402-572-5856
MOBILE:402-708-3269
Edward.Kriegere@CenturyLink.com
-  Junior Hanson
AMU
75 w 3rd St
Atlantic, IA 50022
712-243-1395
jhanson@amul.net

PLAN VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design	Color No.	
Green	(2)		Existing Topographic Features and Labels
Blue	(1)		Proposed Alignment, Stationing, Tic Marks, and Alignment Annotation
Magenta	(5)		Existing Utilities
SHADING	Design	Color No.	
Yellow	(4)		Highlight for Critical Notes or Features
Red	(3)		Delineates Restricted Areas
Lavender	(9)		Temporary Pavement Shading
Gray, Light	(48)		Proposed Pavement Shading
Gray, Med	(80)		Proposed Granular Shading
Gray, Dark	(112)		Proposed Grade and Pave Shading "In conjunction with a paving project"
Brown, Light	(236)		Grading Shading
Tan	(8)		Proposed Sidewalk Shading
Blue, Light	(230)		Proposed Sidewalk Landing Shading
Pink	(11)		Proposed Sidewalk Ramp Shading

PROFILE VIEW COLOR LEGEND OF PLAN AND PROFILE SHEETS

LINEWORK	Design	Color No.	
Green	(2)		Existing Ground Line Profile
Blue	(1)		Proposed Profile and Annotation
Magenta	(5)		Existing Utilities
Blue, Light	(230)		Proposed Ditch Grades, Left
Black	(0)		Proposed Ditch Grades, Median
Rust	(14)		Proposed Ditch Grades, Right

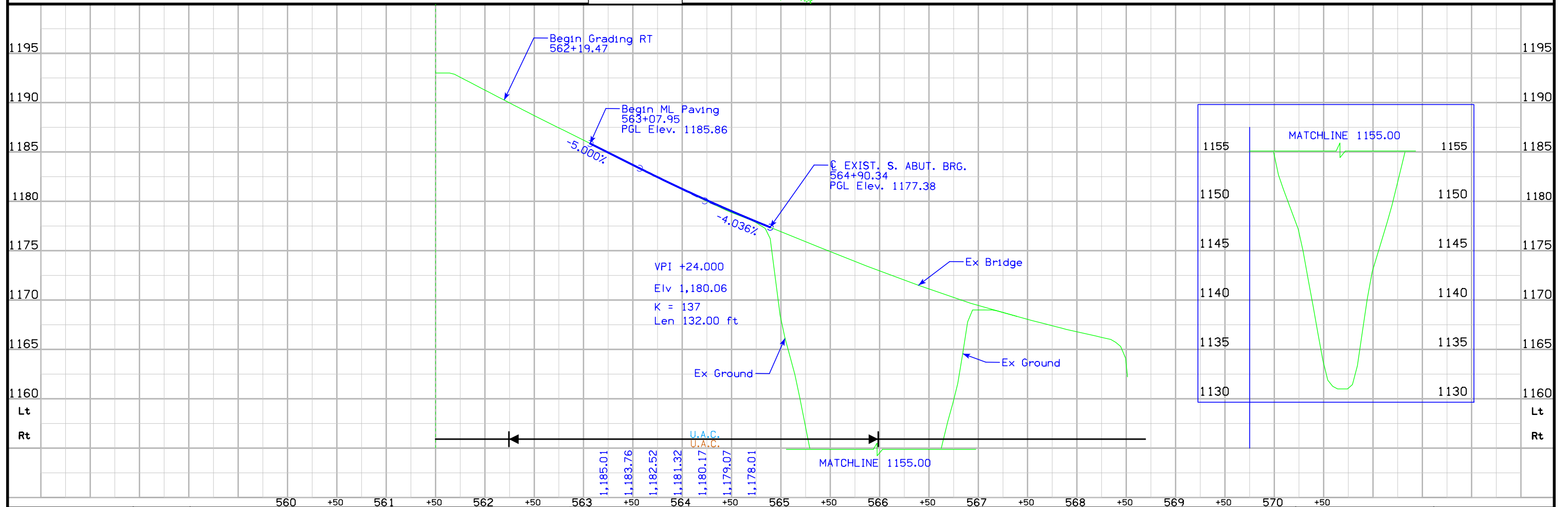
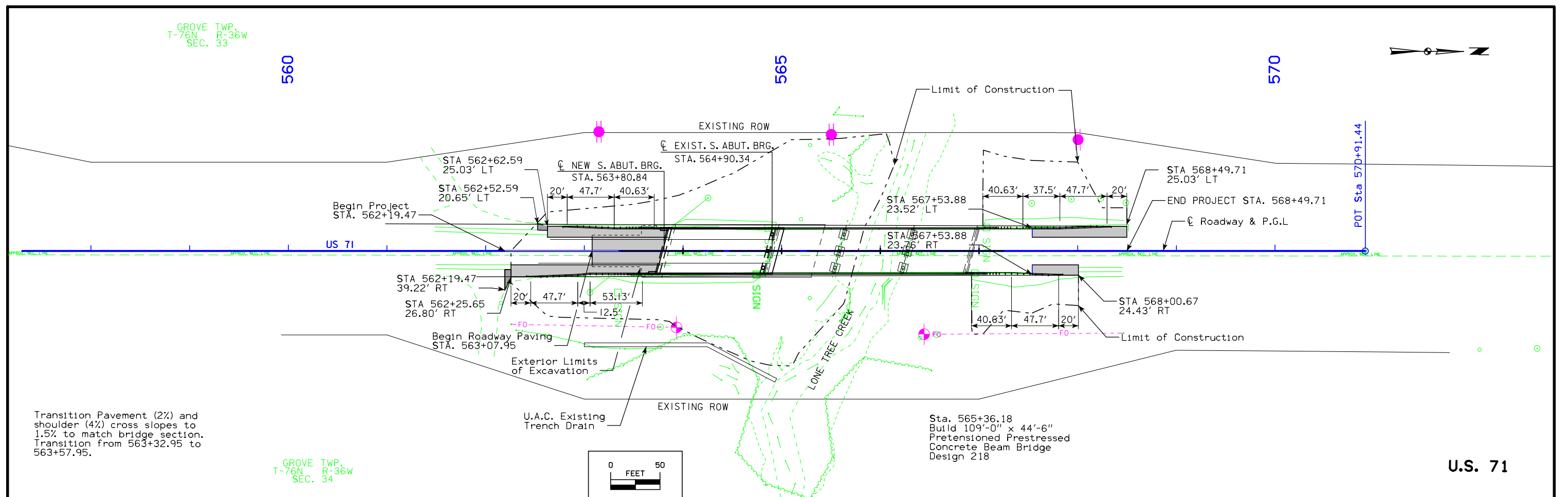
-  Reference Point
-  Station
-  Survey Line
-  Section Corner
-  Ground Line Intercept
-  Saw Cut
-  Guardrail
-  Trench Drain
-  HighTension Cable Guardrail
-  Sheet Pile
-  Pavement Removal
-  Clearing & Grubbing Area

