

**STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
PLANS FOR PROPOSED  
FEDERAL AID HIGHWAY  
F.A.P. ROUTE 533 (IL RTE 176)  
OVER THE KISHWAUKEE RIVER  
BEAM AND BEARING FABRICATION  
SECTION 119R-2-I-1  
PROJECT NO. *ACBRF-0533(009)*  
MCHENRY COUNTY  
C-91-048-08**

CONTRACT NO. 60D58

F.A. ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
533	119R-2-I-1	MCHENRY	13	1
FED. ROAD DIST. NO.	ILLINOIS FED. AID PROJECT			

D-91-471-01

FOR INDEX OF SHEETS, SEE SHEET NO. 2

**TRAFFIC DATA**

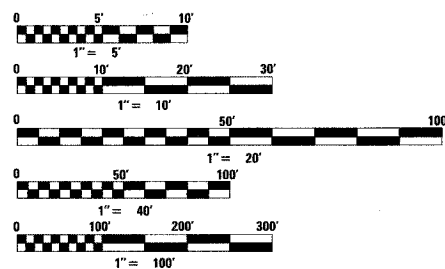
EXISTING ADT  
8,300 (1999)  
DESIGN ADT  
9,960 (2019)  
SPEED LIMIT 55 MPH

**DESIGN DESIGNATION**

OTHER PRINCIPAL ARTERIAL  
0960 (19) ARTERIAL 3.73 (BIT-20)

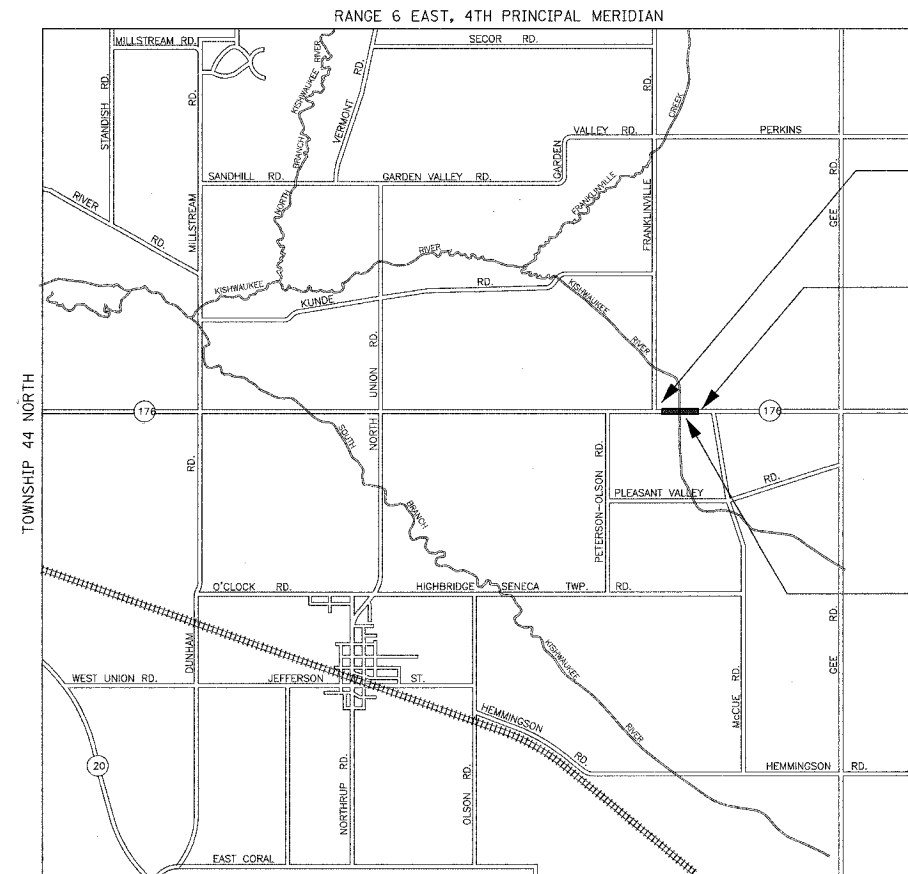


PROJECT LOCATED IN SENECA TOWNSHIP  
IN UNINCORPORATED MCHENRY COUNTY



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. JOINT UTILITY LOCATION INFORMATION  
FOR EXCAVATION 1-800-892-0123



PROJECT BEGINS  
STA 9+61

PROJECT ENDS  
STA 10+39

STA 10+00  
EXISTING SN 056-0005  
REMOVE EXISTING 43 FOOT  
SINGLE SPAN STRUCTURE  
PROPOSED SN 056-0078  
78' SINGLE SPAN, ROLLED  
STEEL SUPERSTRUCTURE.



EXPIRES: 11/30/2008

*[Signature]*  
8/17/09

**STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS**

SUBMITTED August 16 2007  
Diane O'Keefe/CA  
REGION ONE ENGINEER

October 12, 2007  
Eric E. Horn/PE  
ENGINEER OF DESIGN AND ENVIRONMENT

October 12, 2007  
Milton R. Sica/PE  
DIRECTOR, DIVISION OF HIGHWAYS

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THE STATE OF ILLINOIS**

**GRAEF, ANHALT, SCHLOEMER & ASSOCIATES, INC.**  
ENGINEERS & SCIENTISTS  
8501 W. Higgins Road, Suite 280  
Chicago, Illinois 60631  
(773) 399-0112

CONTRACT NO. 60D58

GROSS AND NET LENGTH OF PROJECT: 78 FT (0.015 MI)

DISTRICT ONE PLAN PREPARATION ENGINEER: JOSE DOMINGUEZ (847) 705-4232

CONTRACT NO. 60D58

F.A. ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
533	119R-2-1-1	McHENRY	13	2
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		


**INDEX OF SHEETS**

- 1 TITLE SHEET
- 2 INDEX AND SUMMARY OF QUANTITIES
- 3-19 BRIDGE PLANS SN 056-0071

**SUMMARY OF QUANTITIES**

80% FED.  
20% STATE  
X071-2A

NUMBER	PAY ITEM	UNIT	QUANTITY
50500205	FURNISHING STRUCTURAL STEEL	L. SUM	1
52100110	FURNISHING ELASTOMERIC BEARING ASSEMBLY, TYPE I	EACH	6
X0322770	STORAGE OF STRUCTURAL STEEL AND BEARINGS	CAL DA	30

REVISIONS		ILLINOIS DEPARTMENT OF TRANSPORTATION ILLINOIS ROUTE 176 OVER THE KISHWAUKEE RIVER  <b>INDEX OF DRAWINGS AND SUMMARY OF QUANTITIES</b>  DRAWN BY: WS CHECKED BY: RJS DATE: 8-17-07
NAME	DATE	
 GRAEF, ANHALT, SCHLOEMER & ASSOCIATES, INC. CHICAGO, ILLINOIS		

Bench Mark: Chiseled "□" in south face of concrete base of east storage bin located approximately 425' northwest of existing S.N. 056-0005. Elev. 836.91.

Existing Structure: S.N. 056-0005, built in 1931 as SB1 Rte. 67, Sec. 119. Reconstructed in 1970.

The existing structure is a single span PPC deck beam superstructure on closed abutments.

The structure is 43'-0" Bk. to Bk. Abutments and 33'-0" O. to O. Deck. The structure shall be removed and replaced with a single span wide flange superstructure on pile bent abutments. The road shall be kept open to one lane of traffic at all times by utilizing stage construction.

No Salvage.

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
533	119R-2-I-1	McHenry	13	3
FED. ROAD DIST.	ILLINOIS	FED. AID PROJECT		

Contract #60D58

### DESIGN SPECIFICATIONS

AASHTO LRFD 4th Edition, 2007

### DESIGN STRESSES

#### FIELD UNITS

$f'_c = 3,500$  psi  
 $f_y = 60,000$  psi (Reinforcement)  
 $f_y = 50,000$  psi (Structural Steel M270 Grade 50W)

### SEISMIC DATA

Seismic Performance Category (SPC) = A  
 Bedrock Acceleration Coefficient (A) = 0.035g  
 Site Coefficient (S) = 1.0

### LOADING HL-93

Allow 50 #/sq. ft. for Future Wearing Surface

### ADDITIONAL

### SOIL BORING LOCATION TABLE

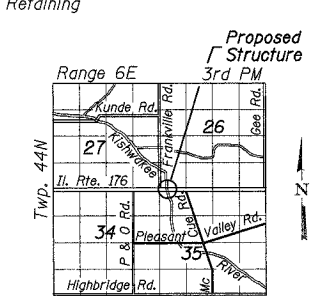
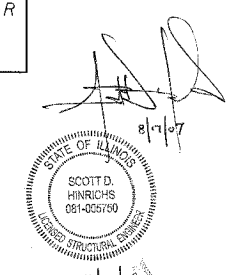
Soil Boring	Station	Offset
R-2	11+50	10.5' Rt.
R-3	12+30	13.0' Rt.
R-4	13+30	13.0' Rt.

STATION 10+00  
 BUILT 200\_ BY  
 STATE OF ILLINOIS  
 F.A.P. RTE 533 SEC. 120A-B-R  
 LOADING HL-93  
 STR. NO. 056-0078

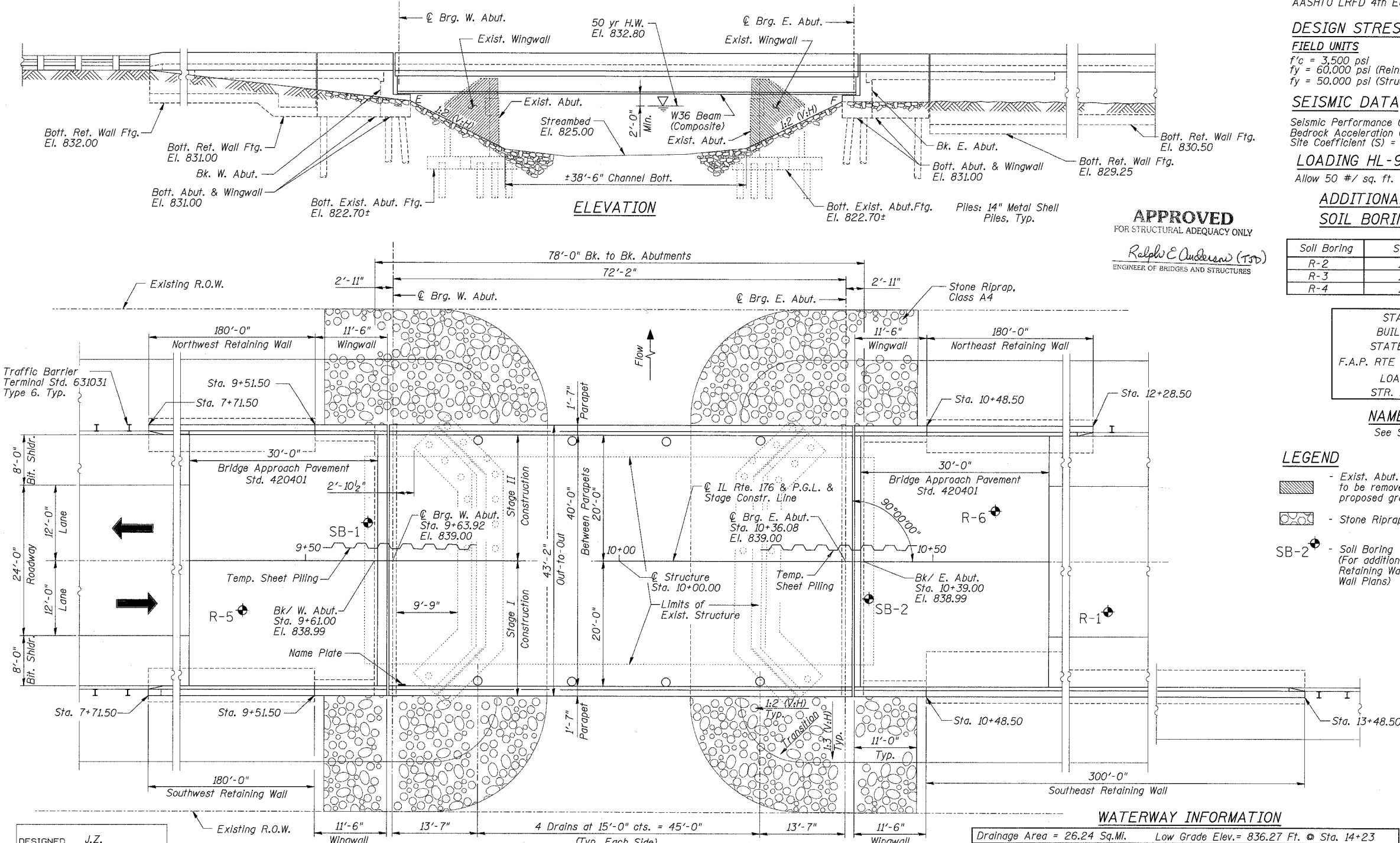
NAME PLATE  
 See Std. 515001

### LEGEND

- Exist. Abut. & Wingwalls to be removed to 1'-0" below proposed grade
- Stone Riprap
- Soil Boring (For additional Soil Borings at Retaining Walls, see Retaining Wall Plans)



