

# STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PLANS FOR PROPOSED HIGHWAY BRIDGE PROGRAM

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	1
	STA. 15+30	TO STA. 26+00		
FED. ROAD DIST. NO. 7		ILLINOIS FED. AID PROJECT*		
CONTRACT NO. 87360				

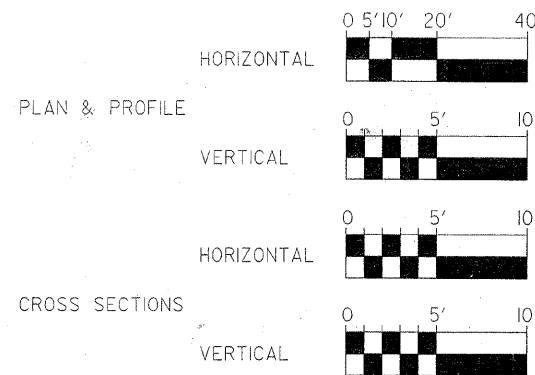
### INDEX OF SHEETS

1	COVER SHEET
2	SUMMARY OF QUANTITIES & SCHEDULE OF QUANTITIES
3	TYPICAL SECTIONS
4	DETOUR MAPS
5-7	PLAN & PROFILE
8-24	BRIDGE STRUCTURE NO. 053-4175
25-28	CROSS SECTIONS

### STATE STANDARD DETAILS

000001-05	702001-01
515001-03	B.L.R. 21-8
601101-01	B.L.R. 22-6
630301-05	B.L.R. 26-1
635006-03	B.L.R. 27-1

### SCALES



### UTILITIES

POWER - COMMONWEALTH EDISON  
TELEPHONE - FRONTIER  
GAS - NICOR

J.U.L.I.E. SYSTEM - THE TOLL FREE TELEPHONE NUMBER FOR JOINT UTILITY LOCATING INFORMATION FOR EXCAVATOR IS 1-800-892-0123.

### BENCHMARKS:

- 1.) PK NAIL IN WOOD FENCE POST N. ONE OF TWO POST @ THE N.W. CORNER OF BRIDGE @ STA 21+30/30' LT, ELEVATION = 97.91
- 2.) CENTER OF BRIDGE DECK @ STA 20+00, ELEVATION = 100.02

JOB NO. C-93-082-07  
CONTRACT NO.: 87360  
CONSTRUCTION TYPE CODE: ROADWAY E000  
BRIDGE X071-2A

## LIVINGSTON COUNTY

# SECTIONS 03-26140-00-BR & 03-21117-00-BR T.R. 224 B (2600E) FEDERAL PROJECT BR-05-105(47)



### LOCATION MAP

T.R. 224B (2600E) GROSS LENGTH OF PROJECT = 1070.00 FT = 0.203 MILE; NET LENGTH OF PROJECT = 1070.00 FT = 0.203 MILE

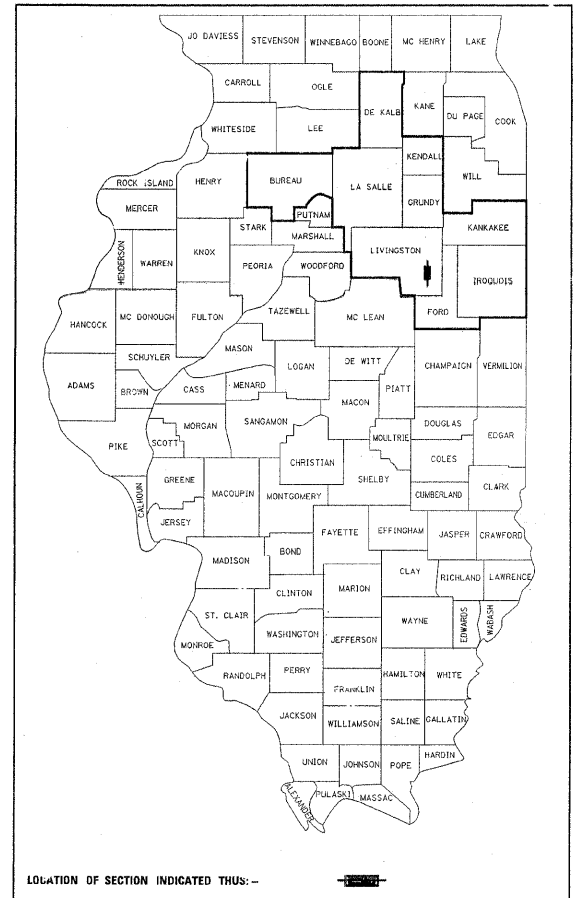
IMPROVEMENT ENDS  
STA. 26+00

PROPOSED STRUCTURE NO. 053-4175  
THE PROPOSED BRIDGE SUPERSTRUCTURE IS A THREE-SPAN STEEL I-BEAM BRIDGE WITH A CAST-IN-PLACE CONCRETE DECK. THE SUBSTRUCTURE CONSISTS OF SPILL-THRU ABUTMENTS ON PILES AND PIERS BUILT FROM DRIVING PILES. THE BRIDGE IS NOT SKEWED MEASURES 26'-0" OUT TO OUT AND 163'-8" BACK TO BACK OF ABUTMENTS.

IMPROVEMENT BEGINS  
STA. 15+30

FUNCTIONAL CLASSIFICATION: LOCAL ROAD (NON-URBAN)  
DESIGN SPEED: 30 M.P.H.  
DESIGN TRAFFIC: 100 (2023)  
% TRUCKS: 5.0%

C - 93-082-07



APPROVED 3/25/09 20 09

*J.R.R.*  
SAJMEVIN TOWNSHIP

APPROVED 3/24 20 09

*Paul E. Hurms*  
PLEASANT RIDGE TOWNSHIP

APPROVED 03/25 20 09

*Paul White*  
COUNTY ENGINEER

PASSED MARCH 31 20 09

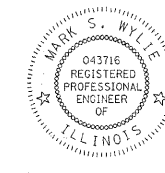
*Ken H. Long*  
DISTRICT ENGINEER OF LOCAL ROADS & STREETS

APPROVED MARCH 31 20 09

*George R. Ryan*  
DEPUTY DIRECTOR OF HIGHWAYS, REGION ENGINEER

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

**Farnsworth GROUP**  
2709 McGraw Drive  
Bloomington, Illinois 61704  
309/663-8435, 309/663-1571 fax



*Mark S. Wylie* Date 3/17/09  
MARK S. WYLIE  
ILLINOIS PROFESSIONAL ENGINEER  
NO. 062-043716  
EXPIRATION 11/30/09

DATE: 03/17/09

**SUMMARY OF QUANTITIES**

**SCHEDULE OF QUANTITIES**

CODE NO.	ITEM	UNIT	TOTAL QUANTITIES	BRIDGE X071-20	ROADWAY E000
* 20200100	EARTH EXCAVATION	CU YD	489		489
20400800	FURNISHED EXCAVATION	CU YD	3,085		3,085
* 20700300	POROUS GRANULAR EMBANKMENT, SPECIAL	TON	250	250	
25000200	SEEDING, CLASS 2	ACRE	0.7		0.7
25100635	HEAVY DUTY EROSION CONTROL BLANKET	SQ YD	3,440		3,440
28000250	TEMPORARY EROSION CONTROL SEEDING	POUND	1,300		1,300
28000300	TEMPORARY DITCH CHECKS	EACH	28		28
28000400	PERIMETER EROSION BARRIER	FOOT	1,870		1,870
28100207	STONE RIPRAP, CLASS A4	TON	970	970	
28200200	FILTER FABRIC	SQ YD	1,065	1,065	
40200800	AGGREGATE SURFACE COURSE, TYPE B	TON	1,362		1,362
48101200	AGGREGATE SHOULDERS, TYPE B	TON	82		82
50100100	REMOVAL OF EXISTING STRUCTURES	EACH	1	1	
50200100	STRUCTURE EXCAVATION	CU YD	820	820	
50300225	CONCRETE STRUCTURES	CU YD	71.9	71.9	
50300255	CONCRETE SUPERSTRUCTURE	CU YD	122.6	122.6	
50300260	BRIDGE DECK GROOVING	SQ YD	436	436	
50300300	PROTECTIVE COAT	SQ YD	436	436	
50500105	FURNISHING AND ERECTING STRUCTURAL STEEL	L SUM	1	1	
50500505	STUD SHEAR CONNECTORS	EACH	1,812	1,812	
50800205	REINFORCEMENT BARS, EPOXY COATED	POUND	36,680	36,680	
Δ 50900205	STEEL RAILING, TYPE S1	FOOT	328	328	
51200957	FURNISHING METAL SHELL PILES 12" X 0.250"	FOOT	1,031	1,031	
51202305	DRIVING PILES	FOOT	1,031	1,031	
51203200	TEST PILE METAL SHELLS	EACH	2	2	
51500100	NAME PLATES	EACH	1	1	
* 54205053	PIPE CULVERTS, SPECIAL 18"	FOOT	176		176
* 54205059	PIPE CULVERTS, SPECIAL 24"	FOOT	65		65
59100100	GEOCOMPOSITE WALL DRAIN	SQ YD	68	68	
* 60109580	PIPE UNDERDRAINS FOR STRUCTURES 4"	FOOT	116	116	
Δ 63100075	TRAFFIC BARRIER TERMINAL, TYPE 5A	EACH	4		4
Δ 63100167	TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT	EACH	4		4
* 67100100	MOBILIZATION	L SUM	1		1
* 70103700	TRAFFIC CONTROL COMPLETE	L SUM	1		1
Δ 78200405	GUARDRAIL MARKERS	EACH	22		22
Δ 78201000	TERMINAL MARKER - DIRECT APPLIED	EACH	4		4

\* DENOTES SEE SPECIAL PROVISIONS

Δ SPECIALTY ITEMS

EARTHWORK					
	EARTH EXCAVATION	STRUCTURE EXCAVATION 50%	TOTAL EXCAVATION ADJUSTED FOR 25% SHRINKAGE	EMBANKMENT	BALANCE WASTE (+) SHORTAGE (-)
LOCATION	CU YD		CU YD	CU YD	CU YD
STA 15+30 TO STA 19+16.67	146		110	1,423	-1,313
STA 19+16.67 TO STA 20+80.33		410	308	0	+308
STA 20+80.33 TO STA 26+00	343		257	2,337	-2,080

TOTALS  
EARTH EXCAVATION = 489 C.Y.  
FURNISHED EXCAVATION = 3,085 C.Y.

SEEDING, CLASS 2 - 25000200			
STATION	TO	STATION	ACRE
16+00		19+11.67	0.3
20+80.33		26+00	0.4
TOTAL			0.7

HEAVY DUTY EROSION CONTROL BLANKET - 25100635			
STATION	TO	STATION	SQ YD
16+00		19+11.67	1,520
20+80.33		26+00	1,920
TOTAL			3,440

TEMPORARY EROSION CONTROL SEEDING - 28000250			
STATION	TO	STATION	POUND
16+00		19+11.67	515
20+80.33		26+00	685
TOTAL			1,200

TEMPORARY DITCH CHECKS - 28000300			
STATION	TO	STATION	EACH
16+52 LT & RT		19+00 LT & RT	12
21+00 LT & RT		24+50 LT & RT	16
TOTAL			28

PERIMETER EROSION BARRIER - 28000400			
STATION	TO	STATION	FOOT
15+30 LT		19+16.67 LT	510
21.00 LT		26+00 LT	500
15+30 RT		18+70 RT	330
20+85.33 RT		26+00 RT	530
TOTAL			1,870

AGGREGATE SURFACE COURSE, TYPE B - 40200800			
STATION	TO	STATION	TON
15+30 LT		19+14.58 LT	263
15+30 RT		19+16.67 RT	267
20+80.33 LT		26+00 LT	367
20+82.42 RT		26+00 RT	330
ENT 18+30 RT			65
ENT 22+83 LT			35
ENT 23+43 LT			35
TOTAL			1,362

AGGREGATE SHOULDERS, TYPE B - 48101200			
STATION	TO	STATION	TON
18+18.50 LT & RT		19+16.67 LT & RT	41
20+80.33 LT & RT		21+78.50 LT & RT	41
TOTAL			82

PIPE CULVERTS, SPECIAL 18" - 54205053			
STATION	TO	STATION	FOOT
21+00 LT		22+00 LT	100
22+83 LT			40
23+43 LT			36
TOTAL			176

PIPE CULVERTS, SPECIAL 24" - 54205059			
STATION	TO	STATION	FOOT
18+05 RT		18+70 RT	65
TOTAL			65

TRAFFIC BARRIER TERMINAL, TYPE 5A - 63100075			
STATION	TO	STATION	EACH
ALL FOUR BRIDGE QUADRANTS			4
TOTAL			4

TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT - 63100167			
STATION	TO	STATION	EACH
18+53.42 LT & RT		19+03.42 LT & RT	2
20+93.58 LT & RT		21+43.58 LT & RT	2
TOTAL			4

MOBILIZATION - 67100100			
STATION	TO	STATION	L SUM
THROUGHOUT PROJECT			1
TOTAL			1

TRAFFIC CONTROL COMPLETE - 70103700			
STATION	TO	STATION	L SUM
THROUGHOUT PROJECT			1
TOTAL			1

GUARDRAIL MARKERS - 78200405			
STATION	TO	STATION	EACH
18+54		21+42	22
TOTAL			22

TERMINAL MARKER - DIRECT APPLIED 78201000			
STATION	TO	STATION	EACH
18+53.42 LT			1
18+53.42 RT			1
21+43.58 LT			1
21+43.58 RT			1
TOTAL			4

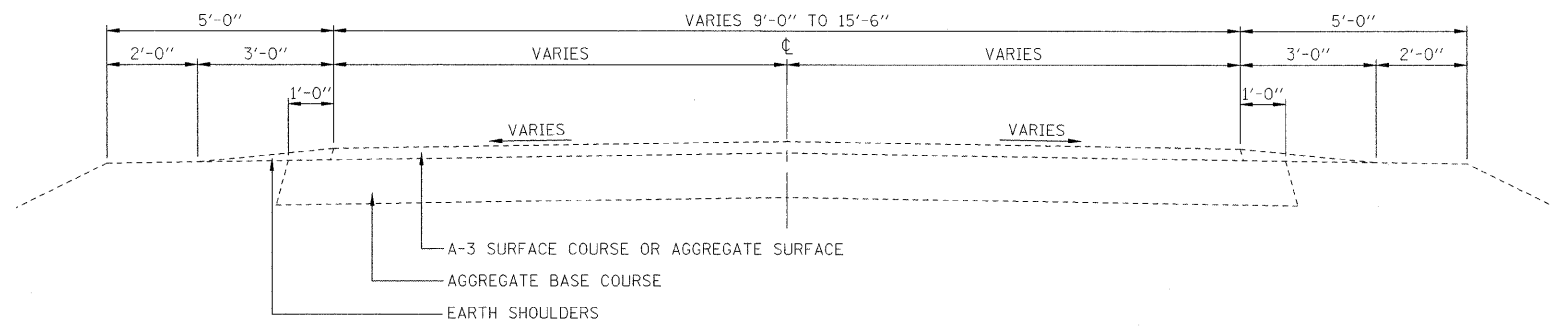
NOTE:  
ASSUMED 50% OF STRUCTURE EXCAVATION (410 CU YD) IS GOOD FOR EMBANKMENT.  
THUS 410 CU YD AT 75.0% FOR SHRINKAGE (308 CU YD) CAN BE USED. MATERIAL THAT IS NOT SUITABLE TO USE SHALL BE HAULED AWAY AT NO COST.

SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

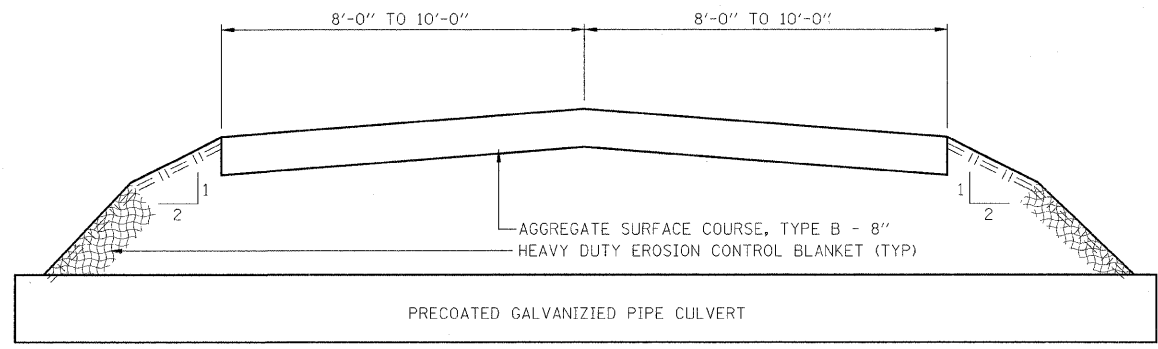
**SUMMARY OF QUANTITIES & SCHEDULE OF QUANTITIES**

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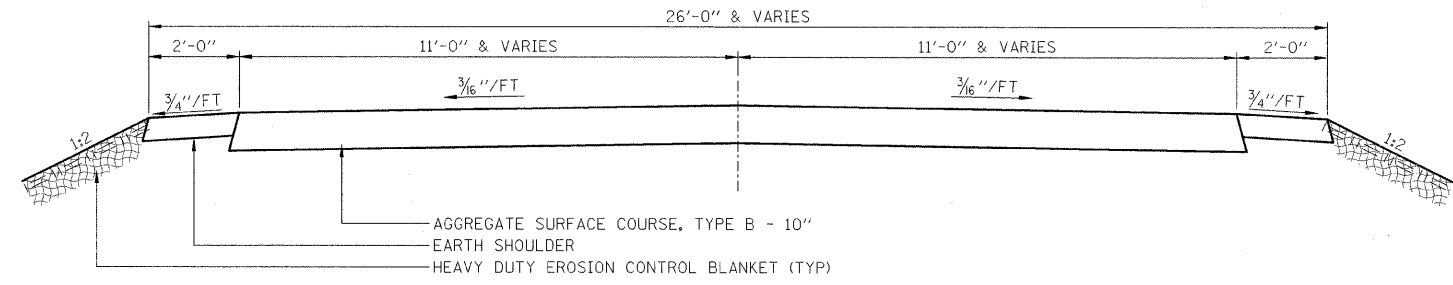
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STA.	TO STA.			
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT*		
CONTRACT NO. 87360				



**EXISTING TYPICAL SECTION**

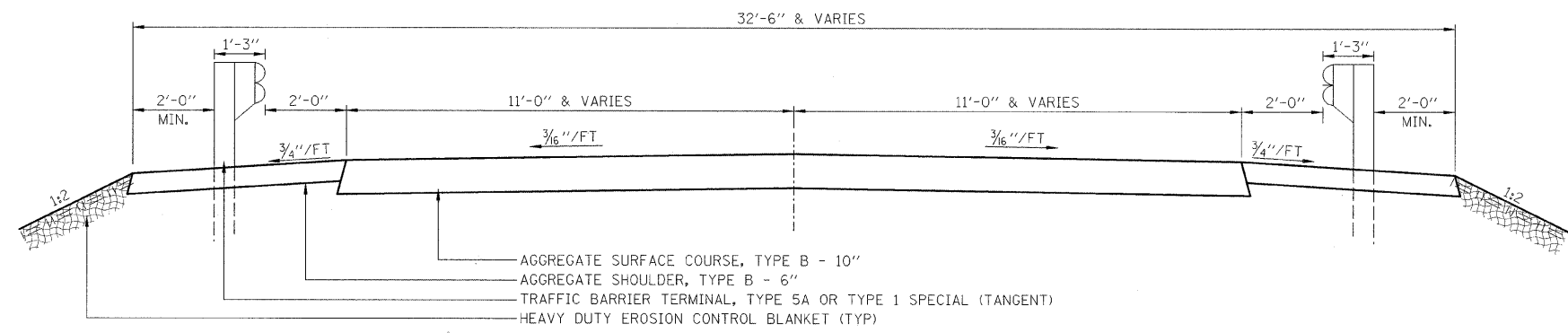


**PROPOSED TYPICAL FIELD ENTRANCE**



**PROPOSED TYPICAL SECTION**

STA 15+30 TO STA 18+52.58  
STA 21+44.42 TO STA 26+00

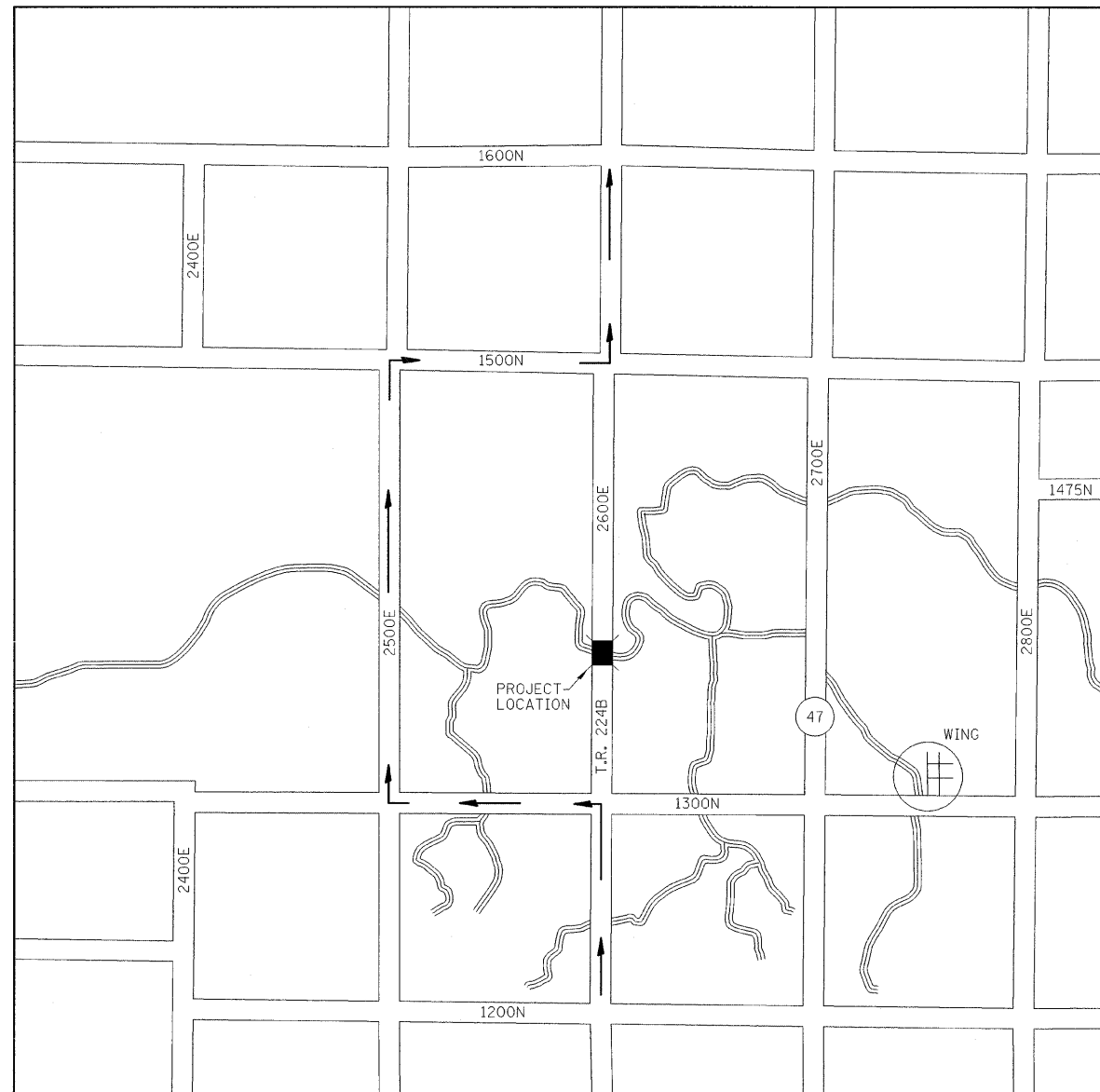


**PROPOSED TYPICAL SECTION**

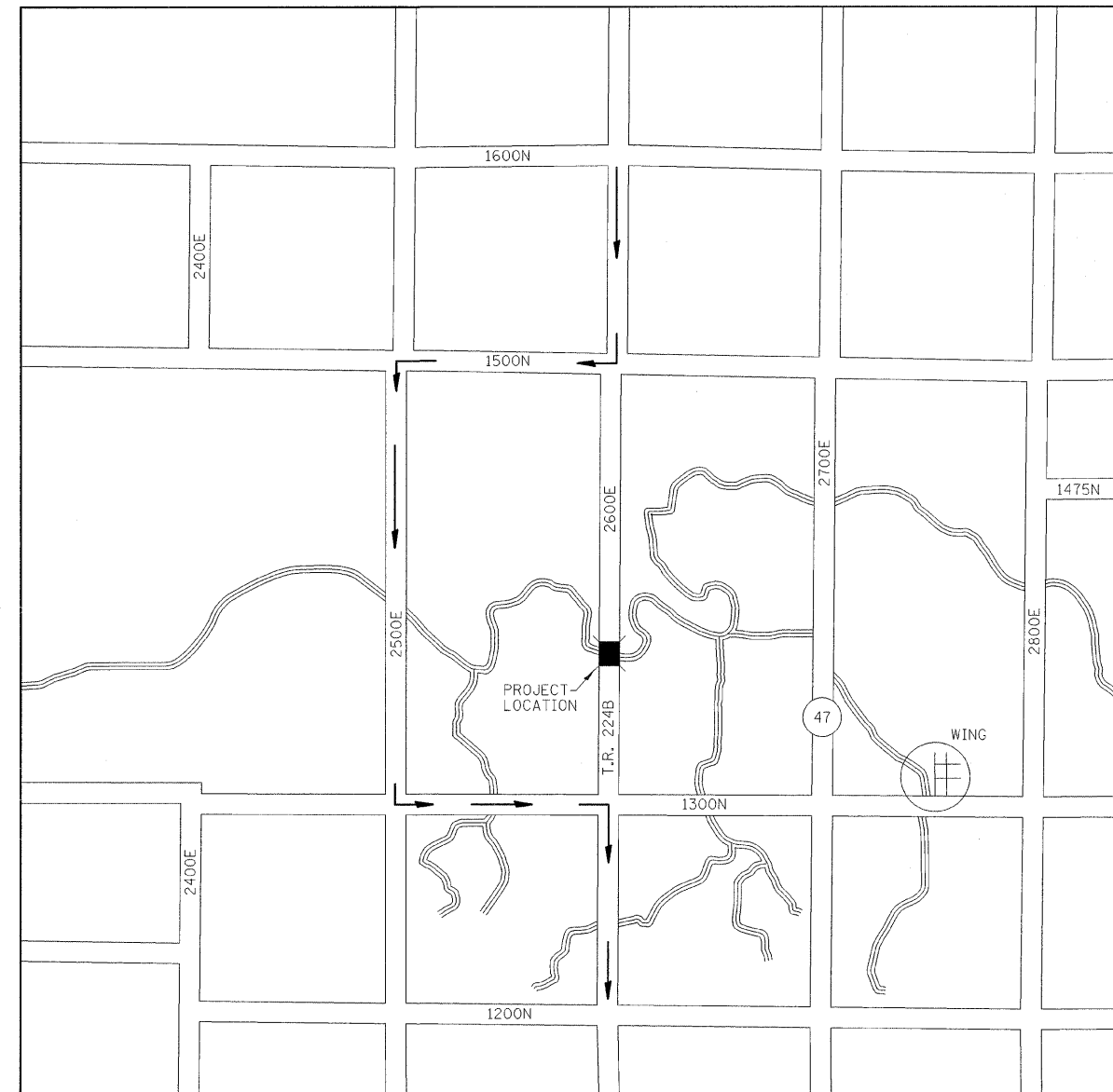
STA 18+52.58 TO STA 19+16.67  
STA 20+80.33 TO STA 21+44.42

