

01-15-2016 LETTING ITEM 118

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	1
		ILLINOIS	CONTRACT NO. 87584	

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**PLANS FOR PROPOSED  
FEDERAL AID PROJECT  
SURFACE TRANSPORTATION  
RURAL-BRIDGE (FY-16)**

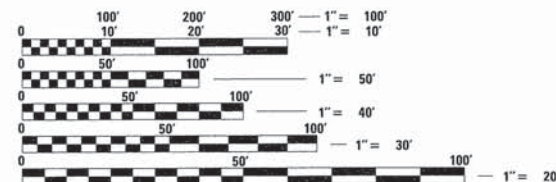
**FAS 244 (COUNTY HIGHWAY 9) (BACKBONE ROAD)  
SECTION 14-00244-00-BR  
PROJECT BRS-0244(106)  
STRUCTURE REPLACEMENT  
BUREAU COUNTY**

C-93-005-14

**STANDARDS**

- 000001-06 STANDARD SYMBOLS, ABBREVIATIONS, AND PATTERNS
- 515001-03 NAME PLATE FOR BRIDGES

**FUNCTIONAL CLASSIFICATION  
MAJOR COLLECTOR  
DESIGN SPEED 40 MPH  
2016 ADT - 1,225  
RURAL GUIDELINES**

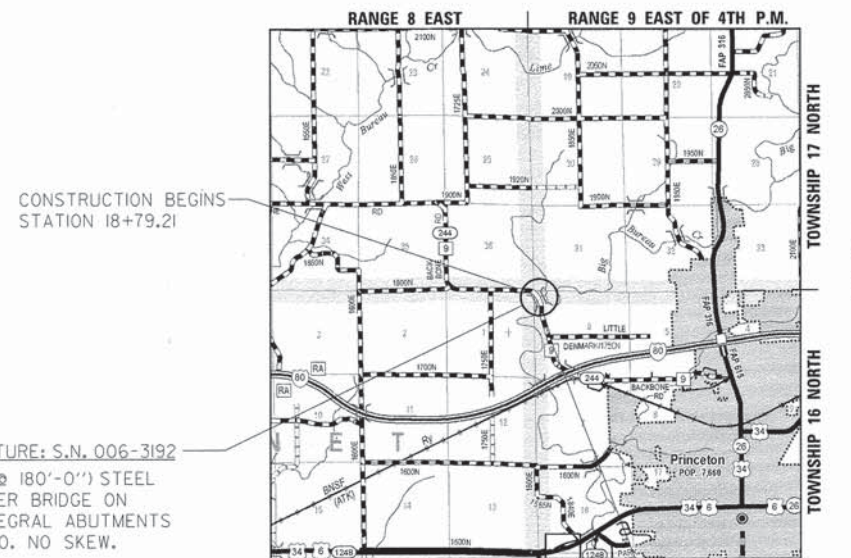


FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

**J.U.L.I.E.  
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION  
1-800-892-0123  
OR 811**

**PROJECT ENGINEER: MAC  
PROJECT MANAGER: BKC**

**CONTRACT NO. 87584**



PROPOSED STRUCTURE: S.N. 006-3192  
A SINGLE SPAN (1 @ 180'-0") STEEL PLATE BEAM GIRDER BRIDGE ON MODIFIED SEMI-INTEGRAL ABUTMENTS AT STATION 20+00. NO SKEW.

GROSS LENGTH = 241.58 FT. = 0.046 MILE  
NET LENGTH = 241.58 FT. = 0.046 MILE

**UTILITIES:**

CH 9 (BACKBONE RD.) OVER BIG BUREAU CREEK  
BUREAU COUNTY  
BUREAU, WYANET, DOVER & PRINCETON TOWNSHIP  
LOCATE# A2531372, A2531378, A2531382, A2531386

**FRONTIER COMMUNICATIONS (NORTH)**

ATTN: GARRETT BURT  
112 ELM STREET  
SYCAMORE, IL 60178  
815-895-1538

**COMCAST**

ATTN: MARTHA GIERAS  
688 INDUSTRIAL DR.  
ELMHURST, IL 60126  
PH: 630-600-6352

**CORN BELT ENERGY CORP.**

ATTN: BARRY BURKMAN  
1702 W. PERU  
PRINCETON, IL 61356  
PH: 309-662-5330 EXT. 301

**NICOR GAS**

GASMAPS@AGLRESOURCES.COM  
PH: 630-388-2362

**NATURAL GAS PIPELINE CO.**

ATTN: GREG SMITH  
370 VAN GORDON ST.  
LAKEWOOD, CO 80228  
PH: 303-914-7848  
EMAIL: GREG\_SMITH@KINDERMORGAN.COM

**ANR PIPELINE CO**

ATTN: KITTY MARTIN  
PH: 248-205-7596  
EMAIL: KITTY\_MARTIN@TRANSCANADA.COM  
US\_CROSSINGS@TRANSCANADA.COM



LOCATION OF SECTION INDICATED THIS: - [black rectangle] -

BUREAU COUNTY HIGHWAY DEPARTMENT		
APPROVED	<i>November 10</i>	2015
	<i>John A. ...</i>	BUREAU COUNTY ENGINEER
PASSED	<i>11/12</i>	2015
	<i>Dan ...</i>	DISTRICT 3 LOCAL ROADS & STREETS ENGINEER
RELEASING FOR BID BASED ON LIMITED REVIEW	<i>11/12</i>	2015
	<i>Paul ...</i>	DEPUTY DIRECTOR OF HIGHWAYS, REGION 2 ENGINEER



*Megan A. Lackey*  
DATE: 11/11/2015  
EXPIRES 11/30/15

**WILLETT HOFMANN  
& ASSOCIATES INC**  
ENGINEERING ARCHITECTURE LAND SURVEYING  
809 EAST 2ND STREET, DIXON, IL 61021-0367  
T: 815-284-3381 DESIGN FIRM: #184-000918

**SUMMARY OF QUANTITIES**

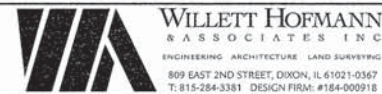
CONSTRUCTION TYPE CODE: 0011

PAY CODE	QUANTITY	UNIT	ITEM
*50100100	1	EACH	REMOVAL OF EXISTING STRUCTURES
50300100	8	EACH	FLOOR DRAINS
*50300225	130.0	CU YD	CONCRETE STRUCTURES
50300255	375.7	CU YD	CONCRETE SUPERSTRUCTURE
50300260	808	SQ YD	BRIDGE DECK GROOVING
50300280	7.6	CU YD	CONCRETE ENCASEMENT
50300300	1,050	SQ YD	PROTECTIVE COAT
50500105	1	L SUM	FURNISHING AND ERECTING STRUCTURAL STEEL
50500505	1,820	EACH	STUD SHEAR CONNECTORS
50800205	97,690	POUND	REINFORCEMENT BARS, EPOXY COATED
51200959	888	FOOT	FURNISHING METAL SHELL PILES 14" X 0.312"
51202305	888	FOOT	DRIVING PILES
51203200	2	EACH	TEST PILE METAL SHELLS
51500100	1	EACH	NAME PLATES
52100530	30	EACH	ANCHOR BOLTS, 1 1/4"
59000200	20	FOOT	EPOXY CRACK INJECTION
59100100	84	SQ YD	GEOCOMPOSITE WALL DRAIN
67100100	1	L SUM	MOBILIZATION
*Z0001900	22	EACH	ASBESTOS BEARING PAD REMOVAL
Z0012755	63	SQ FT	STRUCTURAL REPAIR OF CONCRETE (DEPTH GREATER THAN 5 INCHES)
Z0013798	1	L SUM	CONSTRUCTION LAYOUT
Z0046304	128	FOOT	PIPE UNDERDRAINS FOR STRUCTURES 4"
*X2070302	1,675	TON	POROUS GRANULAR EMBANKMENT, SPECIAL
*X2810210	273	TON	STONE RIPRAP, CLASS A5 (SPECIAL)
*X5210130	5	EACH	HIGH LOAD MULTI-ROTATIONAL BEARINGS, GUIDED EXPANSION, 300K
*Z0028416	1	L SUM	GEOTECHNICAL REINFORCEMENT

\*See contract documents for Special Provisions.

+Specialty Item

FILE - S:\PROJECTS\2013\1192013\BUREAU\DESIGN\STRUCT\20.Draining\1192013.Summary of Quantities.dgn



DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
**FAS 244 (CH 9)(BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

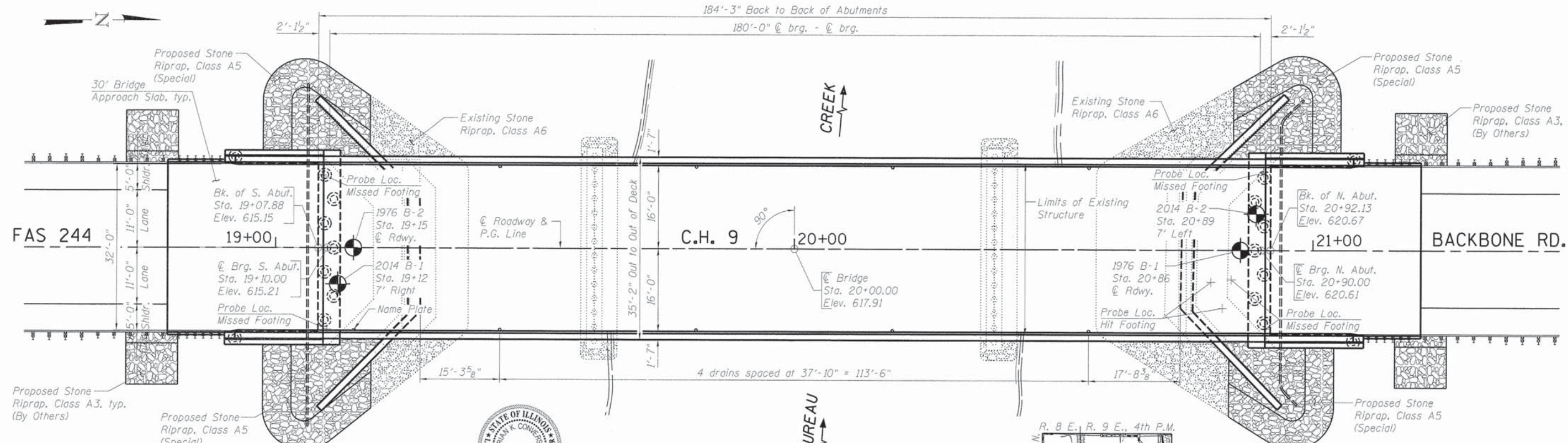
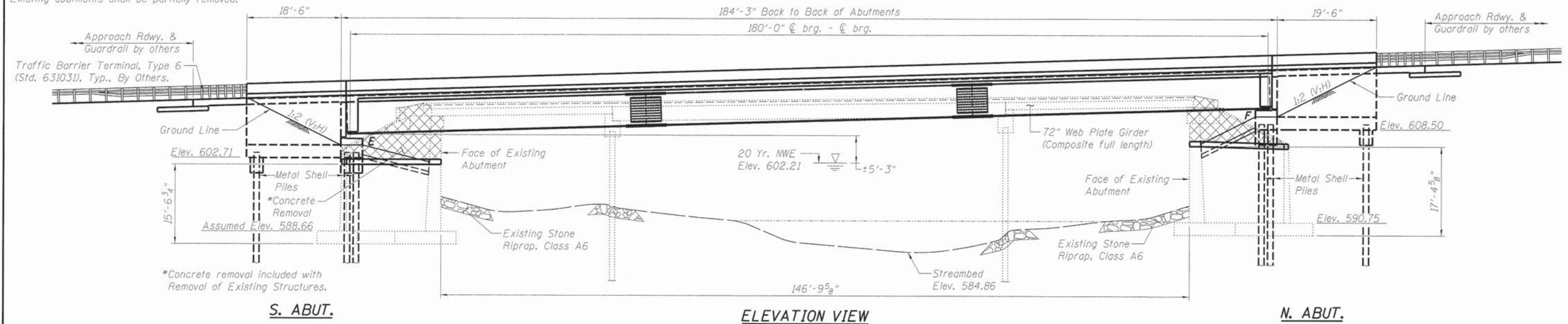
**SUMMARY OF QUANTITIES**  
**STRUCTURE NO. 006-3192**

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	2
WHA* 1192013		CONTRACT NO. 87584		
ILLINOIS FED. AID PROJECT BRS-0244(106)				

Bench Mark: #401 Chis. "□" on northwest hub guard of structure, ±12.2' Lt. of Sta. 19+57.32, El. 615.66

Existing Structure: The original structure consisted of a single span steel truss supported by the closed concrete abutments that exist today. The original constructed date is not known. The truss collapsed due to overloading. The existing superstructure and piers were constructed in 1976 under Section 76-00115-00-BR. The existing structure consists of three spans (37'-0"; 77'-0"; 37'-0") of 17" (Span 1 & 3) and 33" (Span 2) precast prestressed concrete deck beams on the original closed abutments and piers consisting of individual metal shell piles. The structure measures 152'-6" back to back of abutments and 33'-0" out to out of deck. Structure to be removed and replaced. Road will be closed to traffic during construction.

Existing abutments shall be partially removed.



- Commitments:**
1. Provide 6' Hot-Mix Asphalt Shoulders through approved construction limits shown in PDR.
  2. Rumble Strips will be provided on shoulders.
  3. Advanced Warning signs will be provided for curves.
  4. Deer crossing signs will be provided.
  5. Chevrons will be provided along the curves.
  6. Guardrail Markers will be provided on the approach guardrail and across the bridge. Terminal Markers will be used at the ends of the guardrail.

**Brian K. Convent**  
 DATE: 11/11/2015  
 EXPIRES 11/30/16

"I certify that to the best of my knowledge, information and belief, this bridge design is Structurally adequate for the design loading shown on the plans, the design is an economical one for the style of structure and complies with requirements of the current 'AASHTO Bridge Design Specifications.'"



**GENERAL PLAN AND ELEVATION  
 FAS 244 (C.H. 9) (BACKBONE RD.)  
 OVER BIG BUREAU CR.  
 SEC 14-00244-00-BR  
 BUREAU COUNTY  
 STATION 20+00  
 STRUCTURE NO. 006-3192**

FILE # S:\PROJECTS\2013\112013\BUREAU\DESIGN\STRUCT\20\_Drawings\112013\_General Plan & Elevation.dgn

**WILLET HOFMANN & ASSOCIATES INC.**  
 ENGINEERING ARCHITECTURE LAND SURVEYING  
 809 EAST 2ND STREET, DIXON, IL 61021-0367  
 T: 815-284-3381 DESIGN FIRM: #184-000918

DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**(BUREAU COUNTY)  
 FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK  
 STATION 20 + 00.00**

STRUCTURAL SHEET NO. 1 OF 34 SHEETS

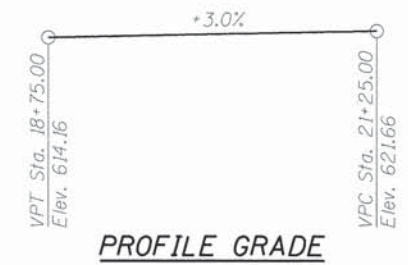
F.A.S. RT.E.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	3
WHA# 1192013		CONTRACT NO. 87584		
ILLINOIS FED. AID PROJECT BRS-0244(106)				

**BILL OF MATERIAL - BRIDGE**

ITEM	UNIT	SUPER	SUB	TOTAL
Removal Of Existing Structures	Each			1
Floor Drains	Each	8		8
Concrete Structures	Cu Yd	20.9	109.1	130.0
Concrete Superstructure	Cu Yd	375.7		375.7
Bridge Deck Grooving	Sq Yd	808		808
Concrete Encasement	Cu Yd		7.6	7.6
Protective Coat	Sq Yd	1,050		1,050
Furnishing And Erecting Structural Steel	L sum	1		1
Stud Shear Connectors	Each	1,820		1,820
Reinforcement Bars, Epoxy Coated	Pound	79,680	18,010	97,690
Furnishing Metal Shell Piles 14" X 0.312"	Foot		888	888
Driving Piles	Foot		888	888
Test Pile Metal Shells	Each		2	2
Name Plates	Each	1		1
Anchor Bolts, 1/4"	Each	30		30
Epoxy Crack Injection	Foot		20	20
Geocomposite Wall Drain	Sq Yd		84	84
Structural Repair Of Concrete (Depth Greater Than 5 Inches)	Sq Ft		63	63
Pipe Underdrains For Structures 4"	Foot		128	128
Porous Granular Embankment, Special	Ton		1,675	1,675
Stone Riprap, Class A5 (Special)	Ton		273	273
High Load Multi-Rotational Bearings, Guided Expansion, 300K	Each		5	5
Geotechnical Reinforcement	Sq Yd		1	1
Asbestos Bearing Pad Removal	Each		22	22

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- 2 General Data
- 3-4 Riprap and Pile Layout
- 5 Existing South Abutment Removal and Repair Details
- 6 Existing North Abutment Removal and Repair Details
- 7 Top of Slab Elevations
- 8 Top of South Approach Slab Elevations
- 9 Top of North Approach Slab Elevations
- 10 Superstructure
- 11 Superstructure Details
- 12 South Abutment Diaphragm Details
- 13 North Abutment Diaphragm Details
- 14 South Bridge Approach Slab Details
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- 20-21 South Abutment Details
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- 24 Metal Shell Pile Details
- 25-27 2014 Boring Logs
- 28-29 1976 Boring Logs from Existing Plans
- 30-34 Existing Plans



BIG BUREAU CREEK  
BUILT 2016 BY  
BUREAU COUNTY  
SECTION 14-00244-00-BR  
FAS 244 STA. 20+00  
STR. NO. 006-3192 LOADING HL-93

**NAME PLATE LETTERING**

**LOADING HL-93**

Allow 50#/sq. ft. for future wearing surface.

**DESIGN SPECIFICATIONS**

2014 AASHTO LRFD Bridge Design Specifications, 7th Edition

**DESIGN STRESSES**

**FIELD UNITS**

- f'c = 3,500 psi
- f'c = 4,000 psi (Superstructure Concrete)
- fy = 60,000 psi (Reinforcement)
- fy = 50,000 psi (M270 Grade 50W)

**SEISMIC DATA**

Seismic Performance Zone (SPZ) = 1  
Design Spectral Acceleration at 1.0 sec. (S<sub>1</sub>) = 0.067g  
Design Spectral Acceleration at 2.0 sec. (S<sub>2</sub>) = 0.116g  
Soil Site Class = C

**WATERWAY INFORMATION**

Drainage Area = 181 sq. mi. Low Grade Elev. 604.23 @ Sta. 12+90.00

Flood	Freq. Yr.	Opening Sq. Ft.		Nat. H.W.E.	Head - Ft.		Headwater El.		
		Q	Prop.		Exist.	Prop.	Exist.	Prop.	
Design	10	8,020	1,610	1,630	601.12	0	0	600.75	600.78
Base	100	14,700	2,042	2,078	604.10	0.24	0.28	604.34	604.38
Overtopping									
Scour Check	200	17,000	2,155	2,201	604.88	0.62	0.60	605.50	605.48
Max. Calc.	500	19,600	2,273	2,333	605.70	0.80	0.80	606.50	606.50

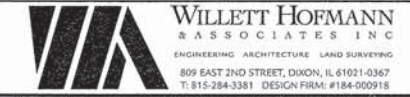
**DESIGN SCOUR ELEVATION TABLE**

Event / Limit	Design Scour Elevations (ft.)			Item 113
	S. Abut.	N. Abut.		
Q100	572.70	584.17		5
Q200	570.08	582.67		
Design	572.70	584.17		
Check	570.08	582.67		

**GENERAL NOTES:**

- Fasteners shall be ASTM A325 Type 3. Bolts 7/8 in. φ, holes 1 in. φ, unless otherwise noted.
- Calculated weight of Structural Steel = 372,840 lbs.
- All structural steel shall be AASHTO M 270 Grade 50W
- No field welding is permitted except as specified in the contract documents.
- Reinforcement bars designated (E) shall be epoxy coated.
- If the Contractor elects to use cantilever forming brackets on the exterior beams or girders, the brackets shall be placed at the same locations as required for the hardwood blocks in Article 503.06(b) of the Standard Specifications. If additional cantilever forming brackets are required, hardwood blocking shall be wedged between the exterior and first interior beam at each of these additional bracket locations.
- Structural steel including expansion and fixed bearings shall only be painted for a distance equal to the depth of embedment into the concrete cap plus 1'-6". Painted areas shall be painted and primed in the shop with a Department approved zinc rich primer. Field painting will not be required. The Organic Zinc Rich Primer/Epoxy/Urethane Paint System shall be used for painting new structural steel in locations noted. The entire system shall be shop applied. The color of the final finish coat shall be Reddish Brown Munsell No. 2.5 YR 3/4.
- Structure excavation will be part of this contract and cost included in concrete structures.
- Layout of the slope protection system may be varied to suit ground conditions in the field as directed by the Engineer.
- Slipforming Parapet not allowed.
- The following will be included in the County's roadway project to be completed by others:
  - A. Embankment work to required subgrade elevations.
  - B. Approach guardrail furnishing & installation.
  - C. Guardrail Markers, Type C.
  - D. Furnishing, placing & excavation for Stone Riprap Class A3 located @ ends of approach pavement.

FILE # SA\PROJECTS\2013\1192013\BCH\DESIGN\STRUCT\20\Drawings\1192013\_General Plan & Elevation.dgn

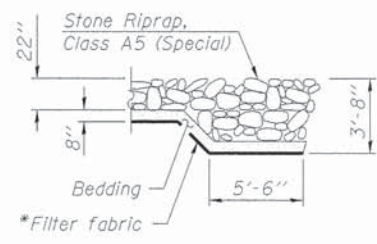
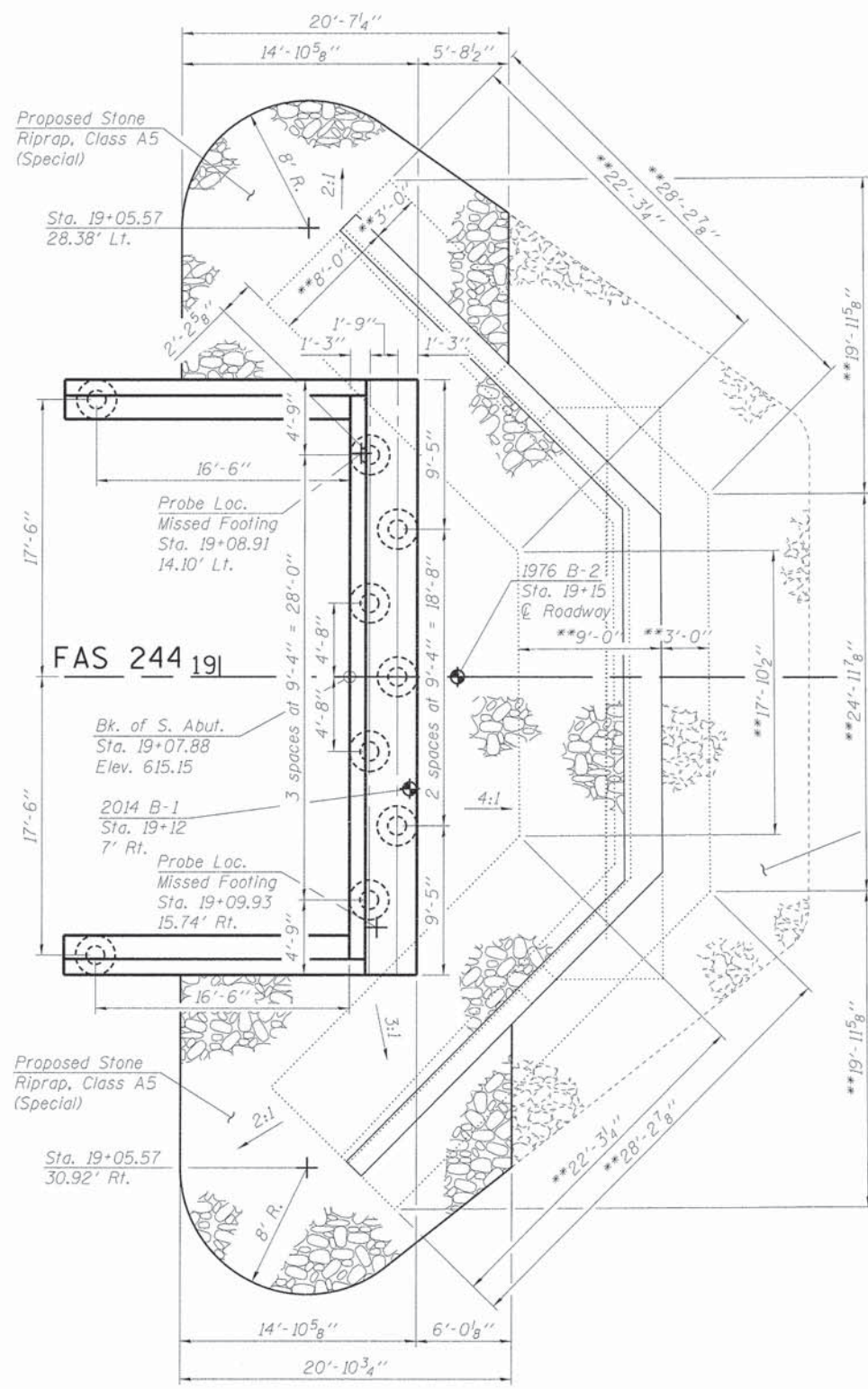


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CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

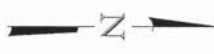
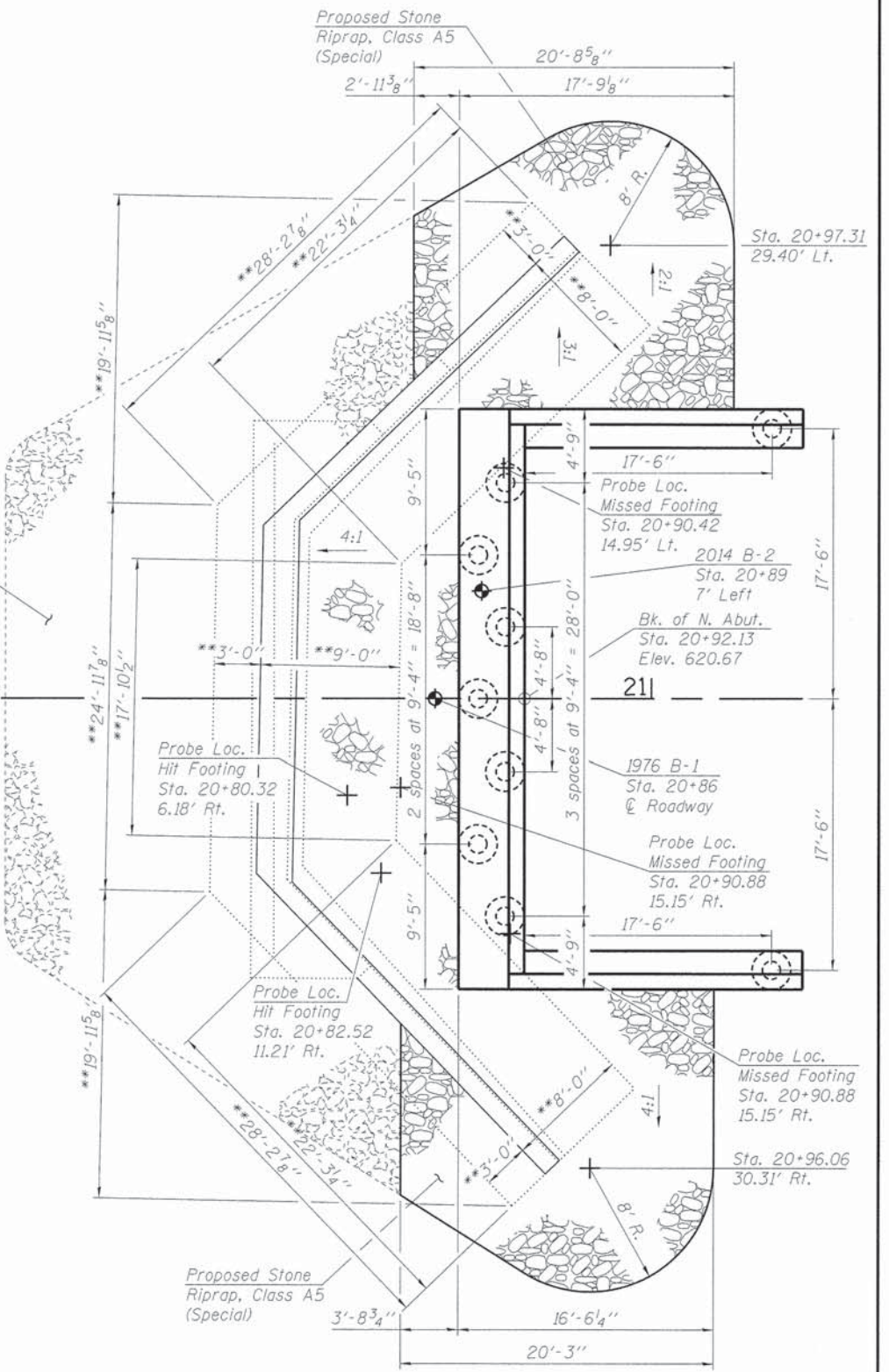
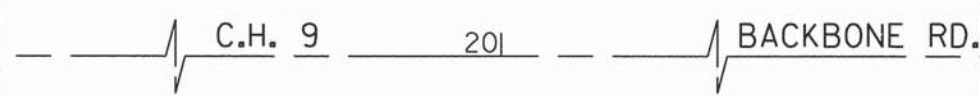
**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

**GENERAL DATA**  
**STRUCTURE NO. 006-3192**  
STRUCTURAL SHEET NO. 2 OF 34 SHEETS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	4
WHA* 1192013			CONTRACT NO. 87584	
[ILLINOIS] FED. AID PROJECT BRS-0244(106)				



SECTION B-B



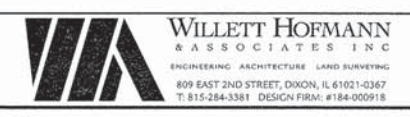
PLAN

**NOTE:**  
 \*Cost to be included with Stone Riprap, Class A5 (Special).  
 \*\*Estimated Dimensions.

**BILL OF MATERIAL**

Item	Unit	Quantity
Stone Riprap, Class A5 (Special)	Ton	273

FILE: S:\PROJECTS\2013\1192013\_BUCOHS\DESIGN\STRUCT\20\_Drawing\1192013\_Riprap\_Layout\_Sheet.dgn

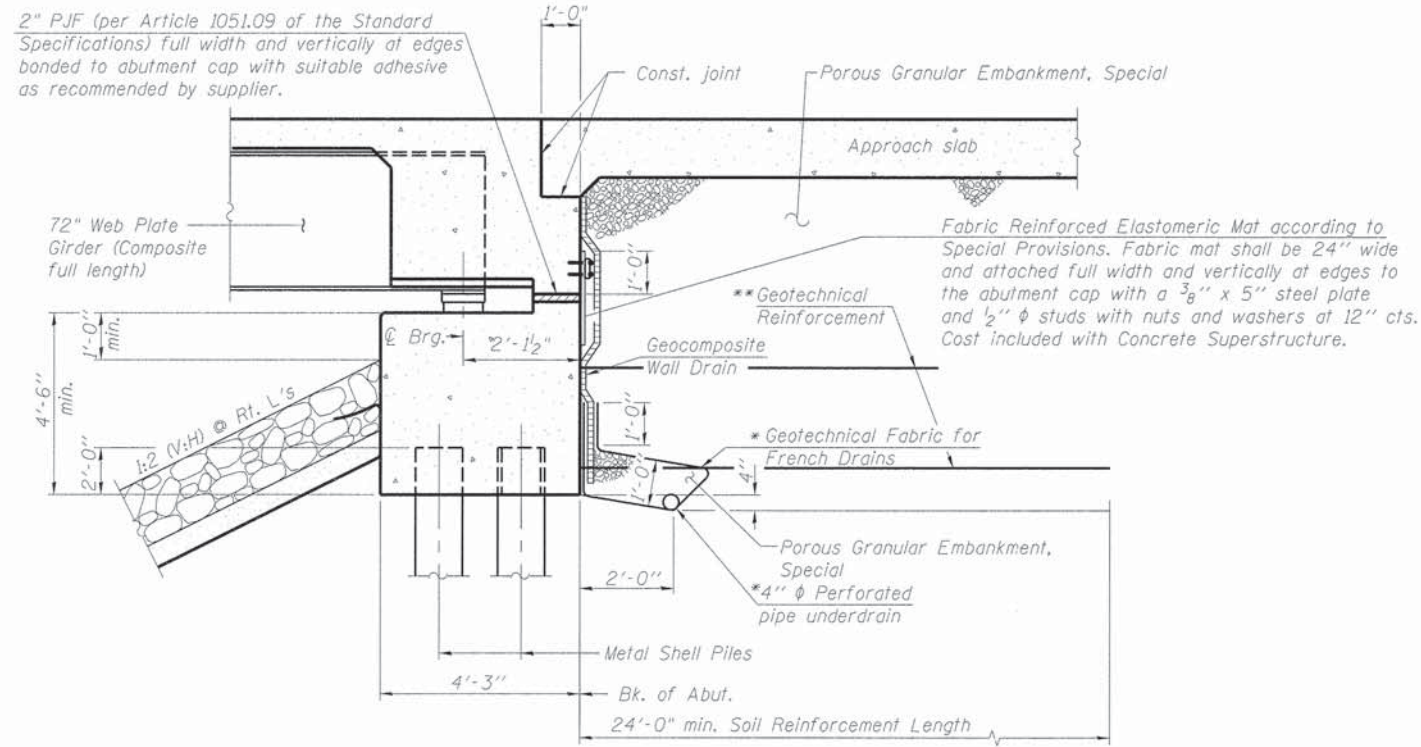


DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

**RIPRAP AND PILE LAYOUT**  
**STRUCTURE NO. 006-3192**  
 STRUCTURAL SHEET NO. 3 OF 34 SHEETS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	5
WHIA* 1192013			CONTRACT NO. 87584	
[ILLINOIS] FED. AID PROJECT			BRS-0244(106)	



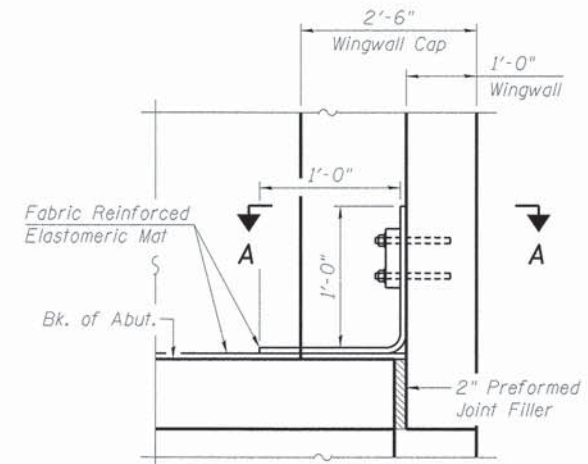
**SECTION THRU SEMI-INTEGRAL ABUTMENT**

(Horiz. dim. @ Rt. L's)

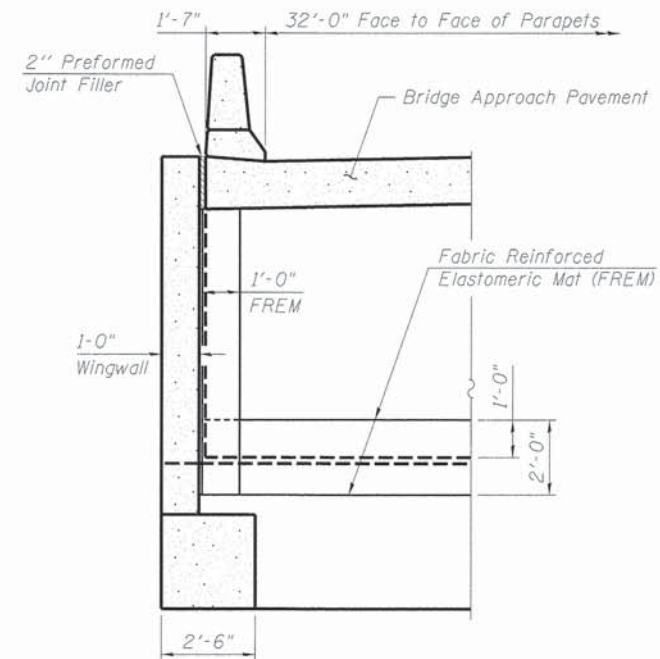
\*Included in the cost of Pipe Underdrains for Structures. (See Special Provisions)

\*\*See Structural Sheets 20 and 22 of 34 for details.