GENERAL PLAN & ELEVATION  
 IL Route 176 over the Kishwaukee River  
 F.A.P. RTE 533, SECTION 119R-2-I-1  
 McHENRY COUNTY  
 STATION 10+00.00  
 S.N. 056-0078  
 DATE: 08-17-07  
 GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC  
 CHICAGO, ILLINOIS



**APPROVED**  
 FOR STRUCTURAL ADEQUACY ONLY  
 Ralph E. Anderson (TS)  
 ENGINEER OF BRIDGES AND STRUCTURES

### WATERWAY INFORMATION

Drainage Area = 26.24 Sq.Mi. Low Grade Elev. = 836.27 Ft. @ Sta. 14+23

Flood Yr.	Freq.	Q C.F.S.	Opening Sq. Ft.		Nat. H.W.E.		Head - Ft.		Headwater El.	
			Exist.	Prop.	Exist.	Prop.	Exist.	Prop.	Exist.	Prop.
10	10	1164	275	343	831.9	0.2	0.1	832.1	832.0	
Design	50	1666	312	405	832.8	0.3	0.2	833.1	833.1	
Base	100	1875	324	425	833.1	0.4	0.4	833.5	833.5	
Overtopping	-	-	-	-	-	-	-	-	-	
Max. Calc.	500	2320	347	465	833.7	0.6	0.5	834.3	834.2	

DESIGNED	J.Z.
CHECKED	S.D.H.
DRAWN	M.S.M.
CHECKED	S.D.H.

PLAN

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ROUTE NO.	SECTION	COUNTY	SHEET NO.	TOTAL SHEETS
533	119R-2-I-1	McHenry	13	4
FED. ROAD DIST.		ILLINOIS	FED. ROAD PROJECT	

SHEET NO. 2 OF  
11 SHEETS

Contract #60D58

### GENERAL NOTES

Fasteners shall be AASTHO M164 Type 1, mechanically galvanized bolts in painted areas and M164 Type 3 in unpainted areas. Bolts 7/8" dia., holes 15/16" dia. unless otherwise noted.

Calculated weight of Structural Steel = 87,270 lbs. (M 270, Gr. 50W) (Including beams, diaphragms, diaphragm gusset plates, end diaphragm splice plates, fixed bearing plates and side retainers.)

All structural steel shall be AASTHO M 270 Grade 50W.

Structural steel shall only be painted for a distance of 10 feet each way from the deck joints. All structural steel shall be cleaned as specified in the Special Provision for "Surface Preparation and Painting Requirements for Weathering Steel."

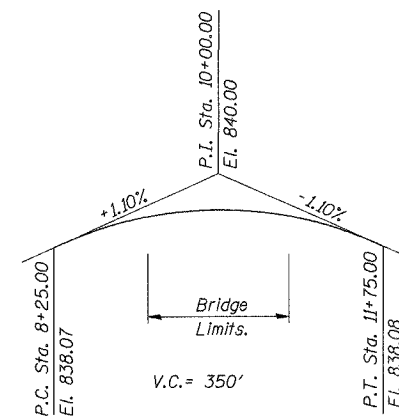
All exposed structural steel of the bearings shall be cleaned and shop painted as specified in the Special Provision for "Surface Preparation and Painting Requirements for Weathering Steel."

### TOTAL BILL OF MATERIAL

ITEMS	UNITS	SUPER-STRUCTURE	SUB-STRUCTURE	TOTAL
Furnishing Structural Steel	L. SUM	1	-	1
Furnishing Elastomeric Bearing Assembly, Type I	EACH	6	-	6
Storage of Structural Steel and Bearings	CAL. DAY	30	-	30

### INDEX OF SHEETS

1. GENERAL PLAN & ELEVATION
2. GENERAL NOTES & TOTAL BILL OF MATERIAL
3. TOP OF SLAB ELEVATIONS I
4. TOP OF SLAB ELEVATIONS II
5. DECK PLAN & CROSS SECTION
6. DECK DETAILS
7. FRAMING PLAN
8. BEAM DETAILS
9. BEARING DETAILS
10. EAST & WEST ABUTMENTS
11. ABUTMENT WINGWALL & DETAILS



### PROFILE GRADE

along & IL Rte. 176

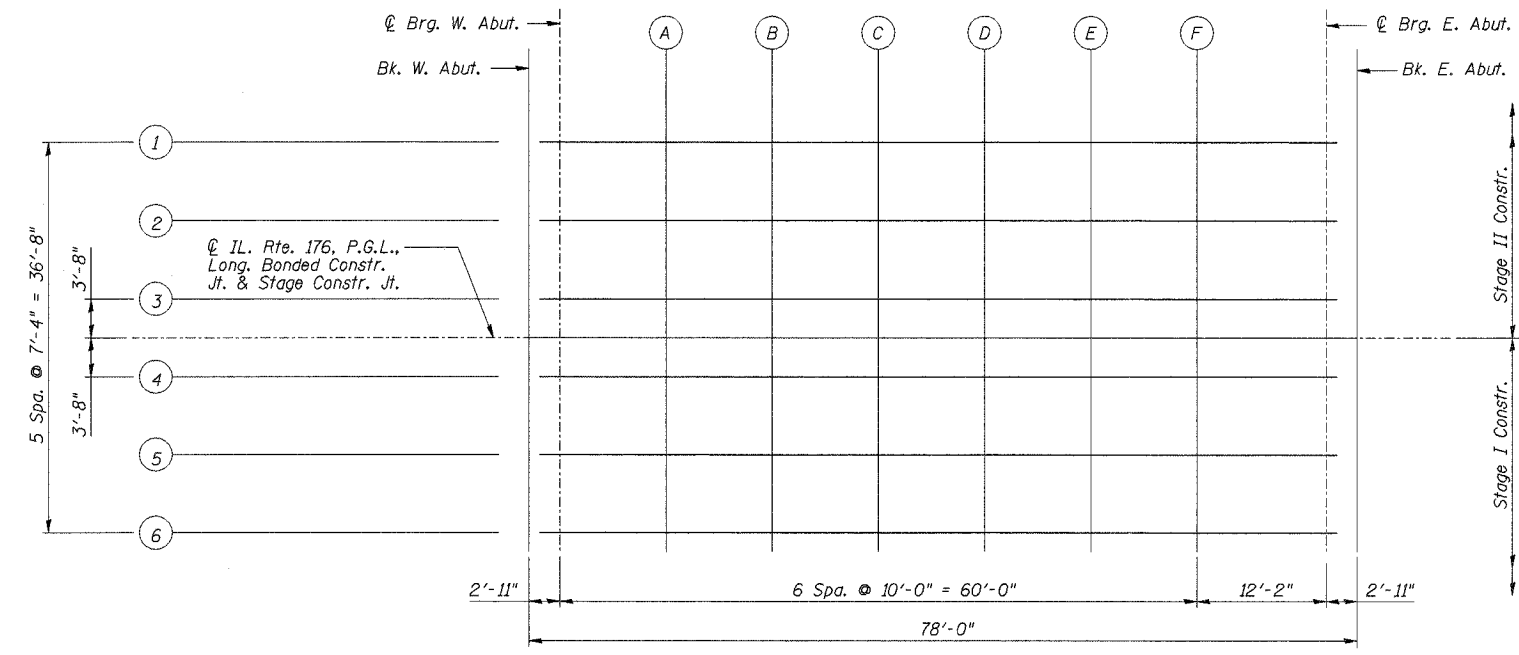
DESIGNED	J.Z.
CHECKED	S.D.H.
DRAWN	M.S.M.
CHECKED	S.D.H.

GENERAL NOTES &  
TOTAL BILL OF MATERIAL  
IL Route 176 over the Kishwaukee River  
F.A.P. RTE 533, SECTION 119R-2-I-1  
McHENRY COUNTY  
STATION 10+00.00  
S.N. 056-0078  
DATE: 08-17-07  
GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC  
CHICAGO ILLINOIS

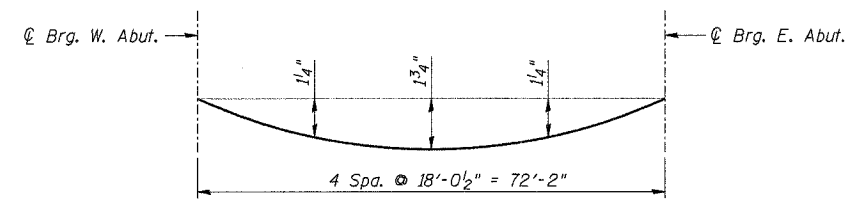
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
533	119R-2-1-1	McHenry	13	5
FED. ROAD DIST.		ILLINOIS	FED. AID PROJECT	

SHEET NO. 3 OF 11 SHEETS

Contract #60D58

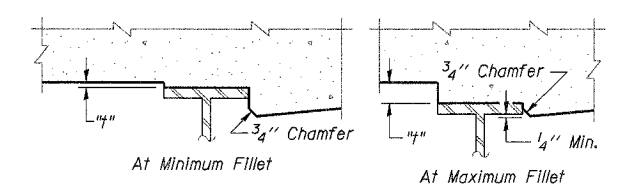


PLAN  
N



**DEAD LOAD DEFLECTION DIAGRAM**  
(Includes weight of concrete deck and all superimposed dead loads except future wearing surface.)

Note: The above deflections are not to be used in the field if the engineer is working from the grade elevations adjusted for dead load deflections.



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

**FILLET HEIGHTS**

FOR INFORMATION ONLY

TOP OF SLAB ELEVATIONS I  
IL Route 176 over the Kishwaukee River  
F.A.P. RTE 533, SECTION 119R-2-1-1  
McHENRY COUNTY  
STATION 10+00.00  
S.N. 056-0078  
DATE: 08-17-07  
GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC  
CHICAGO ILLINOIS

DESIGNED	J.Z.
CHECKED	S.D.H.
DRAWN	M.S.M.
CHECKED	S.D.H.

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ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
533	119R-2-1-1	McHenry	13	6
FED. ROAD DIST.		ILLINOIS	FED. AID PROJECT	

SHEET NO. 4 OF 11 SHEETS

Contract #60D58  
 @ IL RTE. 176, P.G.L.,  
 LONG. BONDED CONSTR. JOINT &  
 STAGE CONSTR. JT.