SECTION 03-26140-00-BR SECTION 03-21117-00-BR LIVINGSTON COUNTY		
TYPICAL SECTIONS		
DRAWN BY DRR	 2700 McGraw Drive Bloomington, Illinois 61704 309/888-9436, 309/888-1071 fax	FILE NO. 24-7191
DATE 03/17/09		BOOK NO. 2606
CHECKED BY MSW		SHEET NO. 3 OF 28

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	4
STA.		TO STA.		
FED. ROAD DIST. NO. 7		ILLINOIS FED. AID PROJECT*		
CONTRACT NO. 87360				



DETOUR MAP - NORTHBOUND



DETOUR MAP - SOUTHBOUND

**NOTES:**

- 1.) DETOUR SIGNS SHALL BE PLACED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER.
- 2.) CONTRACTOR TO CONTACT ALL EMERGENCY SERVICES AND MAIL ROUTES A MINIMUM OF 72 HOURS IN ADVANCE OF STARTING CONSTRUCTION.

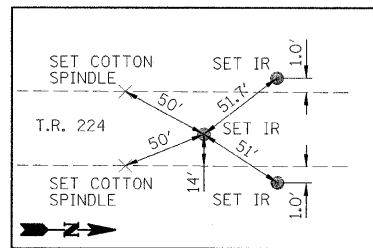
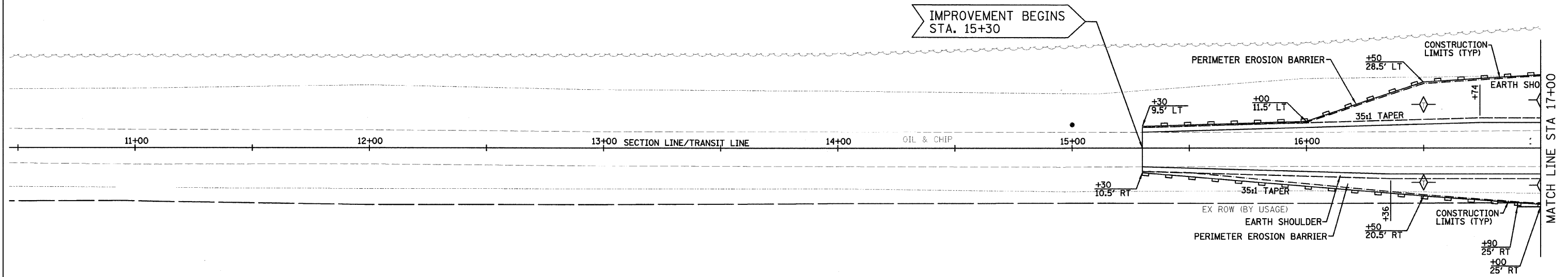
SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

DETOUR MAPS

DRAWN BY DRR	<p>2708 McGraw Drive Bloomington, Illinois 61704 800/685-6656 309/685-1671 fax</p>	FILE NO. 24-7191
DATE 03/17/09		BOOK NO. 2606
CHECKED BY MSW		SHEET NO. 4 OF 28

NE 1/4, SEC. 8, T27N, R7E, 3rd PM

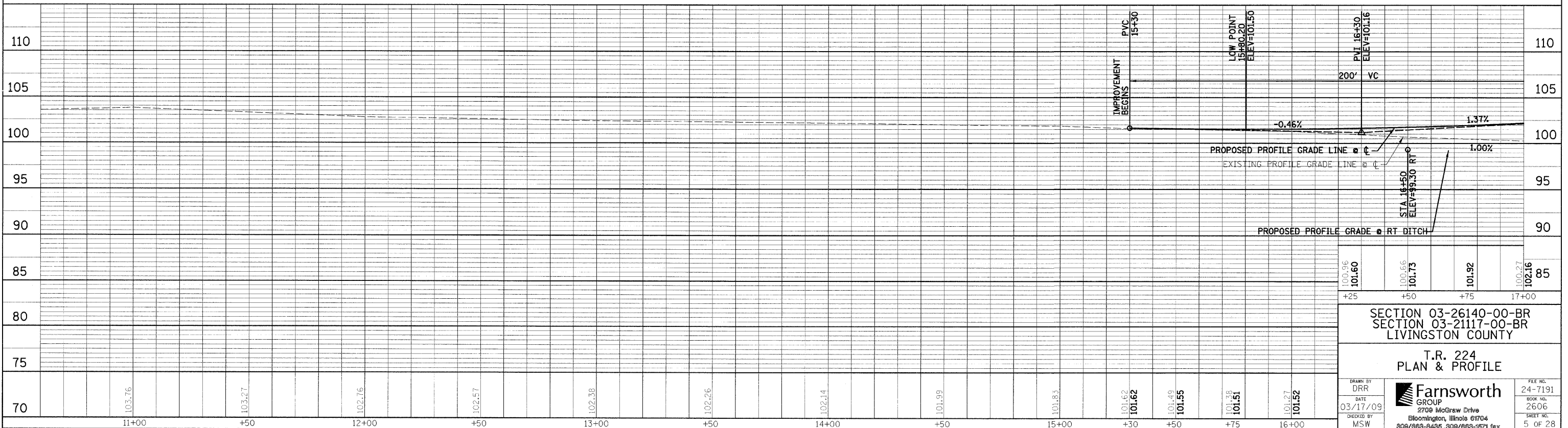
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STA.	TO STA.			
FED. ROAD DIST. NO. 7	ILLINOIS FED. AID PROJECT*			
CONTRACT NO. 87360				



- BENCHMARKS:
- 1.) PK NAIL IN WOOD FENCE POST N. ONE OF TWO POST @ THE N.W. CORNER OF BRIDGE @ STA 21+30/30' LT, ELEVATION = 97.91
  - 2.) CENTER OF BRIDGE DECK @ STA 20+00, ELEVATION = 100.02

NW 1/4, SEC. 9, T27N, R7E, 3rd PM

◇ = TEMPORARY DITCH CHECK



SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

T.R. 224  
PLAN & PROFILE

DRAWN BY DRR	FILE NO. 24-7191
DATE 03/17/09	BOOK NO. 2606
CHECKED BY MSW	SHEET NO. 5 OF 28

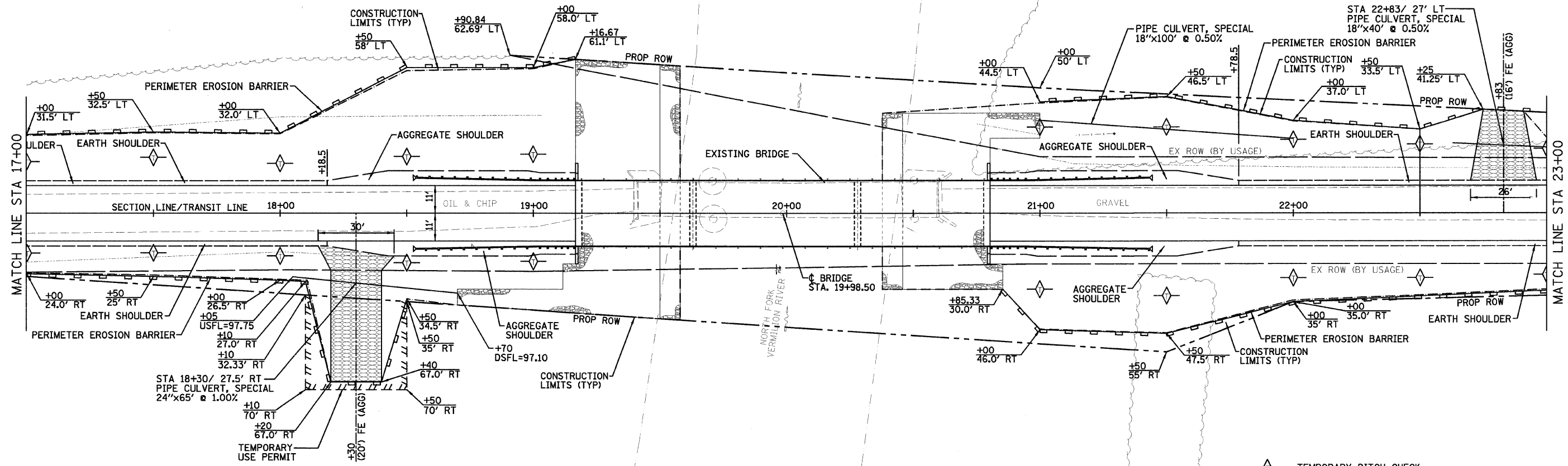
**Farnsworth GROUP**  
2709 McGraw Drive  
Bloomington, Illinois 61704  
309/863-8435, 309/863-1671 fax

FILE: c:\userp\dgn\papep.dgn  
DATE: 8-Dec-96 12:10

NE 1/4, SEC. 8, T27N, R7E, 3rd PM

BEVERLY J. BACHTOLD  
BARBARA J. OLTMAN

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	6
STA.	TO STA.			
FED. ROAD DIST. NO. 7	ILLINOIS FED. AID PROJECT*			
CONTRACT NO. 87360				



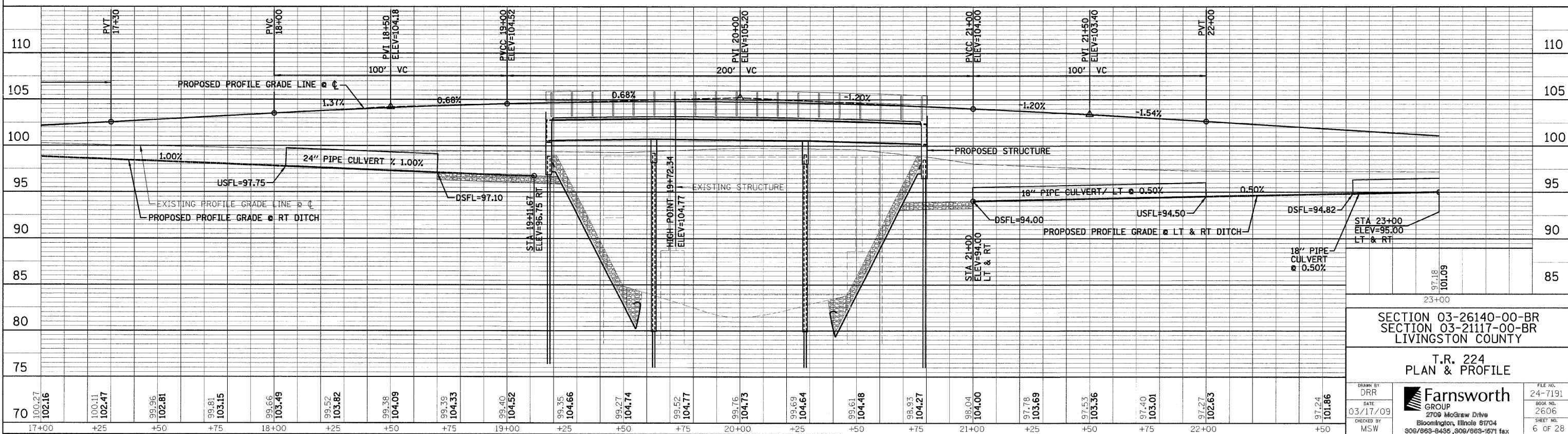
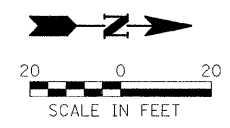
DOUGLAS W. & LORI DEININGER

NW 1/4, SEC. 9, T27N, R7E, 3rd PM

BENCHMARKS:

