

BRIDGE REPLACEMENT- CCS LETTING DATE 07-16-2019
NHSX-030-6(236)--3H-86

TAMA COUNTY - DESIGN NO. 118 & 218

TAMA COUNTY

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
- ABBEY ROAD
ELWOOD



PLANS OF PROPOSED IMPROVEMENTS ON THE

PRIMARY ROAD SYSTEM

TAMA COUNTY

BRIDGE REPLACEMENT-CCS

OVER IOWA RIVER (EAST OVERFLOW)

0.6 MILE WEST OF EAST JUNCTION COUNTY ROAD T47

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.

REVISIONS



1-800-292-8989

www.iowaonecall.com



STANDARD ROAD PLANS

STANDARD ROAD PLANS ARE LISTED
ON SHEET NUMBER C.3

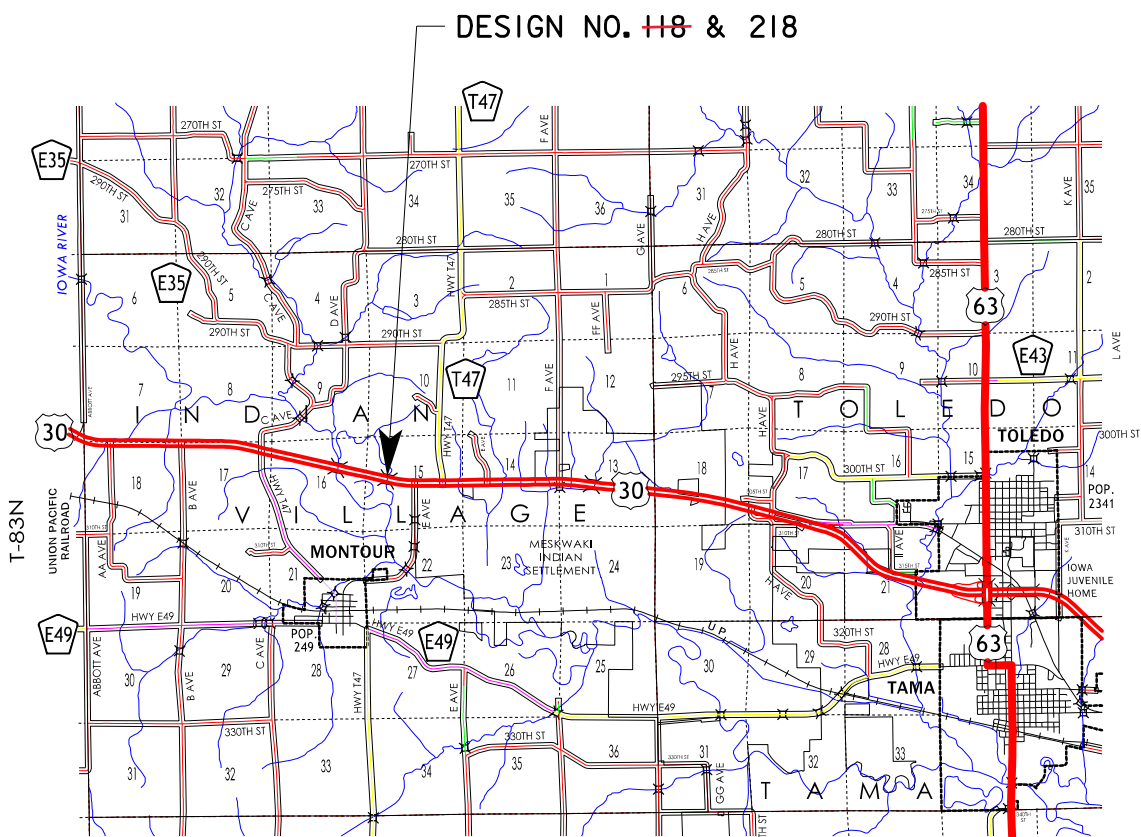
DESIGN DATA URBAN

REFER TO INDIVIDUAL
SITUATION PLANS FOR
TRAFFIC DATA INFORMATION

TOTAL SHEETS
97
PROJECT NUMBER
NHSX-030-6(236)--3H-86
R.O.W. PROJECT NUMBER
21 ESTIMATE SHEET DESIGN NO. 218
PROJECT IDENTIFICATION NUMBER
16-86-030-020

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATE SHEET - DESIGN NO. 118
2-22	DESIGN NO. 118
23-39	DESIGN NO. 218
SPS. 1-SPS.5	SOIL PROFILE SHEET
C.1	ESTIMATE SHEET FOR ROADWAY
A.1-X.1	ROADWAY SHEETS



R+16W

LOCATION MAP

PROJECT DIRECTORY NAME: 8603002016

HYDRAULIC 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 William L. Kaufman Date 05-07-2019

Printed or Typed Name

My license renewal date is December 31, 2019

Pages or sheets covered by this seal: SHEETS 5 THRU 8, 26 OF 97

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.

Signature Haiping Chen Date 05-07-2019

Printed or Typed Name

My license renewal date is December 31, 2020

Pages or sheets covered by this seal: SHEETS 1 THRU 39 OF 97

DESIGN TEAM HC/ADW

ENGLISH

IOWA DOT * OFFICE OF BRIDGES AND STRUCTURES

FILE NO. 31453

TAMA COUNTY

PROJECT NUMBER NHSX-030-6(236)--3H-86

SHEET NUMBER 1

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL - -
2	2402-2720000	EXCAVATION, CLASS 20 - -
3	2402-2721000	EXCAVATION, CLASS 21 - -
4	2403-0100010	STRUCTURAL CONCRETE (BRIDGE) INCLUDES ALL RESILIENT JOINT FILLER REQUIRED. INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), FLOODABLE BACKFILL, POROUS BACKFILL, GEOTEXTILE FABRIC, WATER FLOODING, AND SUBDRAIN OUTLET AT ABUTMENTS AND TOE OF BERM. INCLUDES FURNISHING AND PLACING 3 INCH DIAMETER PVC PLASTIC PIPE AND EXPANDING FOAM IN THE ABUTMENT WINGS. INCLUDES COST OF 4 DRAINS AT 48 LBS STEEL PER DRAIN.
5	2404-7775000	REINFORCING STEEL - -
6	2404-7775005	REINFORCING STEEL, EPOXY COATED - -
7	2404-7775009	REINFORCING STEEL, STAINLESS STEEL - -
8	2414-6424110	CONCRETE BARRIER RAILING IF PLACEMENT OF CONCRETE IS DONE BY THE SLIPFORMING METHOD, CLASS BR CONCRETE IS REQUIRED. CAST-IN-PLACE BARRIER RAILS SHALL USE CLASS C MIX. PRICE BID FOR THIS ITEM SHALL INCLUDE THE COST OF CAST-IN-PLACE FORMS IF REQUIRED FOR PLACEMENT OF THE CONCRETE.
9	2501-0201057	PILES, STEEL, HP 10 X 57 - -
10	2501-6335010	PREBORED HOLES - -
11	2507-2638650	BRIDGE WING ARMORING - EROSION STONE INCLUDES FURNISHING AND PLACING ENGINEERING FABRIC, EROSION STONE, AND ALL REQUIRED EXCAVATING, SHAPING AND COMPACTING FOR WING ARMORING.
12	2507-3250005	ENGINEERING FABRIC ENGINEERING FABRIC SHALL BE MATERIAL AS SPECIFIED FOR EMBANKMENT EROSION CONTROL IN ACCORDANCE WITH ARTICLE 4196.01,B,3, OF THE STANDARD SPECIFICATIONS.
13	2507-6800061	REVETMENT, CLASS E ESTIMATED AT 1.6 TON/CY.
14	2507-8029000	EROSION STONE ESTIMATED AT 1.6 TON/CY.

ESTIMATED BRIDGE QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CY	716.7	
2	2402-2720000	EXCAVATION, CLASS 20	CY	100	
3	2402-2721000	EXCAVATION, CLASS 21	CY	80	
4	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	630.6	
5	2404-7775000	REINFORCING STEEL	LB	7,060	
6	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	118,687	
7	2404-7775009	REINFORCING STEEL, STAINLESS STEEL	LB	3,571	
8	2414-6424110	CONCRETE BARRIER RAILING	LF	322.0	
9	2501-0201057	PILES, STEEL, HP 10 X 57	LF	3,440	
10	2501-6335010	PREBORED HOLES	LF	140	
11	2507-2638650	BRIDGE WING ARMORING - EROSION STONE	SY	13.0	
12	2507-3250005	ENGINEERING FABRIC	SY	1,169.7	
13	2507-6800061	REVTMENT, CLASS E	TON	1,114.6	
14	2507-8029000	EROSION STONE	TON	32.0	

DESIGN FOR 0° SKEW
150'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB BRIDGE
45'-6 END SPANS 59'-0 INTERIOR SPAN
QUANTITIES
STATION 449+83.00, 46.00' LT (W.B. U.S. 30) MAY, 2019
TAMA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 17 FILE NO. 31453 DESIGN NO. 218

GENERAL NOTES:

THIS DESIGN IS FOR REPLACEMENT OF THE EXISTING TWIN 11'-10" x 5'-11" x 204'-0" REINFORCED CONCRETE BOX CULVERT ON US. 30 OVER IOWA RIVER (EAST OVER FLOW). DESIGN NO. 399 WITH A YEAR OF CONSTRUCTION OF 2001. ELECTRONIC PLANS OF THE EXISTING STRUCTURE ARE AVAILABLE TO THE CONTRACTOR AS PART OF THE E-FILES SUPPLIED WITH THE CONTRACT DOCUMENTS.

THE EXISTING CULVERT SHALL BE REPLACED WITH A NEW 150'-0" x 40'-0" CONTINUOUS CONCRETE SLAB BRIDGE.

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

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

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.

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

THE BRIDGE CONTRACTOR SHALL PREBORE HOLES FOR ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON SITUATION PLAN SHEET. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING.

THE BRIDGE CONSTRCTOR IS TO INSTALL SUBDRAINS BEHIND THE ABUTMENTS AS DETAILED. THE SUBDRAINS SHALL BE 4" DIA. PERFORATED SUBDRAIN (POLYETHYLENE CORRUGATED TUBING).

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).

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

CLASS 20 EXCAVATION QUANTITIES ARE BASED ON THE ASSUMPTION THAT THE CHANNEL EXCAVATION IS COMPLETED PRIOR TO STARTING CONSTRUCTION OF THE ABUTMENTS AND PIERS.

SPECIFICATIONS:

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

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8th Ed, SERIES OF 2017, EXCEPT AS NOTED IN THE CURRENT IOWA BRIDGE DESIGN MANUAL.
REINFORCING STEEL IN ACCORDANCE WITH LRFD AASHTO SECTION 5, GRADE 60. CONCRETE IN ACCORDANCE WITH LRFD AASHTO SECTION 5, f'c = 4.0 KSI,

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

BRIDGE DECK DIMENSIONS TABLE			
NO.	ITEM	UNIT	QUANTITY
1	DECK LENGTH	L.F.	153.0
2	MINIMUM DECK WIDTH	L.F.	43.2
3	MAXIMUM DECK WIDTH	L.F.	43.2
4	DECK AREA	S.F.	6610

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

SHOP DRAWING SUBMITTALS

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

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

SHOP DRAWINGS SHALL BE SUBMITTED WITH THE FOLLOWING NAMING CONVENTION:
(Paren)_County_DesignNumber_SubmittalDescription.pdf
Example: (090)_BlackHawk_Design915_DeckDrains.pdf

1	FALSEWORK
2	DECK DRAIN

DESIGN FOR 0° SKEW

150'-0" x 40'-0" CONTINUOUS CONCRETE SLAB BRIDGE

45'-6" END SPANS59'-0" INTERIOR SPAN

GENERAL NOTES

STATION 449+83.00, 46.00' LT (W.B. U.S. 30)MAY. 2019

TAMA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

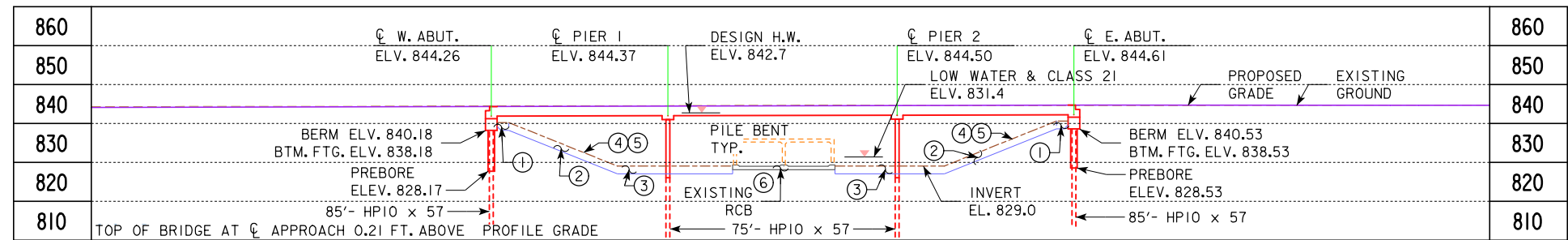
DESIGN SHEET NO. 3 OF 17FILE NO. 31453DESIGN NO. 218

NOTE:
ROADWAY QUANTITIES SHOWN ELSEWHERE IN THESE PLANS.

NOTE:
POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE OPEN TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.



LONGITUDINAL SECTION ALONG CL APPROACH (W.B.)

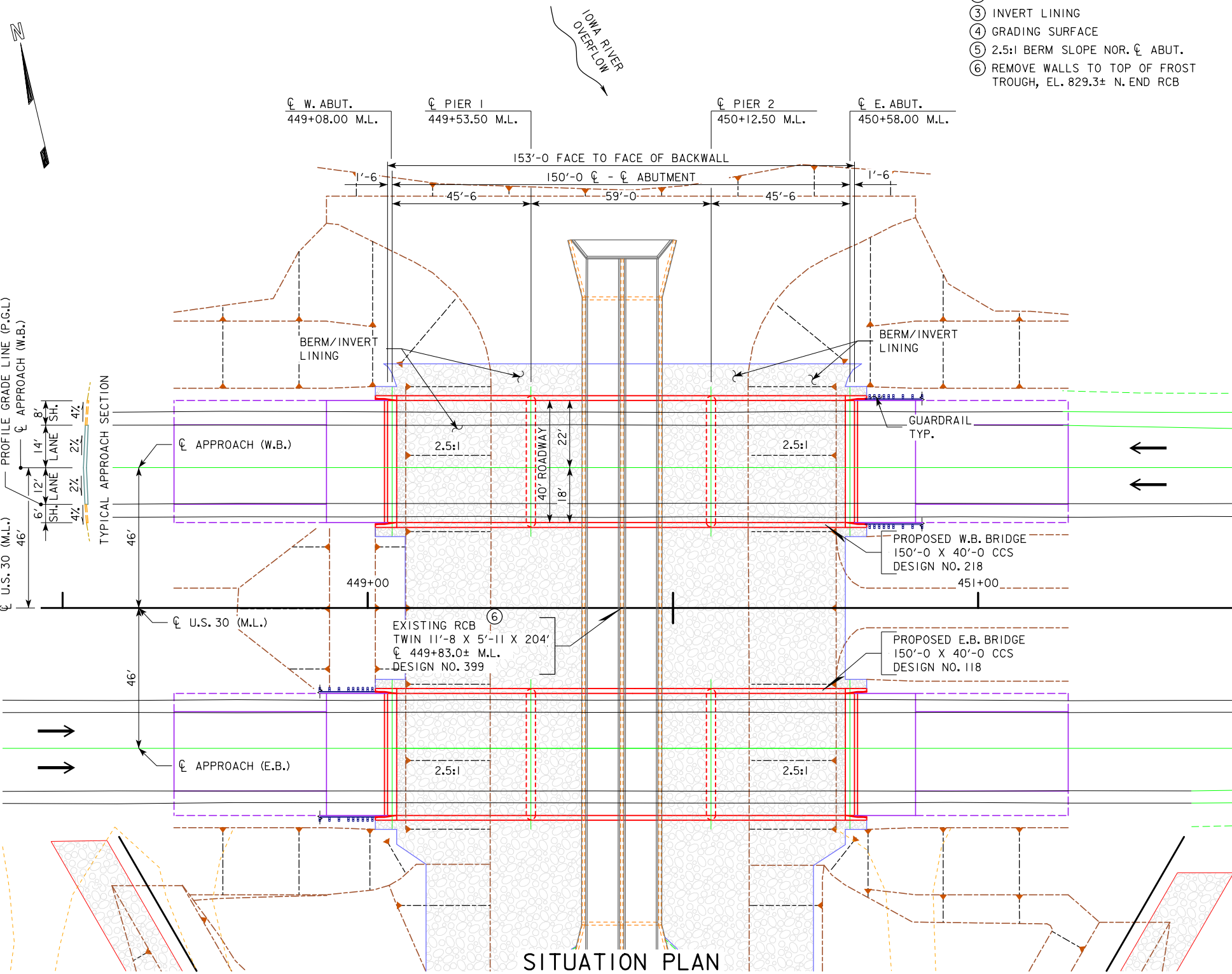
- ① EROSION STONE ABUTMENT FACING
- ② BERM LINING
- ③ INVERT LINING
- ④ GRADING SURFACE
- ⑤ 2.5:1 BERM SLOPE NOR. CL ABUT.
- ⑥ REMOVE WALLS TO TOP OF FROST TROUGH, EL. 829.3± N. END RCB

BENCH MARK:
BM NO. 1908, BRASS PLUG, S.E. COR. E.B. BRIDGE
X=19,528,177.0 Y=7,838,336.3
IARCS ZONE 9, SURVEY FEET
ELEV. = 851.01 NAVD88/IARTN (GEOID12A)

+0.2383%
PVI STA 447+00.00 PVI STA 453+00.00
PVI ELV. 843.55 PVI ELV. 844.98

U.A.C. GRADE ON W.B. U.S. 30

NOTES:
REFER TO TAMA DESIGN NO. 118 FOR HYDRAULIC DATA, SITE PLAN, GRADING CONTROL, REVETMENT DETAILS AND QUANTITIES.



