

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
701	(128BR)I-1	TAZEWELL	30	1

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

# PROPOSED HIGHWAY PLANS

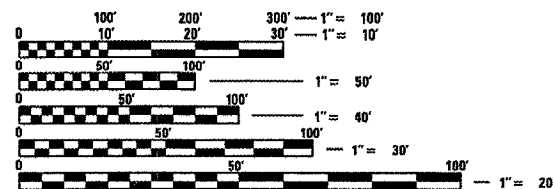
FAP ROUTE 701 (IL 122)  
SECTION (128 BR)I-1  
TAZEWELL COUNTY  
C-94-075-05

INDEX OF SHEETS:

1. COVER SHEET
- 2-3. COMMITMENTS & GENERAL NOTES
- 4-6. SUMMARY OF QUANTITIES
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9. GENERAL SITE PLAN
10. BUTT JOINT DETAIL
11. TRAFFIC STAGING & CONTROL
12. PLAN AND ELEVATION
13. STAGE CONSTRUCTION DETAIL
- 14-22. BRIDGE REPAIR DETAILS
- 23-30. SCOUR MITIGATION PLAN

STANDARDS REQUIRED:

- 420401-05 701101-01 702001-06  
515001-02 701106-01 704001-02  
630001-06 701201-02 780001-01  
631031-05 701306-01 781001-02  
631032-02 701321-08



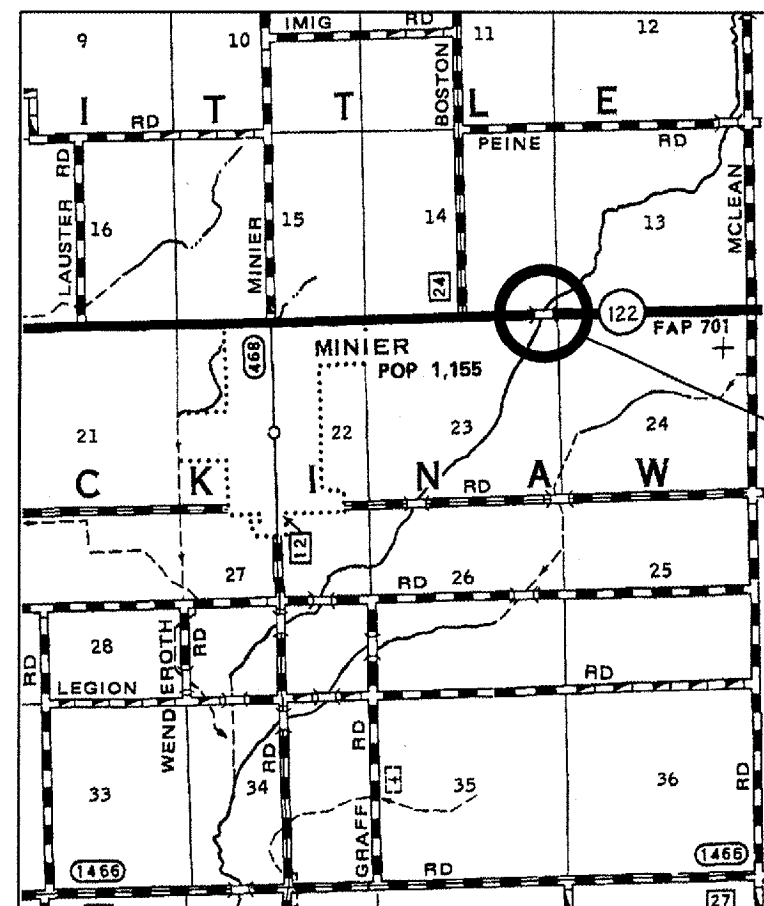
FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

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

CONTRACT NO. 68484 CAT. NO. 033065-00D

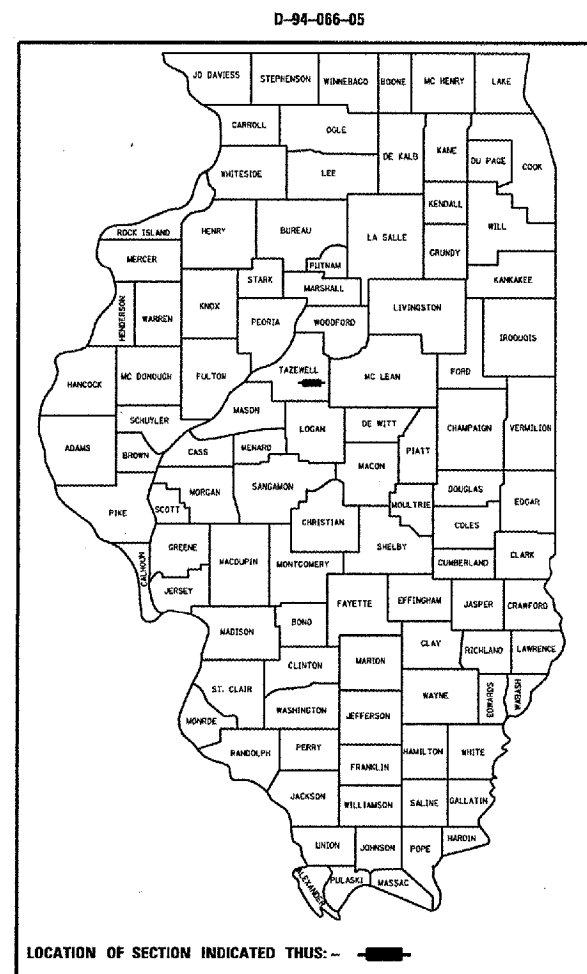
DESIGNER: CLARK JONES  
PHONE NO: (309) 671-3452

PROJECT ENGINEER: JIM MILLER  
PHONE NO: (309) 671-3451



LOCATION MAP

SCOUR MITIGATION AND DECK BEAM REPLACEMENT ON STRUCTURE CARRYING IL. 122 OVER SUGAR CREEK (SN. 090-0058), 1 MILE EAST OF MINIER



LOCATION OF SECTION INDICATED THUS: - [Symbol]

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

SUBMITTED 3/31/06

*Joseph E. Crowe*  
DEPUTY DIRECTOR OF HIGHWAYS, REGION ENGINEER

May 12, 2006  
*Mike Sene*  
ENGINEER OF DESIGN AND ENVIRONMENT

May 12, 2006  
*Milton R. Sene, P.E.*  
DIRECTOR OF HIGHWAYS, CHIEF ENGINEER

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OF THE STATE OF ILLINOIS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
701	(128BR1)-1	TAZEWELL	30	2
STA. 77+63.98		TO STA. 78+48.02		
FED. ROAD DIST. NO. 4 ILLINOIS FED. AID PROJECT				

## GENERAL NOTES

1. Any reference to a standard in these plans shall be interpreted to mean the edition, as indicated by the sub-number listed in the index, or the copy of the standard included in these plans.
2. The Engineer and Owner further do not warrant that all utilities have been illustrated on these documents. The Contractor is solely responsible for contacting J.U.L.I.E. for field verification of all utilities on the site prior where section or subsection monuments are encountered. The Engineer shall be notified before such monuments are removed. The Contractor shall protect and carefully preserve all property markers and monuments until the Owner and an authorized surveyor or agent, have witnessed or otherwise referenced their location.
3. The Contractor shall confine his operations to the area located within the construction limit lines, as shown per plans. Any area disturbed beyond these limits shall be restored to it's original condition at the Contractor's expense.
4. All temporary pavement markings shall be placed in such a manner so as not to interfere with the placement of permanent pavement markings.
5. The thickness of the bituminous mixture shown on the plans is the nominal thickness. Deviations from the nominal thickness will be permitted when such deviations occur due to irregularities in the existing surface or the base course on which the bituminous mixture is placed.
6. No vibratory roller will be allowed.
7. Illinois State law requires a 48-hour notice be given to all utilities before digging. Field marking of facilities may also be obtained by calling J.U.L.I.E. and for non-J.U.L.I.E. members, the utility company directly. Agencies known to have facilities within the project area are as follows:

- \* CORNBELT ELECTRIC COOPERATIVE, INC.
- \* VERIZON
- \* MEDIACOM
- \* AT&T(SBC) COMMUNICATIONS
- \* AMEREN CILCO/IP

8. (Members of J.U.L.I.E. (800-892-0123 are indicated by \*, whereas non-members must be notified individually.)

## COMMITMENTS

There are no commitments for this project.

## UTILITIES - LOCATIONS/INFORMATION ON PLANS

Unless noted otherwise, the location of existing water mains, gas mains, sewers, electric power lines, telephone lines, and other utilities as shown on the plans are based on careful field investigation and the information available, but they are not guaranteed. Some utility connections are shown as future. It shall be the Contractor's responsibility to ascertain their exact location from the utility companies and by field inspection.

## BUTT JOINT CUTTING TIME RESTRICTION

Butt joints shall be milled more than three (3) days prior to placement of the bituminous surface course.

## NAME PLATE RELOCATION

Name plates that will be removed as a result of this work shall be relocated on the steel bridge rail, Type SM as directed by the Engineer. The cost of removing and replacing the name plate(s), including all necessary fasteners, will not be measured or paid for separately, but will be considered as incidental to the contract.

The following mixture requirements are applicable for this project:

MIXTURE USE(S):	SURFACE (1 1/2" LIFT)
AC/PG	PG 64-22
RAP % (MAX)	15%
DESIGN AIR VOIDS	4.2% @ N=50
MIX COMPOSITION (GRADATION MIXTURE)	IL. 9.5 or 12.5
FRICITION AGG	MIXTURE D

Plan quantities for bituminous concrete surface course items are calculated using a unit weight of 112 lb/sq.yd./in.

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

## COMMITMENTS & GENERAL NOTES

SCALE: VERT.  
HORIZ.  
DATE 03-24-2006

DRAWN BY CEJ  
CHECKED BY

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T01	(128BR1)-1	TAZEWELL	30	3
STA. 77+63.98		TO STA. 78+46.02		
FED. ROAD DIST. NO. 4 ILLINOIS FED. AID PROJECT				

## GENERAL NOTES

1. Plan dimensions and details relative to existing structure (including High Water Elevation) have been taken from existing plans and are subject to nominal construction variations. It shall be the Contractor's responsibility to verify such dimensions and details in the field 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 the scope of the work. However, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.
2. All information shown in each structure's Waterway Information Table was provided by the Illinois Department of Transportation.
3. Commitments are not to be altered without the written approval of all parties to which the commitment was made.
4. The Contractor shall be responsible for diverting the water flow from the construction area of each site. The Contractor may use either method of dewatering as described in the Dewatering Special Provision.
5. During site preparation, areas below the final grade shall be brought to grade by placing compacted layers of Granular Subbase Material, Type C; areas of soft or otherwise unsuitable subgrade soils shall be excavated and replaced with compacted layers of Granular Subbase Material, Type C. Removal and replacement of unsuitable material shall be as directed by the Engineer and will be paid for in accordance to Article 109.04 (Force Account Basis) of the Standard Specifications. An assumed quantity for Granular Subbase Material, Type C, is included as part of each structure's mitigation details.
6. Layout of scour protection systems may be varied in the field to suit ground conditions as directed by the engineer.
7. All areas disturbed during construction shall be graded, fertilized, seeded and mulched as directed by the Engineer. Sections 250 and 251 of the Standard Specifications shall govern this work.
8. It is anticipated that the majority of the scour work will not require highway traffic lane closures. Work which would require extended lane closures shall be done while Standard 701321 is in use. Otherwise, the Contractor is restricted to one-lane daytime only closures in accordance with IDOT Standards 701201 and 701301.
9. GABION ANCHOR STAKE layout shown on plan sheets is for information and estimation purposes only. Actual layout shall be determined in the field by the Contractor and approved by the Engineer and shall conform to the procedures stated in the special provisions.

## COMMITMENTS

There are no commitments for this project.

## SCOUR CONSTRUCTION SEQUENCE

1. Install dewatering system and divert water flow from the construction area.
2. Excavate to the lines, grades, contours, and dimensions shown. The prepared area shall be inspected and approved by the Engineer before further work can take place.
3. Install filter fabric on the graded surfaces as shown on the drawings.
4. Install site specific scour countermeasures. See detail sheets for specific installation procedures.
5. Remove dewatering system. Grade and seed ground disturbed during construction.

PLOT DATE  
 DATE  
 PLOT SCALE  
 REFERENCE  
 BRG

REVISIONS		ILLINOIS DEPARTMENT OF TRANSPORTATION
NAME	DATE	
		<b>COMMITMENTS &amp; GENERAL NOTES</b>
SCALE: VERT.		DRAWN BY CEJ
DATE 03-24-2006		

F.A.P. RLE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
701	(128BRII-1	TAZEWELL	30	4
STA. 77+63.98		TO STA. 78+48.02		
FED. ROAD DIST. NO. 4 ILLINOIS FED. AID PROJECT				

# SUMMARY OF QUANTITIES

## CONSTRUCTION TYPE CODE

CODE NO.	ITEM	UNIT	CONSTRUCTION TYPE CODE		TOTAL
			X080-2A	SFTY -3N	
			100% STATE		
20300100	CHANNEL EXCAVATION	CU. YD.	1090		1090
20400800	FURNISHED EXCAVATION	CU. YD.	76		76
25000300	SEEDING, CLASS 3	ACRE	0.03		0.03
25000400	NITROGEN FERTILIZER NUTRIENT	POUND	3		3
25000500	PHOSPHORUS FERTILIZER NUTRIENT	POUND	3		3
25000600	POTASSIUM FERTILIZER NUTRIENT	POUND	3		3
25100630	EROSION CONTROL BLANKET	SQ. YD.	152		152
28000400	PERIMETER EROSION BARRIER	FOOT	92		92
28100109	STONE RIPRAP, CLASS A5	SQ. YD.	183		183
28200200	FILTER FABRIC	SQ. YD.	1067		1067
28400100	GABIONS	CU. YD.	339		339
28401000	SLOPE MATTRESS 12"	SQ. YD.	479		479
31102000	SUB-BASE GRANULAR MATERIAL, TYPE C	CU. YD.	608		608
40600100	BITUMINOUS MATERIALS (PRIME COAT)	GALLON	148		148
40600300	AGGREGATE (PRIME COAT)	TON	1		1
40600980	BITUMINOUS SURFACE REMOVAL-BUTT JOINT	SQ. YD.	160		160
48101200	AGGREGATE SHOULDERS, TYPE B	TON	2		2
50101500	REMOVAL OF EXISTING SUPERSTRUCTURES	EACH	1		1
50300225	CONCRETE STRUCTURES	CU. YD.	6		6
50300260	BRIDGE DECK GROOVING	SQ. YD.	273		273

PLOT DATE \* \* \* \* \*  
 FILE NAME \* \* \* \* \*  
 PLOT SCALE \* \* \* \* \*  
 REFERENCE \* \* \* \* \*

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

## SUMMARY OF QUANTITIES

SCALE: VERT.      DRAWN BY CEJ  
 DATE 03-24-2006      CHECKED BY

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
701	(128BR)-1	TAZEWELL	30	5
STA. 77+63.98		TO STA. 78+48.02		
FED. ROAD DIST. NO. 4   ILLINOIS   FED. AID PROJECT				

# SUMMARY OF QUANTITIES

## CONSTRUCTION TYPE CODE

CODE NO.	ITEM	UNIT	CONSTRUCTION TYPE CODE		TOTAL
			X080-2A	SFTY-3N	
			100% STATE		
50300300	PROTECTIVE COAT	SQ. YD.	294		294
50400105	PRECAST CONCRETE BRIDGE SLAB	SQ. FT.	299		299
50400405	PRECAST PRESTRESSED CONCRETE DECK BEAMS (21" DEPTH)	SQ. FT.	2646		2646
50800205	REINFORCEMENT BARS, EPOXY COATED	POUND	4960		4960
50901005	STEEL BRIDGE RAIL, TYPE SM	FOOT	244		244
51500100	NAME PLATES	EACH	1		1
* 63100087	TRAFFIC BARRIER TERMINAL, TYPE 6A	EACH	4		4
* 63100167	TRAFFIC BARRIER TERMINAL TYPE 1, SPECIAL (TANGENT)	EACH	4		4
* 63300205	REMOVAL & RE-INSTALLMENT OF EXISTING STEEL PLATE BEAM				
*	GUARD RAIL, TYPE A	FOOT	50		50
67000400	ENGINEER'S FIELD OFFICE, TYPE A	CAL. MO.	4		4
67100100	MOBILIZATION	LSUM	1		1
70100405	TRAFFIC CONTROL AND PROTECTION STANDARD 701321	EACH	1		1
70106500	TEMPORARY BRIDGE TRAFFIC SIGNALS	EACH	1		1
70106700	TEMPORARY RUMBLE STRIP	EACH	12		12
70300100	SHORT-TERM PAVEMENT MARKING	FOOT	176		176
70300200	TEMPORARY PAVEMENT MARKING	FOOT	7040		7040
70301000	WORK ZONE PAVEMENT MARKING REMOVAL	SQ. FT.	2405		2405
70400100	TEMPORARY CONCRETE BARRIER	FOOT	500		500

\* SPECIALTY ITEM

DATE  
NAME  
SCALE  
REFERENCE

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
**SUMMARY OF QUANTITIES**  
 SCALE: VERT.      DRAWN BY CEJ  
 HORIZ.              CHECKED BY  
 DATE 03-24-2006

F.A.P. RYE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
701	(128BR)-1	TAZEWELL	30	6
STA. 77+63.98		TO STA. 78+48.02		
FED. ROAD DIST. NO. 4 ILLINOIS FED. AID PROJECT				

# SUMMARY OF QUANTITIES

## CONSTRUCTION TYPE CODE

CODE NO.	ITEM	UNIT	CONSTRUCTION TYPE CODE		
			X080-2A	SFTY-3N	TOTAL
			100% STATE		
70400200	RELOCATE TEMPORARY CONCRETE BARRIER	FOOT	500		500
* 78005110	EPOXY PAVEMENT MARKING - LINE 4"	FOOT	3520		3520
78200410	GUARDRAIL MARKERS, TYPE A	EACH	4		4
78201000	TERMINAL MARKER - DIRECT APPLIED	EACH	4		4
78300100	PAVEMENT MARKING REMOVAL	SQ. FT.	1173		1173
X0301852	DEWATERING STRUCTURE NO.1	EACH	1		1
X0323655	GABION ANCHOR STAKE	EACH	103		103
X0324744	REMOVAL OF EXISTING PRECAST CONCRETE UNITS	SQ. FT.	299		299
X4066424	BITUMINOUS CONCRETE SURFACE COURSE, SUPERPAVE MIX "D", N50	TON	37		37
X4066614	BITUMINOUS CONCRETE BINDER COURSE, SUPERPAVE, IL-19.0, N50	TON	8		8
X5030305	CONCRETE WEARING SURFACE, 5"	SQ. YD.	294		294
X0325294	PREFORMED JOINT STRIP SEAL	FOOT	40		40
Z0002600	BAR SPLICERS	EACH	94		94
Z0030255	IMPACT ATTENUATORS, TEMPORARY(FULLY REDIRECTIVE, NARROW),				
	TEST LEVEL 2	EACH		2	2
Z0030320	IMPACT ATTENUATORS, RELOCATE(FULLY REDIRECTIVE), TEST LEVEL 2	EACH		2	2

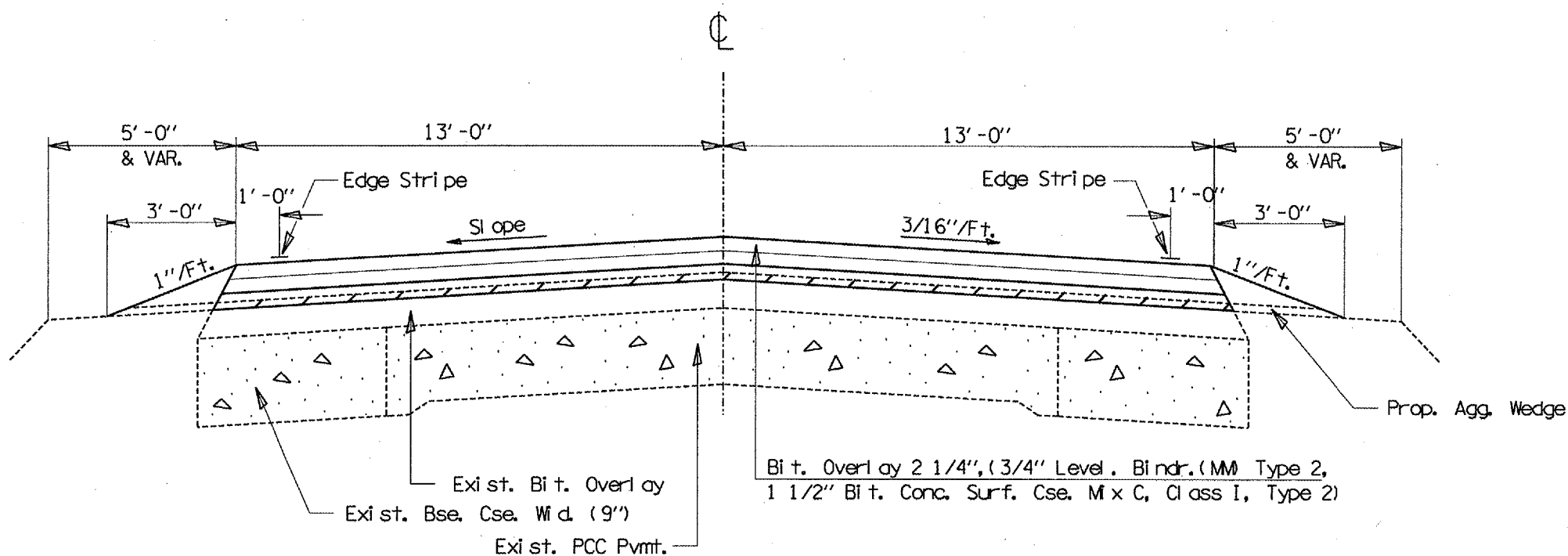
\* SPECIALTY ITEM

DATE  
SCALE  
REFERENCE  
REVISIONS

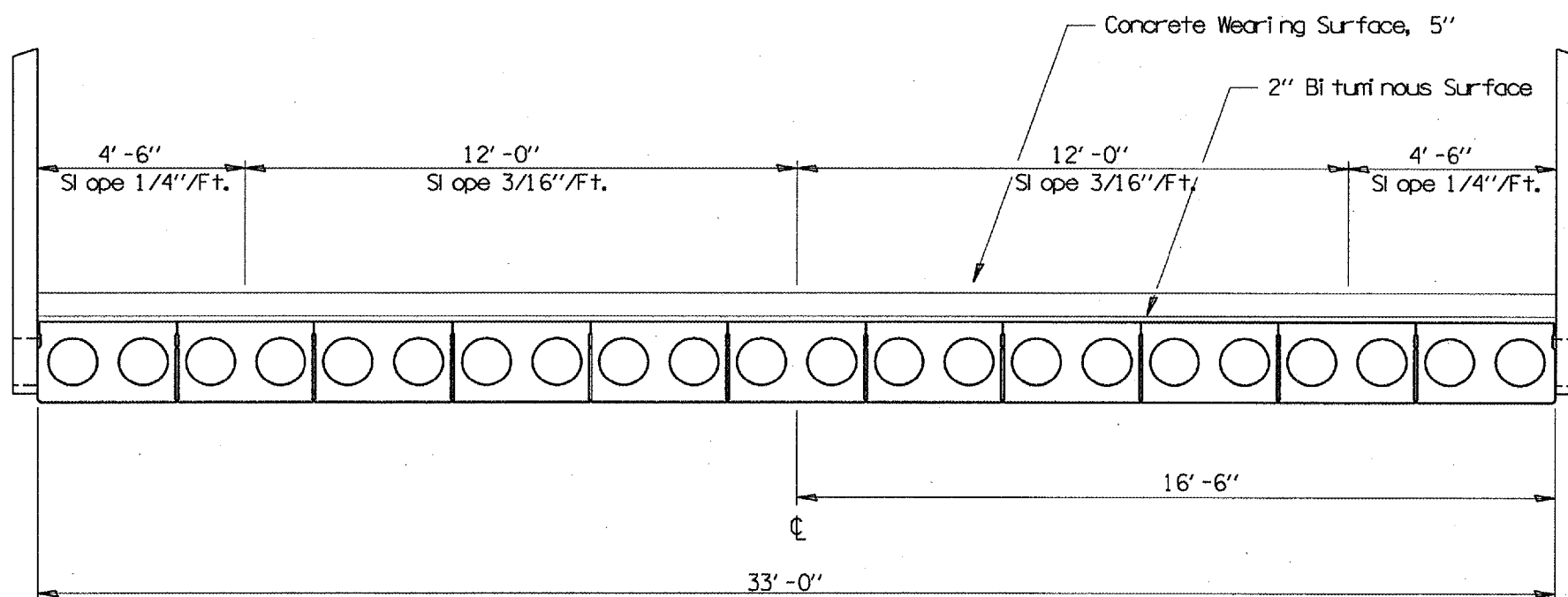
REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
**SUMMARY OF QUANTITIES**  
 SCALE: VERT.  
 HORIZ.  
 DATE 03-24-2006  
 DRAWN BY CEJ  
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F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
701	(128BR11-1	TAZEWELL	30	7
STA. 77+63.98		TO STA. 78+48.02		
FED. ROAD DIST. NO. 4 ILLINOIS FED. AID PROJECT				



Exi st. Typical Section  
Sta. 63+10 to 77+64.5  
Sta. 78+47 to Sta. 84+00



STA. 77+64.5 TO STA. 78+47

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS

SCALE: VERT.  
HORIZ.  
DATE 03-30-2006

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F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
701	(128BR1)-1	TAZEWELL	30	8
STA. 77+63.98		TO STA. 78+48.02		
FED. ROAD DIST. NO. 4		ILLINOIS	FED. AID PROJECT	

# QUANTITIES NOT OTHERWISE SHOWN

ITEM	UNIT	TOTAL	LOCATION
SEEDING, CLASS 3	ACRE	0.03	JOBSITE
NITROGEN FERTILIZER NUTRIENT	POUND	3	JOBSITE
PHOSPHORUS FERTILIZER NUTRIENT	POUND	3	JOBSITE
POTASSIUM FERTILIZER NUTRIENT	POUND	3	JOBSITE
EROSION CONTROL BLANKET	SQ. YD.	152	JOBSITE

## PAVMENT MARKING SCHEDULE

STATION TO STATION		WORK ZONE PAVEMENT MARKING REMOVAL (SQ.FT.)	SHORT TERM PAV'T MARKING (FOOT)	TEMPORARY PAV'T MARKING (FOOT)	EPOXY PAVEMENT MARKERS LINE-4" (EACH)	RAISED REFLECTIVE PAVEMENT MARKERS (EACH)	RAISED REFLECTIVE PAVEMENT MKR. REM. (SQ.YD.)
77+04	79+08	963	153	963			
77+04 RT.	79+08 RT.				209		
77+04 LT.	79+08 LT.				209		
77+04 CL.	79+08 CL.				52	6	6
TOTALS		1116	153	963	470	6	6

PLOT DATE \* DATE  
 FILE NAME \* TITLE  
 PLOT SCALE \* SCALES  
 REFERENCE \* REF.