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◇ = TEMPORARY DITCH CHECK



SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

T.R. 224  
PLAN & PROFILE

DRAWN BY DRR	FILE NO. 24-7191
DATE 03/17/09	BOOK NO. 2606
CHECKED BY MSW	SHEET NO. 6 OF 28

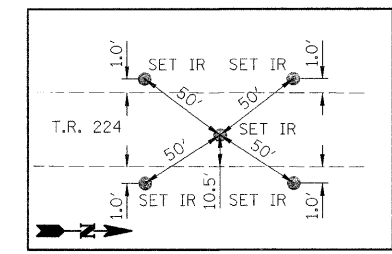
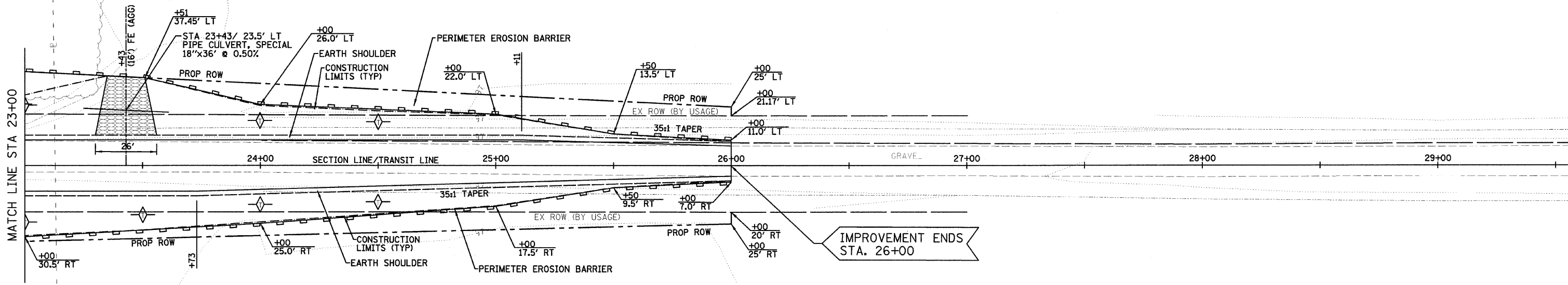
Farnsworth GROUP  
2709 McGraw Drive  
Bloomington, Illinois 61704  
309/863-8435, 309/863-1671 fax

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F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	7
STA.	TO STA.			
FED. ROAD DIST. NO. 7		ILLINOIS		FED. AID PROJECT*
CONTRACT NO. 87360				

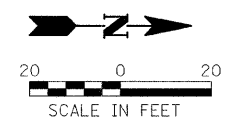
NE 1/4, SEC. 8, T27N, R7E, 3rd PM

MARY V. HANLEY &  
ROBERT DIEKEN TRUSTEES



TIES TO IR  
STA 30+00.00

◇ = TEMPORARY DITCH CHECK

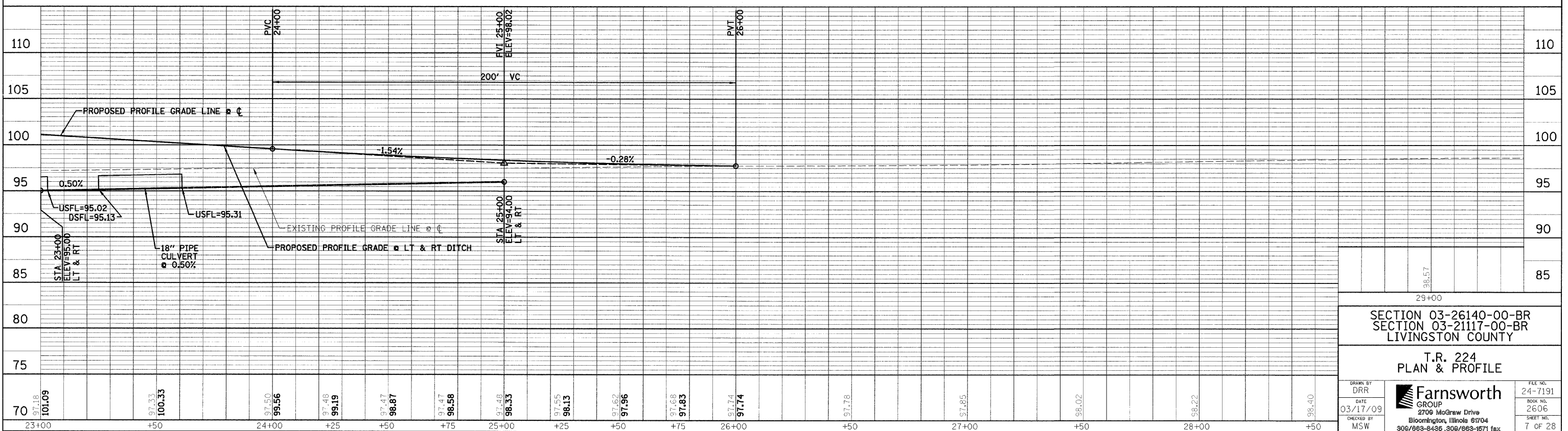


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DOUGLAS W. DEININGER

NW 1/4, SEC. 9, T27N, R7E, 3rd PM



SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

T.R. 224  
PLAN & PROFILE

DRAWN BY DRR	<p>2706 McGraw Drive Bloomington, Illinois 61704 309/863-8436, 309/863-1671 fax</p>	FILE NO. 24-7191
DATE 03/17/09		BOOK NO. 2606
CHECKED BY MSW		SHEET NO. 7 OF 28

FILE: c:\userp\dgm\pdpeng.dgn  
 DATE: 8-Dec-06 12:40

Benchmarks: 1.) P.K. nail in wood fence post N. one of two post @ the N.W. corner of bridge @ Sta. 11+30/30' Lt., Elevation = 97.91  
 2.) Center of bridge deck @ Sta. 10+00, Elevation = 100.02

Existing Structure: Consist of a three-span metal truss bridge with a timber deck on concrete abutments and metal rapped concrete piers. The structure is not skewed to the roadway and is approximately 14' out to out and 122' back to back of abutments. The existing structure has no salvage value.

**DESIGN SPECIFICATIONS**

AASHTO 2002

**LOADING HS20-44**

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

**DESIGN STRESSES**

CAST IN PLACE CONCRETE (FIELD UNITS)

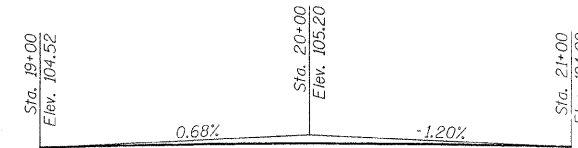
$f'_c = 4,000$  psi  
 $f_y = 60,000$  psi (Reinforcement)

STRUCTURAL STEEL

$f_y = 50,000$  psi

**SEISMIC DATA**

Seismic Performance Category (SPC) = A  
 Bedrock Acceleration Coefficient (A) = 0.043  
 Site Coefficient (S) = 1.0

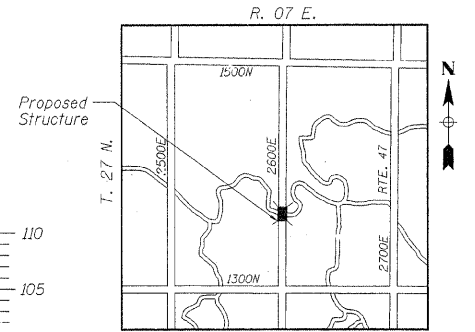


**PROFILE GRADE**

T.R. 224B (along roadway)

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	8
STA. TO STA.				
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT*	
CONTRACT NO. 87360		SHEET NO. B1		

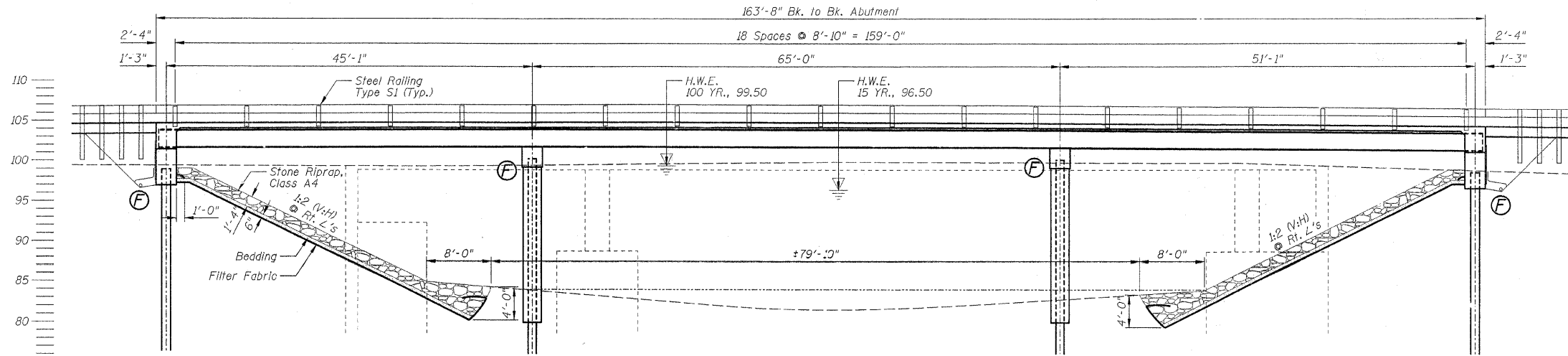
OF 17 SHEETS



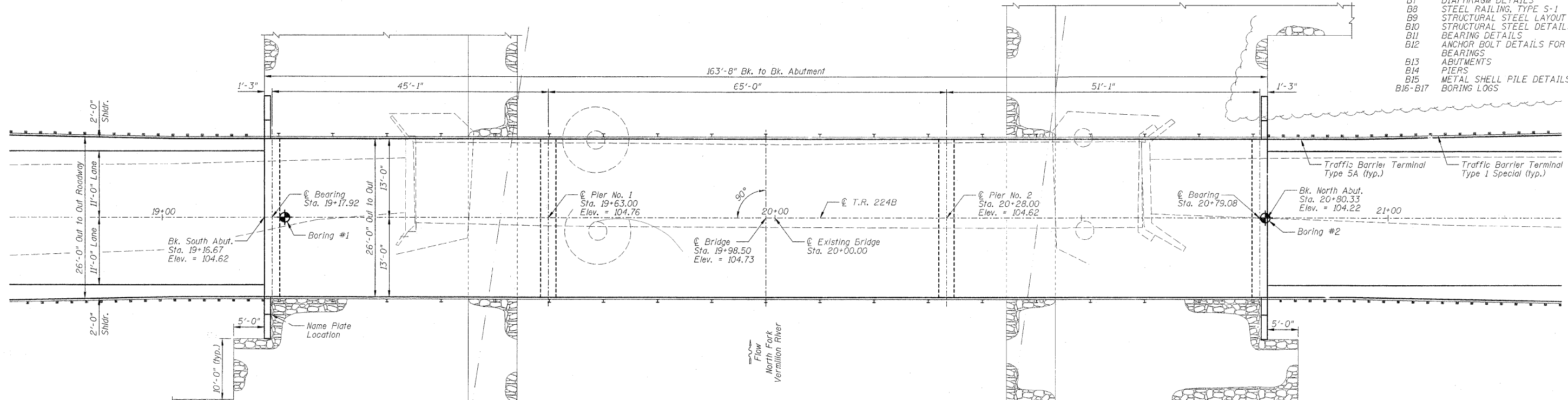
**LOCATION MAP**

**INDEX TO SHEETS**

SHEET NO.	TITLE
B1	GENERAL PLAN AND ELEVATION SECTION THRU INTEGRAL ABUTMENT, BILL OF MATERIALS AND GENERAL NOTES
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B3	ELEVATION LOCATIONS AND DEAD LOAD DEFLECTION DIAGRAM
B4	TOP OF SLAB ELEVATIONS
B5	SUPERSTRUCTURE PLAN AND CROSS SECTION
B6	DIAPHRAGM DETAILS
B7	STEEL RAILING, TYPE S-1
B8	STRUCTURAL STEEL LAYOUT
B9	STRUCTURAL STEEL DETAILS
B10	BEARING DETAILS
B11	ANCHOR BOLT DETAILS FOR BEARINGS
B12	ABUTMENTS
B13	PIERS
B14	METAL SHELL PILE DETAILS
B15	BORING LOGS
B16-B17	



**ELEVATION**



**PLAN**

**WATERWAY INFORMATION**

Drainage Area (Sq. Mi.) = 279		Low Grade Elev. = 97.50 @ Sta. 15+00							
Flood Year	Q C.F.S.	Opening (Sq. Ft.)		Nat. H.W.E.		Head-Ft.		Headwater El.	
		Exist.	Prop.	Exist.	Prop.	Exist.	Prop.	Exist.	Prop.
Design	15	6701	1352	1410	96.5	0.1	0.0	96.6	96.5
Base	100	9879	1481	1888	99.5	0.2	0.3	99.7	99.8
Max. Freq.									
Overtopping									

I certify that to the best of my knowledge, this bridge design is structurally adequate for the design loading shown on the plans. The design is an economical one for the style of structure and complies with requirements of the current 'AASHTO Standard Specifications for Highway Bridges'.