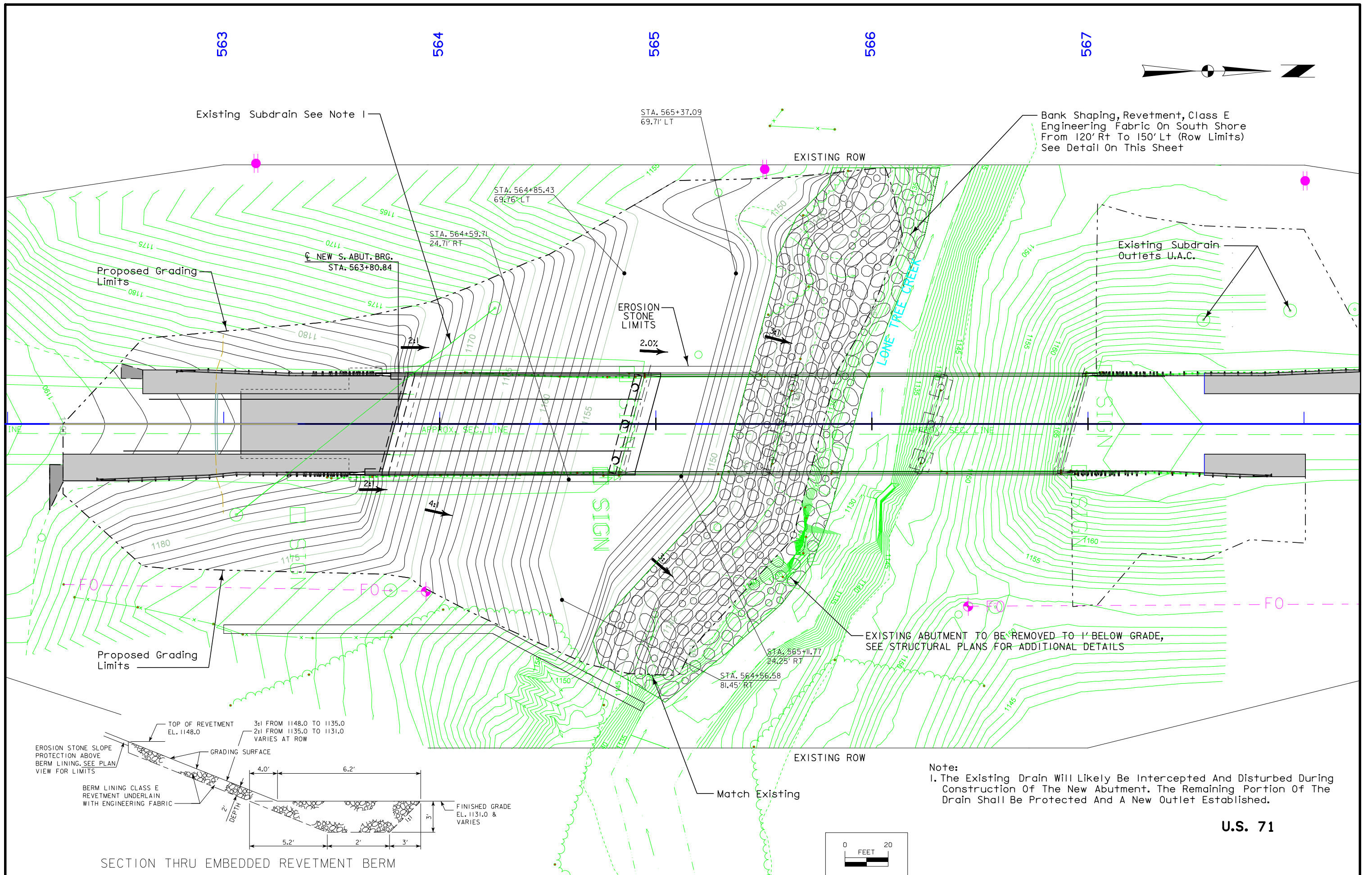
RIGHT-OF-WAY LEGEND

-  Proposed Right-of-Way
-  Existing Right of Way
-  Existing and Proposed Right-of-Way
-  Easement and Existing Right-of-Way
-  Easement (Temporary)
-  Easement
-  Access Control
-  Property Line

PLAN AND PROFILE
LEGEND AND SYMBOL
INFORMATION SHEET

(COVERS SHEET SERIES D, E, F, & K)





Survey Information

County: Cass
PIN: 17-15-071-010
Project Number: NHSN-071-3(57)--2R-15
Location: Lone Tree Creek 0.1 mi S of Co Rd G35
Type of Work: Slide Repair
Project Directory: 1507101017
SAP 902

General Information

Measurement units for this survey are US survey feet. This survey is for slide repair design. There is no aerial photo survey added.

Vertical Control
Vertical datum for this survey is NAVD88 (Computed using Geoid12A) established at the project base point relative to nearby IaRTN stations.

Survey BM 500 Elev.= 1178.17 is the same as Plan F-71-3(8)--20-15 Elev. 1178.15

Horizontal Control
The project coordinate system is IaRCS Zone 7 (U.S. Survey Feet)

Alignment Information

The horizontal alignment for this survey is a retrace of As-built Plans No. F-71-3(8)--20-15. Survey stationing was equated to the plan PI at 570+91.44 and run back without equation throughout the survey.

Survey stationing relates to as built plan stationing as follows:

Survey POT Sta. 536+20.52 is As-built Plans POT Sta. Project No. F-71-3(8)--20-15
Survey POT Sta. 536+19.11

SURVEYED UTILITY OWNER SYMBOLS

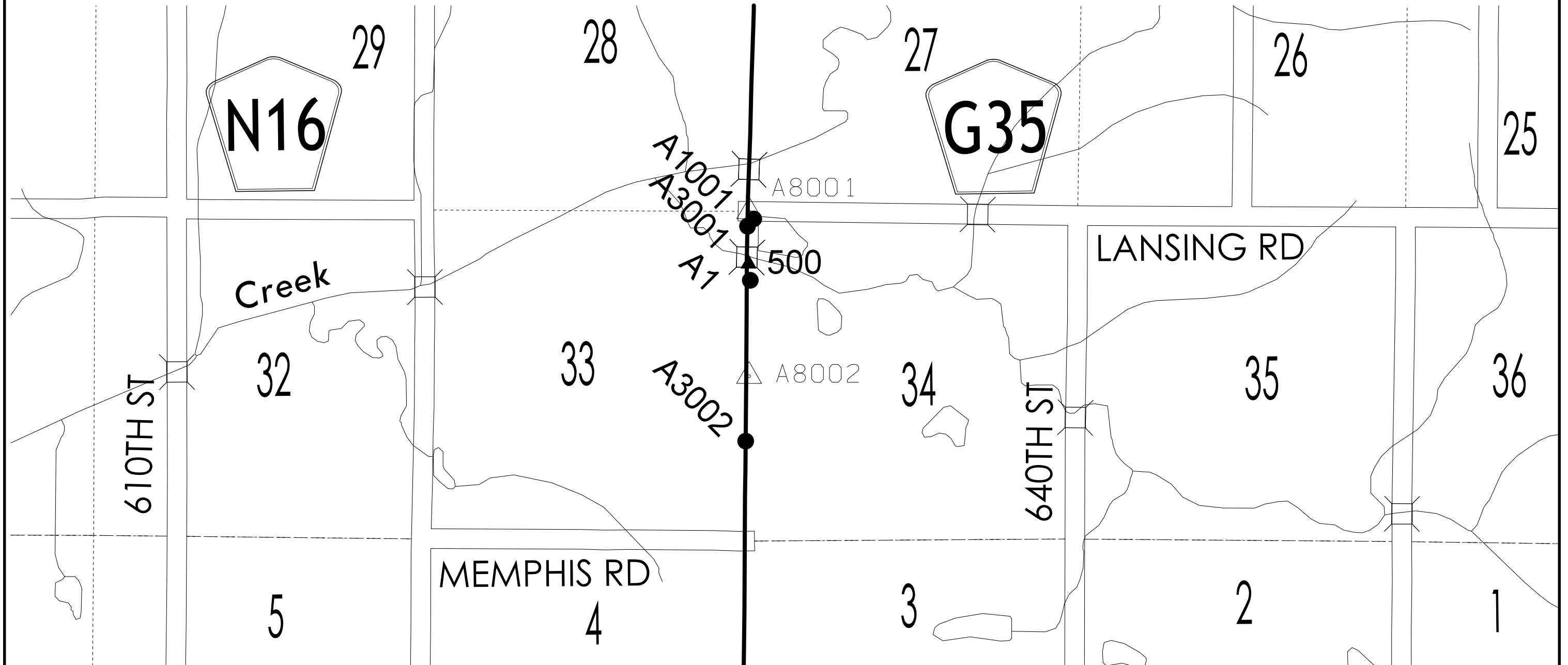
Sub-Surface Utility Mapping Quality Level is in accordance with CI/ASCE 38-02 Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data.

Remark Abbreviations
QLA Quality Level A Highest guideline quality level
QLD Quality Level D Lowest guideline quality level

- FO - FO1D Fiber Optic CENTURY LINK - Quality D
- PPA Power Pole AMU

CONTROL POINT VICINITY MAP

This map is a guide to the vicinity of the primary project control points
Primary control is for use with RTK base stations and for RTN validation.
Future surveys will use primary project control to establish temporary
control as needed for construction or other surveying applications.



HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

VERT. DATUM: NAVD88

1a. Regional Coordinate System Zone 7

Coordinate listing from next sheet will be used with 1aRTN for monument
recovery. No other reference ties are given.