SITUATION PLAN

TRAFFIC ESTIMATE

2020 AADT 12,100 V.P.D.
2040 AADT 17,800 V.P.D.
2040 DHV 1,840 V.P.H.
TRUCKS 12%
TOTAL DESIGN ESALS 4,239,840

UTILITIES LEGEND

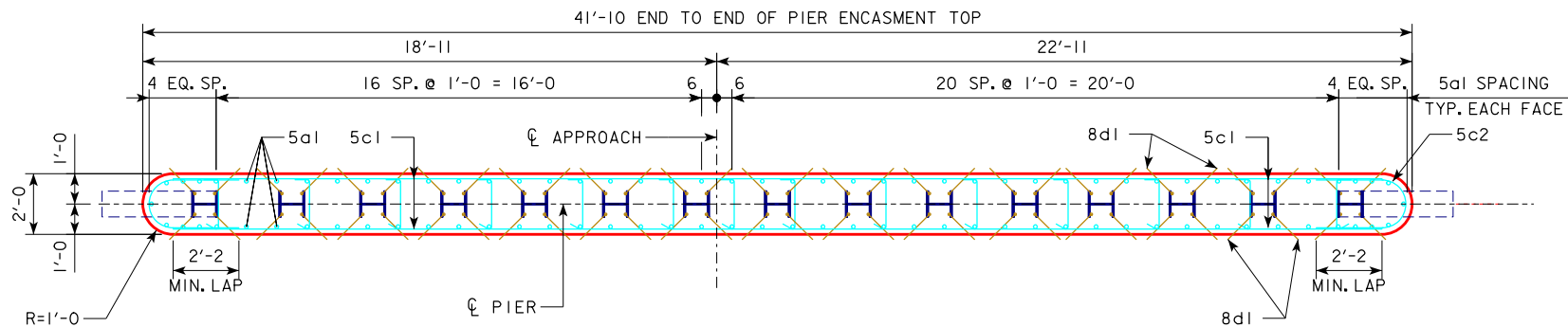
F0 - F01D BURIED FIBER OPTIC CENTURY LINK
F02 - F02D BURIED FIBER OPTIC WINDSTREAM
F03 - F03D BURIED FIBER OPTIC MEDIACOM

LOCATION

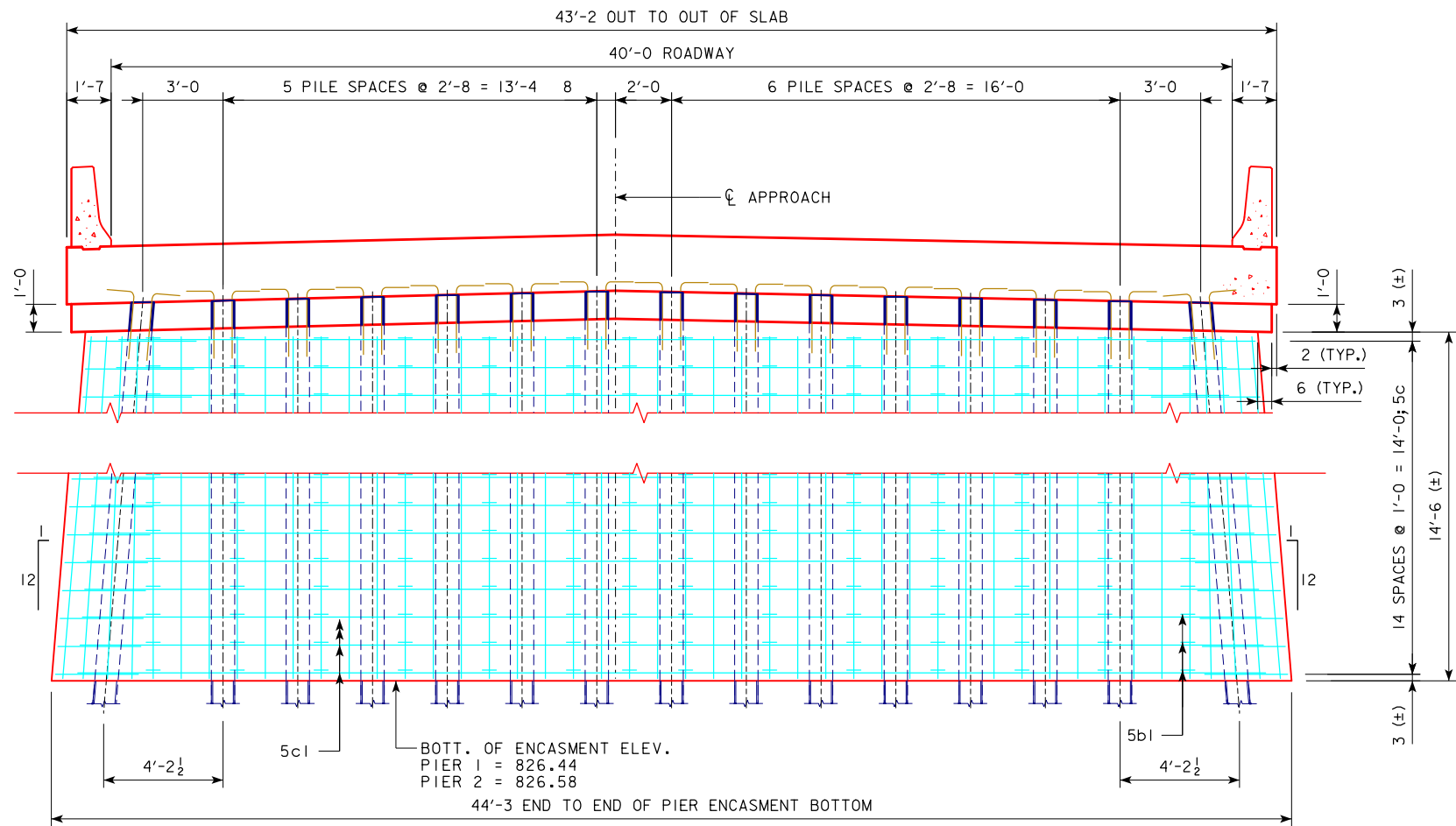
W.B. U.S. 30 OVER IOWA RIVER
(EAST OVERFLOW)
T 83 N R 16 W
SECTION 15
INDIAN VILLAGE TOWNSHIP
TAMA COUNTY
FHWA NO. 700950
MAINT. NO. 8696.3L030
LATITUDE 42.000569°
LONGITUDE -92.703934°

PRELIMINARY

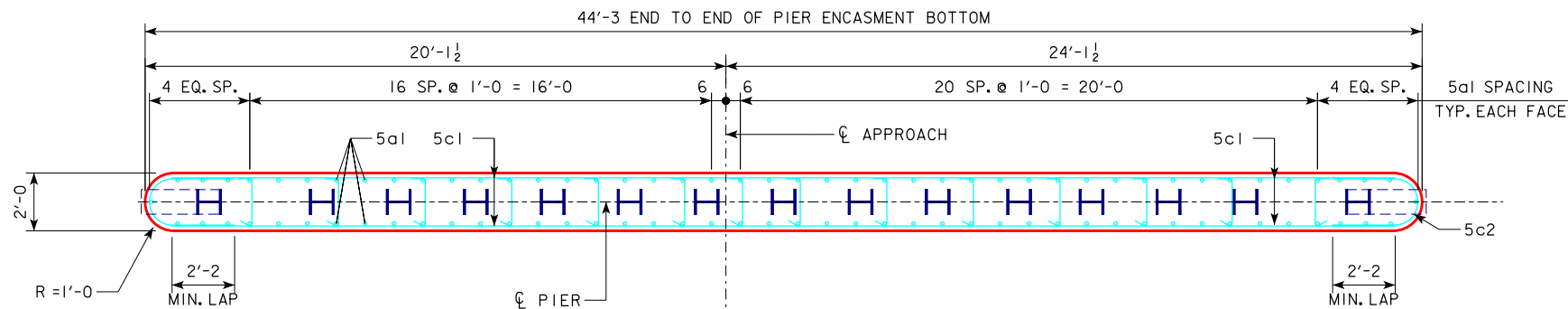
DESIGN FOR 0° SKEW
**150'-0 X 40'-0 CONTINUOUS
CONCRETE SLAB BRIDGE**
45'-6 END SPANS 59'-0 INTERIOR SPAN
SITUATION PLAN
STATION 449+83.00 U.S. 30, 46.00' LT. (W.B.) DEC. 2018
TAMA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 4 OF 1 FILE NO. 31453 DESIGN NO. 218



TOP PLAN OF ENCASEMENT



PIER ENCASEMENT ELEVATION
(LOOKING WEST)



BOTTOM PLAN OF ENCASEMENT

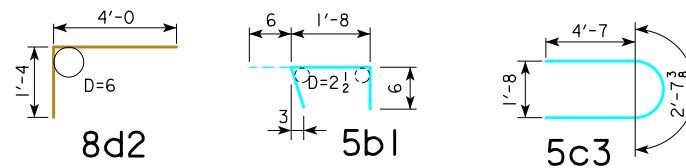
EPOXY COATED REINF. STEEL - ONE ENCASEMENT

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8d1	ENCASEMENT TO CAP DOWELS		60	5'-4	854
EPOXY COATED TOTAL - LBS.					854

REINFORCING STEEL - ONE ENCASEMENT

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5a1	ENCASEMENT, VERTICAL		90	14'-2	1330
5b1	ENCASEMENT, TRANSVERSE, TIES		210	2'-8	584
5c1	ENCASEMENT, HORIZONTAL		30	39'-10	1246
5c2	ENCASEMENT, ENDS		30	11'-10	370
NON-COATED REINF. TOTAL - LBS.					3530

BENT BAR DETAILS



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

CONC. PLACEMENT QTYS - ONE ENCASEMENT

LOCATION	QUANTITY
ENCASEMENT	46.5
TOTAL (CU. YD.)	46.5

ESTIMATED QUANTITIES - ONE ENCASEMENT

ITEM	UNITS	QUANTITY
HP10x57 STEEL PILE 15 @ 75'	L.F.	1125
CLASS 21 EXCAVATION	CU.YDS.	40

PIER NOTES:

THE CONTRACT LENGTH OF 75 FEET FOR THE PIER PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 141 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING.

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

THE REQUIRED NOMINAL AXIAL BEARING RESISTANCE FOR PIER PILES IS 101 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.

DESIGN FOR 0° SKEW

150'-0" x 40'-0" CONTINUOUS CONCRETE SLAB BRIDGE

45'-6" END SPANS 59'-0" INTERIOR SPAN

PIER ENCASEMENT DETAILS

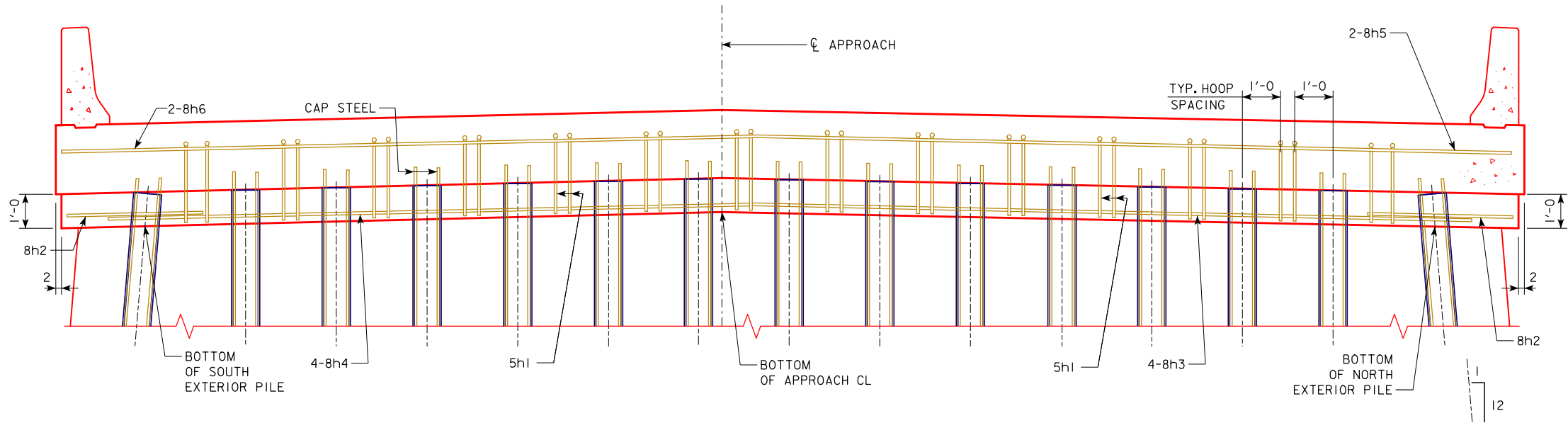
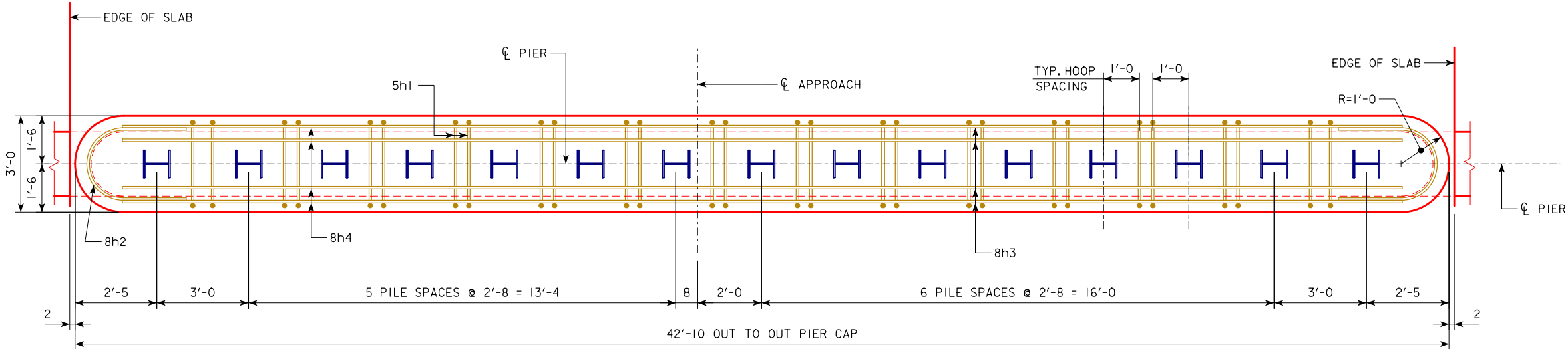
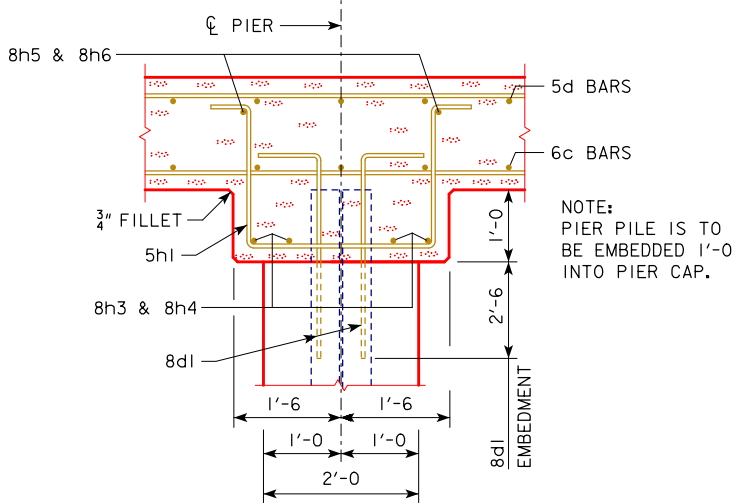
STATION 449+83.00, 46.00' LT (W.B. U.S. 30) MAY, 2019

TAMA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 5 OF 17 FILE NO. 31453 DESIGN NO. 218

BOTTOM OF CAP ELEVATIONS		
POINT	PIER 1	PIER 2
NORTH EXTERIOR PILE	840.92	841.05
APPROACH CL	841.23	841.36
SOUTH EXTERIOR PILE	840.84	840.97



SECTION NEAR PIER
SHOWING STIRRUP SPACING AND NUMBER OF PILING
(15 - HP 10x57 PIELS AT EACH PIER)
(LOOKING WEST)

PIER NOTES:
ALL MONOLITHIC PIER CAP REINFORCING AND
CONCRETE IS INCLUDED IN SUPERSTRUCTURE
ESTIMATE OF QUANTITIES.