**BEAM 1**

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back of W. Abut.	9+61.00	-18.333	838.68	838.68
C.L. Brg. W. Abut.	9+63.92	-18.333	838.69	838.69
A	9+73.92	-18.333	838.71	838.75
B	9+83.92	-18.333	838.72	838.82
C	9+93.92	-18.333	838.73	838.86
D	10+03.92	-18.333	838.73	838.87
E	10+13.92	-18.333	838.72	838.85
F	10+23.92	-18.333	838.71	838.79
C.L. Brg. E. Abut.	10+36.08	-18.333	838.69	838.69
Back of E. Abut.	10+39.00	-18.333	838.68	838.68

**BEAM 2**

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back of W. Abut.	9+61.00	-11.00	838.82	838.82
C.L. Brg. W. Abut.	9+63.92	-11.00	838.83	838.83
A	9+73.92	-11.00	838.85	838.89
B	9+83.92	-11.00	838.86	838.96
C	9+93.92	-11.00	838.87	839.00
D	10+03.92	-11.00	838.87	839.01
E	10+13.92	-11.00	838.87	839.00
F	10+23.92	-11.00	838.85	838.94
C.L. Brg. E. Abut.	10+36.08	-11.00	838.83	838.83
Back of E. Abut.	10+39.00	-11.00	838.82	838.82

**BEAM 3**

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back of W. Abut.	9+61.00	-3.67	838.93	838.93
C.L. Brg. W. Abut.	9+63.92	-3.67	838.94	838.94
A	9+73.92	-3.67	838.96	839.00
B	9+83.92	-3.67	838.97	839.07
C	9+93.92	-3.67	838.98	839.11
D	10+03.92	-3.67	838.98	839.12
E	10+13.92	-3.67	838.98	839.11
F	10+23.92	-3.67	838.96	839.05
C.L. Brg. E. Abut.	10+36.08	-3.67	838.94	838.94
Back of E. Abut.	10+39.00	-3.67	838.93	838.93

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back of W. Abut.	9+61.00	0.00	838.99	838.99
C.L. Brg. W. Abut.	9+63.92	0.00	839.00	839.00
A	9+73.92	0.00	839.02	839.06
B	9+83.92	0.00	839.03	839.13
C	9+93.92	0.00	839.04	839.17
D	10+03.92	0.00	839.04	839.17
E	10+13.92	0.00	839.03	839.16
F	10+23.92	0.00	839.02	839.10
C.L. Brg. E. Abut.	10+36.08	0.00	839.00	839.00
Back of E. Abut.	10+39.00	0.00	838.99	838.99

**BEAM 4**

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back of W. Abut.	9+61.00	3.67	838.93	838.93
C.L. Brg. W. Abut.	9+63.92	3.67	838.94	838.94
A	9+73.92	3.67	838.96	839.00
B	9+83.92	3.67	838.97	839.07
C	9+93.92	3.67	838.98	839.11
D	10+03.92	3.67	838.98	839.12
E	10+13.92	3.67	838.98	839.11
F	10+23.92	3.67	838.96	839.05
C.L. Brg. E. Abut.	10+36.08	3.67	838.94	838.94
Back of E. Abut.	10+39.00	3.67	838.93	838.93

**BEAM 5**

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back of W. Abut.	9+61.00	11.00	838.82	838.82
C.L. Brg. W. Abut.	9+63.92	11.00	838.83	838.83
A	9+73.92	11.00	838.85	838.89
B	9+83.92	11.00	838.86	838.96
C	9+93.92	11.00	838.87	839.00
D	10+03.92	11.00	838.87	839.01
E	10+13.92	11.00	838.87	839.00
F	10+23.92	11.00	838.85	838.94
C.L. Brg. E. Abut.	10+36.08	11.00	838.83	838.83
Back of E. Abut.	10+39.00	11.00	838.82	838.82

**BEAM 6**

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Back of W. Abut.	9+61.00	18.33	838.68	838.68
C.L. Brg. W. Abut.	9+63.92	18.33	838.69	838.69
A	9+73.92	18.33	838.71	838.75
B	9+83.92	18.33	838.72	838.82
C	9+93.92	18.33	838.73	838.86
D	10+03.92	18.33	838.73	838.87
E	10+13.92	18.33	838.72	838.85
F	10+23.92	18.33	838.71	838.79
C.L. Brg. E. Abut.	10+36.08	18.33	838.69	838.69
Back of E. Abut.	10+39.00	18.33	838.68	838.68

FOR INFORMATION ONLY

TOP OF SLAB ELEVATIONS II  
 IL Route 176 over the Kishwaukee River  
 F.A.P. RTE 533, SECTION 119R-2-1-1  
 McHENRY COUNTY  
 STATION 10+00.00  
 S.N. 056-0078  
 DATE: 08-17-07  
 GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC  
 CHICAGO ILLINOIS

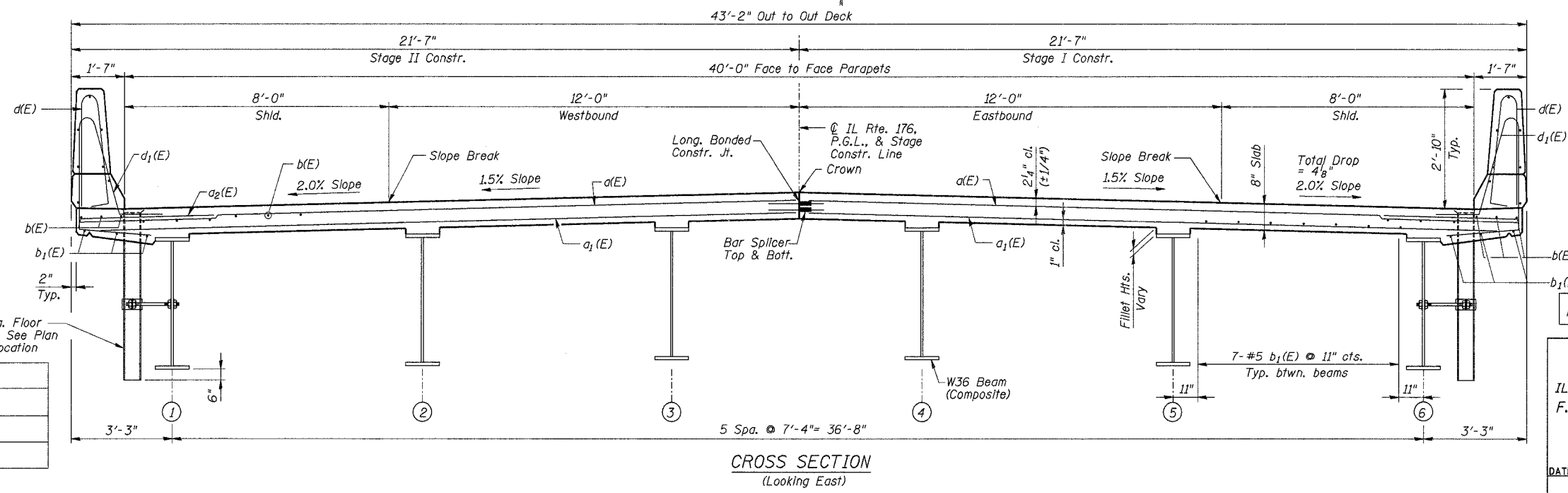
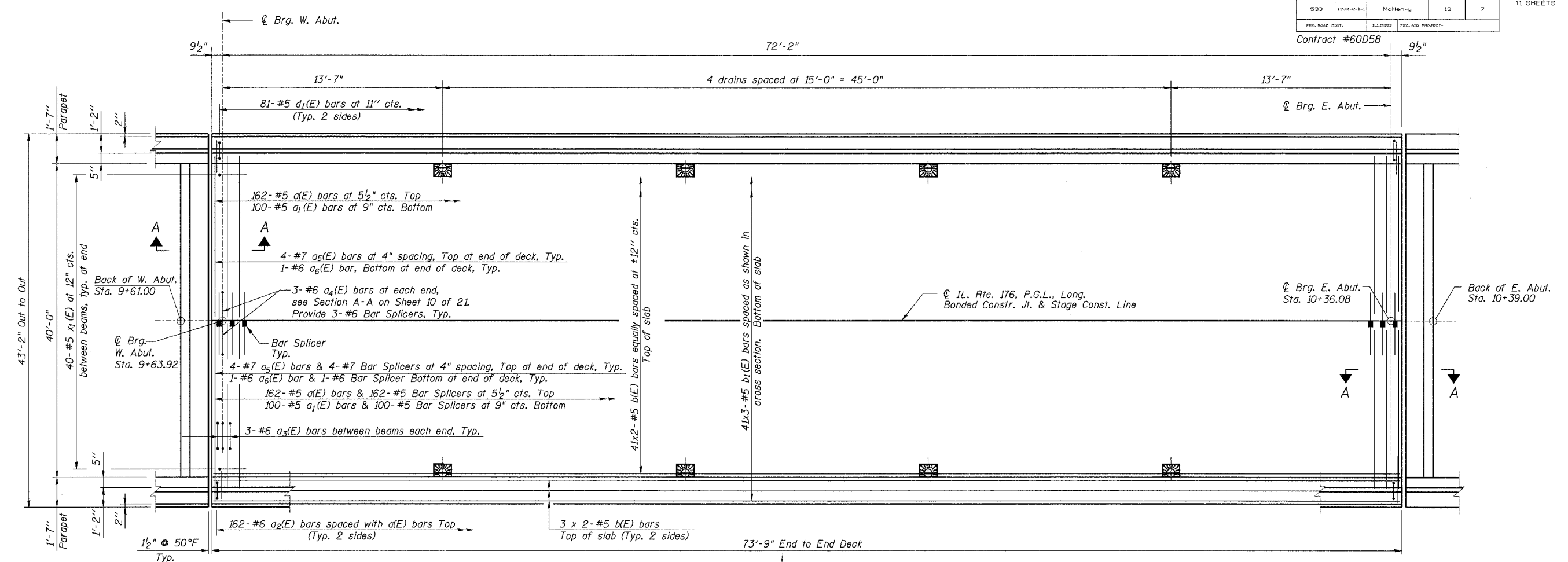
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CHECKED	S.D.H.
DRAWN	M.S.M.
CHECKED	S.D.H.

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ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
533	119R-2-1-1	McHenry	13	7
FED. ROAD DIST.	ADDRESS	FED. AID PROJECT		

SHEET NO. 5 OF 11 SHEETS

Contract #60D58



NOTES:

See Sheet 10 of 21 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 Sheet 10 of 21 for parapet reinforcement.

Work this Sheet with Sheet 10 of 21.

See Sheet 3 of 21 for Construction Staging.

See Sheet 10 of 21 for Section A-A.

Min. Lap Length:

Bar Size	Lap
#4	1'-8"
#5	2'-2"
#6	2'-7"

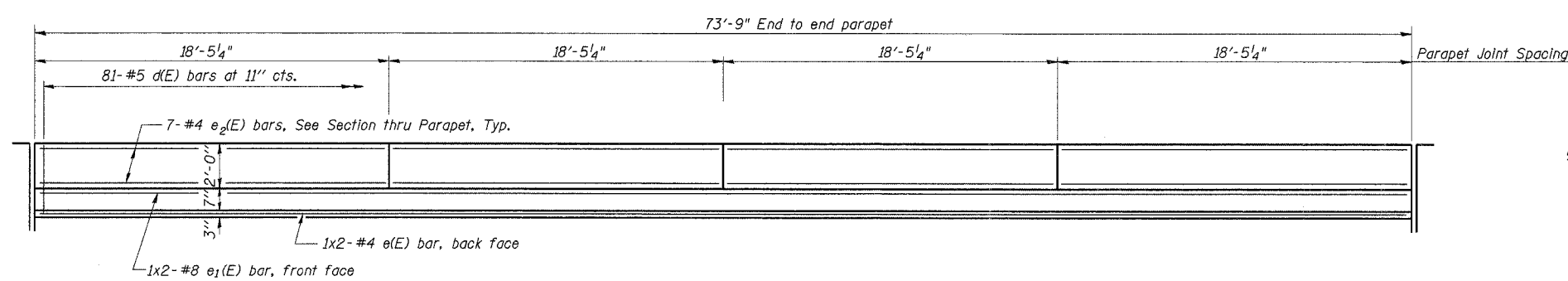
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DECK PLAN & CROSS SECTION  
 IL Route 176 over the Kishwaukee River  
 F.A.P. RTE 533, SECTION 119R-2-1-1  
 McHENRY COUNTY  
 STATION 10+00.00  
 S.N. 056-0078

DATE: 08-17-07  
 GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC  
 CHICAGO ILLINOIS

DESIGNED	J.Z.
CHECKED	S.D.H.
DRAWN	M.S.M.
CHECKED	S.D.H.