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

# QUANTITIES NOT OTHERWISE SHOWN

SCALE: VERT.  
DATE 03-29-2006

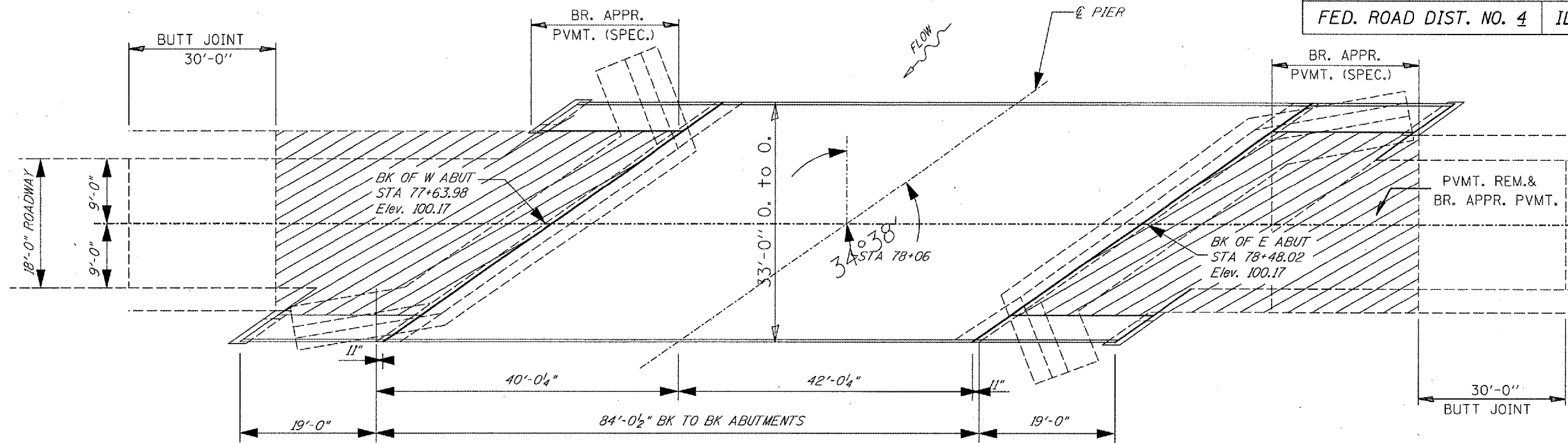
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CHECKED BY



BENCHMARK: CHISLED SQUARE ON BRIDGE DECK  
ON SOUTHWEST CORNER  
ELEV = 100.00

EXISTING STRUCTURE: SN 090-0058 IS A 33'-0" WIDE x 84'-0 1/2"  
LONG P.C.C. DECK BEAM SUPERSTRUCTURE WITH R.C. CLOSED ABUTMENTS.

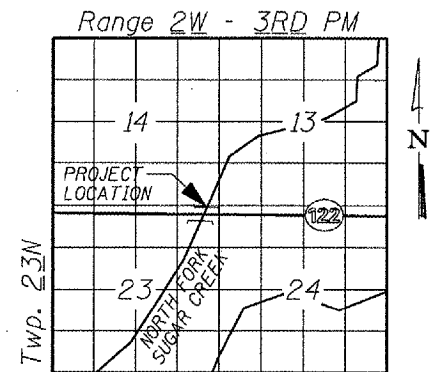
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
701	(128BR)I-1	TAZEWELL	30	9
FED. ROAD DIST. NO. 4		ILLINOIS	FED. AID PROJECT	



PLAN

GUARDRAIL SCHEDULE								
STATION TO STATION		SPBGR TY. A (FOOT)	SPBGR REMOVAL (FOOT)	TRAF. BARR. TERMINAL TYPE 6A (EACH)	TRAF. BARR. TERM. TY. 1 (SPECIAL) (TANGENT) (EACH)	GUARDRAIL MARKERS TYPE A (EACH)	TERMINAL MARKER, DIRECT APPLIED (EACH)	FURNISHED EMBANKMENT (SEE STD. 630301) (CU.YD.)
76+41 RT	77+34 RT	12.5	88	1	1	1	1	25
76+63 LT	77+56 LT	12.5	88	1	1	1	1	25
78+56 RT	79+49 RT	12.5	88	1	1	1	1	25
78+78 LT	79+71 LT	0	38	1	1	1	1	25
TOTALS		37.5	302	4	4	4	4	100

PAVING SCHEDULE								
STATION TO STATION		BIT. CON. SURFACE REMOVAL BUTT JOINT (SQ.YD.)	BITUM. MAT'LS PRIME COAT (GALLON)	AGG. PRIME COAT (TON)	PAVEMENT REMOVAL (SPECIAL) (SQ.YD.)	BRIDGE APPROACH PAVEMENT (SQ.YD.)	BR. APPR. PAVEMENT CONNECTOR (FLEXIBLE) (SQ.YD.)	BIT. CON. SURF. CSE. SUPERPAVE, MIX D, N50 (TON)
77+04	77+34	87	9	1				7.5
77+34	77+64		11	1	84	84	18	7
78+48	78+78		11	1	84	84	18	7
78+78	79+08	87	9	1				7.5
TOTALS		174	60	4	168	168	36	29



LOCATION SKETCH

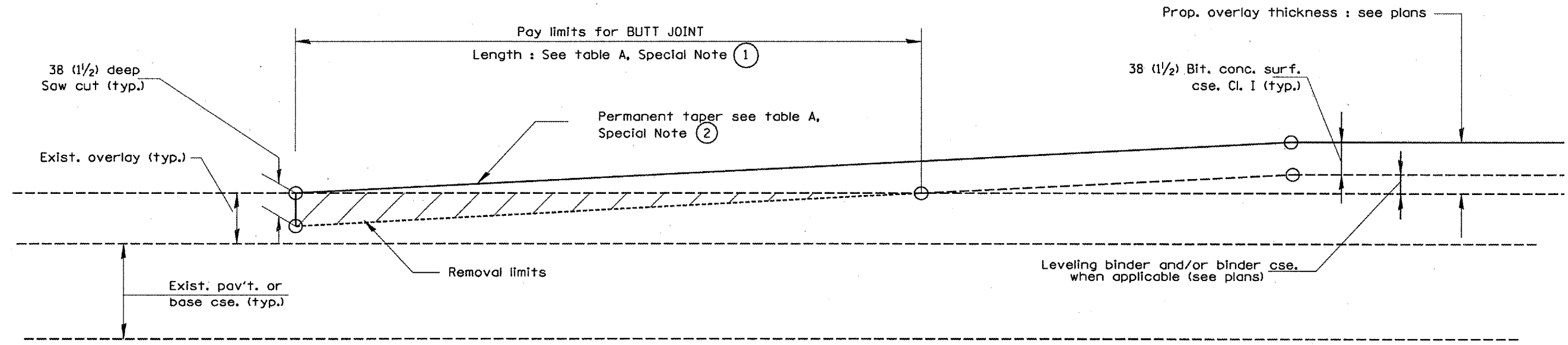
ILLINOIS DEPARTMENT OF TRANSPORTATION

GENERAL SITE PLAN

SCALE: VERT. HORIZ. DATE 03-29-2006

DRAWN BY CEJ CHECKED BY

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
701	(128BR1)-1	TAZEWELL	30	10
STA. 77+63.98		TO STA. 78+48.02		
FED. ROAD DIST. NO. 4 ILLINOIS FED. AID PROJECT				



**CASE 2 : NO BITUMINOUS SURFACE REMOVAL (COLD MILLING)**

**TABLE A**  
(LENGTHS AND TAPER RATES)

SPECIAL NOTE NUMBER	ELEMENT	MAINLINE INTERSTATES & 4-LANE EXPRESSWAYS	ALL OTHERS
①	LENGTH OF BUTT JOINT	18.0 m(60')	9.0 m(30')
②	PERMANENT TAPER RATE	1:480	1:240
③	TEMPORARY RAMP TAPER RATE	1:80	1:40
④	TEMPORARY RAMP LENGTH	3.0 m(10')	1.5 m(5')
⑤	LENGTH OF BUTT JOINT	3.0 m(10')	3.0 m(10')

**GENERAL NOTES**

- The work shall be done in accordance with Article 406.18 and the Special Provision for Butt Joints.
- The pavement surface to be removed may be either bituminous or P.C. concrete. The work shall be performed in accordance with Article 440.03 and the Special Provisions for Butt Joints.
- The saw cut joints shall be primed just prior to the placing of bituminous material. The work will be in accordance with the applicable portions of Article 406.06.

DESIGNER NOTES:  
1. Include District Special Provision for Butt Joints & for Bituminous Surface Removal (Cold Milling).  
2. The butt joints pay item includes the saw cut & temporary ramp. Payment for the Butt Joint applies whether or not the project features Bituminous Surface Removal (Cold Milling).

03-29-2005

All dimensions are in millimeters (inches) unless otherwise noted.

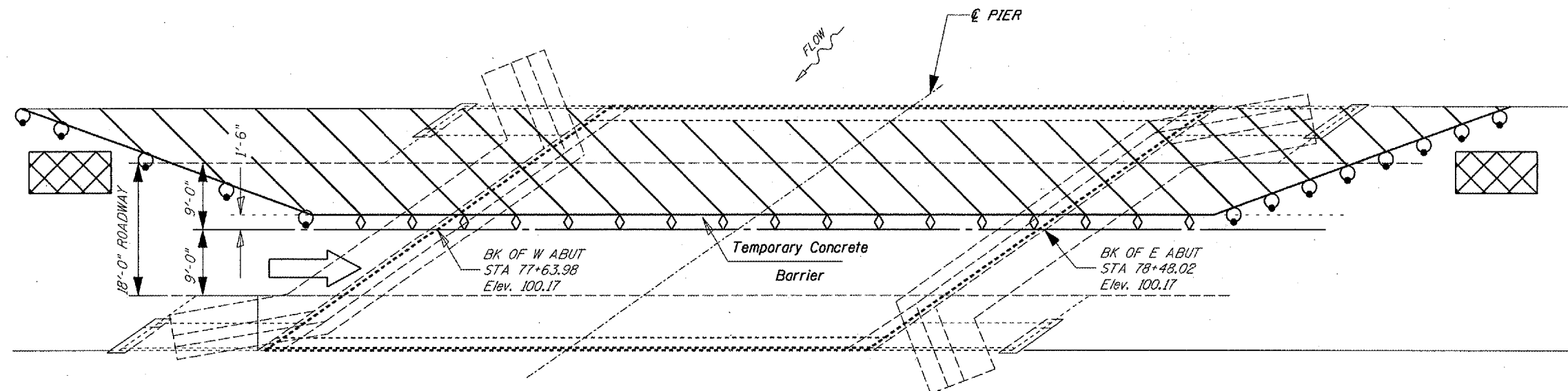
ILLINOIS DEPARTMENT OF TRANSPORTATION  
**DISTRICT CADD STANDARD**

**BUTT JOINTS**

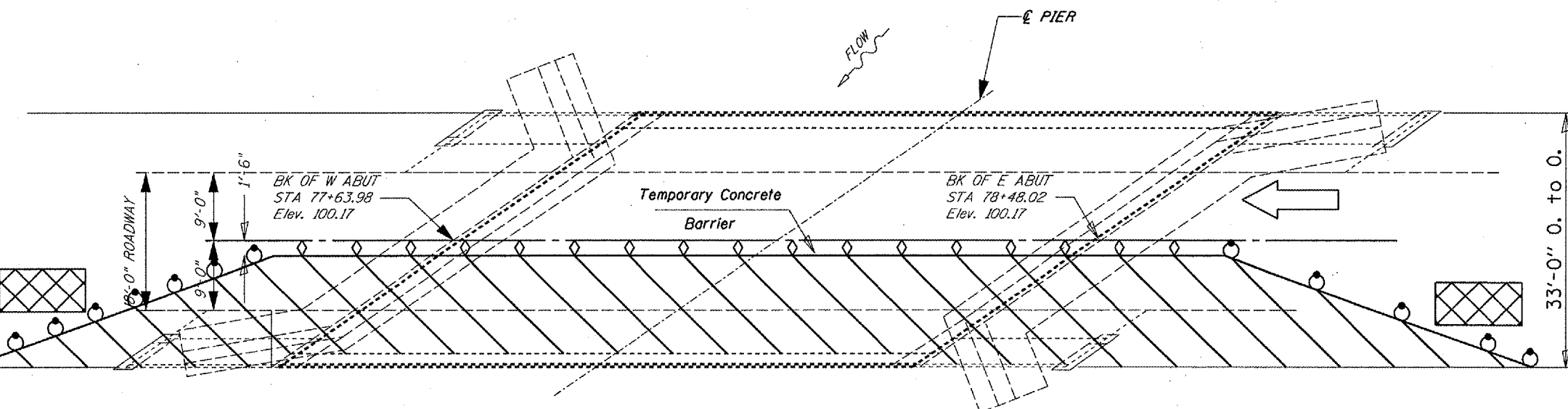
CADD STD NO. 406101-D4 SHEET 1  
SCALE: NOT DRAWN TO SCALE DRAWN BY CADD  
DATE 03-29-2005 CHECKED BY

DATE	REVISIONS	BY
1-1-97	RENUM. C-23.01, NEW REVISION BOX	T.P.
4-1-97	CORRECTION TO DEPTH	J.A.
9-15-05	REVISED DESIGNER NOTE	M.M.A.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
701	(128BR)1-1	TAZEWELL	30	11
STA. 77+63.98		TO STA. 78+48.02		
FED. ROAD DIST. NO. 4   ILLINOIS   FED. AID PROJECT				













PLAN  
STAGE I



PLAN  
STAGE II

Symbols

-  Work Area
-  Drum w/Steady-Burn Light
-  Sign
-  Type III Barricade
-  Traffic Signal
-  Steady Burn Lights and Dbl. Vert. Panels
-  Type C Bidirectional Reflector
-  Sand Module Impact Attenuator
-  Temporary Concrete Barrier
-  Induction Loop Detector

NOTES:  
Refer to Highway Standard 701321 for exact placement of traffic management devices and other clarifications as construction staging symbols and dimensioning were duplicated off of this standard.

DATE: 03-27-2006  
DRAWN BY: CEJ  
CHECKED BY:

REVISIONS	
NAME	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION  
**TRAFFIC STAGING AND CONTROL**  
SCALE: VERT. DATE 03-27-2006  
DRAWN BY: CEJ  
CHECKED BY:

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		Tozowall	12	1
SHEET NO. 1 11 SHEETS				

Contract Number: 68484

**GENERAL NOTES**

Plan dimensions and details relative to existing structure have been taken from existing plans and are subject to nominal construction variations. It shall be the Contractor's responsibility to verify such dimensions and details in the field 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 the scope of the work, however, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.

The minimum thickness of the Concrete overlay shall be 5" and varies as required to adjust for the new profile grade and beam camber.

The cut strands at each beam end shall be given two coats of zinc dust spray or paint meeting the requirements of ASTM A780. The zinc dust spray or paint shall be applied before corrosion appears and allowed to dry according to manufacturer's specifications prior to another coat of zinc. A concrete sealer meeting the requirements of Section 587 of the Standard Specifications shall be applied to the exterior face and 9" in on the underside of each fascia beam. The sealer shall be applied after visible crack growth has subsided. This work shall be performed by the producer and included with the cost of the beam.

All construction joints shall be bonded.

The contractor is advised that the existing PPC Deck Beams are in a deteriorated condition with reduced load carrying capacity. It is the Contractor's responsibility to account for the condition of the beams when developing construction procedures for removal and replacement of the superstructure.

Attach new Name plate to the backside of 8" Rail element. Existing name plate is to be removed, cleaned and relocated adjacent to new name plate. Cost included in the cost of Name Plates.

If the contractor's procedure for existing beam removal or placement of new beams involves placement of cranes or other heavy equipment on new beams, a detailed procedure shall be submitted to the Engineer for approval. The procedure shall include calculations, prepared and sealed by an Illinois Licensed Structural Engineer, verifying that the equipment and procedure used will not overstress the new beams. To distribute load to multiple beams and protect the concrete, in all cases a double layer mat of heavy timbers shall be used at all times under crane tracks or wheels and any outriggers in the down position. If necessary, shims shall be used under the crane mat to ensure uniform contact with the underlying beams. Prior to placement of the timber mats the following shall be done: placement and tightening of transverse tie assemblies, grouting and curing the dowel rods 24 hours minimum and grouting and curing the shear keys. A temporary means of lateral restraint will be required for fascia beams at expansion ends of beams to prevent movement of the beams.

**LOADING HS20-44**

No allowance for future wearing surface.

**DESIGN SPECIFICATIONS**  
2002 AASHTO Standard Specifications

**DESIGN STRESSES**

**FIELD UNITS**

$f'_c = 3,500$  psi

$f'_c = 5,000$  psi (Concrete Wearing Surface)

$f_y = 60,000$  psi (Reinforcement)

**PRECAST PRESTRESSED UNITS**

$f'_c = 5,000$  psi

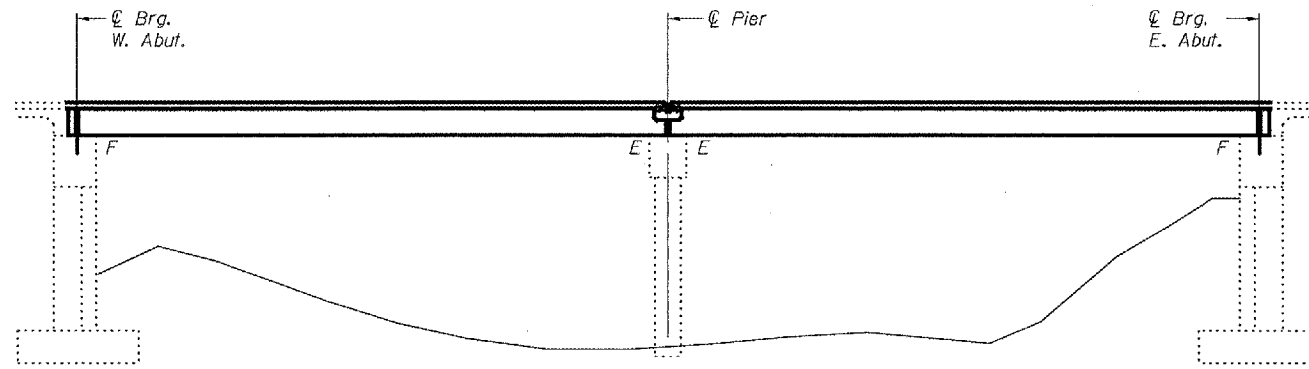
$f'_{ci} = 4,000$  psi

$f'_s = 270,000$  psi ( $\frac{1}{2}$ "  $\phi$  low lax strands)

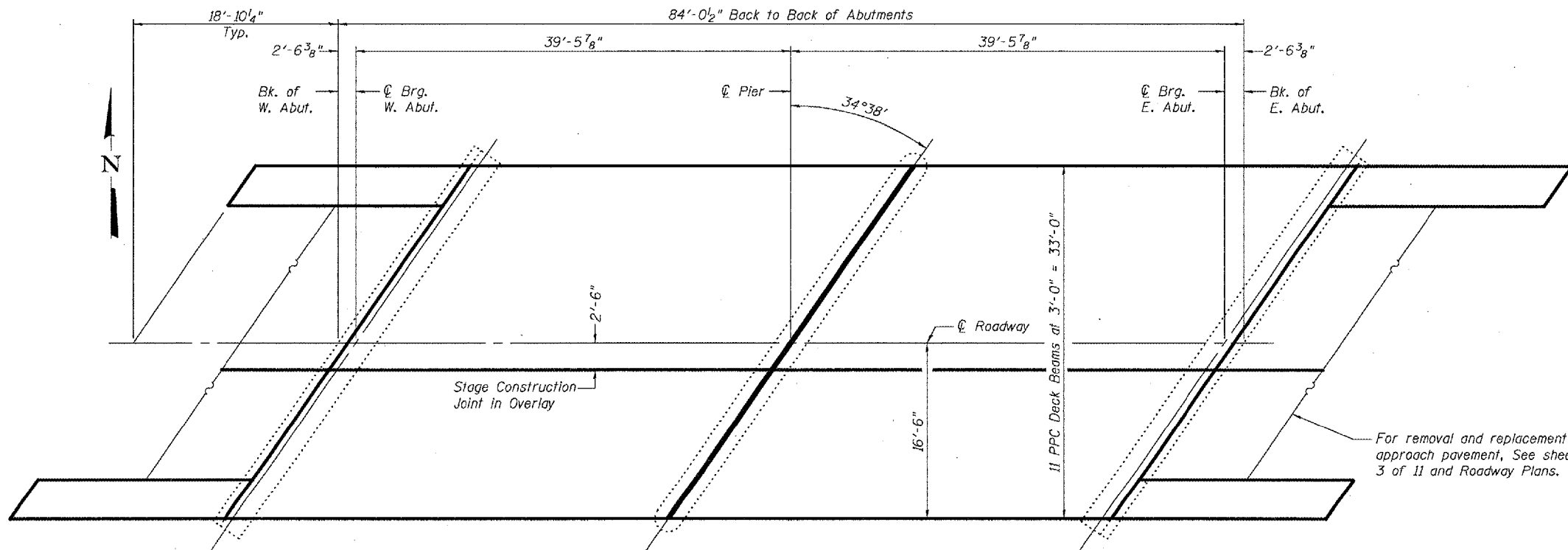
$f'_{si} = 201,960$  psi ( $\frac{1}{2}$ "  $\phi$  low lax strands)

**PRECAST NON-PRESTRESSED UNITS**

$f'_c = 4,500$  psi



**ELEVATION**



**PLAN**

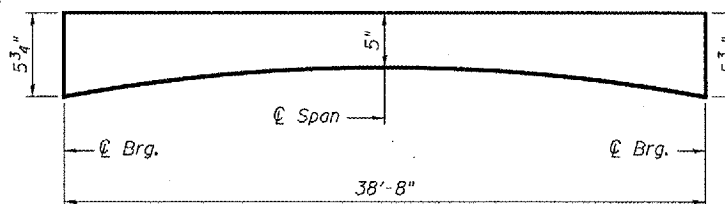
**TOTAL BILL OF MATERIAL**

ITEM	UNIT	QUANTITY
Prefomed Joint Strip Seal	Foot	40
Protective Coat	Sq. Yd.	294
Removal of Existing Superstructures	Each	1
PPC Deck Beams (21" Depth)	Sq. Ft.	2646
Reinforcement Bars, Epoxy Coated	Pound	4,960
Steel Bridge Rail, Type SM	Foot	244
Concrete Wearing Surface, 5"	Sq. Yd.	294
Bridge Deck Grooving	Sq. Yd.	273
Name Plates	Each	1
Bar Splicers	Each	94
Removal of Existing Precast Unit	Sq. Ft.	299
Concrete Structures	Cu. Yd.	6.0
Precast Concrete Bridge Slab	Sq. Ft.	299

STATION 78+06  
REBUILT 20 BY  
STATE OF ILLINOIS  
F.A.P. RT. 701 SEC. (128BR)I  
LOADING HS20  
STR. NO. 090-0058

**NAME PLATE**  
(See Std. 515001)

**PLAN AND ELEVATION**  
**IL 122 / SUGAR CREEK**  
**TAZEWELL COUNTY**  
**SN 090-0058**

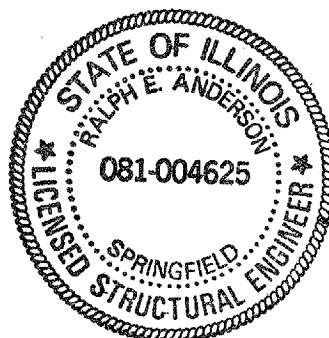


**CONCRETE WEARING SURFACE PROFILE**

(Additional  $\frac{1}{4}$ " thickness at  $\phi$  Roadway to account for crown of Roadway.)