HORIZONTAL AND VERTICAL PROJECT CONTROL COORDINATE LISTING

HORIZ. DATUM: NAD83(2011) EPOCH 2013.00

VERT. DATUM: NAVD88

Ia. Regional Coordinate System Zone 7

Point Name	Northing	Easting	Elevation	Feature Definition
A1	7198371.32	17403605.50	1188.63	CP
500	7198638.55	17183577.76	1178.17	BM
A8001	7199481.25	17403589.66	1161.00	SCR
A3001	7199247.34	17403560.27	1162.30	CP
A3002	7195776.54	17403530.93	1269.17	CP
A8002	7196825.54	17403586.31	1254.14	SCR

ALIGNMENT COORDINATES

[illegible]

108-23A
08-01-08

TRAFFIC CONTROL PLAN

US 71 will be closed to traffic. An off-site detour route will be provided by the Iowa DOT. The District will place the detour signs.

108-26A
08-01-08

STAGING NOTES

Stage 1
Close US 71
Remove existing roadway, shoulder, guardrail and bridge approach.
Construct new abutment and bridge span.
Complete proposed approach pavement, guardrail, grading contours and erosion control.

Stage 2
Return traffic to US 71.

511 TRAVEL RESTRICTIONS												108-25 10-21-14
Route	Direction	County	Location Description	Feature Crossed	Object Type	Maint. Bridge No., Structure ID, or FHWA No.	Type of Restriction	Existing Measurement	Construction Measurement	Construction Measurement as Signed	Projected As Built Measurement	Remarks
			None Expected									

RURAL



- CUT SIDE Total Cut Adjusted



- RURAL



- FILL SIDE Total Fill Adjusted



- | | | |
|----------|---------|---|
| FILE NO. | ENGLISH | DESIGN TEAM Bondhus \ Zafar \ Quraishi |
|----------|---------|---|

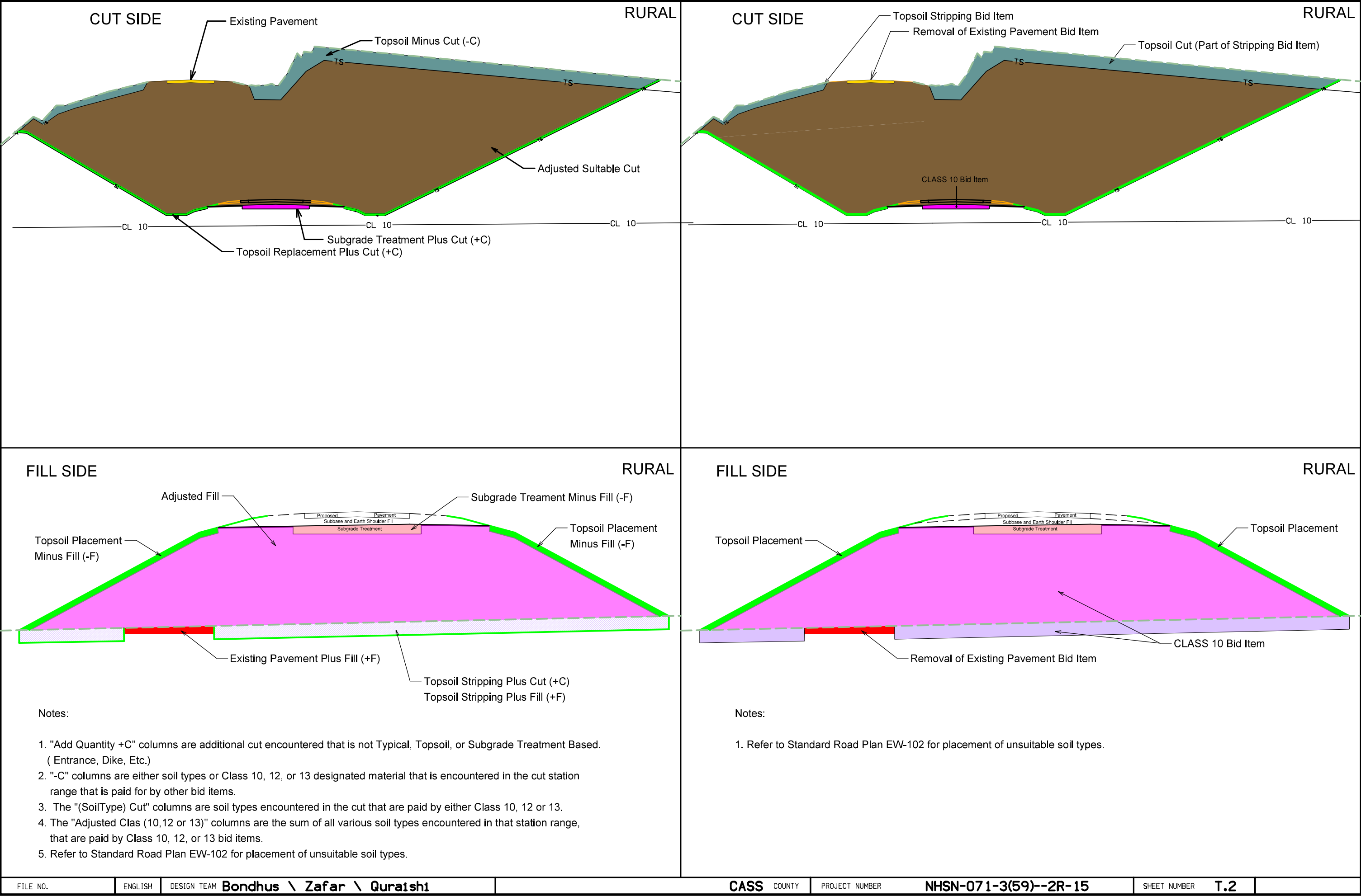
CASS

COUNTY

PROJECT NUMBER

NHSN-071-3(59)--2R-15

SHEET NUMBER	T.1
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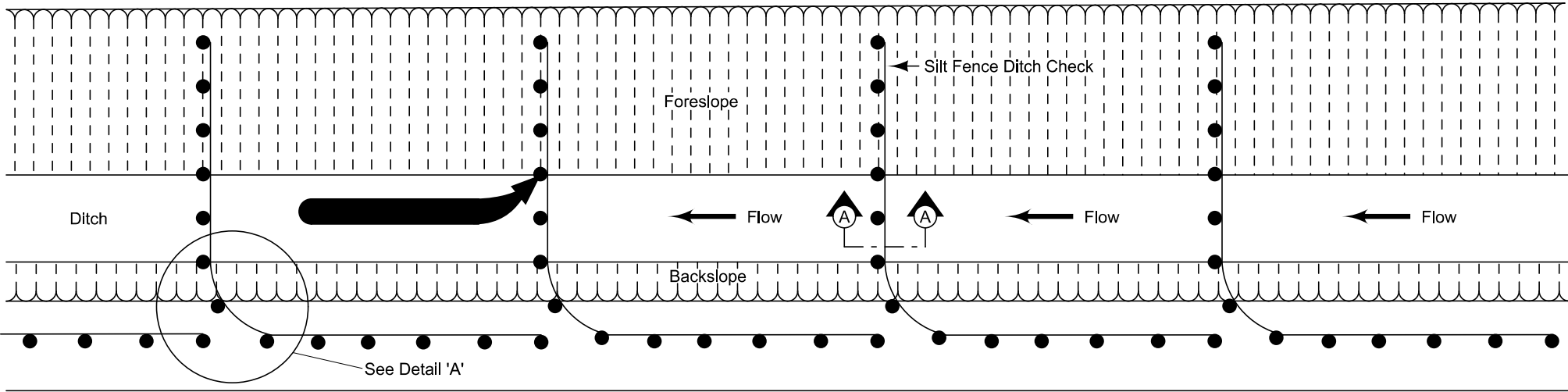


Refer to Standard Road Plans EW-101 and EW-102.