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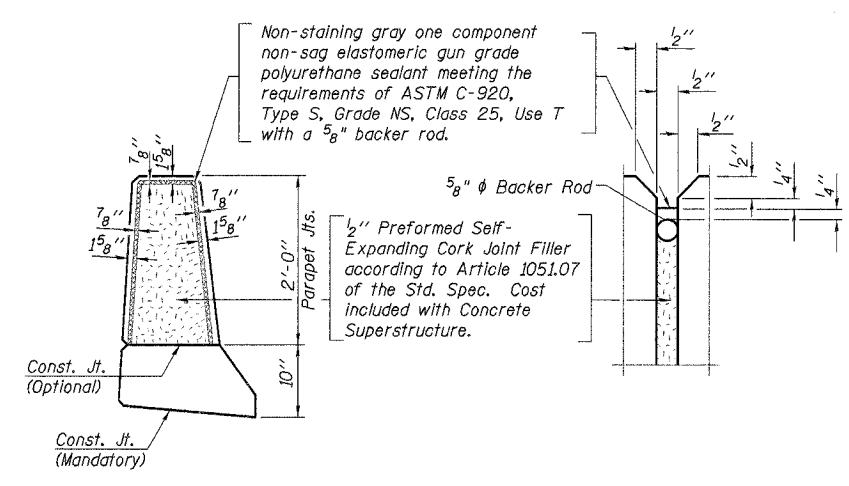
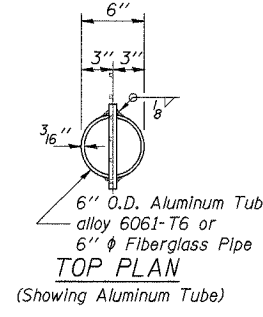
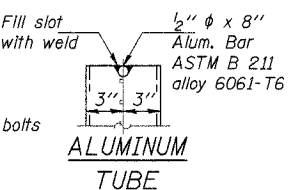
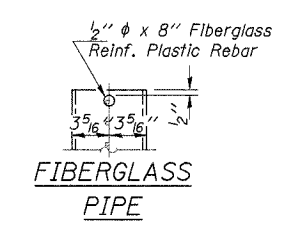
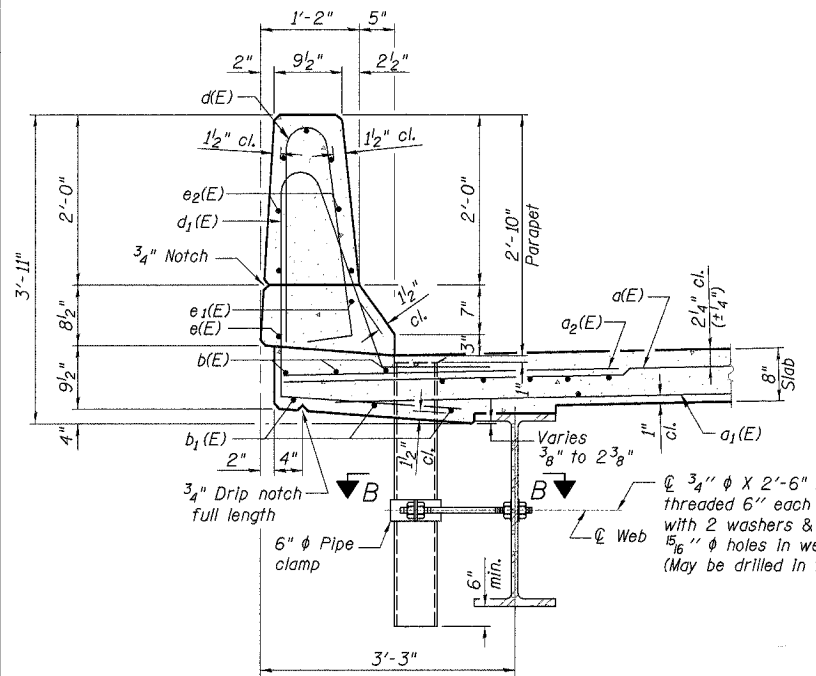


**MINIMUM BAR LAP**  
(Parapet)  
#4 bar = 1'-8"  
#8 bar = 4'-6"

**SUPERSTRUCTURE  
BILL OF MATERIAL**

Bar	No.	Size	Length	Shape
a(E)	324	#5	21'-3"	—
a1(E)	200	#5	20'-9"	—
a2(E)	324	#6	6'-0"	—
a3(E)	24	#6	8'-5"	U
a4(E)	12	#6	4'-1"	U
a5(E)	16	#7	21'-3"	—
a6(E)	4	#6	18'-2"	—
b(E)	94	#5	37'-10"	—
b1(E)	123	#5	26'-8"	—
d(E)	162	#5	5'-7"	U
d1(E)	162	#5	7'-11"	U
e(E)	4	#4	37'-8"	—
e1(E)	4	#8	39'-0"	—
e2(E)	56	#4	18'-1"	—
x1(E)	80	#5	5'-11"	U
Floor Drains	EACH		8	
Concrete Superstructure	CU YD		116.1	
Bridge Deck Grooving	SQ YD		310	
Protective Coat	SQ YD		409	
Reinforcement Bars, Epoxy Coated	LB		26,710	
Bar Splacers	EACH		278	

**INSIDE ELEVATION OF PARAPET**

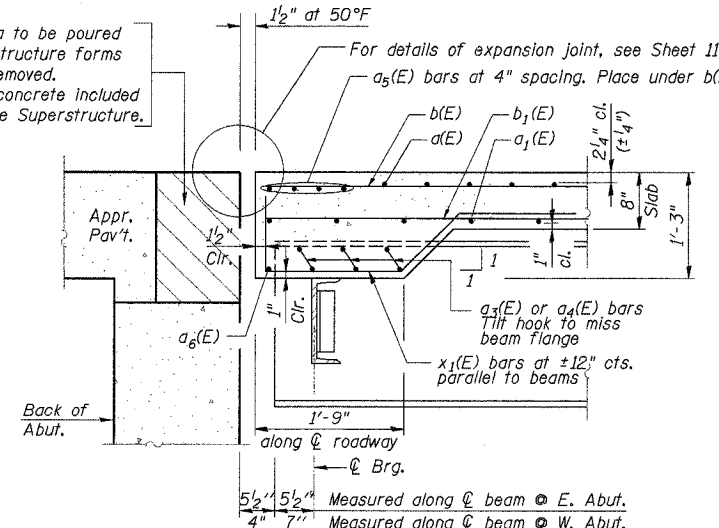
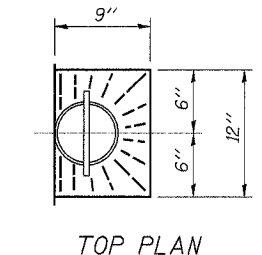
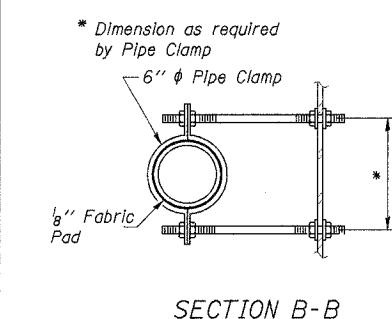


**PARAPET JOINT DETAILS**

Notes:  
Fiberglass pipe shall conform to ASTM D 2996, with short-time rupture strength hoop tensile stress of 30,000 p.s.i. minimum.

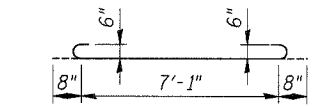
**SECTION THRU PARAPET**

Hatched area to be poured after superstructure forms have been removed. Quantity of concrete included with Concrete Superstructure.

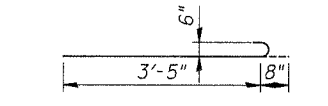


**SECTION A-A**

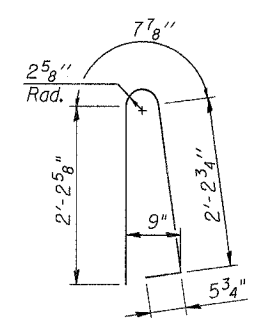
DESIGNED	J.Z.
CHECKED	S.D.H.
DRAWN	M.S.M.
CHECKED	S.D.H.



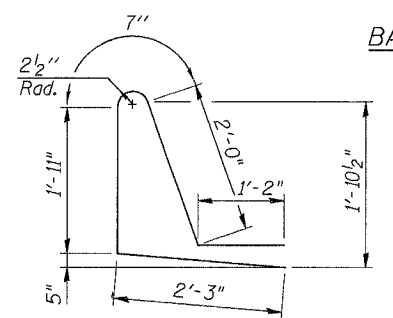
**a3(E) BAR**



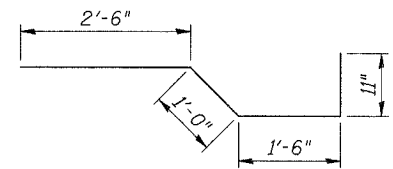
**a4(E) BAR**



**BAR d(E)**



**BAR d1(E)**



**BAR x1(E)**

**FOR INFORMATION ONLY**

**DECK DETAILS**  
IL Route 176 over the Kishwaukee River  
F.A.P. RTE 533, SECTION 119R-2-I-1  
McHENRY COUNTY  
STATION 10+00.00  
S.N. 056-0078  
DATE: 08-17-07  
GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC  
CHICAGO ILLINOIS