DESIGNED *Paul J. Adams*  
CHECKED *Rita Brakke*  
DRAWN *[Signature]*  
CHECKED *PSJ / JSB*

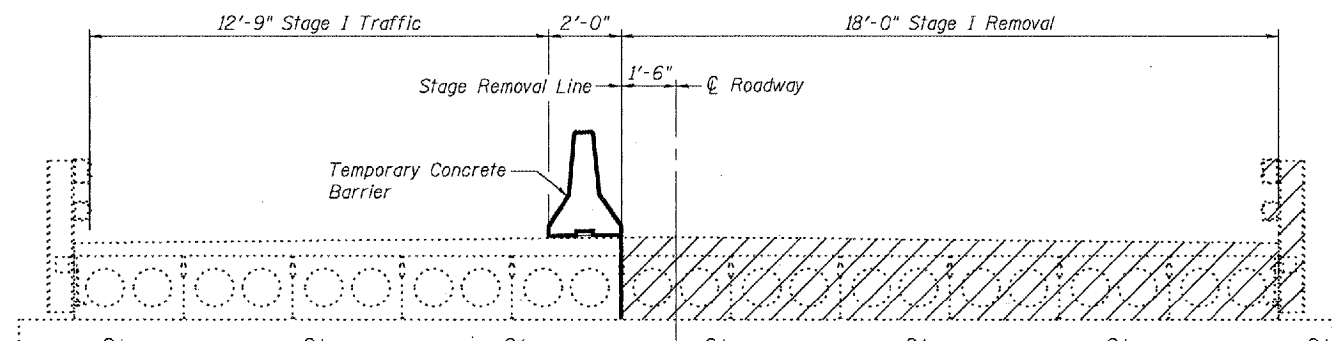
APRIL 24, 2006  
EXAMINED *John A. Morris*  
PASSED *Ralph E. Anderson*



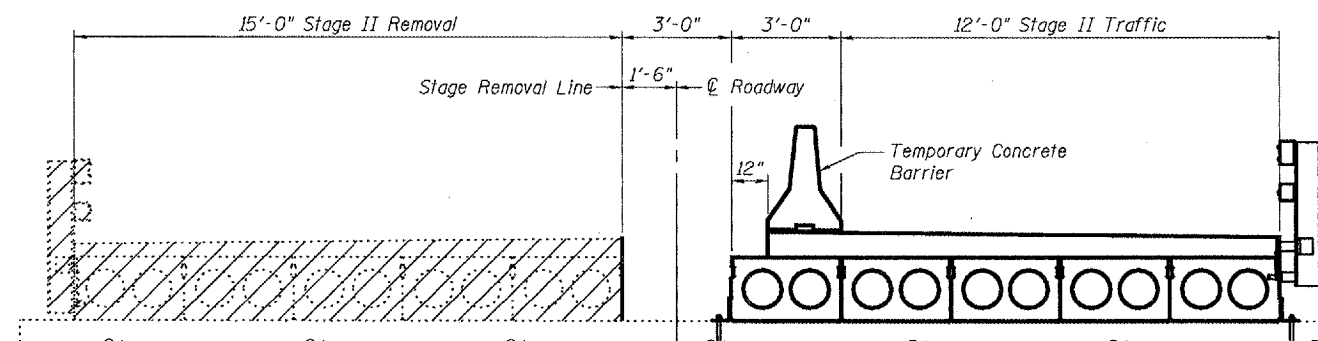
Expires: November 30, 2006

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	SHEETS	SET	SHEET NO. 2
		Tazewell	13		11 SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT	Contract Number: 68484		

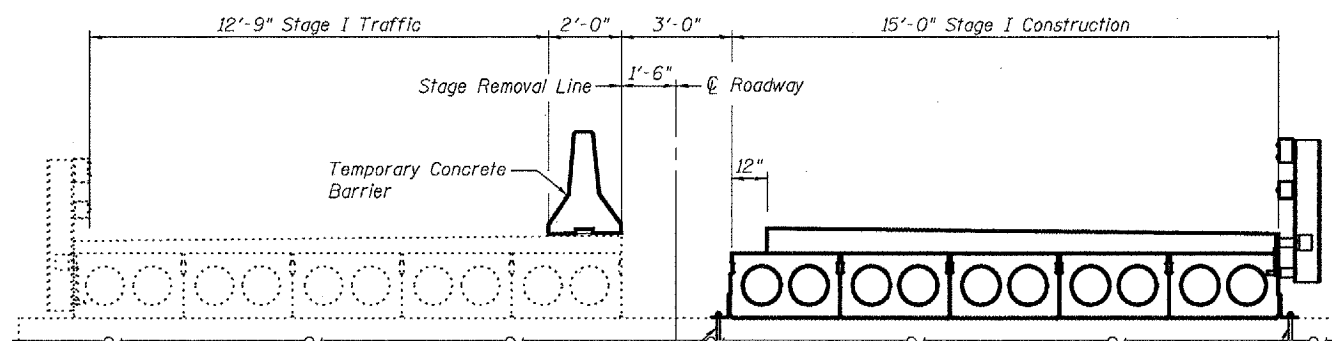


**STAGE I REMOVAL**

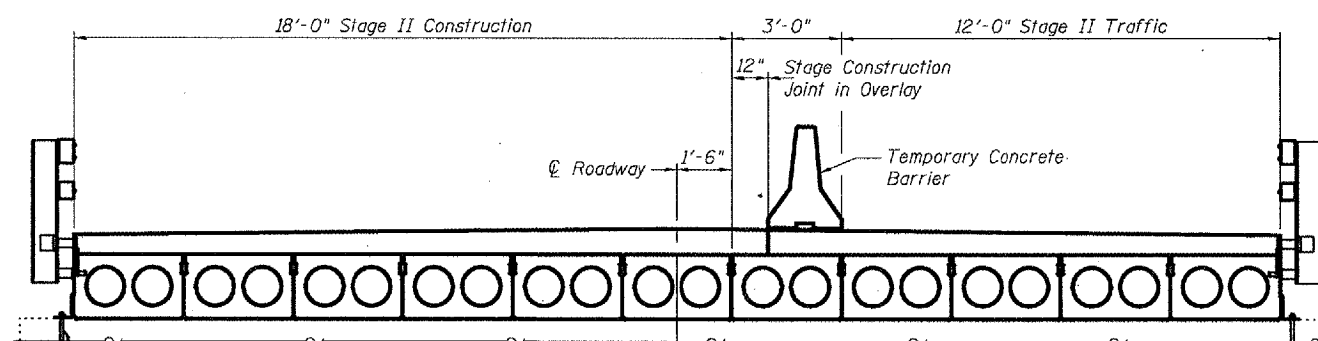


**STAGE II REMOVAL**

Notes:  
All cross-sections are looking East.  
Cross Hatched area indicates Removal of Existing Superstructure.  
For Temporary Concrete Barrier Details see sheet 10 of 11.  
For Anchor Bolt details see sheet 9 of 11.



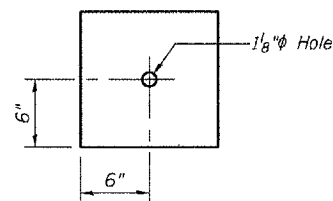
**STAGE I CONSTRUCTION**



**STAGE II CONSTRUCTION**

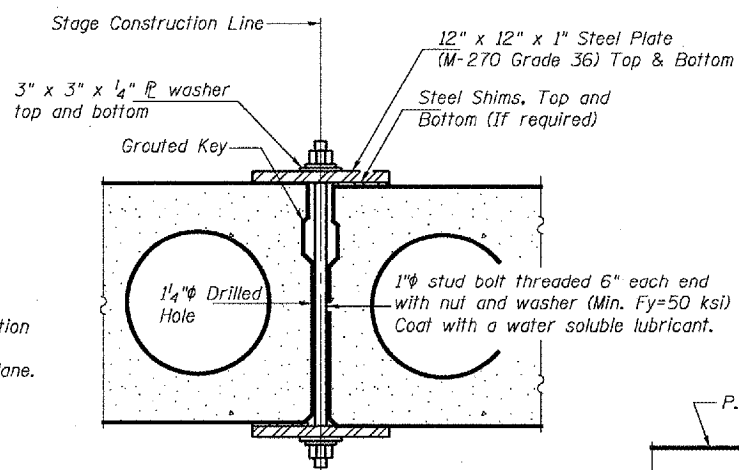
Temporary side retainer at Pier only. Remove angle and burn off anchor bolt flush with cap, grind smooth, and seal with epoxy prior to placement of Stage II PPC Deck beam.

Permanent side retainer at Pier only.

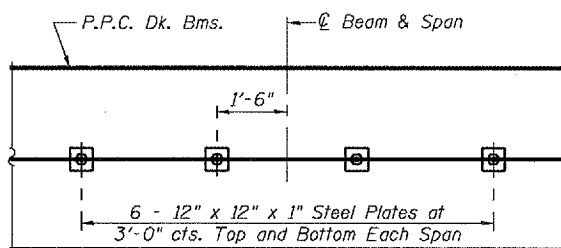


**CLAMPING PLATE**

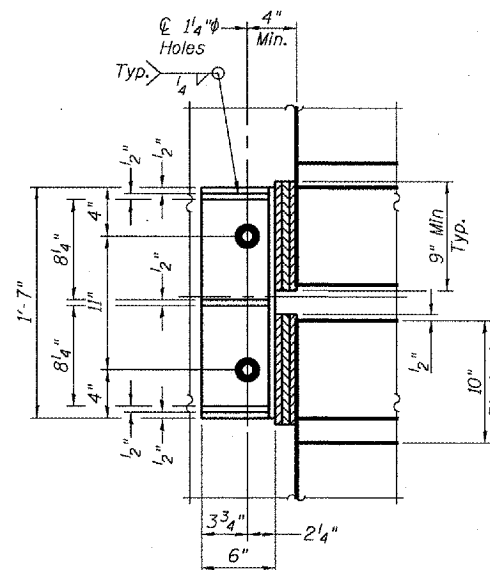
Notes:  
See Special Provisions for Stage Construction Precast Prestressed Concrete Deck Beams.  
See Stage Construction Detail for traffic lane.  
Cost is included with Precast Prestressed Concrete Deck Beams.



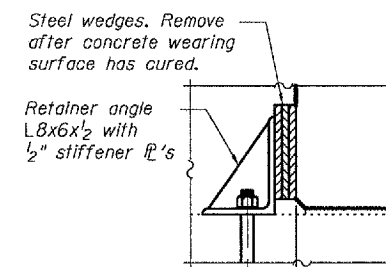
**SECTION AT STAGE CONSTRUCTION LINE**



**PLAN AT STAGE CONSTRUCTION LINE**



**RETAINER ANGLE PLAN**



\*@ 1" x 12" galv. anchor bolt with 2 1/2" x 2 1/2" x 5/16" washer under nut.

**RETAINER ANGLE ELEVATION**

\*Anchor bolts or approved threaded rod may be placed in drilled holes and grouted in place. Cost of retainer, accessories, and galvanizing are included with Precast Prestressed Concrete Deck Beams.

**STAGE CONSTRUCTION DETAILS**  
**IL 122 / SUGAR CREEK**  
**TAZEWELL COUNTY**  
**SN 090-0058**

DESIGNED	P.S.J.
CHECKED	S.J.B.
DRAWN	Drew Christopher
CHECKED	P.S.J. S.J.B.

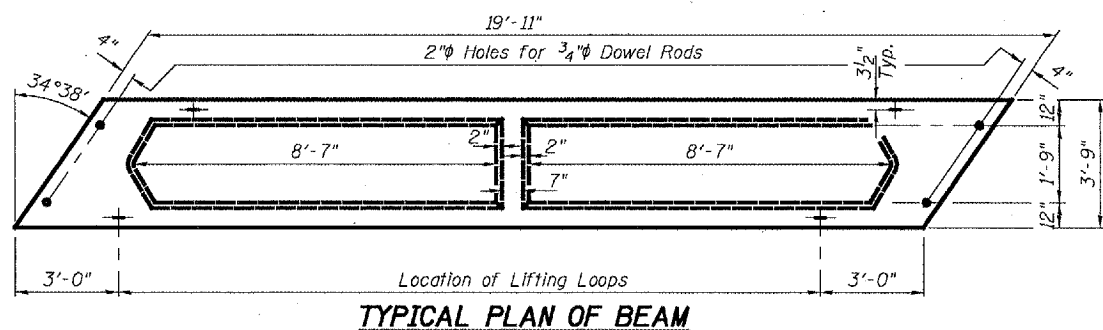
EXAMINED	John A. Morris	April 24, 2006
PASSED	Ralph E. Anderson	

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

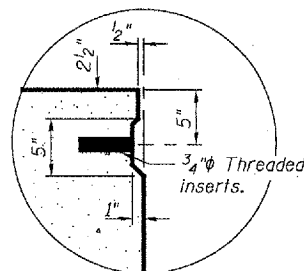
Note:  
Tack welding of stirrups to bottom longitudinal reinforcement bars will not be permitted except as otherwise authorized in writing by the Engineer.

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		Tozwell	14	3
SHEET NO. 3 11 SHEETS				

Contract Number: 68484

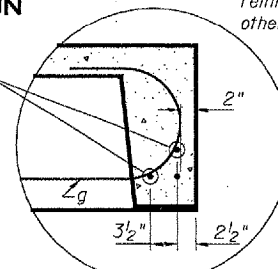


TYPICAL PLAN OF BEAM



KEY DETAIL

Weld ends of g bars to b<sub>1</sub> bars with full bead weld

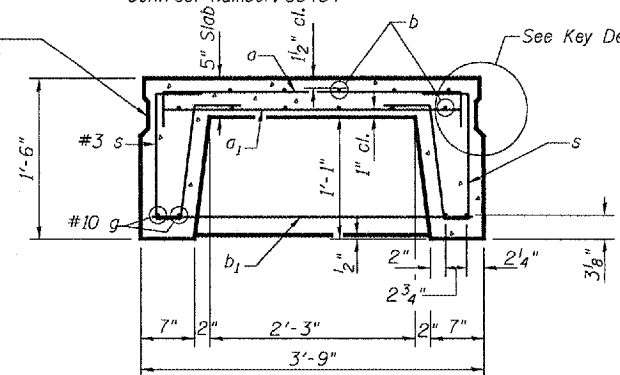
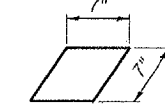


DETAIL A

BEARING PADS  
(16 Required)

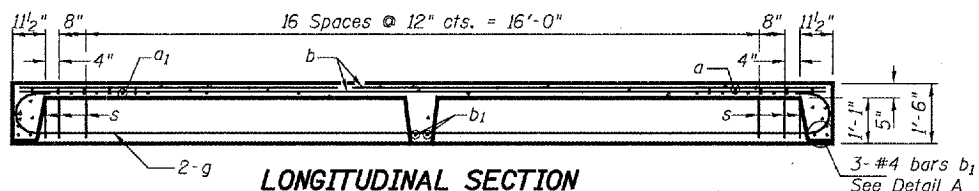
The surface of the member shall not deviate more than 1/1200 of the full length of the member from a straight line connecting the two end points on the member's surface. In addition to State inspection and prior to erection, the beam shall be approved by the resident Engineer at the jobsite. The units shall remain on the bottom supporting forms until the concrete has attained a compressive strength of not less than 3,500 pounds per square inch.

Omit key on exterior face of outside beams.

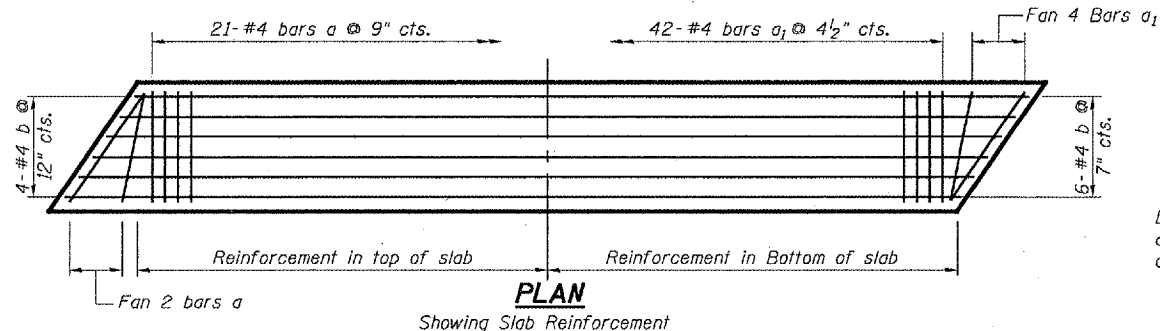


TYPICAL SECTION THRU BEAM

\*\*Joint shall be filled with non-shrink grout. Dimension may vary to accommodate tolerance in beam lengths.

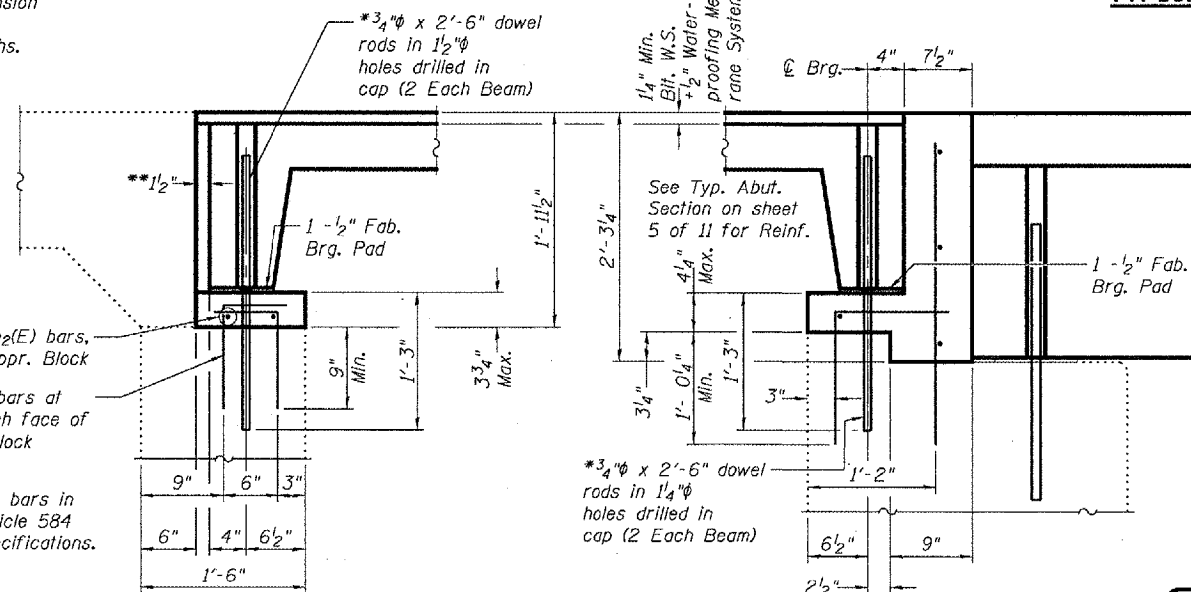


LONGITUDINAL SECTION



PLAN

Showing Slab Reinforcement



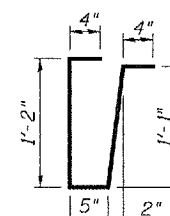
BENT

ABUTMENT

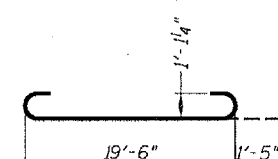
TYPICAL SECTION AT OUTSIDE FACE OF APPROACH BEAM

(Dimensions Shown are at Rt. L's to Abutment / Approach Cap)  
(See Typical Abutment Sections at @ Roadway for Information not Shown)

BAR v<sub>2</sub>(E)



BAR s

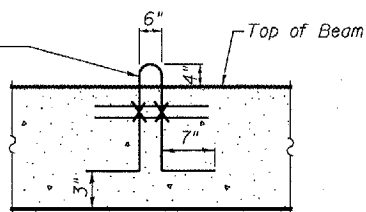


BAR g

BILL OF MATERIAL

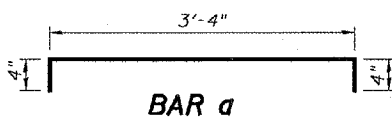
Bar	No.	Size	Length	Shape
h <sub>2</sub> (E)	8	#4	4'-9"	—
v <sub>2</sub> (E)	40	#4	1'-6"	L
Precast Concrete Bridge Slab			Sq. Ft.	299
Reinforcement Bars, Epoxy Coated			Pound	70
Removal of Existing Precast Unit			Sq. Ft.	299
Concrete Structures			Cu. Yd.	0.3

2-1/2" Strands/Loop, 2 Ea. End, Ea. Beam. Loop shall be burned off after beams have been erected. Strands shall conform to the requirements to the requirements of AASHTO M 203.