Mark S. Wylie Date 3/17/09  
 MARK S. WYLIE  
 ILLINOIS STRUCTURAL ENGINEER  
 NO. 081-005002  
 Exp. Date 11/30/10

T.R. 224B OVER  
 NORTH FORK VERMILION RIVER  
 BUILT 200... BY  
 LIVINGSTON COUNTY  
 SECTION 03-26140-00-BR  
 SECTION 03-21117-00-BR  
 STATION 19+98.50  
 LOADING HS20  
 STR. NO. 053-4175

**NAME PLATE DETAIL**  
 See Standard 515001

SECTION 03-26140-00-BR  
 SECTION 03-21117-00-BR  
 LIVINGSTON COUNTY

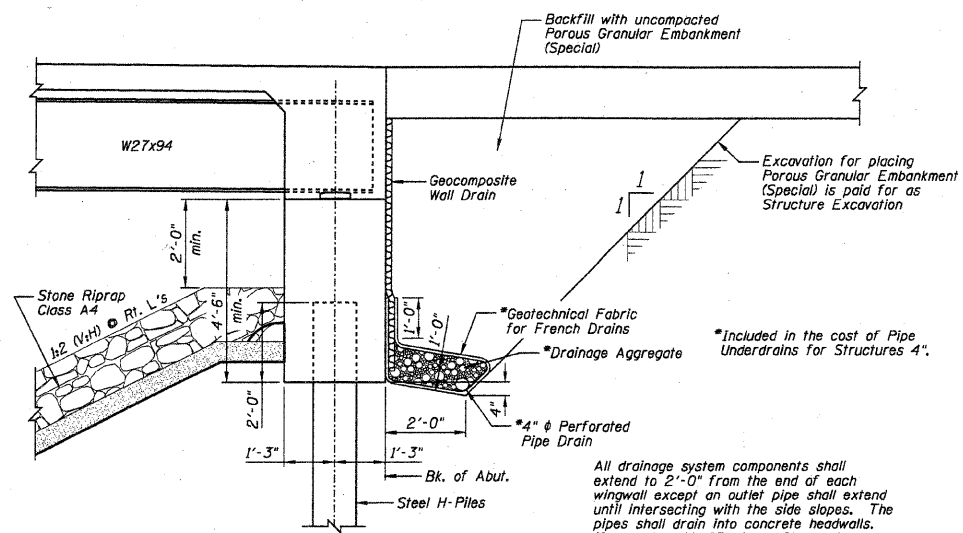
**GENERAL PLAN AND ELEVATION**

DESIGNED BY S.D.H.		FILE NO. 24-7191
CHECKED BY D.J.M.		DATE 03/17/09
CHECKED BY M.S.W.	<small>2700 S. Greenwood Drive        Bloomington, Illinois 61704        309/838-8438, 309/838-1871 fax</small>	SHEET NO. 8 of 28



F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	9
STA.	TO STA.			
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		
CONTRACT NO. 87360	SHEET NO. B2			

OF 17 SHEETS



SECTION THRU INTEGRAL ABUTMENT

All drainage system components shall extend to 2'-0" from the end of each wingwall except an outlet pipe shall extend until intersecting with the side slopes. The pipes shall drain into concrete headwalls. (See Article 601.05 of the Standard Specifications and Highway Standard 601101).

TOTAL BRIDGE BILL OF MATERIALS

ITEM	UNIT	SUPER	SUB	TOTAL
Porous Granular Embankment, Special	Ton		250	250
Stone Riprap, Class A4	Ton		970	970
Filter Fabric	Sq. Yd.		1065	1065
Removal of Existing Structures	Each	1		1
Structure Excavation	Cu. Yd.		820	820
Concrete Structures	Cu. Yd.		71.9	71.9
Concrete Superstructure	Cu. Yd.	122.6		122.6
Bridge Deck Grooving	Sq. Yd.	4.36		4.36
Protective Coat	Sq. Yd.	4.36		4.36
Furnishing and Erecting Structural Steel	L. Sum	1		1
Stud Shear Connectors	Each	1812		1812
Reinforcement Bars, Epoxy Coated	Pound	31150	5530	36680
Steel Rolling, Type S1	Foot	328		328
Furnishing Metal Shell Piles 12"x0.250"	Foot		1031	1031
Driving Piles	Foot		1031	1031
Test Pile Metal Shells	Each		2	2
Name Plates	Each	1		1
Geocomposite Wall Drain	Sq. Yd.		68	68
Pipe Underdrains For Structures 4"	Foot		116	116

GENERAL NOTES

- Fasteners shall be AASHTO M164 Type 1, mechanically galvanized bolts. Bolts  $\frac{7}{8}$  in.  $\phi$ , nuts  $\frac{5}{8}$  in.  $\phi$ , unless otherwise noted.
- Calculated weight of Structural Steel = 73,690 lb.
- All structural steel shall be AASHTO M 222 Grade 50W.
- No field welding is permitted except as specified in the contract documents.
- Reinforcement bars shall conform to the requirements of AASHTO M-31, M-42 or M-53 Grade 60.
- All reinforcement bars shall be epoxy-coated.
- Bearing seat surfaces shall be constructed or adjusted to the designated elevations within a tolerance of  $\frac{1}{8}$  in. (0.01 ft.). Adjustment shall be made either by grinding the surface or by shimming the bearings.
- Layout of the slope protection system may be varied to suit ground conditions in the field as directed by the Engineer.
- The embankment configuration shown shall be the minimum that must be placed and compacted prior to construction of the abutments.
- The Contractor shall drive test piles to 110% of the nominal required bearing specified in production locations at substructures specified or approved by the Engineer before ordering the remainder of piles.
- The Contractor shall make allowance for the deflection of forms, shrinkage and settlement of falsework, in addition to allowance for dead load deflection.
- The Contractor is to field locate all utilities before starting construction.
- Cast in place Class S1 Concrete shall be used throughout except for the superstructure (Deck), which shall be Class BD Concrete. The 14-day compressive strength is  $f'c = 4000$  psi. Concrete clear cover shall be 2" unless otherwise shown.
- The concrete slab shall be finished in accordance with Article 503.17 of the Standard Specifications and shall be poured in one continuous operation.
- The design specifications are the 2002 AASHTO Standard Specifications for Highway Bridges.
- The live loading is HS20 with an allowance of 50lb/sq. ft. for future wearing surface.
- This project shall be constructed in accordance with IDOT Standard Specifications for Road and Bridge Construction adopted January 1, 2007.
- See Sheets B16 and B17 for boring data.
- Pier piles shall have a minimum tip elevation of 15' below streambed (min. tip elev. = 69.00).
- This structure has been designated to be stable for scour conditions in accordance with the FHWA Technical Advisory-T 5140.23, "Evaluating Scour at Bridges" Hydraulic Engineering Circular 18-"Evaluating Scour at Bridges".
- The Contractor shall clean out the channel within the right-of-way as shown in elevation. The cost of for removal or replacement of fill in the channel shall be incidental.

SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

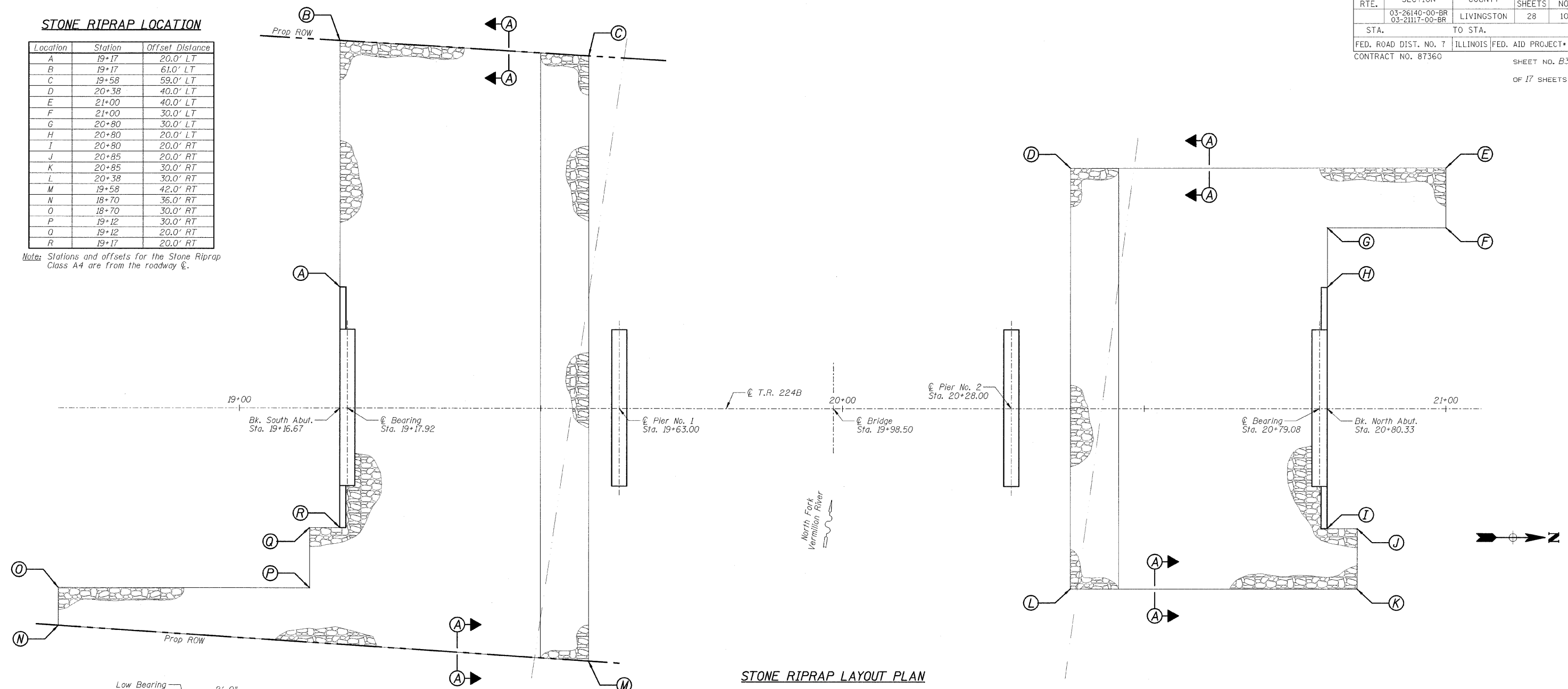
SECTION THRU INTEGRAL  
ABUTMENT, BILL OF MATERIALS  
AND GENERAL NOTES

DESIGNED BY S.D.H.	<p>2700 McGraw Drive Bloomington, Illinois 61704 309/403-3436, 309/663-1871 fax</p>	FILE NO. 24-7191
DRAWN BY D.J.M.		DATE 03/17/09
CHECKED BY M.S.W.		SHEET NO. 9 of 28

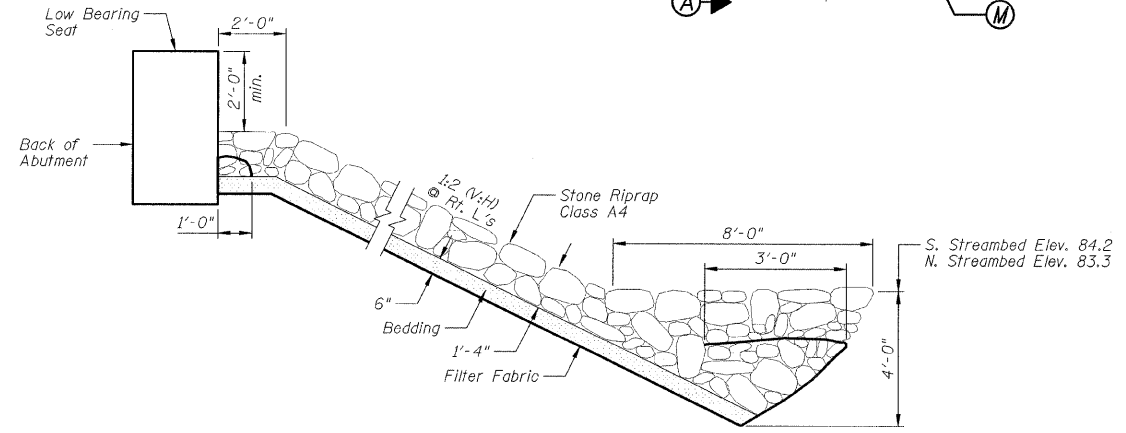
**STONE RIPRAP LOCATION**

Location	Station	Offset Distance
A	19+17	20.0' LT
B	19+17	61.0' LT
C	19+58	59.0' LT
D	20+38	40.0' LT
E	21+00	40.0' LT
F	21+00	30.0' LT
G	20+80	30.0' LT
H	20+80	20.0' LT
I	20+80	20.0' RT
J	20+85	20.0' RT
K	20+85	30.0' RT
L	20+38	30.0' RT
M	19+58	42.0' RT
N	18+70	36.0' RT
O	18+70	30.0' RT
P	19+12	30.0' RT
Q	19+12	20.0' RT
R	19+17	20.0' RT

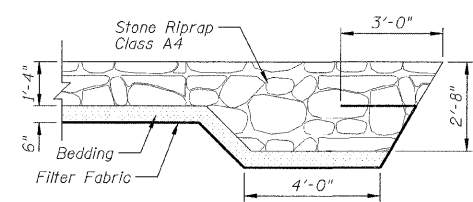
Note: Stations and offsets for the Stone Riprap Class A4 are from the roadway centerline.