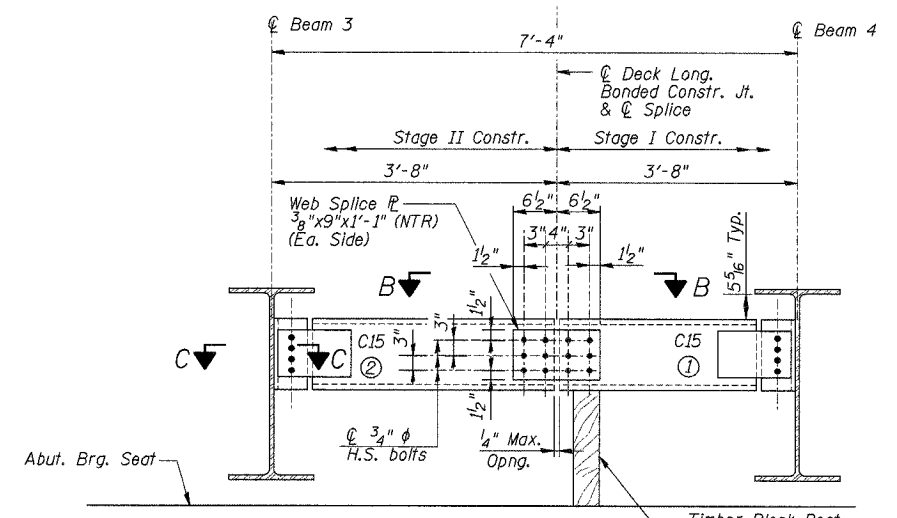
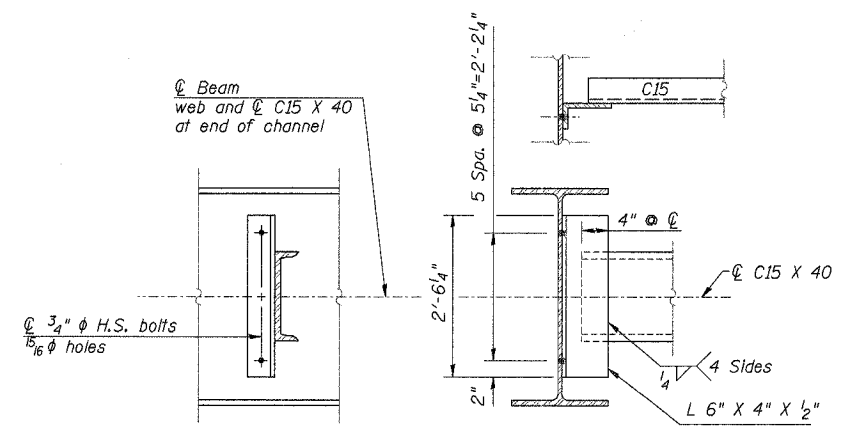
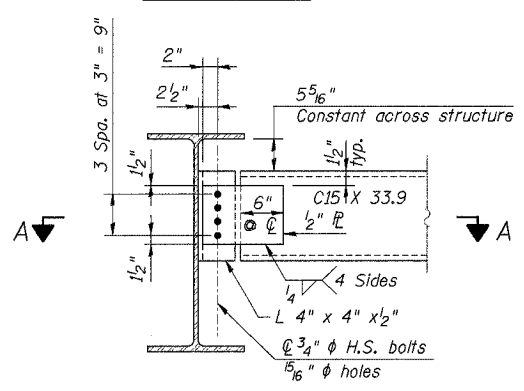
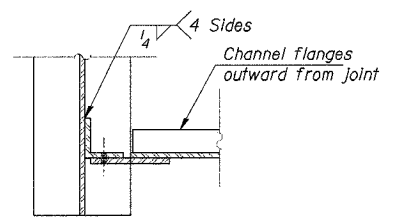
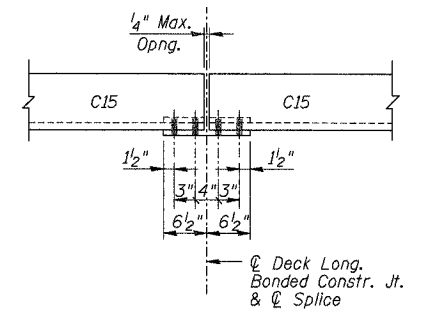
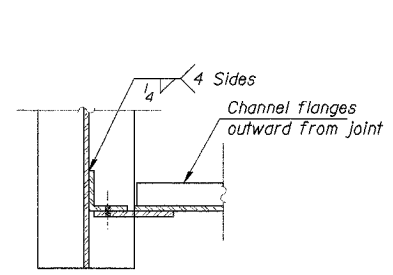
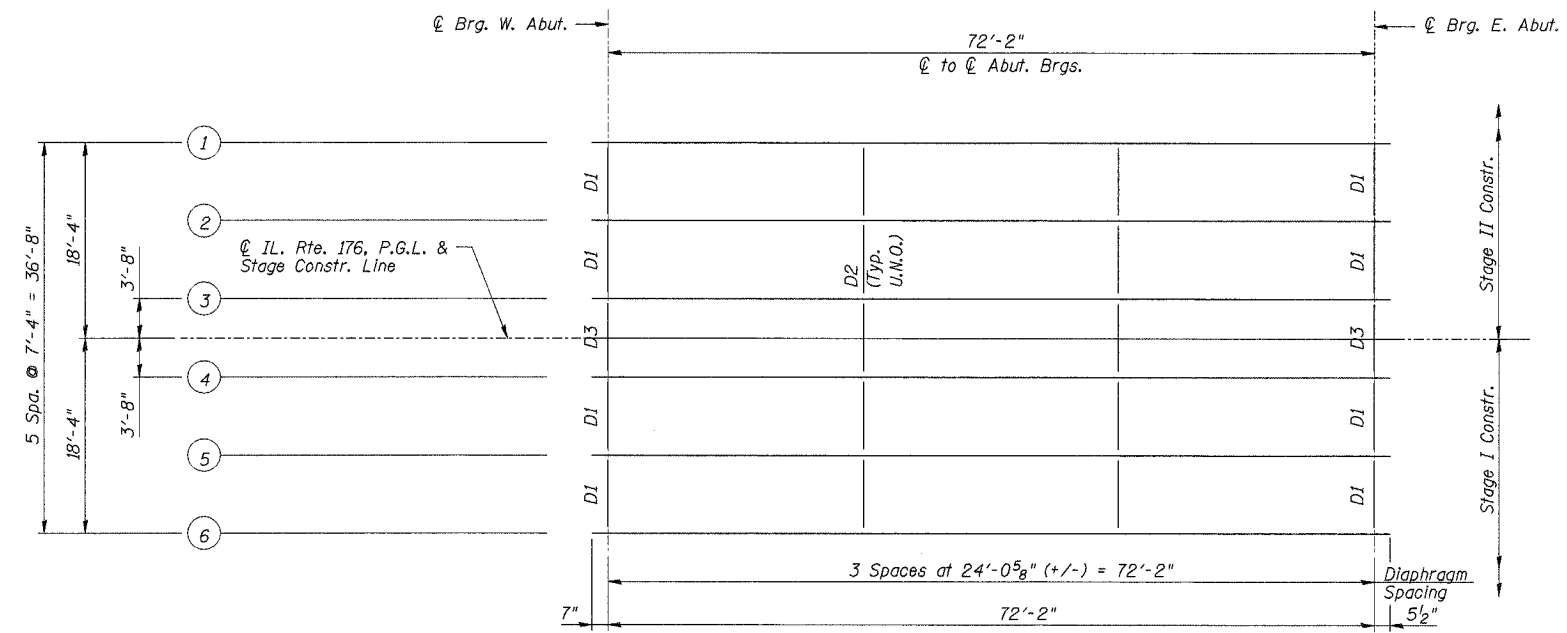
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ROUTE NO.	SECTION	COUNTY	SHEET NO.	SHEET TOTAL
533	119R-2-I-1	McHenry	13	9
FED. ROAD DIST.		BILLED BY	FED. AID PROJECT	

Contract #60D58

SHEET NO. 7 OF 11 SHEETS



Notes:

Two hardened washers required for each set of oversized holes at diaphragms.

All Structural Steel on this sheet shall be AASHTO M270 Grade 50W.

Work this Sheet with Sheet 8 of 11.

DESIGNED	J.Z.
CHECKED	S.D.H.
DRAWN	M.S.M.
CHECKED	S.D.H.

FRAMING PLAN

IL Route 176 over the Kishwaukee River

F.A.P. RTE 533, SECTION 119R-2-I-1

McHENRY COUNTY

STATION 10+00.00

S.N. 056-0078

DATE: 08-17-07

GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC

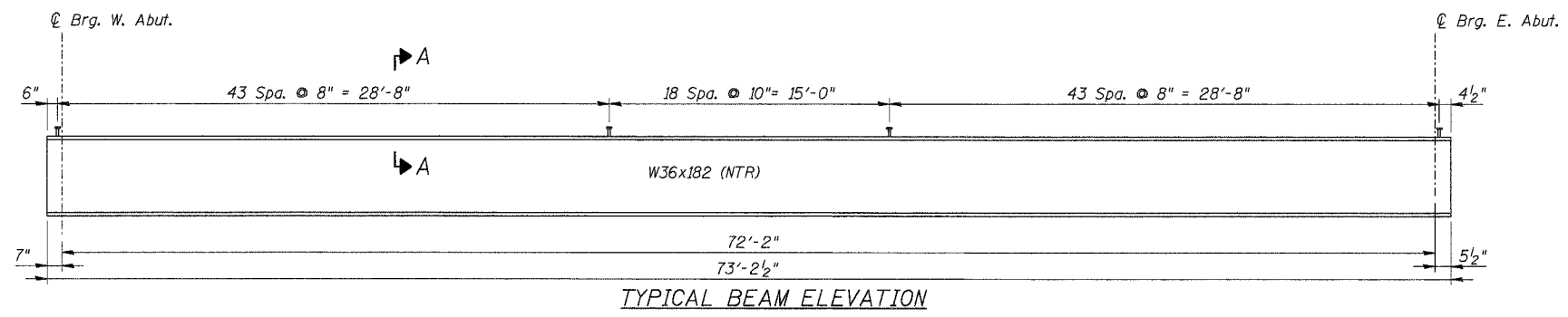
CHICAGO ILLINOIS

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ROUTE NO.	SECTION	QUANTITY	TOTAL SHEETS	SHEET NO.
533	119R-2-1-1	McHenry	13	10
FED. ROAD DIST.	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 8 OF 11 SHEETS

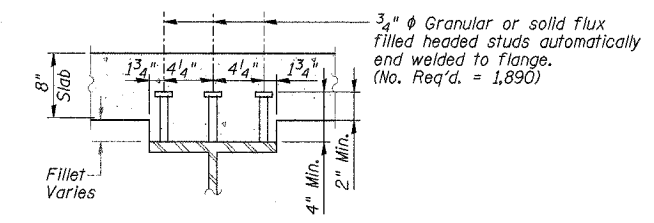
Contract #60D58



0.5 Span		
$I_s$	(in <sup>4</sup> )	11,300
$I_c$ (n)	(in <sup>4</sup> )	28,521
$I_c$ (3n)	(in <sup>4</sup> )	20,706
$S_s$	(in <sup>3</sup> )	621.9
$S_c$ (n)	(in <sup>3</sup> )	896.9
$S_c$ (3n)	(in <sup>3</sup> )	806
DC1	(k')	0.98
MDC1	(k')	621
DC2	(k')	0.25
MDC2	(k')	163
DW	(k')	0.33
MDW	(k')	217
$M_{LL} + Imp$	(k')	1072
$M_u$ (Strength I)	(k')	3021.4
$\phi_r M_n, \phi_r M_{nc}$	(k')	4494.3
$f_s$ DC1	(ksi)	11.97
$f_s$ DC2	(ksi)	2.44
$f_s$ DW	(ksi)	3.21
$f_s$ 1.3(LL+I)	(ksi)	18.64
$f_s$ (Service II)	(ksi)	36.26
$f_s$ (Total)(Strength I)	(ksi)	45.5
$V_f$	(k)	24.1

HL93 Loading		Abut.	
RDC1	(k)	34.44	
RDC2	(k)	9.02	
RDW	(k)	12.02	
$R_{LL} + Imp$	(k)	81.66	
RTotal	(k)	137.13	

	W. Abut.	E. Abut.
Beam 1	837.982	837.982
Beam 2	838.123	838.123
Beam 3	838.233	838.233
Beam 4	838.233	838.233
Beam 5	838.123	838.123
Beam 6	837.982	837.982



$I_s, S_s$  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.

$I_c(n), S_c(n)$  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) due to short-term composite live loads.

$I_c(3n), S_c(3n)$  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) due to long-term composite (superimposed) dead loads.

DC1 Un-factored non-composite dead load.

MDC1 Un-factored moment due to non-composite dead load.

DC2 Un-factored long-term composite (superimposed excluding future wearing surface) dead load.

MDC2 Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load.

DW Un-factored long-term composite (superimposed future wearing surface only) dead load.

MDW Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load.

$M_{LL} + Imp$  Un-factored live load moment plus dynamic load allowance (impact).

$M_u$ (Strength I) Factored design moment.  
 $1.25(M_{DC1} + M_{DC2}) + 1.5M_{DW} + 1.75M_{LL} + Imp$

$\phi_r M_n$  Compact composite positive moment capacity computed according to Article 6.10.7.1.