DESIGN FOR 0° SKEW

150'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPAN

PIER ENCASMENT DETAILS

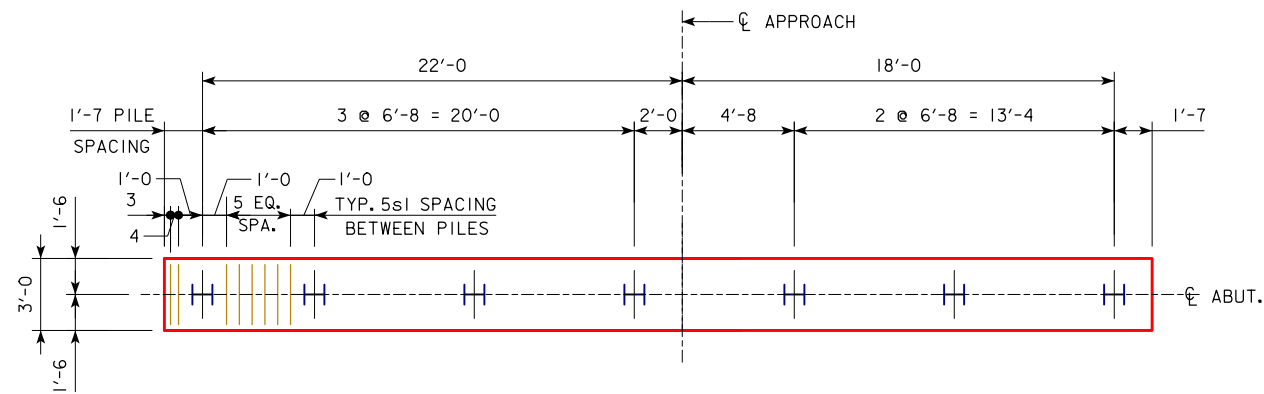
STATION 449+83.00, 46.00' LT (W.B. U.S. 30)

MAY. 2019

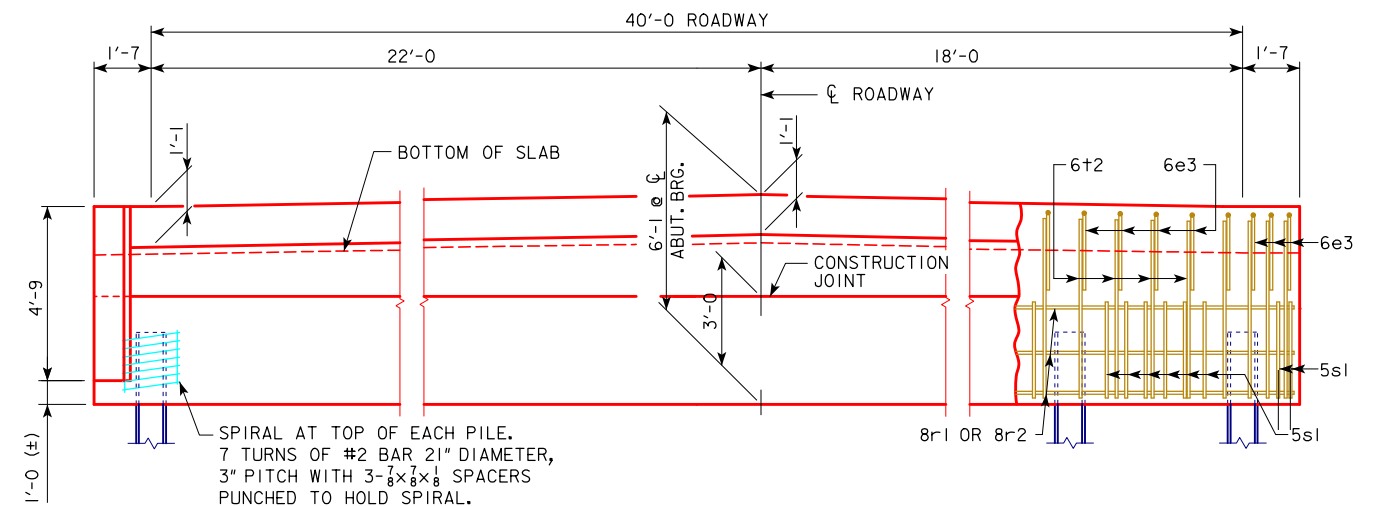
TAMA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 6 OF 17FILE NO. 31453DESIGN NO. 218

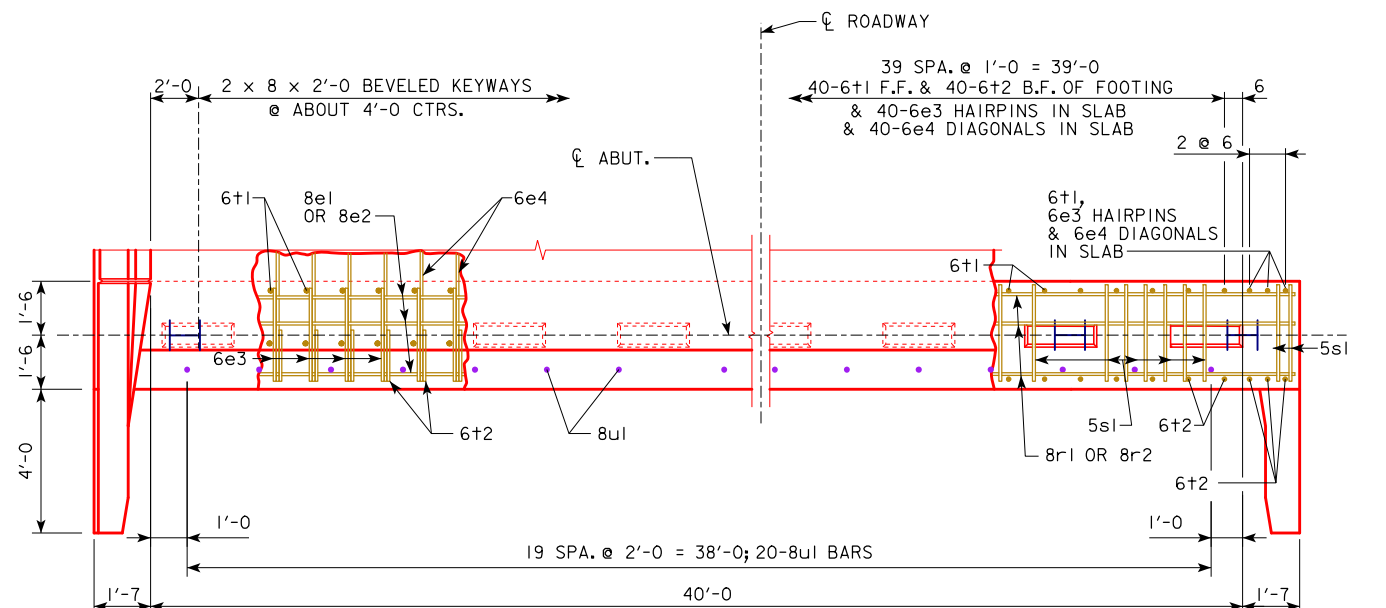
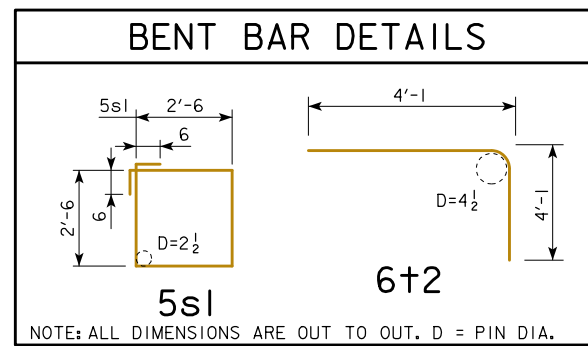


STEEL PILE PLAN
7- HPI0 x 57 STEEL PILES PILE PLAN
(WEST ABUTMENT, EAST ABUTMENT SIMILAR)



REAR ELEVATION
(WEST ABUTMENT, EAST ABUTMENT SIMILAR)

REINFORCING STEEL - ONE ABUTMENT					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8r1	ABUTMENT FOOTING LONGITUDINAL		7	26'-4	492
8r2	ABUTMENT FOOTING LONGITUDINAL		7	21'-4	399
5s1	ABUTMENT FOOTING HOOPS		40	11'-0	459
6+1	FOOTING TO SLAB BARS		46	5'-0	345
6+2	FOOTING TO SLAB BARS		46	5'-7	386
#2	PILE SPIRAL		7	38'-6	45
	SPIRAL SPACERS - L $\frac{7}{8} \times \frac{7}{8} \times \frac{1}{8} \times 0.70$		21	1'-10	27
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					2153



PLAN VIEW

NOTE: WING REINFORCING AND RAIL NOT SHOWN.
6e3, 6e4, AND 8e ARE INCLUDED WITH SUPERSTRUCTURE QUANTITIES.

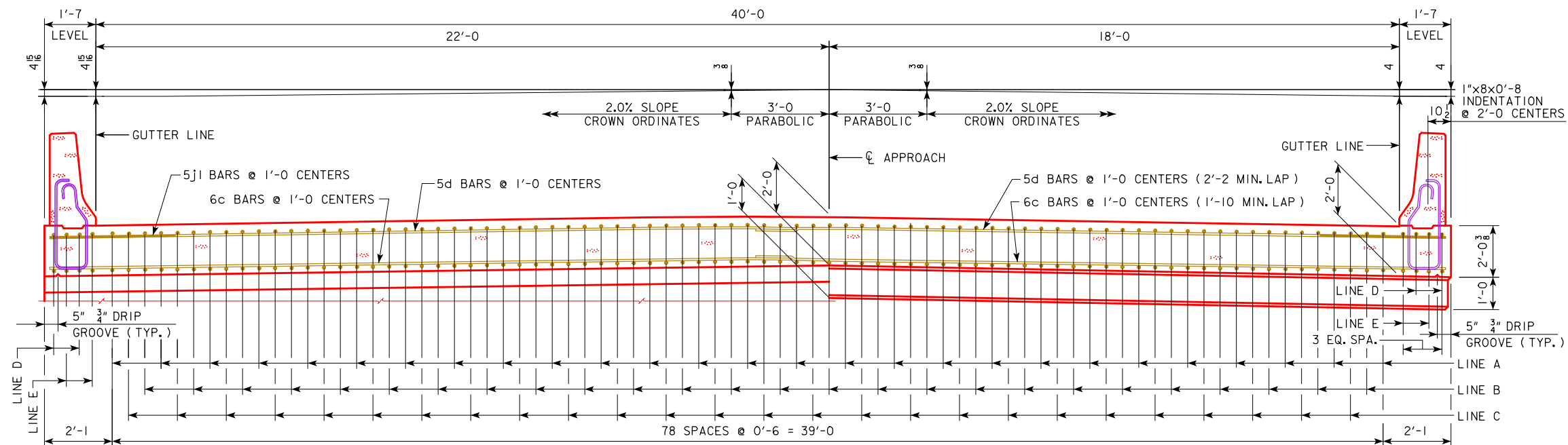
ABUTMENT NOTES:

THE CONTRACT LENGTH OF 85 FEET FOR THE ABUTMENT PILES IS BASED ON A NON-COHESIVE SOIL CLASSIFICATION, A TOTAL FACTORED AXIAL LOAD PER PILE (PU) OF 127 KIPS, AND A GEOTECHNICAL RESISTANCE FACTOR (PHI) OF 0.65 FOR SOIL AND 0.7 FOR ROCK END BEARING.

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

THE NOMINAL AXIAL BEARING RESISTANCE FOR ABUTMENT PILES IS 91 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.

DESIGN FOR 0° SKEW
150'-0" x 40'-0" CONTINUOUS CONCRETE SLAB BRIDGE
45'-6" END SPANS 59'-0" INTERIOR SPAN
ABUTMENT DETAILS
STATION 449+83.00, 46.00' LT (W.B. U.S. 30) MAY. 2019
TAMA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 7 OF 17 FILE NO. 31453 DESIGN NO. 218



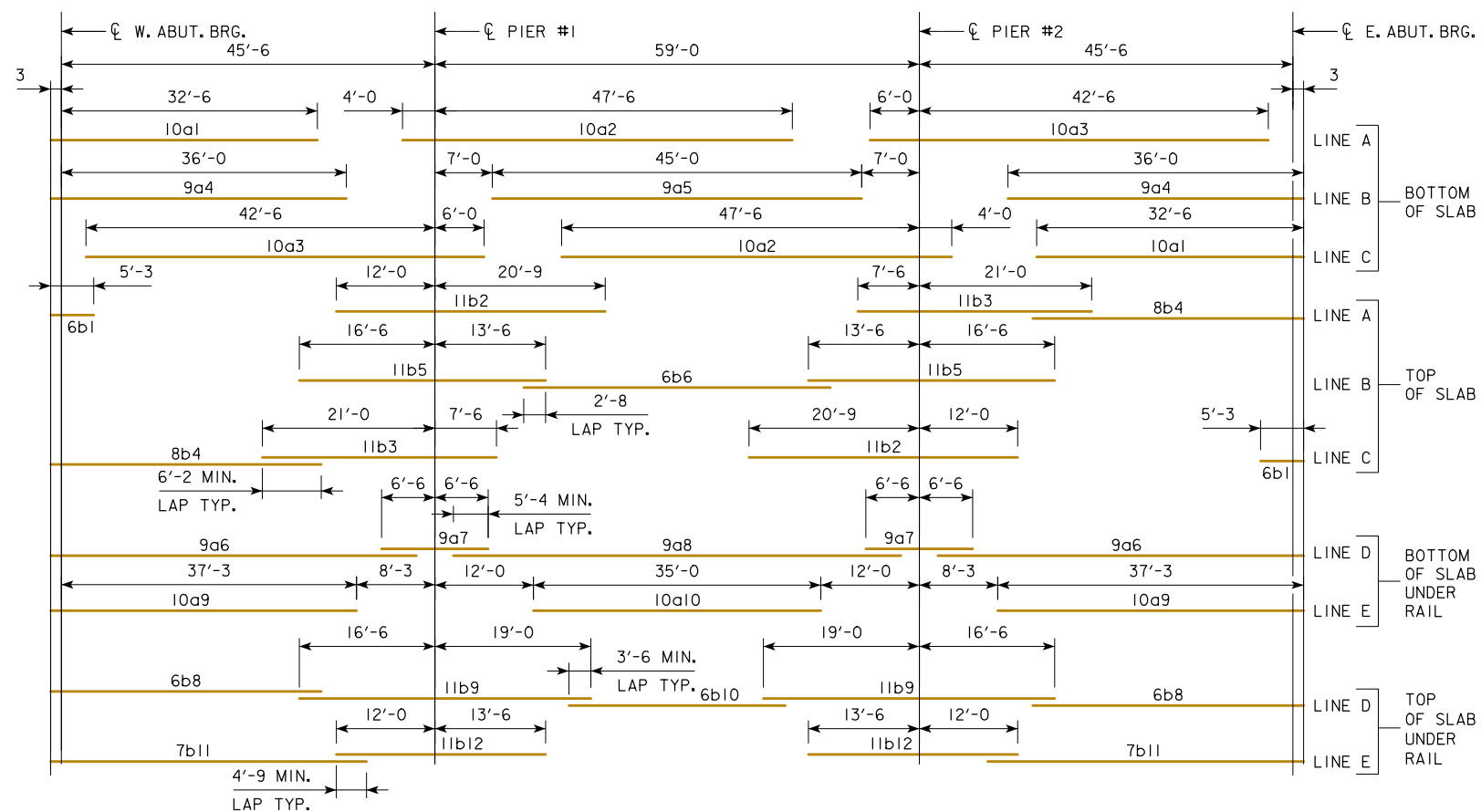
HALF SECTION NEAR ABUTMENT

HALF SECTION NEAR PIER

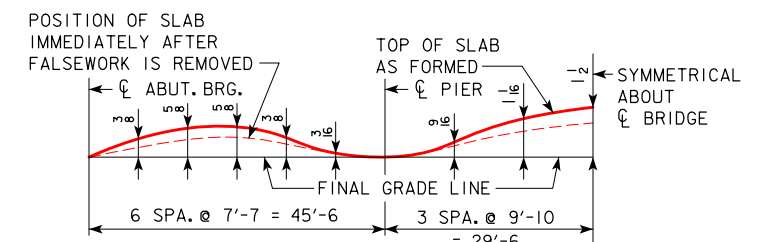
NOTE: TOP LONGITUDINAL REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2" CLEAR BELOW TOP OF SLAB. BOTTOM LONGITUDINAL REINFORCING STEEL IS TO BE PARALLEL TO AND 1 1/2" CLEAR ABOVE BOTTOM OF SLAB. REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS POURED. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS.