Note:  
All drainage system components shall extend to 2'-0" from the end of each wingwall except an outlet pipe shall extend around existing abutment and until intersecting with the side slopes. The pipes shall drain into the riprap.

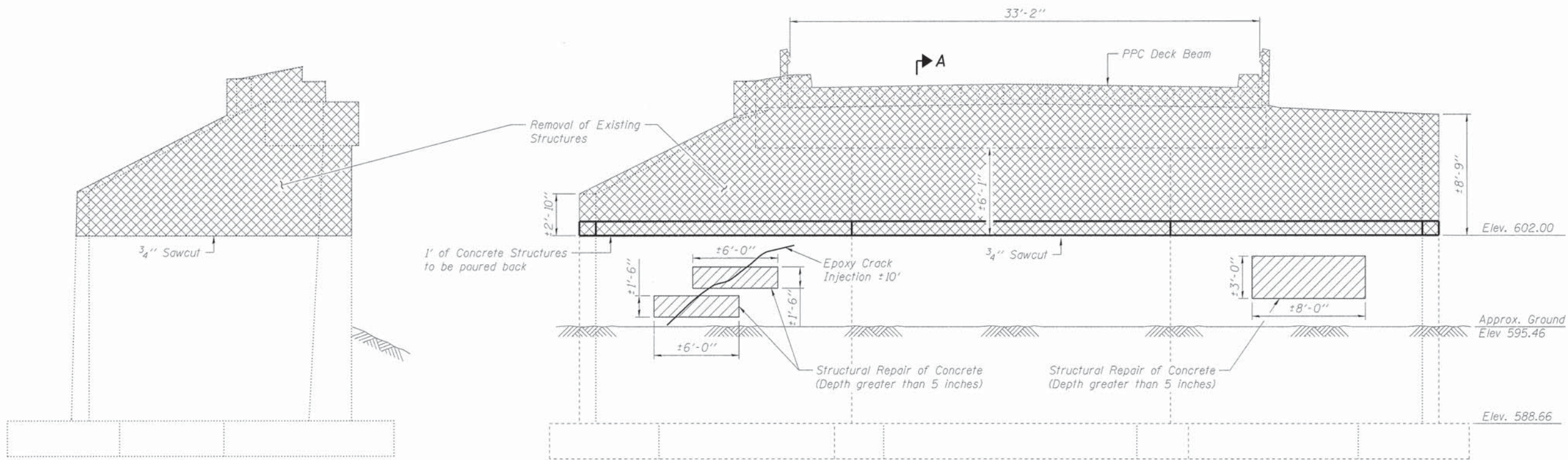


**PLAN VIEW AT CORNER OF ABUTMENT**



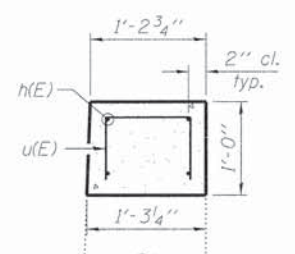
**SECTION A-A  
FABRIC REINFORCED  
ELASTOMERIC MAT DETAILS**

FILE # SA\PROJECTS\2013\1192013\BUCC\DESIGN\STRUCT\20\_Drains\1192013\_Riprap\_Layout\_Sheet.dgn

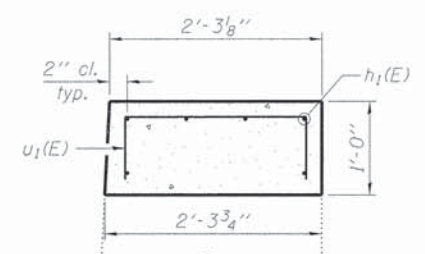


SECTION A-A

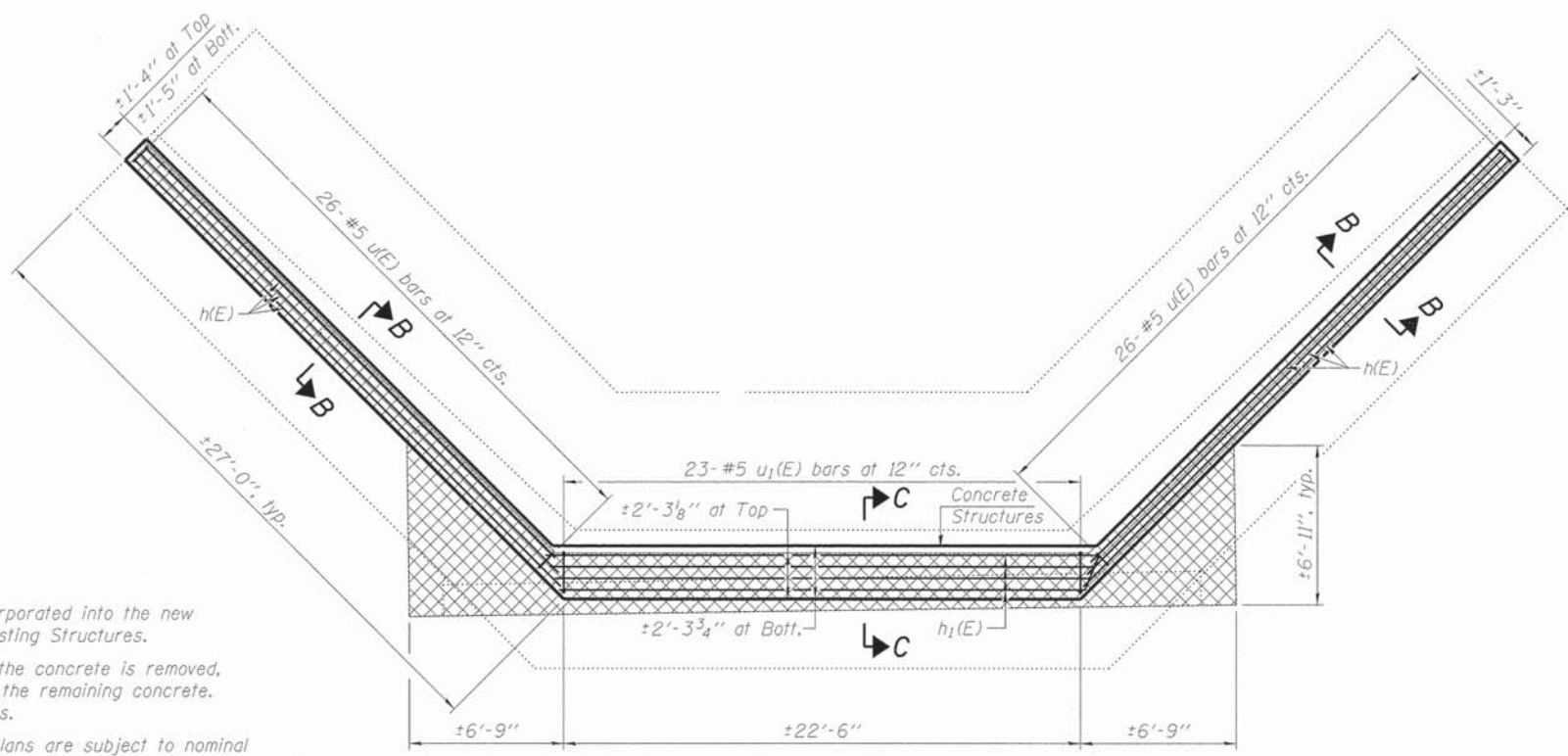
EXISTING SOUTH ABUTMENT ELEVATION  
(Looking South)



SECTION B-B



SECTION C-C



EXISTING SOUTH ABUTMENT PLAN

EXISTING ABUTMENT  
BILL OF MATERIAL

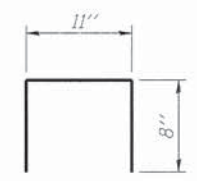
Bar	No.	Size	Length	Shape
n(E)	8	#5	26'-8"	—
h1(E)	6	#5	22'-2"	—
u(E)	52	#5	2'-3"	U
u1(E)	23	#5	3'-3"	U
Concrete Structures		Cu. Yd.	4.3	
Epoxy Crack Injection		Foot	10	
Structural Repair of Concrete (Depth Greater than 5 Inches)		Sq. Ft.	42	
Reinforcement Bars, Epoxy Coated		Pound	560	

NOTES:

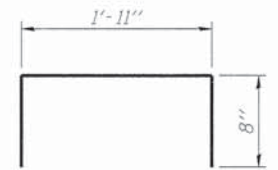
Existing reinforcement shall be cleaned and incorporated into the new construction. Cost included with Removal of Existing Structures.

All sawcuts shall be to such a depth that when the concrete is removed, a clean neat edge will result with no spalling of the remaining concrete. Cost included with Removal of Existing Structures.

Plan dimensions and details relative to existing plans are subject to nominal construction variations. The Contractor shall field verify existing dimensions and details affecting new construction and make necessary approved adjustments prior to construction or ordering of materials. Such variations shall not be cause for additional compensation for a change in scope of the work, however, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.

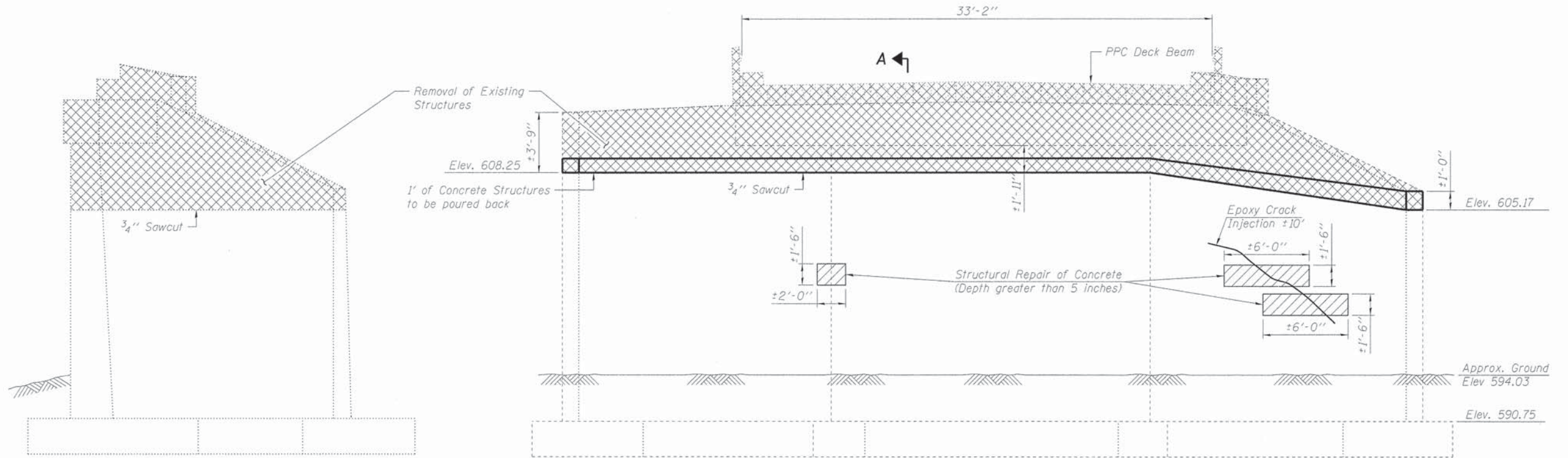


BAR u(E)



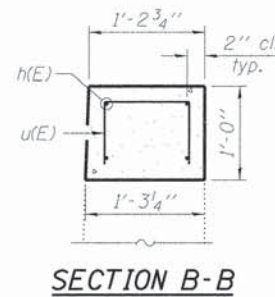
BAR u1(E)

FILE: S:\PROJECTS\2013\1192013-BUREAU\DESIGN\STRUCT\20\_Drawing\1192013-South Abutment Removal Detail.rvt

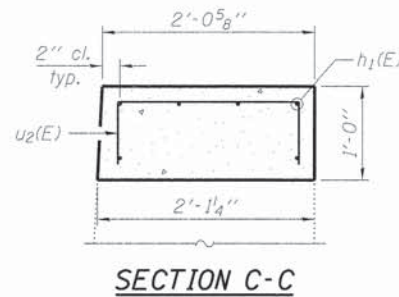


SECTION A-A

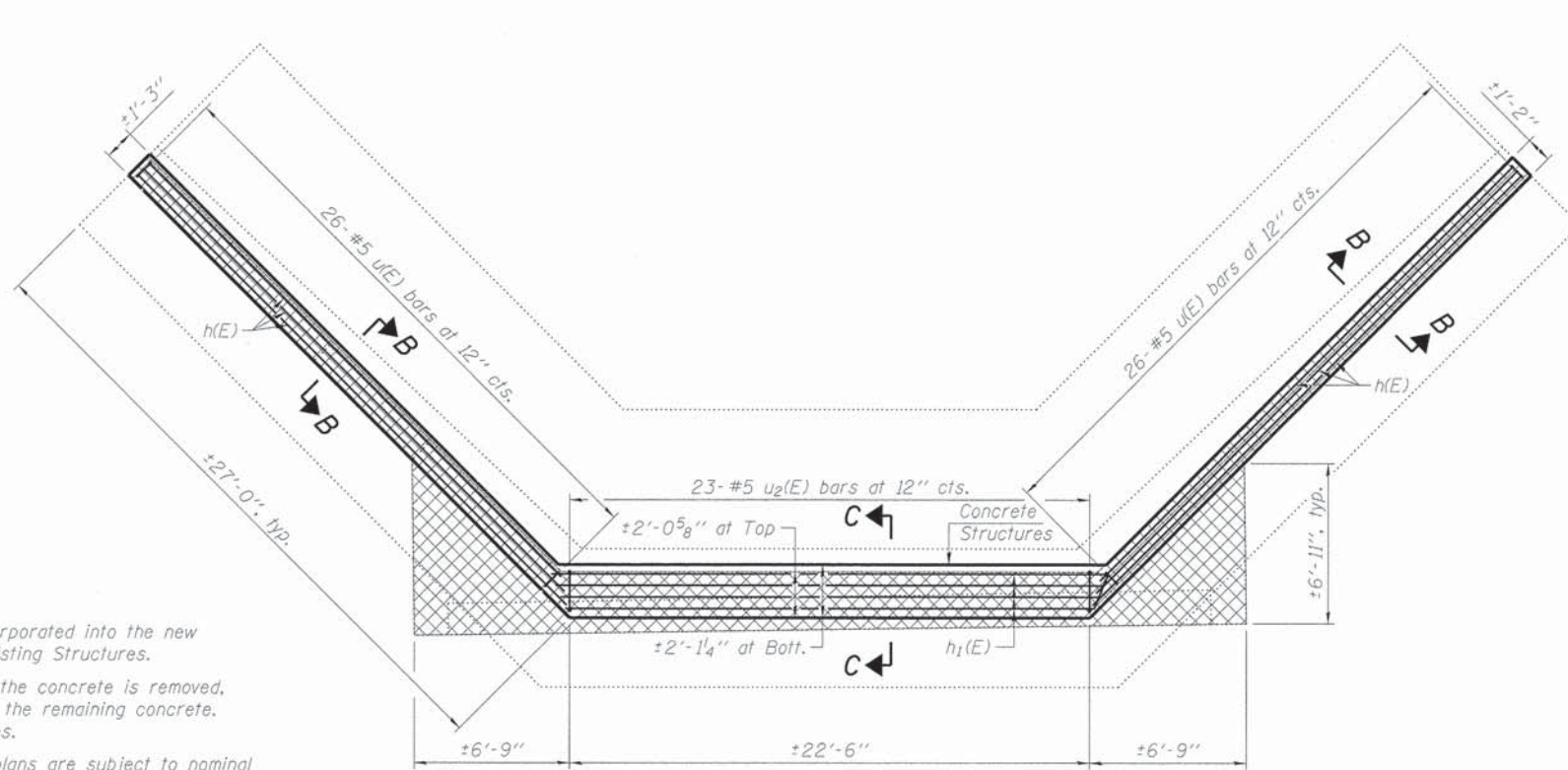
EXISTING NORTH ABUTMENT ELEVATION  
(Looking North)



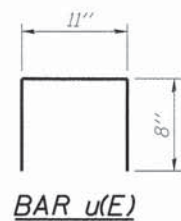
SECTION B-B



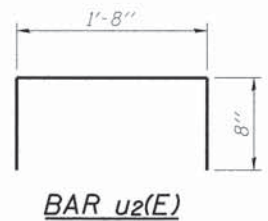
SECTION C-C



EXISTING NORTH ABUTMENT PLAN



BAR u(E)



BAR u2(E)

EXISTING ABUTMENT  
BILL OF MATERIAL

Bar	No.	Size	Length	Shape
h(E)	8	#5	26'-8"	—
h1(E)	6	#5	22'-2"	—
u(E)	52	#5	2'-3"	U
u2(E)	23	#5	3'-0"	U
Concrete Structures		Cu. Yd.	4.1	
Epoxy Crack Injection		Foot	10	
Structural Repair of Concrete (Depth Greater than 5 Inches)		Sq. Ft.	21	
Reinforcement Bars, Epoxy Coated		Pound	560	

NOTES:

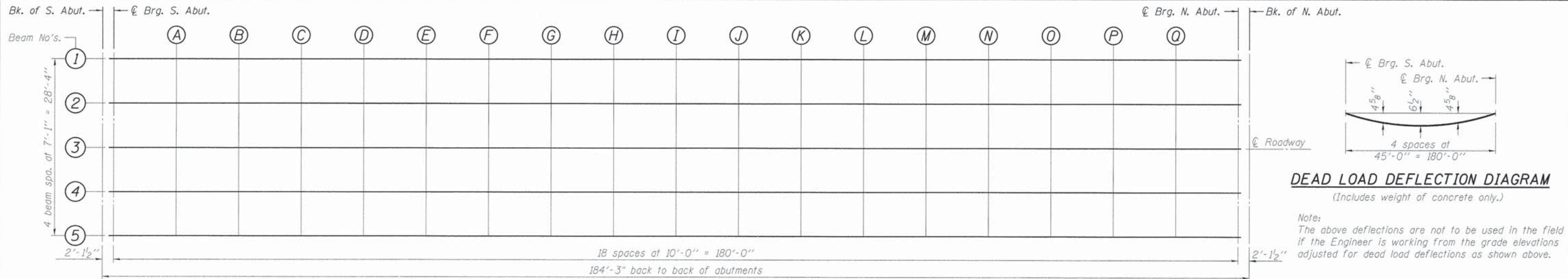
Existing reinforcement shall be cleaned and incorporated into the new construction. Cost included with Removal of Existing Structures.

All sawcuts shall be to such a depth that when the concrete is removed, a clean neat edge will result with no spalling of the remaining concrete. Cost included with Removal of Existing Structures.

Plan dimensions and details relative to existing plans are subject to nominal construction variations. The Contractor shall field verify existing dimensions and details affecting new construction and make necessary approved adjustments prior to construction or ordering of materials. Such variations shall not be cause for additional compensation for a change in scope of the work, however, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.

FILE # SA\PROJECTS\2013\1192013\_BUCR\DESIGN\STRUCT\20\_Drawing\1192013\_North Abutment Removal Details.dgn





**PLAN VIEW**

**BEAM 1**

Location	Station	Offset Lt.	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk S Abut	19+07.88	14.17	614.93	614.93
CL Brg S Abut	19+10.00	14.17	615.00	615.00
A	19+20.00	14.17	615.30	615.39
B	19+30.00	14.17	615.60	615.78
C	19+40.00	14.17	615.90	616.17
D	19+50.00	14.17	616.20	616.55
E	19+60.00	14.17	616.50	616.91
F	19+70.00	14.17	616.80	617.27
G	19+80.00	14.17	617.10	617.61
H	19+90.00	14.17	617.40	617.93
I	20+00.00	14.17	617.70	618.24
J	20+10.00	14.17	618.00	618.53
K	20+20.00	14.17	618.30	618.81
L	20+30.00	14.17	618.60	619.07
M	20+40.00	14.17	618.90	619.31
N	20+50.00	14.17	619.20	619.55
O	20+60.00	14.17	619.50	619.77
P	20+70.00	14.17	619.80	619.98
Q	20+80.00	14.17	620.10	620.19
CL Brg N Abut	20+90.00	14.17	620.40	620.40
Bk N Abut	20+92.13	14.17	620.46	620.46

**BEAM 2**

Location	Station	Offset Lt.	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk S Abut	19+07.88	7.08	615.04	615.04
CL Brg S Abut	19+10.00	7.08	615.10	615.10
A	19+20.00	7.08	615.40	615.50
B	19+30.00	7.08	615.70	615.89
C	19+40.00	7.08	616.00	616.28
D	19+50.00	7.08	616.30	616.65
E	19+60.00	7.08	616.60	617.02
F	19+70.00	7.08	616.90	617.37
G	19+80.00	7.08	617.20	617.71
H	19+90.00	7.08	617.50	618.04
I	20+00.00	7.08	617.80	618.35
J	20+10.00	7.08	618.10	618.64
K	20+20.00	7.08	618.40	618.91
L	20+30.00	7.08	618.70	619.17
M	20+40.00	7.08	619.00	619.42
N	20+50.00	7.08	619.30	619.65
O	20+60.00	7.08	619.60	619.88
P	20+70.00	7.08	619.90	620.09
Q	20+80.00	7.08	620.20	620.30
CL Brg N Abut	20+90.00	7.08	620.50	620.50
Bk N Abut	20+92.13	7.08	620.57	620.57

**BEAM 3**

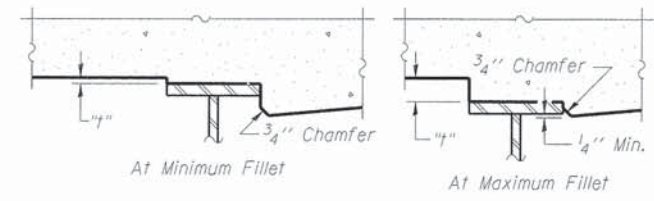
Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk S Abut	19+07.88	0.00	615.15	615.15
CL Brg S Abut	19+10.00	0.00	615.21	615.21
A	19+20.00	0.00	615.51	615.61
B	19+30.00	0.00	615.81	616.00
C	19+40.00	0.00	616.11	616.38
D	19+50.00	0.00	616.41	616.76
E	19+60.00	0.00	616.71	617.13
F	19+70.00	0.00	617.01	617.48
G	19+80.00	0.00	617.31	617.82
H	19+90.00	0.00	617.61	618.14
I	20+00.00	0.00	617.91	618.45
J	20+10.00	0.00	618.21	618.74
K	20+20.00	0.00	618.51	619.02
L	20+30.00	0.00	618.81	619.28
M	20+40.00	0.00	619.11	619.53
N	20+50.00	0.00	619.41	619.76
O	20+60.00	0.00	619.71	619.98
P	20+70.00	0.00	620.01	620.20
Q	20+80.00	0.00	620.31	620.41
CL Brg N Abut	20+90.00	0.00	620.61	620.61
Bk N Abut	20+92.13	0.00	620.67	620.67

**BEAM 4**

Location	Station	Offset Lt.	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk S Abut	19+07.88	7.08	615.04	615.04
CL Brg S Abut	19+10.00	7.08	615.10	615.10
A	19+20.00	7.08	615.40	615.50
B	19+30.00	7.08	615.70	615.89
C	19+40.00	7.08	616.00	616.28
D	19+50.00	7.08	616.30	616.65
E	19+60.00	7.08	616.60	617.02
F	19+70.00	7.08	616.90	617.37
G	19+80.00	7.08	617.20	617.71
H	19+90.00	7.08	617.50	618.04
I	20+00.00	7.08	617.80	618.35
J	20+10.00	7.08	618.10	618.64
K	20+20.00	7.08	618.40	618.91
L	20+30.00	7.08	618.70	619.17
M	20+40.00	7.08	619.00	619.42
N	20+50.00	7.08	619.30	619.65
O	20+60.00	7.08	619.60	619.88
P	20+70.00	7.08	619.90	620.09
Q	20+80.00	7.08	620.20	620.30
CL Brg N Abut	20+90.00	7.08	620.50	620.50
Bk N Abut	20+92.13	7.08	620.57	620.57

**BEAM 5**

Location	Station	Offset Lt.	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk S Abut	19+07.88	14.17	614.93	614.93
CL Brg S Abut	19+10.00	14.17	615.00	615.00
A	19+20.00	14.17	615.30	615.39
B	19+30.00	14.17	615.60	615.78
C	19+40.00	14.17	615.90	616.17
D	19+50.00	14.17	616.20	616.55
E	19+60.00	14.17	616.50	616.91
F	19+70.00	14.17	616.80	617.27
G	19+80.00	14.17	617.10	617.61
H	19+90.00	14.17	617.40	617.93
I	20+00.00	14.17	617.70	618.24
J	20+10.00	14.17	618.00	618.53
K	20+20.00	14.17	618.30	618.81
L	20+30.00	14.17	618.60	619.07
M	20+40.00	14.17	618.90	619.31
N	20+50.00	14.17	619.20	619.55
O	20+60.00	14.17	619.50	619.77
P	20+70.00	14.17	619.80	619.98
Q	20+80.00	14.17	620.10	620.19
CL Brg N Abut	20+90.00	14.17	620.40	620.40
Bk N Abut	20+92.13	14.17	620.46	620.46



To determine "t": After all structural steel has been erected, elevations of the top flanges of the beams shall be taken at intervals shown above. These elevations subtracted from the "Theoretical Grade Elevations Adjusted For Dead Load Deflection" shown to the left, minus slab thickness, equals the fillet heights "t" above top flange of beams.

**FILLET HEIGHTS**

FILE # SA\PROJECT\5-2813\1192013\_BUCKLE\DESIGN\STRUCT\20\_Dr-wrings\1192013\_Top of Slab Elevations.dgn

**WILLET HOFMANN ASSOCIATES INC**  
 ENGINEERING ARCHITECTURE LAND SURVEYING  
 809 EAST 2ND STREET, DIXON, IL 61021-0367  
 T: 815-284-3381 DESIGN FIRM: #184-000918

DESIGNED -	MAC	REVISED -	
CHECKED -	BKC	REVISED -	
DRAWN -	FDL	REVISED -	
CHECKED -	MAC	REVISED -	

**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

**TOP OF SLAB ELEVATIONS**  
**STRUCTURE NO. 006-3192**  
 STRUCTURAL SHEET NO. 7 OF 34 SHEETS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	9
WHA# 1192D13			CONTRACT NO. 87584	
[ILLINOIS] FED. AID PROJECT BRS-04221061				

**LEFT EDGE OF SHOULDER**

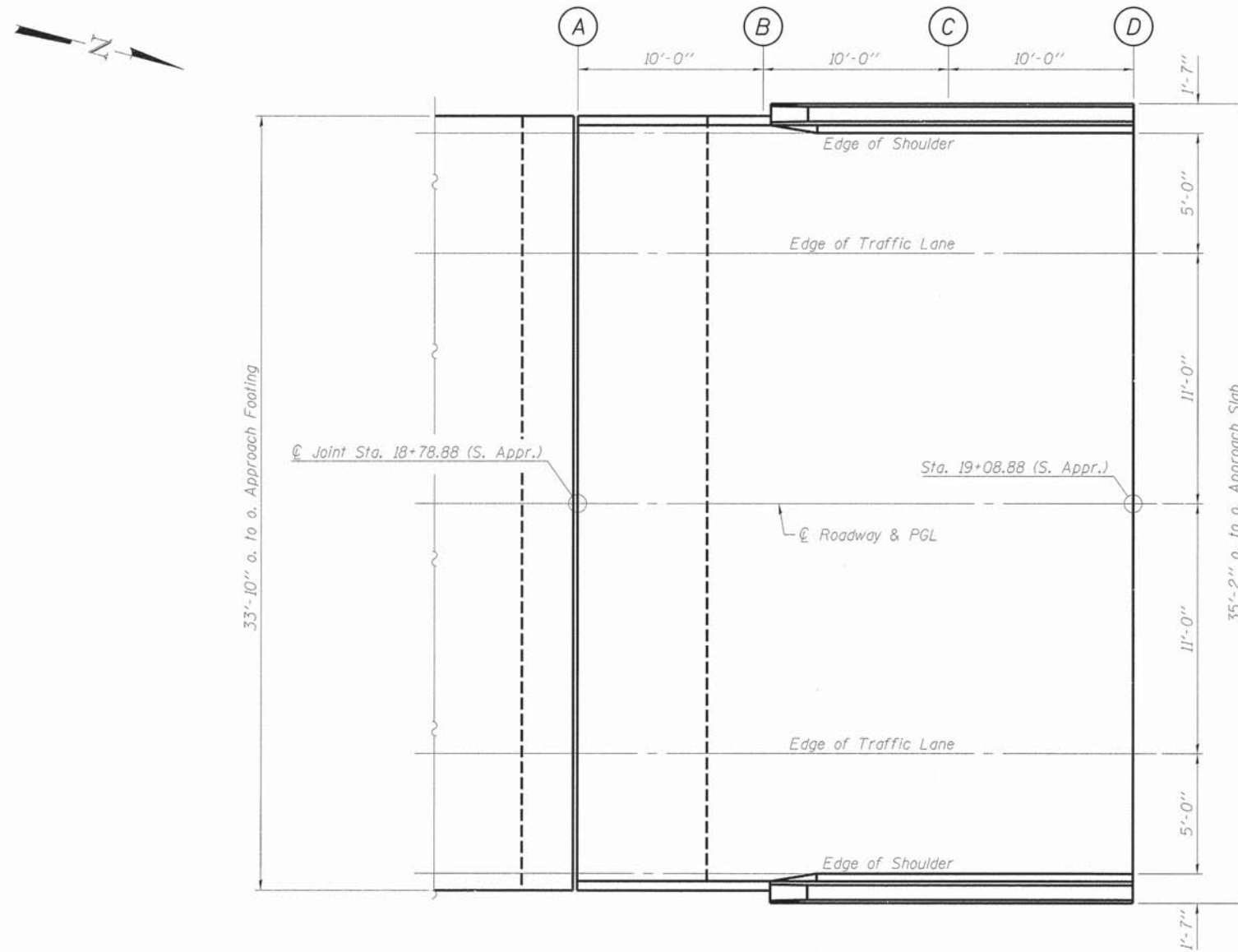
Location	Station	Offset Lt.	Theoretical Grade Elevations
A	18+78.88	16.00'	614.04
B	18+88.88	16.00'	614.34
C	18+98.88	16.00'	614.64
D	19+08.88	16.00'	614.94

**LEFT EDGE OF TRAFFIC LANE**

Location	Station	Offset Lt.	Theoretical Grade Elevations
A	18+78.88	11.00'	614.12
B	18+88.88	11.00'	614.42
C	18+98.88	11.00'	614.72
D	19+08.88	11.00'	615.02

**CENTERLINE OF ROADWAY & P.G.L.**

Location	Station	Offset	Theoretical Grade Elevations
A	18+78.88	0.00'	614.28
B	18+88.88	0.00'	614.58
C	18+98.88	0.00'	614.88
D	19+08.88	0.00'	615.18



**PLAN**

**RIGHT EDGE OF TRAFFIC LANE**

Location	Station	Offset Rt.	Theoretical Grade Elevations
A	18+78.88	11.00'	614.12
B	18+88.88	11.00'	614.42
C	18+98.88	11.00'	614.72
D	19+08.88	11.00'	615.02