$\phi_r M_{nc}$  Compact non-composite negative moment capacity computed according to Article A6.1.1.

$f_s$  (Service II) Sum of stresses as computed from the moments below.  
 $M_{DC1} + M_{DC2} + M_{DW} + 1.3M_{LL} + Imp$

$f_s$  (Total)(Strength I) Sum of stresses as computed from the moments below on non-compact section.  
 $1.25(M_{DC1} + M_{DC2}) + 1.5M_{DW} + 1.75M_{LL} + Imp$

$V_f$  Factored shear range computed according to Article 6.10.10.

**NOTES:**  
 Work this Sheet with Sheet 7 of 11.  
 Load carrying components designated "NTR" shall conform to the Supplemental Requirements for Notch Toughness, Zone 2.  
 All Structural Steel on this Sheet shall be AASHTO M270 Grade 50W Steel.  
 Stud Shear Connectors not included in this Contract.

**BILL OF MATERIAL**

Item	Unit	Total
Furnishing Structural Steel	L. Sum	1

**BEAM DETAILS**  
 IL Route 176 over the Kishwaukee River  
 F.A.P. RTE 533, SECTION 119R-2-1-1  
 McHENRY COUNTY  
 STATION 10+00.00  
 S.N. 056-0078

DATE: 08-17-07  
 GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC  
 CHICAGO ILLINOIS

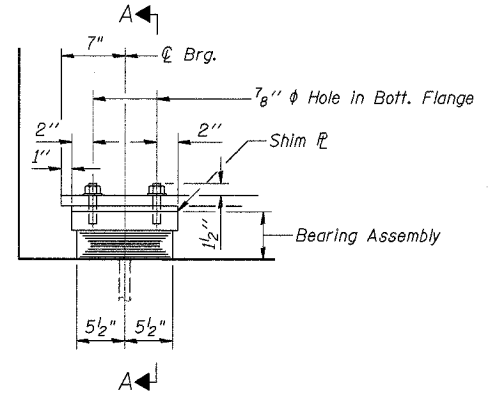
DESIGNED	J.Z.
CHECKED	S.D.H.
DRAWN	M.S.M.
CHECKED	S.D.H.

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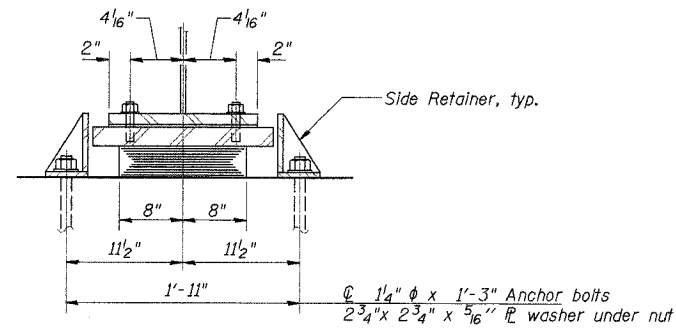
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
533	119R-2-1-1	McHenry	13	11
DESIGNED BY:	DRAWN BY:	CHECKED BY:	DATE:	

SHEET NO. 9 OF 11 SHEETS

Contract #60D58

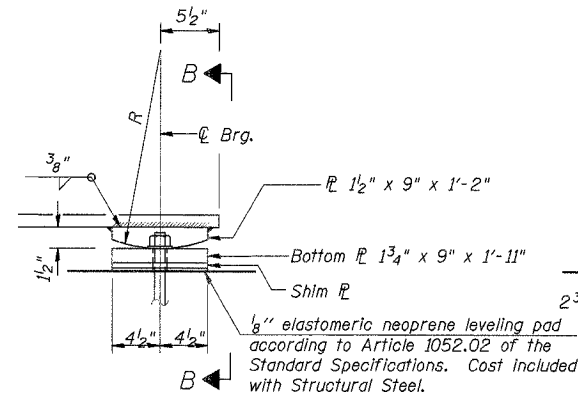


ELEVATION AT ABUT.

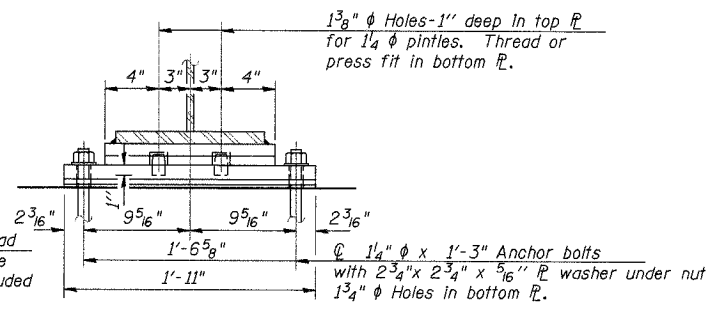


SECTION A-A

TYPE I ELASTOMERIC EXP. BRG. AT W. ABUT.

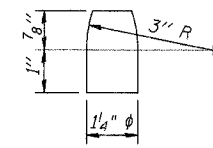


ELEVATION AT ABUT.

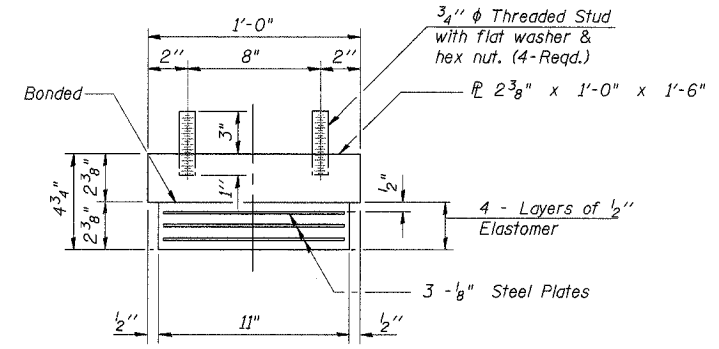


SECTION B-B

FIXED BEARING AT E. ABUT.



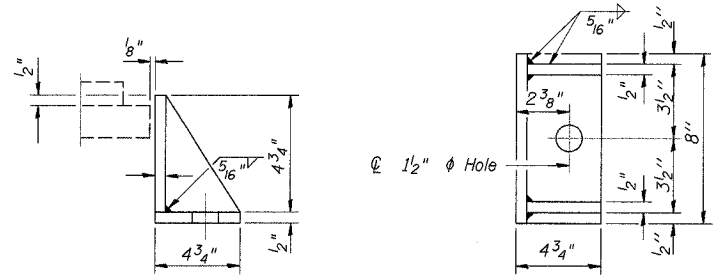
PINTLE



BEARING ASSEMBLY

Notes:  
 Side retainers and other steel members required for the bearing assembly shall be included in the cost of Furnishing Elastomeric Bearing Assembly, Type I.  
 The structural steel plates of the Bearing Assembly shall conform to the requirements of AASHTO M 270 Grade 50W.  
 Anchor bolts not included in this Contract.

Note:  
 Shim plates shall not be placed under Bearing Assembly.



SIDE RETAINER  
 Equivalent rolled angle with stiffeners will be allowed in lieu of welded plates.

BILL OF MATERIAL

Item	Unit	Total
Furnishing Elastomeric Bearing Assembly, Type I	EACH	6

BEARING DETAILS

IL Route 176 over the Kishwaukee River  
 F.A.P. RTE 533, SECTION 119R-2-1-1  
 McHENRY COUNTY  
 STATION 10+00.00  
 S.N. 056-0078

DATE: 08-17-07  
 GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC  
 CHICAGO ILLINOIS

DESIGNED	J.Z.
CHECKED	S.D.H.
DRAWN	M.S.M.
CHECKED	S.D.H.

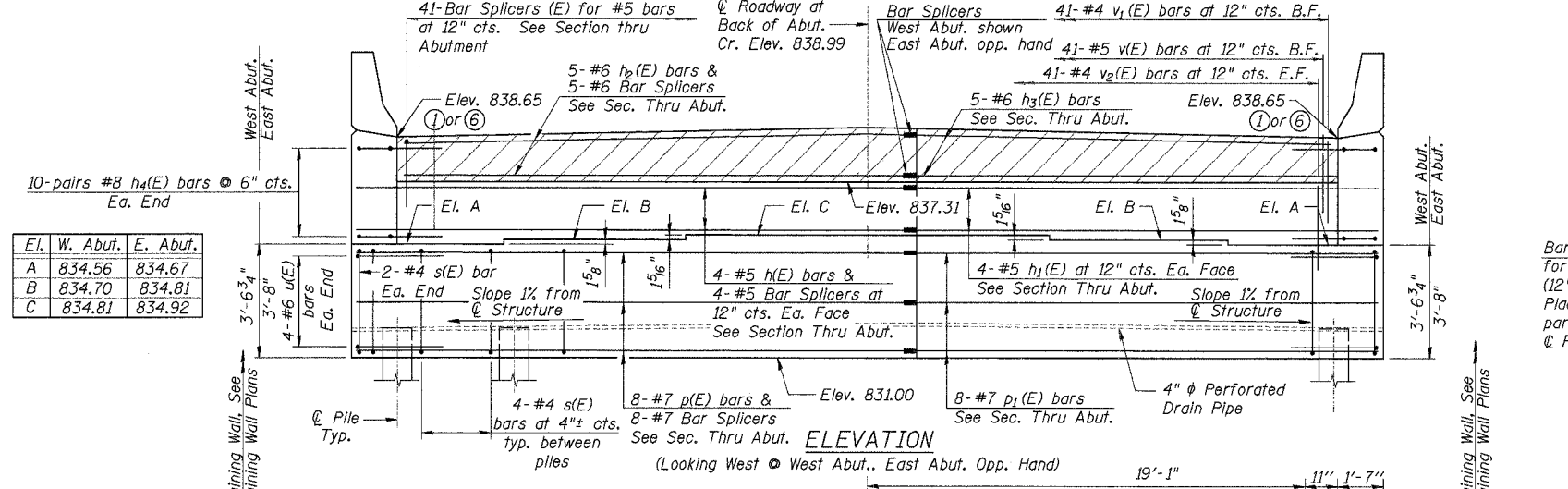
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ROUTE NO.	SECTION	COUNTY	SHEET NO.	SHEET
533	119R-2-I-1	McHenry	13	12
FED. ROAD DIST.		ILLINOIS	FED. AID PROJECT	

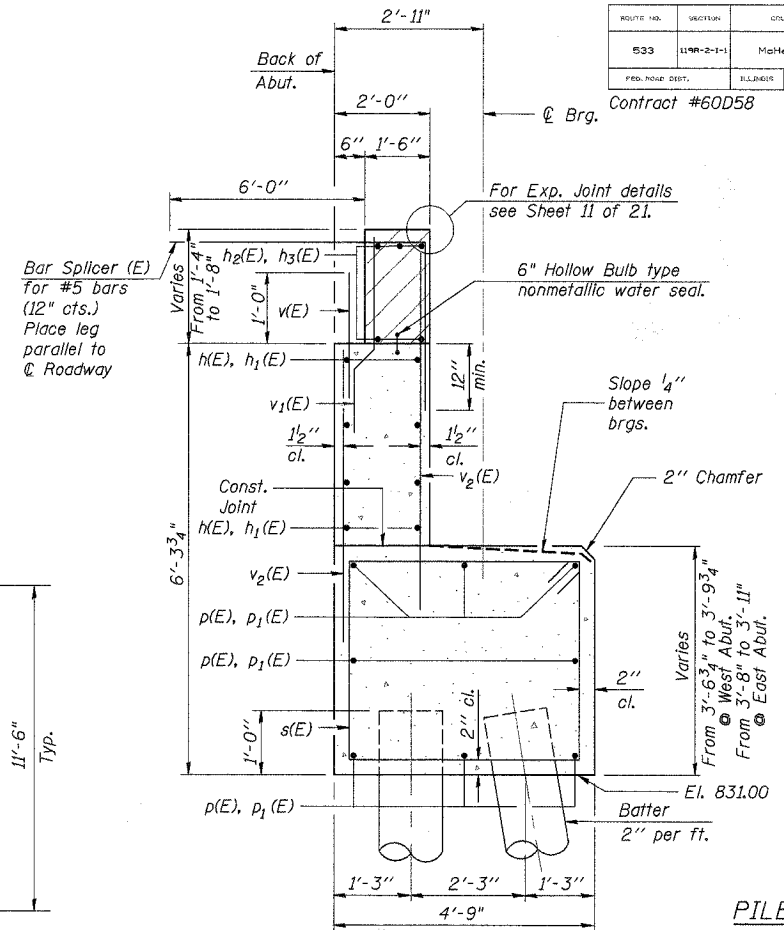
SHEET NO. 12 OF 11 SHEETS

Contract #60D58

**Notes:**  
 Hatched area to be poured after superstructure false work has been removed. Quantity of Concrete Included with Concrete Superstructure.  
 Space reinforcement in cap to miss anchor bolts. Pour steps monolithically with cap.  
 Concrete sealer shall be applied to the top of seats, front face of backwall, and front face of abutment stem.  
 Excavation behind existing abutment walls shall be performed to balance front and back soil pressure before removing the existing superstructure. The Contractor shall sawcut the upper portion of the existing abutment at the stage removal line before Stage I removal to ensure the remaining portion will not be prematurely damaged.