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

107-28
11-08-17

Station	Cut					Fill						Checks (EW-102)		Topsoil								
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]	[21]	[22]
	[2]+[3]				[1]-[3]				[6]+[7]+[8]	[9]*1.3	[5]-[10]					[15]*1.4	[12]-[16]					
	Total Cut Unadjusted Volume	Total Class 10 Unadjusted Volume	Topsoil Cut Volume	Template Pavement Removal Volume	Total Cut Adjusted	Total Fill Unadjusted Volume	Existing Topsoil Stripping Undercut (+ Fill)	Existing Pavement Undercut (+Fill)	Total Fill Adjusted	Total Fill Adjusted w/ Weighted Average 1.3 Shrink Factor	Total Cut Adjusted Minus Fill w/ Shrink	Approx. Fill Vol. Below 5' & Above 20' w/ Shrink	Approx. Fill Volume Below 3' w/ Shrink	Topsoil Stripping Undercut Volume	Topsoil Placement Undercut Volume	Topsoil Placement With 1.4 Shrink Factor	Topsoil Stripping Minus Topsoil Placement w/Shrink					
ML US71																						
562+00.00	11	11	0	1	11	0	0	0	0	0	11	0	0	0	0	0	0					
562+25.65	25	25	0	2	25	0	0	0	0	0	25	0	0	0	0	0	0					
562+50.00	9	6	3	1	6	0	1	0	1	2	4	0	0	0	0	1	2					
562+55.78	20	11	9	1	11	0	4	0	4	5	6	0	0	9	4	5	3					
562+62.58	45	27	18	2	27	0	10	0	10	13	13	0	0	18	9	12	6					
562+75.00	43	24	19	2	24	0	11	0	11	14	9	0	0	19	9	12	8					
562+86.98	20	11	9	1	11	0	5	0	5	6	5	0	0	9	4	5	3					
562+92.65	3	2	1	0	2	0	1	0	1	1	1	0	0	9	1	1	8					
563+93.72	21	13	8	1	13	0	4	0	4	5	8	0	0	6	4	6	1					
563+00.00	19	13	6	1	13	0	3	0	3	4	9	0	0	2	3	4	-3					
563+08.25	6	4	2		4	0	1	0	1	3	3	0	0	17	1	1	16					
563+07.95	61	44	17	16	44	0	10	0	10	13	31	0	0	6	9	13	-7					
563+25.00	19	13	6	9	13	0	4	0	4	5	8	0	0	34	3	4	30					
563+30.35	92	58	34	36	58	0	22	0	22	29	29	0	0	55	16	22	33					
563+50.00	141	86	55	44	86	0	36	0	36	47	39	0	0	14	25	35	-22					
563+75.00	43	29	14	11	29	0	5	0	5	7	23	0	0	66	8	11	54					
563+80.84	452	386	66	40	386	0	10	0	10	13	373	0	0	123	54	76	47					
564+00.00	1,324	1,202	123	58	1,202	0	9	0	9	12	1,190	0	0	147	94	132	15					
564+25.00	2,024	1,877	147	59	1,877	0	7	0	7	9	1,868	0	0	163	101	141	21					
564+50.00	2,499	2,337	163	59	2,337	0	7	0	7	9	2,328	0	0	188	110	154	34					
565+00.00	2,282	2,094	188	29	2,094	0	0	0	0	0	2,094	0	0	195	105	147	48					
565+00.00	1,484	1,289	195	0	1,289	0	0	0	0	0	1,289	0	0	171	92	129	42					
565+25.00	893	722	171	0	722	0	0	0	0	0	722	0	0	120	79	111	10					
565+50.00																						
565+75.00	543	423	120	0	423	0	0	0	0	0	423	0	0	120	49	69	52					
566+92.94																						
567+04.48	48	8	40	0	8	0	73	0	73	95	-87	0	0	14	25	35	-22					
567+04.48	109	25	84	0	25	0	129	0	129	168	-143	0	0	66	53	74	-9					
567+25.00	40	13	27	0	13	0	25	0	25	33	-20	0	0	123	18	25	97					
567+32.96	87	28	59	0	28	0	39	0	39	51	-23	0	0	147	38	53	93					
567+50.00	22	9	13	1	9	0	7	0	7	9	0	0	0	163	8	11	151					
567+53.88	128	61	67	7	61	0	37	0	37	48	13	0	0	188	42	59	129					
567+75.00	40	18	22	2	18	0	12	0	12	16	2	0	0	195	13	18	177					
567+82.00	107	47	60	5	47	0	27	0	27	35	12	0	0	171	36	50	121					
568+00.67	111	48	63	5	48	0	27	0	27	35	13	0	0	120	39	55	66					
568+25.00																						
568+49.71	65	33	32	3	33	0	13	0	13	17	16	0	0	120	19	27	94					
US71																						
Totals:	12,834	10,996	1,838	396	10,996	0	539	0	539	701	10,295	0	0	2,799	1,071	1,500	1,300					



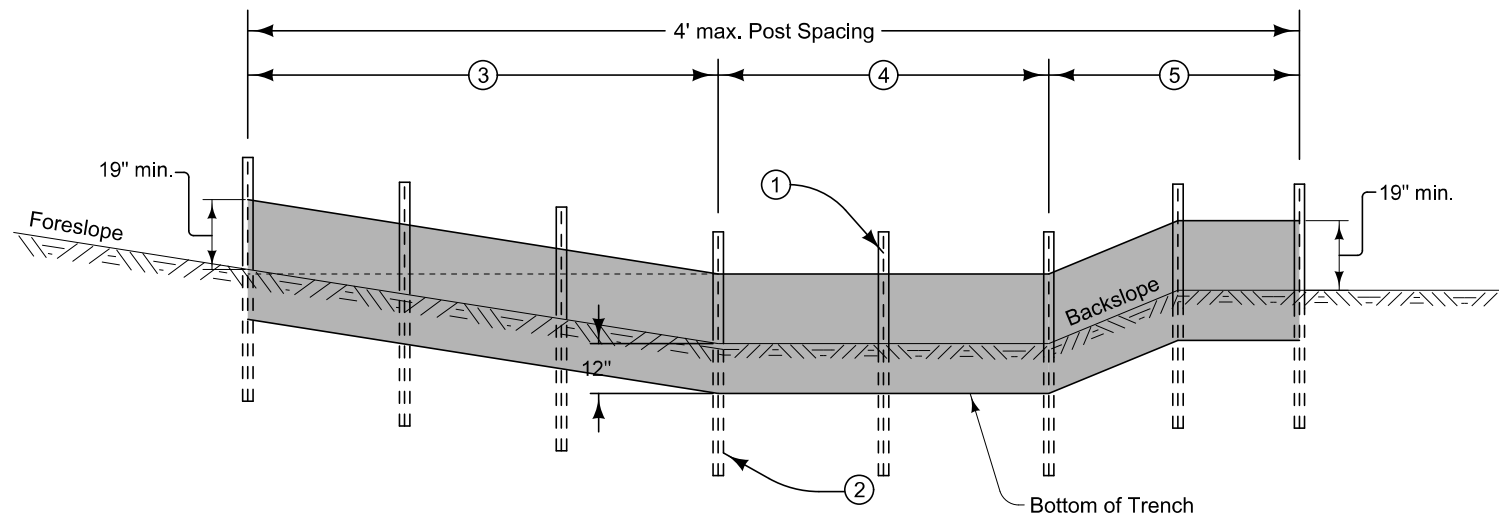
PLAN FOR SILT DITCH (SHALLOW DITCH SECTION-TYPE 4) ⑥

Install all silt fence using a silt fence machine. Use manual (trench) installation if physical conditions prohibit machine installation.

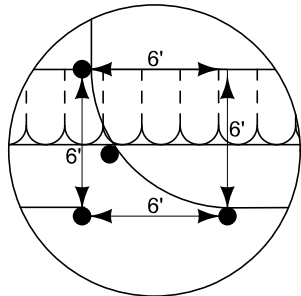
For machine installation, compact by driving over each side of silt fence at least two times with device exerting 60 p.s.i. or greater.

For manual installation, compact with a mechanical or pneumatic tamper.

- ① Secure top of engineering fabric to steel posts using cable ties (50 lb.) or wire. See attachment to post.
- ② Embed all posts 28 inches below the ground line.
- ③ The minimum end span (in feet) = 2 X Foreslope (H:V).
- ④ Locate posts at toe of foreslope and toe of backslope and space remaining posts equally.
- ⑤ Place posts as shown in Detail 'A' to transition from tranverse to parallel installation. Place one post at the backslope intercept and the other beyond the intercept.
- ⑥ Refer to Tab. 100-18.