**RIGHT EDGE OF SHOULDER**

Location	Station	Offset Rt.	Theoretical Grade Elevations
A	18+78.88	16.00'	614.04
B	18+88.88	16.00'	614.34
C	18+98.88	16.00'	614.64
D	19+08.88	16.00'	614.94

FILE # : S:\PROJECTS\2013\1192013\BUCC\DESIGN\STRUCT\20.Drawings\1192013.Top of South Approach Slab Elevations.dgn

**LEFT EDGE OF SHOULDER**

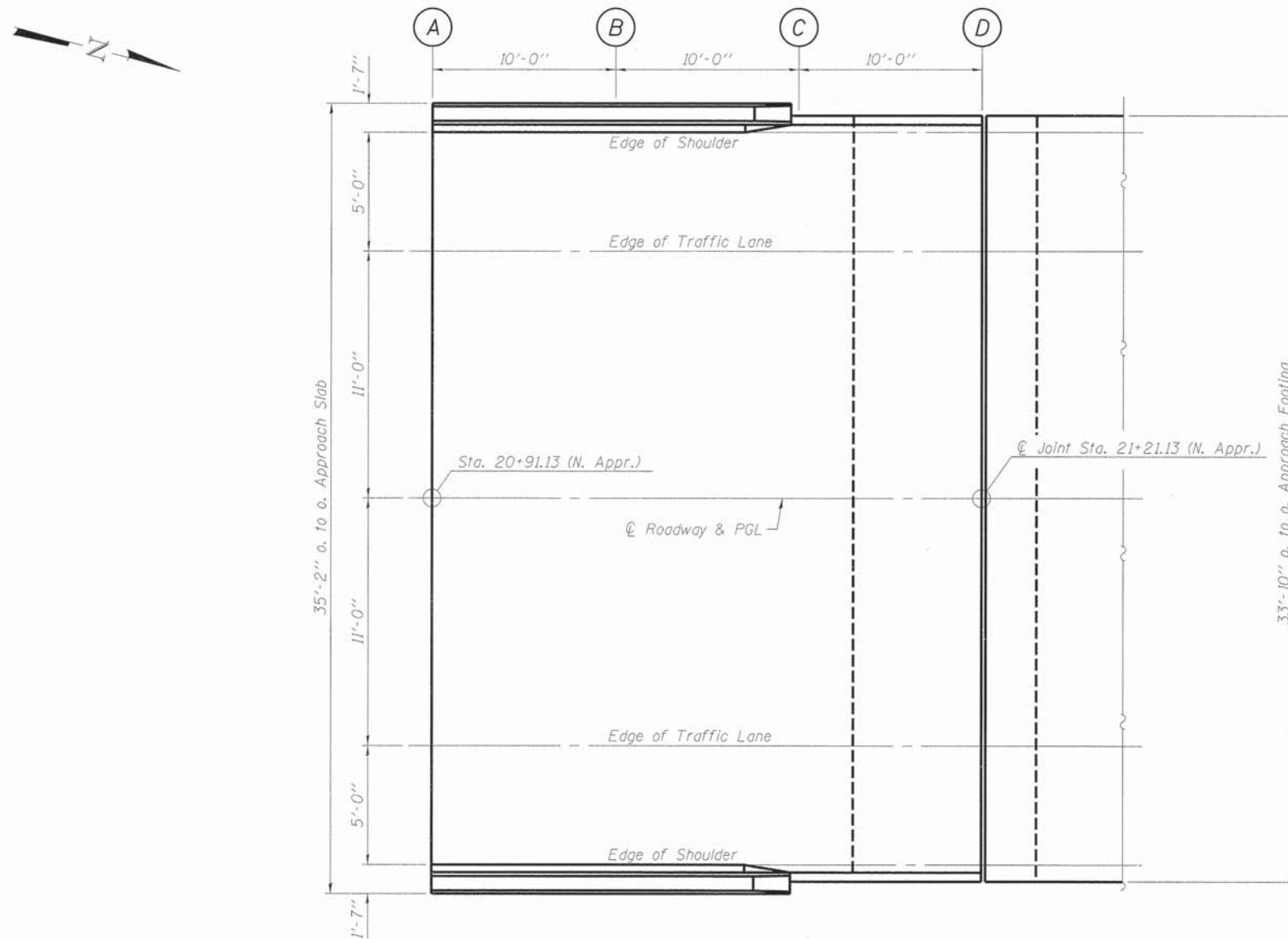
Location	Station	Offset Lt.	Theoretical Grade Elevations
A	20+91.13	16.00'	620.40
B	21+01.13	16.00'	620.70
C	21+11.13	16.00'	621.00
D	21+21.13	16.00'	621.30

**LEFT EDGE OF TRAFFIC LANE**

Location	Station	Offset Lt.	Theoretical Grade Elevations
A	20+91.13	11.00'	620.48
B	21+01.13	11.00'	620.78
C	21+11.13	11.00'	621.08
D	21+21.13	11.00'	621.38

**CENTERLINE OF ROADWAY & P.G.L.**

Location	Station	Offset	Theoretical Grade Elevations
A	20+91.13	0.00'	620.64
B	21+01.13	0.00'	620.94
C	21+11.13	0.00'	621.24
D	21+21.13	0.00'	621.54



**PLAN**

**RIGHT EDGE OF TRAFFIC LANE**

Location	Station	Offset Rt.	Theoretical Grade Elevations
A	20+91.13	11.00'	620.48
B	21+01.13	11.00'	620.78
C	21+11.13	11.00'	621.08
D	21+21.13	11.00'	621.38

**RIGHT EDGE OF SHOULDER**

Location	Station	Offset Rt.	Theoretical Grade Elevations
A	20+91.13	16.00'	620.40
B	21+01.13	16.00'	620.70
C	21+11.13	16.00'	621.00
D	21+21.13	16.00'	621.30

FILE: S:\PROJECTS\2013\1192013\_BUCCHON\DESIGN\STRUCT\20-Drawings\1192013\_Top of North Approach Slab Elevations.dgn



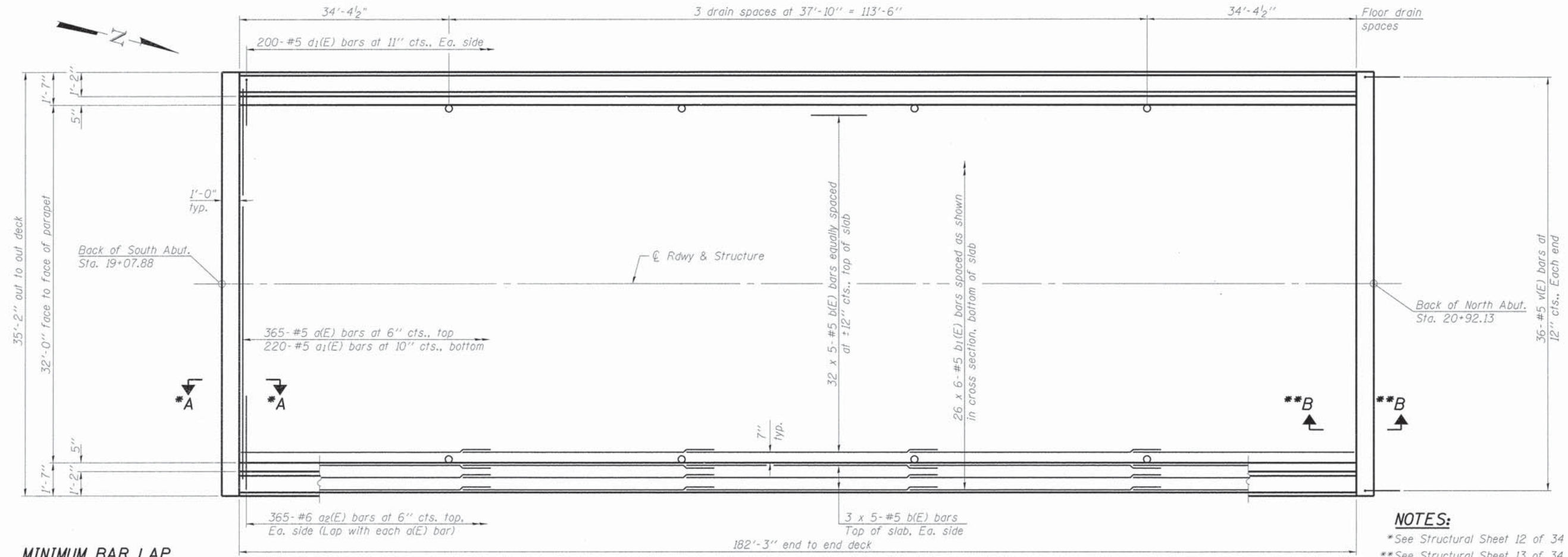
DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

**TOP OF NORTH APPROACH SLAB ELEVATIONS**  
**STRUCTURE NO. 006-3192**

STRUCTURAL SHEET NO. 9 OF 34 SHEETS

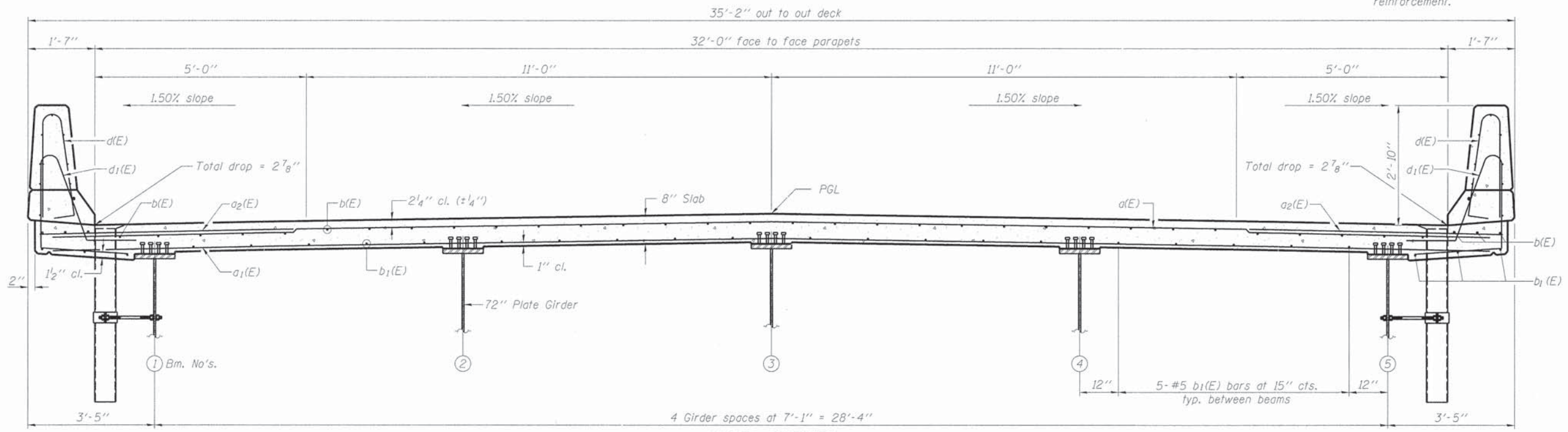
F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	11
WHA* 1192D13			CONTRACT NO. 87584	
ILLINOIS FED. AID PROJECT			BRS-0244(106)	



**MINIMUM BAR LAP**  
#5 bar = 3'-6"

**PLAN**

**NOTES:**  
\* See Structural Sheet 12 of 34 for Section A-A.  
\*\* See Structural Sheet 13 of 34 for Section B-B.  
See Structural Sheet 11 of 34 for superstructure details and Bill of Material.  
Bars indicated thus 20 x 3-#5 etc. indicates 20 lines of bars with 3 lengths per line.  
See Structural Sheet 11 of 34 for parapet reinforcement.



**CROSS SECTION**  
(Looking North)

FILE # S:\PROJECTS\2011\192013\BUREAU\DESIGN\STRUCT\20.Dwg\rgp\192013.Superstructure.dwg

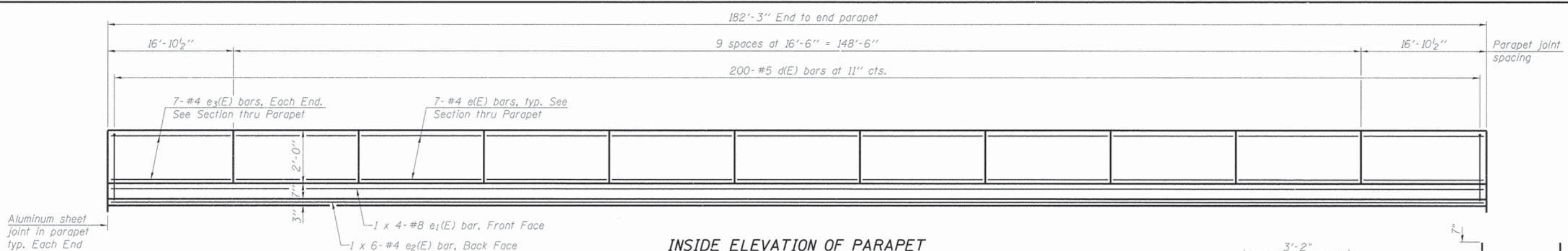
**WILLETT HOFMANN & ASSOCIATES INC.**  
ENGINEERING ARCHITECTURE LAND SURVEYING  
809 EAST 2ND STREET, DIXON, IL 61021-0367  
T: 815-284-3381 DESIGN FIRM: #184-000918

DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

**SUPERSTRUCTURE**  
**STRUCTURE NO. 006-3192**  
STRUCTURAL SHEET NO. 10 OF 34 SHEETS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	12
WHA* 1192D13			CONTRACT NO. 87584	
ILLINOIS FED. AID PROJECT			BRS-0244(106)	

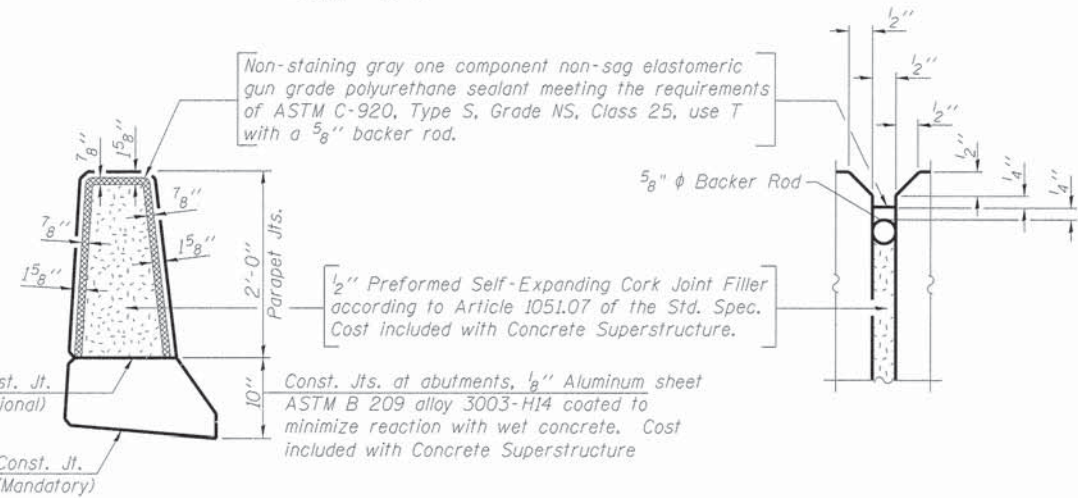


**INSIDE ELEVATION OF PARAPET**

**MINIMUM BAR LAP**

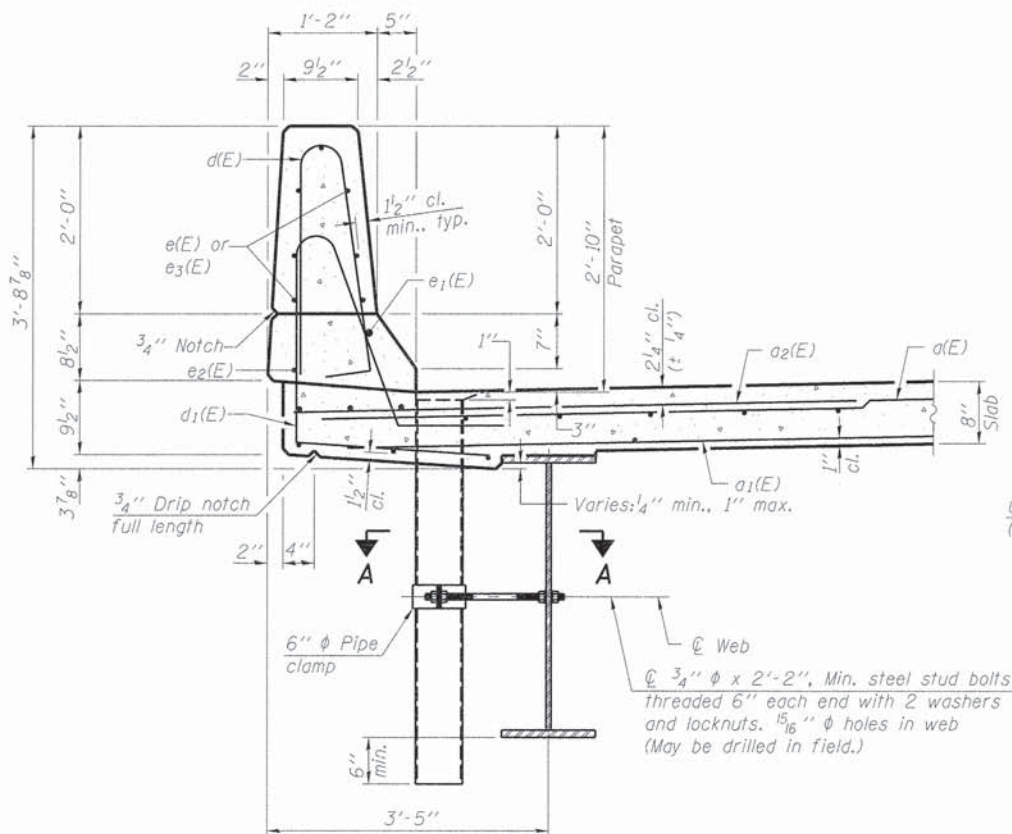
(Parapet)  
 #4 bar = 2'-8"  
 #8 bar = 5'-11"

Non-staining gray one component non-sag elastomeric gun grade polyurethane sealant meeting the requirements of ASTM C-920, Type S, Grade NS, Class 25, use T with a 5/8" backer rod.

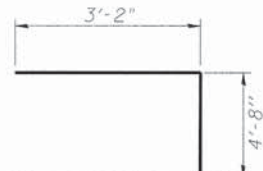


**PARAPET JOINT DETAILS**

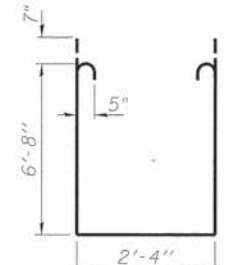
Notes:  
 Drains shall be located clear of all diaphragms.  
 The exterior surfaces of the floor drains shall be painted according to Article 506 with the finish coat as specified. The exterior surfaces of the drains shall be cleaned according to Society of Protective Coatings Spec. SSPC-SPI prior to painting.  
 Fiberglass pipe shall conform to ASTM D 2996, with short-time rupture strength hoop tensile stress of 30,000 p.s.i. minimum.  
 Galvanize clamping device according to AASHTO M232. Cost of clamping device and inserts is included with Floor Drains.



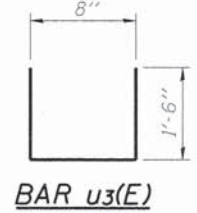
**SECTION THRU PARAPET**



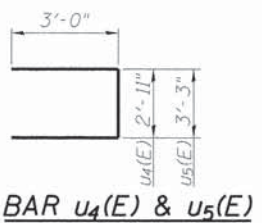
**BAR s2(E)**



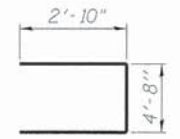
**BAR s3(E)**



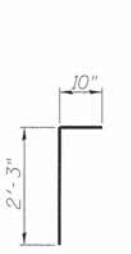
**BAR u3(E)**



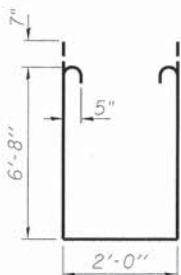
**BAR u4(E) & u5(E)**



**BAR s(E)**



**BAR v(E)**



**BAR s1(E)**

**SUPERSTRUCTURE BILL OF MATERIAL**

Bar	No.	Size	Length	Shape
a(E)	365	#5	34'-6"	—
a1(E)	220	#5	33'-6"	—
a2(E)	730	#6	6'-6"	—
b(E)	190	#5	39'-3"	—
b1(E)	156	#5	33'-3"	—
d(E)	400	#5	5'-7"	U
d1(E)	400	#5	7'-11"	U
e(E)	126	#4	16'-2"	—
e1(E)	8	#8	50'-0"	—
e2(E)	12	#4	32'-7"	—
e3(E)	28	#4	16'-6"	—
m(E)	30	#6	34'-10"	—
m1(E)	64	#6	6'-8"	—
m2(E)	32	#6	3'-0"	—
m3(E)	60	#5	4'-0"	—
s(E)	32	#5	10'-4"	U
s1(E)	32	#5	16'-6"	U
s2(E)	32	#5	11'-0"	U
s3(E)	32	#5	16'-10"	U
u3(E)	74	#5	3'-8"	U
u4(E)	14	#6	8'-11"	U
u5(E)	14	#6	9'-3"	U
v(E)	72	#5	3'-1"	U
Floor Drains	Each		8	
Concrete Superstructure		Cu. Yd.	266.2	
Bridge Deck Grooving		Sq. Yd.	608	
Protective Coat		Sq. Yd.	800	
Reinforcement Bars, Epoxy Coated		Pound	55,100	

**NOTES:**  
 Bars indicated thus 1 x 2-#8 etc. indicates 1 line of bars with 2 lengths per line.

FILE - S:\PROJECTS\2013\1192013-BUCKHORN\DESIGN\STRUCT\20-Drawings\1192013-Superstructure-Details.dwg

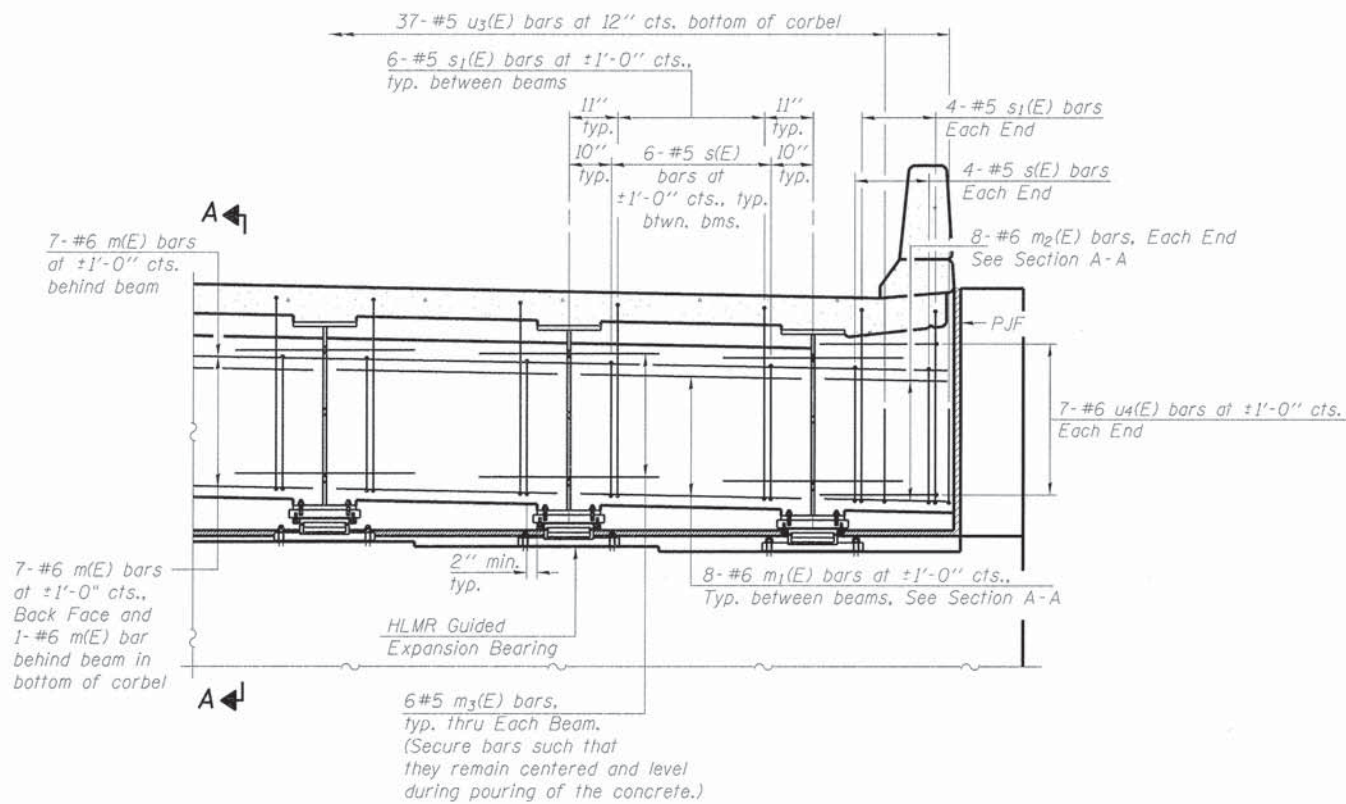
**WILLET HOFMANN & ASSOCIATES INC.**  
 ENGINEERING ARCHITECTURE LAND SURVEYING  
 809 EAST 2ND STREET, DIXON, IL 61021-0367  
 T: 815-284-3381 DESIGN FIRM: #184-000918

DESIGNED -	MAC	REVISED -	
CHECKED -	BKC	REVISED -	
DRAWN -	FDL	REVISED -	
CHECKED -	MAC	REVISED -	

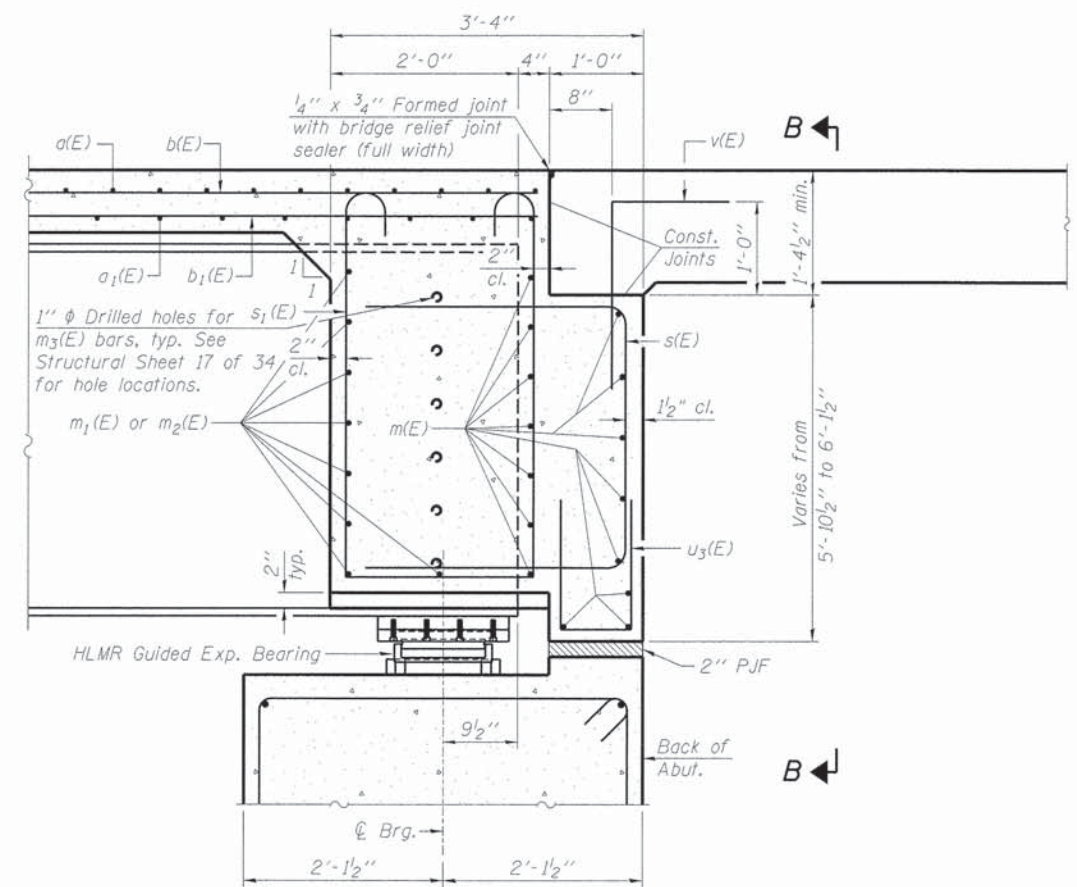
**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

**SUPERSTRUCTURE DETAILS**  
**STRUCTURE NO. 006-3192**  
 STRUCTURAL SHEET NO. 11 OF 34 SHEETS

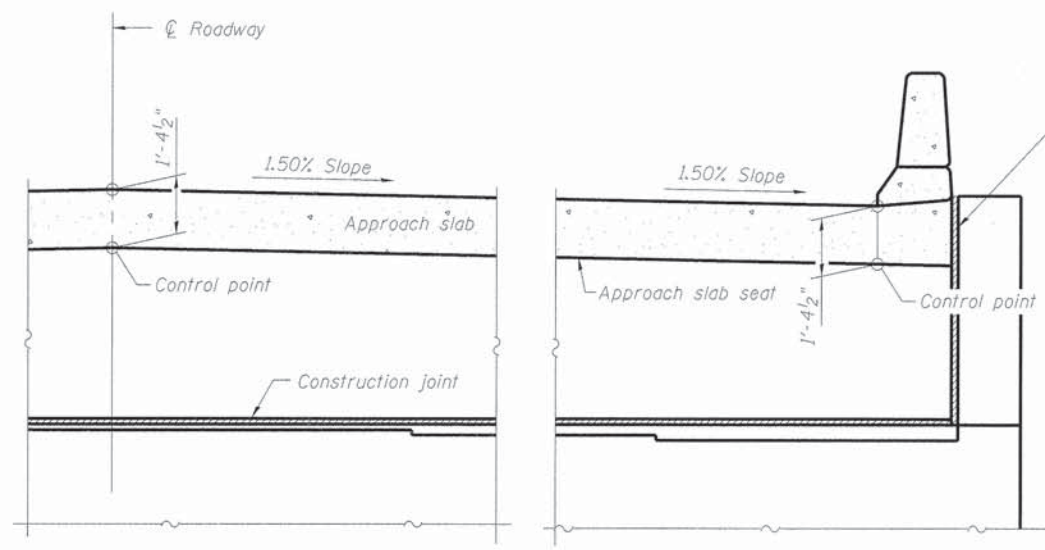
F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	13
	WHA* 1192013		CONTRACT NO.	87584
			ILLINOIS FED. AID PROJECT	BRS-0421061



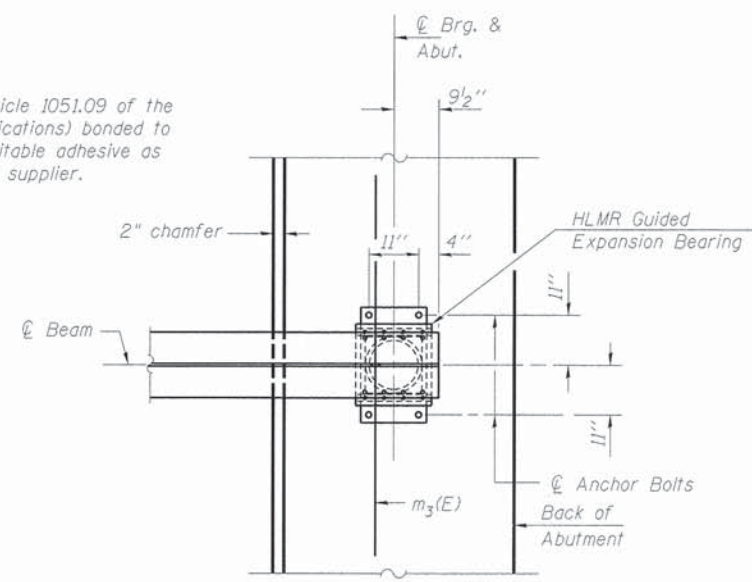
**DIAPHRAGM ELEVATION AT SOUTH ABUTMENT**