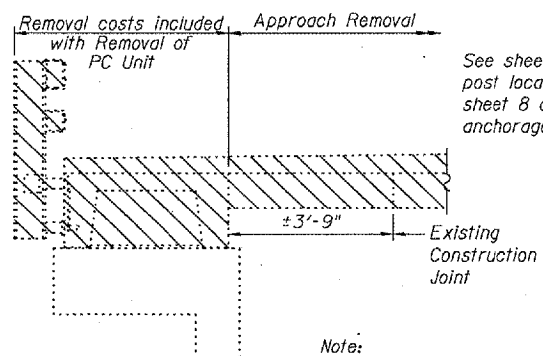


LIFTING LOOP

Approved alternate may be substituted for the above.



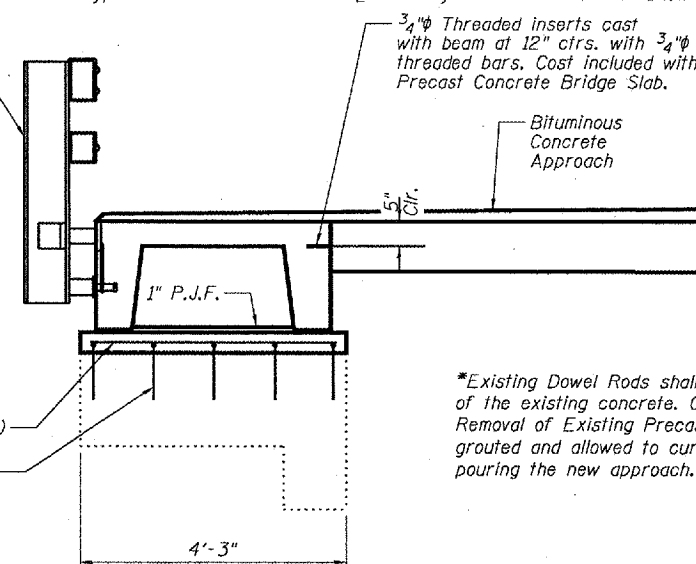
BAR a



TYPICAL APPROACH REMOVAL SECTION

Note:  
Hatched area indicates area of approach removal.

See sheet 7 of 11 for post locations and sheet 8 of 11 for anchorage details.



TYPICAL APPROACH SECTION NEAR BENT

\*Existing Dowel Rods shall be burned off flush with the top of the existing concrete. Cost to be included in the cost of Removal of Existing Precast Unit. New Dowel Rods shall be grouted and allowed to cure a minimum of 24 hours prior to pouring the new approach.

APPROACH DETAILS  
IL 122 / SUGAR CREEK  
TAZEWELL COUNTY  
SN 090-0058

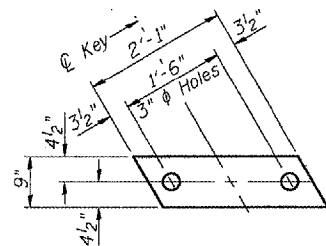
DESIGNED	P.S.J.
CHECKED	S.J.B.
DRAWN	Drew Christopher
CHECKED	P.S.J. S.J.B.

APPROVED	April 24, 2006
EXAMINED	John A. Morris ENGINEER OF STRUCTURAL SERVICES
PASSED	Ralph E. Anderson ENGINEER OF BRIDGES AND STRUCTURES

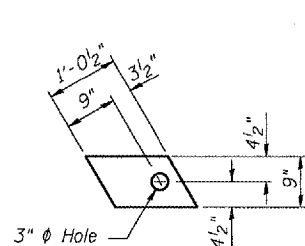


STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	DATE	SHEET NO.
		Tozowall		15
CONTRACT NO. 68484				11 SHEETS

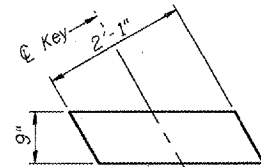


FABRIC BEARING PAD  
(Interior)

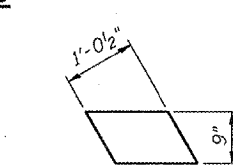


FABRIC BEARING PAD  
(Exterior)

FIXED

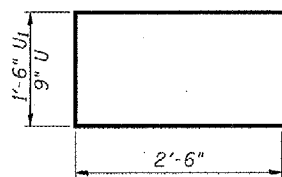


FABRIC BEARING PAD  
(Interior)



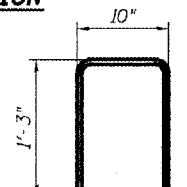
FABRIC BEARING PAD  
(Exterior)

EXPANSION

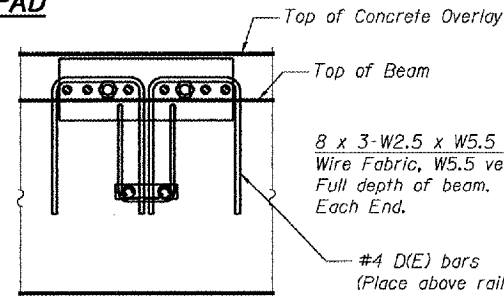


BAR U AND U<sub>1</sub>

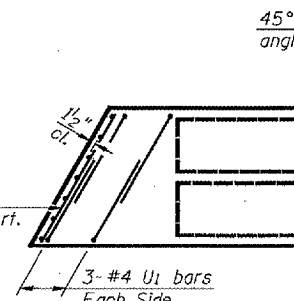
1'-6" Lifting loops  
2 each end



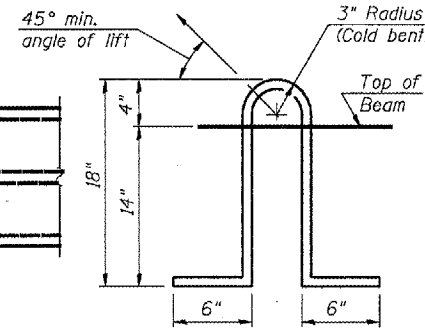
BAR D (E)



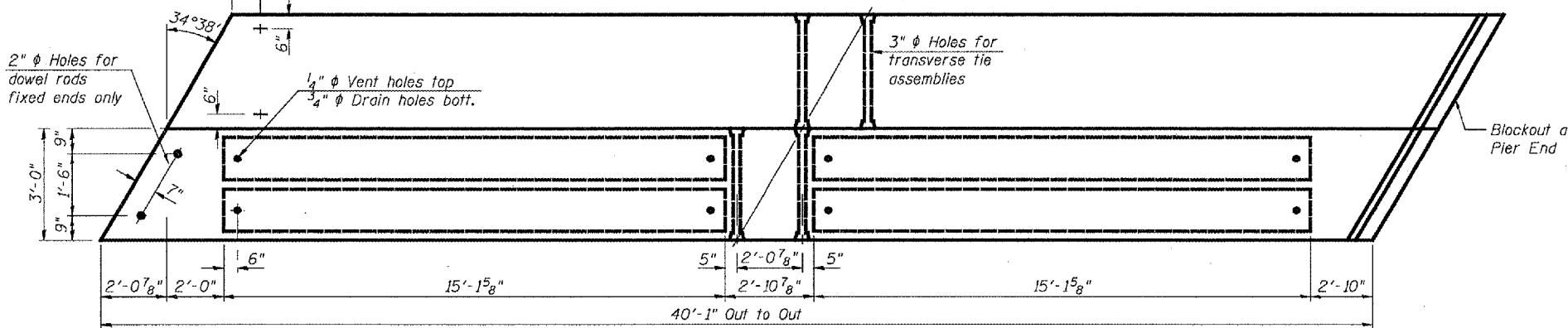
SECTION A-A



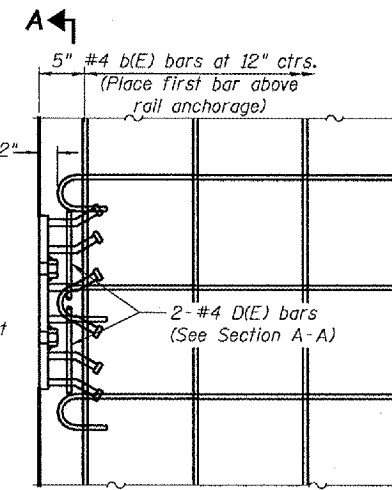
FIXED END PLAN



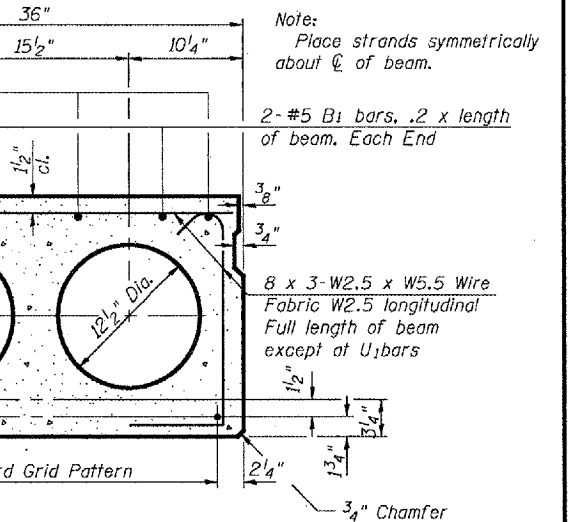
LIFTING LOOP DETAIL



PLAN

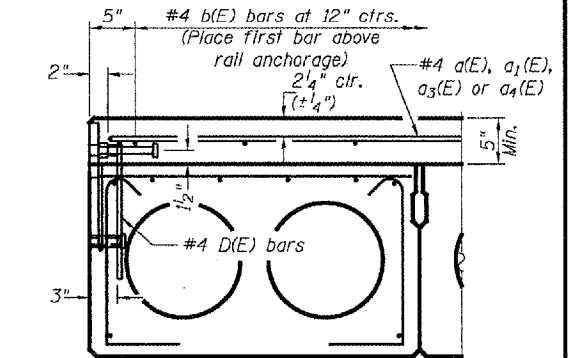


PARTIAL DECK PLAN AT  
RAIL ANCHORAGE



TYPICAL SECTION

1/2"  $\phi$  Strands, Each Strand Stressed to 30,900 Lbs.  
6-Strands 1 3/4" up, 4-Strands 3/4" up



FASCIA BEAM

Rail anchorage shall be cast in precast beams. See typical section for dimensions, strand pattern, and bar callouts not shown. Formwork necessary for the wearing surface may be secured utilizing the bottom rail inserts and/or additional inserts cast into the beam. Drilling into the beam will not be permitted.

NOTES

Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter shall be 1/2" and the nominal cross-sectional area shall be 0.153 sq. in. Lifting loops shall be 2-1/2"  $\phi$  270 ksi strands, as shown. 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. The bearing seat surfaces shall be adjusted by shimming to assure firm and even bearing. Two 1/8" fabric adjusting shims of the dimensions of the Exterior Bearing Pad shall be provided for each bearing. Keyway surfaces shall be cleaned to remove form oil or other bond breaking material prior to shipment of the beams. Cleaning shall be done by sandblasting the keyway areas between top of the beam and the bottom edge of the key. Corrosion Inhibitor, as covered in the Special Provisions, shall be used in the concrete for precast prestressed concrete deck beams. Required Release Strength, f'ci, shall be 4000 p.s.i. See sheet 7 of 11 for Rail Anchorage Locations.

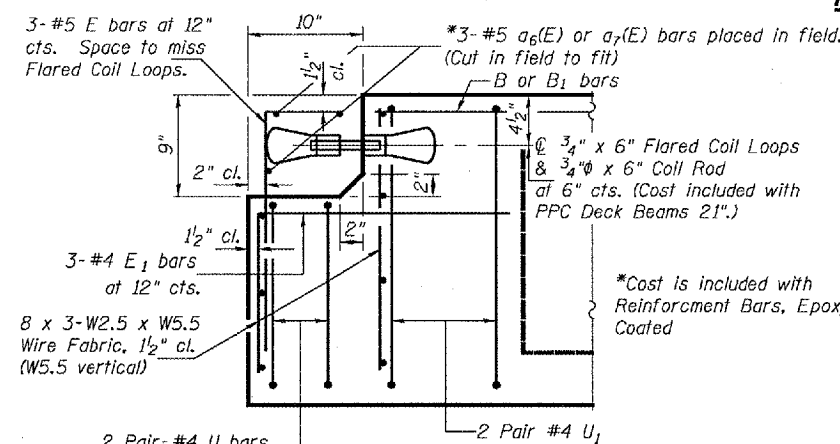
BILL OF MATERIAL

Precast Prestressed Conc. Deck Bms. (21" Depth)	Sq. Ft.	2,646
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DECK BEAM DETAILS  
IL 122 / SUGAR CREEK  
TAZEWELL COUNTY  
SN 090-0058

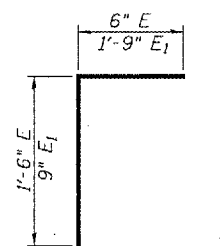
DESIGNED	P.S.J.
CHECKED	S.J.B.
DRAWN	Drew Christopher
CHECKED	P.S.J. S.J.B.

April 24, 2006  
EXAMINED John A. Morris  
ENGINEER OF STRUCTURAL SERVICES  
PASSED Ralph E. Anderson  
ENGINEER OF BRIDGES AND STRUCTURES



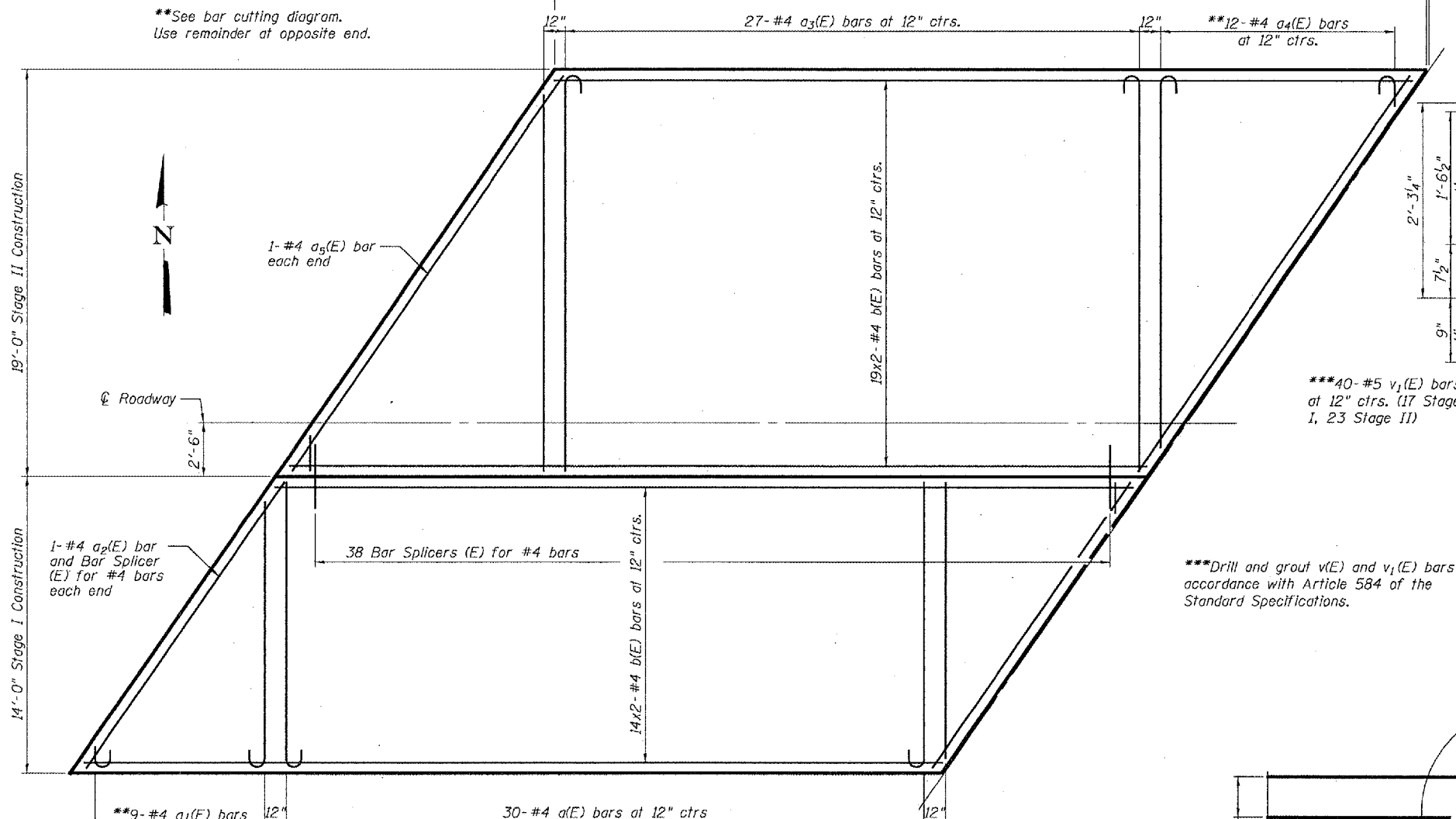
EXPANSION END OF BEAM

BAR E AND E<sub>1</sub>



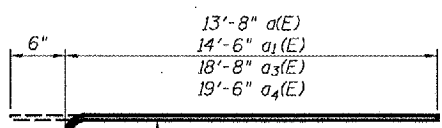
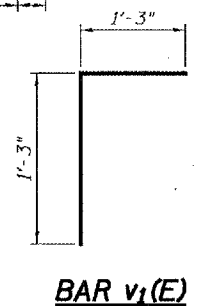
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		Tazewell	16	5
SHEET NO. 5 11 SHEETS				
Contract Number: 68484				



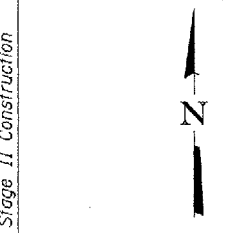
**PARTIAL OVERLAY PLAN**  
(Span 1 Shown, Span 2 Similar)

Note:  
Concrete wearing surface to be poured after grouting keys.



**BARS a(E), a1(E), a3(E) and a4(E)**

19'-0" Stage II Construction  
14'-0" Stage I Construction



☉ Roadway

1- #4 a2(E) bar and Bar Splicer (E) for #4 bars each end

1- #4 a5(E) bar each end

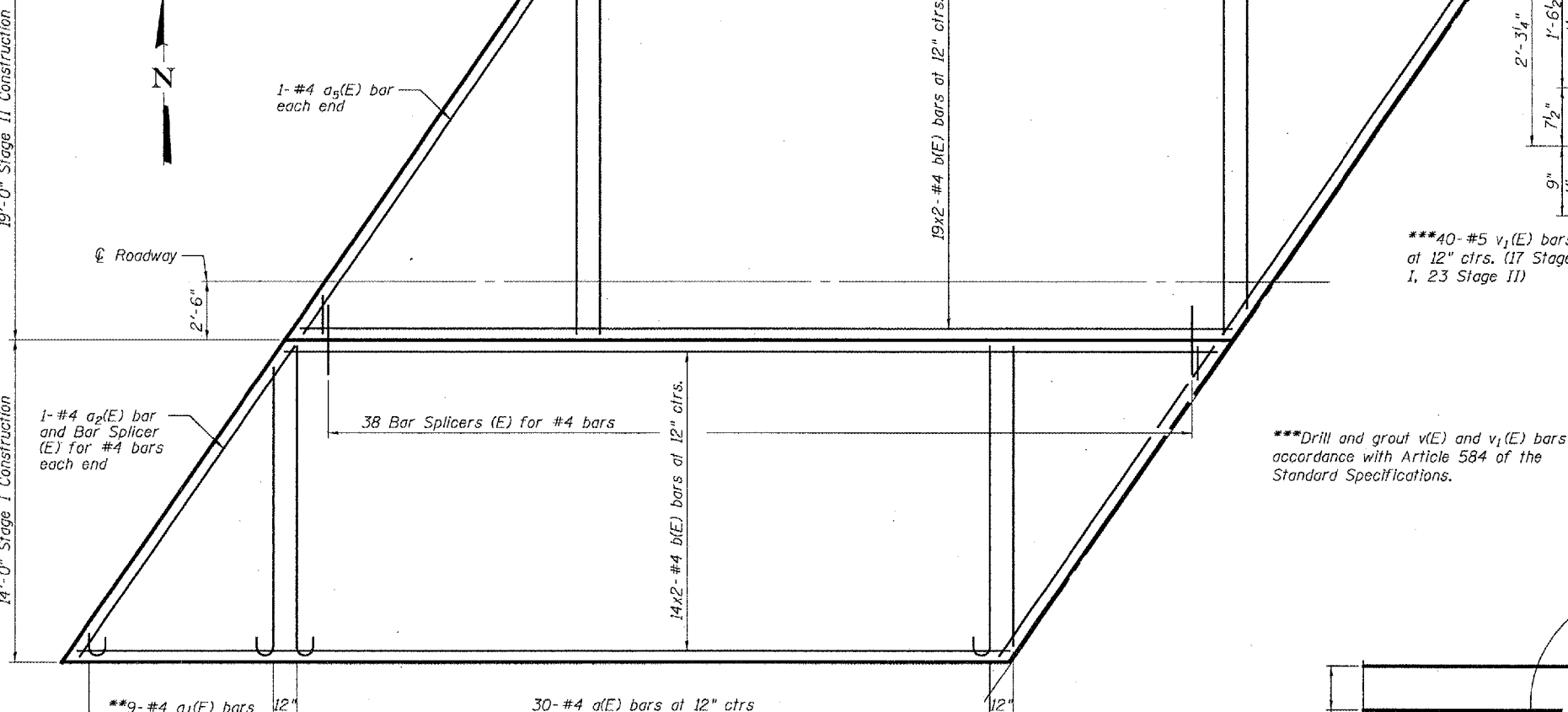
38 Bar Splicers (E) for #4 bars

19x2- #4 b(E) bars at 12" ctrs.

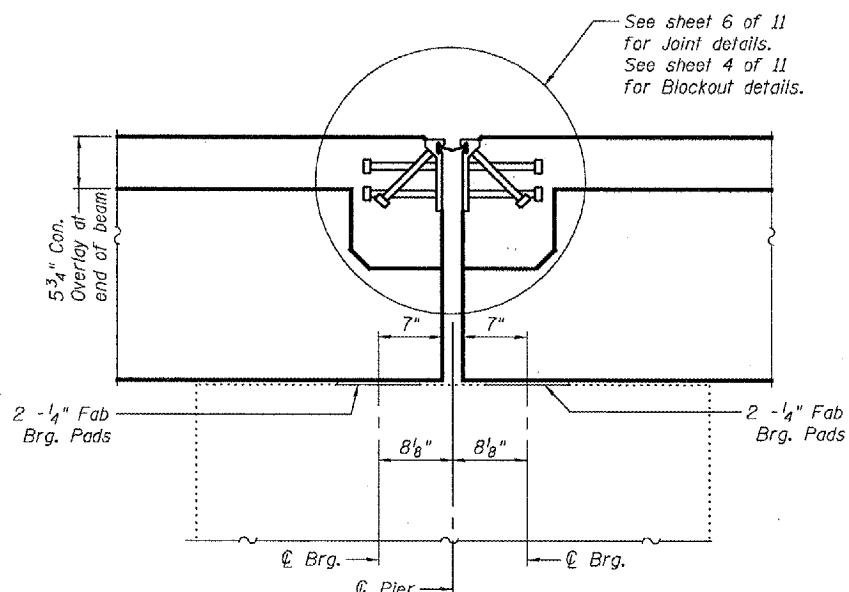
14x2- #4 b(E) bars at 12" ctrs.

27- #4 a3(E) bars at 12" ctrs.  
12" 40'-1" 12" \*\*12- #4 a4(E) bars at 12" ctrs.

\*\*9- #4 a1(E) bars at 12" ctrs. 30- #4 a(E) bars at 12" ctrs.