FRONT VIEW

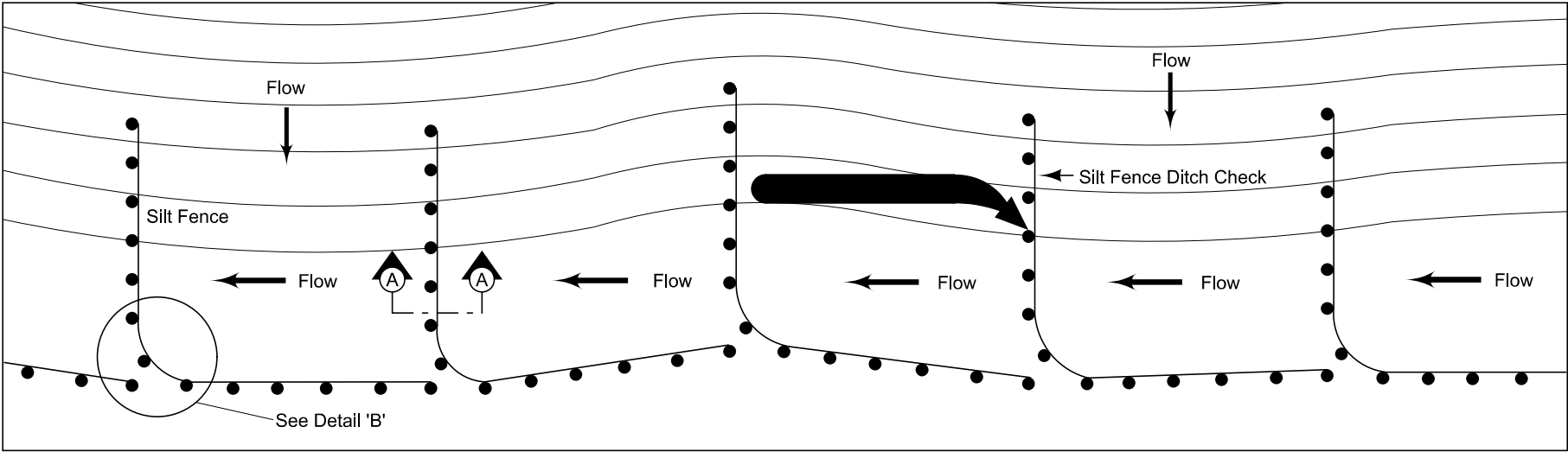


Detail 'A'

Possible Contract Items:
Silt Fence for Ditch Checks

Possible Tabulations:
100-18

REVISION	
NEW	10-18-16
570-4	
SHEET 1 of 3	
ROAD DESIGN DETAIL	
REVISIONS: NEW	
SILT FENCE INSTALLATION FOR SHALLOW OR NO DITCH	

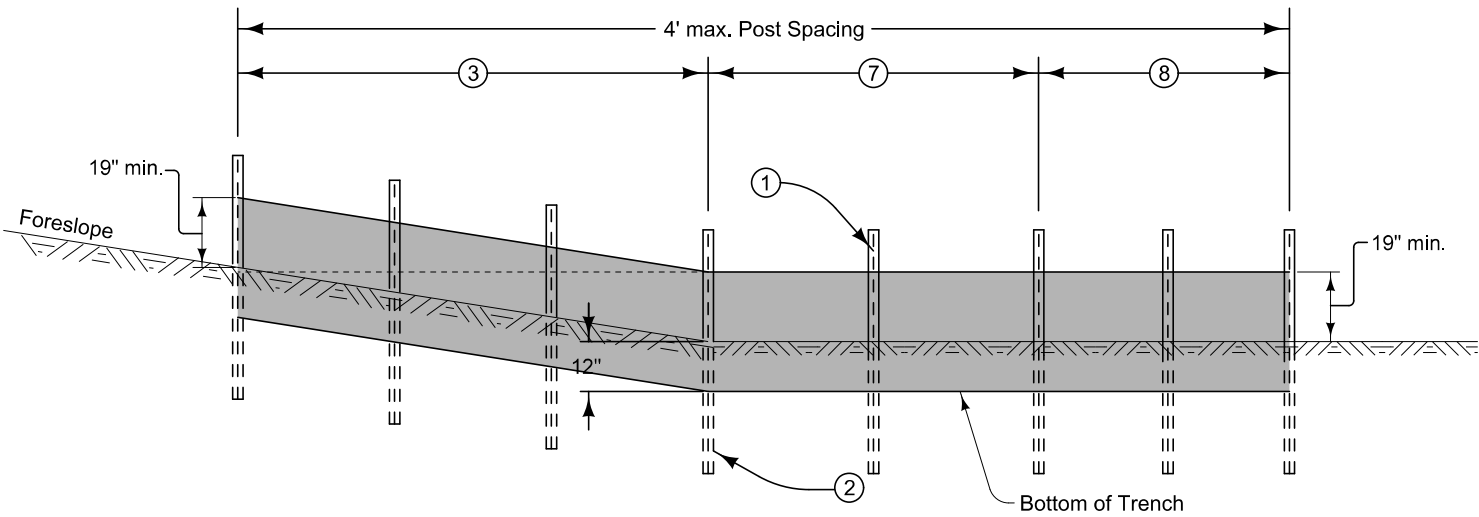


PLAN FOR SILT FENCE (NO DITCH SECTION-TYPE 5) ⑥

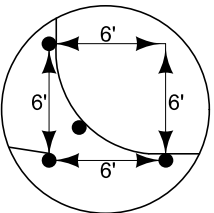
- ① Secure top of engineering fabric to steel posts using cable ties (50 lb.) or wire. See attachment to post.
- ② Embed all posts 28 inches below the ground line.
- ③ The minimum end span (in feet) = 2 X Foreslope (H:V).
- ⑥ Refer to tabulation 100-18.
- ⑦ Locate post at toe of foreslope. Locate 2 additional posts at 4 foot spacing.
- ⑧ Place posts as shown in Detail 'B' to transition from transverse to parallel installation. The parallel portion of the installation should approximately parallel the intercept of the foreslope.



Contour Lines

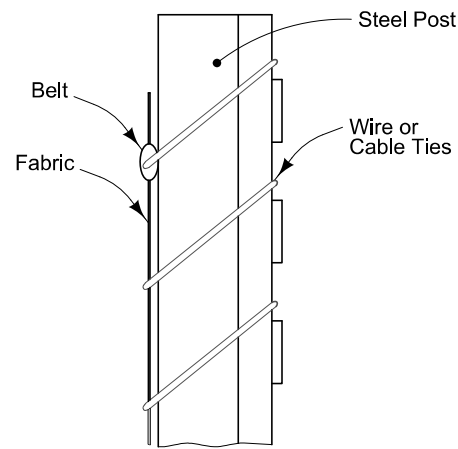


FRONT VIEW

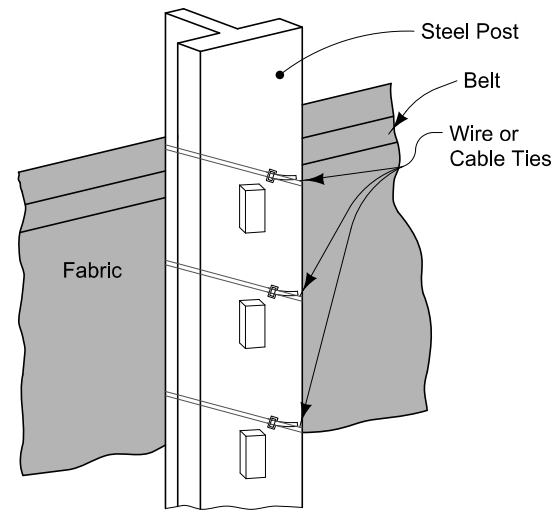


Detail 'B'

REVISION	
NEW	10-18-16
570-4	
SHEET 2 of 3	
ROAD DESIGN DETAIL	
REVISIONS: NEW	
SILT FENCE INSTALLATION FOR SHALLOW OR NO DITCH	



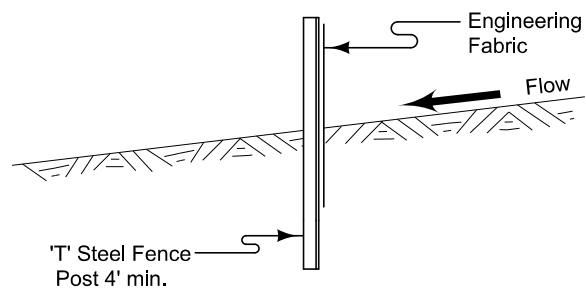
**PROFILE VIEW
ATTACHMENT TO POST**



**BACK VIEW
ATTACHMENT TO POST**

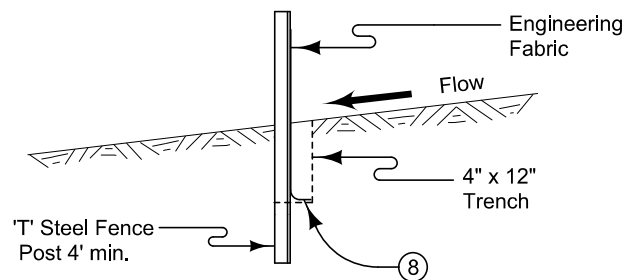
⑧ For manual installation only, fold engineering fabric along bottom of trench.