**SECTION A-A**



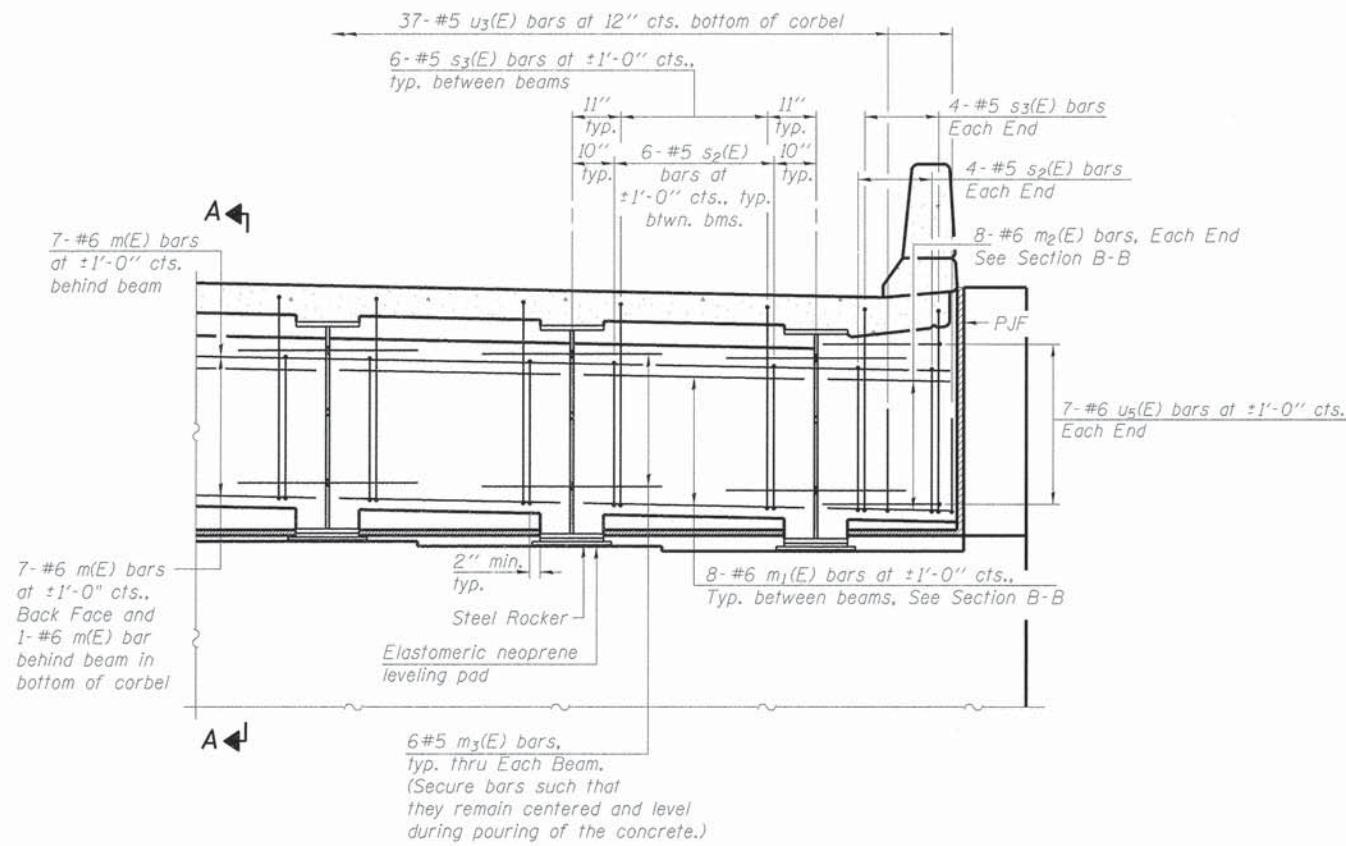
**SECTION B-B**



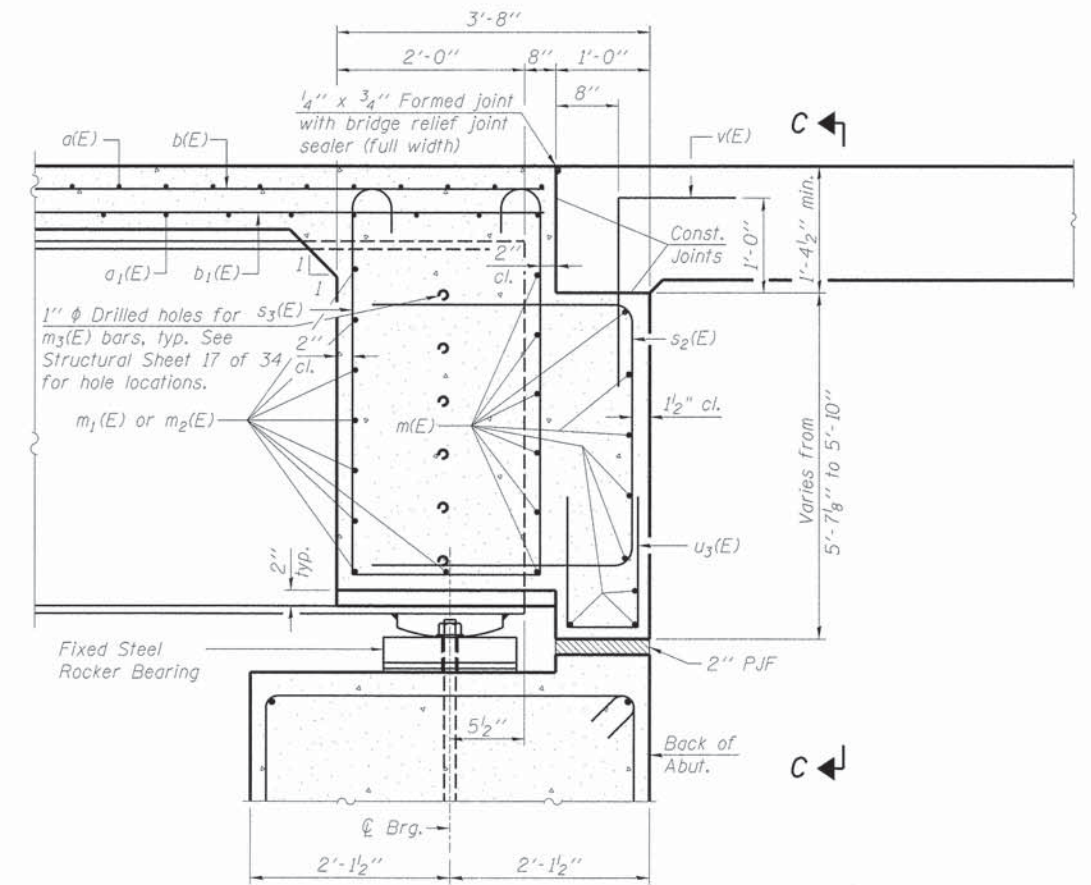
**PARTIAL PLAN AT SOUTH ABUTMENT**  
(Showing bottom flange of beam)

**NOTES:**  
 Reinforcement bars in diaphragm are billed with superstructure on Structural Sheet 11 of 34.  
 Concrete in diaphragm is included with Concrete Superstructure on Structural Sheet 11 of 34.  
 For details of bars s(E), s1(E), u3(E), u4(E) and v(E) see Structural Sheet 11 of 34.  
 The approach slab seat shall have a constant slope determined from the control points shown.  
 For bearing details see Structural Sheet 19 of 34.

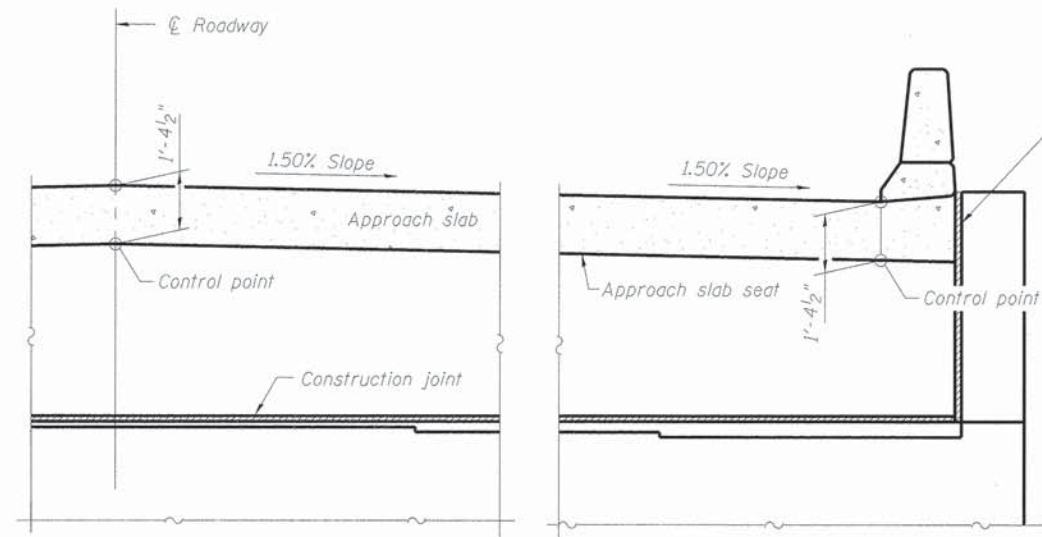
FILE # S:\PROJECTS\2013\1192013\BUCCHE\DESIGN\STRUCT\20.Dr\wings\1192013\_Diaphragm\_Details.dgn



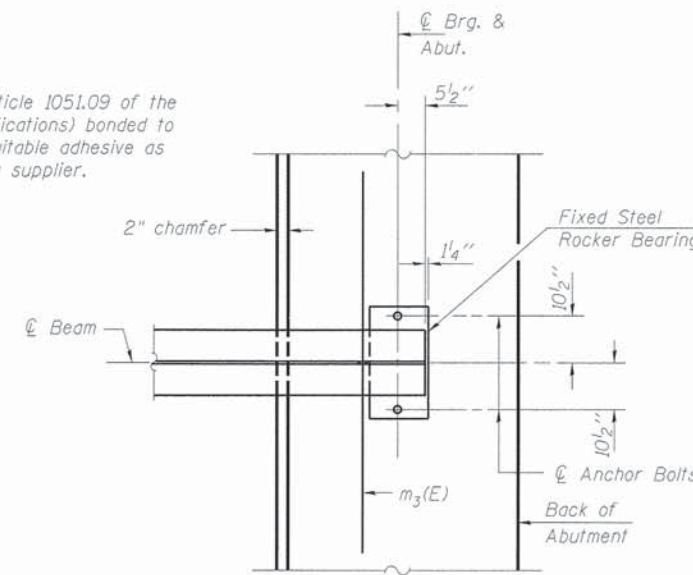
**DIAPHRAGM ELEVATION AT NORTH ABUTMENT**



**SECTION B-B**



**SECTION C-C**



**PARTIAL PLAN AT NORTH ABUTMENT**  
(Showing bottom flange of beam)

**NOTES:**

Reinforcement bars in diaphragm are billed with superstructure on Structural Sheet 11 of 34.

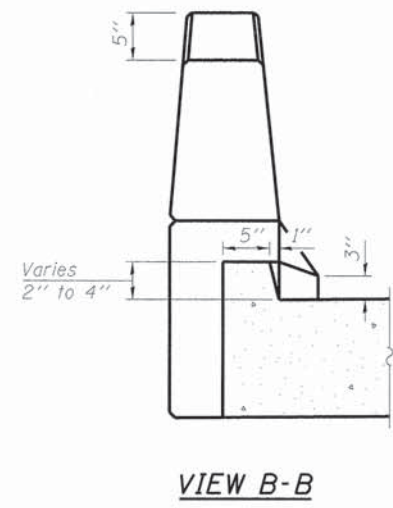
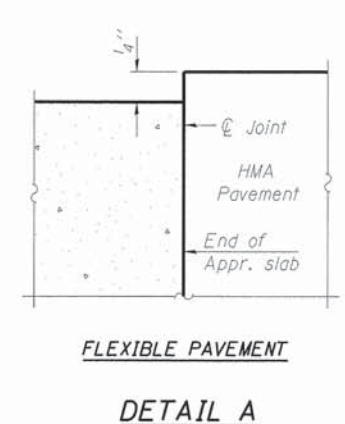
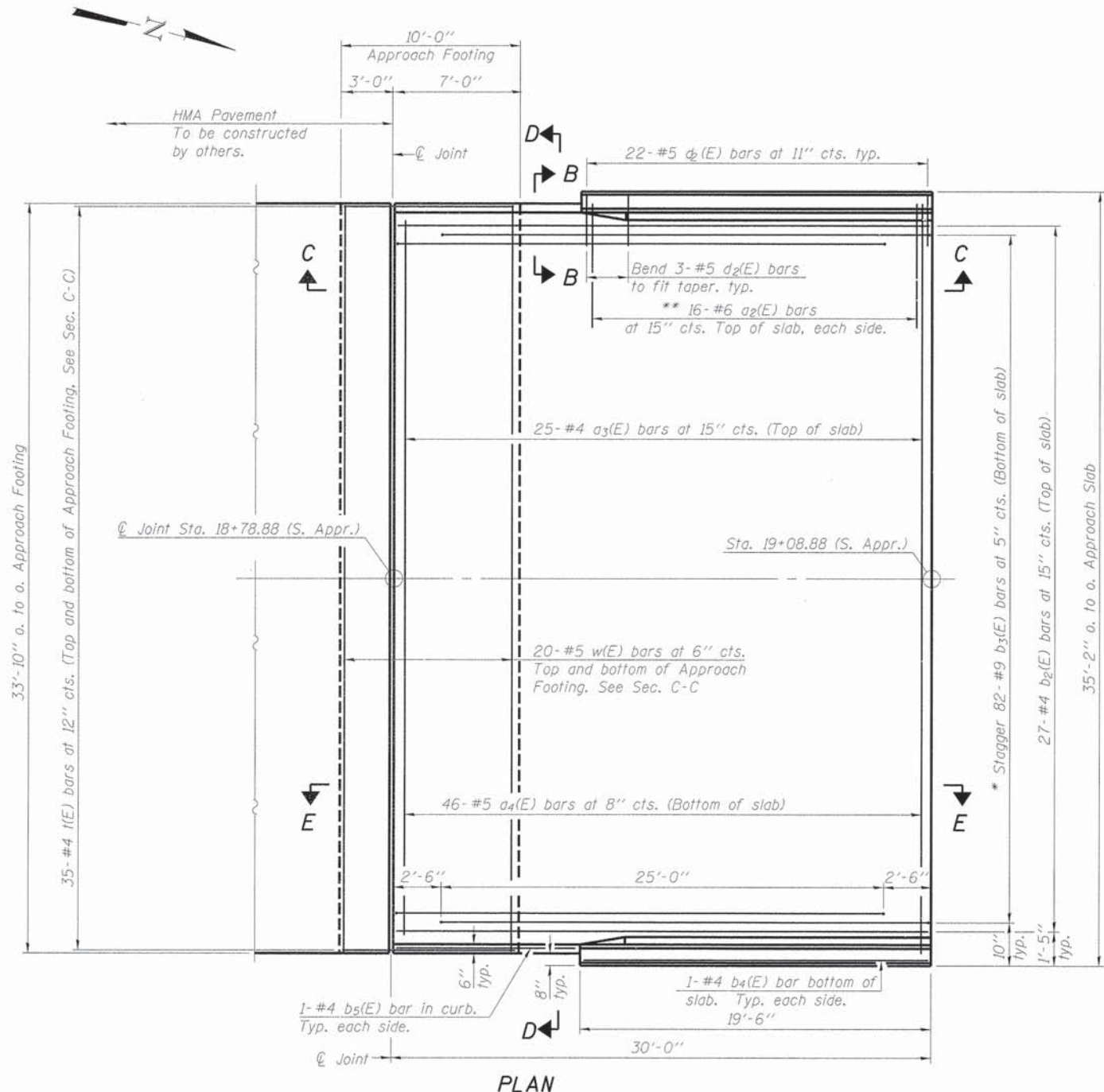
Concrete in diaphragm is included with Concrete Superstructure on Structural Sheet 11 of 34.

For details of bars s2(E), s3(E), u3(E), u5(E) and v(E) see Structural Sheet 11 of 34.

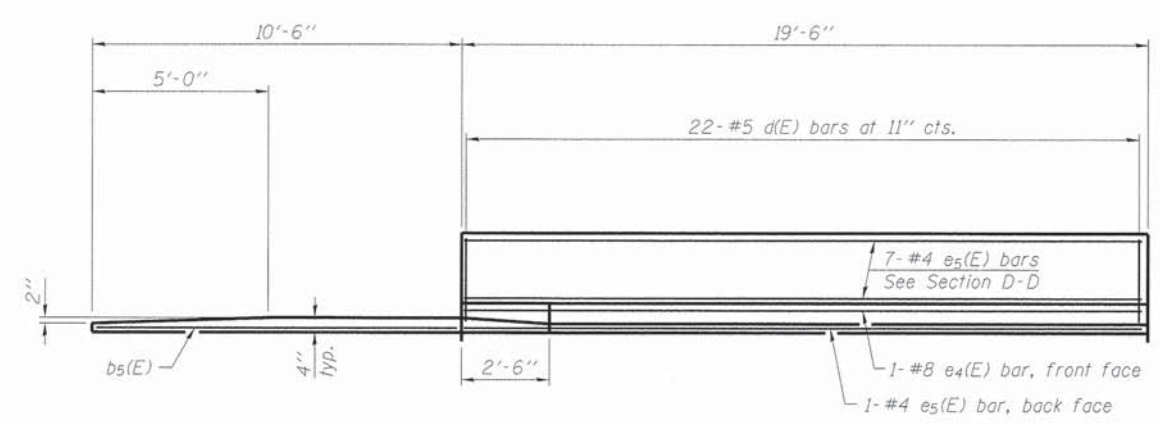
The approach slab seat shall have a constant slope determined from the control points shown.

For bearing details see Structural Sheet 19 of 34.

FILE # SA\PROJECTS\2013\1192013\_BUREAU\DESIGN\STRUCT\20\_Drawing\1192013\_Diaphragm\_Details.dwg



- NOTES:**
- \* Tilt #9 b3(E) bars as required to maintain clearance.
  - \*\* Space between a3(E) bars, typ. ea. parapet.
  - See Structural Sheet 16 of 34 for Sections D-D and E-E.



**VIEW C-C**

FILE: S:\PROJECTS\2013\1192013\_BUCKINGHAM\DESIGN\STRUCT\20-Drwings\1192013-Approach Slab Details.dgn

**WILLET HOFMANN & ASSOCIATES INC.**  
 ENGINEERING ARCHITECTURE LAND SURVEYING  
 809 EAST 2ND STREET, DIXON, IL 61021-0367  
 T: 815-284-3381 DESIGN FIRM: #184-000918

DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

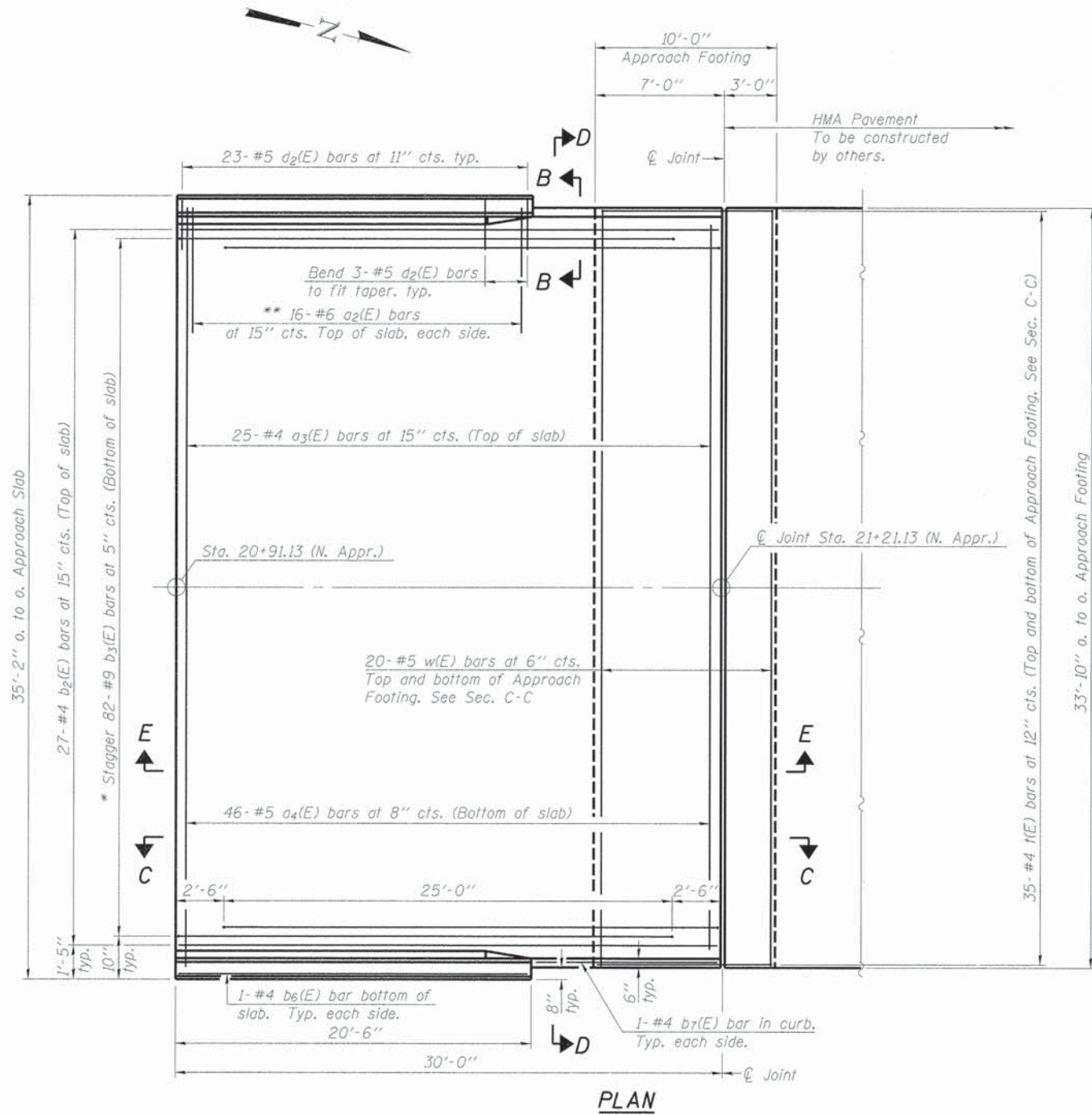
**SOUTH BRIDGE APPROACH SLAB DETAILS**  
**STRUCTURE NO. 006-3192**

F.A.S. RTE. 244	SECTION 14-00244-00-BR	COUNTY BUREAU	TOTAL SHEETS 36	SHEET NO. 16
WHA# 1192013		CONTRACT NO. 87584		
ILLINOIS FED. AID PROJECT BR5-0244(106)				

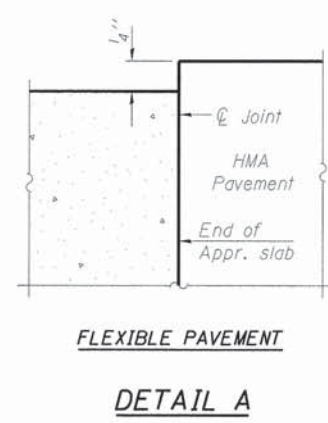
STRUCTURAL SHEET NO. 14 OF 34 SHEETS

(Sheet 1 of 3)

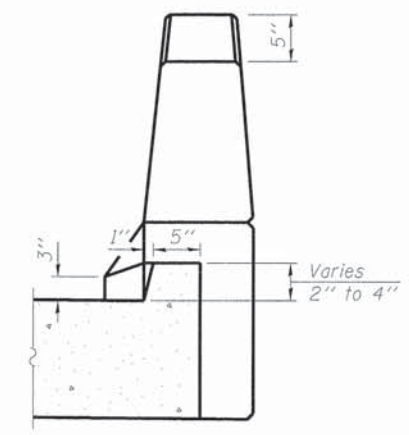




PLAN



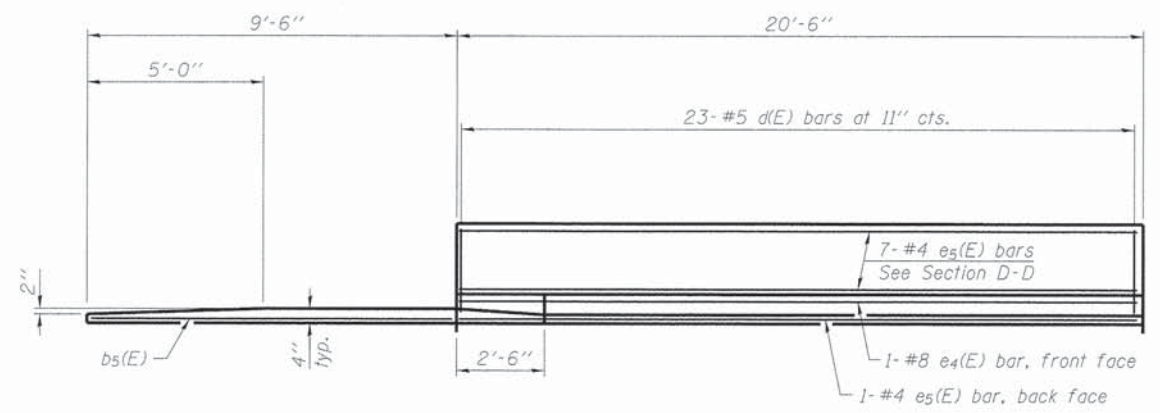
FLEXIBLE PAVEMENT  
DETAIL A



VIEW B-B

NOTES:

- \* Tilt #9 b3(E) bars as required to maintain clearance.
- \*\* Space between a3(E) bars, typ. ea. parapet. See Structural Sheet 16 of 34 for Sections D-D and E-E.



VIEW C-C

(Sheet 2 of 3)

FILE # S:\PROJECTS\2013\1192013\_BUREAU\DESIGN\STRUCT\20\_Drawing\1192013\_Approach Slab Detail.dwg

**WILLET HOFMANN & ASSOCIATES INC.**  
ENGINEERING ARCHITECTURE LAND SURVEYING  
809 EAST 2ND STREET, DIXON, IL 61021-0367  
T: 815-284-3381 DESIGN FIRM: #184-009918

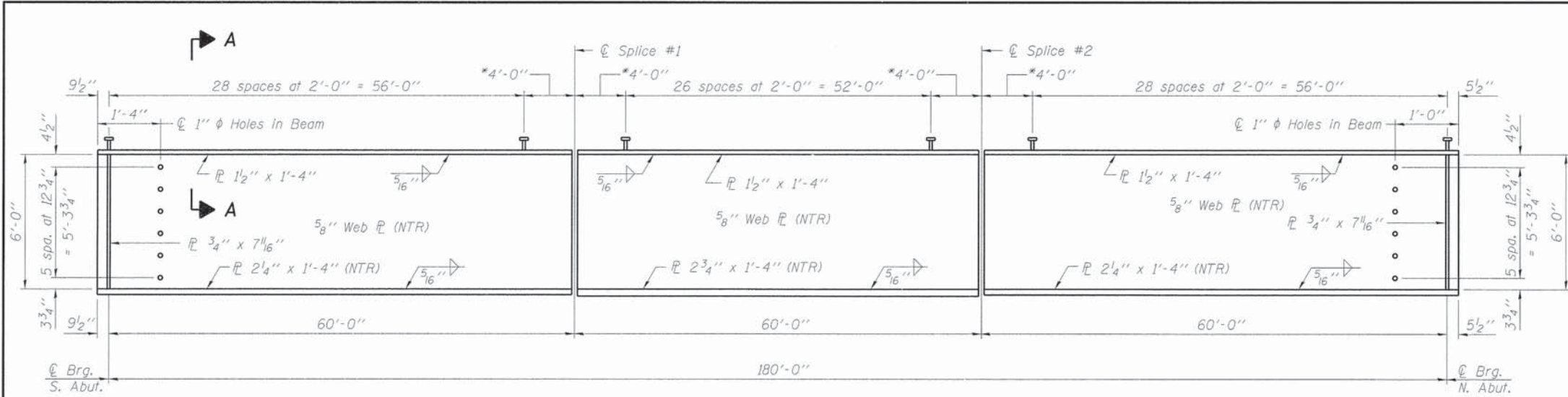
DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK  
STATION 20 + 00.00

**NORTH BRIDGE APPROACH SLAB DETAILS**  
STRUCTURE NO. 006-3192

F.A.S. RTE. 244	SECTION 14-00244-00-BR	COUNTY BUREAU	TOTAL SHEETS 36	SHEET NO. 17
WHA* 1192013		CONTRACT NO. 87584		
[ILLINOIS] FED. AID PROJECT BRS-0244(106)				

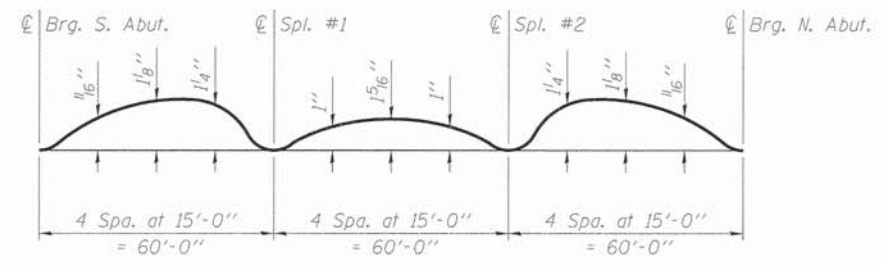




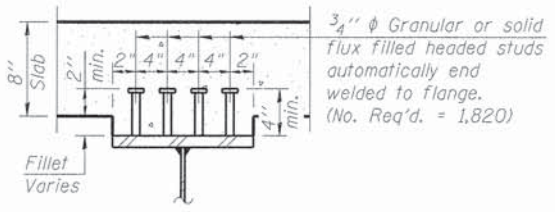
**GIRDER ELEVATION**

Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.

- $I_s, S_s$ : Non-composite moment of inertia and section modulus of the steel section used for computing  $f_s$  (Total-Strength I, and Service II) due to non-composite dead loads (in.<sup>4</sup> and in.<sup>3</sup>).
- $I_c(n), S_c(n)$ : Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing  $f_s$  (Total-Strength I, and Service II) in uncracked sections due to short-term composite live loads (in.<sup>4</sup> and in.<sup>3</sup>).
- $I_c(3n), S_c(3n)$ : Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing  $f_s$  (Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads (in.<sup>4</sup> and in.<sup>3</sup>).
- $I_c(cr), S_c(cr)$ : Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing  $f_s$  (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads (in.<sup>4</sup> and in.<sup>3</sup>).
- DC1: Un-factored non-composite dead load (kips/ft.).
- M<sub>DC1</sub>: Un-factored moment due to non-composite dead load (kip-ft.).
- DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).
- M<sub>DC2</sub>: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).
- DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).
- M<sub>DW</sub>: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).
- LLDF: Moment live load distribution factor.
- M<sub>ℓ + IM</sub>: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).
- M<sub>u</sub> (Strength I): Factored design moment (kip-ft.).  
1.25 (M<sub>DC1</sub> + M<sub>DC2</sub>) + 1.5 M<sub>DW</sub> + 1.75 M<sub>ℓ + IM</sub>
- φ<sub>r</sub>M<sub>n</sub>: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft.).
- f<sub>s</sub> DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).  
M<sub>DC1</sub> / S<sub>nc</sub>
- f<sub>s</sub> DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).  
M<sub>DC2</sub> / S<sub>c(3n)</sub> or M<sub>DC2</sub> / S<sub>c(cr)</sub> as applicable.
- f<sub>s</sub> DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).  
M<sub>DW</sub> / S<sub>c(3n)</sub> or M<sub>DW</sub> / S<sub>c(cr)</sub> as applicable.
- f<sub>s</sub> (ℓ + IM): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).  
M<sub>ℓ + IM</sub> / S<sub>c(n)</sub> or M<sub>DW</sub> / S<sub>c(cr)</sub> as applicable.
- f<sub>s</sub> (Service II): Sum of stresses as computed below (ksi).  
f<sub>s</sub> DC1 + f<sub>s</sub> DC2 + f<sub>s</sub> DW + 1.3 f<sub>s</sub> (ℓ + IM)
- 0.95R<sub>n</sub>F<sub>y</sub>F: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).
- f<sub>s</sub> (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).  
1.25 (f<sub>s</sub> DC1 + f<sub>s</sub> DC2) + 1.5 f<sub>s</sub> DW + 1.75 f<sub>s</sub> (ℓ + IM)
- φ<sub>r</sub>F<sub>n</sub>: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).
- V<sub>r</sub>: Maximum factored shear range in span computed according to Article 6.10.10.



**CAMBER DIAGRAM**



**SECTION A-A**

TOP OF WEB ELEVATIONS (FOR FABRICATORS USE ONLY)

Beam Number	℄ Brg. S. Abut.	Splice #1	Splice #2	℄ Brg. N. Abut.
1	614.081	616.532	618.332	619.481
2	614.187	616.638	618.438	619.587
3	614.293	616.745	618.545	619.693
4	614.187	616.638	618.438	619.587
5	614.081	616.532	618.332	619.481

INTERIOR GIRDER MOMENT TABLE

Item	Unit	Value
$I_s$	(in. <sup>4</sup> )	108,204
$I_c(n)$	(in. <sup>4</sup> )	221,581
$I_c(3n)$	(in. <sup>4</sup> )	161,088
$I_c(cr)$	(in. <sup>4</sup> )	—
$S_s$	(in. <sup>3</sup> )	3,381
$S_c(n)$	(in. <sup>3</sup> )	4,203
$S_c(3n)$	(in. <sup>3</sup> )	3,865
$S_c(cr)$	(in. <sup>3</sup> )	—
DC1	(k/ft)	1.20
M <sub>DC1</sub>	(k)	4,860
DC2	(k/ft)	0.18
M <sub>DC2</sub>	(k)	729
DW	(k/ft)	0.35
M <sub>DW</sub>	(k)	1,418
LLDF		0.523
M <sub>ℓ + IM</sub>	(k)	3,415
M <sub>u</sub> (Strength I)	(k)	15,089
φ <sub>r</sub> M <sub>n</sub>	(k)	18,045
f <sub>s</sub> DC1	(ksi)	17.25
f <sub>s</sub> DC2	(ksi)	2.26
f <sub>s</sub> DW	(ksi)	4.40
f <sub>s</sub> (ℓ + IM)	(ksi)	9.75
f <sub>s</sub> (Service II)	(ksi)	36.58
0.95R <sub>n</sub> F <sub>y</sub> F	(ksi)	47.50
f <sub>s</sub> (Total)(Strength I)	(ksi)	—
φ <sub>r</sub> F <sub>n</sub>	(ksi)	—
V <sub>r</sub>	(k)	16.5

INTERIOR GIRDER REACTION TABLE

Item	Abut.
LLDF	0.749
OCF	—
R <sub>DC1</sub>	(k) 151.6
R <sub>DC2</sub>	(k) 16.2
R <sub>DW</sub>	(k) 31.9
R <sub>LL</sub>	(k) 94.0
R <sub>IM</sub>	(k) 16.8
R <sub>Total</sub>	(k) 265.2

**BILL OF MATERIAL**

Item	Unit	Total
Stud Shear Connectors	Each	1,820
Furnishing and Erecting Structural Steel	L. Sum	1

**NOTES:**

\*See Structural Sheet 18 of 34 for shear stud connector spacing on splice plates.