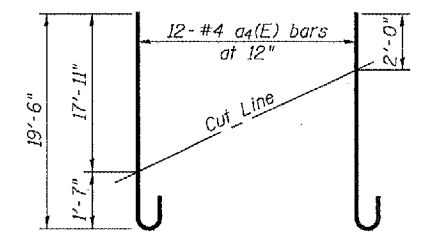
**TYPICAL ABUTMENT SECTION**  
(Dimensions at Rt. L's to End of Beam)  
(Near ☉ Roadway)



**TYPICAL PIER SECTION**  
(Dimensions at Rt. L's to End of Beam)  
(Near ☉ Roadway)

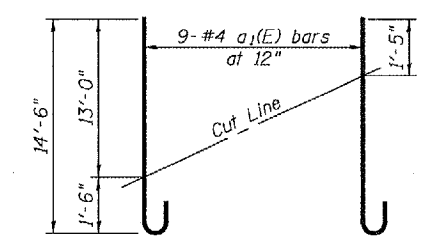
**MIN. BAR LAP**  
#4 = 1'-8"

\*Existing Dowel Rods shall be burned off flush with the top of the existing concrete, ground smooth, and sealed with epoxy. Cast to be included in the cost of Removal of Existing Superstructure. New Dowel Rods shall be grouted and allowed to cure a minimum of 24 hours prior to grouting the shear keys.



**a4(E) FIELD CUTTING DIAGRAM**

Order a4(E) full length. Cut as shown and use remainder of bars in opposite end.



**a1(E) FIELD CUTTING DIAGRAM**

Order a1(E) full length. Cut as shown and use remainder of bars in opposite end.

**BILL OF MATERIAL**

Bar	No.	Size	Length	Shape
a(E)	60	#4	14'-2"	┌
a1(E)	18	#4	15'-0"	┌
a2(E)	4	#4	16'-6"	┌
a3(E)	54	#4	19'-2"	┌
a4(E)	24	#4	20'-0"	┌
a5(E)	4	#4	22'-9"	┌
a6(E)	6	#5	16'-6"	┌
a7(E)	6	#5	22'-9"	┌
b(E)	132	#4	20'-9"	┌
h(E)	8	#5	16'-6"	┌
h1(E)	8	#5	22'-9"	┌
v(E)	144	#5	2'-9"	┌
v1(E)	80	#5	2'-6"	┌
Reinforcement Bars, Epoxy Coated		Pound	4,890	
Bar Splicers		Each	94	
Concrete Wearing Surface, 5"		Sq. Yd.	294	
Concrete Structures		Cu. Yd.	5.7	

Reinforcement bars designated (E) shall be epoxy coated.  
Bars indicated thus 1 x 2- #5 etc. indicates 1 line of bars with 2 lengths per line.

**OVERLAY DETAILS AND TYPICAL SECTIONS**  
**IL 122 / SUGAR CREEK**  
**TAZEWELL COUNTY**  
**SN 090-0058**

DESIGNED	P.S.J.
CHECKED	S.J.B.
DRAWN	Drew Christopher
CHECKED	P.S.J. S.J.B.

EXAMINED	John A. Morris	April 24, 2006
PASSED	Ralph E. Anderson	



STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		Tazewell		17
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		

SHEET NO. 6  
11 SHEETS

Contract Number: 68484

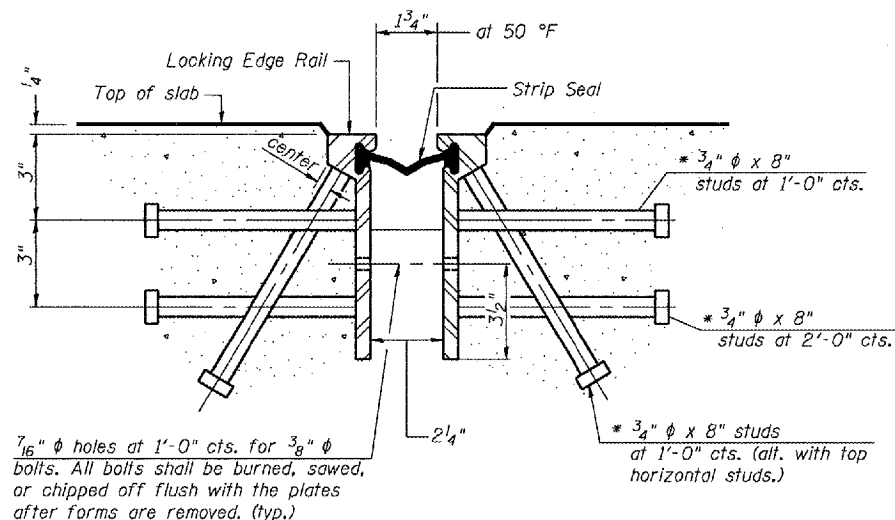
**GENERAL NOTES**

The strip seal shall be made continuous and shall have a minimum thickness of 1/4". The configuration of the strip seal shall match the configuration of the Locking Edge Rails.

The height and thickness of the Locking Edge Rails shown are minimum dimensions. The actual configuration of the Locking Edge Rails and matching strip seal may vary from manufacturer to manufacturer. Flanged edge rails will not be allowed.

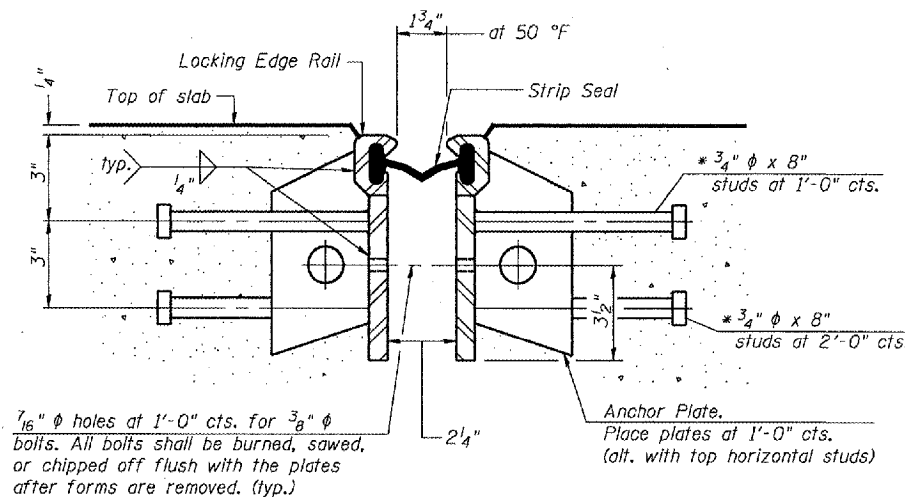
Locking Edge Rails may be spliced at slope discontinuities and stage construction joints.

The manufacturer's recommended installation methods shall be followed.



**SECTION THRU ROLLED RAIL EXP. JOINT**

(198 Studs Required)

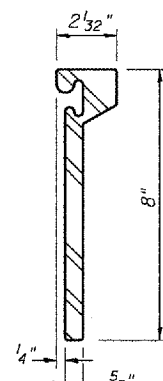


**SECTION THRU WELDED RAIL EXP. JOINT**

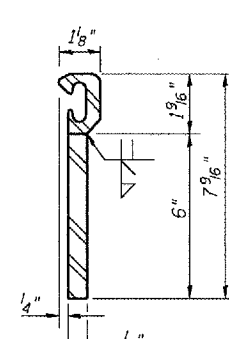
(118 Studs Required)  
(80 Anchor Plates Required)

\* Granular or solid flux filled headed studs conforming to Article 1006.32 of the Std. Specs., automatically end welded.

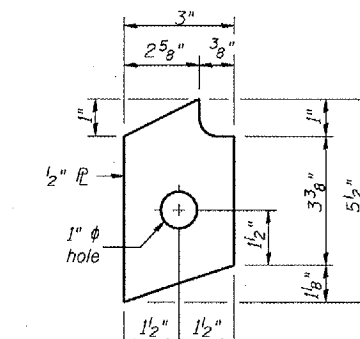
Strip Seal Expansion Joint	
Design Movement	Required Strip Seal Rated movement
1 5/8"	2"



**ROLLED (EXTRUDED) RAIL**

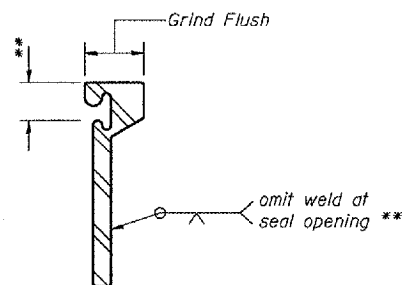


**WELDED RAIL**



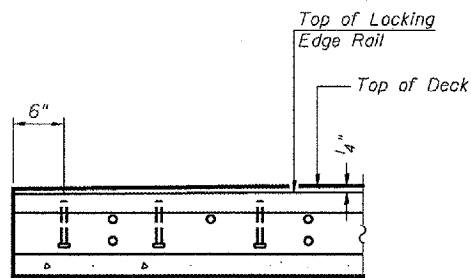
**ANCHOR PL**  
(for welded rail)

**LOCKING EDGE RAILS**



**LOCKING EDGE RAIL SPLICE**

The inside of the locking edge rail groove shall be free of weld residue.



**TYPICAL END TREATMENT**

**BILL OF MATERIAL**

Item	Unit	Total
Preformed Joint Strip Seal	Foot	40

DESIGNED	P.S.J.
CHECKED	S.J.B.
DRAWN	Drew Christopher
CHECKED	P.S.J. S.J.B.

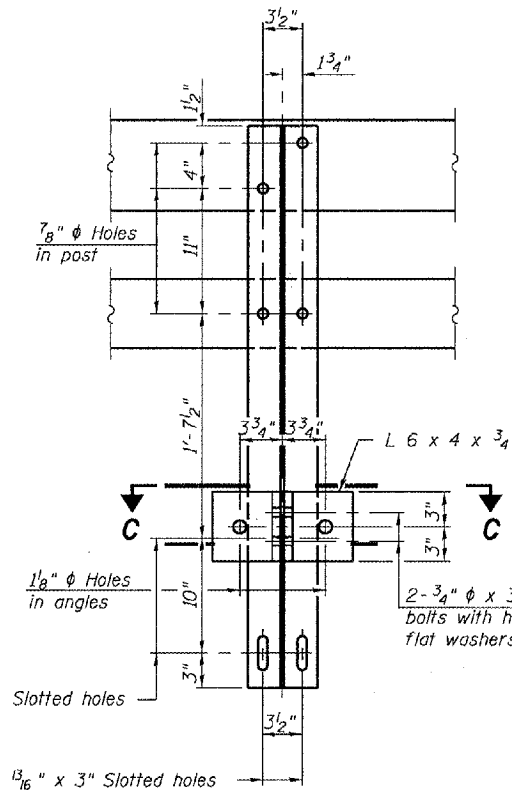
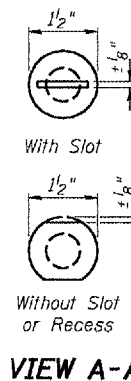
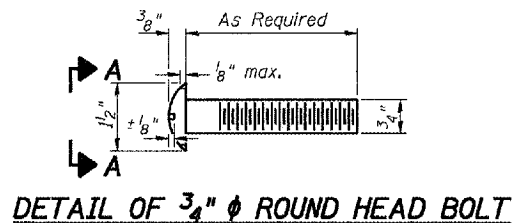
APPROVED	April 24, 2006
EXAMINED	John A. Morris ENGINEER OF STRUCTURAL SERVICES
PASSED	Ralph E. Anderson ENGINEER OF BRIDGES AND STRUCTURES

**STRIP SEAL JOINT DETAILS**  
**IL 122 / SUGAR CREEK**  
**TAZEWELL COUNTY**  
**SN 090-0058**

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

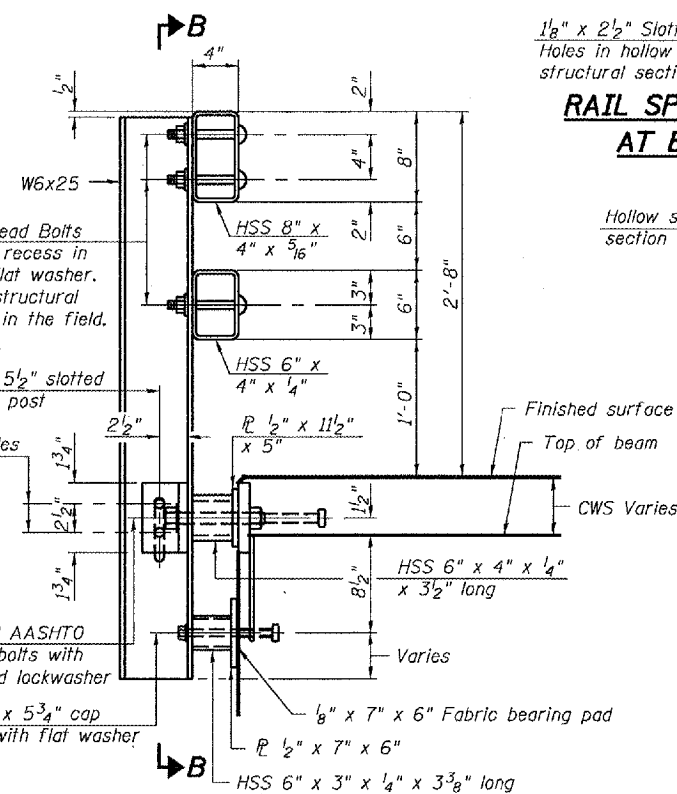
ROUTE NO.	SECTION	COUNTY	STATE SHEETS	SHEET NO.
		Tazewell	18	11
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		

Contract Number: 68484



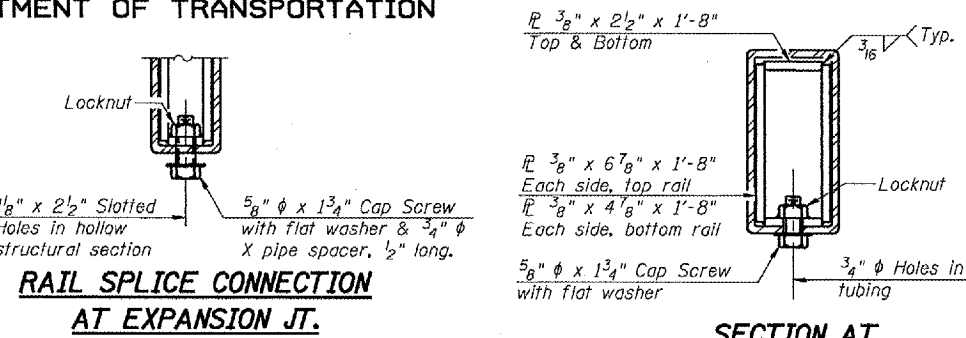
4- 3/4"  $\phi$  x 6" Round Head Bolts  
(With slot or approved recess in head) with locknut & flat washer.  
7/8"  $\phi$  holes in hollow structural section may be drilled in the field.

VIEW A-A

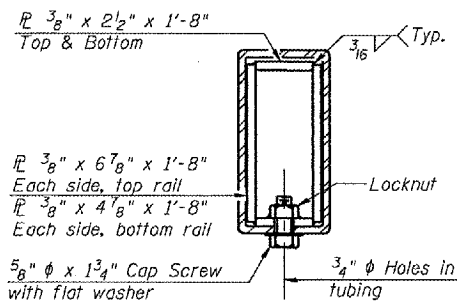


2- 1"  $\phi$  x 7 3/4" AASHTO M-164 anchor bolts with flat washer and lockwasher  
2- 5/8"  $\phi$  x 5 3/4" cap screws with flat washer

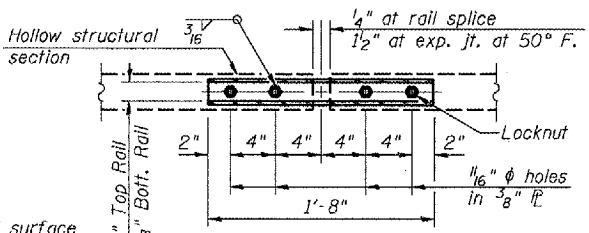
SECTION AT RAIL POST



RAIL SPLICE CONNECTION  
AT EXPANSION JT.

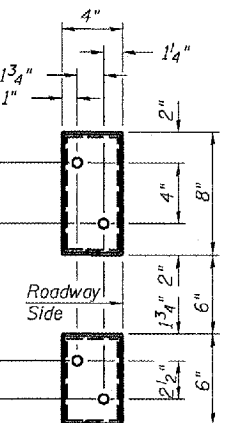


SECTION AT  
RAIL SPLICE

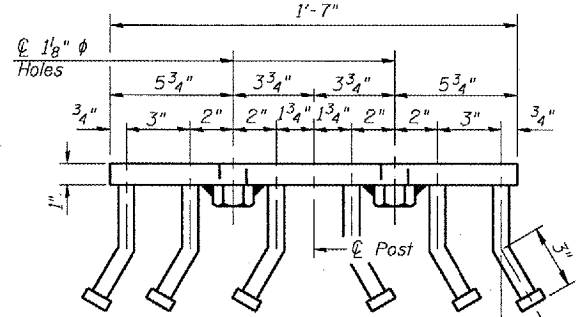


PLAN-BOTT. SPLICE TYPICAL

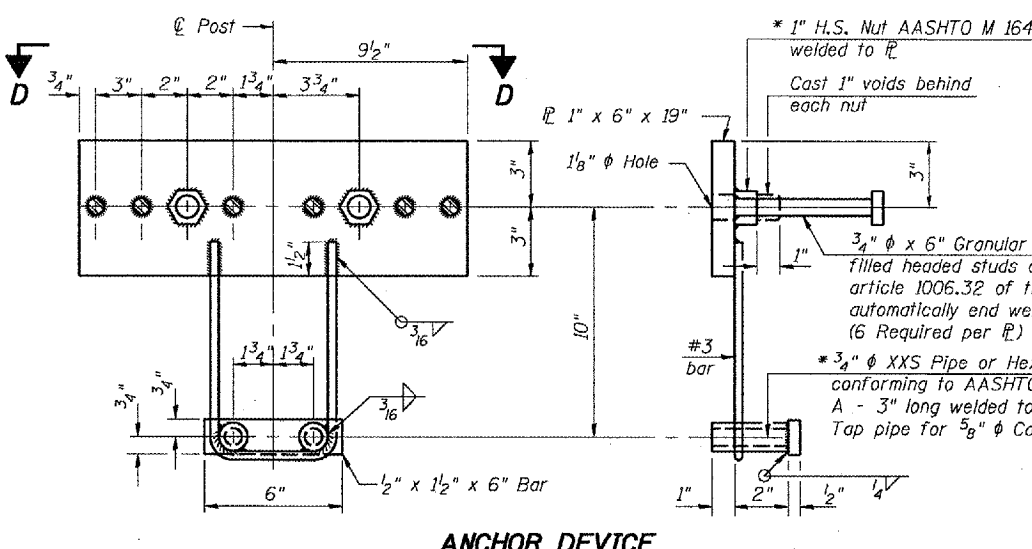
5/8" reduced base welded studs. Provide 4 - 5/8" washers and self-locking nuts or nuts and jam nuts for guardrail connection shown on Std. 631032



VIEW E-E



VIEW D-D



ANCHOR DEVICE

\* Threaded areas shall be plugged or blocked off during casting of beam. Galvanized after fabrication.

**NOTES**

Hollow structural sections shall conform to the requirements of ASTM designation A 500 Grade B Structural Steel Tubing and shall meet the longitudinal CVN requirements of 15 ft-lbs at 0° F.

All other steel shapes and plates shall conform to the requirements of AASHTO M 270 Grade 36 except posts and angles shall conform to AASHTO M 270, Grade 50.

Bolts, cap screws, and nuts shall conform to the requirements of ASTM designation A 307 except for high strength bolts, nuts and washers noted which shall conform to AASHTO M 164.

All bolts, nuts, cap screws, washers and lock washers shall be galvanized according to AASHTO M 232.

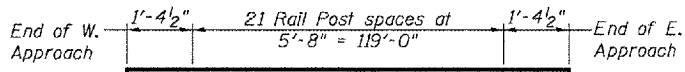
All posts, railing, rail splices, anchor devices and angles shall be galvanized after shop fabrication according to AASHTO M 111 and ASTM A 385. Galvanized rail shall not be painted.

Railing shall be according to Section 509 of the Standard Specifications, except as noted, and will be paid for at the contract unit price per foot for Steel Bridge Rail, Type SM.

All field drilled holes shall be coated with an approved zinc rich paint before erection.

For multi-span bridges, sufficient 1/4" x 6" x 1'-2" galvanized steel shims shall be provided to align rail between adjacent spans. Cost included with Steel Bridge Rail, Type SM.

The 3/4" high strength bolts used to connect the 6 x 4 x 3/4 angles to the post shall be tightened according to Article 505.04(f)(2) of the Standard Specifications. The 1" high strength bolts connecting the angles to the concrete shall be tightened to a snug fit and given an additional 1/8 turn. The 5/8"  $\phi$  cap screws in bottom of posts shall be tightened to a snug fit only.



RAIL POST SPACING

**BILL OF MATERIAL**

Item	Unit	Quantity
Steel Bridge Rail, Type SM	Foot	244

**BRIDGE RAILING DETAILS**  
**IL 122 / SUGAR CREEK**  
**TAZEWELL COUNTY**  
**SN 090-0058**

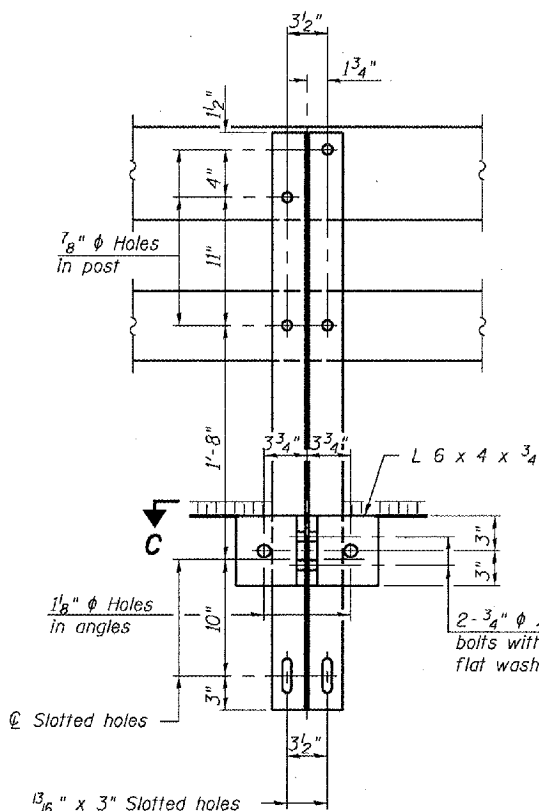
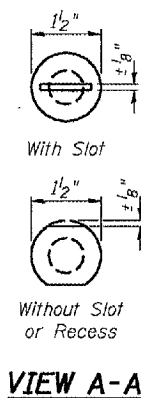
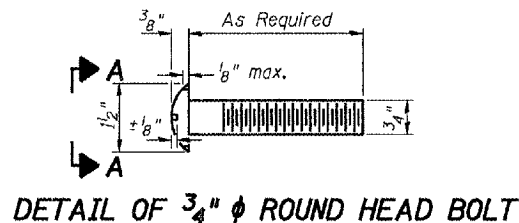
DESIGNED	P.S.J.
CHECKED	S.J.B.
DRAWN	Drew Christopher
CHECKED	P.S.J. S.J.B.