DITCH CHECK - MACHINE INSTALLATION



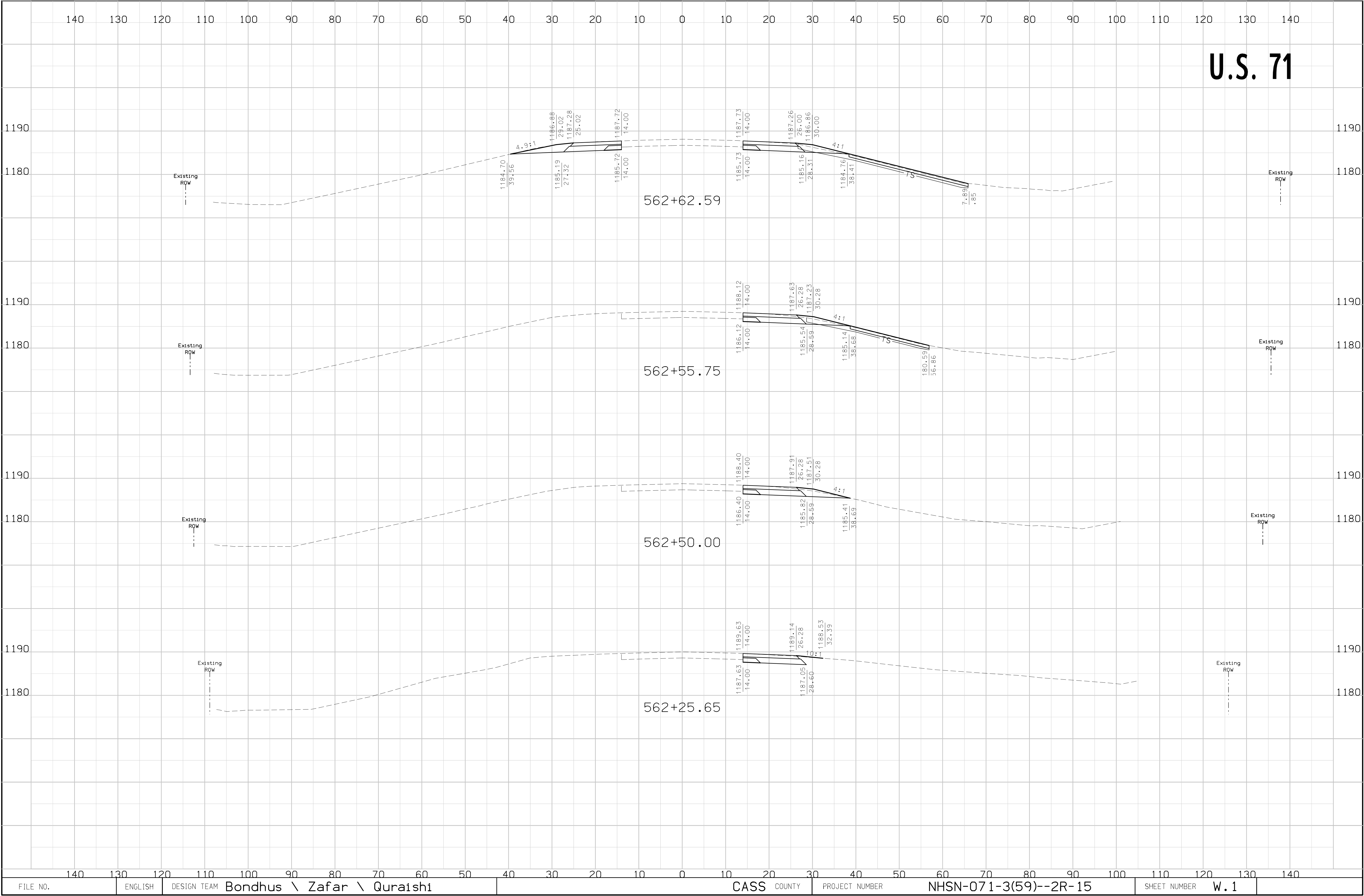
SECTION A-A

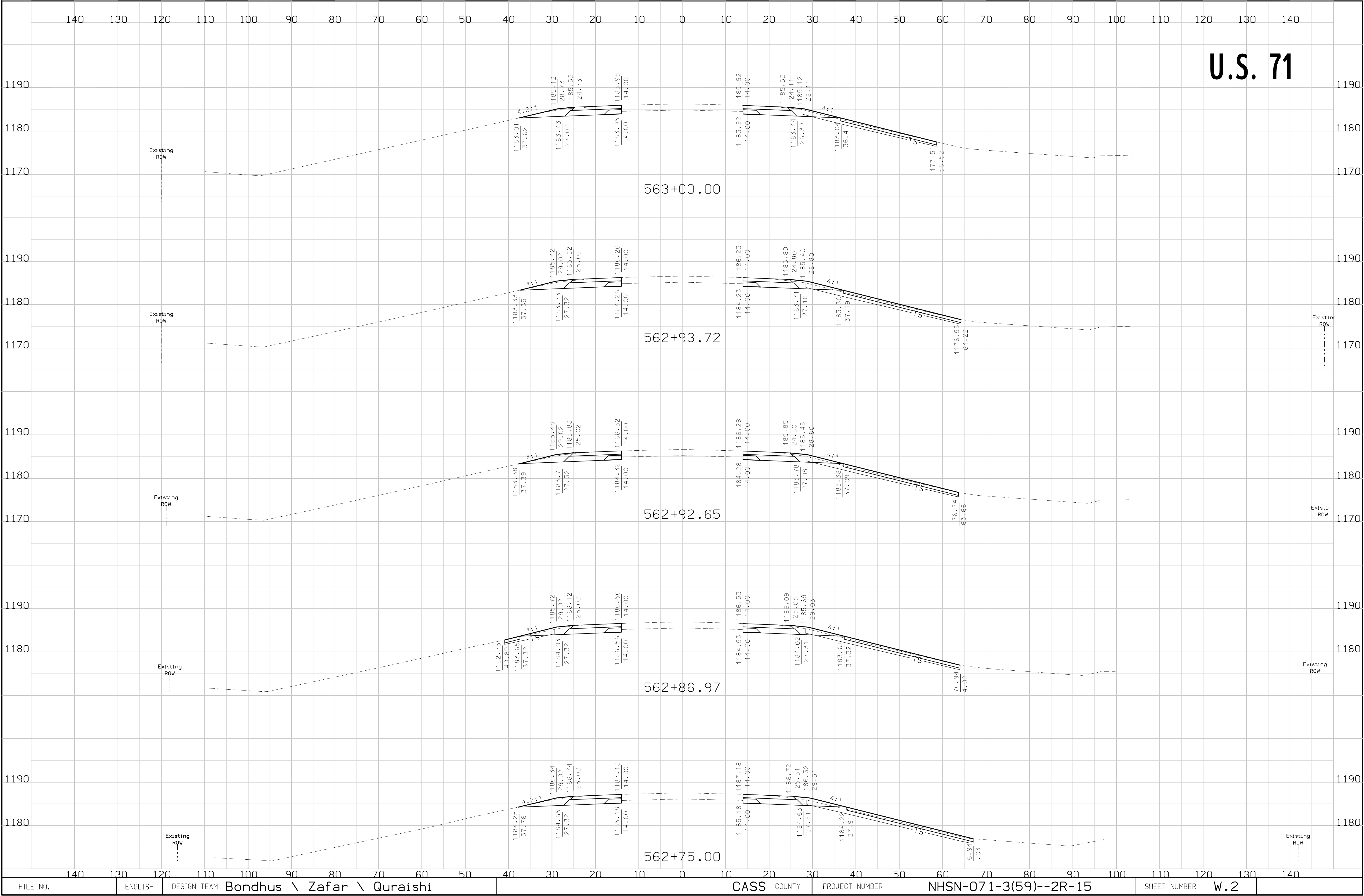
DITCH CHECK - MANUAL INSTALLATION

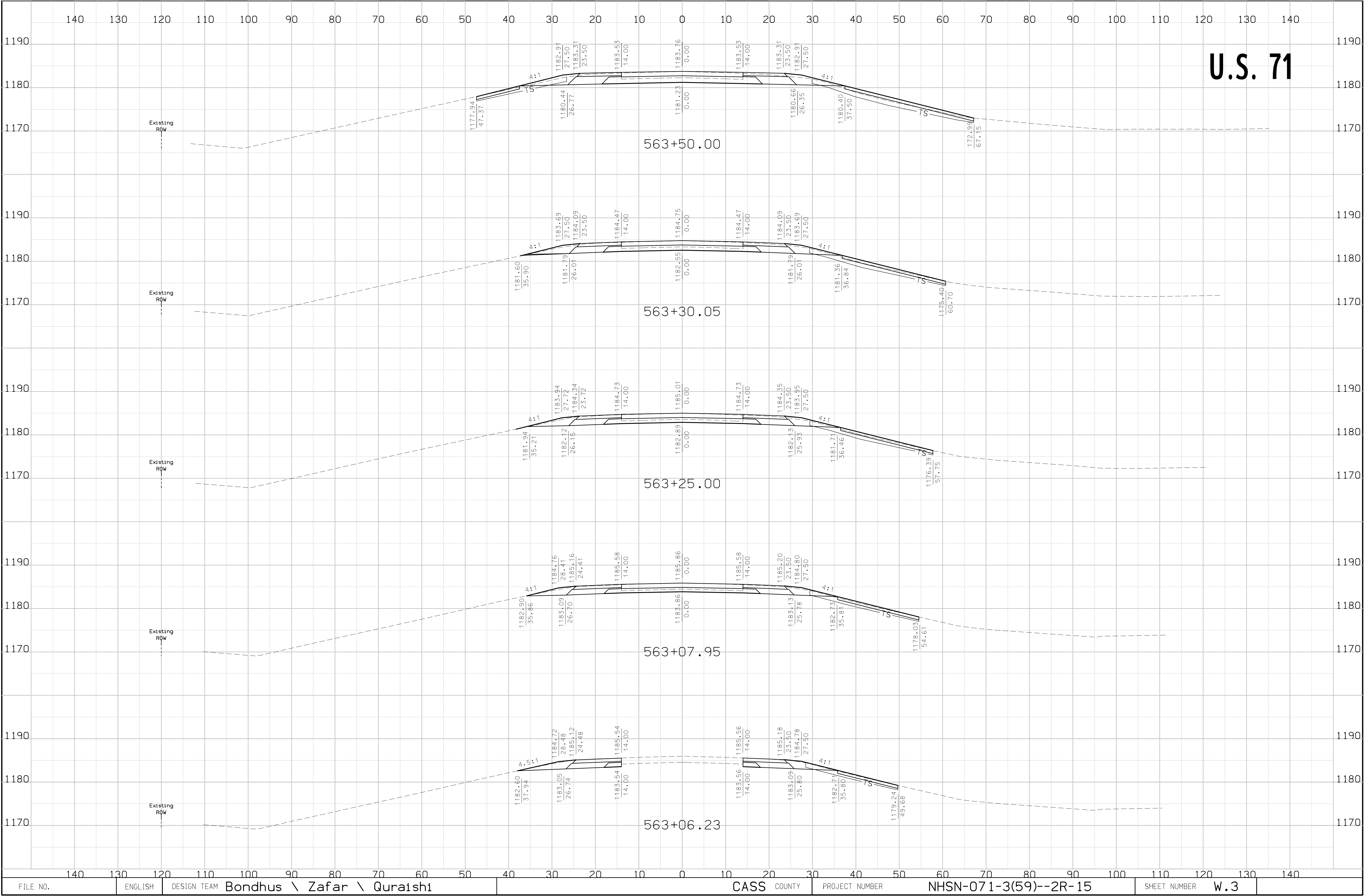