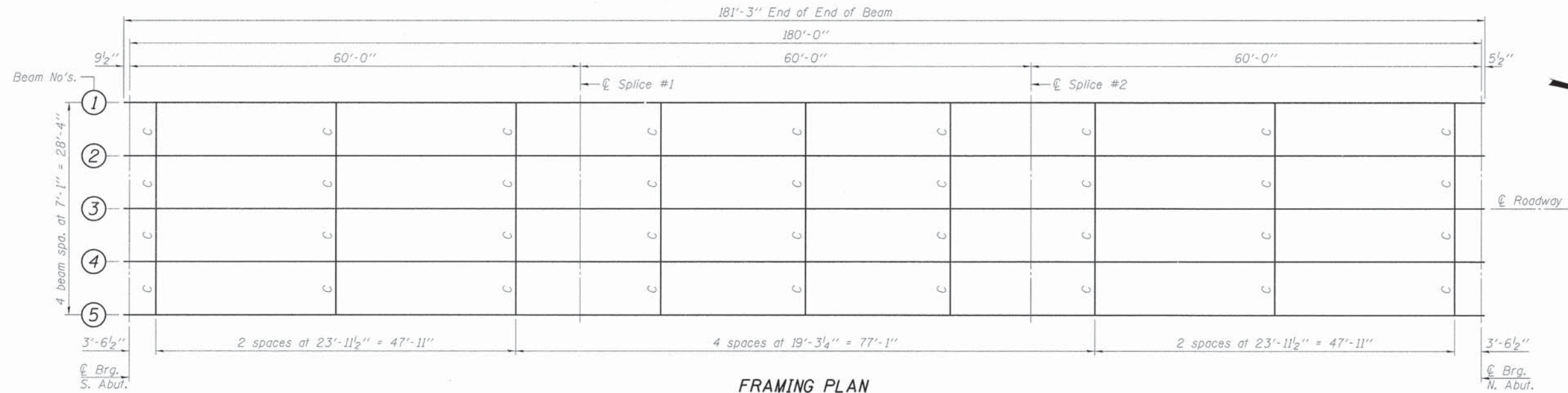
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CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

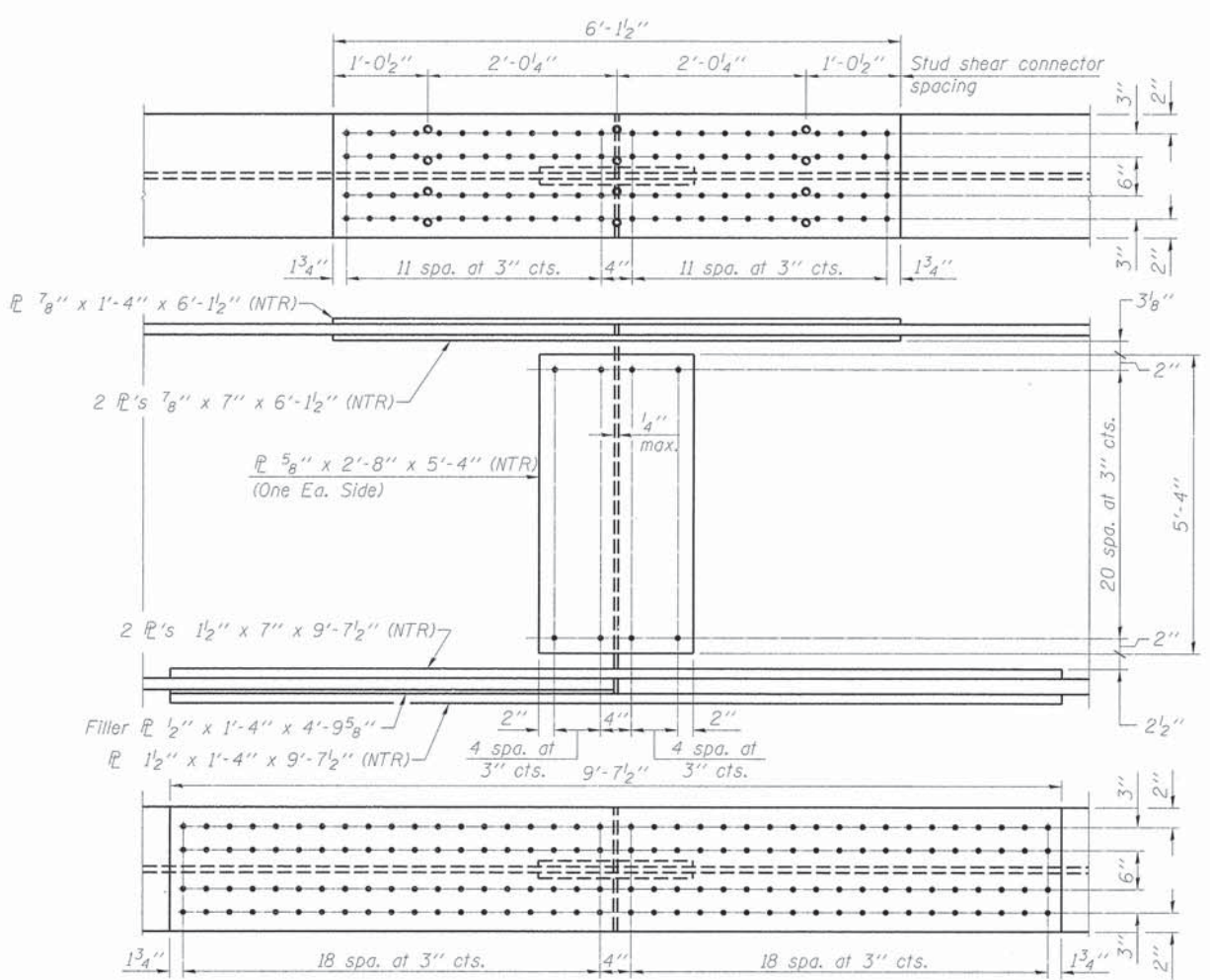
**STRUCTURAL STEEL DETAILS**  
**STRUCTURE NO. 006-3192**  
 STRUCTURAL SHEET NO. 17 OF 34 SHEETS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	19
WHA* 1192D13			CONTRACT NO. 87584	
[ILLINOIS] FED. AID PROJECT			BRS-0244(106)	

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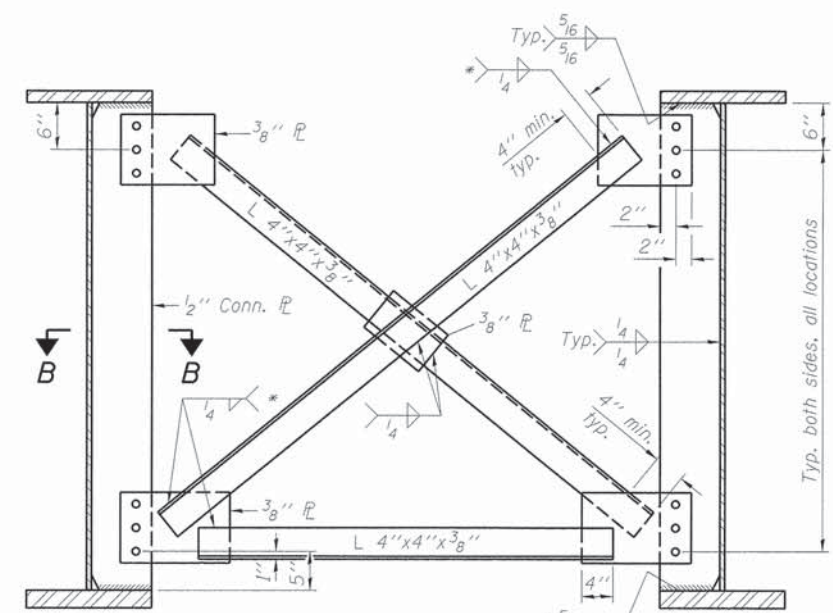


**FRAMING PLAN**



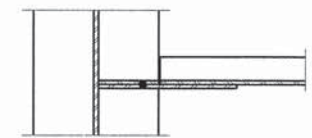
**FIELD SPLICE #1 & #2**

Field Splice #2 mirrored.  
Load carrying components designated "NTR" shall conform to the Impact Testing Requirement, Zone 2.



**INTERIOR CROSS FRAME (C)**

\* Fillet weld angles along 3 sides on one face of gusset plate.



**SECTION B-B**

**NOTES:**  
**CROSS FRAMES**  
Bolts shall be 3/4" φ HS bolts. 15/16" φ holes  
Two hardened washers required for each set of oversized holes.  
All cross frames shall be installed as steel is erected and secured with erection pins and bolts. Individual cross frames at supports may be temporarily disconnected to install bearing anchor rods.  
All cross frame plates, members and hardware are included with Furnishing and Erecting Structural Steel on Structural Sheet 17 of 34.  
**SPLICES**  
All splice plates and hardware are included with Furnishing and Erecting Structural Steel on Structural Sheet 17 of 34.

FILE # SA\PROJECTS\2013\1192013\_BUREAU\DESIGN\STRUCT\20\_Drawing\1192013\_Framing\_Plan.dgn

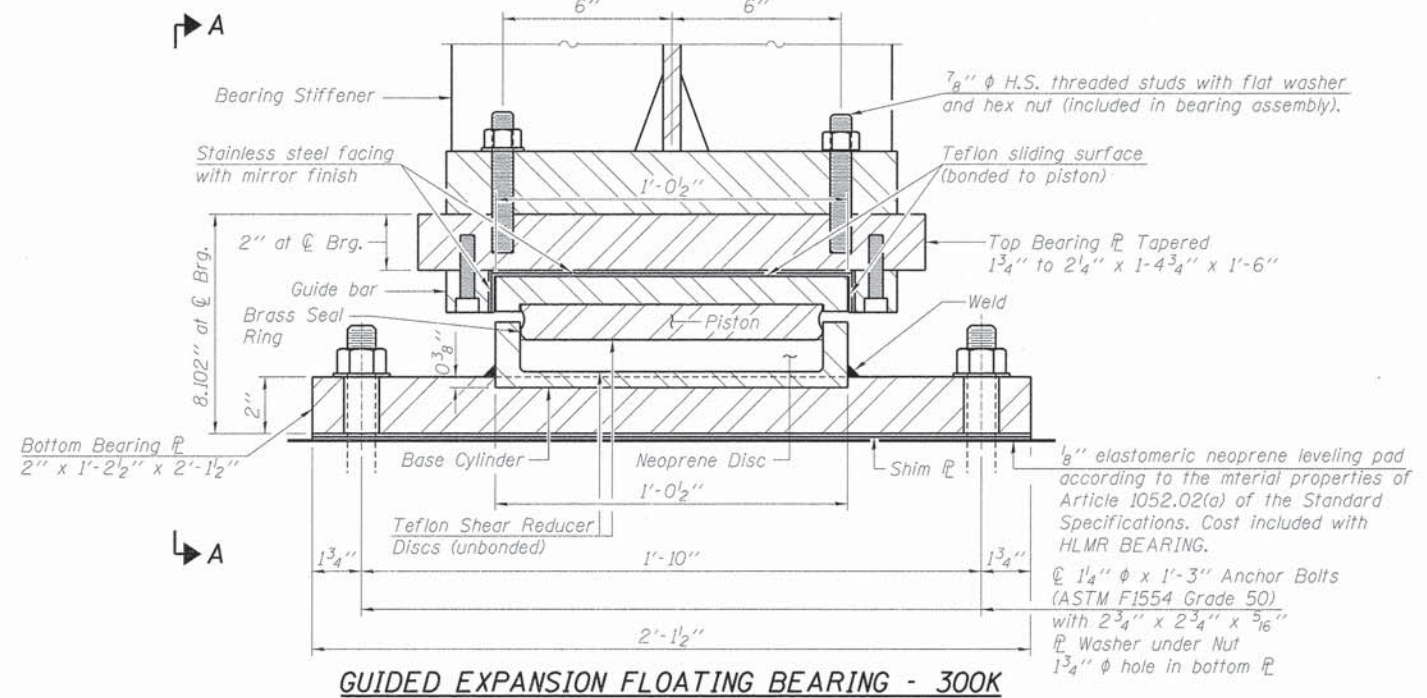
**WILLET HOFMANN & ASSOCIATES INC.**  
ENGINEERING ARCHITECTURE LAND SURVEYING  
809 EAST 2ND STREET, DIXON, IL 61021-0347  
T: 815-264-3381 DESIGN FIRM: #184-000918

DESIGNED -	MAC	REVISED -	
CHECKED -	BKC	REVISED -	
DRAWN -	FDL	REVISED -	
CHECKED -	MAC	REVISED -	

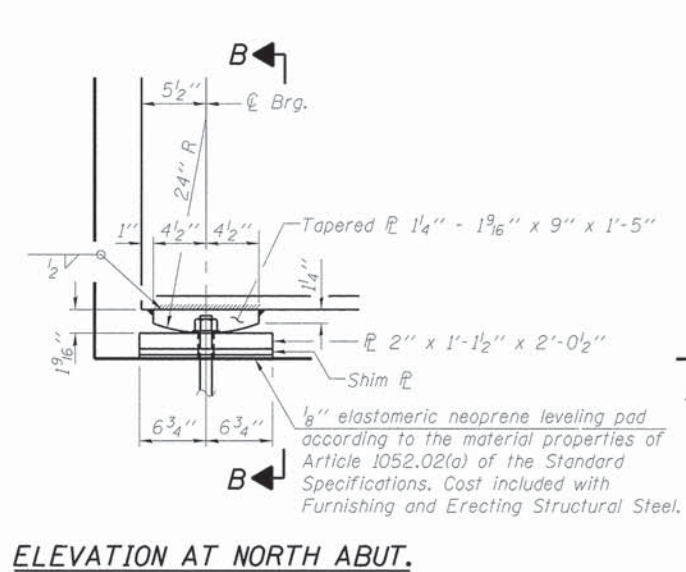
**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

**FRAMING PLAN**  
**STRUCTURE NO. 006-3192**  
STRUCTURAL SHEET NO. 18 OF 34 SHEETS

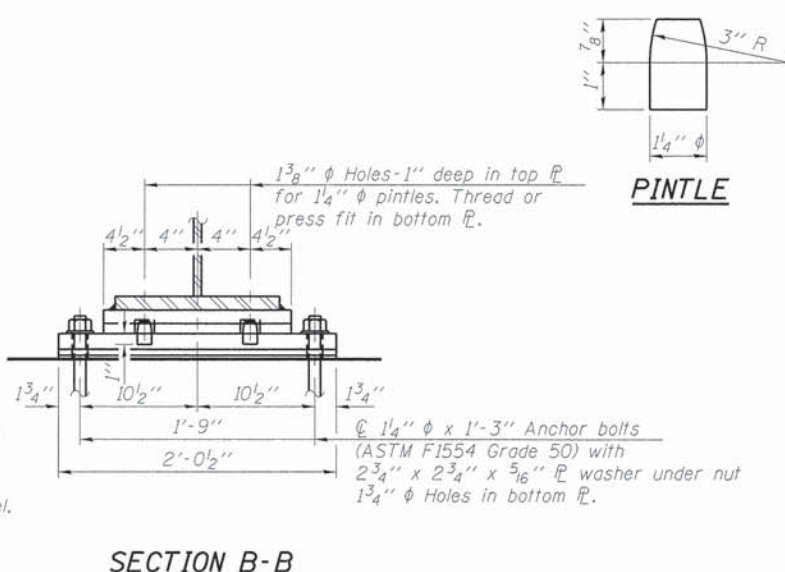
F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	20
WHA# 1192013		CONTRACT NO. 87584		
ILLINOIS FED. AID PROJECT		BRS-02441061		



**GUIDED EXPANSION FLOATING BEARING - 300k**



**ELEVATION AT NORTH ABUT.**



**SECTION B-B**

**FIXED BEARING**

No. required = 5  
 (Fixed bearing plates & pintles are included with Furnishing & Erecting Structural Steel Bill on Structural Sheet 17 of 34.)

**HLMR BEARING DATA**

Vertical Design Load (kips)	Lateral Design Load (kips)	Total Required Movement (in.)	Total Required Rotation (rad.)	L (in.)	D (in.)	Tt (in.)	Tb (in.)	Th (in.)
293.7	Hu 58.7 Ou 0	1 1/8"	0.0002	12 1/2"	12 1/2"	*	2.0	**

Expansion Length = 180'-0"

\*Tapered 1.75" - 2.25"  
 \*\*Varies 7.75" to 8.25"  
 Dead Load = 199.7 k  
 Live Load = 94.0 k

**NOTES:**

The structural steel plates of both bearing assemblies shall conform to the requirements of AASHTO M 270 Grade 50.

Two 1/8" adjusting shims shall be provided for each bearing in addition to all other plates or shims and placed as shown in bearing details.

Total Bearing Heights (Th) are based on values taken from a specific manufacturer's design tables. Actual bearing heights may differ from contract plans. Contractor to verify bearing heights and adjust seat elevations if required.

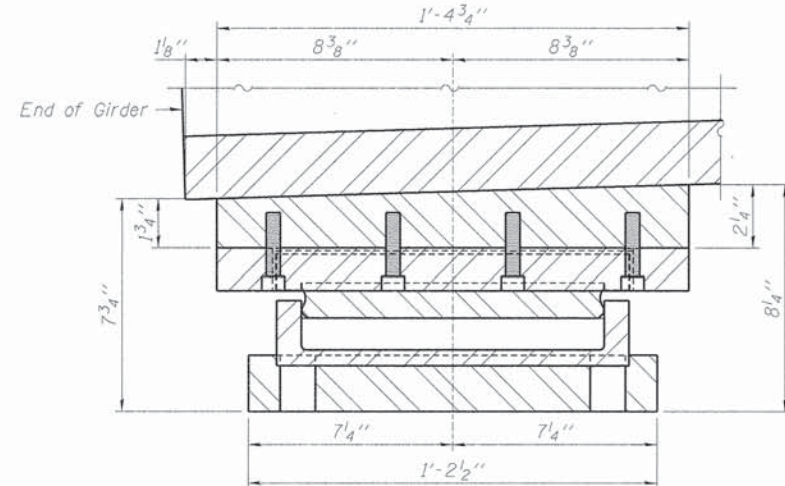
Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.

Anchor bolts at fixed bearings may be either cast in place or installed in holes drilled after the supported member is in place.

Drilled and set anchor bolts shall be installed according to Article 521.06 of the Standard Specifications.

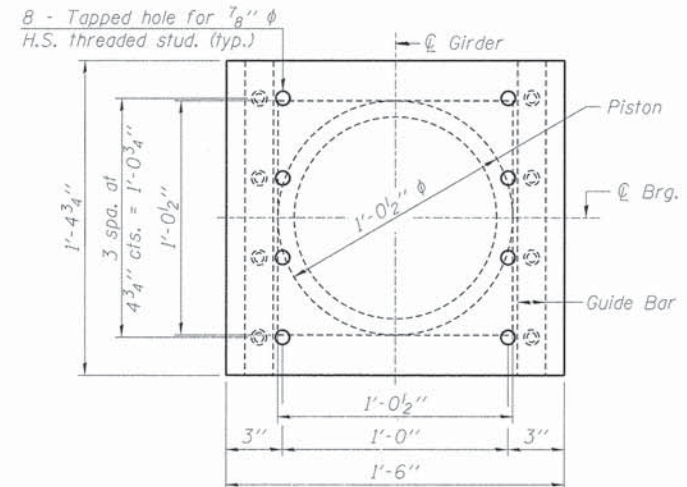
**BILL OF MATERIAL**

Item	Unit	Total
High Load Multi-Rotation Bearings, Guided Expansion, 300k	Each	5
Anchor Bolts, 1 1/4"	Each	30

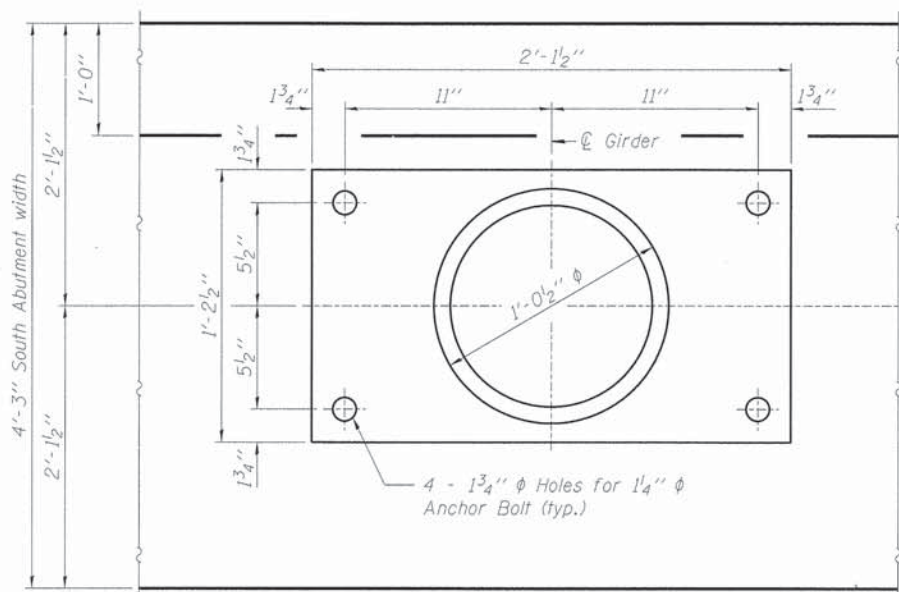


**SECTION A-A**

**ELEVATION AT SOUTH ABUTMENT**

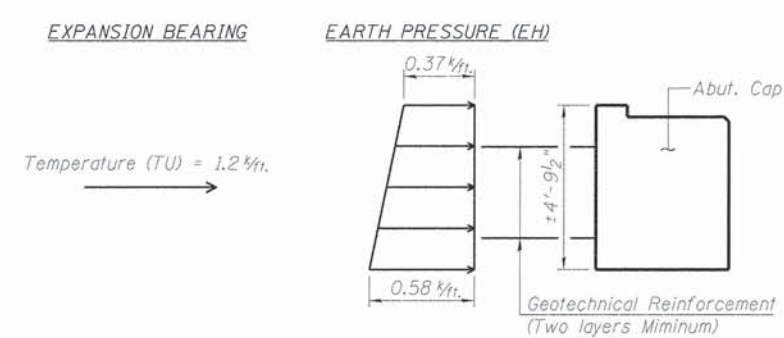
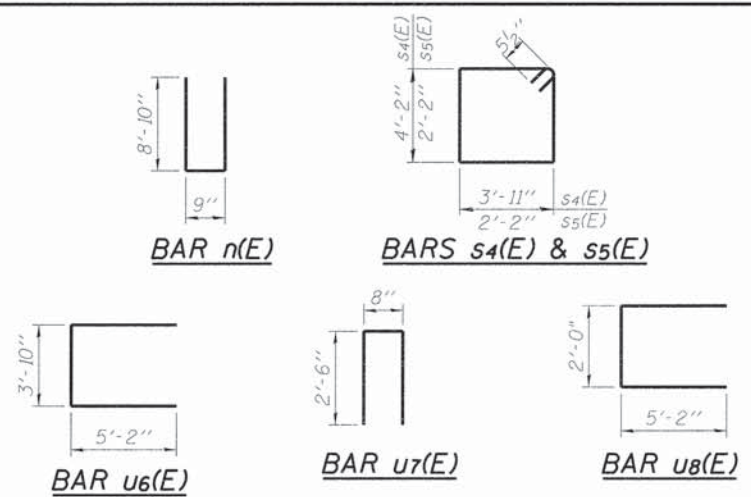


**TOP BEARING PLATE AND PISTON PLAN**



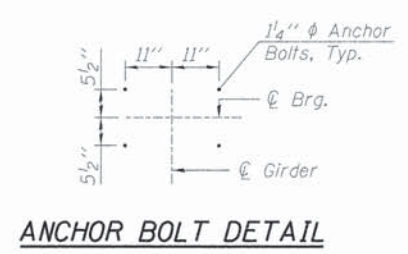
**BOTTOM BEARING PLATE AND BASE CYLINDER PLAN**

FILE # S:\PROJECTS\2013\1192013\_BUCCHINO\DESIGN\STRUCT\20\_Drawings\1192013\_Bearing\_Details.dgn



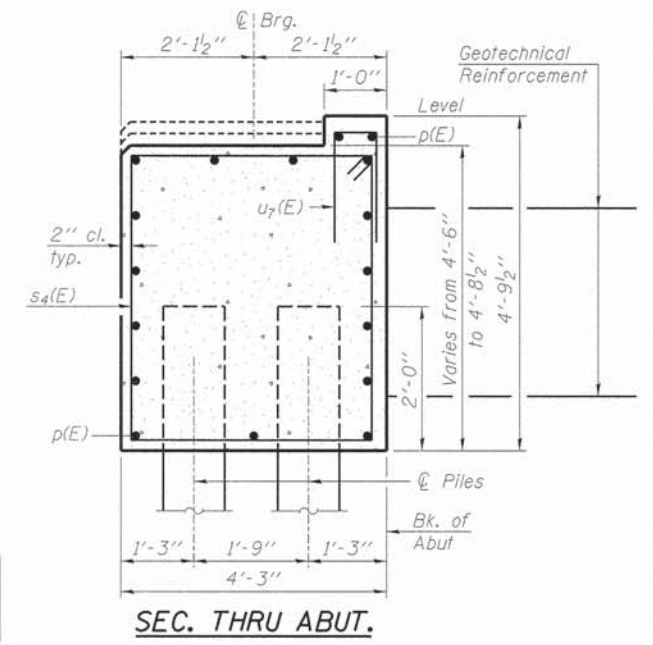
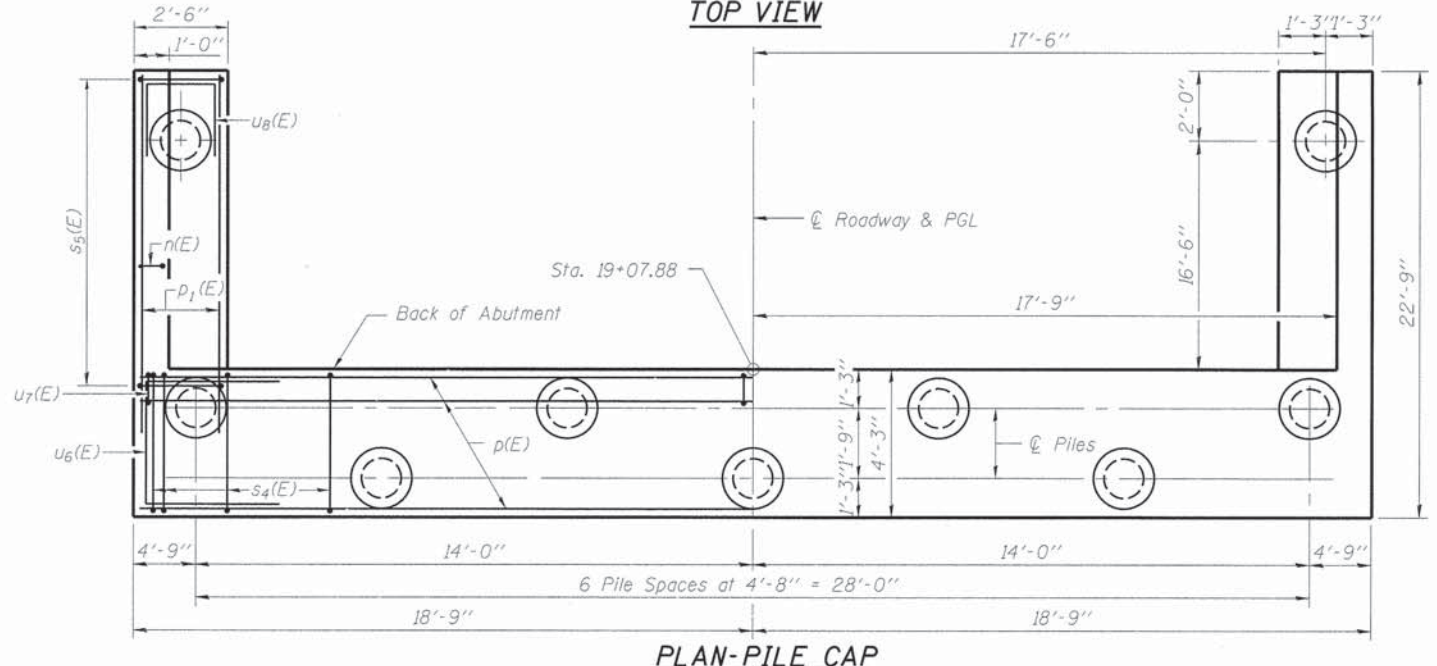
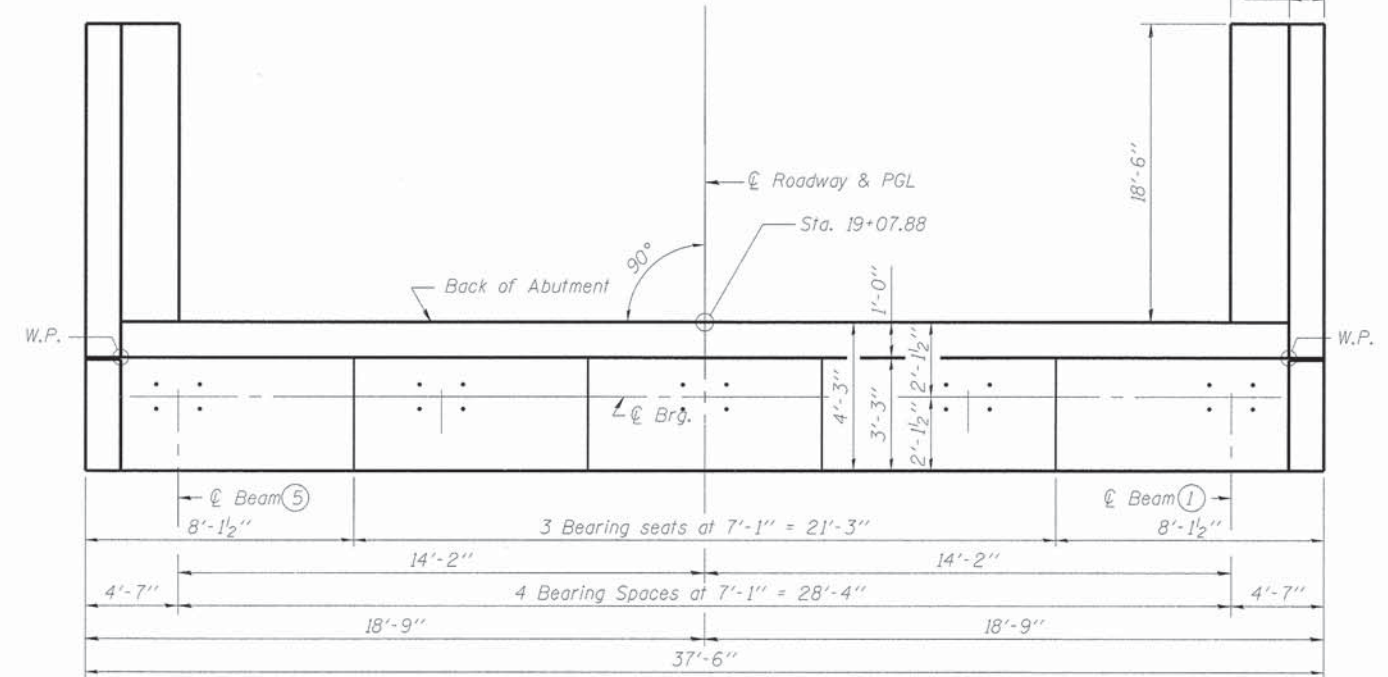
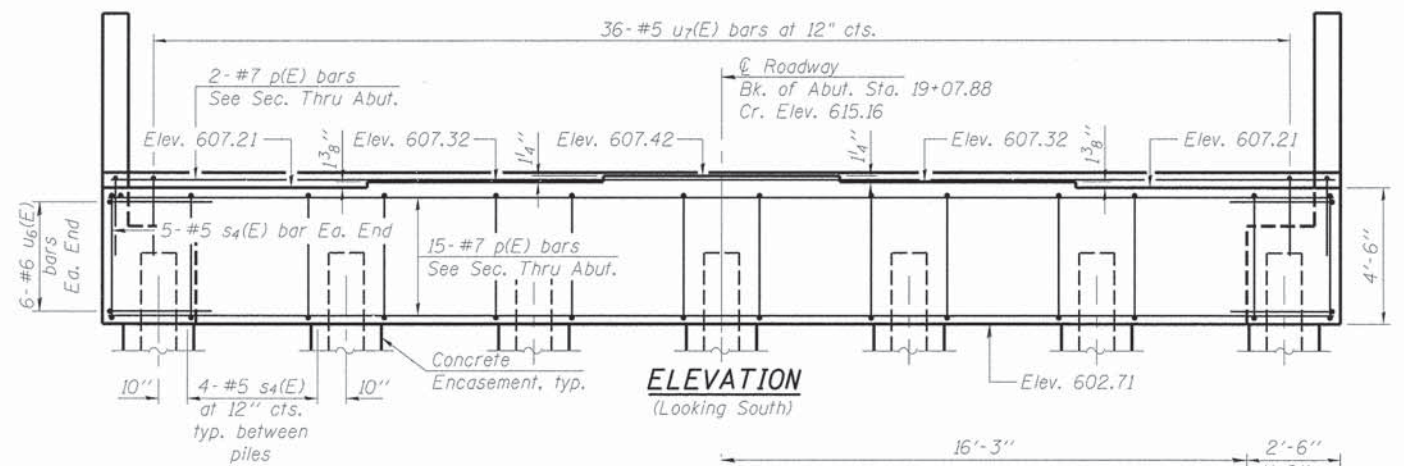
**GEOTECHNICAL REINFORCEMENT**

- NOTES:**
- Geotechnical Reinforcement shall be designed in accordance with the 2014 Edition of AASHTO.
  - Loads given are Service Loads and Suppliers of Geotechnical Reinforcement shall apply appropriate load factors to AASHTO load combinations.
  - See Special Provisions.