**STONE RIPRAP LAYOUT PLAN**



**STONE RIPRAP ANCHOR DETAIL**

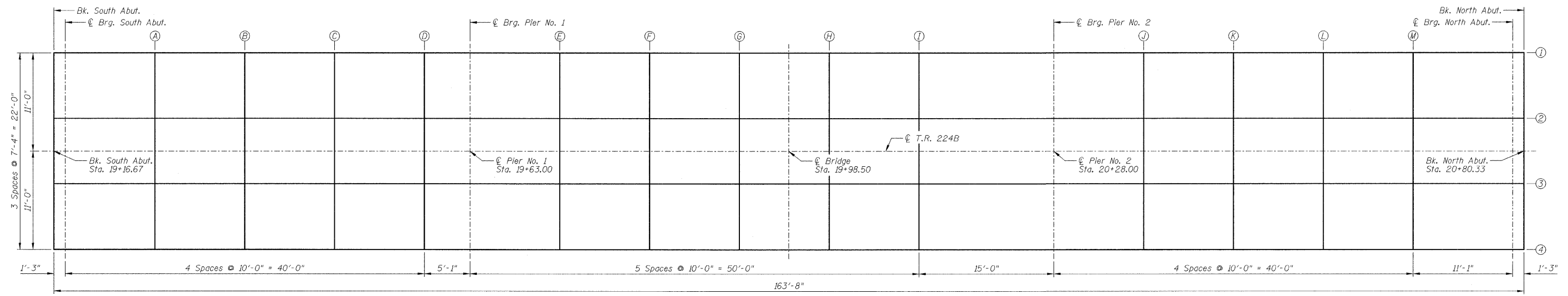


**SECTION A-A**

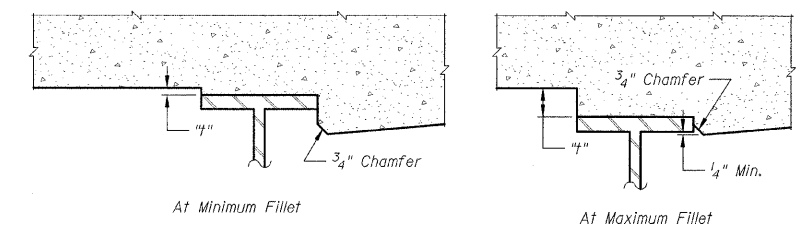
SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

**STONE RIPRAP LAYOUT PLAN**

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	11
STA.		TO STA.		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT*	
CONTRACT NO. 87360		SHEET NO. B4		
OF 17 SHEETS				

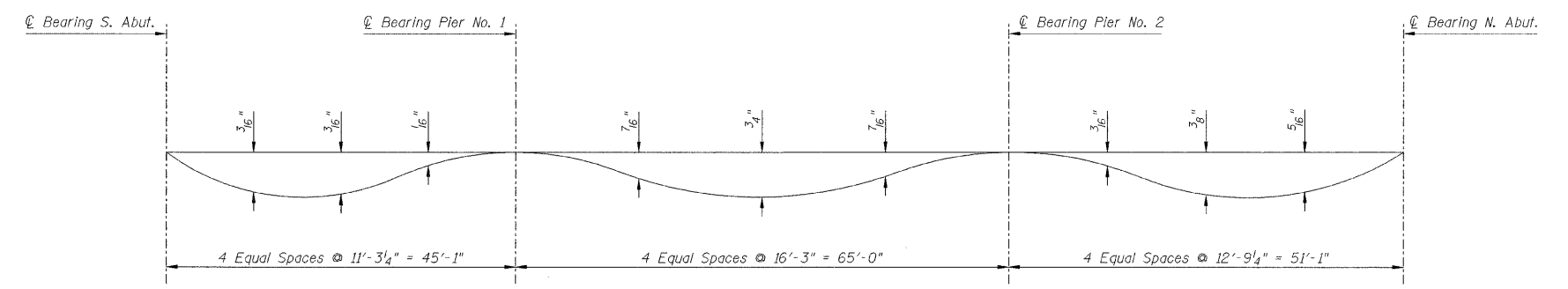


PLAN



To determine "t": After all structural steel has been erected, elevations of the top flanges of the beams shall be taken at intervals shown on Sheet B5. These elevations subtracted from the "Theoretical Grade Elevations Adjusted for Dead Load Deflection" shown below, minus slab thickness, equals the fillet heights "t" above top flange of beams.

FILLET HEIGHTS



DEAD LOAD DEFLECTION DIAGRAM  
(Includes weight of concrete only)

- Notes:
- 1.) The above deflections are not to be used in the field if the Engineer is working from the theoretical grade elevations adjusted for dead load deflections as shown on Sheet B5.
  - 2.) For elevations, see Sheet B5. Work this sheet with Sheet B5.

**SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY**

**ELEVATION LOCATIONS AND  
DEAD LOAD DEFLECTION DIAGRAM**

DESIGNED BY S.D.H.	<b>Farnsworth GROUP</b> <small>2706 McGraw Drive Bloomington, Illinois 61704 309/843-8436, 309/843-4771 fax</small>	FILE NO. 24-7191
DRAWN BY D.J.M.		DATE 03/17/09
CHECKED BY M.S.W.		SHEET NO. 11 of 28

**Beam 1**

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevation Adjusted for Dead Load Deflection
Back of South Abut.	19+16.668	-11.000	104.448	104.448
☉ Brg. South Abut.	19+17.918	-11.000	104.455	104.455
A	19+27.918	-11.000	104.501	104.514
B	19+37.918	-11.000	104.538	104.554
C	19+47.918	-11.000	104.566	104.573
D	19+57.918	-11.000	104.584	104.584
☉ Brg. Pier No. 1	19+63.000	-11.000	104.590	104.590
E	19+73.000	-11.000	104.594	104.615
F	19+83.000	-11.000	104.589	104.636
G	19+93.000	-11.000	104.574	104.636
H	20+03.000	-11.000	104.550	104.605
I	20+13.000	-11.000	104.516	104.548
☉ Brg. Pier No. 2	20+28.000	-11.000	104.448	104.448
J	20+38.000	-11.000	104.391	104.400
K	20+48.000	-11.000	104.325	104.351
L	20+58.000	-11.000	104.249	104.284
M	20+68.000	-11.000	104.164	104.190
☉ Brg. North Abut.	20+79.084	-11.000	104.059	104.059
Back of North Abut.	20+80.334	-11.000	104.046	104.046

**Centerline - T.R. 224B & Profile Grade Line**

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevation Adjusted for Dead Load Deflection
Back of South Abut.	19+16.668	0.000	104.620	104.620
☉ Brg. South Abut.	19+17.918	0.000	104.627	104.627
A	19+27.918	0.000	104.673	104.686
B	19+37.918	0.000	104.710	104.725
C	19+47.918	0.000	104.738	104.745
D	19+57.918	0.000	104.756	104.756
☉ Brg. Pier No. 1	19+63.000	0.000	104.762	104.762
E	19+73.000	0.000	104.766	104.787
F	19+83.000	0.000	104.761	104.808
G	19+93.000	0.000	104.746	104.807
H	20+03.000	0.000	104.722	104.777
I	20+13.000	0.000	104.688	104.720
☉ Brg. Pier No. 2	20+28.000	0.000	104.620	104.620
J	20+38.000	0.000	104.563	104.572
K	20+48.000	0.000	104.497	104.523
L	20+58.000	0.000	104.421	104.456
M	20+68.000	0.000	104.336	104.362
☉ Brg. North Abut.	20+79.084	0.000	104.230	104.230
Back of North Abut.	20+80.334	0.000	104.218	104.218

**Beam 4**

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevation Adjusted for Dead Load Deflection
Back of South Abut.	19+16.668	11.000	104.448	104.448
☉ Brg. South Abut.	19+17.918	11.000	104.455	104.455
A	19+27.918	11.000	104.501	104.514
B	19+37.918	11.000	104.538	104.554
C	19+47.918	11.000	104.566	104.573
D	19+57.918	11.000	104.584	104.584
☉ Brg. Pier No. 1	19+63.000	11.000	104.590	104.590
E	19+73.000	11.000	104.594	104.615
F	19+83.000	11.000	104.589	104.636
G	19+93.000	11.000	104.574	104.636
H	20+03.000	11.000	104.550	104.605
I	20+13.000	11.000	104.516	104.548
☉ Brg. Pier No. 2	20+28.000	11.000	104.448	104.448
J	20+38.000	11.000	104.391	104.400
K	20+48.000	11.000	104.325	104.351
L	20+58.000	11.000	104.249	104.284
M	20+68.000	11.000	104.164	104.190
☉ Brg. North Abut.	20+79.084	11.000	104.059	104.059
Back of North Abut.	20+80.334	11.000	104.046	104.046

**Beam 2**

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevation Adjusted for Dead Load Deflection
Back of South Abut.	19+16.668	-3.667	104.563	104.563
☉ Brg. South Abut.	19+17.918	-3.667	104.569	104.569
A	19+27.918	-3.667	104.616	104.628
B	19+37.918	-3.667	104.653	104.668
C	19+47.918	-3.667	104.681	104.688
D	19+57.918	-3.667	104.699	104.699
☉ Brg. Pier No. 1	19+63.000	-3.667	104.705	104.705
E	19+73.000	-3.667	104.709	104.730
F	19+83.000	-3.667	104.703	104.751
G	19+93.000	-3.667	104.689	104.750
H	20+03.000	-3.667	104.664	104.720
I	20+13.000	-3.667	104.631	104.663
☉ Brg. Pier No. 2	20+28.000	-3.667	104.563	104.563
J	20+38.000	-3.667	104.506	104.515
K	20+48.000	-3.667	104.440	104.466
L	20+58.000	-3.667	104.364	104.398
M	20+68.000	-3.667	104.279	104.304
☉ Brg. North Abut.	20+79.084	-3.667	104.173	104.173
Back of North Abut.	20+80.334	-3.667	104.161	104.161

**Beam 3**

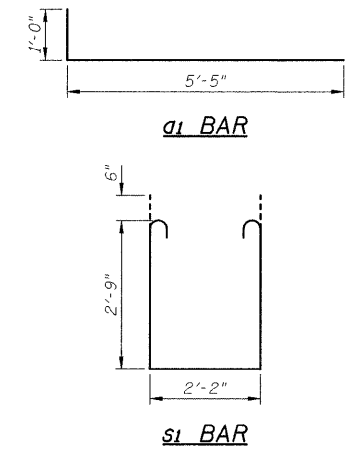
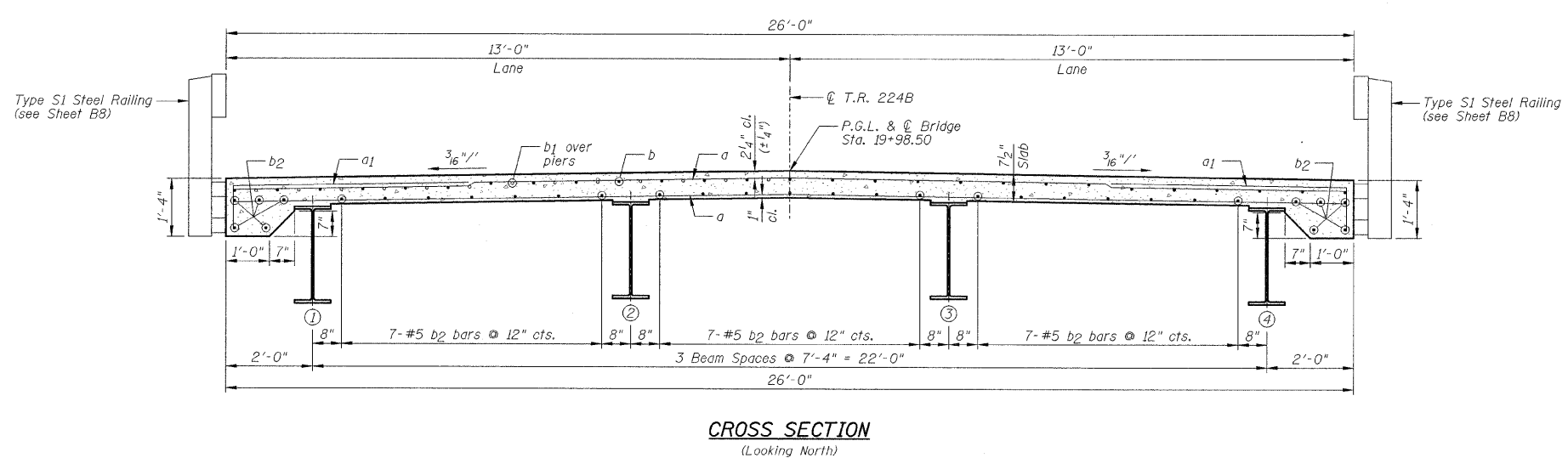
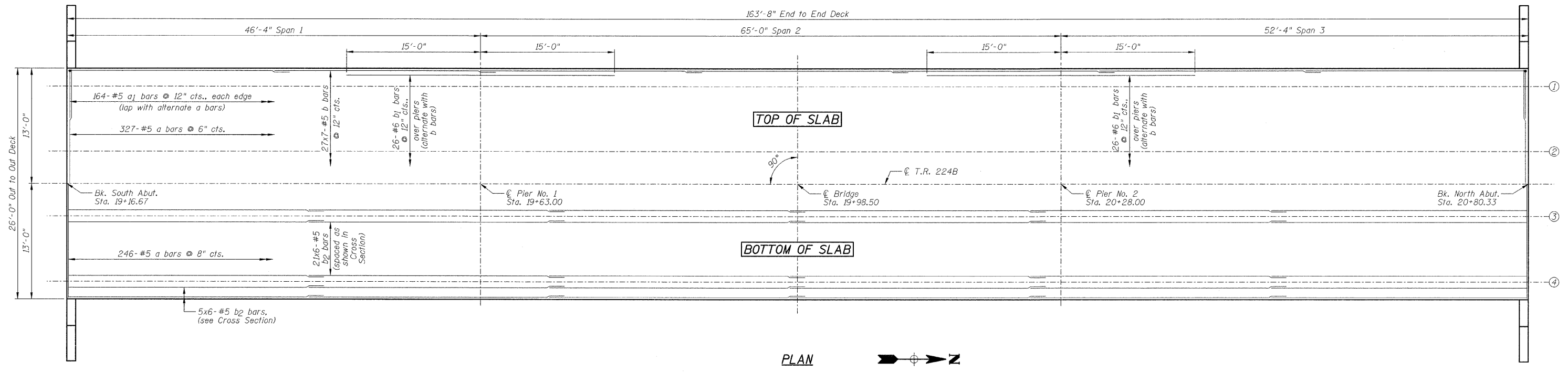
Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevation Adjusted for Dead Load Deflection
Back of South Abut.	19+16.668	3.667	104.563	104.563
☉ Brg. South Abut.	19+17.918	3.667	104.569	104.569
A	19+27.918	3.667	104.616	104.628
B	19+37.918	3.667	104.653	104.668
C	19+47.918	3.667	104.681	104.688
D	19+57.918	3.667	104.699	104.699
☉ Brg. Pier No. 1	19+63.000	3.667	104.705	104.705
E	19+73.000	3.667	104.709	104.730
F	19+83.000	3.667	104.703	104.751
G	19+93.000	3.667	104.689	104.750
H	20+03.000	3.667	104.664	104.720
I	20+13.000	3.667	104.631	104.663
☉ Brg. Pier No. 2	20+28.000	3.667	104.563	104.563
J	20+38.000	3.667	104.506	104.515
K	20+48.000	3.667	104.440	104.466
L	20+58.000	3.667	104.364	104.398
M	20+68.000	3.667	104.279	104.304
☉ Brg. North Abut.	20+79.084	3.667	104.173	104.173
Back of North Abut.	20+80.334	3.667	104.161	104.161

**NOTE:**

For Elevation Locations see Sheet B4.

SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

TOP OF SLAB ELEVATIONS



**SUPERSTRUCTURE BILL OF MATERIALS**

Bar	No.	Size	Length	Shape
a	573	#5	25'-8"	—
a1	327	#5	6'-5"	—
b	189	#5	24'-10"	—
b1	52	#6	30'-0"	—
b2	186	#5	28'-8"	—
m	6	#6	25'-8"	—
m1	16	#6	8'-7"	—
m2	6	#6	7'-0"	—
m3	4	#6	1'-9"	—
s1	54	#4	8'-8"	□
Item	Unit	Quantity		
Reinforcement Bars, Epoxy Coated	Pound	31,150		
Concrete Superstructures	Cu. Yd.	122.6		

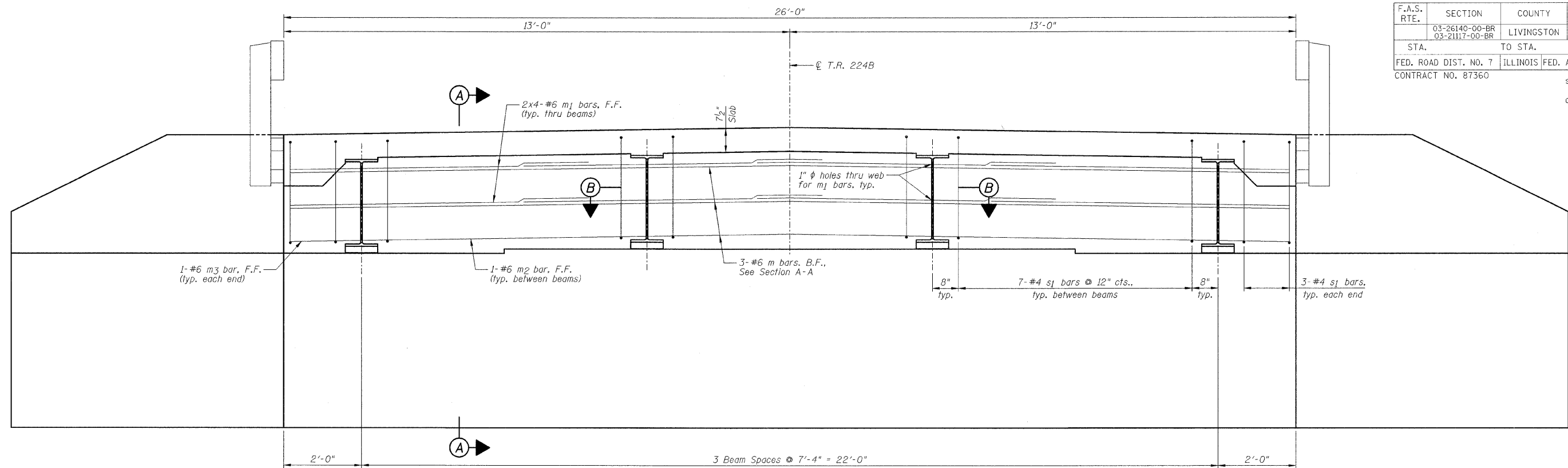
- NOTES:**
- 1.) Work this sheet with Sheet B7.
  - 2.) Bars indicated thus 27x7-#5 Etc. indicates 27 lines of bars with 7 lengths per line.
  - 3.) Minimum bar lap #5 = 1'-8".

SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

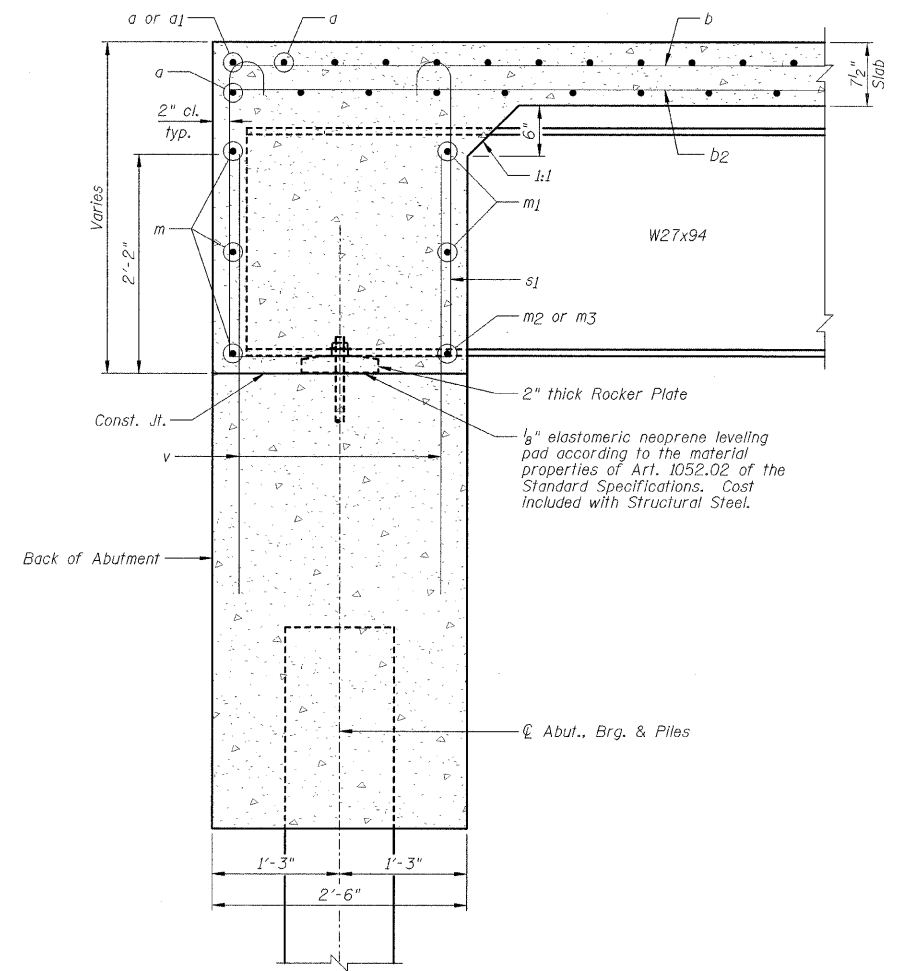
**SUPERSTRUCTURE PLAN AND CROSS SECTION**

DESIGNED BY S.D.H.	<p>Farnsworth GROUP 2700 Madison Drive Bloomington, Illinois 61704 309/883-8436, 309/883-1571 fax</p>	FILE NO. 24-7191
DRAWN BY D.J.M.		DATE 03/17/09
CHECKED BY M.S.W.		SHEET NO. 13 of 28

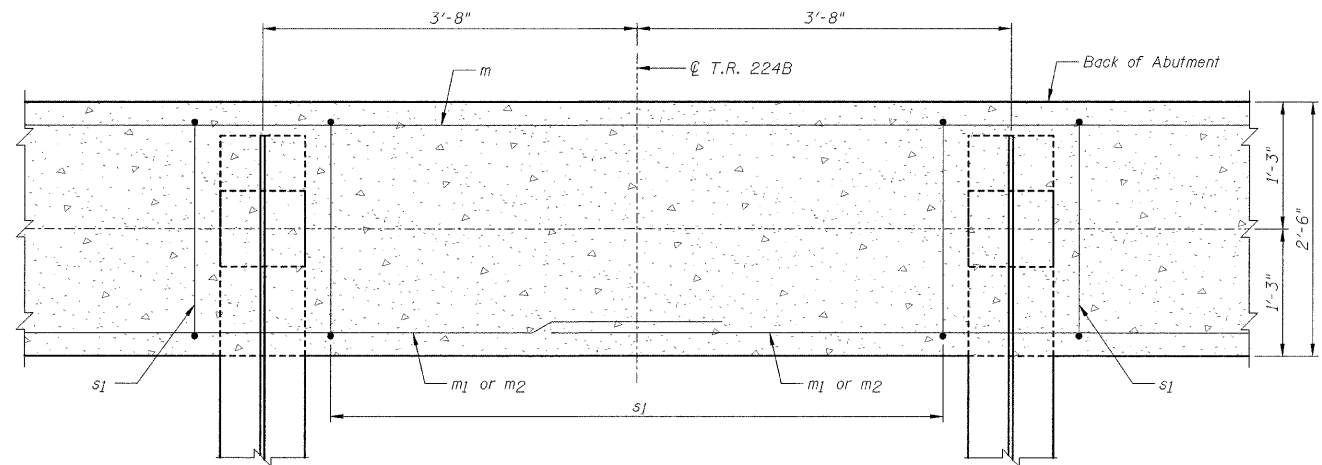
F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	14
STA.	TO STA.			
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT*		
CONTRACT NO. 87360		SHEET NO. B7 OF 17 SHEETS		



**ELEVATION OF DIAPHRAGM AT ABUTMENT**



**SECTION A-A**



**SECTION B-B**

**NOTES:**

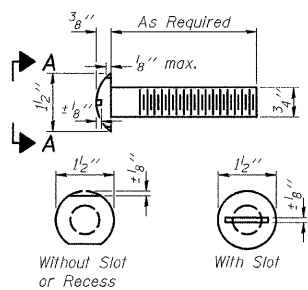
- 1.) Work this sheet with Sheets B6, B10 & B13.
- 2.) Quantities for reinforcing steel & concrete superstructure in the diaphragm shall be included with the superstructure. See Sheet B6.
- 3.) F.F. denotes Front Face, B.F. denotes Back Face.
- 4.) Minimum bar lap #6 = 2'-10".

SECTION 03-26140-00-BR SECTION 03-21117-00-BR LIVINGSTON COUNTY	
<b>DIAPHRAGM DETAILS</b>	
DESIGNED BY S.D.H.	FILE NO. 24-7191
DRAWN BY D.J.M.	DATE 03/17/09
CHECKED BY M.S.W.	SHEET NO. 14 of 28

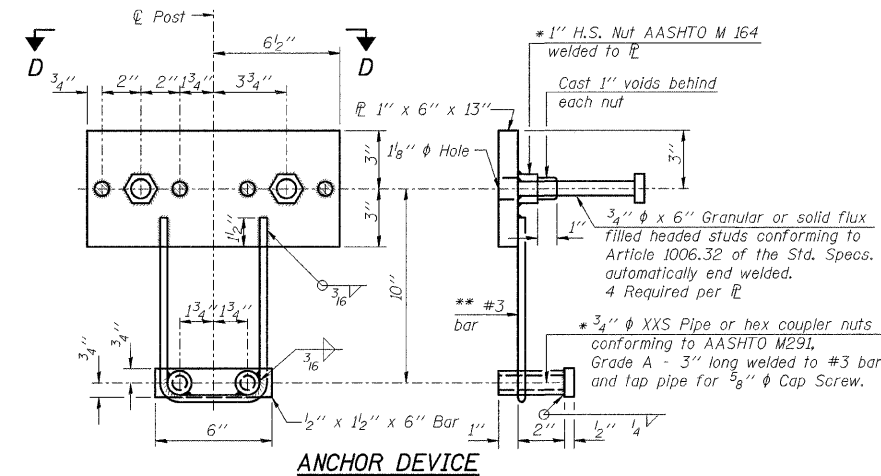
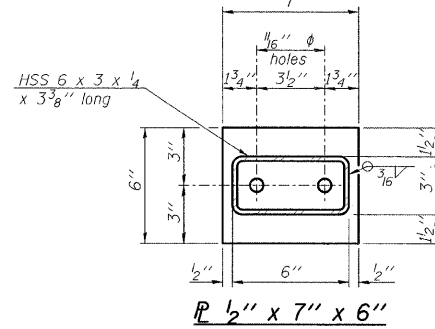
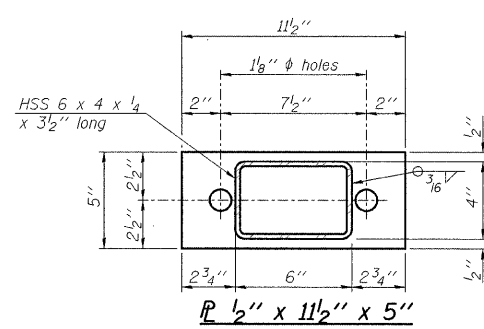
**Farnsworth GROUP**  
2700 McGraw Drive  
Bloomington, Illinois 61704  
309/893-8436, 309/893-1871 fax

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	15
STA.	TO STA.			
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		
CONTRACT NO. 87360		SHEET NO. B8		