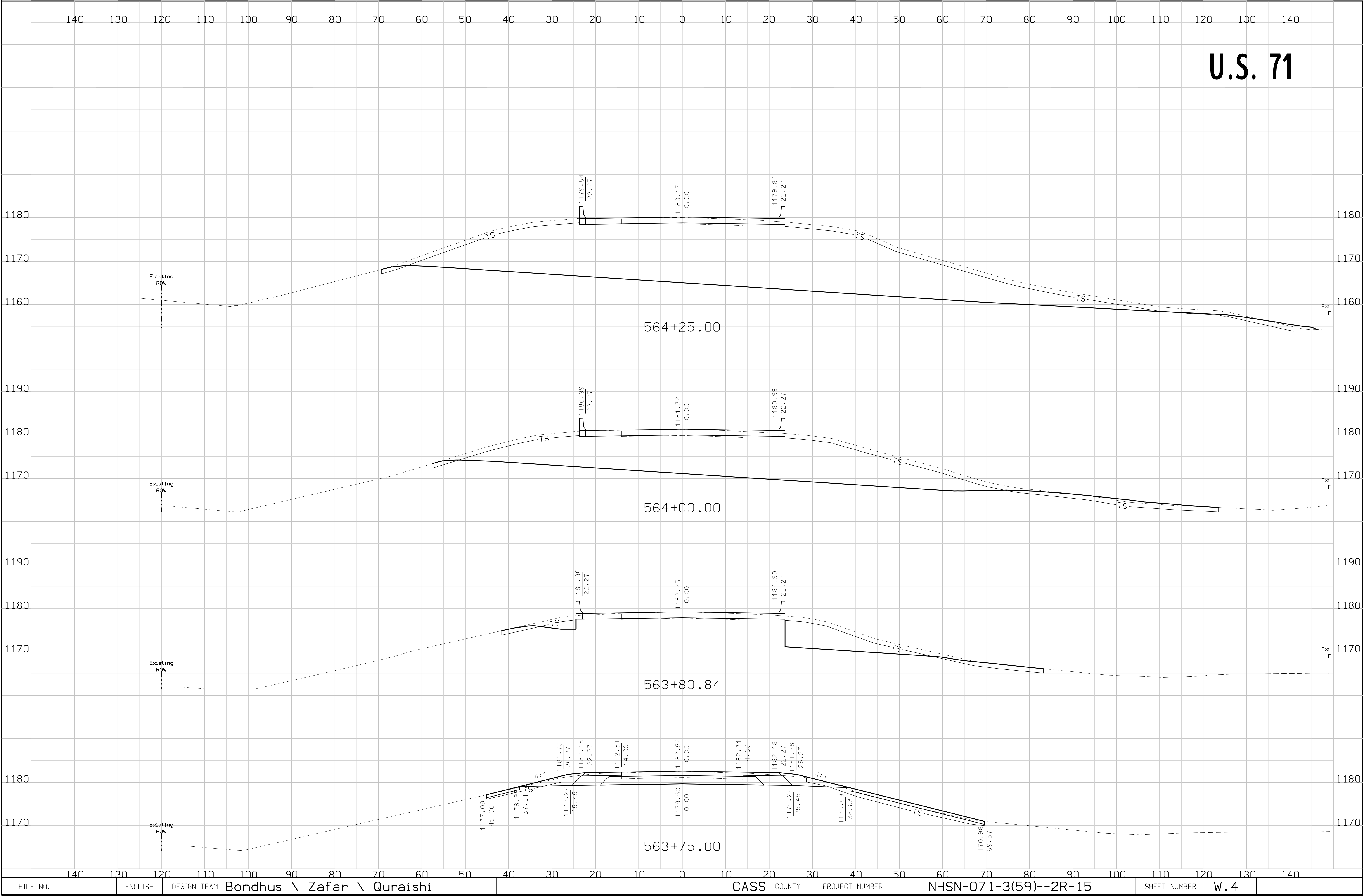
SECTION A-A

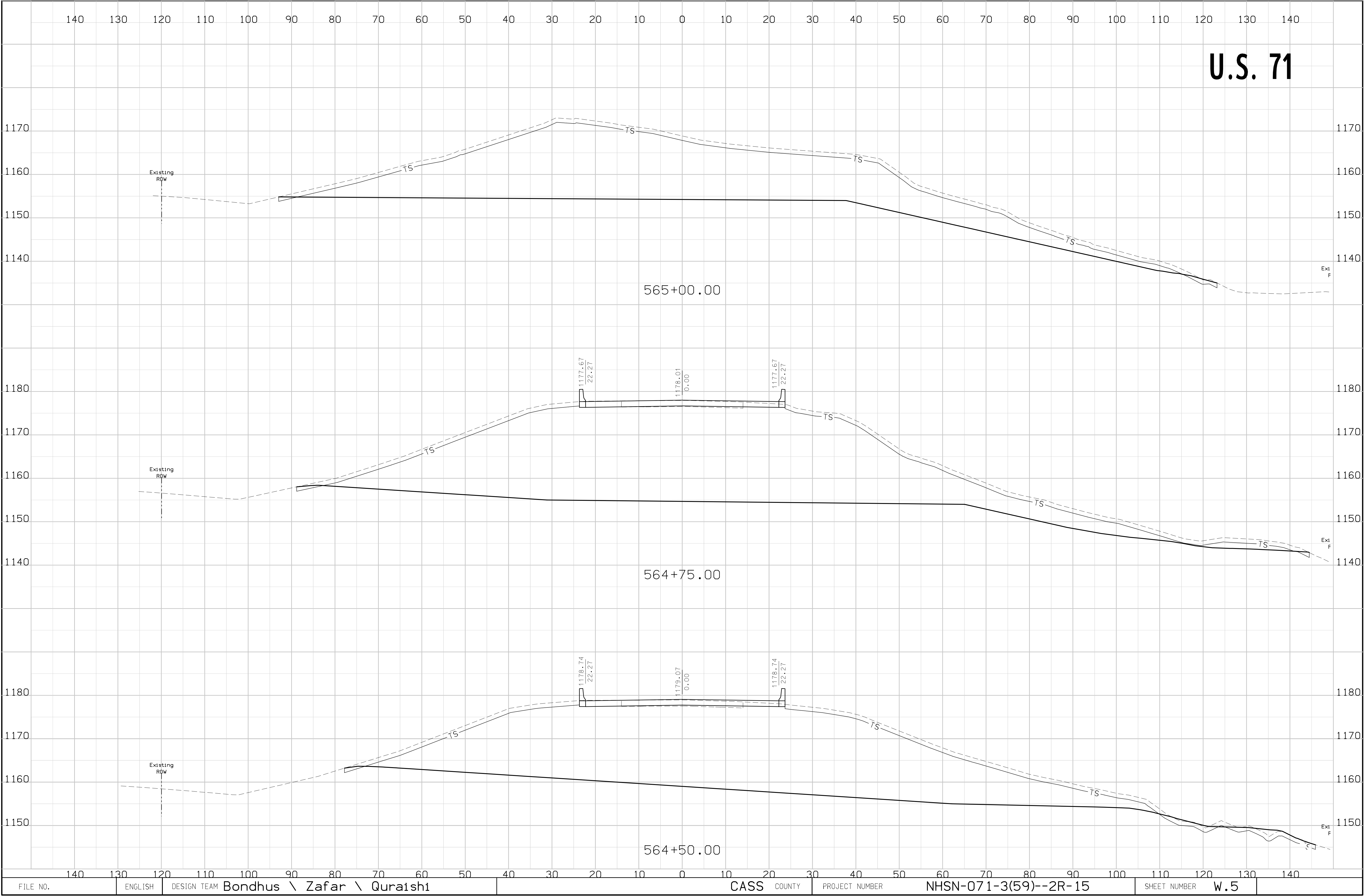
	REVISION	
	NEW	10-18-16
	570-4	
	SHEET 3 of 3	
REVISIONS: NEW		
SILT FENCE INSTALLATION FOR SHALLOW OR NO DITCH		