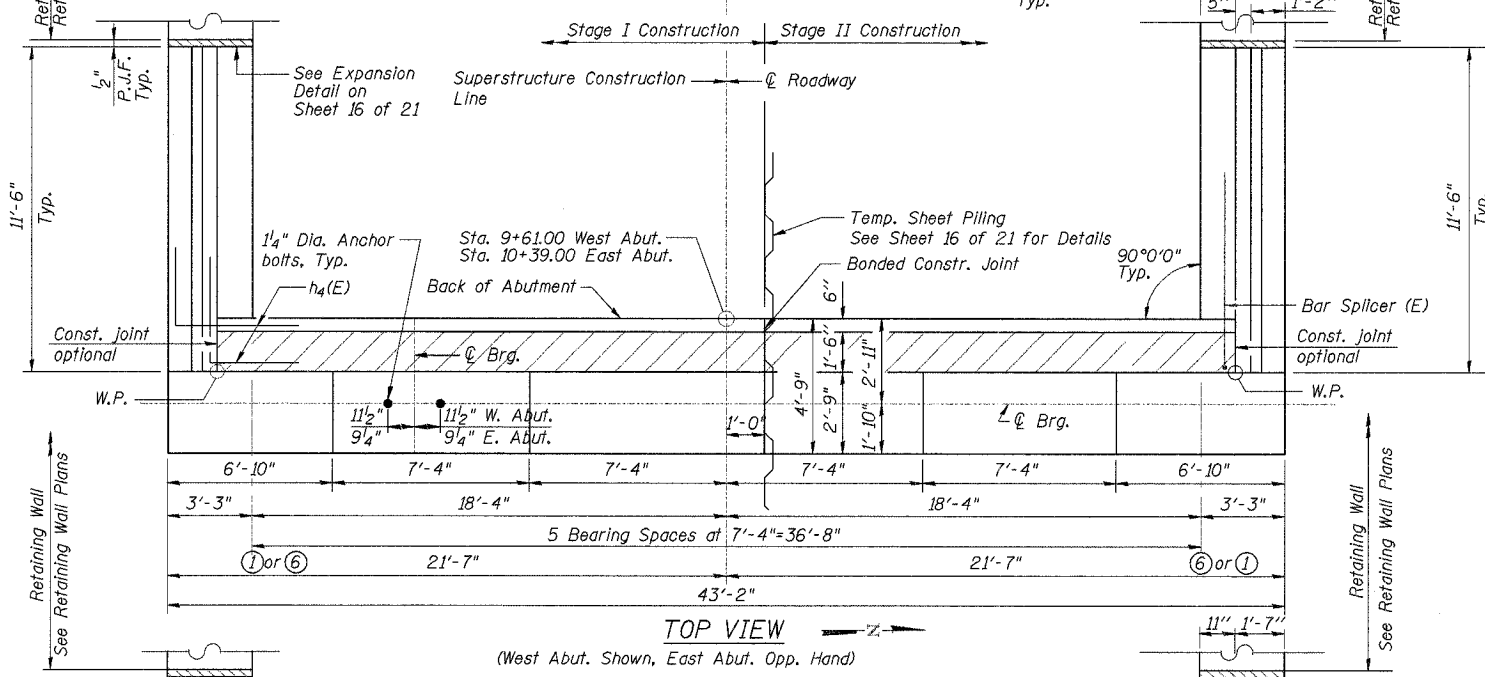


El.	W. Abut.	E. Abut.
A	834.56	834.67
B	834.70	834.81
C	834.81	834.92

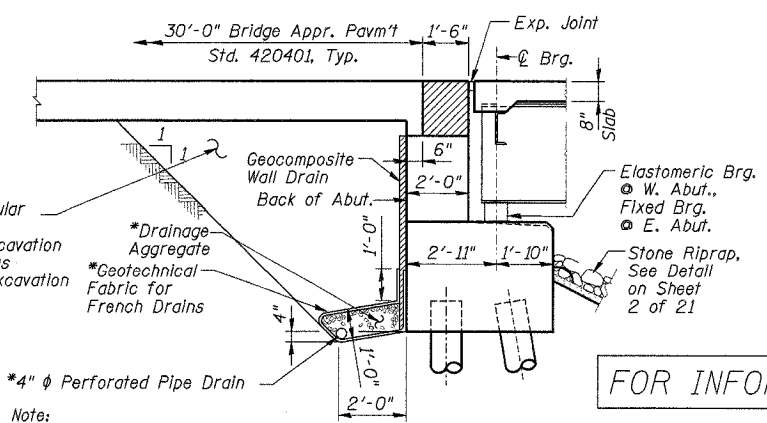


SECTION THRU ABUTMENT (Showing reinforcement)

**PILE DATA**  
 Pile Type and Size: Metal Shell 14" dia. x 1/4" Walls  
 Nominal Required Bearing: 390 kips  
 Allowable Resistance Available: 130 kips  
 Estimated Pile Length: 52 ft. @ West Abut.  
 54 ft. @ East Abut.  
 Number of Production Piles: 18 at each Abut.  
 Number of Test Piles: 1 at each Abut.



TOP VIEW (West Abut. Shown, East Abut. Opp. Hand)



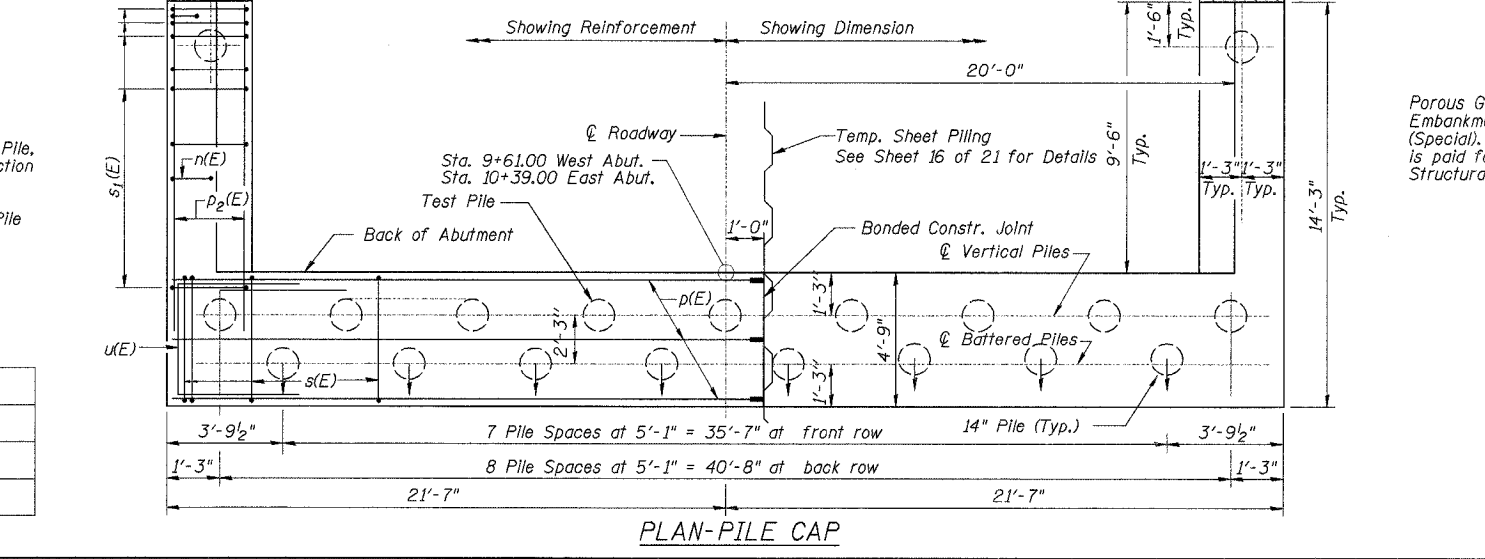
SECTION THRU ABUTMENT (Showing details)

FOR INFORMATION ONLY

**EAST & WEST ABUTMENTS**  
 IL Route 176 over the Kishwaukee River  
 F.A.P. RTE 533, SECTION 119R-2-I-1  
 McHENRY COUNTY  
 STATION 10+00.00  
 S.N. 056-0078  
 DATE: 08-17-07  
 GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC  
 CHICAGO ILLINOIS

**LEGEND**  
 Designates Battered Pile, arrow points to direction of batter  
 Designates Vertical Pile

DESIGNED	J.Z.
CHECKED	S.D.H.
DRAWN	M.S.M.
CHECKED	S.D.H.



PLAN-PILE CAP

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**ABUTMENT  
 BILL OF MATERIAL**

Bar	No.	Size	Length	Shape
h(E)	16	#5	22'-3"	
h <sub>1</sub> (E)	16	#5	20'-3"	
h <sub>2</sub> (E)	10	#6	20'-8"	
h <sub>3</sub> (E)	10	#6	18'-8"	
h <sub>4</sub> (E)	80	#8	16'-8"	
h <sub>5</sub> (E)	48	#8	11'-2"	
h <sub>6</sub> (E)	48	#4	11'-2"	
n(E)	52	#6	12'-4"	
p(E)	16	#7	22'-3"	
p <sub>1</sub> (E)	16	#7	20'-3"	
p <sub>2</sub> (E)	40	#8	13'-10"	
s(E)	136	#4	15'-11"	
s <sub>1</sub> (E)	40	#4	9'-5"	
u(E)	16	#6	13'-9"	
v(E)	82	#5	2'-4"	
v <sub>1</sub> (E)	82	#4	2'-10"	
v <sub>2</sub> (E)	164	#4	5'-6"	
v <sub>3</sub> (E)	52	#6	5'-7"	
v <sub>4</sub> (E)	52	#6	5'-5"	