SLAB CROSS-SECTIONAL AREA FOR BARRIER RAIL = 86.38 SQ. FT.

(LOOKING EAST)



PLACEMENT FOR LONGITUDINAL REINFORCEMENT



FORM CAMBER DIAGRAM

THIS DIAGRAM SHOWS THE FORM CAMBER REQUIRED TO COMPENSATE FOR THE ANTICIPATED ULTIMATE DEAD LOAD DEFLECTION. THE ABOVE DIMENSIONS DO NOT INCLUDE ANY ALLOWANCE FOR FORM DEFLECTION OR FALSEWORK SETTLEMENT.

DESIGN FOR 0° SKEW

150'-0" x 40'-0" CONTINUOUS CONCRETE SLAB BRIDGE

45'-6" END SPANS 59'-0" INTERIOR SPAN

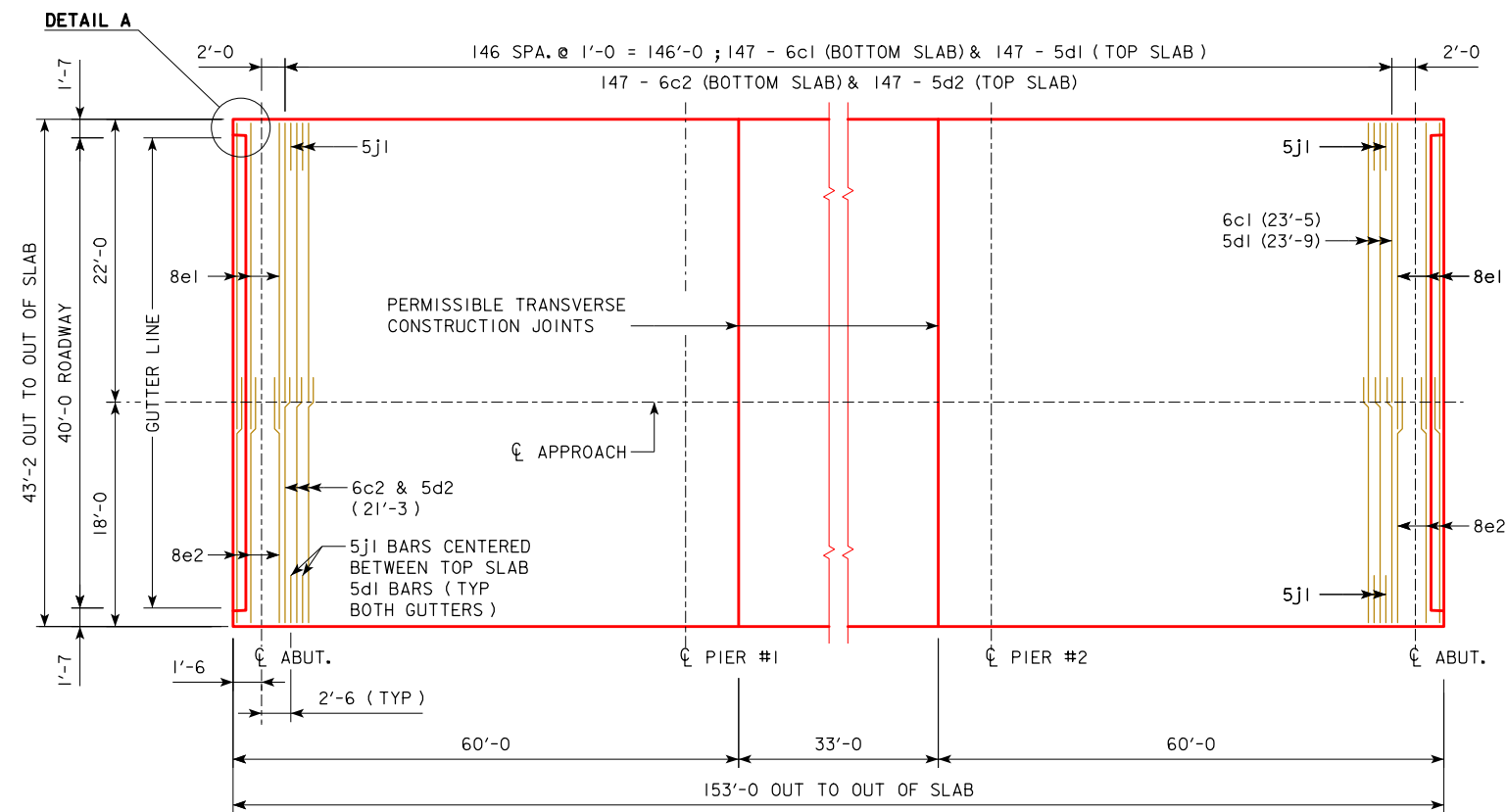
SUPERSTRUCTURE DETAILS

STATION 449+83.00, 46.00' LT (W.B. U.S. 30) MAY, 2019

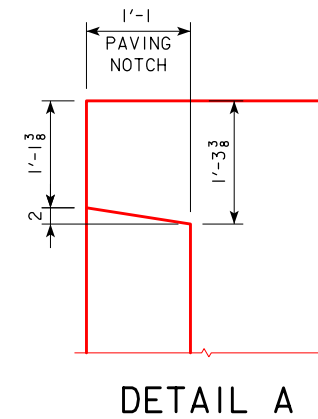
TAMA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

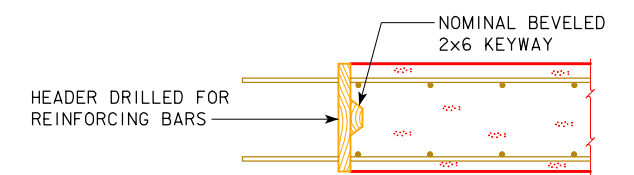
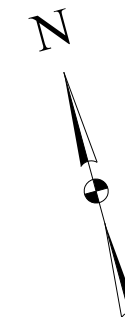
DESIGN SHEET NO. 8 OF 17 FILE NO. 31453 DESIGN NO. 218



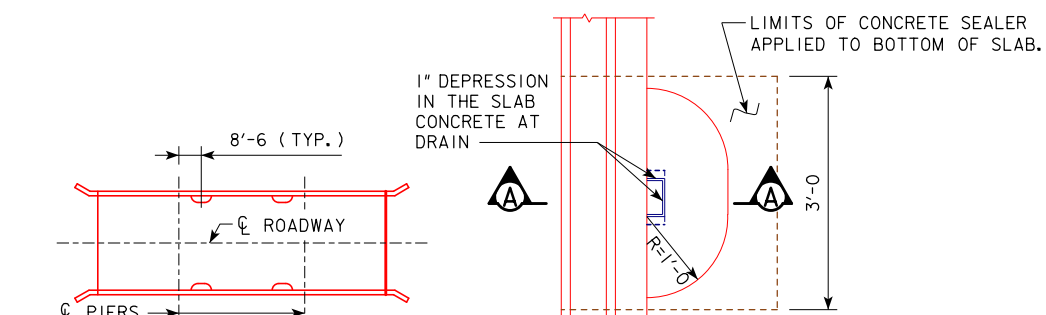
TRANSVERSE REINFORCING STEEL LAYOUT



DETAIL A



TRANSVERSE CONSTR. JOINT



FLOOR DRAIN LOCATION

NOTE: 4" x 8" OUTSIDE DIMENSION ROLLED TUBE WITH 1/4" WALL THICKNESS MAY BE SUBSTITUTED FOR THE WELDED DRAIN SHOWN.

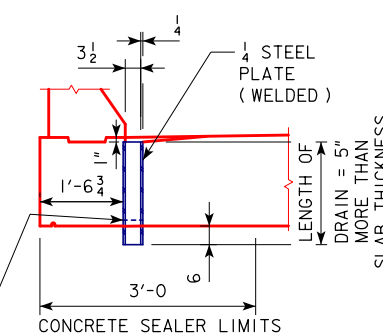
FLOOR DRAIN DETAILS

(DRAIN WEIGHT = 48 LBS EACH)

NOTE: DRAINS ARE TO BE GALVANIZED. INCLUDE COST OF DRAINS IN PRICE BID FOR "STRUCTURAL CONCRETE". 4 DRAINS REQUIRED.

PART PLAN

L 1 1/4 x 1 1/4 x 1/8 x 0'-3" WELDED TO BOTH SIDES OF DRAIN WITH 2-1/4" HOLES IN EACH OUTSTANDING LEG FOR NAILING TO FORMS



SECTION A-A

DESIGN FOR 0° SKEW

150'-0" x 40'-0" CONTINUOUS CONCRETE SLAB BRIDGE

45'-6" END SPANS 59'-0" INTERIOR SPAN

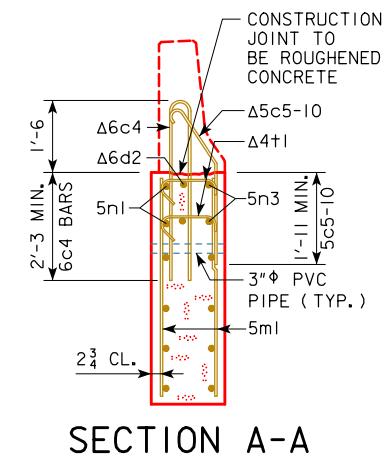
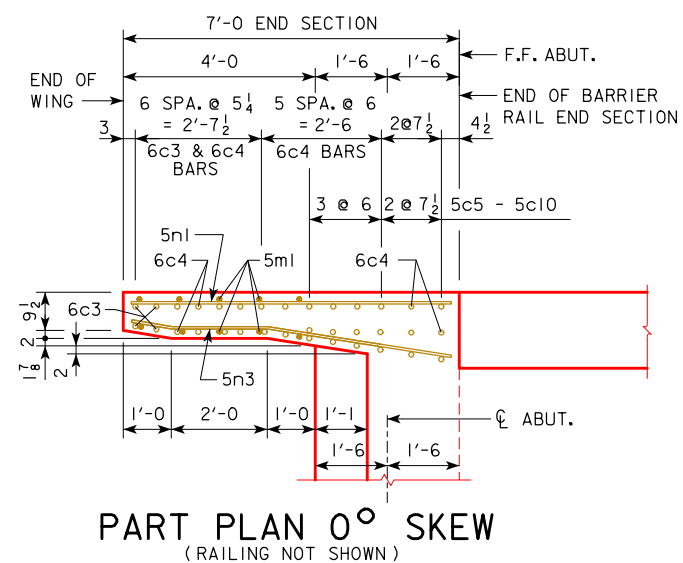
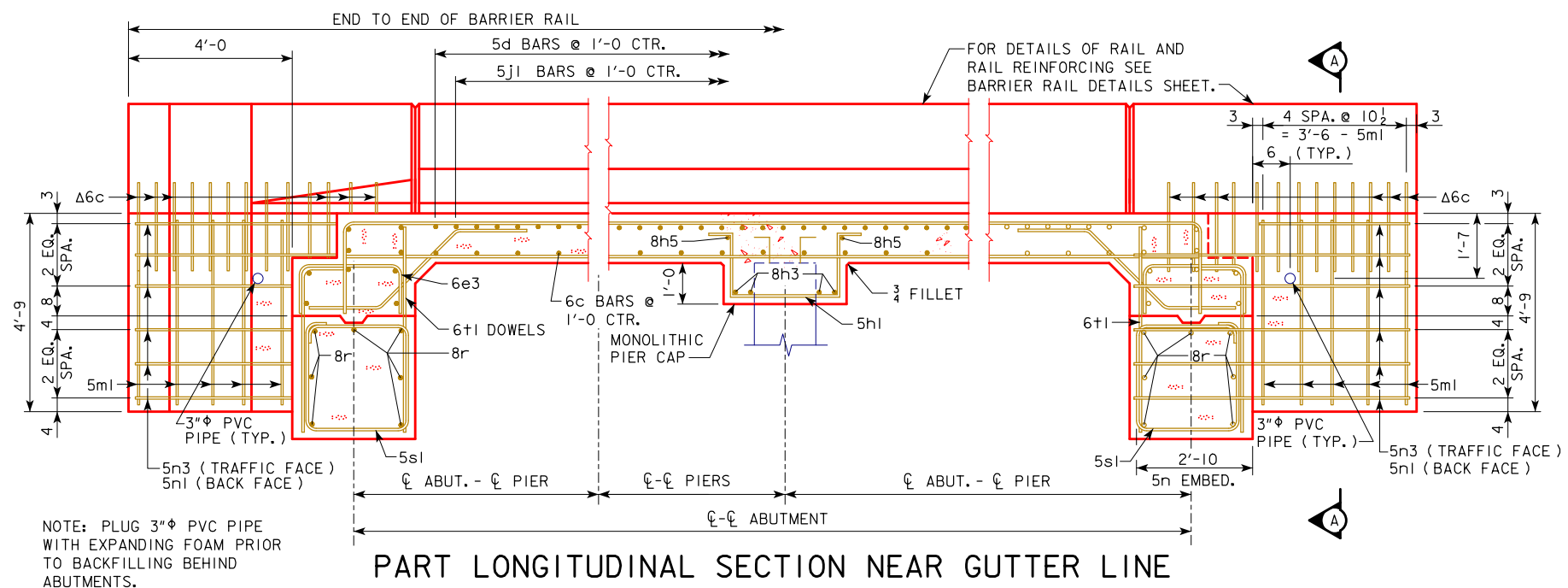
SUPERSTRUCTURE DETAILS

STATION 449+83.00, 46.00' LT (W.B. U.S. 30) MAY. 2019

TAMA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 9 OF 17 FILE NO. 31453 DESIGN NO. 218



Δ NOTE: SEE END SECTION DETAILS IN THESE PLANS FOR DETAILS OF BARRIER RAIL END SECTION. REINFORCING BARS 6c3, 6c4, 5c5-10, 6d2 & 4+1 ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.

NOTE: 5ml & 5nl BARS ARE INCLUDED
IN SUPERSTRUCTURE BAR LIST. 5c, 6c, 6d
& 4tl BARS ARE INCLUDED IN BARRIER
RAIL BAR LIST.

SUPERSTRUCTURE NOTES:

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

THE SLAB AS SHOWN INCLUDES A $\frac{1}{2}$ INCH INTEGRAL WEARING SURFACE.

THE MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR
REINFORCING BAR SHALL BE 2 INCHES UNLESS OTHERWISE NOTED
OR SHOWN. ALL REINFORCING STEEL IS TO BE SECURELY WIRED
IN PLACE. SEE "BAR CHAIR NOTE".