April 24, 2006  
EXAMINED John A. Morris  
PASSED Ralph E. Anderson

R-34CWS 10-28-05 (6'-3" Maximum Post Spacing) (5" minimum to 7 7/8" maximum CWS thickness)

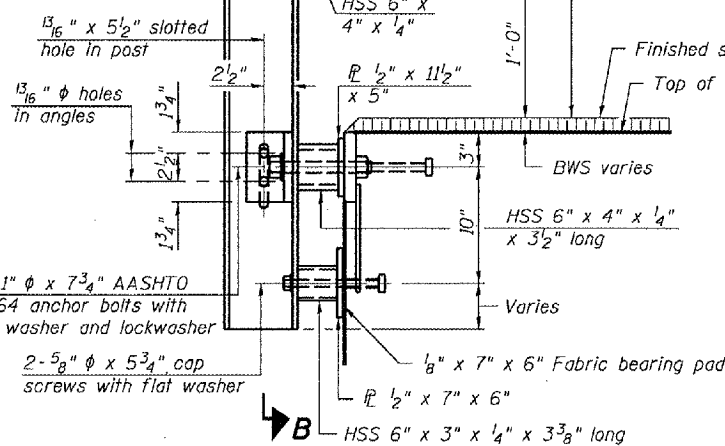
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		Tazewell	19	11 SHEETS
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT				
Contract Number: 68484				

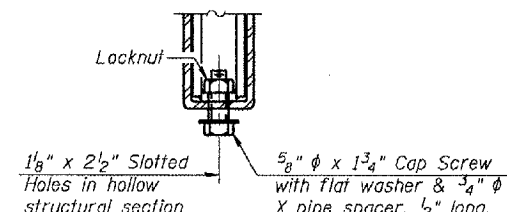


SECTION B-B

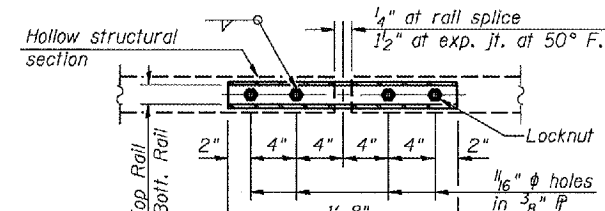
4- $\frac{3}{4}$ "  $\phi$  x 6" Round Head Bolts (With slot or approved recess in head) with locknut & flat washer.  $\frac{7}{8}$ "  $\phi$  holes in hollow structural section may be drilled in the field.



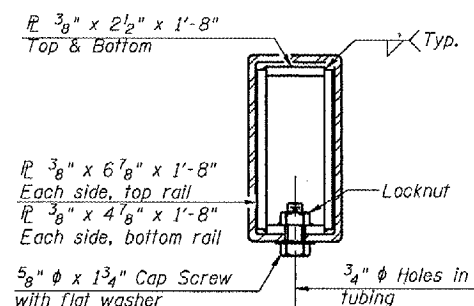
SECTION AT RAIL POST



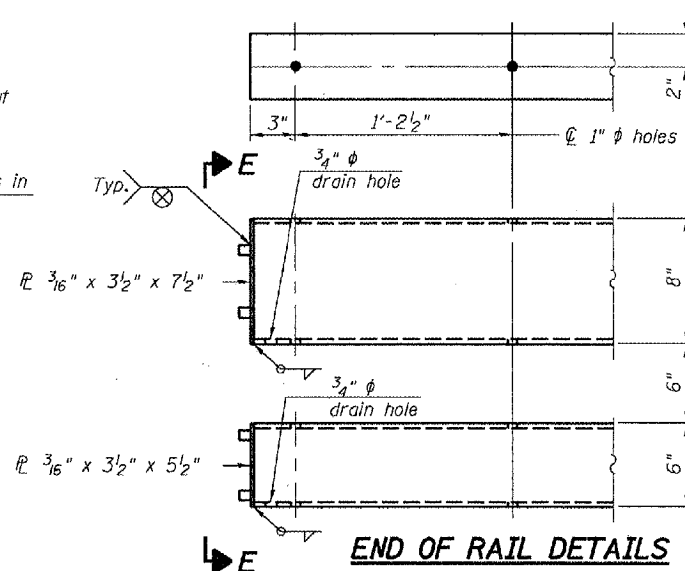
RAIL SPLICE CONNECTION AT EXPANSION JT.



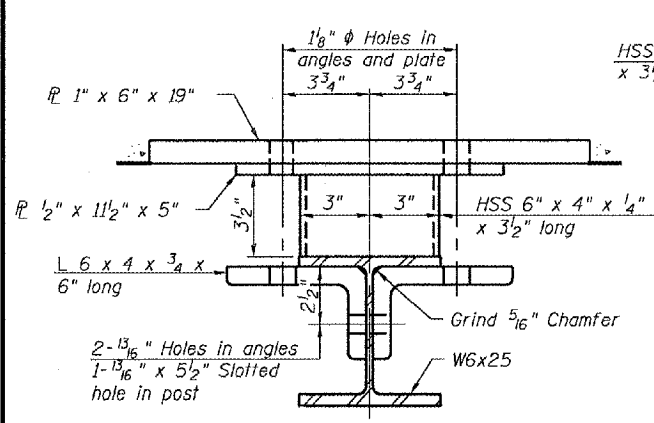
PLAN-BOTT. SPLICE R TYPICAL



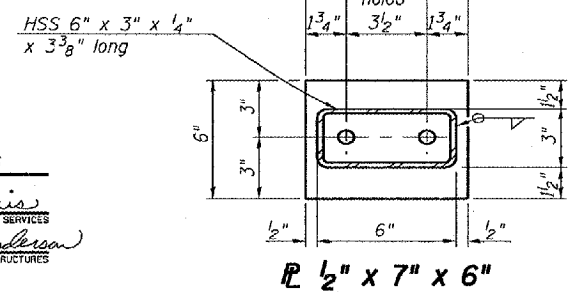
SECTION AT RAIL SPLICE



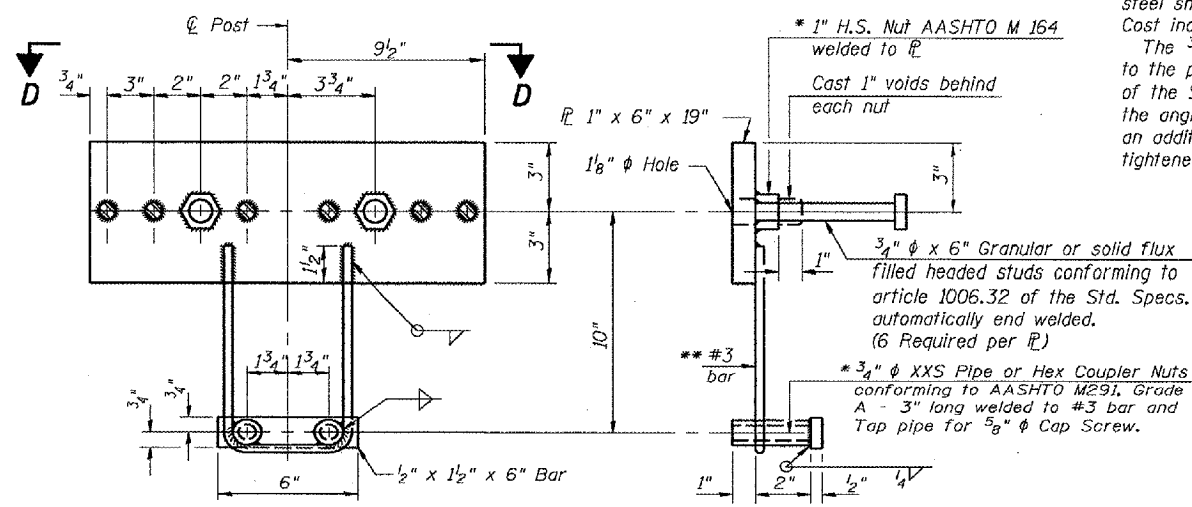
END OF RAIL DETAILS



SECTION C-C



ANCHOR DEVICE



VIEW D-D

\* Threaded areas shall be plugged or blocked off during casting of beam. Galvanized after fabrication.

\*\* Whenever the lower insert assemblies interfere with strand locations, the #3 bars shall be cut and adjusted in order to allow raising or lowering of the lower inserts. Maximum adjustment not to exceed  $\frac{1}{2}$ ".

NOTES

Hollow structural sections shall conform to the requirements of ASTM designation A 500 Grade B Structural Steel Tubing and shall meet the longitudinal CVN requirements of 15 ft-lbs at 0° F. All other steel shapes and plates shall conform to the requirements of AASHTO M 270 Grade 36 except posts and angles shall conform to AASHTO M 270, Grade 50. Bolts, cap screws, and nuts shall conform to the requirements of ASTM designation A 307 except for high strength bolts, nuts and washers noted which shall conform to AASHTO M 164. All bolts, nuts, cap screws, washers and lock washers shall be galvanized according to AASHTO M 232. All posts, railing, rail splices, anchor devices and angles shall be galvanized after shop fabrication according to AASHTO M 111 and ASTM A 385. Galvanized rail shall not be painted. Railing shall be according to Section 509 of the Standard Specifications, except as noted, and will be paid for at the contract unit price per foot for Steel Bridge Rail, Type SM. All field drilled holes shall be coated with an approved zinc rich paint before erection. For multi-span bridges, sufficient  $\frac{1}{4}$ " x 6" x 1'-2" galvanized steel shims shall be provided to align rail between adjacent spans. Cost included with Steel Bridge Rail, Type SM. The  $\frac{3}{4}$ "  $\phi$  high strength bolts used to connect the 6 x 4 x  $\frac{3}{4}$  angles to the post shall be tightened according to Article 505.04(f)(2) of the Standard Specifications. The 1"  $\phi$  high strength bolts connecting the angles to the concrete shall be tightened to a snug fit and given an additional  $\frac{1}{8}$  turn. The  $\frac{5}{8}$ "  $\phi$  cap screws in bottom of posts shall be tightened to a snug fit only.

APPROACH RAILING DETAILS  
IL 122 / SUGAR CREEK  
TAZEWELL COUNTY  
SN 090-0058

DESIGNED	P.S.J.
CHECKED	S.J.B.
DRAWN	Drew Christopher
CHECKED	P.S.J. S.J.B.

April 24, 2006  
EXAMINED John A. Morris  
ENGINEER OF STRUCTURAL SERVICES  
PASSED Ralph E. Anderson  
ENGINEER OF BRIDGES AND STRUCTURES

R-34BWS

10-28-05 (6'-3" Maximum Post Spacing) ( $\frac{1}{4}$ " minimum to  $\frac{3}{8}$ " maximum BWS thickness)

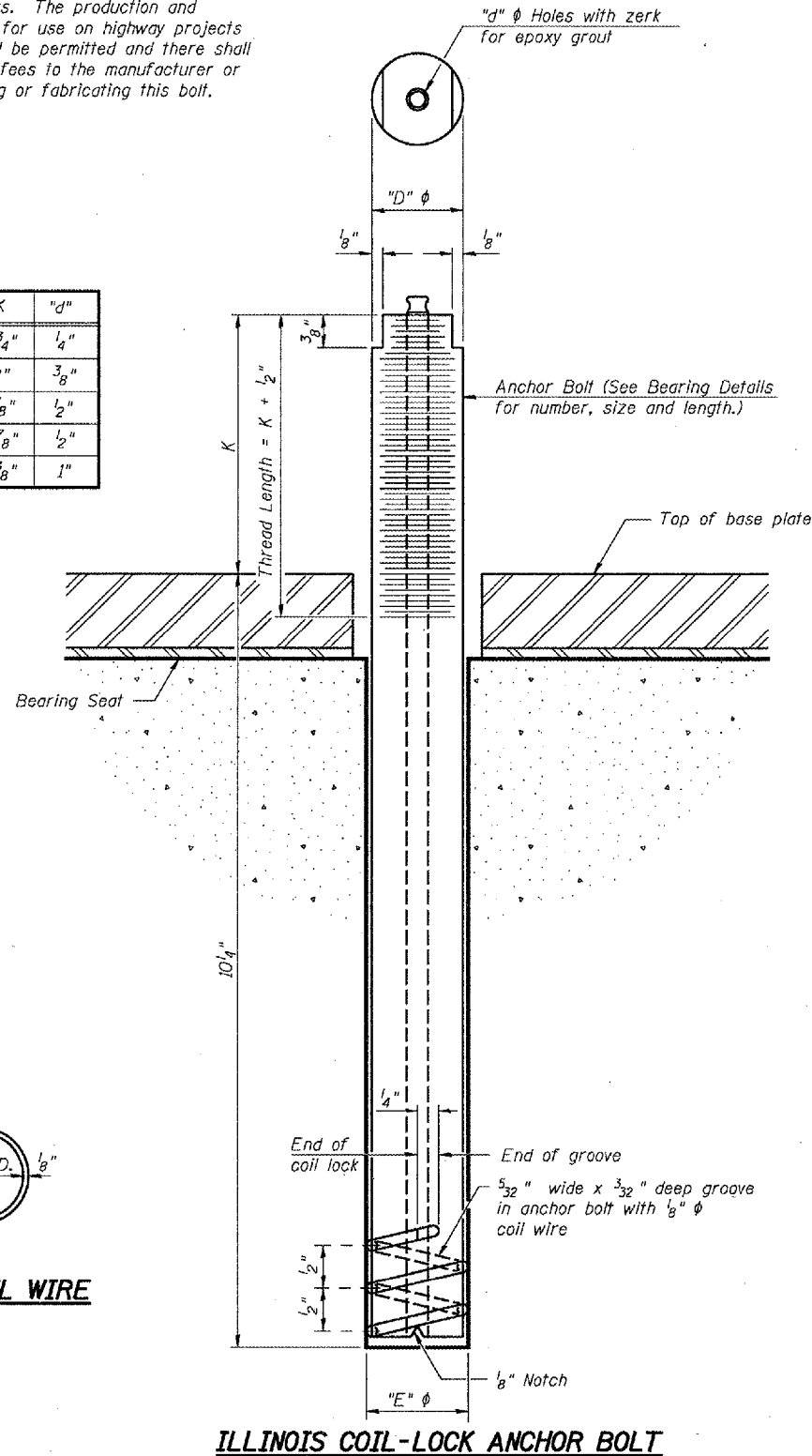
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		Tazewell	20	9
FED. ROAD DIST. NO. 7		ALIGNMENT	FED. ROAD PROJECT	11 SHEETS

Contract Number: 68484

The Illinois Coil-Lock Anchor Bolt is a proprietary item which is the property of the Illinois Department of Transportation. Use, reproduction or disclosure without express written permission is prohibited and protected under Federal copyright laws. The production and the fabrication of this bolt for use on highway projects in the State of Illinois shall be permitted and there shall be no incurred charges or fees to the manufacturer or the fabricator for producing or fabricating this bolt.

D	E	H	K	"d"
1"	1 1/8"	1 3/16"	1 3/4"	1/4"
1 1/4"	1 3/8"	1 1/16"	2"	3/8"
1 1/2"	1 5/8"	1 5/16"	2 1/8"	1/2"
2"	2 1/8"	1 3/16"	2 7/8"	1/2"
2 1/2"	2 5/8"	2 5/16"	3 3/8"	1"



**MATERIALS FOR ILLINOIS COIL-LOCK ANCHOR BOLT**

The anchor bolt shall be fabricated from cold drawn or hot finished seamless carbon steel mechanical tubing conforming to ASTM A 519, Grade 1026, CW and supplied with hexagonal nuts and cut washers.

The coil wire shall be made of any suitable soft steel wire.

The finished anchor bolt shall be cleaned of rust and other foreign materials and wrapped or packaged to prevent contamination until they are installed.

The epoxy grout shall be a two-component, epoxy resin bonding system conforming to ASTM C 881, Type I, Grade 1 and of a Class suitable for the temperature at installation.

**INSTALLATION PROCEDURE for the ILLINOIS COIL-LOCK ANCHOR BOLT**

1. With the coil wire in place, the bolt shall be inserted into the hole and turned clockwise to a snug fit in the hole. Nut and washer shall be placed on the bolt. The nut shall be tensioned until the steel base plates are held securely to the concrete bearing seat.
2. Epoxy grout shall be pumped through the zerk fitting with a pressure gun. Pumping shall continue until the epoxy overflows the hole around the bolt shank. After pumping is discontinued, excess epoxy shall be immediately wiped off.

**ALTERNATE ANCHOR BOLTS**

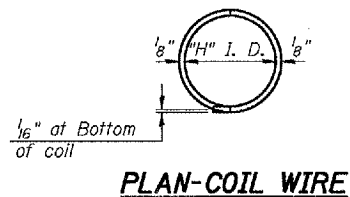
The Contractor may use, at his option, the capsule or the adhesive cartridge type anchor rods that have been previously tested and given a prior approval by the Department. The Contractor shall install these anchor rods in pre-drilled holes according to the manufacturer's recommendations and procedures.

The capsule or the adhesive cartridge type anchor rods shall be a two part system composed of:

1. A threaded rod stud with nut and washer of the type specified.
2. A sealed glass capsule or a sealed glass adhesive cartridge containing premeasured amounts of the adhesive chemical.

Location	Type
Pier	A307

ASTM F 1554 Grade 105, ASTM A 449 and AASHTO M 314 Grade 105 anchor bolts may be substituted for the anchor bolts shown above.



PLAN-COIL WIRE

DESIGNED	P.S.J.	DATE	April 24, 2006
CHECKED	S.J.B.	EXAMINED	John A. Morris ENGINEER OF STRUCTURAL SERVICES
DRAWN	Drew Christopher	PASSED	Ralph E. Anderson ENGINEER OF BRIDGES AND STRUCTURES
CHECKED	P.S.J. S.J.B.		

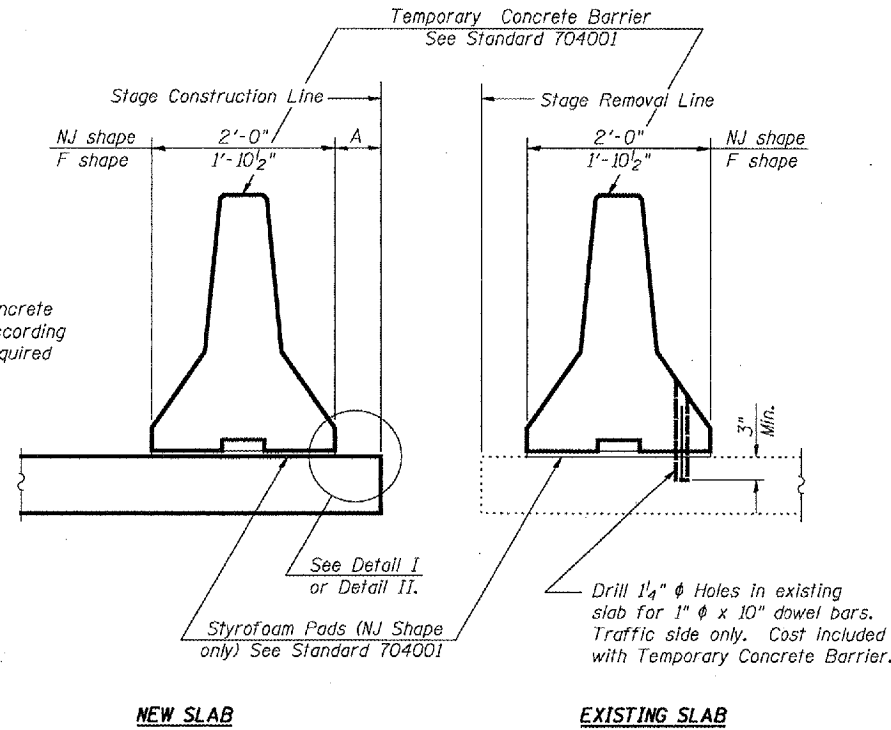
ABB-1 10-22-04

**ANCHOR BOLT DETAILS**  
**IL 122 / SUGAR CREEK**  
**TAZEWELL COUNTY**  
**SN 090-0058**

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		Tazewell		21
SHEET NO. 10 11 SHEETS				
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		
Contract Number: 68484				

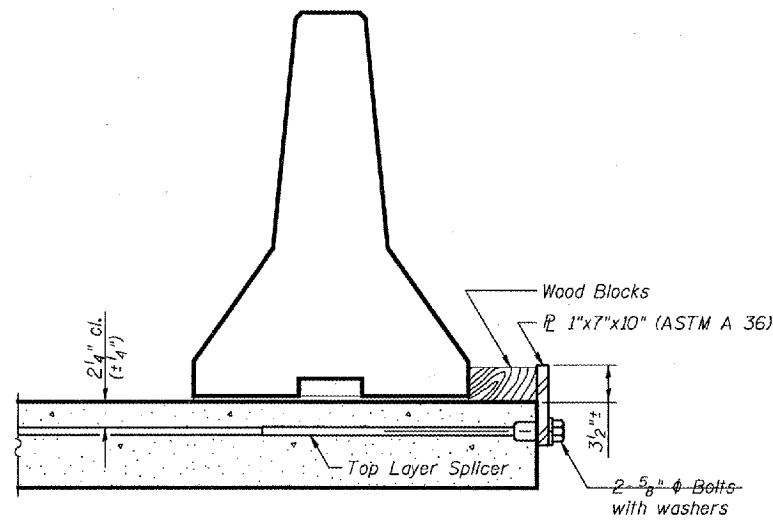
When "A" is 3'-6" or less, the temporary concrete barrier shall be anchored to the new slab according to Detail I or Detail II. No anchorage is required when "A" is greater than 3'-6".



SECTION THRU SLAB

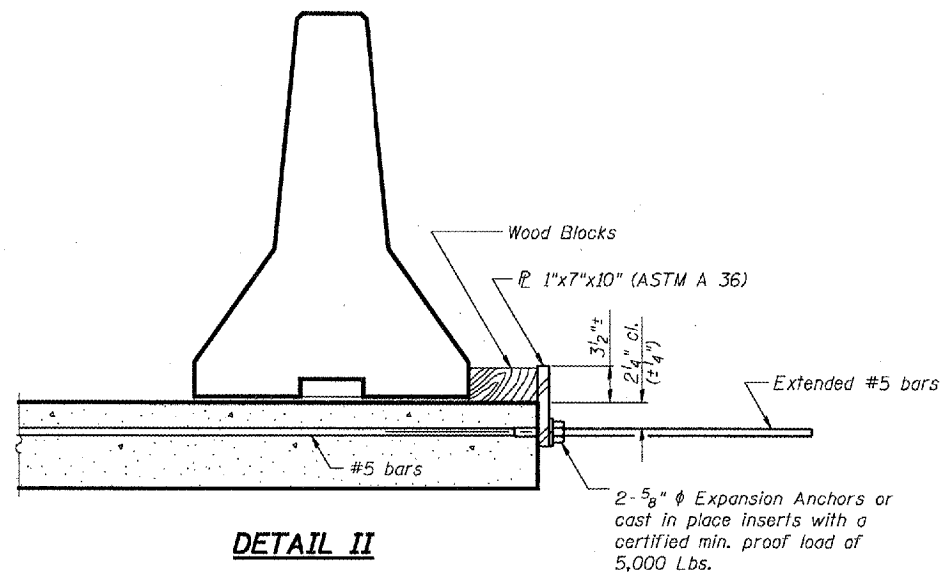
NOTES

- Detail I - With Bar Splicer or Couplers:  
Connect one (1) 1"x7"x10" steel  $\bar{P}$  to the top layer of couplers with 2-5/8"  $\phi$  bolts screwed to coupler at approximate  $\phi$  of each barrier panel.
- Detail II - With Extended Reinforcement Bars:  
Connect one (1) 1"x7"x10" steel  $\bar{P}$  to the concrete slab with 2-5/8"  $\phi$  Expansion Anchors or cast in place inserts spaced between the top layer of reinforcement at approximate  $\phi$  of each barrier panel.
- Cost of anchorage is included with Temporary Concrete Barrier.



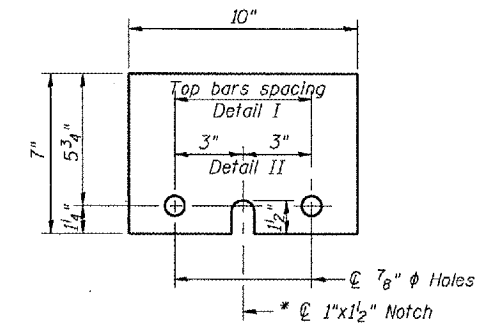
DETAIL I

The 1"x7"x10" Plate shall not be removed until Stage II Construction forms and reinforcement bars are in place.