**PILE DATA**

Type: Metal Shell 14" x 0.312" walls  
 Nominal Required Bearing: 516 k.  
 Factored Resistance Available: 283.8 k.  
 Est. Length: 55'  
 No. Production Piles: 8  
 No. Test Piles: 1  
 Minimum Pile Tip Elevation = 555.0

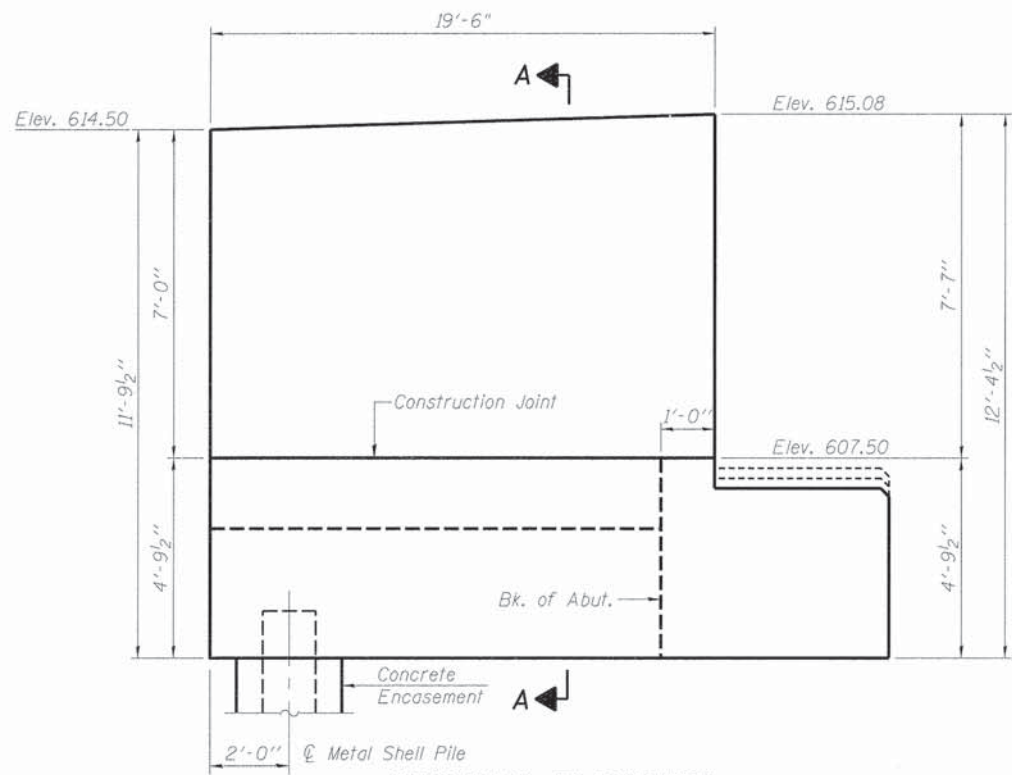


**SOUTH ABUTMENT BILL OF MATERIAL**

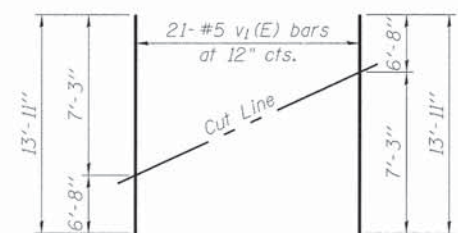
Bar	No.	Size	Length	Shape	
h2(E)	4	#5	2'-10"	—	
h3(E)	48	#5	19'-2"	—	
n(E)	42	#6	18'-5"	□	
p(E)	17	#7	37'-2"	—	
p1(E)	18	#7	22'-5"	—	
s4(E)	34	#5	17'-1"	□	
s5(E)	40	#5	9'-7"	□	
u6(E)	12	#6	14'-2"	□	
u7(E)	44	#5	5'-8"	□	
u8(E)	6	#6	12'-4"	□	
v1(E)	42	#5	13'-11"	—	
Porous Granular Embankment (Special)				Ton	851
Concrete Structures				Cu. Yd.	49.6
Concrete Encasement				Cu. Yd.	3.8
Reinforcement Bars, Epoxy Coated				Pound	6,490
Furnishing Metal Pile Shells 14" x 0.312"				Foot	440
Driving Piles				Foot	440
Test Pile Metal Shell				Each	1
Geocomposite Wall Drain				Sq. Yd.	43
Pipe Underdrains For Structures, 4"				Foot	66
Geotechnical Reinforcement				L. Sum	0.5

- NOTES:**
- All exposed edges shall be chamfered 3/4" unless otherwise noted.
  - For Pile and Concrete Encasement details, see Structural Sheet 24 of 34.
  - Space reinforcement in cap to miss anchor bolts.
  - Wingwall & Concrete Side Retainer details on Structural Sheet 21 of 34.
  - Pour steps monolithically with cap.

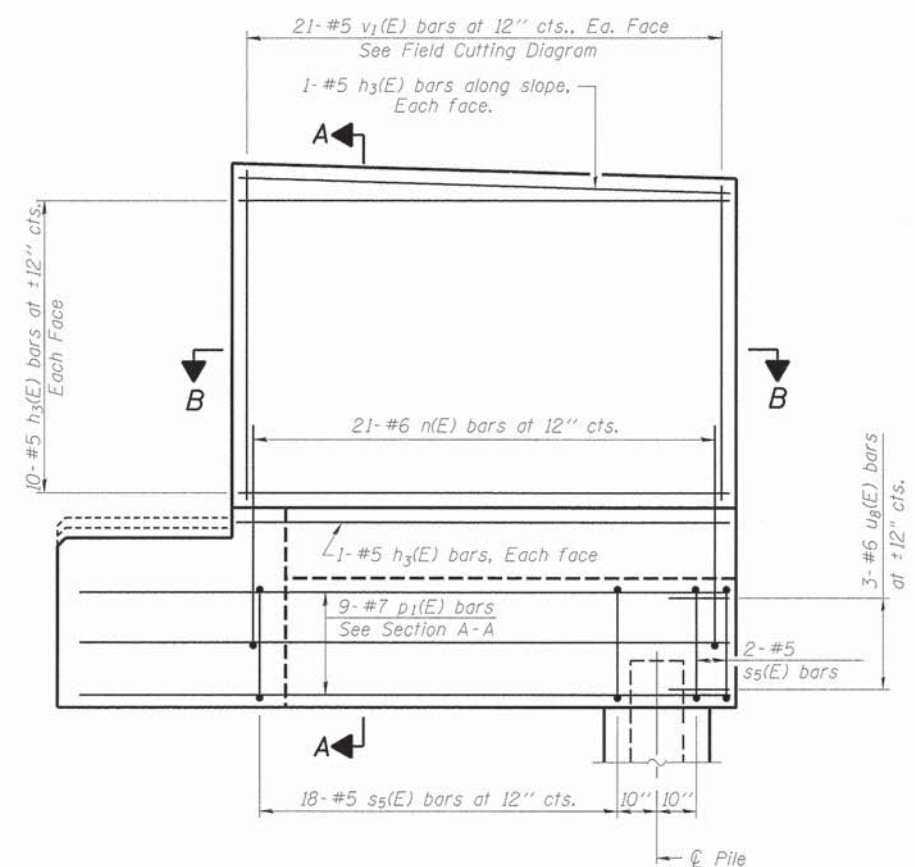
FILE: S:\PROJECTS\2013\1192013\BCCP\DESIGN\STRUCT\20.Draining\1192013\_South Abutment Details.dgn



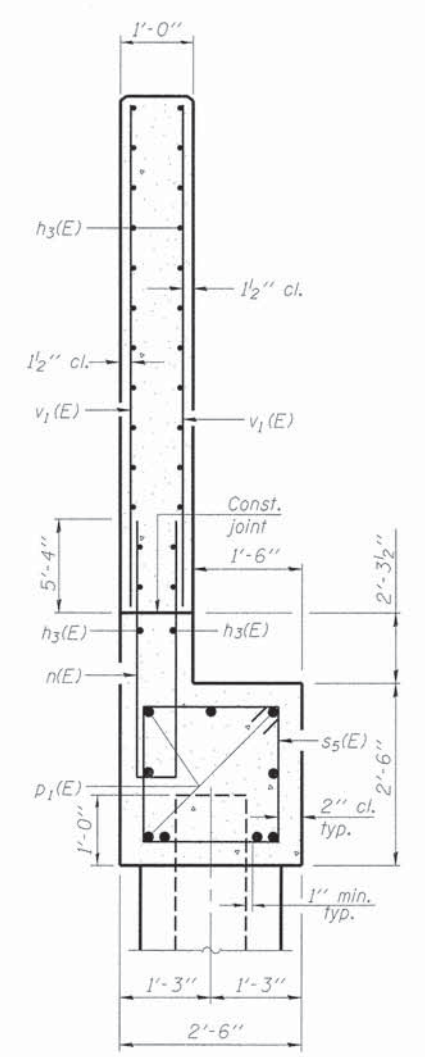
**WING WALL ELEVATION**  
Showing Dimensions



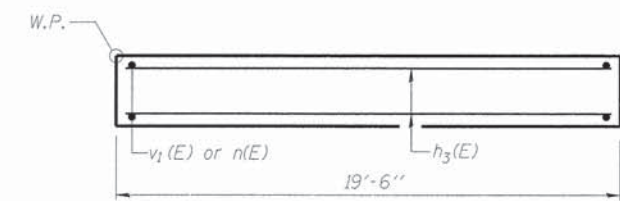
**FIELD CUTTING DIAGRAM**  
Order v<sub>1</sub>(E) bars full length. Cut as shown and use remainder of bars in opposite face.



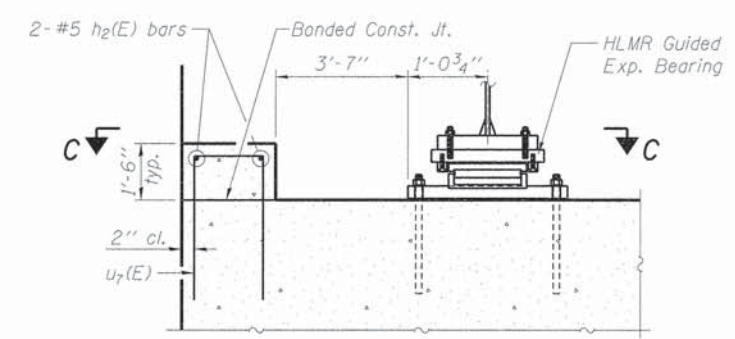
**WING WALL ELEVATION**  
Showing Reinforcement



**SECTION A-A**

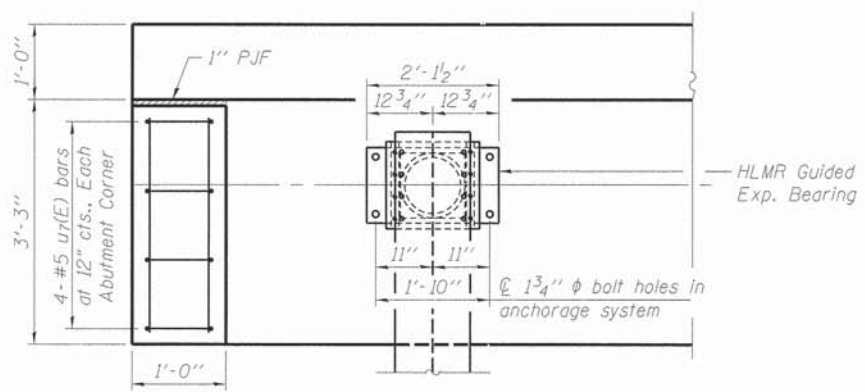


**SECTION B-B**



**ELEVATION**

**CONCRETE SIDE RETAINER DETAILS**

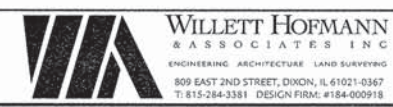


**SECTION C-C**

**NOTES:**

- All exposed edges shall be chamfered 3/4" unless otherwise noted.
- For Pile and Concrete Encasement details, see Structural Sheet 24 of 34.
- For Drainage details, see Structural Sheet 4 of 34.

FILE # SA\PROJECTS\2013\1192013\BUCC\DESIGN\STRUCT\20.Draining\1192013\_South Abutment Detail.dgn

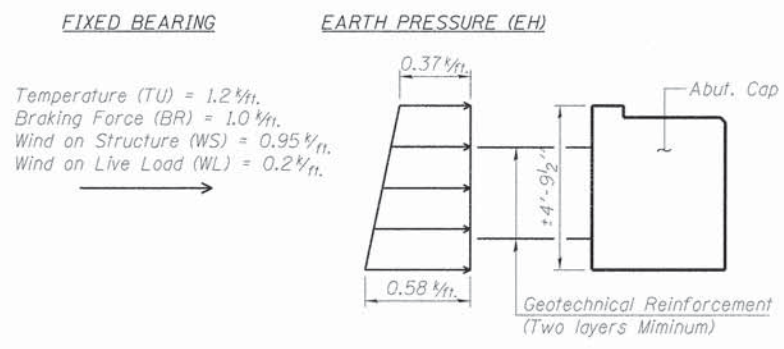
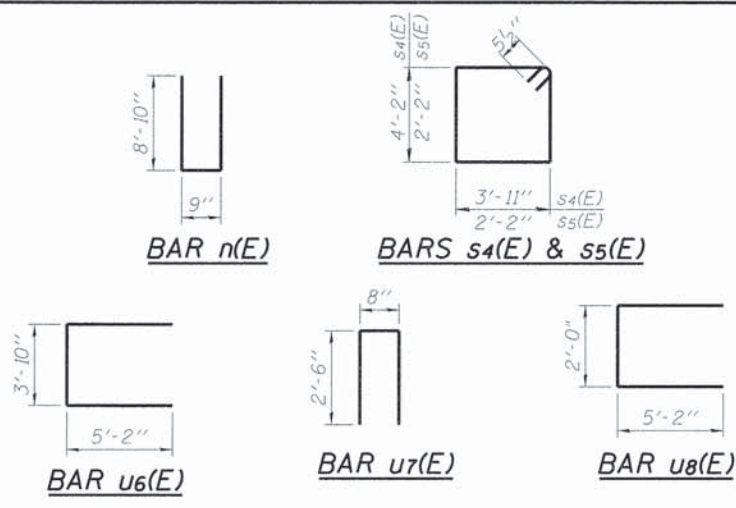


DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK  
STATION 20 + 00.00

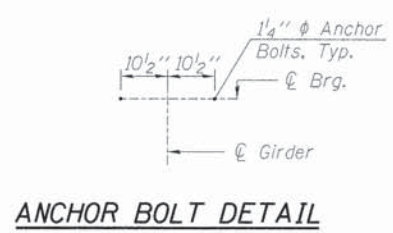
**SOUTH ABUTMENT DETAILS**  
STRUCTURE NO. 006-3192  
STRUCTURAL SHEET NO. 21 OF 34 SHEETS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	23
WHA# 1192013			CONTRACT NO. 87584	
[ILLINOIS] FED. AID PROJECT BRS-0244(106)				



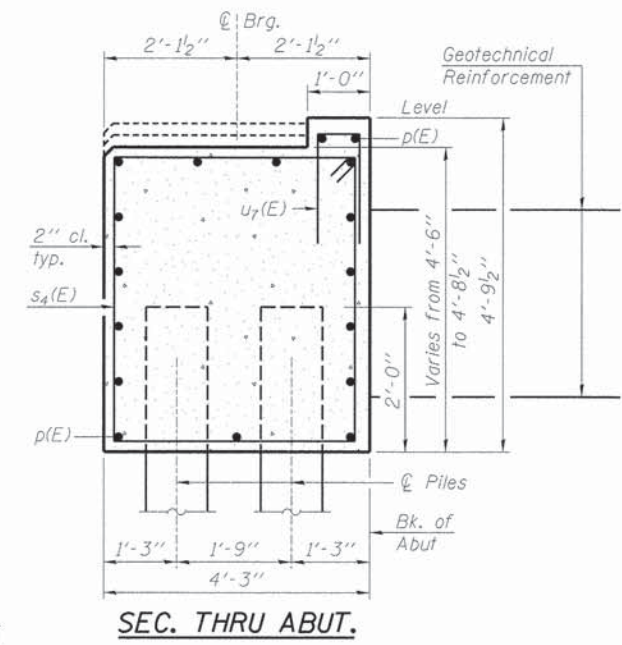
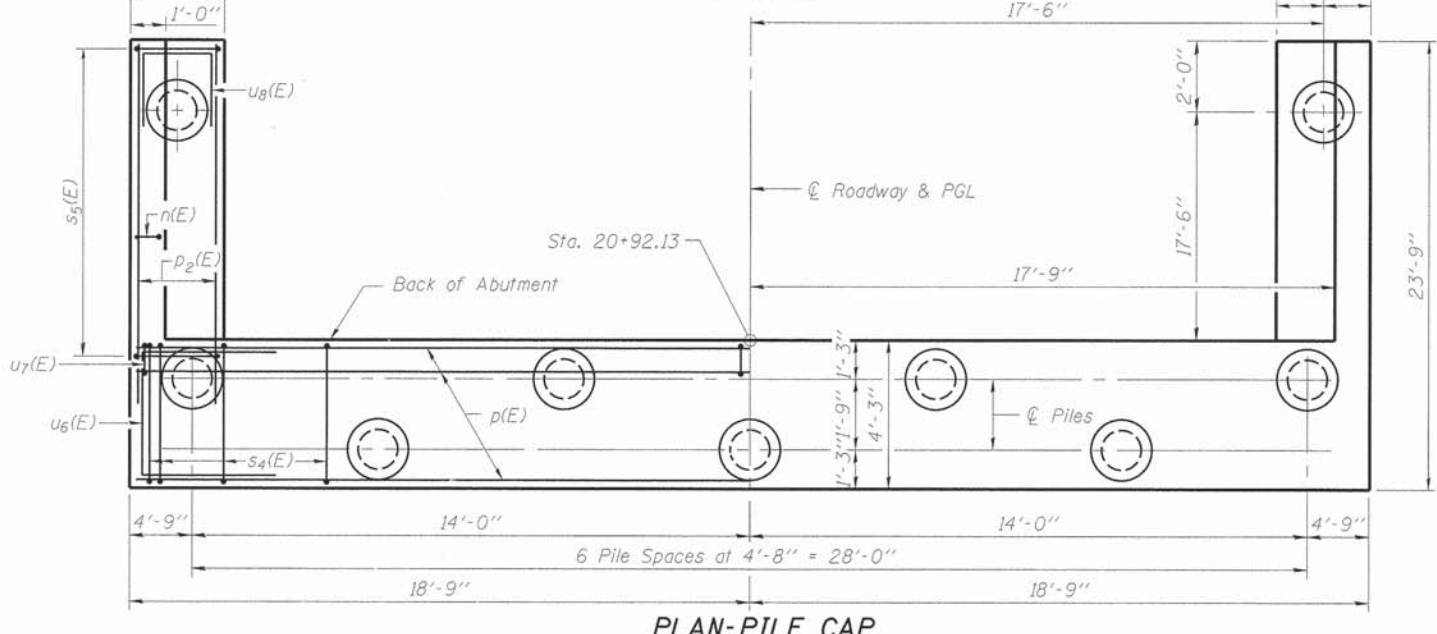
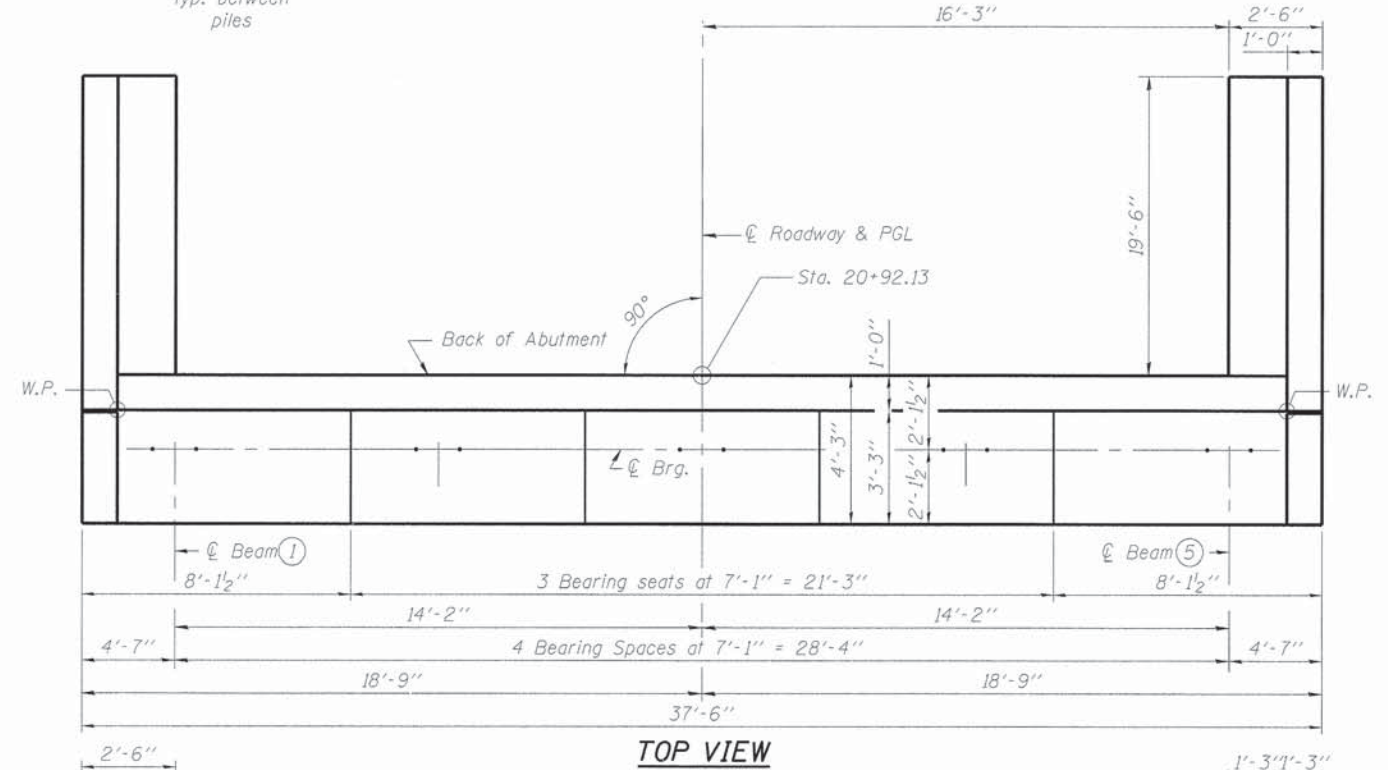
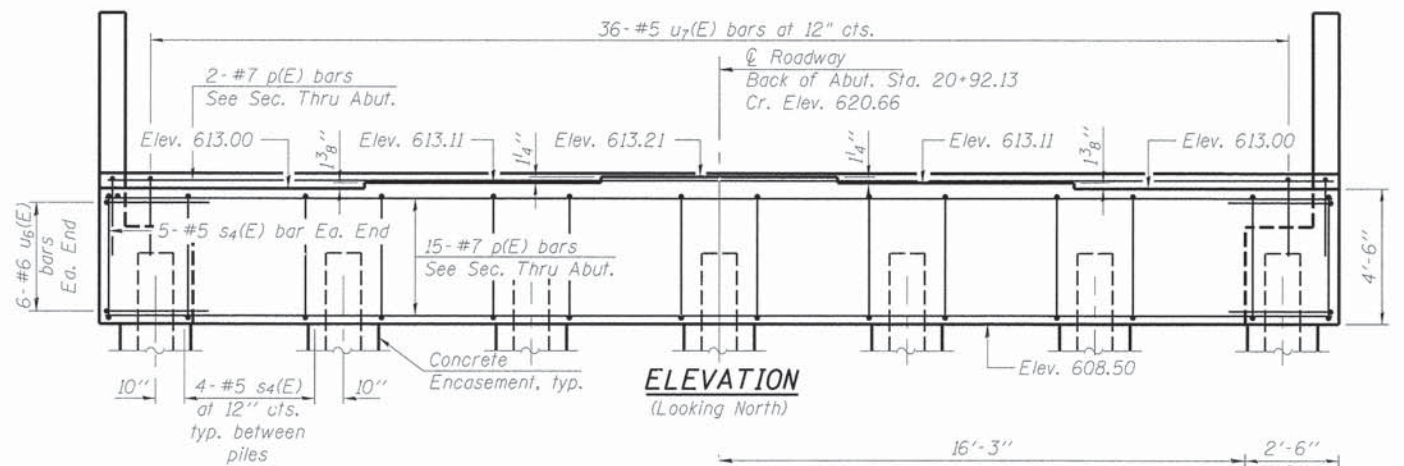
**GEOTECHNICAL REINFORCEMENT**

- NOTES:**
1. Geotechnical Reinforcement shall be designed in accordance with the 2014 Edition of AASHTO.
  2. Loads given are Service Loads and Suppliers of Geotechnical Reinforcement shall apply appropriate load factors to AASHTO load combinations.
  3. See Special Provisions.



**PILE DATA**

Type: Metal Shell 14" x 0.312" walls  
Nominal Required Bearing: 516 k.  
Factored Resistance Available: 283.8 k.  
Est. Length: 56'  
No. Production Piles: 8  
No. Test Piles: 1  
Minimum Pile Tip Elevations = 560.0



**NORTH ABUTMENT BILL OF MATERIAL**

Bar	No.	Size	Length	Shape
h2(E)	4	#5	2'-10"	—
h4(E)	48	#5	20'-2"	—
n(E)	44	#6	18'-5"	□
p(E)	17	#7	37'-2"	—
p2(E)	18	#7	23'-5"	—
s4(E)	34	#5	17'-1"	□
s5(E)	42	#5	9'-7"	□
u6(E)	12	#6	14'-2"	□
u7(E)	44	#5	5'-8"	□
u8(E)	6	#6	12'-4"	□
v2(E)	44	#5	14'-4"	—
Porous Granular Embankment (Special)		Ton	824	
Concrete Structures		Cu. Yd.	51.1	
Concrete Encasement		Cu. Yd.	3.8	
Reinforcement Bars, Epoxy Coated		Pound	6,700	
Furnishing Metal Pile Shells 14" x 0.312"		Foot	448	
Driving Piles		Foot	448	
Test Pile Metal Shell		Each	1	
Geocomposite Wall Drain		Sq. Yd.	41	
Pipe Underdrains For Structures, 4"		Foot	62	
Geotechnical Reinforcement		L. Sum	0.5	

- NOTES:**
- All exposed edges shall be chamfered 3/4" unless otherwise noted.
  - For Pile and Concrete Encasement details, see Structural Sheet 24 of 34.
  - Space reinforcement in cap to miss anchor bolts.
  - Wingwall & Concrete Side Retainer details on Structural Sheet 23 of 34.
  - Pour steps monolithically with cap.

FILE = S:\PROJECTS\2013\1192013\_BUCHANAN\DESIGN\STRUCT\2D\_Drawing\1192013\_North Abutment Details.dgn



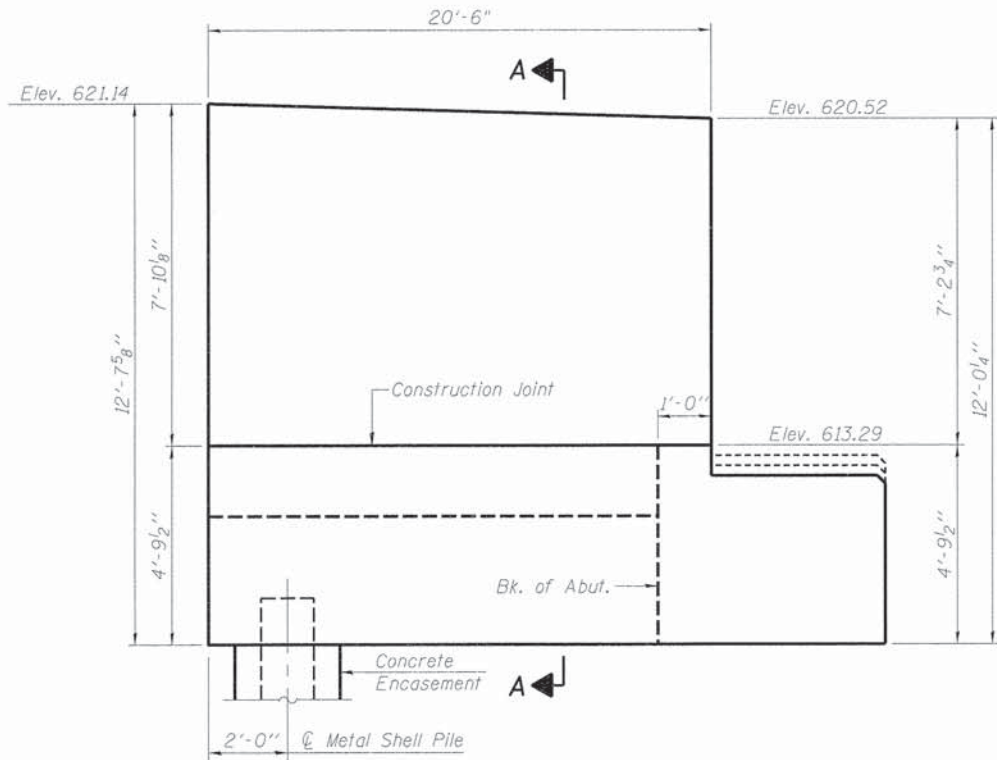
DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK  
STATION 20 + 00.00

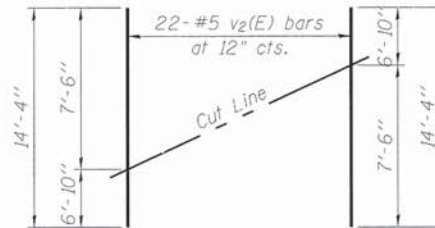
**NORTH ABUTMENT DETAILS**  
STRUCTURE NO. 006-3192  
STRUCTURAL SHEET NO. 22 OF 34 SHEETS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	24
WHA* 1192013		CONTRACT NO. 87584		
[ILLINOIS] FED. AID PROJECT		BRS-02441061		

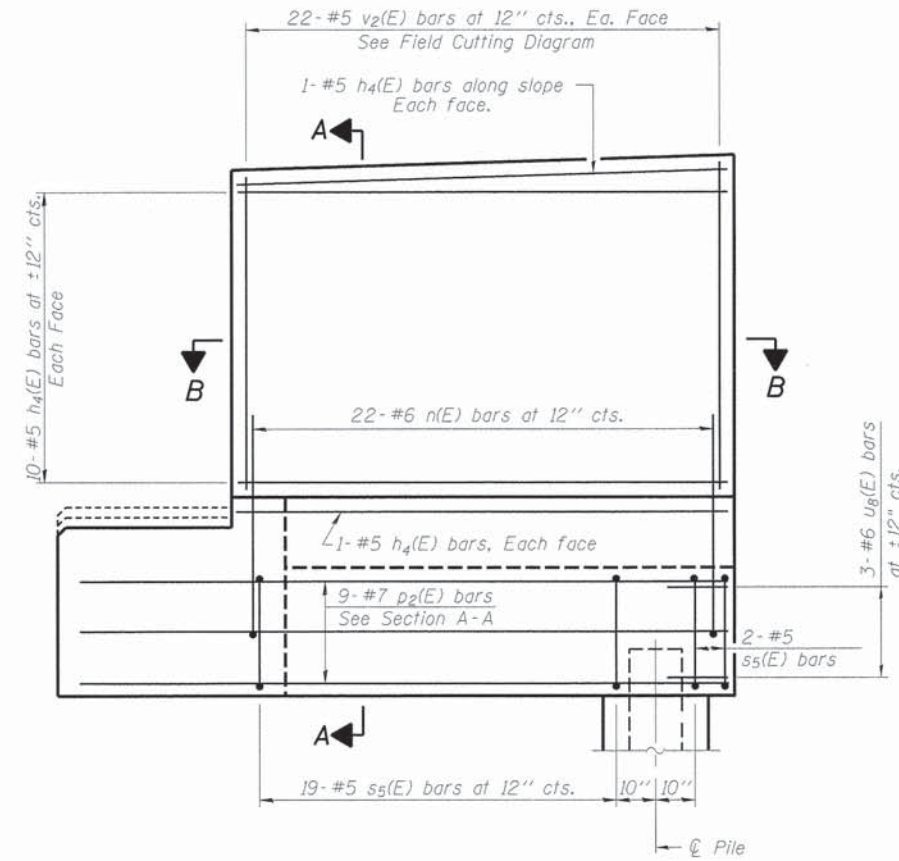




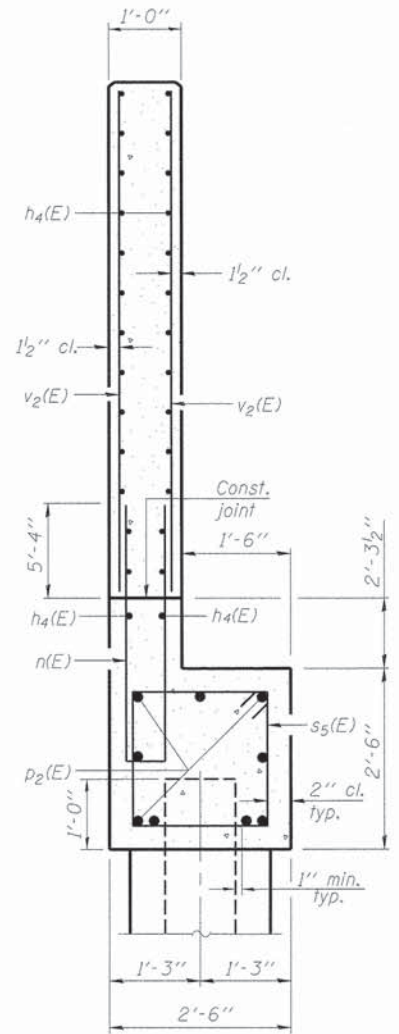
**WING WALL ELEVATION**  
Showing Dimensions



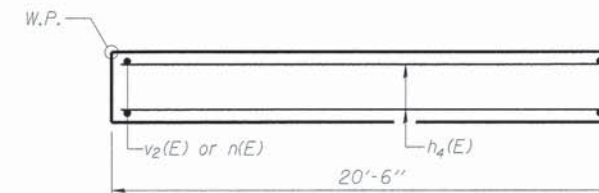
**FIELD CUTTING DIAGRAM**  
Order v<sub>2</sub>(E) bars full length. Cut as shown and use remainder of bars in opposite face.