ALL REINFORCING SHALL BE GRADE 60.

THE CONCRETE SLAB IS TO BE PLACED WITH A MINIMUM OF CONSTRUCTION JOINTS. PROCEDURES FOR PLACING SLAB CONCRETE SHALL BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULT. SLAB FALSEWORK SHALL BE REMOVED PRIOR TO CONSTRUCTION OF THE BARRIER RAILS.

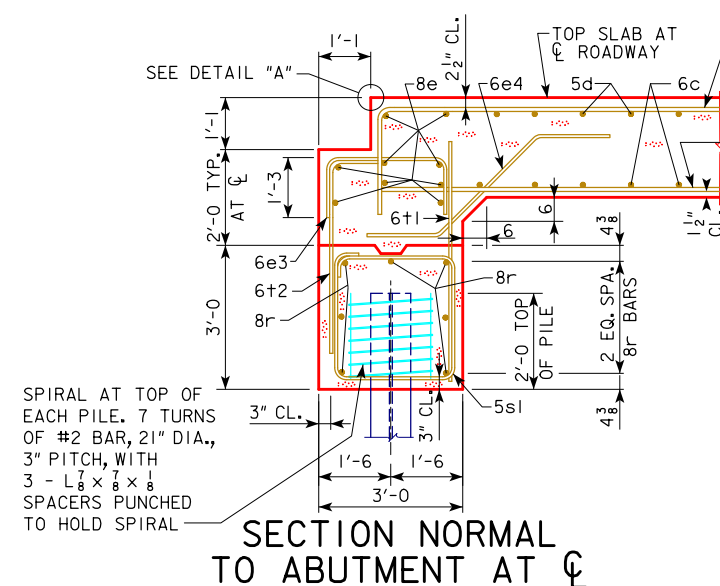
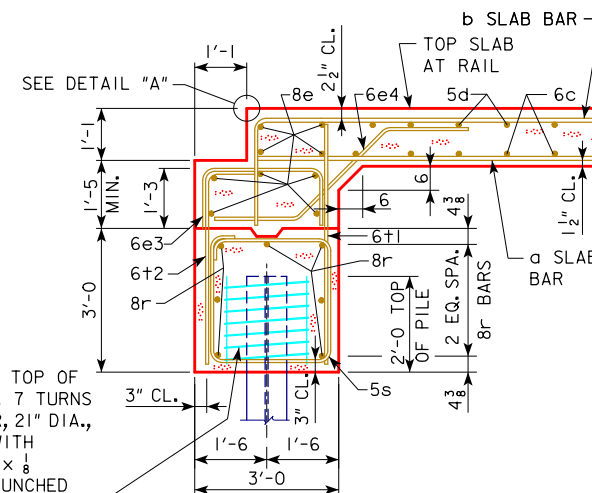
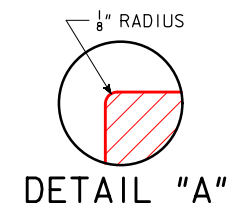
NOTE THAT WHEN PORTLAND CEMENT APPROACH PAVEMENT IS PLACED,
COMPRESSIBLE JOINT MATERIAL MUST BE USED BETWEEN PAVEMENT
AND END OF BRIDGE.

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

COST OF FURNISHING AND PLACING 3" ϕ PVC PIPE IN EACH WING IS INCLUDED IN THE PRICE BID FOR STRUCTURAL CONCRETE.

BAR CHAIR NOTE:

TOP MAT OF REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY. THE BOTTOM MAT OF REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF BAR HIGH CHAIRS OR SLAB BOLSTERS SPACED 4'-0" APART. I.M. 451.01 REQUIREMENTS SHALL APPLY FOR BAR CHAIRS, BAR HIGH CHAIRS, AND SLAB BOLSTERS.



SPIRAL AT TOP OF
EACH PILE. 7 TURNS
OF #2 BAR, 21" DIA.,
3" PITCH, WITH
3 - $L_{\frac{7}{8}} \times \frac{7}{8} \times \frac{1}{8}$
SPACERS PUNCHED
TO HOLD SPIRAL —

SECTION NORMAL TO
ABUTMENT AT GUTTERLINE

DESIGN FOR 0° SKEW

150'-0" x 40'-0" CONTINUOUS
CONCRETE SLAB BRIDGE

45'-6" END SPANS 59'-0" INTERIOR SPAN








































SUPERSTRUCTURE DETAILS

STATION 449+83.00, 46.00' LT (W.B. U.S. 30) MAY, 2019

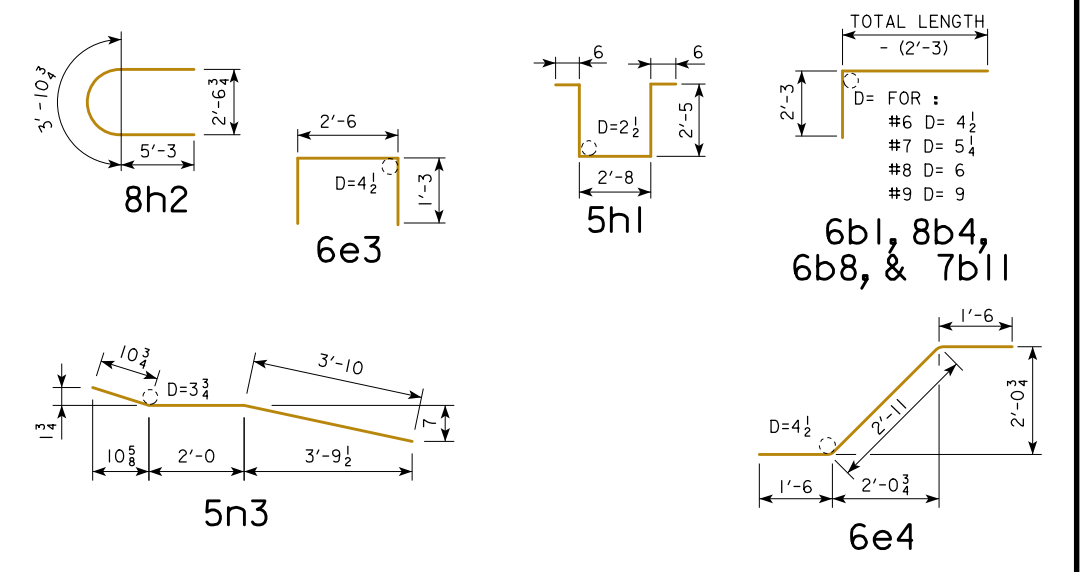
TAMA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 10 OF 17 FILE NO. 31453 DESIGN NO. 218


EPOXY COATED REINFORCING STEEL FOR SUPERSTRUCTURE					
LOCATION	SHAPE	BAR	NO.	LENGTH	WEIGHT
SLAB LONGITUDINAL BOTTOM		10a1	53	32'-9	7469
SLAB LONGITUDINAL BOTTOM		10a2	53	51'-6	11746
SLAB LONGITUDINAL BOTTOM		10a3	53	48'-6	11061
SLAB LONGITUDINAL BOTTOM		9a4	52	36'-3	6409
SLAB LONGITUDINAL BOTTOM		9a5	26	45'-0	3978
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a6	8	44'-7	1213
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a7	8	13'-0	354
SLAB LONGITUDINAL BOTTOM, AT RAIL		9a8	4	56'-8	771
SLAB LONGITUDINAL BOTTOM, AT RAIL		10a9	8	37'-6	1291
SLAB LONGITUDINAL BOTTOM, AT RAIL		10a10	4	35'-0	603
SLAB LONGITUDINAL TOP		6b1	53	7'-9	617
SLAB LONGITUDINAL TOP		11b2	53	32'-9	9223
SLAB LONGITUDINAL TOP		11b3	53	28'-6	8026
SLAB LONGITUDINAL TOP		8b4	53	33'-2	4694
SLAB LONGITUDINAL TOP		11b5	52	30'-0	8289
SLAB LONGITUDINAL TOP		6b6	26	37'-4	1458
SLAB LONGITUDINAL TOP, AT RAIL		6b8	8	35'-0	421
SLAB LONGITUDINAL TOP, AT RAIL		11b9	8	35'-6	1509
SLAB LONGITUDINAL TOP, AT RAIL		6b10	4	28'-0	169
SLAB LONGITUDINAL TOP, AT RAIL		7b11	8	40'-9	667
SLAB LONGITUDINAL TOP, AT RAIL		11b12	8	25'-6	1084
SLAB TRANSVERSE BOTTOM		6c1	147	23'-5	5171
SLAB TRANSVERSE BOTTOM		6c2	147	21'-3	4692
SLAB TRANSVERSE TOP		5d1	147	23'-9	3642
SLAB TRANSVERSE TOP		5d2	147	21'-3	3259
SLAB, TRANSVERSE AT ABUTMENT		8e1	18	26'-4	1266
SLAB, TRANSVERSE AT ABUTMENT		8e2	18	21'-4	1026
SLAB, HAIRPINS, AT ABUTMENT		6e3	92	5'-0	691
SLAB, DIAGONALS, AT ABUTMENT		6e4	92	5'-11	818
PIER CAP HOOPS		5h1	60	8'-6	532
PIER CAP ENDS		8h2	4	14'-5	154
PIER CAP, BOTTOM LONGITUDINAL		8h3	8	25'-5	543
PIER CAP, BOTTOM LONGITUDINAL		8h4	8	19'-11	426
PIER CAP, TOP LONGITUDINAL		8h5	4	26'-2	280
PIER CAP, TOP LONGITUDINAL		8h6	4	21'-5	229
TOP OF SLAB, TRANSVERSE, AT RAIL		5j1	292	8'-6	2589
WING, VERTICAL		5m1	40	4'-5	185
WING, HORIZONTAL BACK FACE		5n1	24	6'-8	167
WING, HORIZONTAL TRAFFIC FACE		5n3	24	6'-9	169
TOTAL - LBS.					106,891

BENT BAR DETAILS



D= FOR :
#6 D= 4 1/2
#7 D= 5 1/4
#8 D= 6
#9 D= 9

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

STAINLESS STEEL REINFORCING FOR SUPERSTRUCTURE					
LOCATION	SHAPE	BAR	NO.	LENGTH	WEIGHT
ABUTMENT PAVING NOTCH BAR		8u1	40	2'-1	223

THE TRANSVERSE REBARS ARE DETAILED WITH A SPLICE LAP. AT THE CONTRACTOR'S OPTION, THIS LAP MAY BE ELIMINATED BY FURNISHING FULL LENGTH BARS WITH NO REDUCTION IN PAY WEIGHT FOR SAME.

DESIGN FOR 0° SKEW

150'-0 x 40'-0 CONTINUOUS CONCRETE SLAB BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPAN

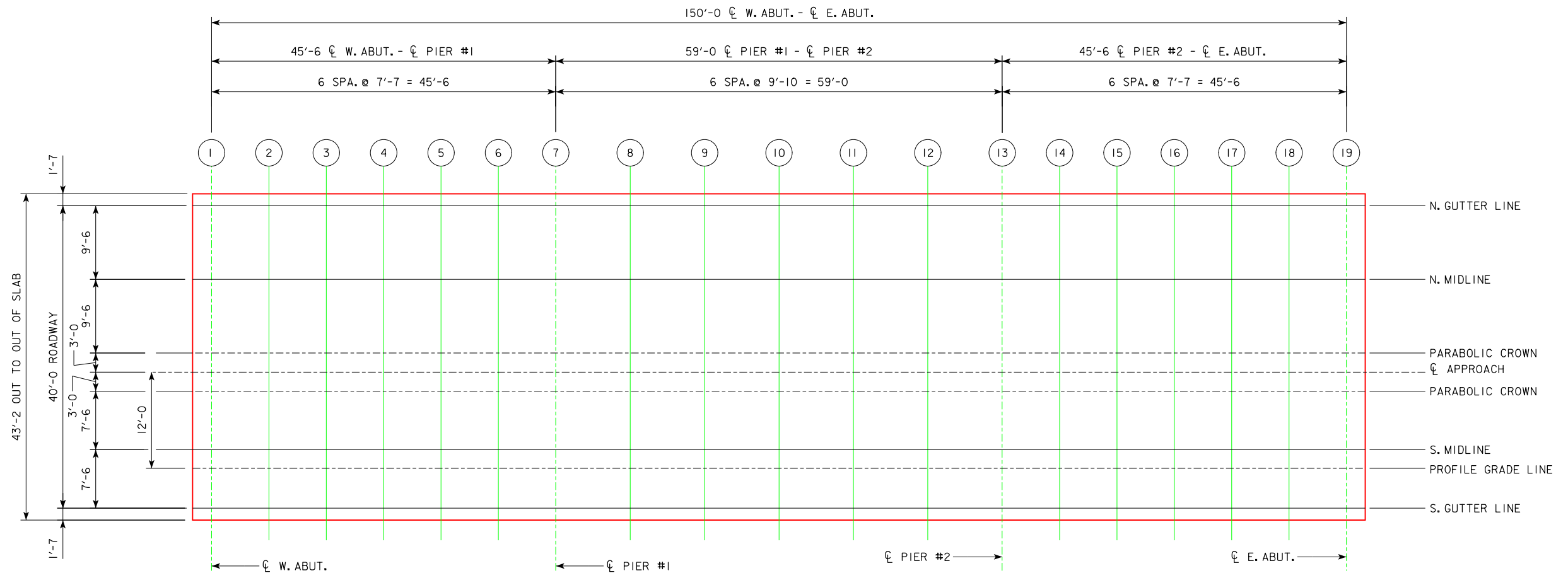
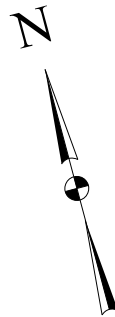
SUPERSTRUCTURE DETAILS

STATION 449+83.00, 46.00' LT (W.B. U.S. 30)MAY. 2019

TAMA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 11 OF 17FILE NO. 31453DESIGN NO. 218



TOP OF SLAB ELEVATION LAYOUT

TOP SLAB ELEVATION																			
LOCATION	℄ W. ABUT.						℄ PIER #1						℄ PIER #2						℄ E. ABUT.
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
NORTH GUTTER LINE	843.85	843.86	843.88	843.90	843.92	843.94	843.95	843.98	844.00	844.02	844.05	844.07	844.09	844.11	844.13	844.15	844.17	844.19	844.20
NORTH MIDLINE	844.04	844.05	844.07	844.09	844.11	844.13	844.14	844.17	844.19	844.21	844.24	844.26	844.28	844.30	844.32	844.34	844.36	844.38	844.39
PARABOLIC CROWN	844.23	844.24	844.26	844.28	844.30	844.32	844.33	844.36	844.38	844.40	844.43	844.45	844.47	844.49	844.51	844.53	844.55	844.57	844.58
APPROACH CENTER LINE	844.26	844.28	844.29	844.31	844.33	844.35	844.37	844.39	844.41	844.44	844.46	844.48	844.51	844.52	844.54	844.56	844.58	844.60	844.61
PARABOLIC CROWN	844.23	844.24	844.26	844.28	844.30	844.32	844.33	844.36	844.38	844.40	844.43	844.45	844.47	844.49	844.51	844.53	844.55	844.57	844.58
SOUTH MIDLINE	844.08	844.09	844.11	844.13	844.15	844.17	844.18	844.21	844.23	844.25	844.28	844.30	844.32	844.34	844.36	844.38	844.40	844.42	844.43
SOUTH GUTTER LINE	843.93	843.94	843.96	843.98	844.00	844.02	844.03	844.06	844.08	844.10	844.13	844.15	844.17	844.19	844.21	844.23	844.25	844.27	844.28