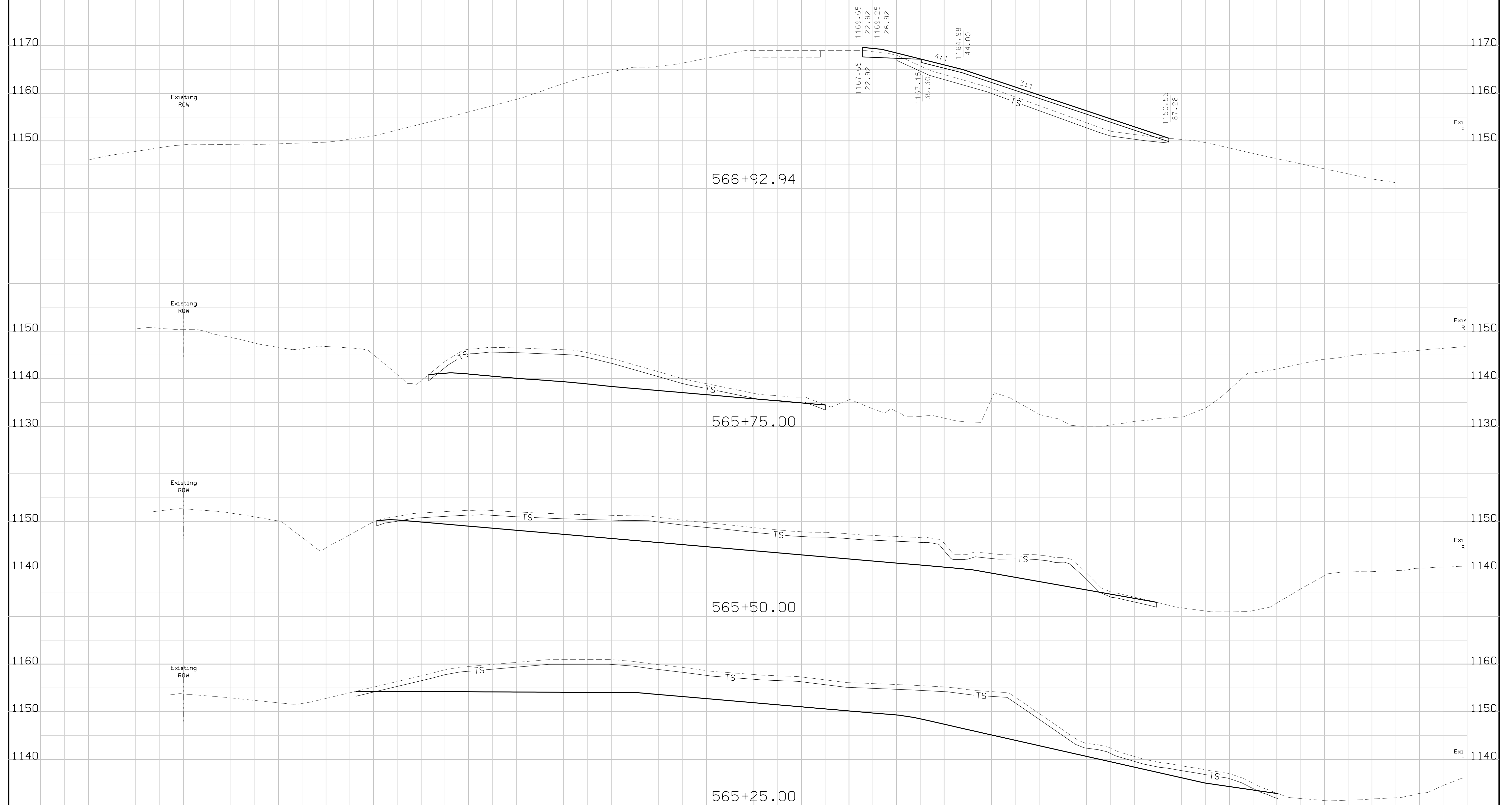








U.S. 71



FILE NO.	ENGLISH	DESIGN TEAM	Bondhus \ Zafar \ Quraishi	CASS COUNTY	PROJECT NUMBER	NHSN-071-3(59)--2R-15	SHEET NUMBER	W.6
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