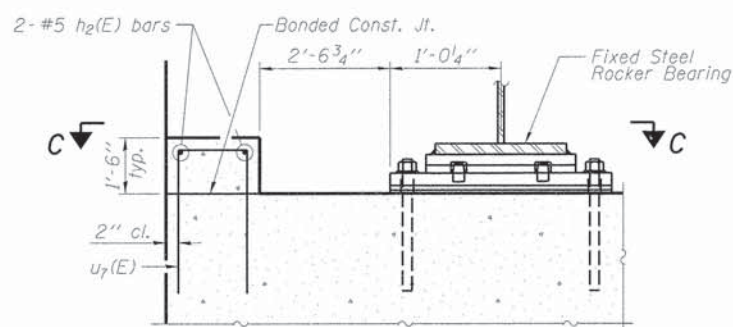
**WING WALL ELEVATION**  
Showing Reinforcement



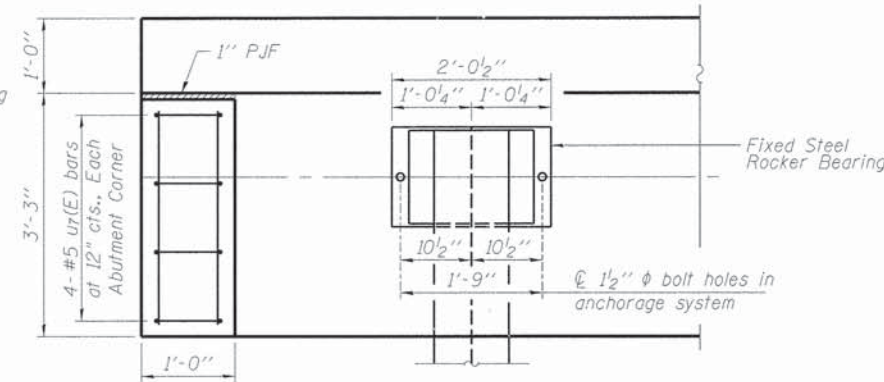
**SECTION A-A**



**SECTION B-B**



**ELEVATION**



**SECTION C-C**

**CONCRETE SIDE RETAINER DETAILS**

**NOTES:**

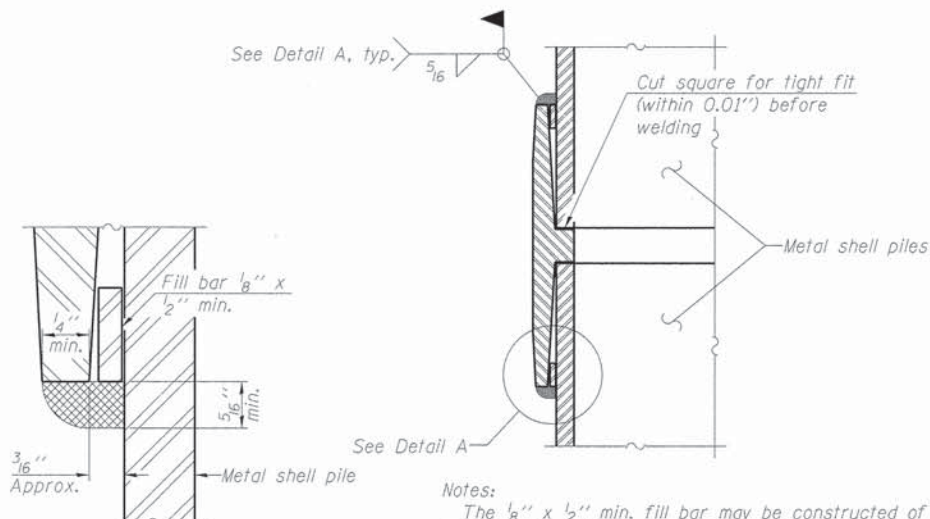
- All exposed edges shall be chamfered 3/4" unless otherwise noted.
- For Pile and Concrete Encasement details, see Structural Sheet 24 of 34.
- For Drainage details, See Structural Sheet 4 of 34.

FILE # SA\PROJECTS\2013\1192013\_BUCKHORN\DESIGN\STRUCT\20\_Pilewings\1192013\_North Abutment\_Details.rvt



**METAL SHELL PILE TABLE**

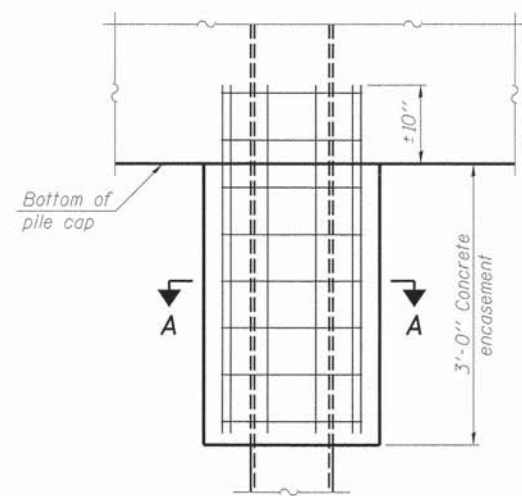
Designation and outside diameter	Wall thickness t	Weight per foot (Lbs./ft.)	Inside volume (yd. <sup>3</sup> /ft.)
PP12	0.179"	22.60	0.0274
PP12	0.250"	31.37	0.0267
PP14	0.250"	36.71	0.0368
PP14	0.312"	45.61	0.0361



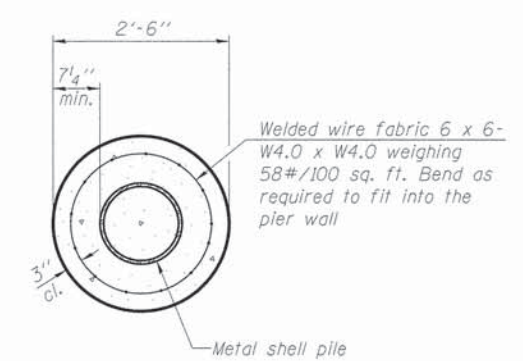
**DETAIL A**

Notes:  
 The 1/8" x 1/2" min. fill bar may be constructed of 2 bars with a 1/8" max. gap between them.  
 Pile segments shall be driven to solid contact with splicer before welding.

**WELDED COMMERCIAL SPLICE**



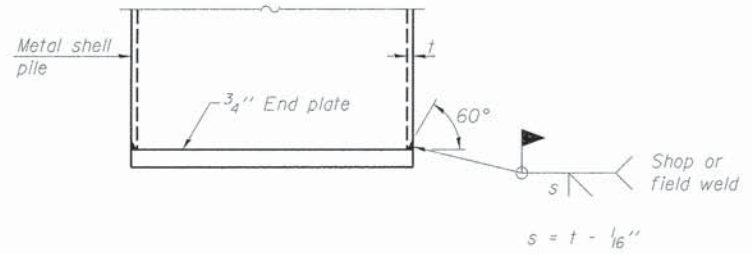
**ELEVATION**



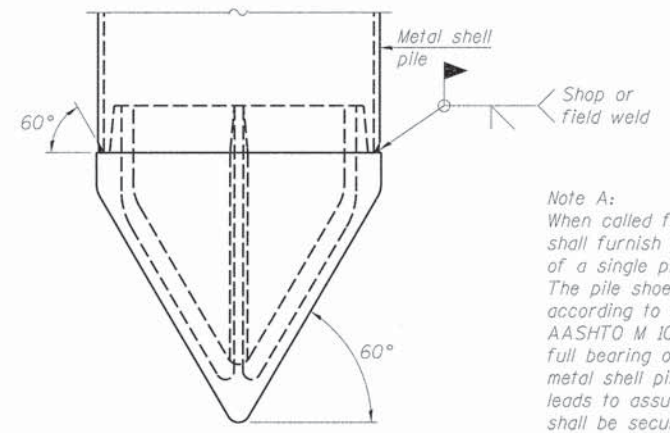
**SECTION A-A**

Note:  
 Forms for encasement may be omitted when soil conditions permit.

**CONCRETE ENCASEMENT AT ABUTMENTS**



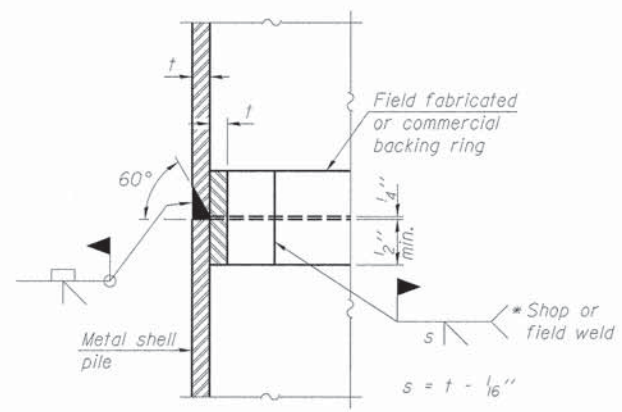
**END PLATE ATTACHMENT**



Note A:  
 When called for on the plans, the Contractor shall furnish metal shell pile shoes consisting of a single piece conical pile point as shown. The pile shoes shall be cast in one piece steel according to either ASTM A 148 Grade 90-60 or AASHTO M 103 Grade 65-35 and shall provide full bearing over the full circumference of the metal shell pile. The pile shoe shall have tapered leads to assure proper alignment and fitting and shall be secured to the pile with a circumferential weld.

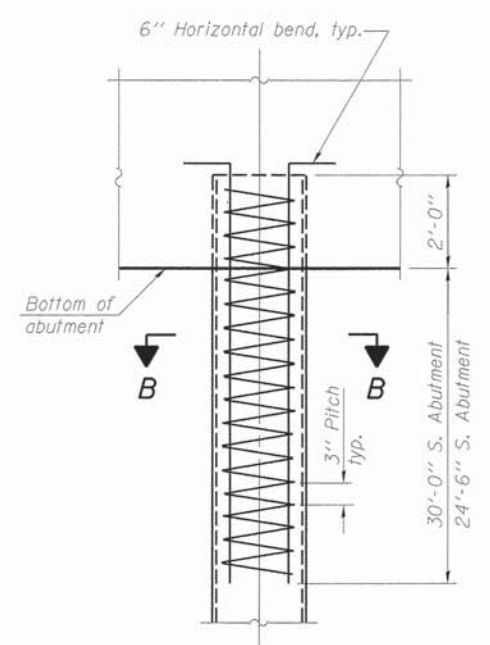
**METAL SHELL PILE SHOE ATTACHMENT**

(See Note A)

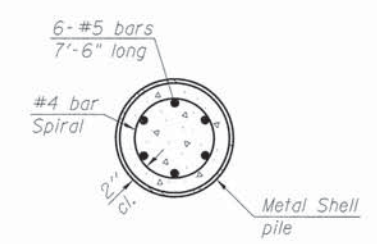


**COMPLETE PENETRATION WELD SPLICE**

\* Field fabricated backing ring may be made from pile shell by removing segment to allow reducing circumference and vertically rejoin with partial joint penetration weld.



**ELEVATION**



**SECTION B-B**

**METAL SHELL REINFORCEMENT AT ABUTMENTS**

Note:  
 The metal shell piles shall be according to ASTM A 252 Grade 3.

FILE # SA\PROJECTS\2013\1192013\BUREAU\DESIGN\STRUCT\20.Dwg\eng\1192013.Metal Shell Pile Details.dgn



DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

**METAL SHELL PILE DETAILS**  
**STRUCTURE NO. 006-3192**  
 STRUCTURAL SHEET NO. 24 OF 34 SHEETS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	26
WHA* 1192013			CONTRACT NO. 87584	
ILLINOIS FED. AID PROJECT BRS-0244(106)				

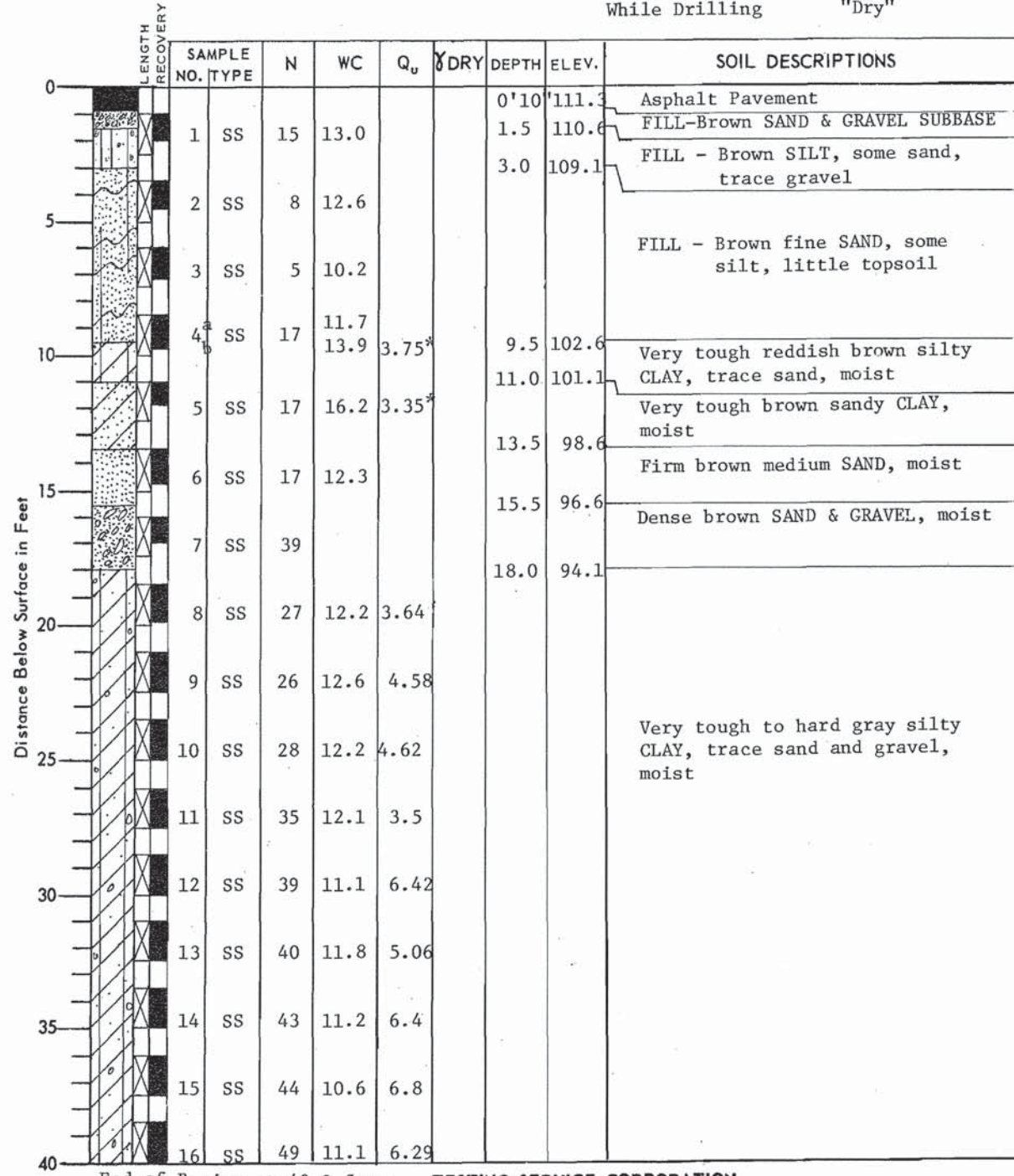






PROJECT BRIDGE REDESIGN, BACKBONE ROAD, BUREAU COUNTY, ILLINOIS  
 CLIENT BUREAU COUNTY HIGHWAY DEPT., County Court House, Princeton, Illinois  
 BORING 1 DATE STARTED 8-23-76 DATE COMPLETED 8-23-76 JOB 13,740

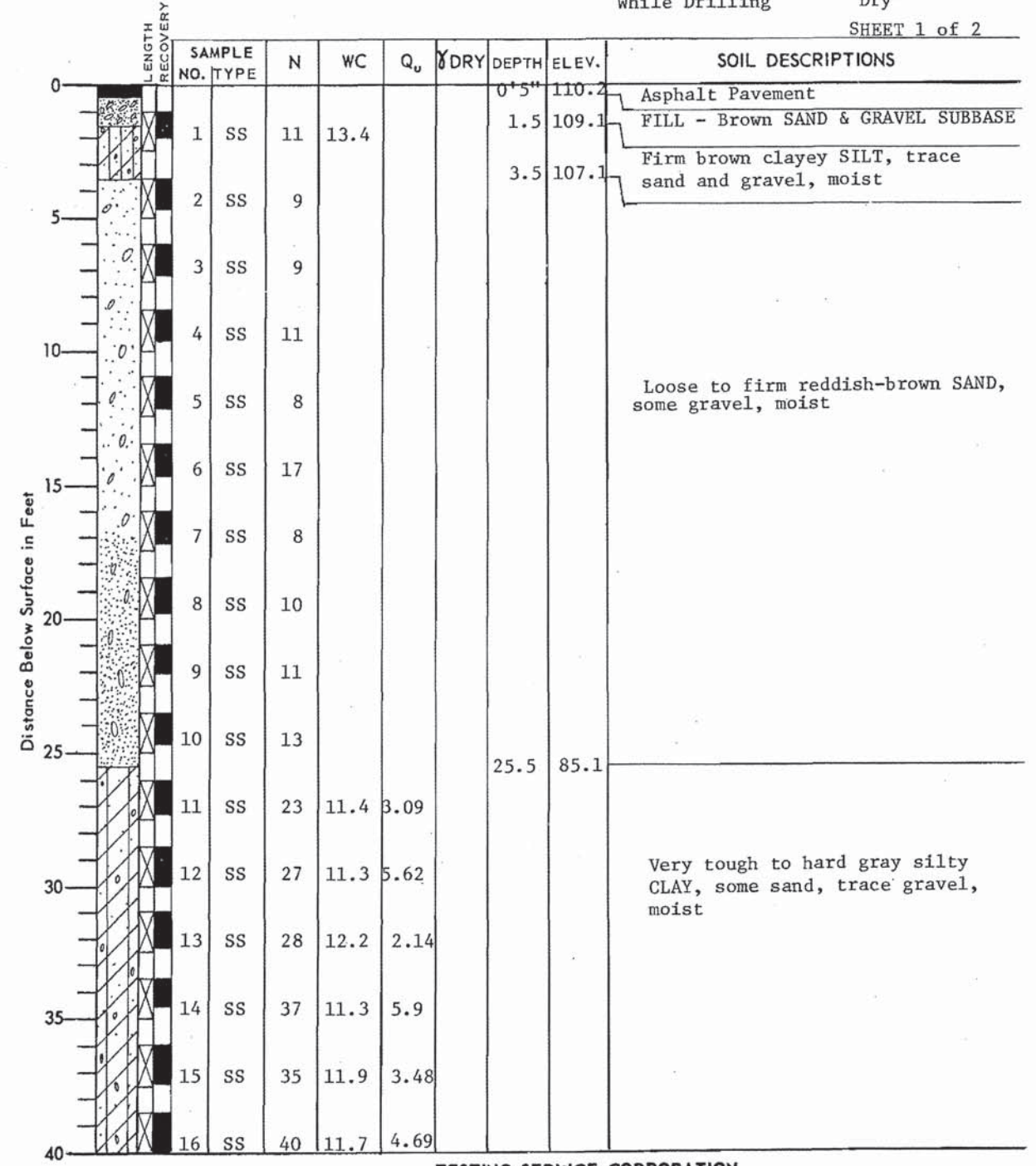
ELEVATIONS WATER TABLE  
 GROUND SURFACE 112.1 AT END OF BORING "Dry"  
 END OF BORING 72.1 24 HOURS "Dry"  
 While Drilling "Dry"



End of Boring at 40.0 feet TESTING SERVICE CORPORATION  
 DRILL RIG NO. \_\_\_\_\_

PROJECT BRIDGE REDESIGN, BACKBONE ROAD, BUREAU COUNTY, ILLINOIS  
 CLIENT BUREAU COUNTY HIGHWAY DEPT., County Court House, Princeton, Illinois  
 BORING 2 DATE STARTED 8-23-76 DATE COMPLETED 8-23-76 JOB 13,740

ELEVATIONS WATER TABLE  
 GROUND SURFACE 110.6 AT END OF BORING "Dry"  
 END OF BORING 65.6 24 HOURS "Dry"  
 While Drilling "Dry"



TESTING SERVICE CORPORATION  
 DRILL RIG NO. \_\_\_\_\_ CONTINUED ON SHEET 2

SHEET 1 of 2

FILE: S:\PROJECTS\2013\1192013-BUREAU REDESIGN\STRUCT\20-Drawings\1192013-Boring\_Logs.dgn



DESIGNED - MAC REVISIONS -  
 CHECKED - BKC REVISIONS -  
 DRAWN - FDL REVISIONS -  
 CHECKED - MAC REVISIONS -

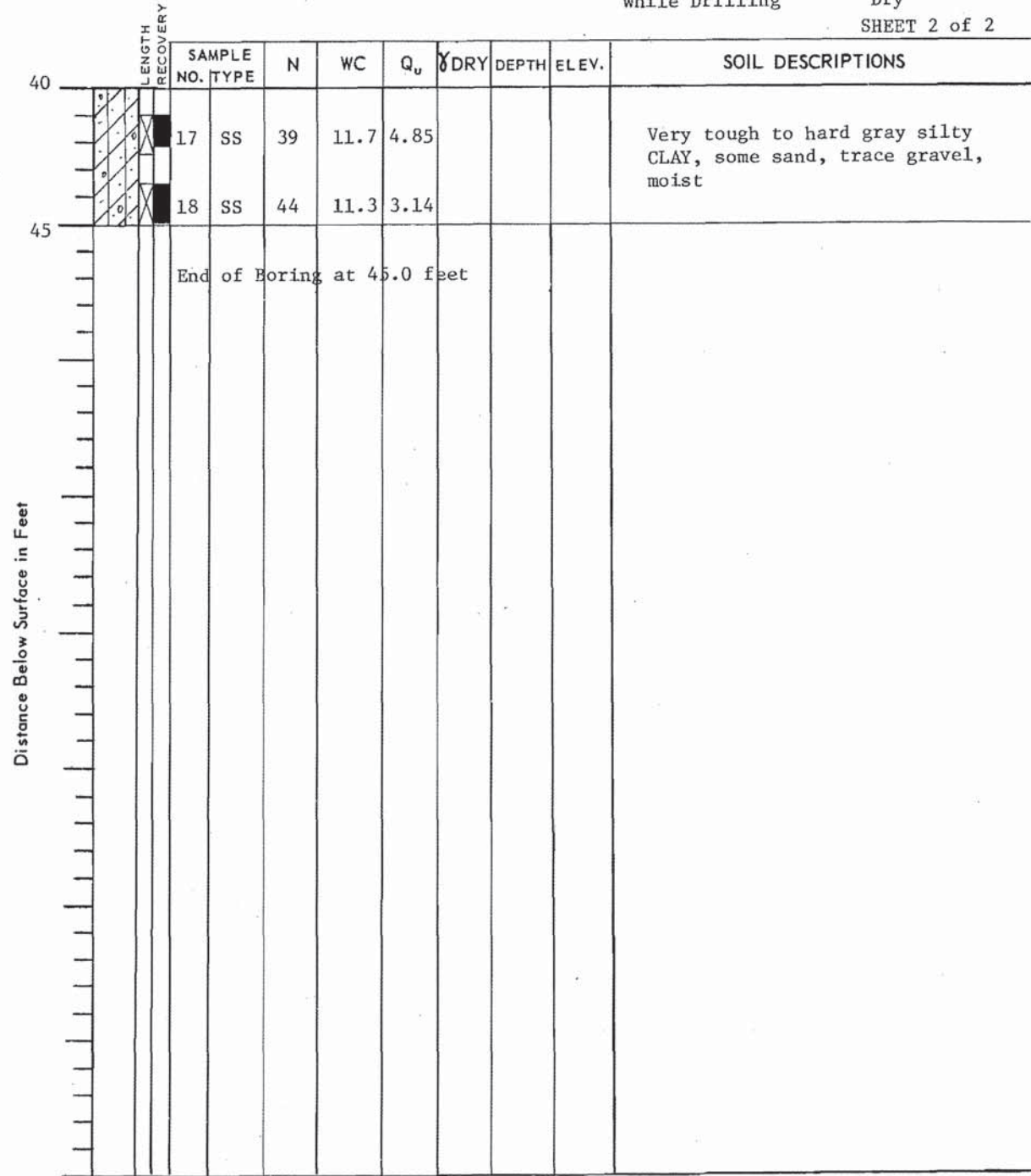
BUREAU COUNTY  
 FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK  
 STATION 20 + 00.00

1976 BORING LOGS FROM EXISTING PLANS  
 STRUCTURE NO. 006-3192  
 STRUCTURAL SHEET NO. 28 OF 34 SHEETS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	30
WHA# 1192013		CONTRACT NO. 87584		
ILLINOIS FED. AID PROJECT BRS-0244(106)				

PROJECT BRIDGE REDESIGN, BACKBONE ROAD, BUREAU COUNTY, ILLINOIS  
 CLIENT BUREAU COUNTY HIGHWAY DEPT., County Court House, Princeton, Illinois  
 BORING 2-Cont'd. DATE STARTED 8-23-76 DATE COMPLETED 8-23-76 JOB 13,740

ELEVATIONS		WATER TABLE	
GROUND SURFACE	<u>110.6</u>	AT END OF BORING	<u>"Dry"</u>
END OF BORING	<u>65.6</u>	24 HOURS	<u>"Dry"</u>
		While Drilling	<u>"Dry"</u>



TESTING SERVICE CORPORATION  
 DRILL RIG NO. \_\_\_\_\_

FILE - S:\PROJECTS\2013\1192013\_BUREAU\DESIGN\STRUCT\20.Dr-wings\1192013-Boring\_Logs.dgn



DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

**1976 BORING LOGS FROM EXISTING PLANS**  
**STRUCTURE NO. 006-3192**  
 STRUCTURAL SHEET NO. 29 OF 34 SHEETS

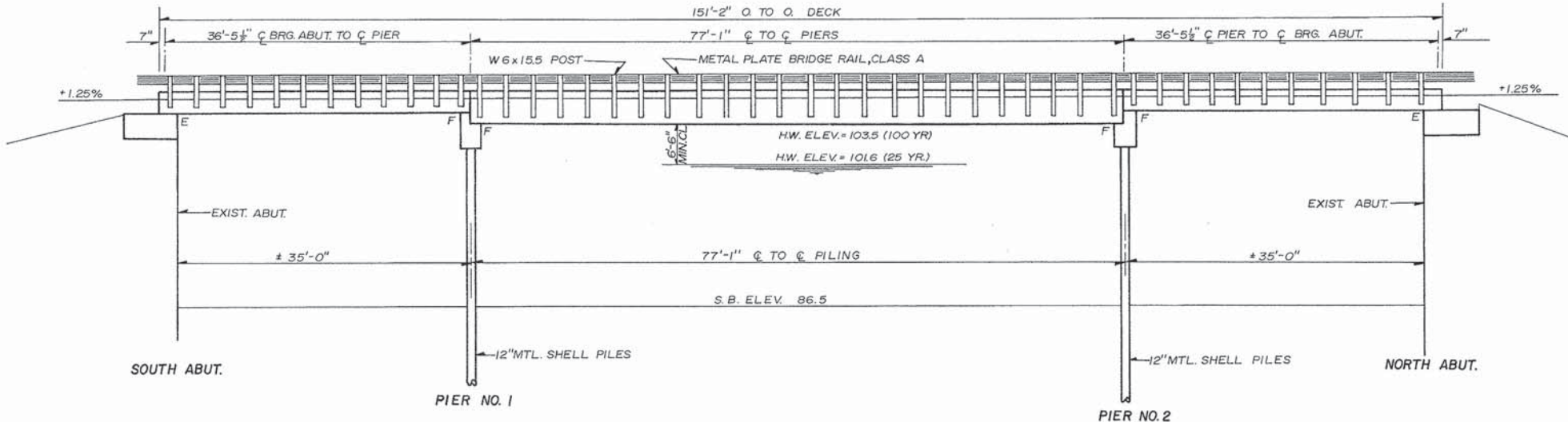
F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	31
WHA* 1192013		CONTRACT NO. 87584		
ILLINOIS FED. AID PROJECT BRS-0244(106)				

BENCH MARK - CHISELED "d" N. ABUT. W. CORNER ELEV.=111.89

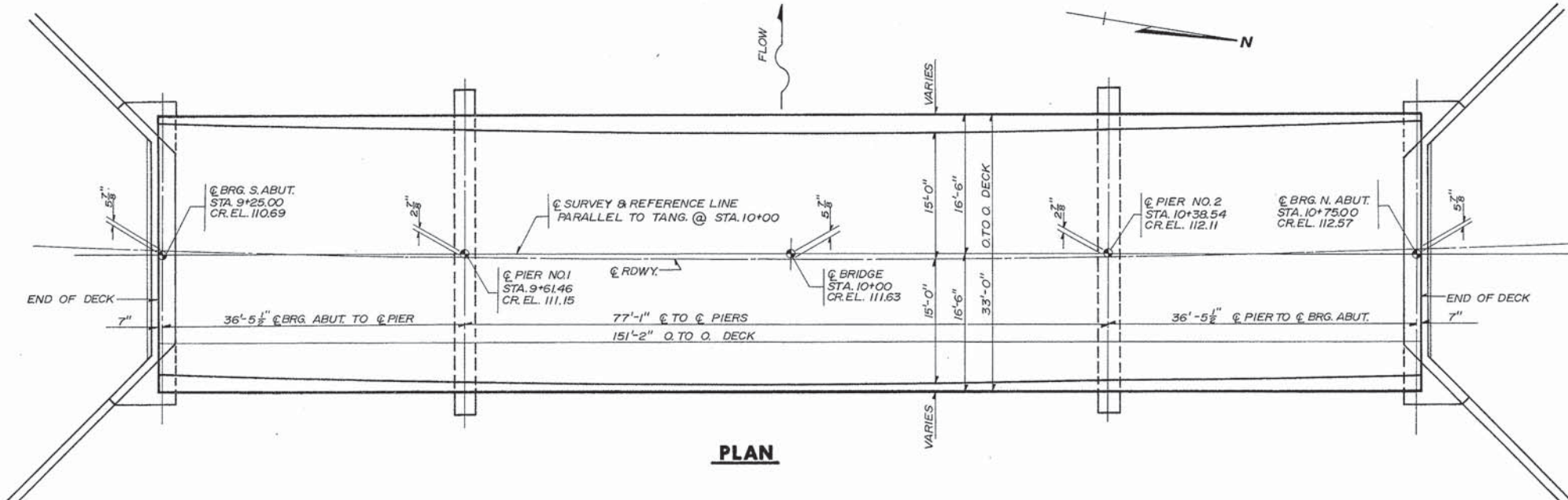
EXISTING STRUCTURE : SUPERSTRUCTURE HAS BEEN REMOVED.  
CONTRACTOR SHALL CLEAN OUT CHANNEL OF ANY CONCRETE  
AND DEBRIS AND SALVAGE EXISTING ABUTMENTS AS SHOWN  
ON PLANS.

**GENERAL NOTES**

- SEE SPECIAL PROVISIONS FOR BORING DATA.
- ALL REINFORCEMENT BARS SHALL BE LAPPED 24-BAR DIAMETERS UNLESS OTHERWISE SHOWN.
- THE CONTRACTOR SHALL DRIVE ONE METAL SHELL TEST PILE IN A PERMANENT LOCATION IN EACH PIER AS DIRECTED BY THE ENGINEER BEFORE ORDERING THE REMAINDER OF PILES.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL DIMENSIONS AND CONDITIONS EXISTING IN THE FIELD PRIOR TO CONSTRUCTION AND ORDERING OF MATERIALS.
- PRESTRESSING STEEL SHALL BE NON-GALVANIZED HIGH STRENGTH, STRESS-RELIEVED 7-WIRE STRAND, GRADE 270.
- THE NOMINAL DIAMETER SHALL BE 7/16" AND THE NOMINAL CROSS-SECTIONAL AREA SHALL BE 0.115 SQUARE INCH.
- LIFTING LOOPS SHALL BE 3/4" DIAMETER, 6 X 25 CLASS WIRE ROPE WITH FIBER CORE AND SHALL HAVE A MINIMUM ULTIMATE TENSILE STRENGTH OF 46,000 LBS. FOR THE 33" BEAMS.
- LIFTING LOOPS SHALL BE 1/2" DIAMETER, 6 X 25 CLASS WIRE ROPE WITH FIBER CORE AND SHALL HAVE A MINIMUM ULTIMATE TENSILE STRENGTH OF 21,000 LBS. FOR THE 17" BEAMS.
- THE 1"  $\phi$  RODS IN THE TRANSVERSE TIE ASSEMBLY SHALL BE TIGHTENED TO A SNUG FIT AND THE THREADS SET. POCKETS THAT RECEIVE TRANSVERSE TIE BAR ON OUTSIDE SHALL BE FILLED WITH GROUT AFTER TRANSVERSE TIE ASSEMBLY IS IN PLACE.
- LONGITUDINAL SHEAR KEYS SHALL BE PACKED WITH A VERY DRY MIX OF 2:1 SAND AND P.C. MORTAR.
- AFTER BEAMS HAVE BEEN ERECTED, HOLES FOR THE DOWEL ANCHORS SHALL BE DRILLED INTO THE SUBSTRUCTURE AND THE ANCHOR DOWELS SHALL BE GROUTED IN PLACE.
- COST OF REINFORCEMENT AND ACCESSORIES CAST INTO THE BEAMS, OF BEARING PADS, AND OF GROUTING LONGITUDINAL SHEAR KEYS IS INCLUDED IN UNIT PRICE BID FOR "PRECAST PRESTRESSED CONCRETE DECK BEAMS".
- THE CONTRACTOR SHALL REMOVE THE EXISTING ABUTMENTS AS SHOWN BY THE CROSS-MATCHING ON THE SUBSTRUCTURE. THE REINFORCEMENT FROM THE EXISTING ABUTMENT SHALL BE EXTENDED INTO THE NEW CAP. THE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "CLASS X CONCRETE".
- THE EXISTING CHANNEL SHALL BE CLEANED OUT OF ALL DEBRIS AS DIRECTED BY THE ENGINEER IN THE FIELD. THE COST OF THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.