DESIGN FOR 0° SKEW

150'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPAN

TOP OF SLAB ELEVATIONS

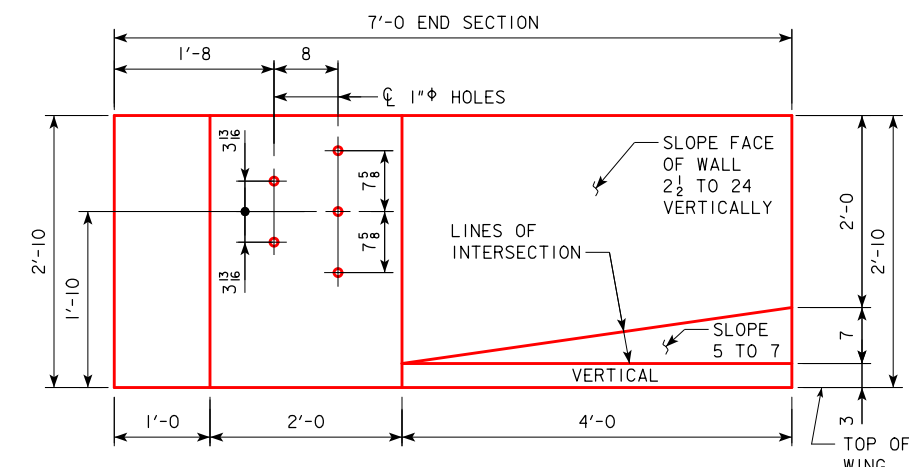
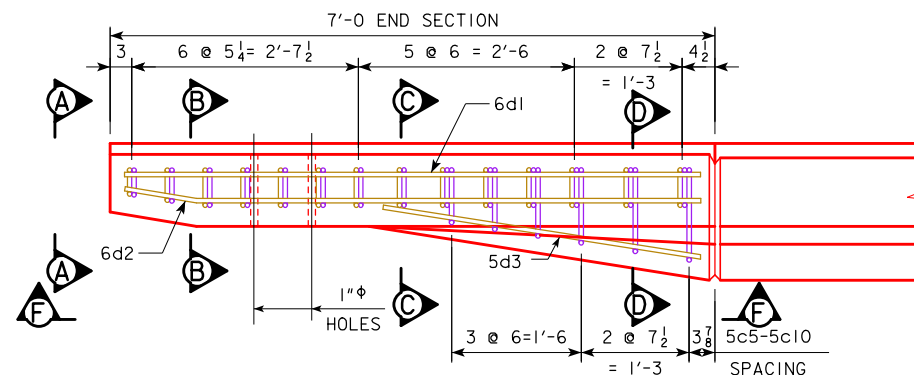
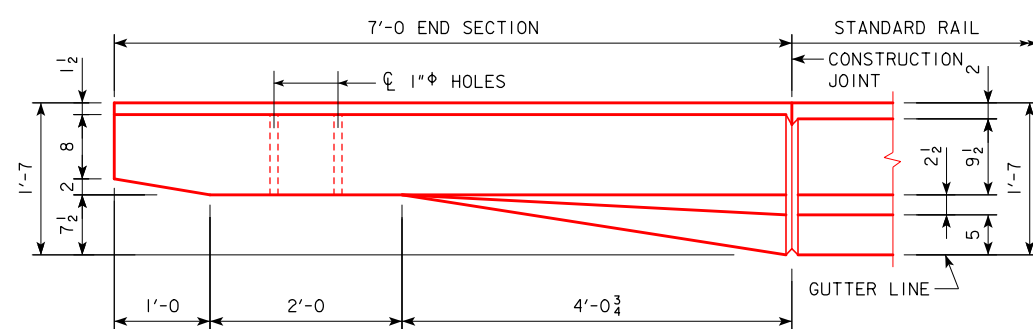
STATION 449+83.00, 46.00' LT (W.B. U.S. 30)

MAY. 2019

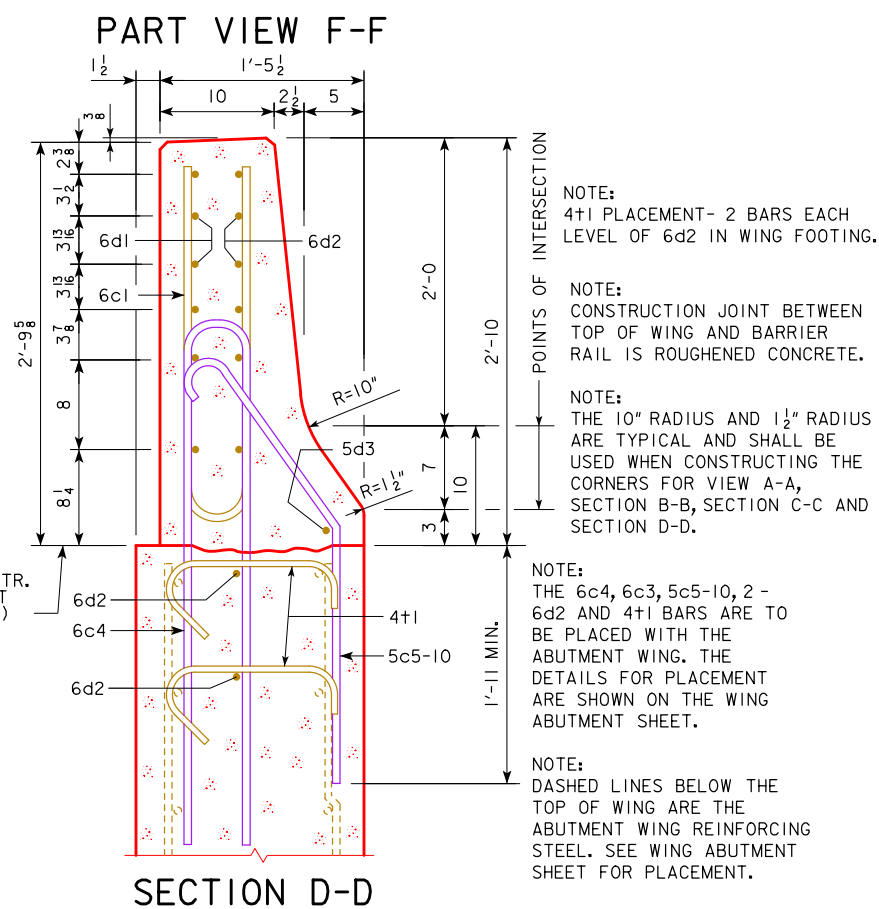
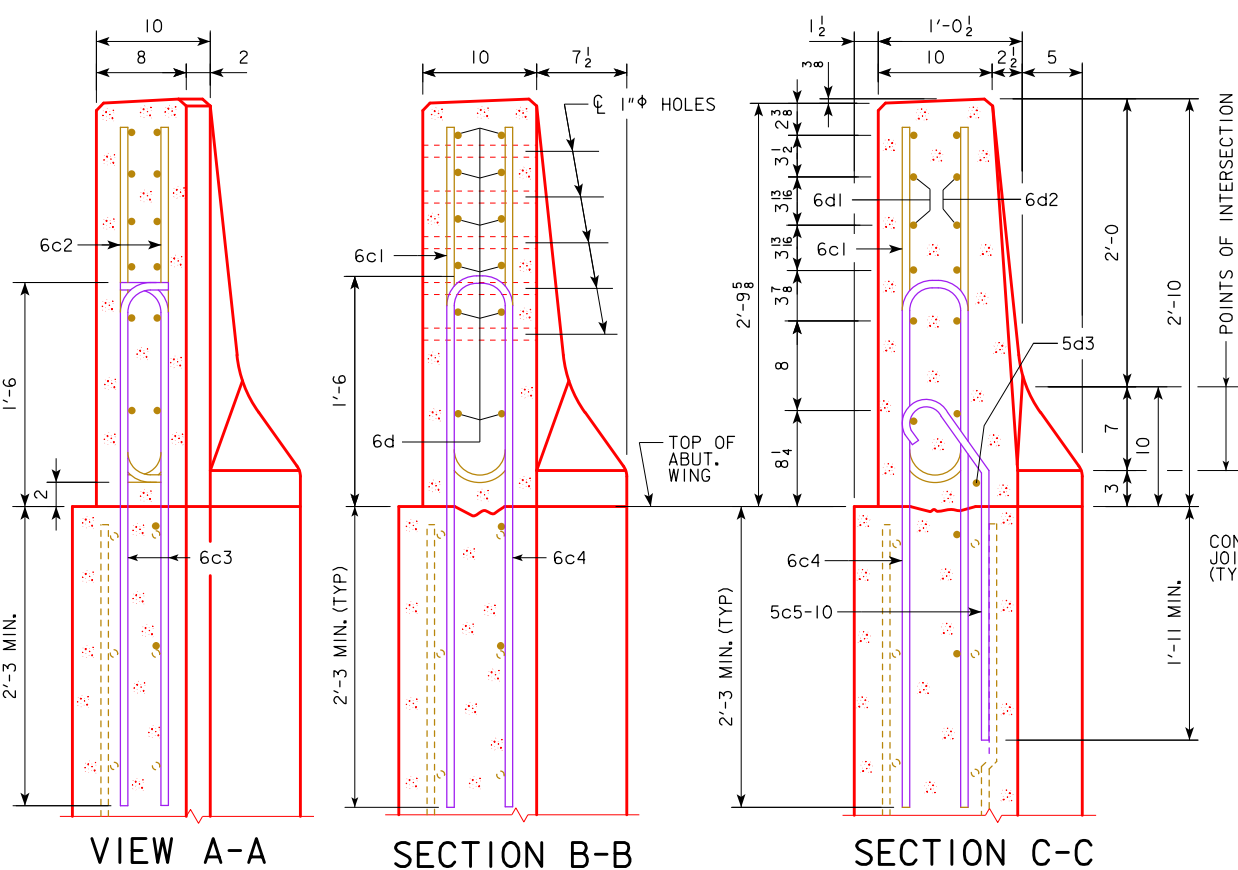
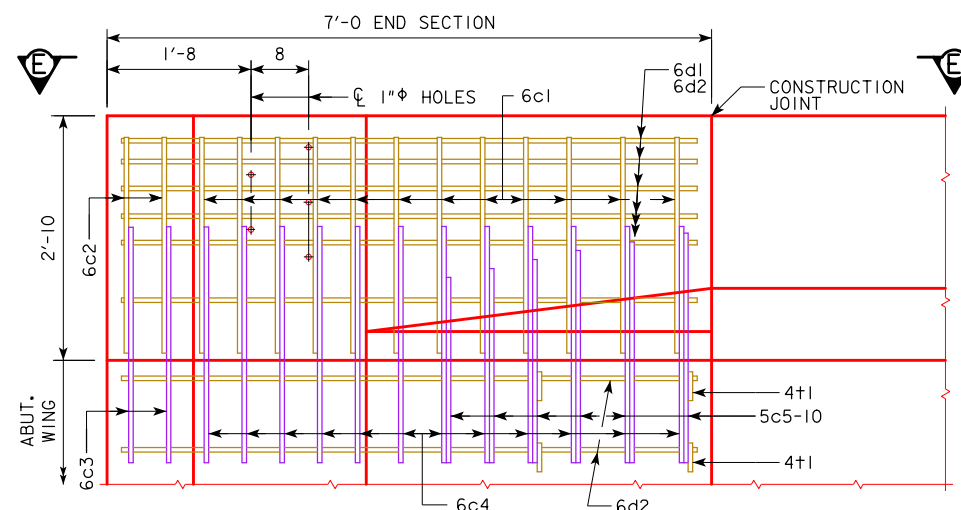
TAMA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION







DESIGN SHEET NO. 12 OF 17FILE NO. 31453DESIGN NO. 218






PROVIDE 5 HOLES FORMED WITH 1"Ø PVC PIPE. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



EPOXY COATED REINF. STEEL - ONE END SECT.

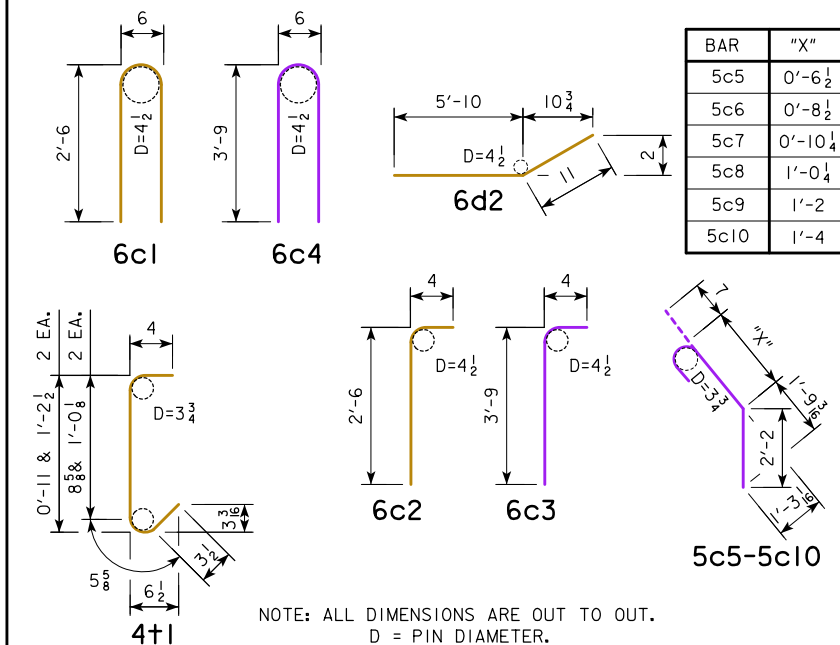
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	RAIL, VERTICAL		12	5'-6	99
6c2	RAIL, VERTICAL		4	2'-10	17
6d1	RAIL, HORIZONTAL		6	6'-8	60
6d2	RAIL, HORIZONTAL		8	6'-9	81
5d3	RAIL, HORIZONTAL		1	3'-9	4
4+1	RAIL, ABUTMENT WING TIE BARS		4	VARIES	5
EPOXY REINF. TOTAL WEIGHT (LBS.)					266

STAINLESS STEEL REINF. STEEL - ONE END SECT

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

CONCRETE PLACEMENT SUMMARY	
SECTION	TOTAL
BARRIER RAIL ONE END SECTION	0.65 CU. YD.

BENT BAR DETAILS



DESIGN FOR 0° SKEW
150'-0" x 40'-0" CONTINUOUS
CONCRETE SLAB BRIDGE
45'-6" END SPANS 59'-0" INTERIOR SPAN
BARRIER RAIL END SECTION
STATION 449+83.00, 46.00' LT (W.B. U.S. 30) MAY, 2015
TAMA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 14 OF 17 FILE NO. 31453 DESIGN NO. 218

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.

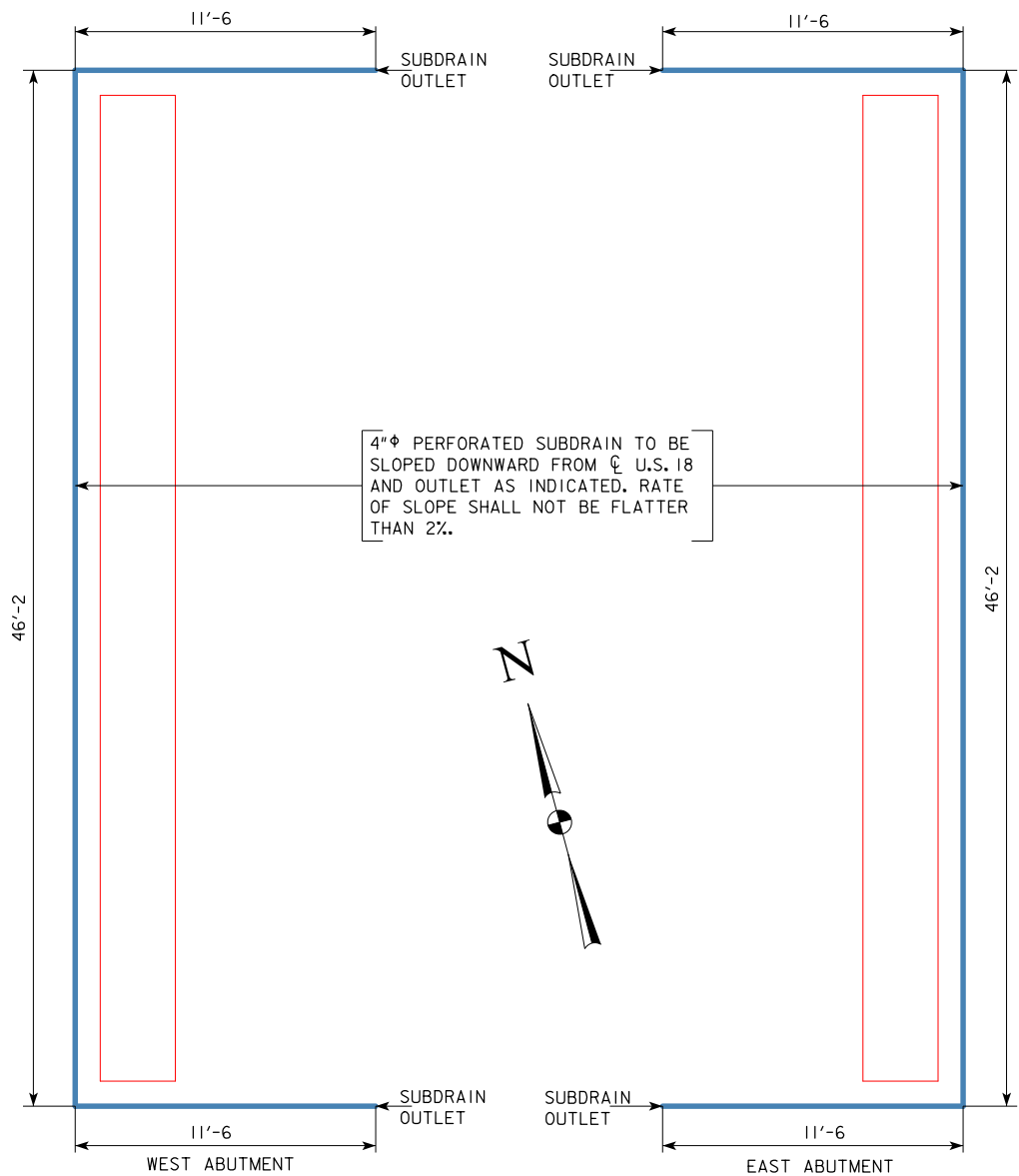
THE SUBDRAIN OUTLET SHALL CONSIST OF A LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET. THE LENGTH OF THE OUTLET PIPE SHALL BE DETERMINED BY THE REVETMENT AND IT'S PLACEMENT LOCATION. THE CONTRACTOR IS TO INSURE THE OUTLET PIPE IS ADEQUATELY STRONG ENOUGH AND WILL NOT BE DAMAGED 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"Ø SUBDRAIN INTO THE 6"Ø METAL OUTLET PIPE, THEN FULLY SEAL THE ENTIRE OPENING WITH GROUT.