DETAIL II

The 1"x7"x10" Plate shall not be removed until Stage II Construction forms and all reinforcement bars are in place and the concrete is ready to be placed.



$\bar{P}$  1"x7"x10"

\* Required only with Detail II

DESIGNED	P.S.J.
CHECKED	S.J.B.
DRAWN	Drew Christopher
CHECKED	P.S.J. S.J.B.

April 24, 2006

EXAMINED *John A. Morris*  
ENGINEER OF STRUCTURAL SERVICES

PASSED *Ralph E. Anderson*  
ENGINEER OF BRIDGES AND STRUCTURES

R-27 10-22-04

TEMPORARY CONCRETE BARRIER  
IL 122 / SUGAR CREEK  
TAZEWELL COUNTY  
SN 090-0058

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		Tozowell	22	11
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		

Contract Number: 68484

**NOTES**

Bar splicer assemblies shall be of an approved type and shall develop in tension at least 125 percent of the yield strength of the lapped reinforcement bars.

Splicer rods shall be of minimum 60 ksi yield strength, threaded or coiled full length.

All reinforcement bars shall be lapped and tied to the splicer rods or dowel bars.

Bar splicer assemblies shall be epoxy coated according to the requirements for reinforcement bars.

Other systems of similar design may be submitted to the Engineer for approval. Approval shall be based on certified test results from an approved testing laboratory that the proposed bar splicer assembly satisfies the following requirements:

- ① Minimum Capacity =  $1.25 \times f_y \times A_t$   
(Tension in kips)
- ② Minimum \*Pull-out Strength =  $1.25 \times f_{s_{allow}} \times A_t$   
(Tension in kips)

Where  $f_y$  = Yield strength of lapped reinforcement bars in ksi.

$f_{s_{allow}}$  = Allowable tensile stress in lapped reinforcement bars in ksi (Service Load)

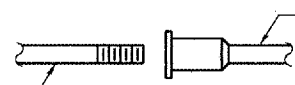
$A_t$  = Tensile stress area of lapped reinforcement bars.

\* = 28 day concrete

Bar Size to be Spliced	Splicer Rod or Dowel Bar Length	Strength Requirements	
		Min. Capacity kips - tension	Min. Pull-Out Strength kips - tension
#4	1'-8"	14.7	5.9
#5	2'-0"	23.0	9.2
#6	2'-7"	33.1	13.3
#7	3'-5"	45.1	18.0
#8	4'-6"	58.9	23.6
#9	5'-9"	75.0	30.0
#10	7'-3"	95.0	38.0
#11	9'-0"	117.4	46.8

Bar splicer assemblies shall be according to Section 508 of the Standard Specifications, except as noted. The furnishing and installation of bar splicer assemblies will be measured and paid for at the contract unit price each for "BAR SPLICERS."

The diameter of this part is the same as the diameter of the bar spliced.

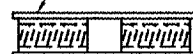


ROLLED THREAD DOWEL BAR



\*\* ONE PIECE

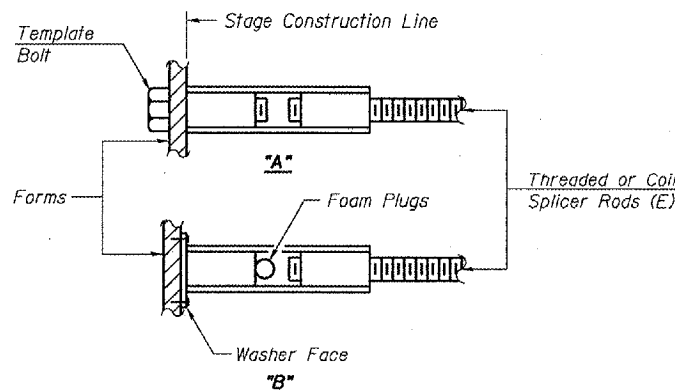
Wire Connector



WELDED SECTIONS

**BAR SPLICER ASSEMBLY ALTERNATIVES**

\*\* Heavy Hex Nuts conforming to ASTM A 563, Grade C, D or DH may be used.

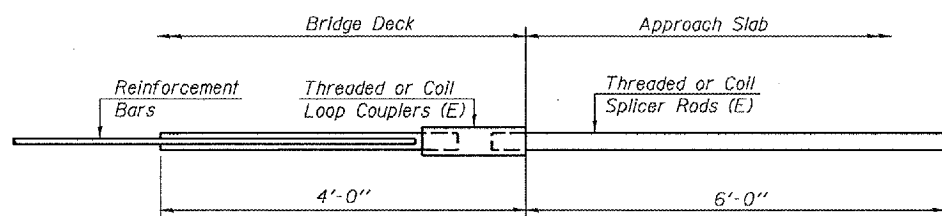


**INSTALLATION AND SETTING METHODS**

"A" : Set bar splicer assembly by means of a template bolt.

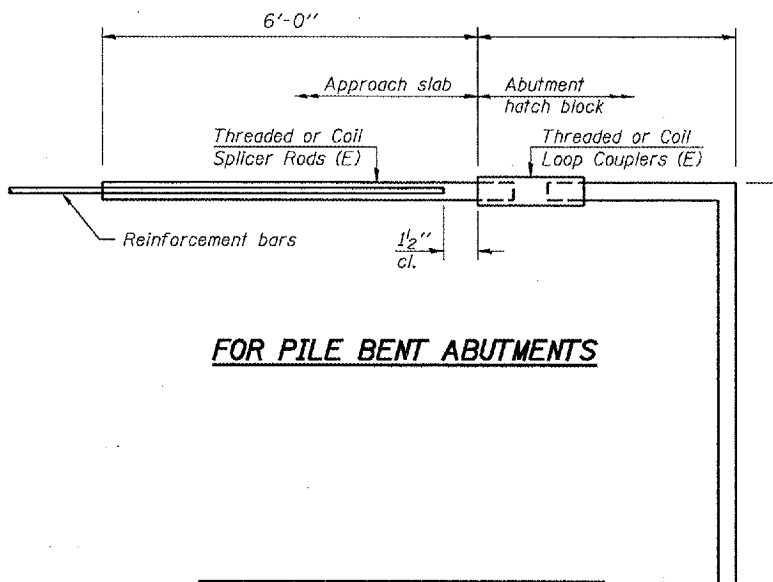
"B" : Set bar splicer assembly by nailing to wood forms or cementing to steel forms.

(E) : Indicates epoxy coating.



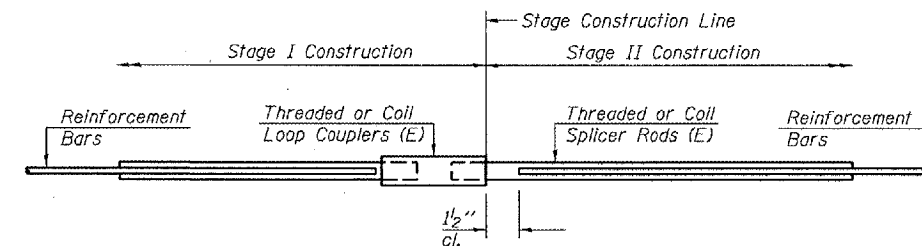
**FOR INTEGRAL OR SEMI-INTEGRAL ABUTMENTS**

Bar Splicer for #5 bar
Min. Capacity = 23.0 kips - tension
Min. Pull-out Strength = 9.2 kips - tension
No. Required =



**FOR PILE BENT ABUTMENTS**

Bar Splicer for #5 bar
Min. Capacity = 23.0 kips - tension
Min. Pull-out Strength = 9.2 kips - tension
No. Required =



**STANDARD**

Bar Size	No. Assemblies Required	Location
#4	80	Overlay
#5	6	Exp. Blockout
#5	8	Hatch Block

DESIGNED	P.S.J.
CHECKED	S.J.B.
DRAWN	Drew Christopher
CHECKED	P.S.J. S.J.B.

APPROVED	April 24, 2006
EXAMINED	John A. Morris ENGINEER OF STRUCTURAL SERVICES
PASSED	Ralph E. Anderson ENGINEER OF BRIDGES AND STRUCTURES

BSD-1 10-22-04

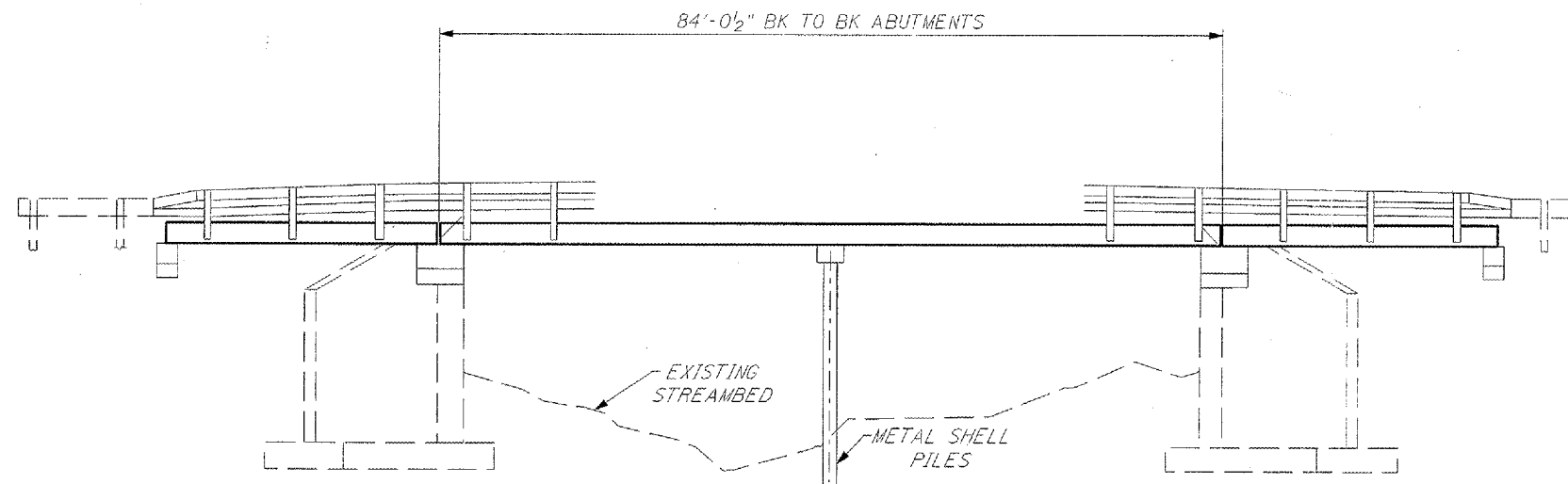
**BAR SPLICER DETAILS**  
**IL 122 / SUGAR CREEK**  
**TAZEWELL COUNTY**  
**SN 090-0058**

BENCHMARK: CHISLED SQUARE ON BRIDGE DECK  
ON SOUTHWEST CORNER  
ELEV = 100.00

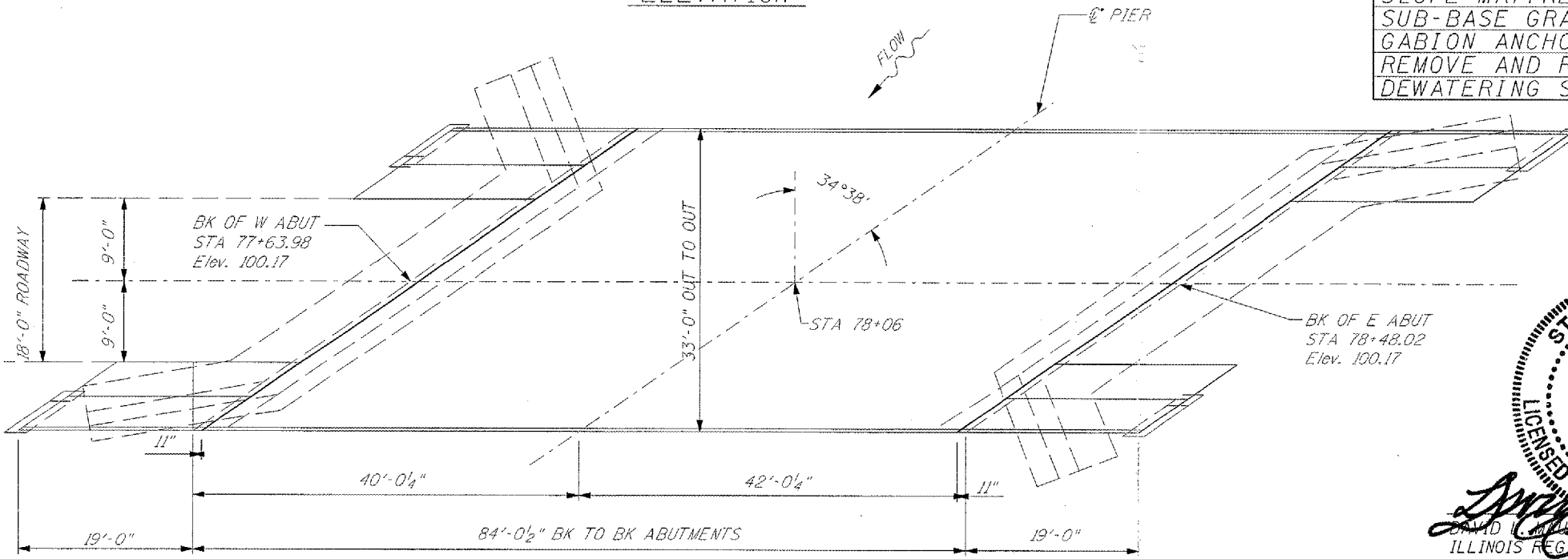
EXISTING STRUCTURE: SN 090-0058 IS A 33'-0" WIDE x 84'-0 1/2"  
LONG P.C.C. DECK BEAM SUPERSTRUCTURE WITH R.C. CLOSED ABUTMENTS.

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 701	*	TAZEWELL	30	23
FED. ROAD DIST. NO. 4		ILLINOIS	FED. AID PROJECT	

EXISTING BRIDGE



ELEVATION



PLAN

INDEX OF SHEETS

SHEET NUMBER	DESCRIPTION
1	GENERAL PLAN AND PROFILE, SUMMARY OF QUANTITIES, LOCATION MAP
2	R.O.W. PLAN
3	PROPOSED SITE PLAN
4	PROPOSED DIMENSION PLAN
5	SITE PROFILE
6-8	CROSS SECTIONS

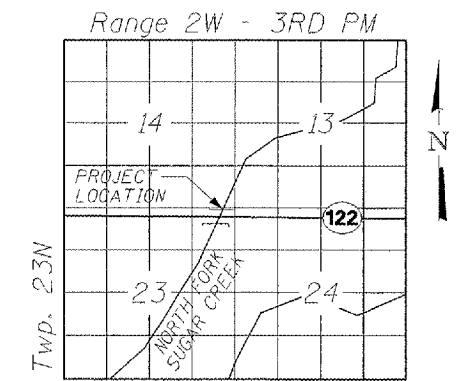
\* (128BR)I-1

BILL OF MATERIALS

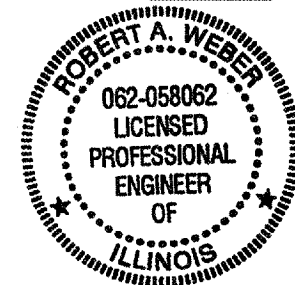
ITEM	UNIT	TOTAL
CHANNEL EXCAVATION	CU YD	1090
PERIMETER EROSION CONTROL BARRIER	FOOT	92
STONE RIP-RAP, CLASS A5	TONS	183
FILTER FABRIC FOR RIPRAP	SQ YD	1067
GABIONS	CU YD	339
SLOPE MATTRESS 12"	SQ YD	479
SUB-BASE GRANULAR MATERIAL, TYPE C	TONS	608
GABION ANCHOR STAKES	EACH	103
REMOVE AND REPLACE STEEL PLATE GUARD RAIL, TYPE A	FOOT	50
DEWATERING STRUCTURE NO. 1	EACH	1



*David L. Maurer* 5/9/06  
DATE  
ILLINOIS REGISTERED STRUCTURAL ENGINEER NO.: 81-3921  
EXP DATE: 11/30/2006



LOCATION SKETCH



*Robert A. Weber III* 05/09/06  
DATE  
ILLINOIS REGISTERED PROFESSIONAL ENGINEER NO.: 062-058062  
EXP DATE: 11/30/2007

WATERWAY/SCOUR INFORMATION

DESIGN FLOOD	100 YRS
DRAINAGE AREA	23.4 SQ MI
FLOW	4,299 CFS
FLOW DEPTH	10.76 FT
REQUIRED OPENING	515 SQ FT
PROVIDED OPENING	842 SQ FT
CONTRACTION SCOUR DEPTH	8 FT

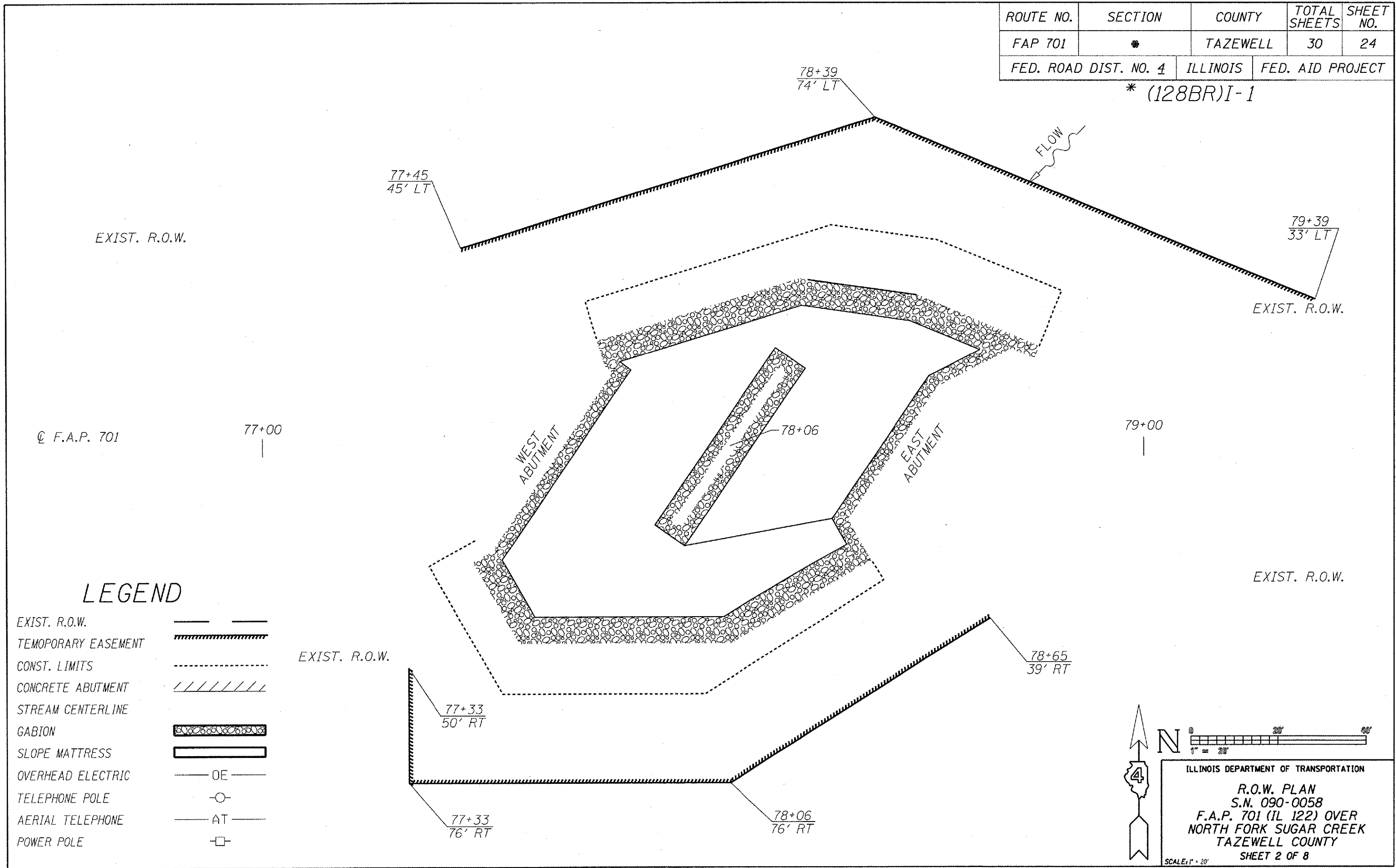
ILLINOIS DEPARTMENT OF TRANSPORTATION  
GENERAL PLAN & ELEVATION  
S.N. 090-0058  
F.A.P. 701 (IL 122) OVER  
NORTH FORK SUGAR CREEK  
TAZEWELL COUNTY  
SHEET 1 OF 8



68484

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 701	*	TAZEWELL	30	24
FED. ROAD DIST. NO. 4		ILLINOIS	FED. AID PROJECT	

\*(128BR)I-1



LEGEND

- EXIST. R.O.W.
- TEMPORARY EASEMENT
- CONST. LIMITS
- CONCRETE ABUTMENT
- STREAM CENTERLINE
- GABION
- SLOPE MATTRESS
- OVERHEAD ELECTRIC
- TELEPHONE POLE
- AERIAL TELEPHONE
- POWER POLE

N

ILLINOIS DEPARTMENT OF TRANSPORTATION

R.O.W. PLAN  
S.N. 090-0058  
F.A.P. 701 (IL 122) OVER  
NORTH FORK SUGAR CREEK  
TAZEWELL COUNTY  
SHEET 2 OF 8

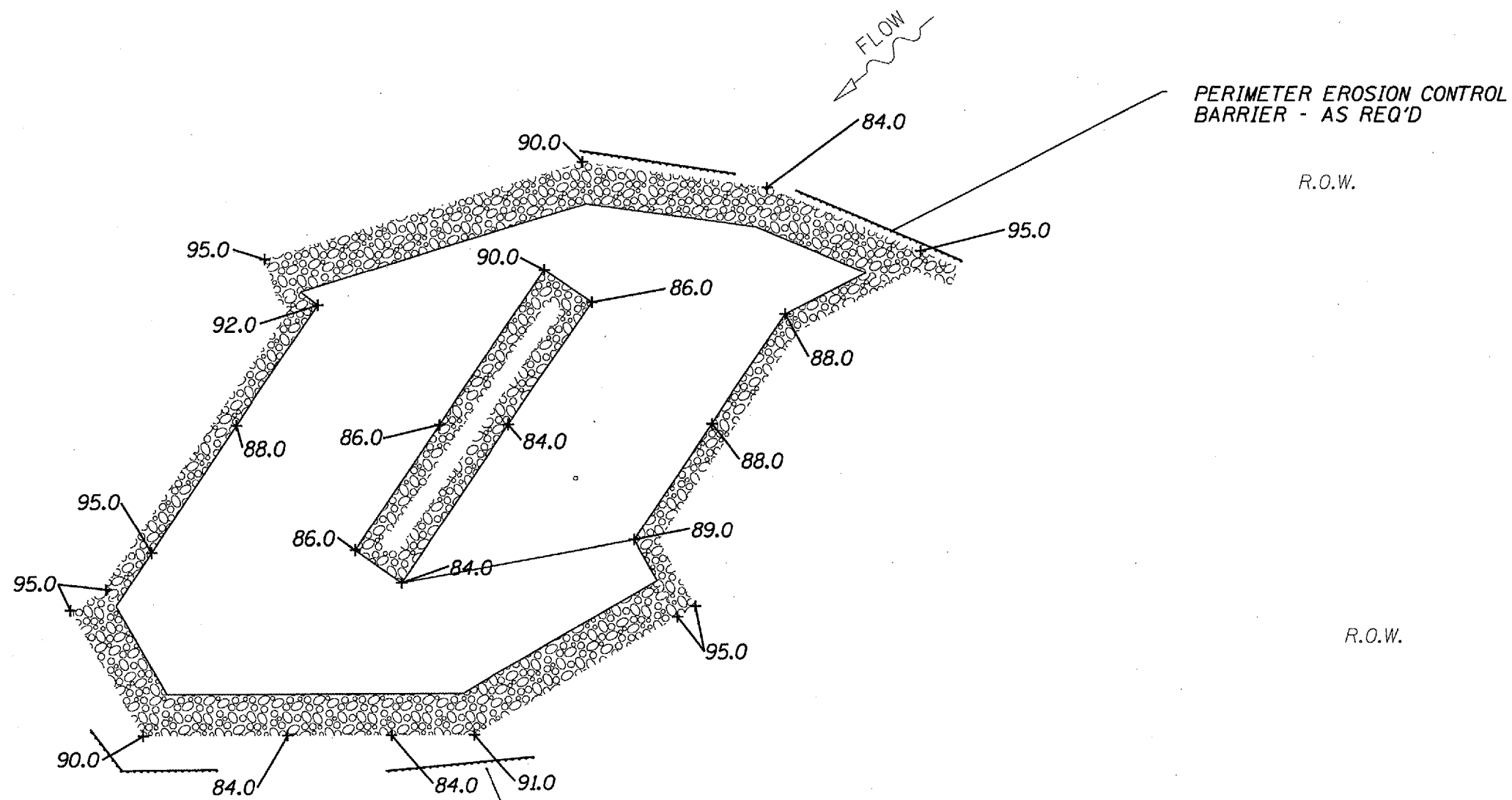
SCALE: 1" = 20'