**ELEVATION**



**PLAN**

**BILL OF MATERIAL BRIDGE**

ITEM	UNIT	SUPER	SUBSTR	TOTAL
PRECAST PRESTR. CONC. DECK BEAMS - 17"	SQ. FT.	2442		2442
PRECAST PRESTR. CONC. DECK BEAMS - 33"	SQ. FT.	2541		2541
CLASS X CONCRETE	CU. YDS.	15.9	53.2	69.1
REINFORCEMENT BARS	LBS.	410	5640	6050
METAL PLATE BRIDGE RAIL, CLASS A	LIN. FT.	297		297
FURNISHING CONCRETE PILES	LIN. FT.		1071	1071
DRIVING CONCRETE PILES	LIN. FT.		1071	1071
TEST PILES - CONCRETE	EACH		2	2
NAME PLATES	EACH	1		1

**WATERWAY INFORMATION**

DRAINAGE AREA	171	SQ. MI.
DESIGN DISCHARGE		CFS
EXISTING OPENING	2220	SQ. FT.
REQUIRED OPENING (BELOW 25 YR. HWE)		SQ. FT.
PROPOSED OPENING (BELOW 25 YR. HWE)	2192	SQ. FT.
CREATED HEAD FOR DESIGN FLOOD		FT.
100 YR. DISCHARGE		CFS.
CREATED HEAD FOR 100 YR. FLOOD		FT.

**DESIGN STRESSES PRESTRESSED UNITS**

- f'c = 5,000psi
- f'ci = 4,000psi
- fs = 270,000psi
- fsi = 189,000psi

**DESIGN STRESSES FIELD UNITS**

- f'c = 3,500 psi
- f c = 1,400 psi
- fs = 20,000psi
- n = 10

**LOADING HS-20**  
INCLUDES 25 PSF FOR FUTURE WEARING SURFACE

STATION 10+00  
BUREAU CREEK  
BUILT 1976 BY  
BUREAU COUNTY  
SECTION 76-00115-00-BR  
BRIDGE NO 006-3192  
LOADING HS 20

**LETTERING FOR NAMEPLATE**  
SEE STD. 2113



**GENERAL PLAN & ELEVATION SECTION 76-00115-00-BR (NON MFT) F.A.S. ROUTE 244 PRINCETON ROAD DISTRICT BUREAU COUNTY**



DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

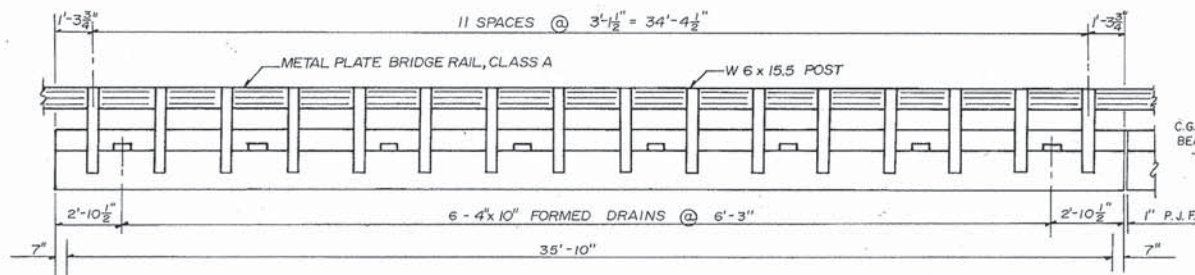
**BUREAU COUNTY**  
FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK  
STATION 20 + 00.00

**EXISTING PLANS**  
STRUCTURE NO. 006-3192

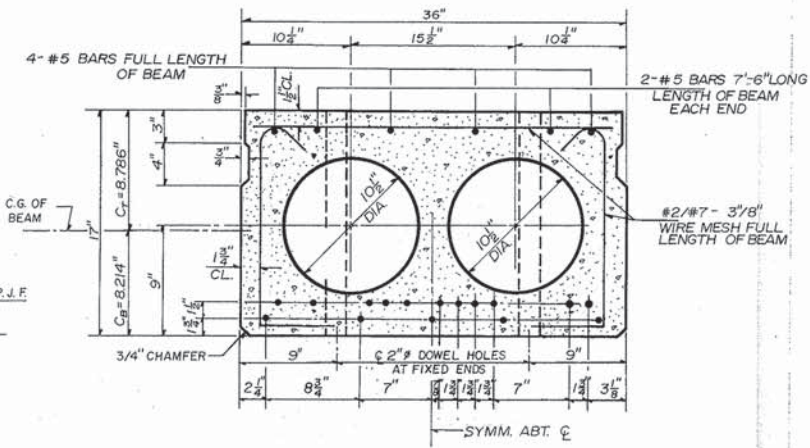
F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	32
WHA* 1192013		CONTRACT NO. 87584		
ILLINOIS FED. AID PROJECT BRS-0244(106)				

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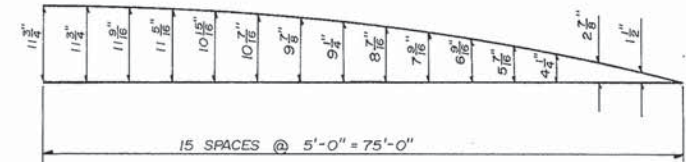


**ELEVATION**



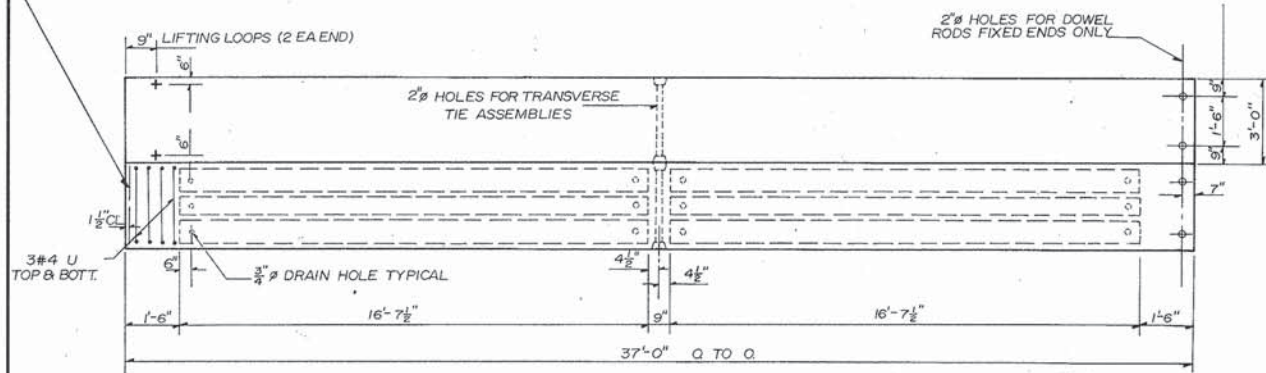
**TYPICAL SECTION THRU 36" BEAM**

17-7 WIRE - 7/16" Ø STRANDS EA STRAND STRESSED TO 22,700 LBS. 5-STRANDS 1 1/4" UP, 12-STRANDS 3 3/4" UP

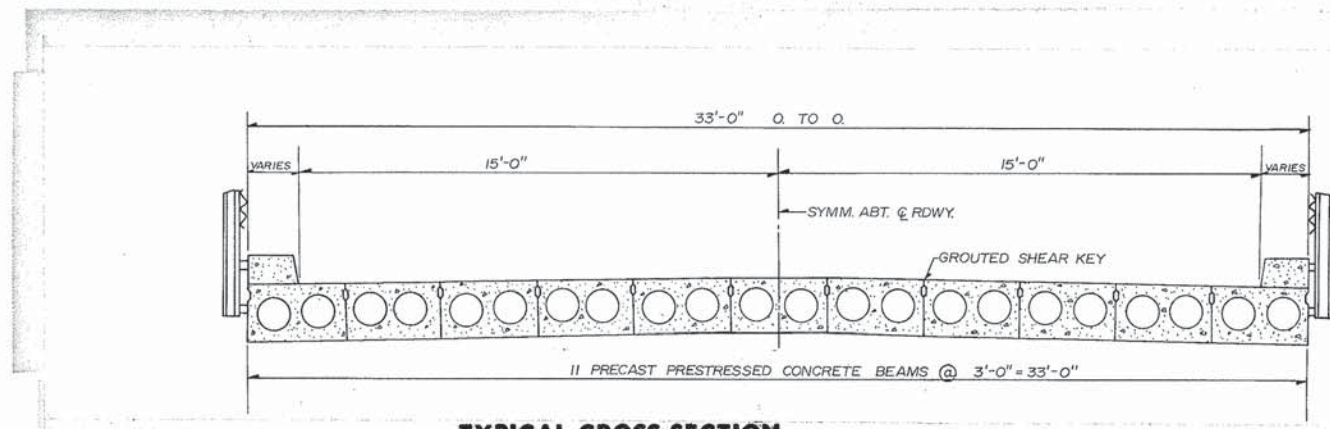


**CURVE OFFSET DIAGRAM**  
TO BE USED FOR FORMING THE FACE OF THE CURB

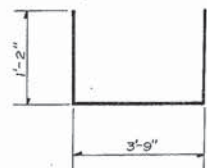
#2/7-3/8" W.W.M. FULL DEPTH OF BEAM (#2 WIRE VERTICAL)



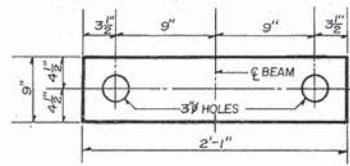
**PLAN**



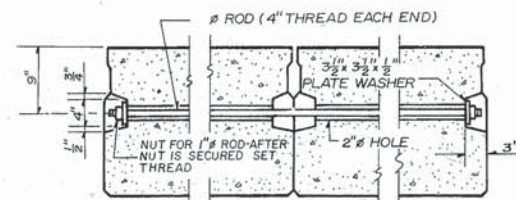
**TYPICAL CROSS SECTION**



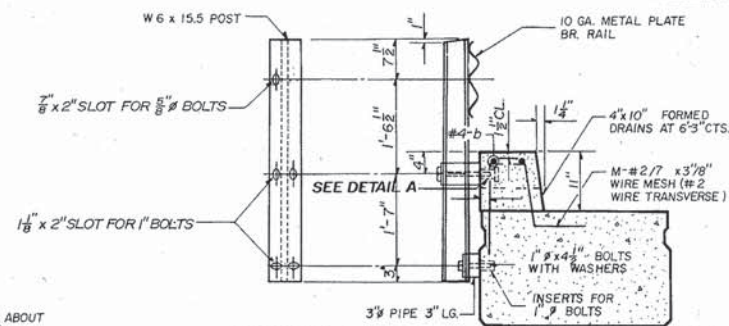
**BAR U**



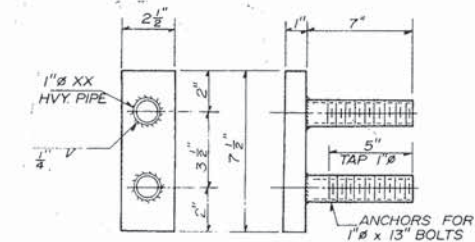
**FABRIC BEARING PAD**



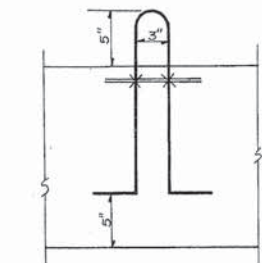
**TRANSVERSE TIE ASSEMBLY**



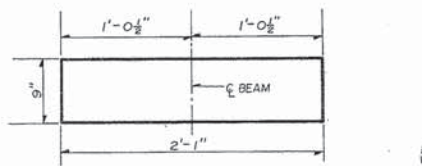
**ELEVATION SECTION THRU CURB RAIL DETAILS**



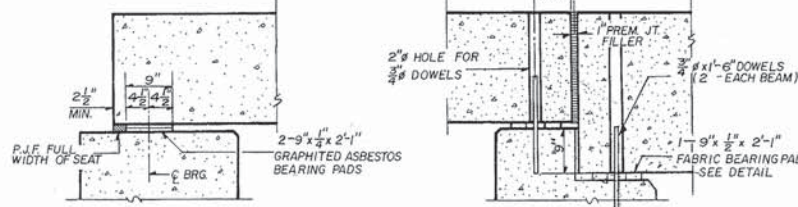
**DETAIL A**



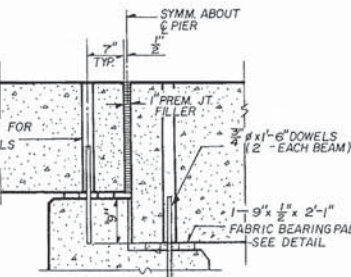
**LOOP SHAPE**  
LIFTING LOOPS SHALL BE MULTIPLE OF 7/16" OR 1/2" STRAND



**PLAN OF GRAPHITED ASBESTOS BEARING PAD**



**SECTION THRU ABUTMENTS**



**SECTION THRU PIER**

**BILL OF MATERIAL SUPER**

BAR	NO.	SIZE	LENGTH	SHAPE
b	16	#4	19'-0"	
PRECAST PRESTR. CONC. BR. DK-17"		SQ. FT.	2442	
CLASS X CONCRETE		CU. YD.	7.3	
REINFORCEMENT BARS		LBS.	200	

**SUPERSTRUCTURE END SPANS SEC. 76-00115-00-BR(NON MFT) F.A.S. ROUTE 244 PRINCETON ROAD DISTRICT BUREAU COUNTY**

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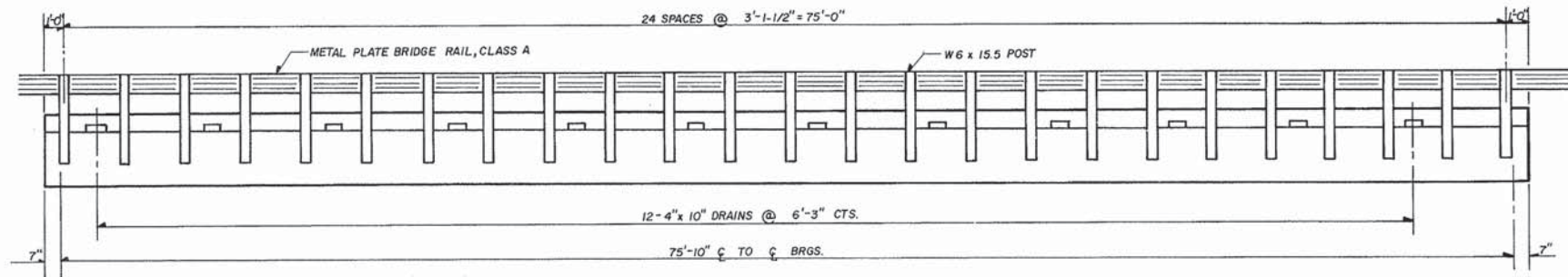
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CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK STATION 20 + 00.00**

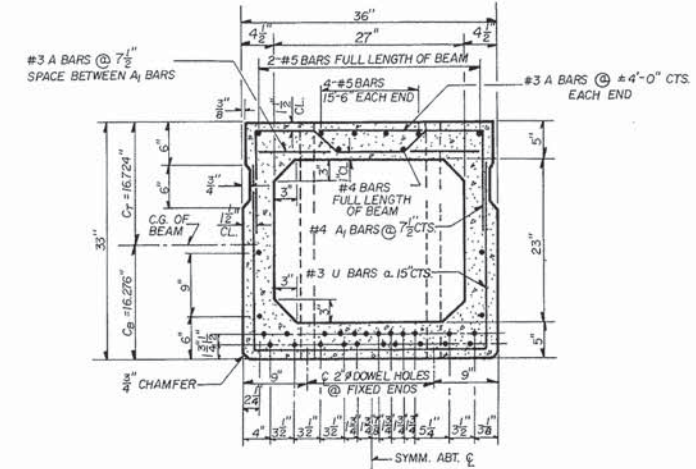
**EXISTING PLANS STRUCTURE NO. 006-3192**

STRUCTURAL SHEET NO. 31 OF 34 SHEETS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	33
WHA# 1192013			CONTRACT NO. 87584	
ILLINOIS FED. AID PROJECT BR5-02441061				

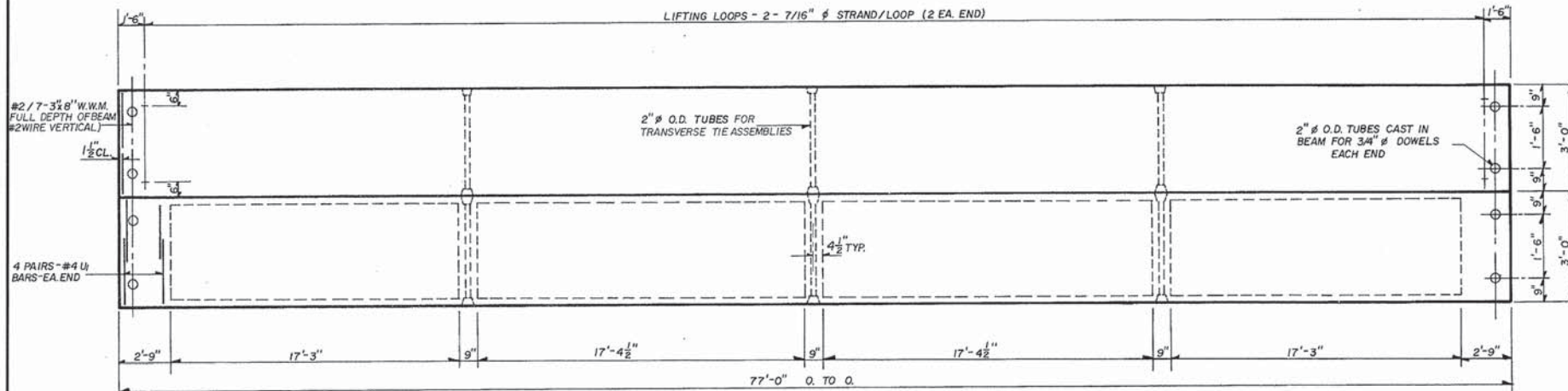


**ELEVATION**

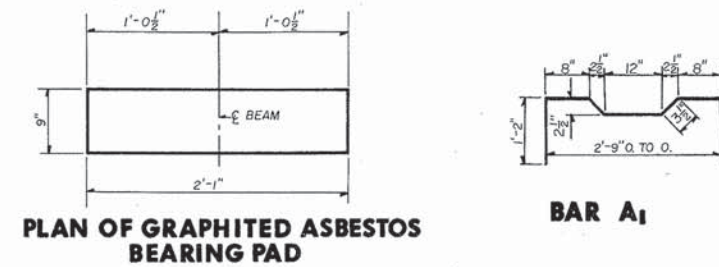


**TYPICAL SECTION THRU BEAM**

26 - 7 WIRE -  $\frac{1}{16}$ " STRANDS. EACH STRESSED TO 21,700 LBS.  
 10 - STRANDS  $\frac{1}{8}$ " UP, 12 - STRANDS  $\frac{3}{4}$ " UP, 2 - STRANDS 6" UP,  
 2 - STRANDS 15" UP.

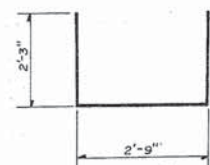


**PLAN**

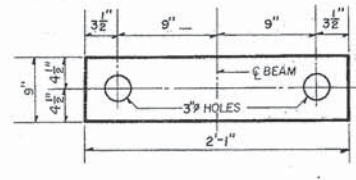


**PLAN OF GRAPHITED ASBESTOS BEARING PAD**

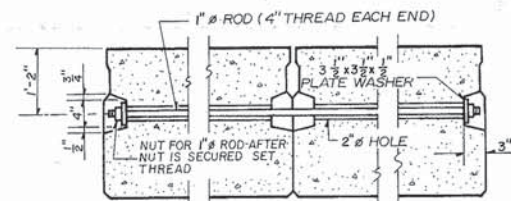
**BAR A<sub>1</sub>**



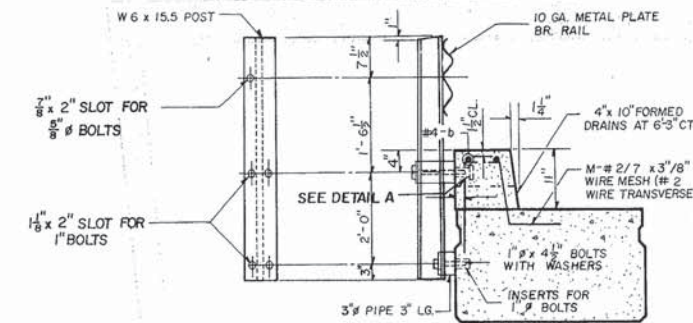
**BAR U**



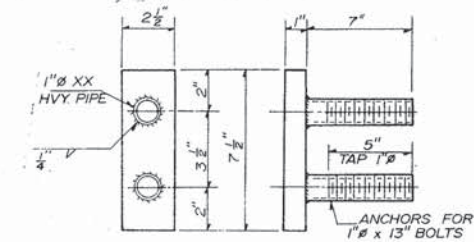
**FABRIC BEARING PAD**



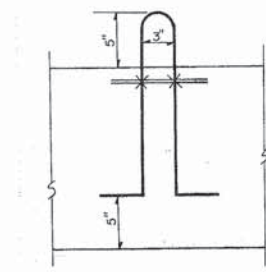
**TRANSVERSE TIE ASSEMBLY**



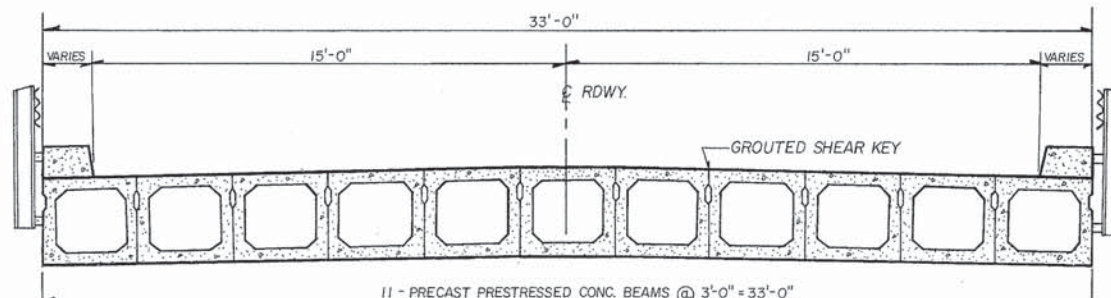
**ELEVATION SECTION THRU CURB RAIL DETAILS**



**DETAIL A**



**LOOP SHAPE**  
LIFTING LOOPS SHALL BE MULTIPLE OF  $\frac{7}{16}$ " OR  $\frac{1}{2}$ " STRAND



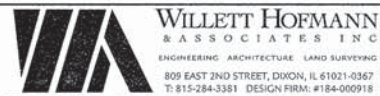
**TYPICAL CROSS SECTION**

**BILL OF MATERIAL SUPER**

BAR	NO.	SIZE	LENGTH	SHAPE
b	16	#4	20'-0"	
PRECAST PRESTR. CONC. BEAMS	33"	SQ. FT.	2541	
CLASS X CONCRETE		CU. YD.	8.1	
REINFORCEMENT BARS		LBS.	210	

**SUPERSTRUCTURE CENTER SPAN**  
 SEC. 76 00115 00 BR (NON MFT)  
 F.A.S. ROUTE 244  
 PRINCETON ROAD DISTRICT  
 BUREAU COUNTY

FILE \* SA\PROJECTS\2013\1192013\_BUCKHEAD\DESIGN\STRUCT\20\_Dr\wrg\1192013\_Existing Plans.dgn



DESIGNED - MAC	REVISED -
CHECKED - BKC	REVISED -
DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
 FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK  
 STATION 20 + 00.00

**EXISTING PLANS**  
 STRUCTURE NO. 006-3192

STRUCTURAL SHEET NO. 32 OF 34 SHEETS

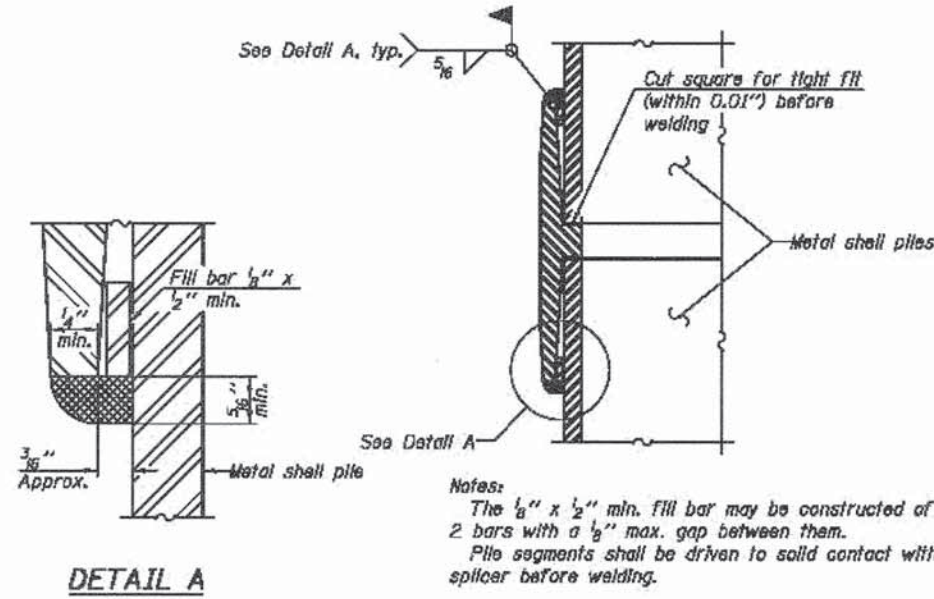
F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	34
WHA# 1192013		CONTRACT NO. 87564		
ILLINOIS FED. AID PROJECT BRS-02441061				





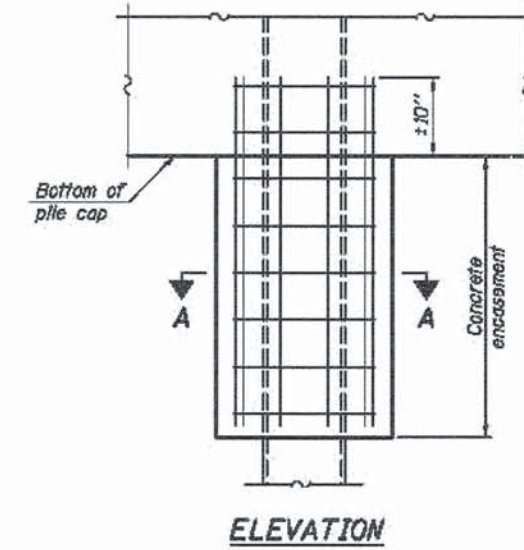
**METAL SHELL PILE TABLE**

Designation and outside diameter	Wall thickness t	Weight per foot (Lbs./ft.)	Inside volume (yd. <sup>3</sup> /ft.)
PP12	0.179"	22.60	0.0274
PP12	0.250"	31.37	0.0267
PP14	0.250"	36.71	0.0368
PP14	0.312"	45.61	0.0361

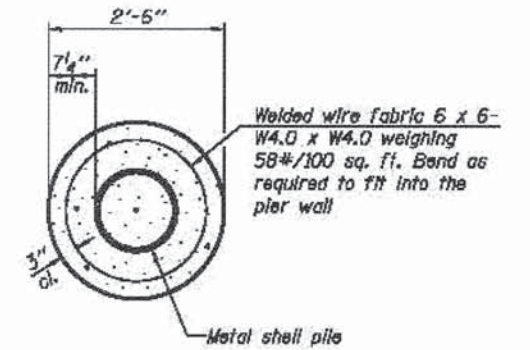


**Notes:**  
 The 1/2" x 1/2" min. fill bar may be constructed of 2 bars with a 1/8" max. gap between them.  
 Pile segments shall be driven to solid contact with splicer before welding.

**WELDED COMMERCIAL SPLICE**



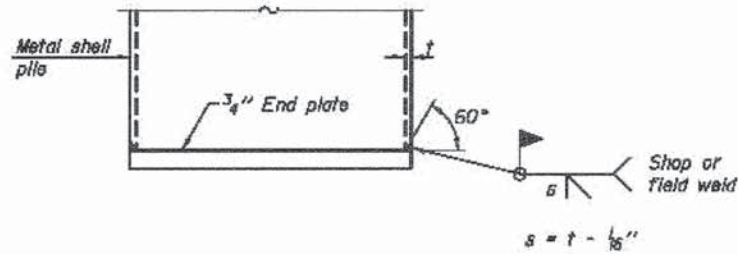
**ELEVATION**



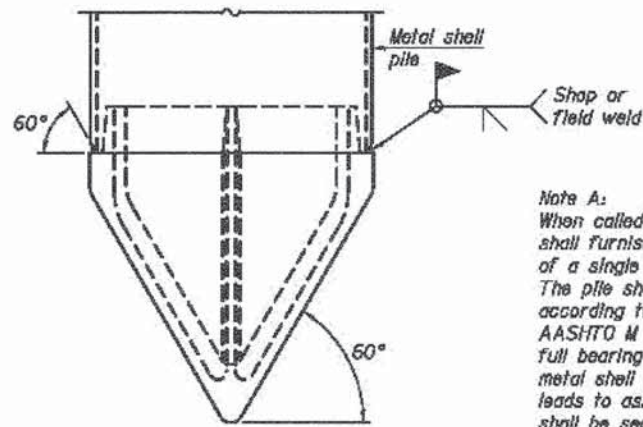
**SECTION A-A**

**Notes:**  
 Forms for encasement may be omitted when soil conditions permit.

**CONCRETE ENCASEMENT AT PIERS**

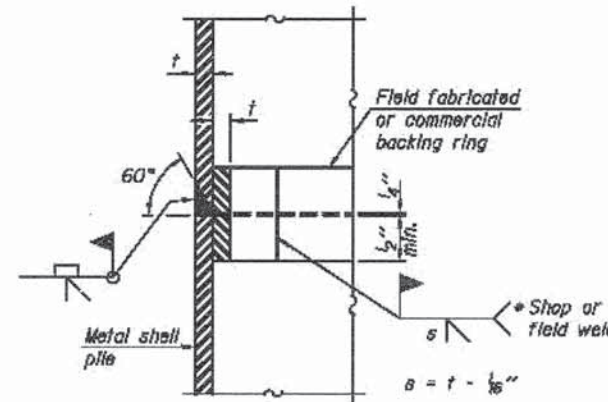


**END PLATE ATTACHMENT**



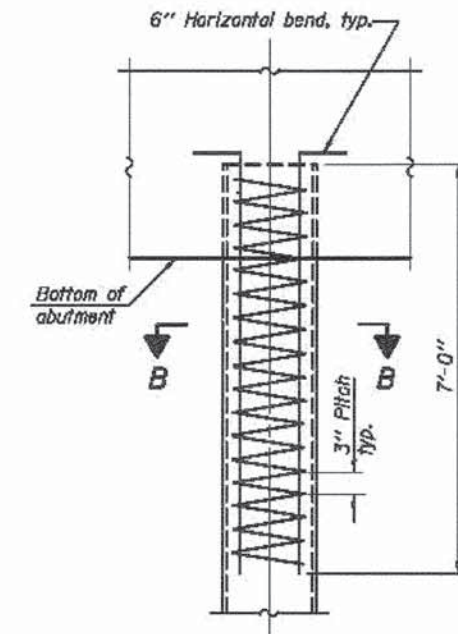
**METAL SHELL PILE SHOE ATTACHMENT**  
 (See Note A.)

**Note A:**  
 When called for on the plans, the Contractor shall furnish metal shell pile shoes consisting of a single piece conical pile point as shown. The pile shoes shall be cast in one piece steel according to either ASTM A 148 Grade 90-60 or AASHTO M 103 Grade 65-35 and shall provide full bearing over the full circumference of the metal shell pile. The pile shoe shall have tapered leads to assure proper alignment and fitting and shall be secured to the pile with a circumferential weld.

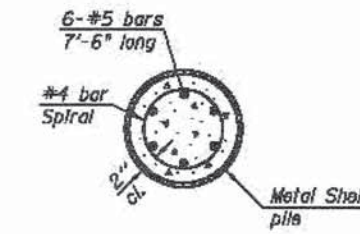


**COMPLETE PENETRATION WELD SPLICE**

\* Field fabricated backing ring may be made from pile shell by removing segment to allow reducing circumference and vertically rejoin with partial joint penetration weld.



**ELEVATION**



**SECTION B-B**

**METAL SHELL REINFORCEMENT AT ABUTMENTS**

**Notes:**  
 The metal shell piles shall be according to ASTM A 252 Grade 3.

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F-MS 1-27-12



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DRAWN - FDL	REVISED -
CHECKED - MAC	REVISED -

**BUREAU COUNTY**  
**FAS 244 (CH 9) (BACKBONE RD) OVER BIG BUREAU CREEK**  
**STATION 20 + 00.00**

**EXISTING PLANS**  
**STRUCTURE NO. 006-3192**  
 STRUCTURAL SHEET NO. 34 OF 34 SHEETS

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
244	14-00244-00-BR	BUREAU	36	36
WHA* 1192013		CONTRACT NO. 87584		
ILLINOIS FED. AID PROJECT BRS-02441061				