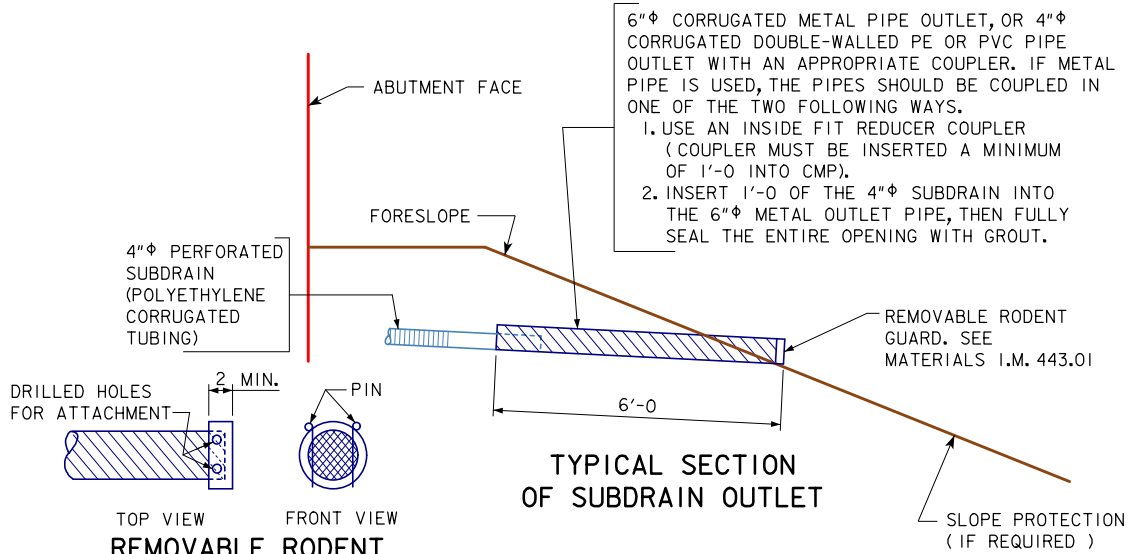
THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE.

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.



SUBDRAIN LAYOUT

SUBDRAIN OUTLET ELEVATIONS	
LOCATION	ELEVATIONS
WEST ABUTMENT	838.28
EAST ABUTMENT	838.63



OUTLET DETAILS

DESIGN FOR 0° SKEW

150'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB BRIDGE

45'-6 END SPANS59'-0 INTERIOR SPAN

SUBDRAIN DETAILS

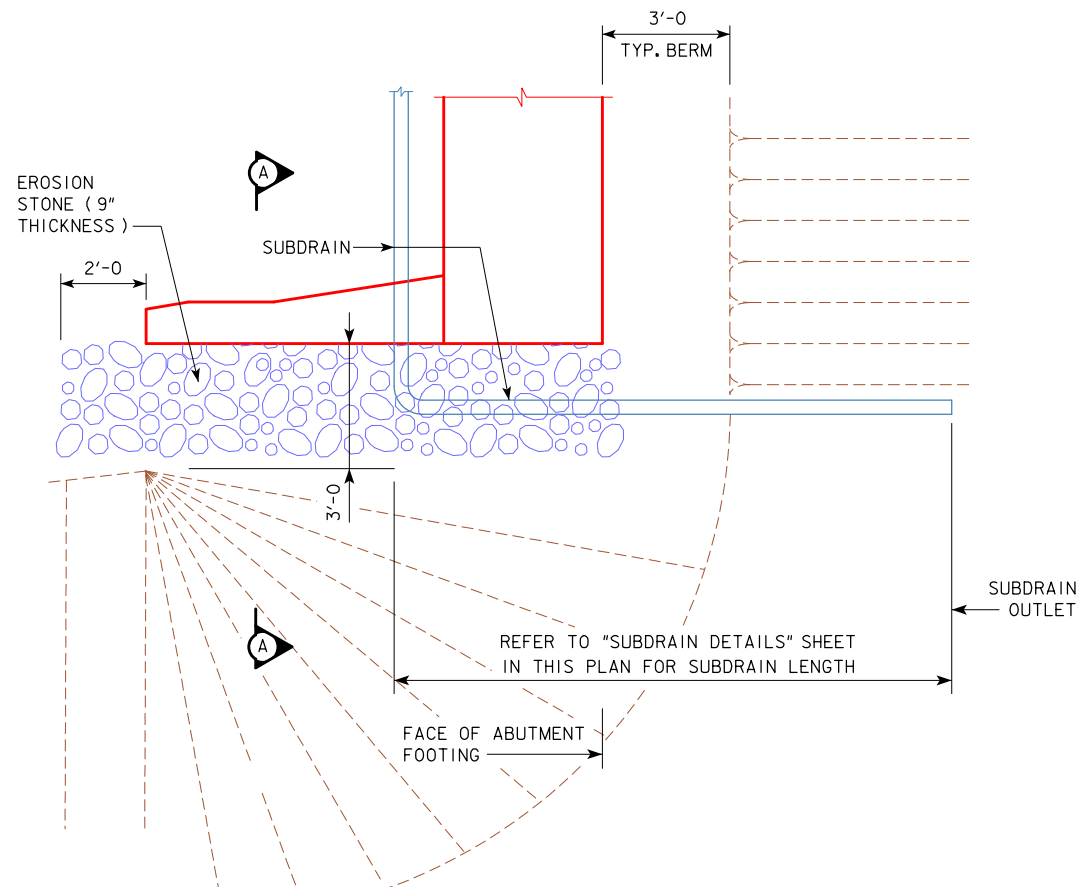
STATION 449+83.00, 46.00' LT (W.B. U.S. 30)

MAY. 2019

TAMA COUNTY

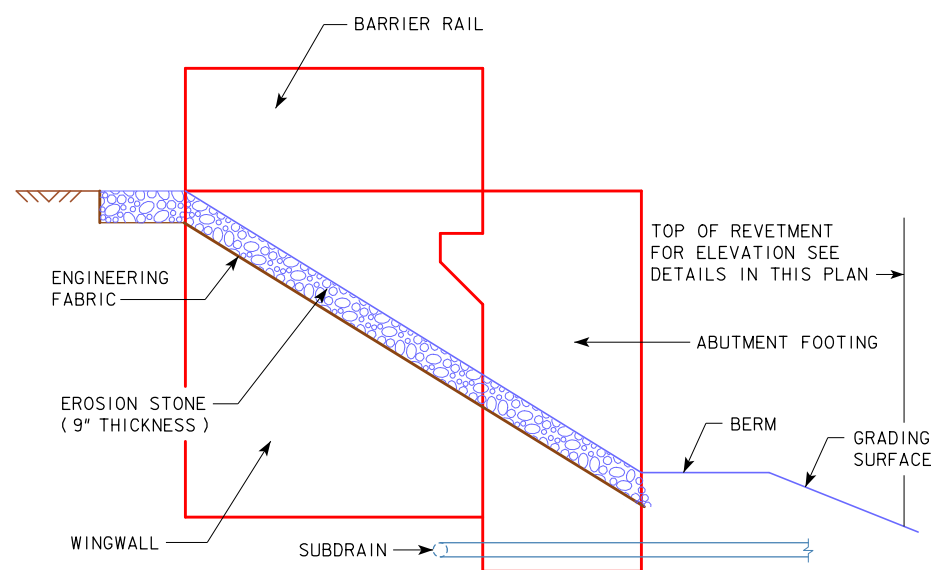
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 15 OF 17FILE NO. 31453DESIGN NO. 218

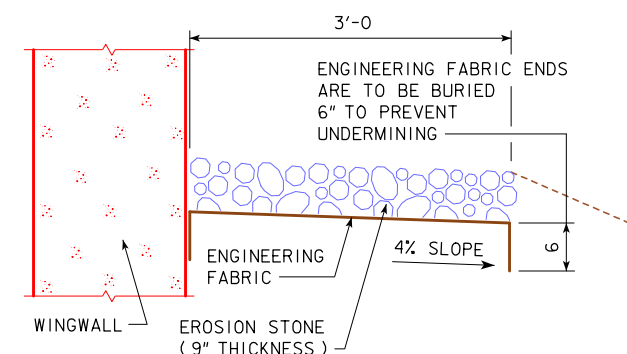


TOP VIEW OF WING ARMORING

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



PROFILE VIEW OF WING ARMORING
(SHOWN FOR INTEGRAL ABUTMENT)



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 CHOKER 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 0° SKEW

150'-0" x 40'-0" CONTINUOUS CONCRETE SLAB BRIDGE

45'-6" END SPANS 59'-0" INTERIOR SPAN

WING ARMORING DETAILS

STATION 449+83.00, 46.00' LT (W.B. U.S. 30) MAY, 2019

TAMA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 16 OF 17 FILE NO. 31453 DESIGN NO. 218

ABUTMENT BACKFILL PROCESS:

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

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

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

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

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

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

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

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

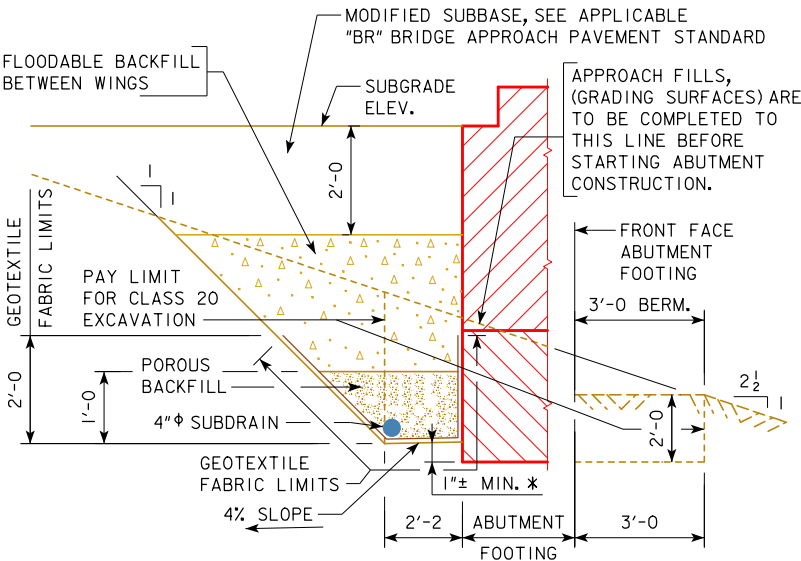
THE COST OF WATER REQUIRED FOR FLOODING, SUBDRAINS, POROUS BACKFILL, FLOODABLE BACKFILL, AND GEOTEXTILE FABRIC FURNISHED AT THE BRIDGE ABUTMENTS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR STRUCTURAL CONCRETE.

NOTE:

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

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

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



SECTION A-A
BACKFILL DETAILS

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

* DIMENSION VARIES DUE TO 2% SUBDRAIN SLOPE.

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

DESIGN FOR 0° SKEW
150'-0 x 40'-0 CONTINUOUS
CONCRETE SLAB BRIDGE
45'-6 END SPANS 59'-0 INTERIOR SPAN
ABUTMENT BACKFILL DETAILS
STATION 449+83.00, 46.00' LT (W.B. U.S. 30) MAY. 2019
TAMA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 17 OF 17 FILE NO. 31453 DESIGN NO. 218

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

0 ENGLISH 40
SCALE IN FEET

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

LOCATION

U.S. 30 E.B. OVER IOWA RIVER
(EAST OVERFLOW)
T 83 N R 16 W
SECTION 15
INDIAN VILLAGE TOWNSHIP
TAMA COUNTY
FHWA NO. 700945
MAINT. NO. 8696.3R030
STA. 449+83.00 \pm M.L., 46.00' RT.
LATITUDE 42.000324°
LONGITUDE -92.704012°

LOCATION

U.S. 30 W.B. OVER IOWA RIVER
(EAST OVERFLOW)
T 83 N R 16 W
SECTION 15
INDIAN VILLAGE TOWNSHIP
TAMA COUNTY
FHWA NO. 700950
MAINT. NO. 8696.3L030
STA. 449+83.00 \pm M.L., 46.00' LT.
LATITUDE 42.000569°
LONGITUDE -92.703934°

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 Mark A. Dell Date 3/13/18

Printed or Typed Name
My license renewal date is December 31, 2019.