68484

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 701	•	TAZEWELL	30	25
FED. ROAD DIST. NO. 4		ILLINOIS	FED. AID PROJECT	

\*(128BR)I-1



### LEGEND

- R.O.W.
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION 95.0  
↓
- CONCRETE ABUTMENT / / / / /
- STREAM CENTERLINE | | | | |
- GABION ▨
- SLOPE MATTRESS ▭
- PERIMETER EROSION CONTROL BARRIER - - - - -
- OVERHEAD ELECTRIC — O E —
- TELEPHONE POLE — O —
- AERIAL TELEPHONE — AT —
- POWER POLE — □ —

N

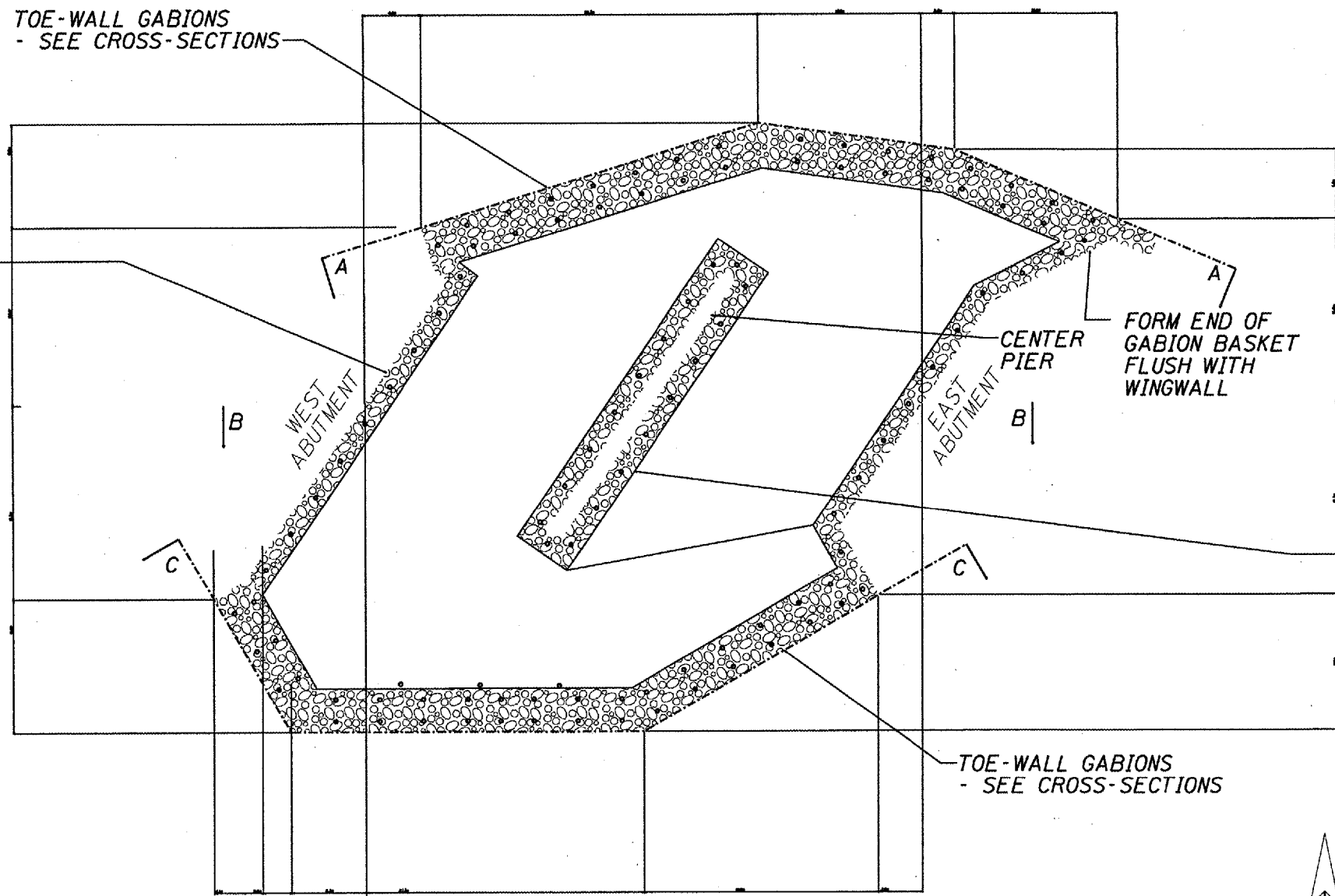
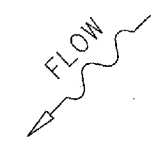
ILLINOIS DEPARTMENT OF TRANSPORTATION  
 PROPOSED SITE PLAN  
 S.N. 090-0058  
 F.A.P. 701 (IL 122) OVER  
 NORTH FORK SUGAR CREEK  
 TAZEWELL COUNTY  
 SHEET 3 OF 8

SCALE: 1" = 20'

68484

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 701	*	TAZEWELL	30	26
FED. ROAD DIST. NO. 4		ILLINOIS	FED. AID PROJECT	

\*(128BR)I-1



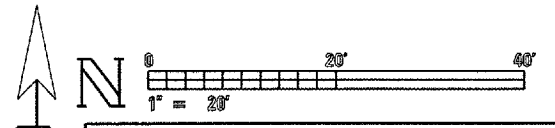
3' WIDE x 3' DEEP ANCHOR GABIONS - SEE CROSS SECTIONS

3' WIDE x 3' DEEP ANCHOR GABIONS - SEE CROSS SECTIONS

LEGEND

- R.O.W.
- CONCRETE ABUTMENT
- STREAM CENTERLINE
- GABION
- SLOPE MATTRESS
- GABION ANCHOR STAKE
- OVERHEAD ELECTRIC
- TELEPHONE POLE
- AERIAL TELEPHONE
- POWER POLE

TOE-WALL GABIONS - SEE CROSS-SECTIONS



ILLINOIS DEPARTMENT OF TRANSPORTATION  
 PROPOSED DIMENSION PLAN  
 S.N. 090-0058  
 F.A.P. 701 (IL 122) OVER  
 NORTH FORK SUGAR CREEK  
 TAZEWELL COUNTY  
 SHEET 4 OF 8

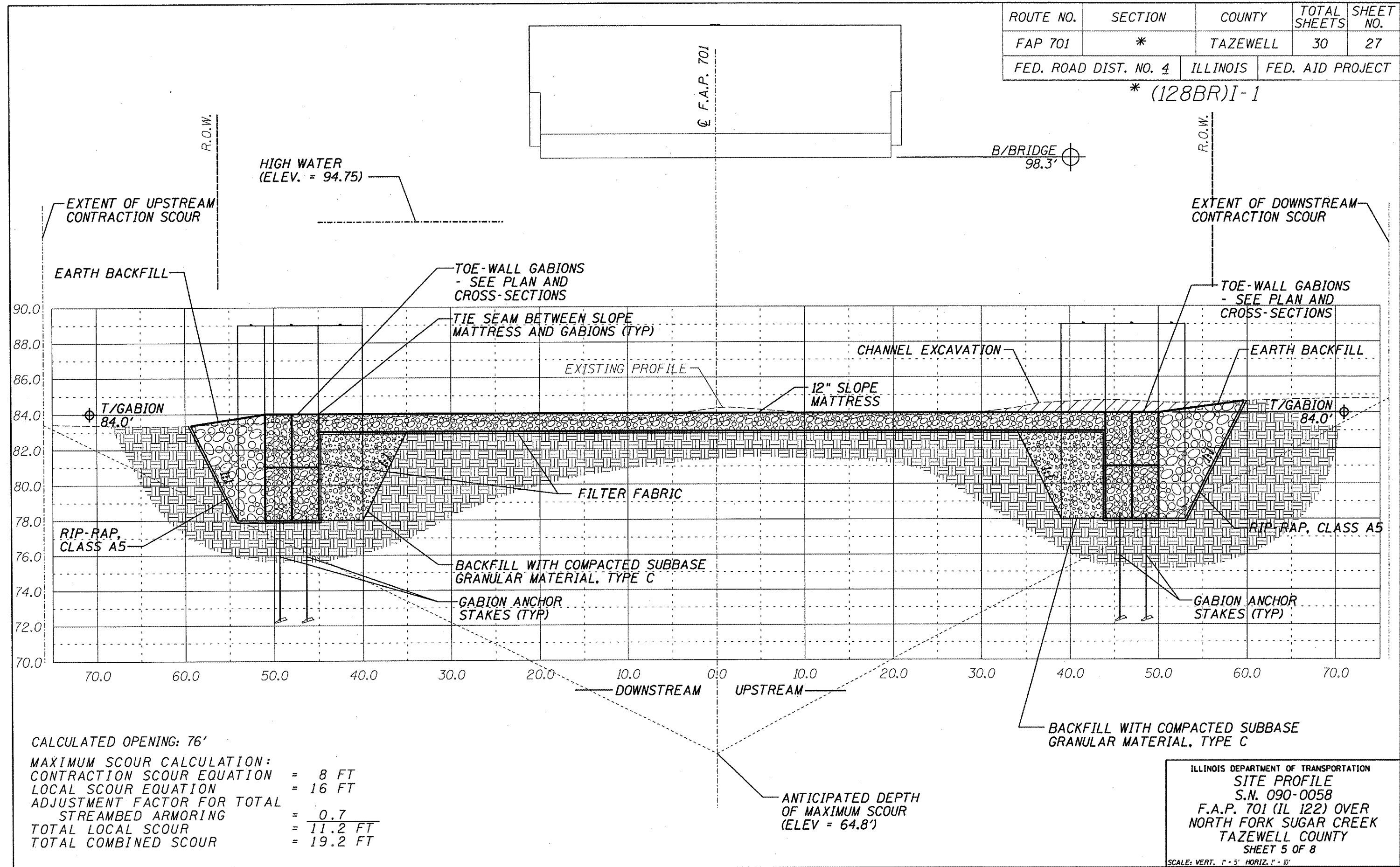
© F.A.P. 701



68484

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 701	*	TAZEWELL	30	27
FED. ROAD DIST. NO. 4		ILLINOIS	FED. AID PROJECT	

\* (128BR)I-1



CALCULATED OPENING: 76'  
 MAXIMUM SCOUR CALCULATION:  
 CONTRACTION SCOUR EQUATION = 8 FT  
 LOCAL SCOUR EQUATION = 16 FT  
 ADJUSTMENT FACTOR FOR TOTAL STREAMBED ARMORING = 0.7  
 TOTAL LOCAL SCOUR = 11.2 FT  
 TOTAL COMBINED SCOUR = 19.2 FT

ANTICIPATED DEPTH OF MAXIMUM SCOUR (ELEV = 64.8')

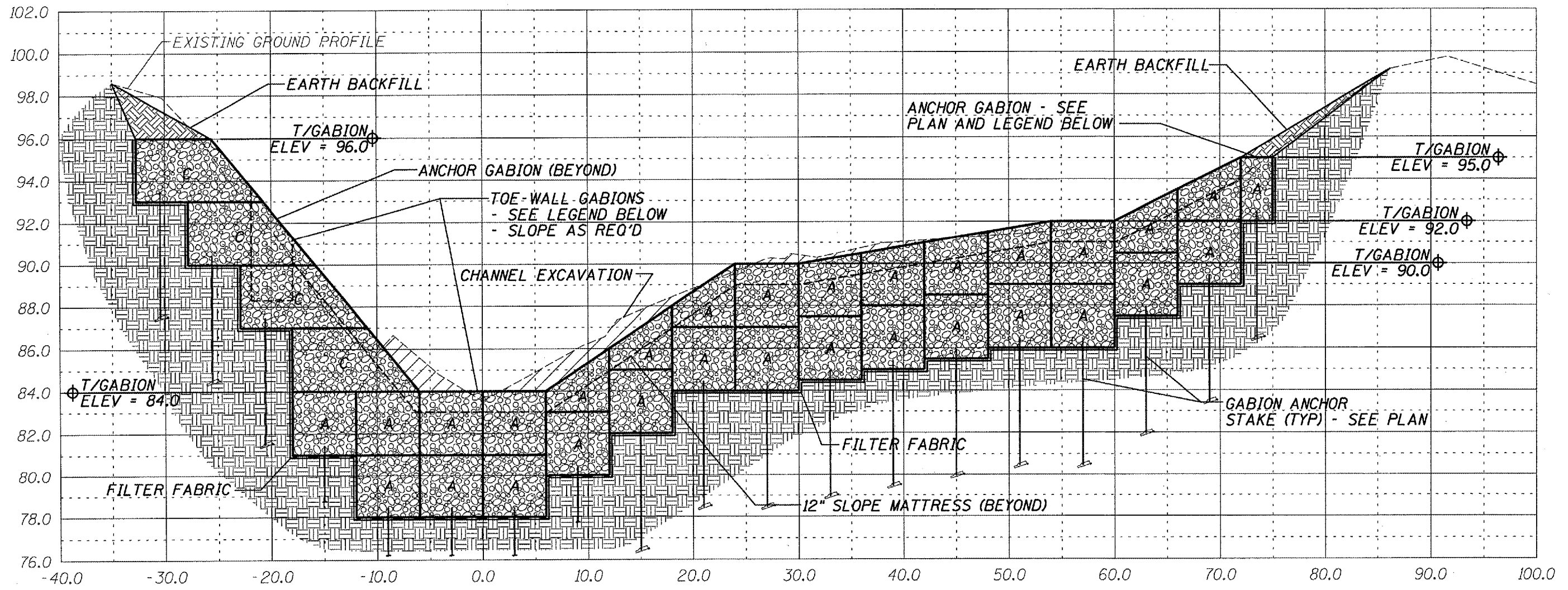
ILLINOIS DEPARTMENT OF TRANSPORTATION  
 SITE PROFILE  
 S.N. 090-0058  
 F.A.P. 701 (IL 122) OVER  
 NORTH FORK SUGAR CREEK  
 TAZEWELL COUNTY  
 SHEET 5 OF 8  
 SCALE: VERT. 1" = 5' HORIZ. 1" = 10'



68484

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 701	*	TAZEWELL	30	28
FED. ROAD DIST. NO. 4		ILLINOIS	FED. AID PROJECT	

\* (128BR)I-1



SECTION A-A THROUGH NORTH GABION TOE-WALL

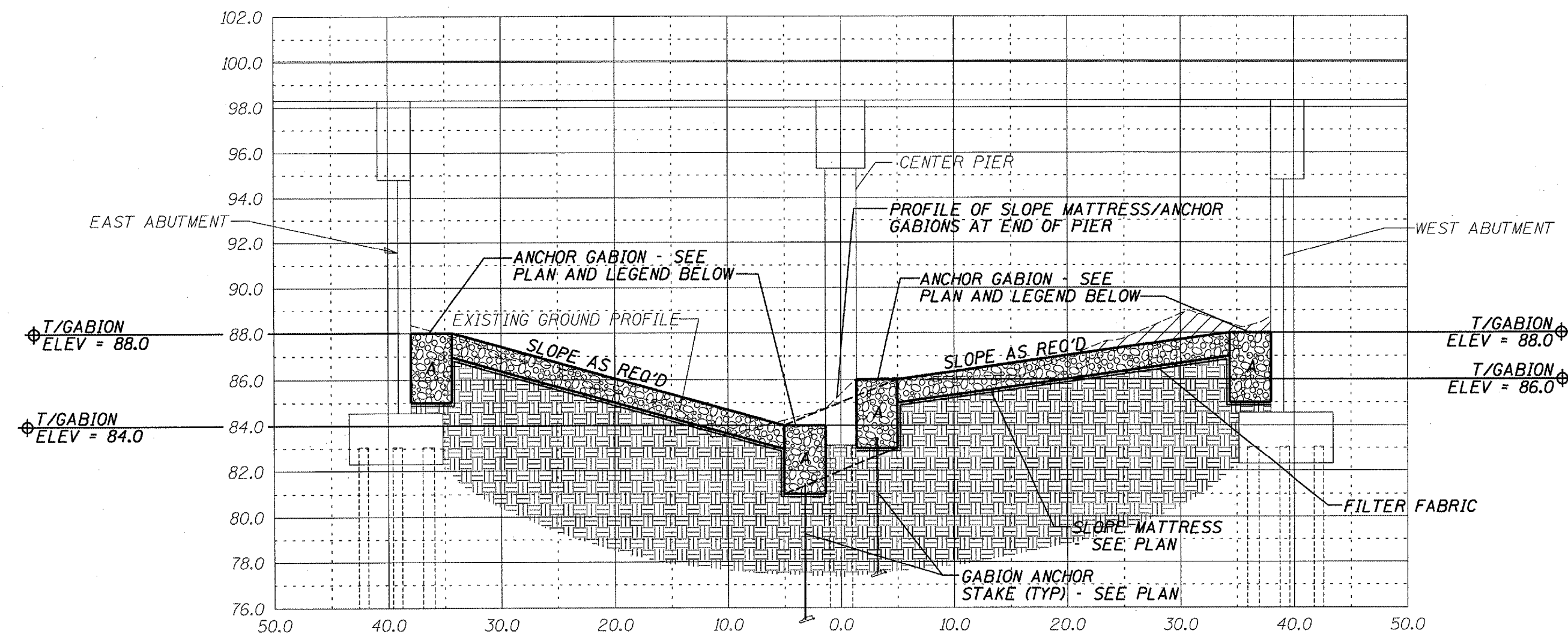
MARK	LENGTH	WIDTH	HEIGHT
A	6'	3'	3'
C	12'	3'	3'

ILLINOIS DEPARTMENT OF TRANSPORTATION  
 SITE CROSS SECTION  
 S.N. 090-0058  
 F.A.P. 701 (IL 122) OVER  
 NORTH FORK SUGAR CREEK  
 TAZEWELL COUNTY  
 SHEET 6 OF 8  
 SCALE: VERT. 1" = 5' HORIZ. 1" = 10'

68484

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 701	*	TAZEWELL	30	29
FED. ROAD DIST. NO. 4		ILLINOIS	FED. AID PROJECT	

\*(128BR)I-1



SECTION B-B THROUGH C OF F.A.P. 701

MARK	LENGTH	WIDTH	HEIGHT
A	6'	3'	3'

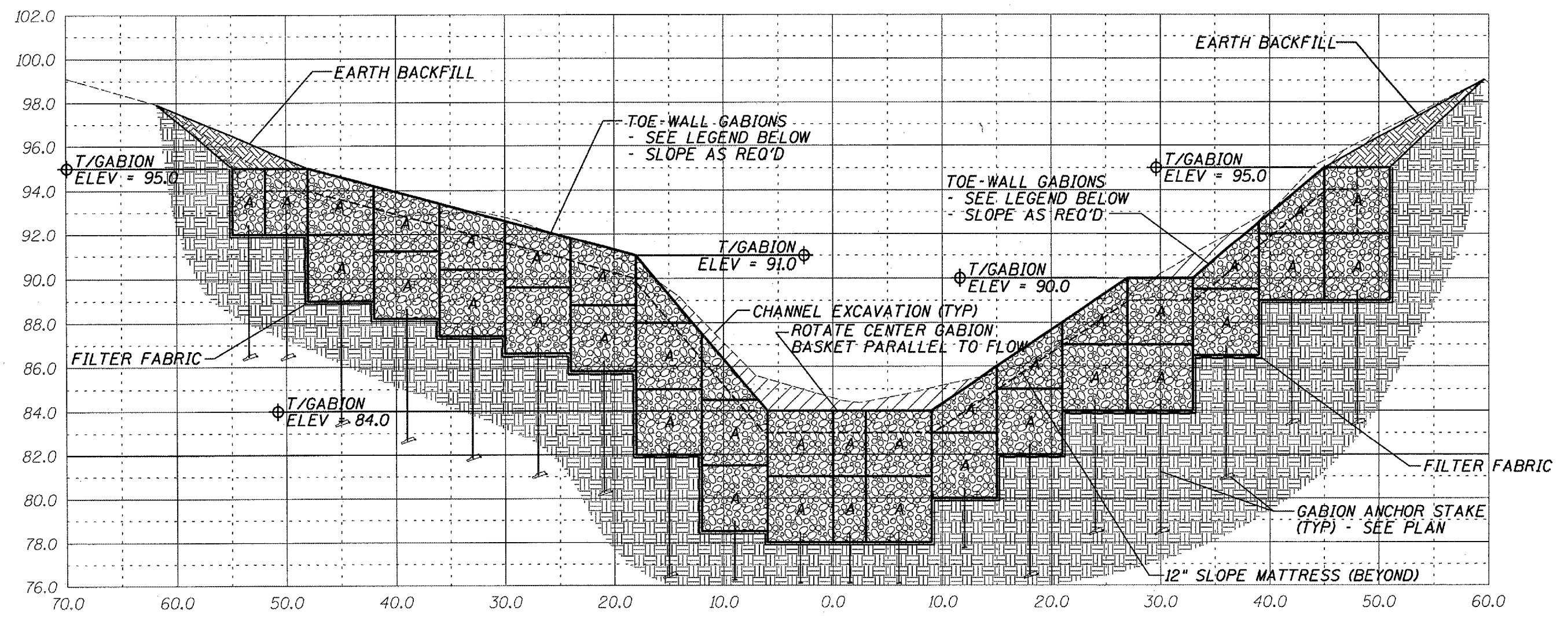
ILLINOIS DEPARTMENT OF TRANSPORTATION  
 SITE CROSS SECTION  
 S.N. 090-0058  
 F.A.P. 701 (IL 122) OVER  
 NORTH FORK SUGAR CREEK  
 TAZEWELL COUNTY  
 SHEET 7 OF 8

SCALE: VERT. 1" = 5' HORIZ. 1" = 10'

68484

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP 702	*	TAZEWELL	30	30
FED. ROAD DIST. NO. 4		ILLINOIS	FED. AID PROJECT	

\*(128BR)I-1



SECTION C-C THROUGH SOUTH GABION TOE-WALL

MARK	LENGTH	WIDTH	HEIGHT
A	6'	3'	3'

ILLINOIS DEPARTMENT OF TRANSPORTATION  
 SITE CROSS SECTION  
 S.N. 090-0058  
 F.A.P. 701 (IL 122) OVER  
 NORTH FORK SUGAR CREEK  
 TAZEWELL COUNTY  
 SHEET 8 OF 8

SCALE: VERT. 1" = 5' HORIZ. 1" = 10'