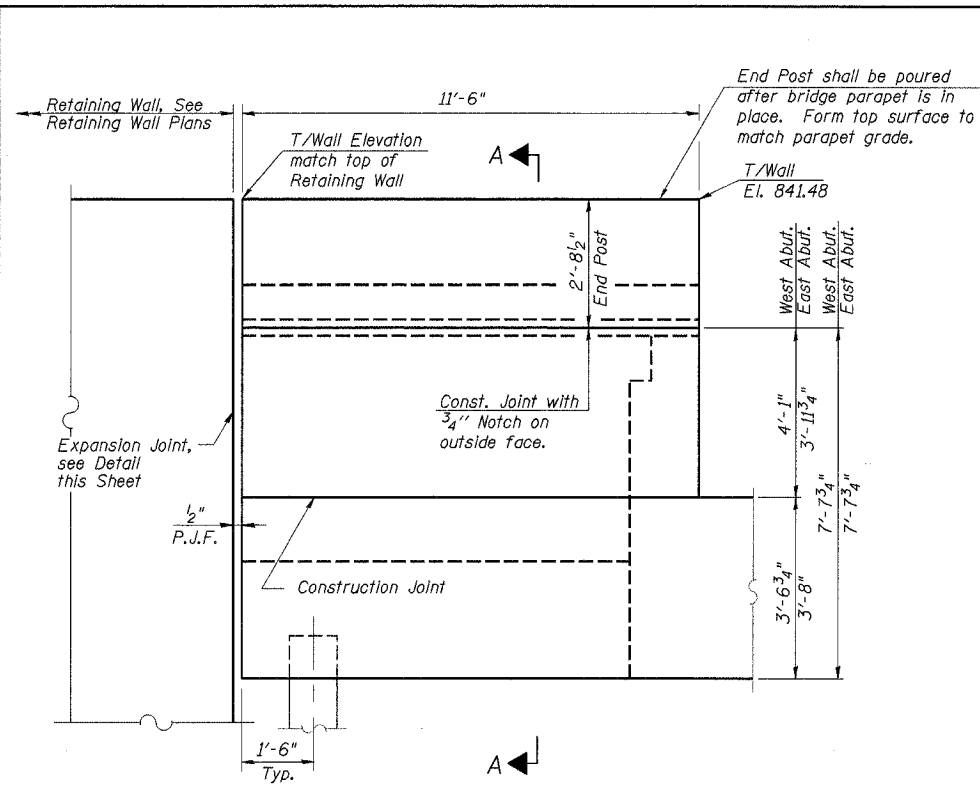
Porous Granular Embankment (Special)	CU YD	108
Stone Riprap	SQ YD	641
Filter Fabric	SQ YD	756
Structure Excavation	CU YD	235
Concrete Structures	CU YD	92.7
Reinforcement Bars, Epoxy Coated	LB	14,330
Bar Splicers	EACH	124
Furnishing Metal Shell Piles 14"	FOOT	1,908
Driving Piles	FOOT	1,908
Test Pile Metal Shells	EACH	2
Temporary Sheet Piling	SQ FT	1,244
Concrete Sealer	SQ FT	927
Geocomposite Wall Drain	SQ YD	77
Pipe Underdrains for Structures 4"	FOOT	123

For details of Bar Splicers, see Sheet 18 of 21.  
 For details of Piles, see Sheet 17 of 21.

**FOR INFORMATION ONLY**

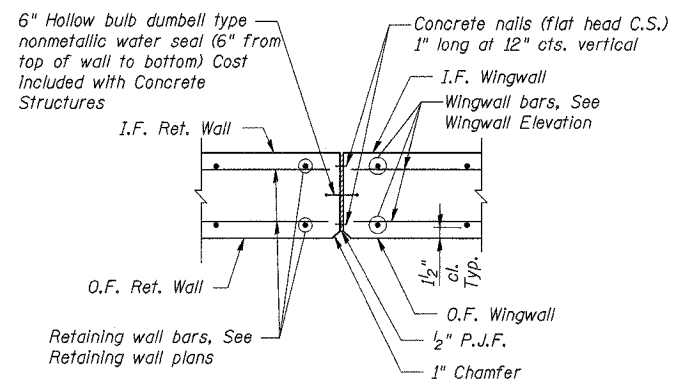
**ABUTMENT WINGWALL AND DETAILS**  
 IL Route 176 over the Kishwaukee River  
 F.A.P. RTE 533, SECTION I19R-2-I-1  
 McHENRY COUNTY  
 STATION 10+00.00  
 S.N. 056-0078

DATE: 08-17-07  
 GRAEF, ANHALT, SCHLOEMER & ASSOCIATES INC  
 CHICAGO ILLINOIS



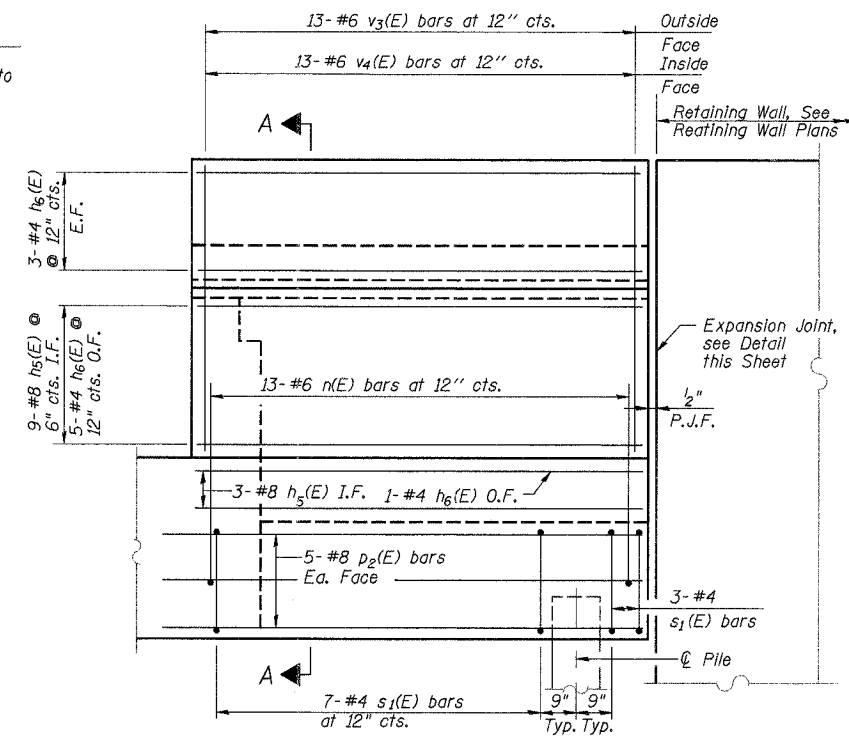
**WINGWALL ELEVATION**  
 Showing Dimensions

**Note:**  
 Quantity of concrete in end post included with Concrete Superstructure on Sheet 10 of 21.

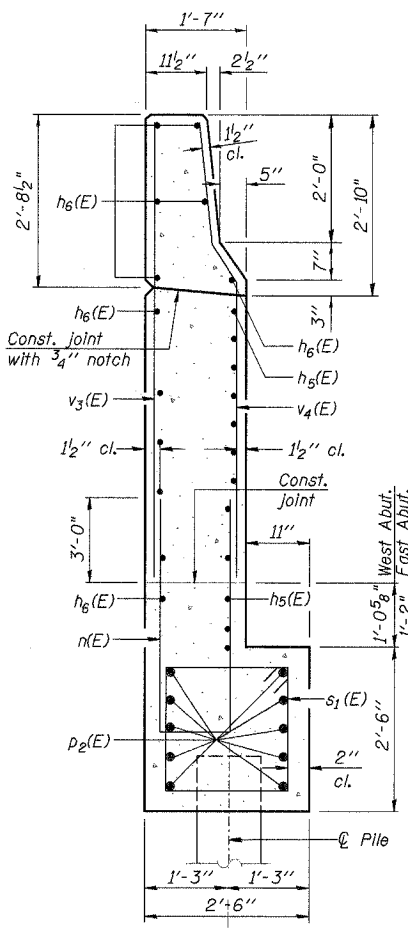


**EXPANSION JOINT DETAIL**

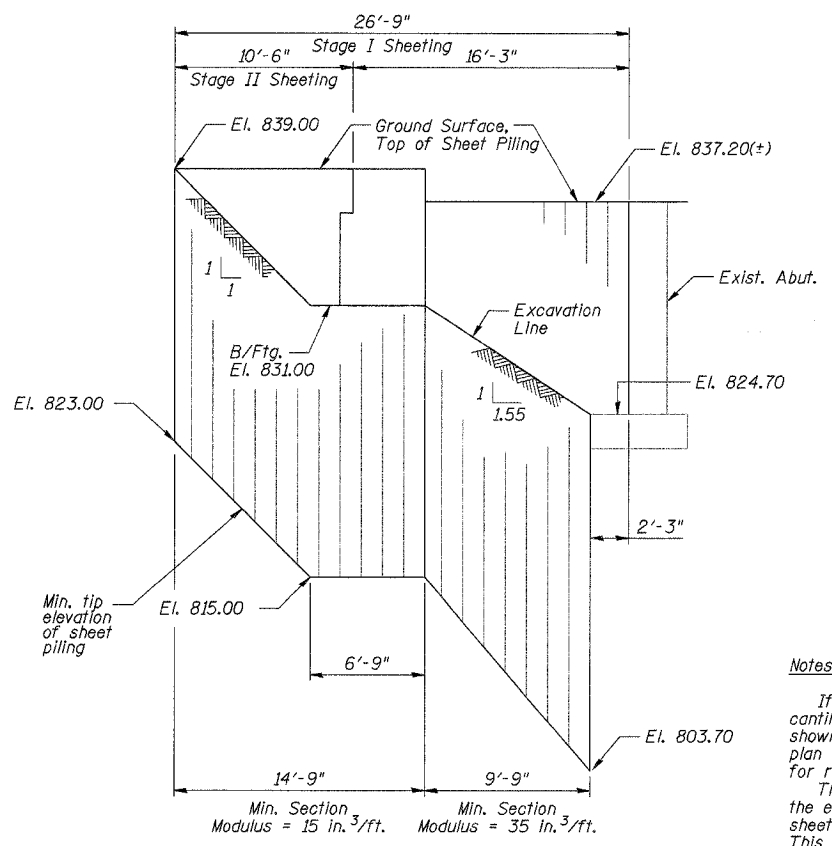
DESIGNED	J.Z.
CHECKED	S.D.H.
DRAWN	M.S.M.
CHECKED	S.D.H.



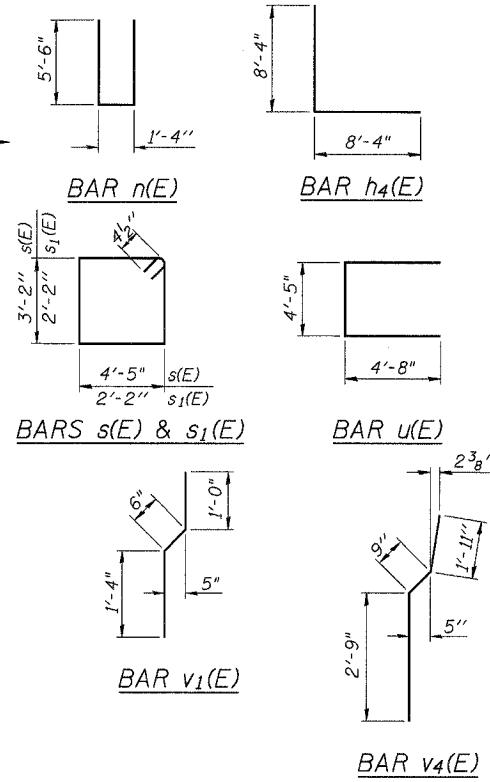
**WINGWALL ELEVATION**  
 Showing Reinforcement



**SECTION A-A**



**TEMP. SHEET PILING ELEVATION AT ABUT.**



**Notes:**  
 If the Contractor chooses to alter the temporary cantilevered sheet piling design requirements shown on the plans, a design submittal including plan details and calculations will be required for review and acceptance by the Engineer.  
 The contractor shall connect the first sheet to the existing abutment wall to ensure stability of sheets driven to the top of the existing footing. This connection shall be reviewed and accepted by the Engineer and included in the cost for Temporary Sheet Piling.