Pages or sheets covered by this seal: SPS.1, SPS.2, SPS.3,
SPS.4, and SPS.5

DESIGN FOR 0° SKEW 150'-0 X 40'-0 CONTINUOUS CONCRETE SLAB BRIDGE

45'-6 END SPANS 59'-0 INTERIOR SPAN

BORING LOCATION
STATION 449+83.00 U.S. 30, 46.00' RT (E.B.) DEC. 2018
TAMA COUNTY

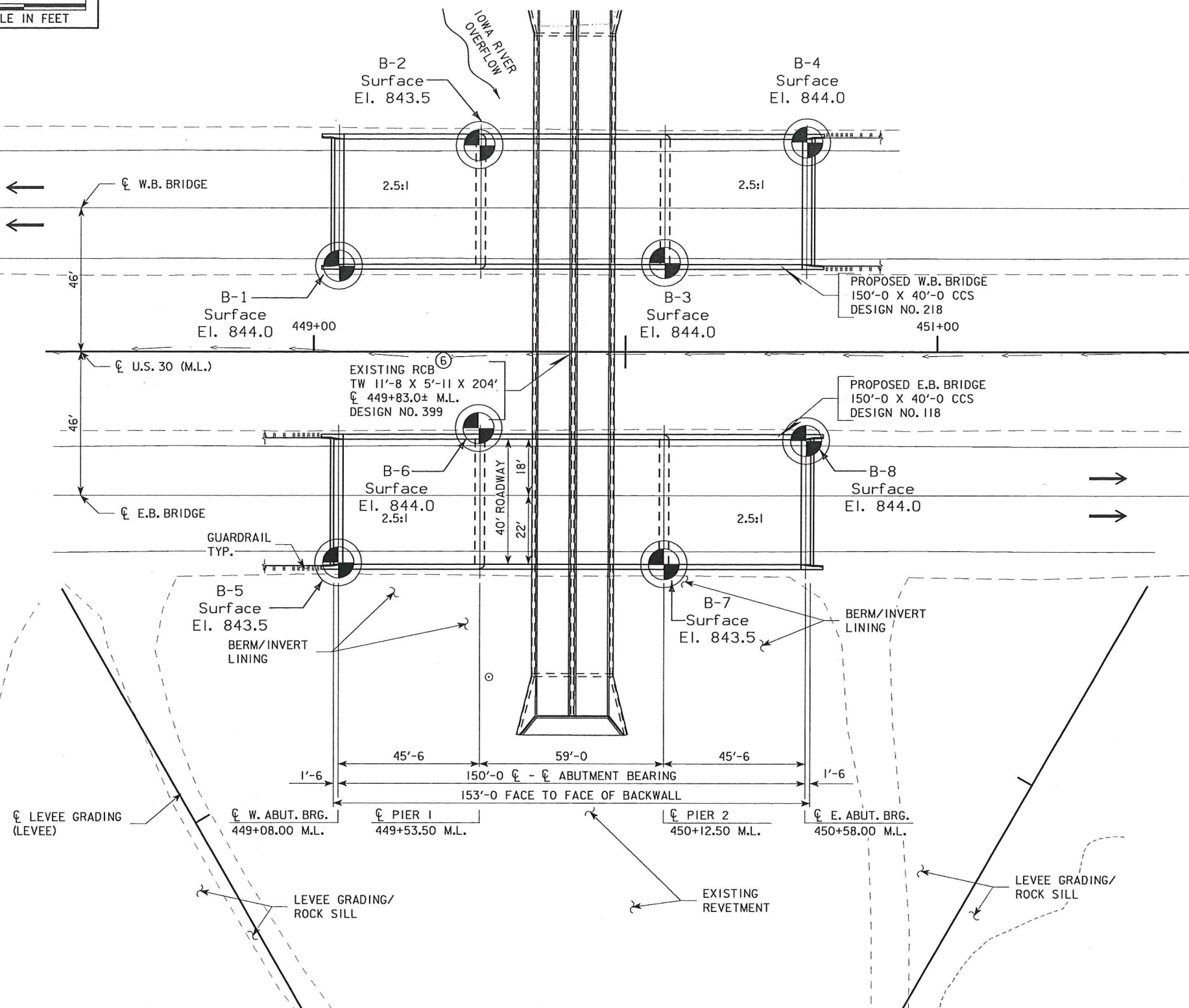
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 5 FILE NO. 31453 DESIGN NO. 118

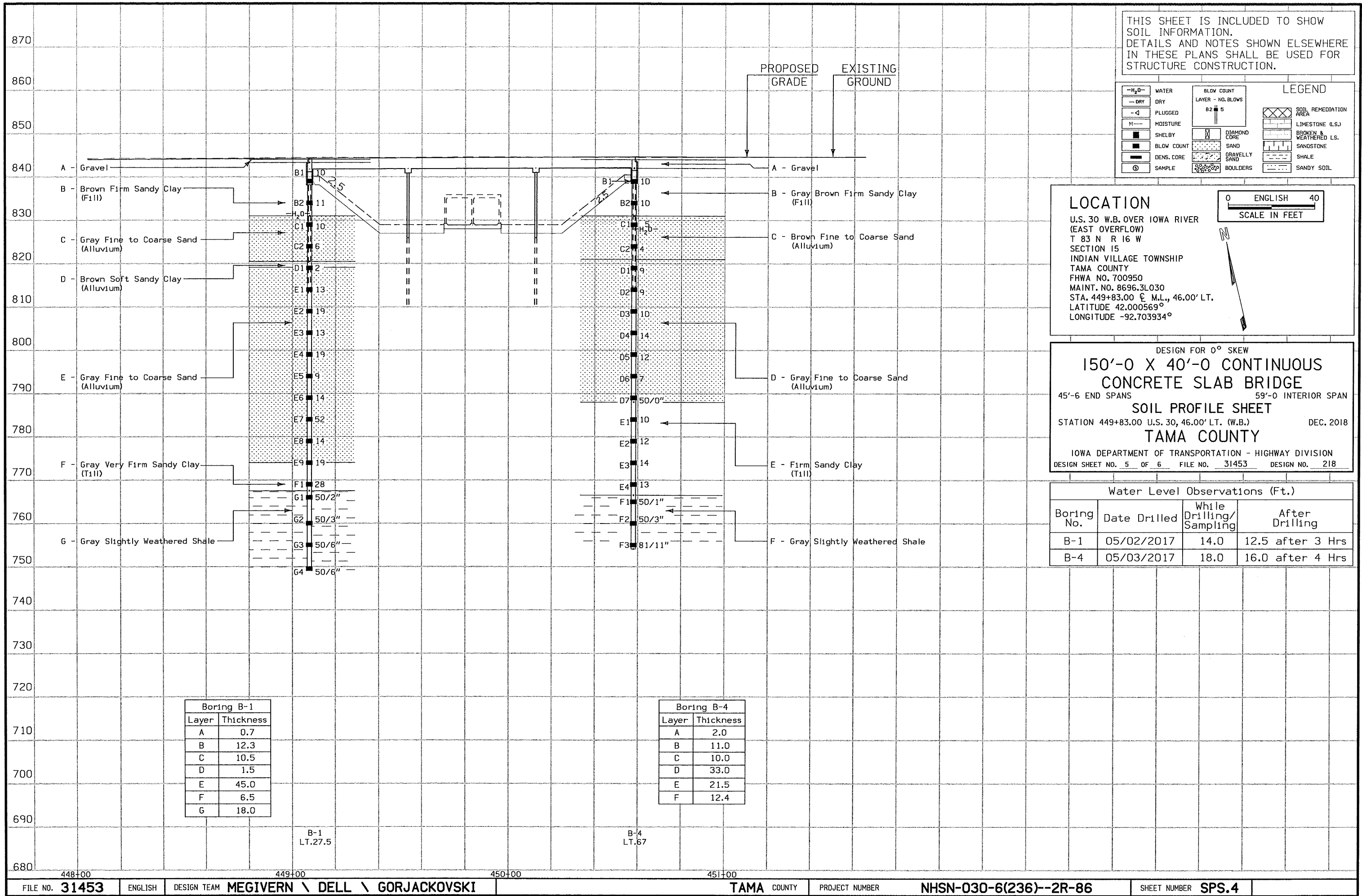
DESIGN FOR 0° SKEW 150'-0 X 40'-0 CONTINUOUS CONCRETE SLAB BRIDGE

45'-6 END SPANS 59'-0 INTERIOR SPAN

BORING LOCATION
STATION 449+83.00 U.S. 30, 46.00' LT. (W.B.) DEC. 2018
TAMA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 5 FILE NO. 31453 DESIGN NO. 218

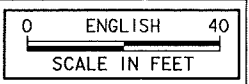




THIS SHEET IS INCLUDED TO SHOW
SOIL INFORMATION.
DETAILS AND NOTES SHOWN ELSEWHERE
IN THESE PLANS SHALL BE USED FOR
STRUCTURE CONSTRUCTION.

LOCATION

U.S. 30 W.B. OVER IOWA RIVER
(EAST OVERFLOW)
T 83 N R 16 W
SECTION 15
INDIAN VILLAGE TOWNSHIP
TAMA COUNTY
FHWA NO. 700950
MAINT. NO. 8696.3L030
STA. 449+83.00 @ M.L., 46.00' LT.
LATITUDE 42.00569°
LONGITUDE -92.703934°



Water Level Observations (Ft.)			
Boring No.	Date Drilled	While Drilling/ Sampling	After Drilling
B-2	05/03/2017	20.0	19.0 after 2 Hrs
B-3	05/03/2017	13.5	12.5 after 4 Hrs

DESIGN FOR 0° SKEW
**150'-0 X 40'-0 CONTINUOUS
CONCRETE SLAB BRIDGE**
45'-6 END SPANS 59'-0 INTERIOR SPAN
SOIL PROFILE SHEET
STATION 449+83.00 U.S. 30, 46.00' LT. (W.B.) DEC. 2018
TAMA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 6 OF 6 FILE NO. 31453 DESIGN NO. 218

SHELBY TUBE CORE DATA

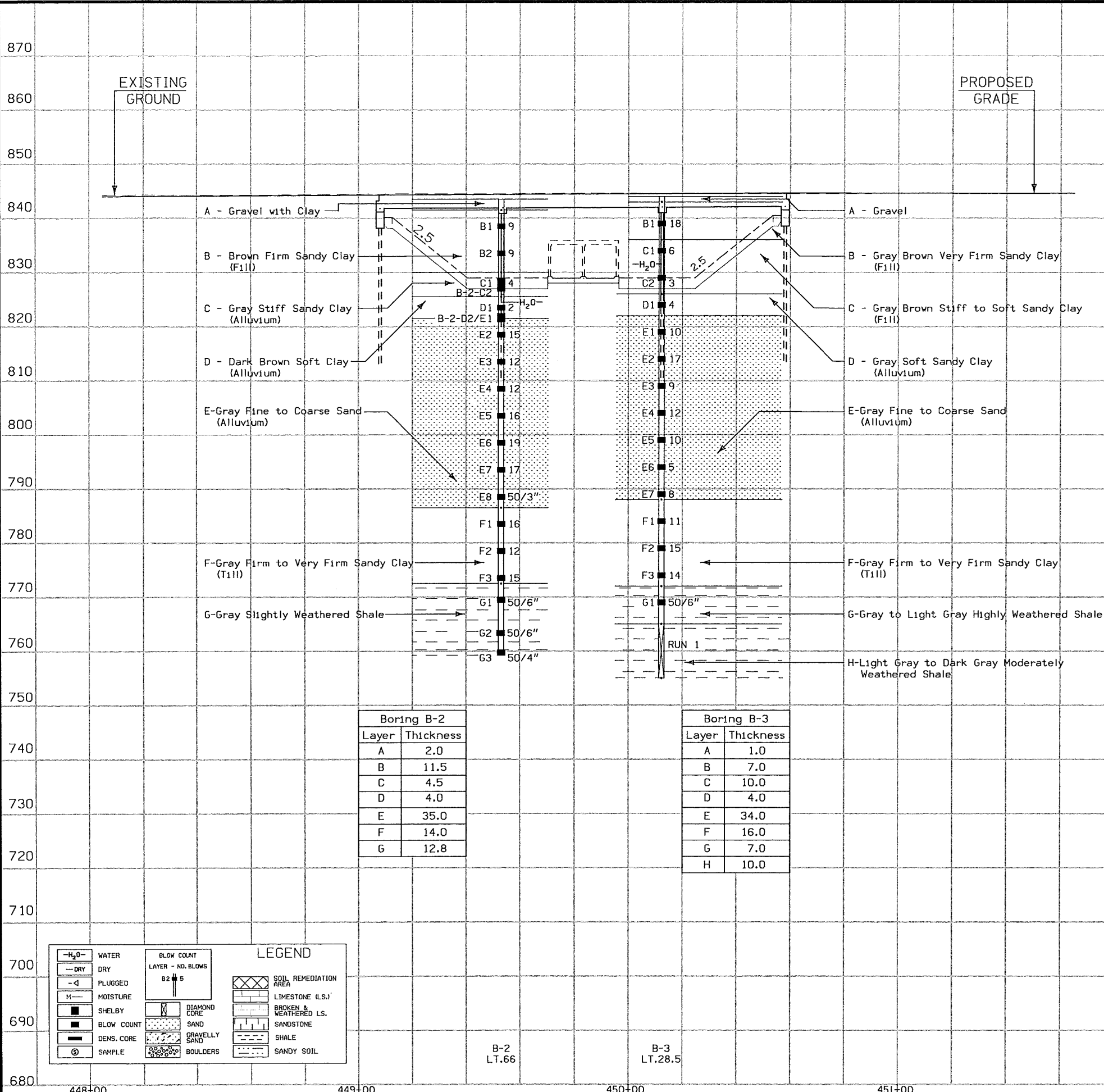
CORE NO.	B-2-C2	B-2-D2/E1
DEPTH IN FEET	15.5 - 17.5	20.5 - 22.5
CLASSIFICATION (AASHTO)	--	A-7-6(32)
COEFF. CONSOL. (SQ. FT / DAY)	--	--
TRIAXIAL COMPRESSION	--	CU
COHESION - PSF	--	86.4
FRICTION COEFF.	--	0.2736
MOISTURE CONTENT %	24	38
DRY DENSITY - PCF	95	83
CU-CONSOLIDATED UNDRAINED		
UU-UNCONSOLIDATED UNDRAINED		
UC-UNCONFINED COMPRESSION ($c=1/2 Q_u$)		

ROCK CORE INFORMATION

Boring	Approx. Surf. El. (ft)	Run No.	Interval (ft)	Recovery (%)	RQD (%)
B-3	844.0	RUN 1	79.0 - 89.0	90%	42%

ROCK CORE COMPRESSIVE STRENGTH TESTING REPORT

Boring	Elevation (ft)	Material Description	Compressive Strength (psi)	Moisture (%)	Dry Density (PCF)
B-3	764.0 - 763.7	Light Gray to Dark Gray Moderately Weathered Shale	1,420	9	149
	755.4 - 755.1		703	7	132



Boring B-2	
Layer	Thickness
A	2.0
B	11.5
C	4.5
D	4.0
E	35.0
F	14.0
G	12.8

Boring B-3	
Layer	Thickness
A	1.0
B	7.0
C	10.0
D	4.0
E	34.0
F	16.0
G	7.0
H	10.0

100-0A
10-28-97

FILE NO. 31453	ENGLISH	DESIGN TEAM Gustafson\Smyth
-----------------------	---------	------------------------------------

100-1D
10-18-05

2401-6745650	REMOVAL OF EXISTING STRUCTURES
	Refer to Tab. 110-2 on CD Sheet for additional information.

100-4A
10-29-02

Tama COUNTY	PROJECT NUMBER	NHSX-030-6(236) -- 3H-86	SHEET NUMBER	C.1
--------------------	----------------	---------------------------------	--------------	------------

[illegible]

281-1
10-18-16

SECTION 404 PERMIT AND CONDITIONS

Construct this project according to the requirements of U.S. Army Corps of Engineers Nationwide 14, Permit No. 2018-1366. 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.

282-3
04-17-18

TEMPORARY STREAM CROSSING, CAUSEWAY, OR EQUIPMENT PAD

[illegible]

232-11
04-16-19

EROSION CONTROL (STABILIZING CROP SEEDING)

If outside of permanent seeding dates in Section 2601 of the Standard Specifications, or if required by a storm water permit, place stabilizing crop, fertilizer, and mulch on the disturbed area as follows:

Place seed and fertilize according to the requirements of Article 2601.03,C,1 and Section 4169 of the Standard Specifications.

Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.

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

262-5
10-18-05

UTILITIES (POINT 25 PROJECT)

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

<div>232-3C 04-16-19</div> <div>EROSION CONTROL (NATIVE GRASS SEEDING)</div>	
Following the completion of work in a disturbed area and according to the seeding dates in Section 2601 of the Standard Specifications, place seed and mulch on the disturbed area lying 8 feet or more beyond the shoulder as follows:	
SEED MIX:	
Big bluestem (<i>Andropogon gerardii</i>)	6 lbs. PLS/Acre (7.0 kg/ha)
Indiangrass (<i>Sorghastrum nutans</i>)	6 lbs. PLS/Acre (7.0 kg/ha)
Little bluestem (<i>Schizachyrium scoparium</i>)	6 lbs. PLS/Acre (7.0 kg/ha)
Partridge Pea (<i>Chamaecrista fasciculata</i>)	4 lbs. PLS/Acre (4.5 kg/ha)
Sideoats grama (<i>Bouteloua curtipendula</i>)	4 lbs. PLS/Acre (4.5 kg/ha)
Canada wildrye (<i>Elymus canadensis</i>)	2 lbs. PLS/Acre (2.2 kg/ha)
Switchgrass (<i>Panicum virgatum</i>)	1 lbs. PLS/Acre (1.1 kg/ha)
Oats (<i>Avena sativa</i>)	32 lbs./Acre (36.0 kg/ha)
Furnish Big bluestem, Indiangrass, Canada wildrye and Little bluestem that is debarbed or equal to facilitate the application of seed.	
Furnish seed certified as Source Identified Class (Yellow Tag) Source G0-Iowa. Oats are excluded from this requirement.	
Place seed according to the requirements of Article 4169.02 of the Standard Specifications.	
Place mulch according to the requirements of Articles 2601.03,E,2,a and 4169.07,A of the Standard Specifications.	
Preparing the seedbed, furnishing and applying seed and mulch are incidental to mobilization and will not be paid for separately.	

FILE NO.	31453	ENGLISH	DESIGN TEAM	Gustafson\Smyth		Tama	COUNTY	PROJECT NUMBER	NHSX-030-6(236) - - 3H-86	SHEET NUMBER	C.3	
----------	--------------	---------	-------------	------------------------	--	-------------	--------	----------------	----------------------------------	--------------	------------	--

[illegible][illegible][illegible]