OF 17 SHEETS

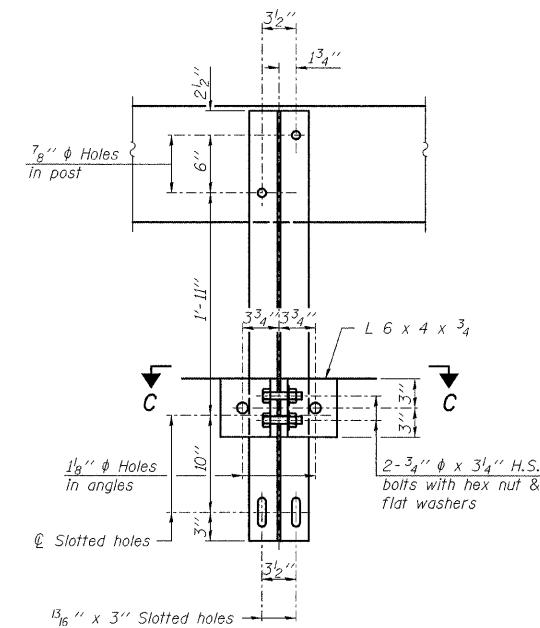


**VIEW A-A  
ROUND HEAD BOLT**

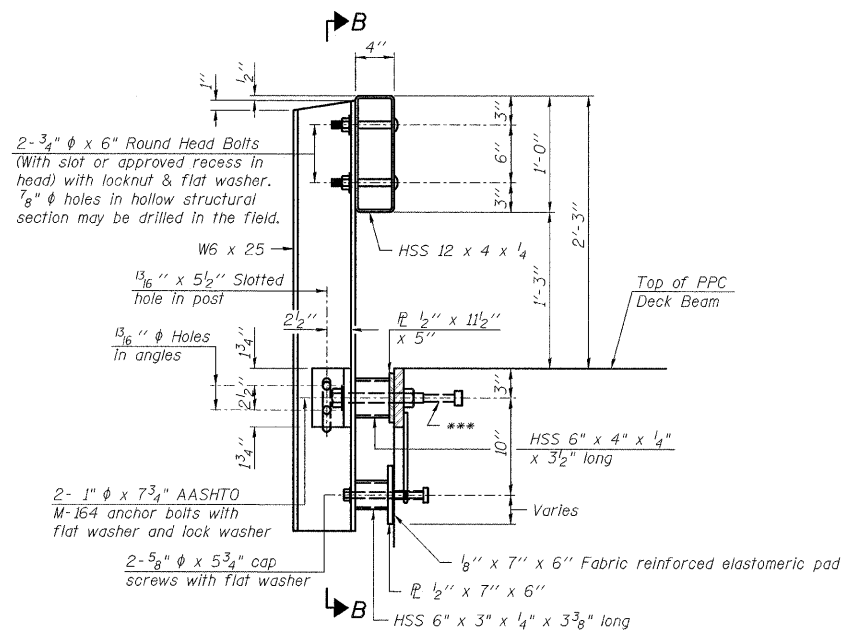


**ANCHOR DEVICE**

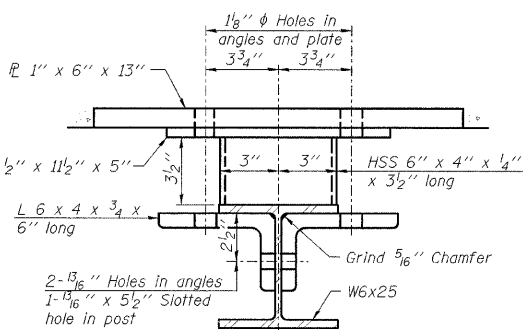
- \* Threaded areas shall be plugged or blocked off during casting of beam.
- \*\* Whenever the lower insert assemblies interfere with strand locations, the #3 bars shall be cut and adjusted in order to allow raising or lowering of the lower inserts. Maximum adjustment not to exceed 1/2 inch.



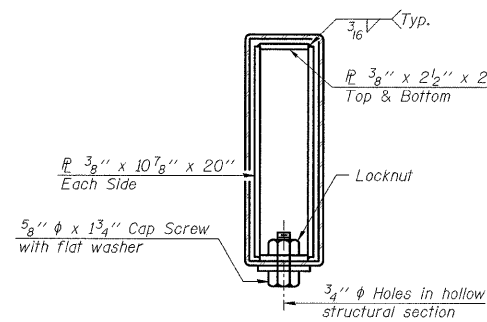
**SECTION B-B**



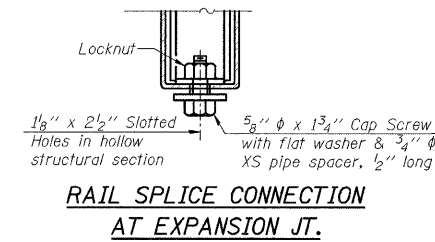
**SECTION AT RAILING POST**



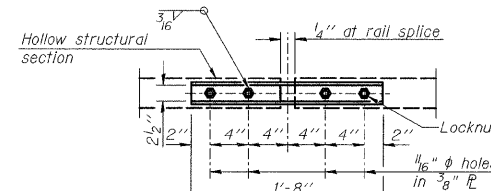
**SECTION C-C**



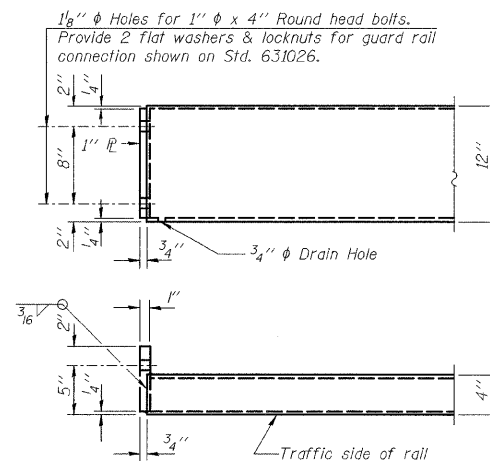
**SECTIONS AT RAIL SPLICE**



**RAIL SPLICE CONNECTION  
AT EXPANSION JT.**



**PLAN-BOTT. SPLICE R  
TYPICAL**



**END OF RAIL DETAILS**

Notes:  
 All field drilled holes shall be coated with an approved zinc rich paint before erection.  
 For multi-span bridges, sufficient 1/4 inch x 6 inch x 1-2 inch galvanized steel shims shall be provided to align rail between adjacent spans. Cost included with Steel Railing, Type S-1.  
 All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.  
 \*\*\* The studs of the anchor devices shall be placed below the top reinforcement bars and the outermost longitudinal reinforcement bar shall be placed directly above the studs of the rail post anchor device.

**BILL OF MATERIAL**

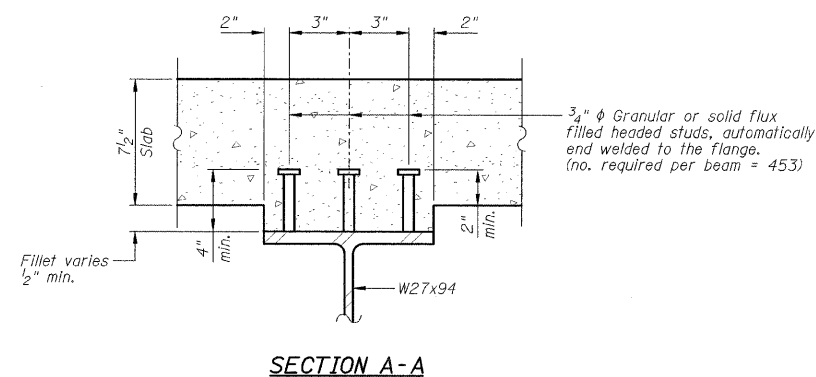
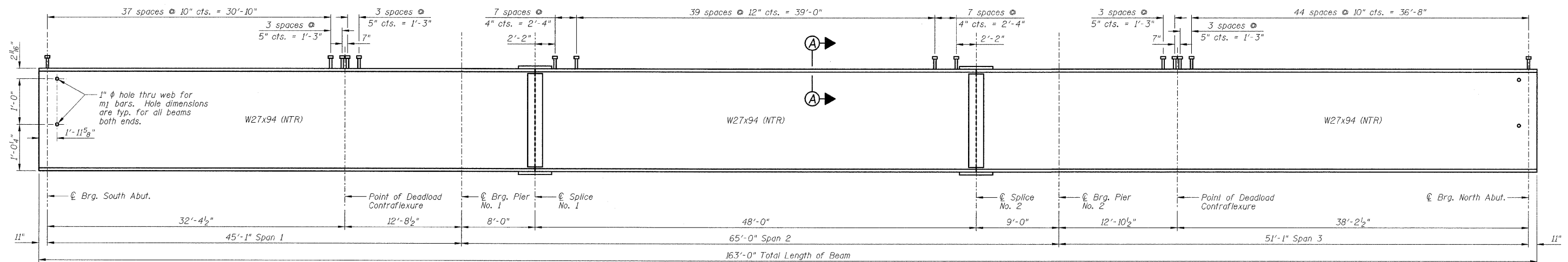
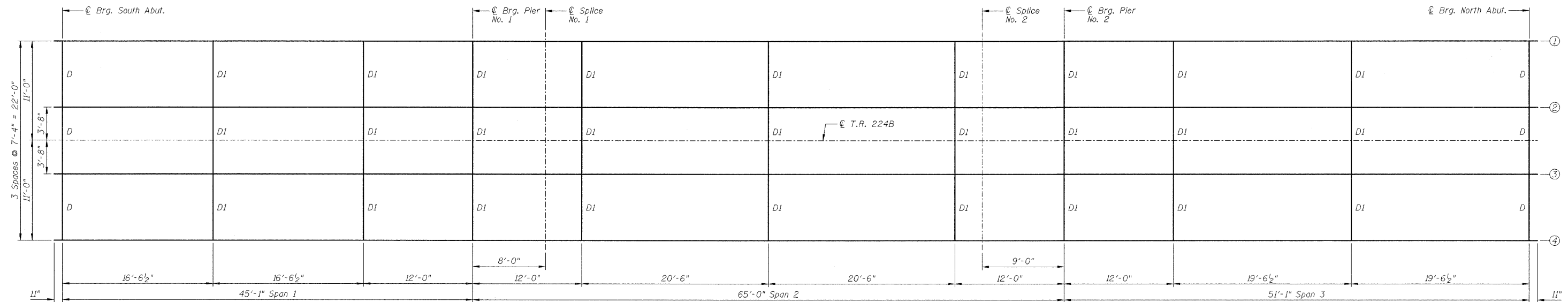
Item	Unit	Quantity
Steel Railing, Type S-1	Foot	328

SECTION 03-26140-00-BR  
 SECTION 03-21117-00-BR  
 LIVINGSTON COUNTY

STEEL RAILING, TYPE S-1

DESIGNED BY S.D.H.	 2700 McGraw Drive Bloomington, Illinois 61704 309/263-8436, 309/883-1671 fax	FILE NO. 24-7191
DRAWN BY D.J.M.		DATE 03/17/09
CHECKED BY M.S.W.		SHEET NO. 15 of 28

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	16
STA.		TO STA.		
FED. ROAD DIST. NO. 7		ILLINOIS FED. AID PROJECT		
CONTRACT NO. 87360		SHEET NO. B9 OF 17 SHEETS		



ITEM	UNITS	TOTAL
Stud Shear Connectors	Each	1812

**NOTES:**

- 1.) Work this sheet with Sheet B10.
- 2.) See Sheet B10 for Splice Details and Diaphragm Details.
- 3.) N.T.R. designates Notch Toughness Requirements. Load carrying components designated "NTR" shall conform to the Supplemental Requirements for Notch Toughness, Zone 2.
- 4.) All cross frames or diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.

SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

**STRUCTURAL STEEL LAYOUT**

DESIGNED BY S.D.H.	<p>2700 Midway Drive Bloomington, Illinois 61704 309/898-8636, 309/898-9871 fax</p>	FILE NO. 24-7191
DRAWN BY D.J.M.		DATE 03/17/09
CHECKED BY M.S.W.		SHEET NO. 16 of 28



	0.4 Sp. 1	Pier No. 1	0.5 Sp. 2	Pier No. 2	0.6 Sp. 3
$I_s$ (in <sup>4</sup> )	3267	3267	3267	3267	3267
$I_c(n)$ (in <sup>4</sup> )	9868		9868		9868
$I_c(3n)$ (in <sup>4</sup> )	7429		7429		7429
$S_s$ (in <sup>3</sup> )	243	243	243	243	243
$S_c(n)$ (in <sup>3</sup> )	1150		1150		1150
$S_c(3n)$ (in <sup>3</sup> )	567		567		567
$Z$ (in <sup>3</sup> )		278		278	
$\phi$ (k/')	0.82	0.82	0.82	0.82	0.82
$M_D$ (k)	98	249	157	281	203
$s_D$ (k/')	0.33	0.33	0.33	0.33	0.33
$M_{sD}$ (k)	45	87	82	97	64
$M_L$ (k)	313	223	414	236	372
$M_{iL}$ (k)	92	62	109	64	105
$M_3 [M_L + i]$ (k)	675	475	872	500	795
$M_e$ (k)	106.3	1055	1441	1142	1300
$M_u$ (k)	1890	1175	1506	1175	1519
$f_s \phi_{non-comp}$ (ksi)	4.9	12.5	7.9	14.1	7.0
$f_s \phi_{comp}$ (ksi)	1.5		2.7		2.1
$f_s \phi_3 [M_L + M_i]$ (ksi)	22.4	20.2	29	21.3	26.4
$f_s$ (Overload) (ksi)	28.8	32.7	39.6	35.4	35.5
$f_s$ (Total) (ksi)		42.5		46.1	
VR (k)	54.4		47.3		55.5

	S. Abut.	Pier No. 1	Pier No. 2	N. Abut.
$R_L$ (k)	18.0	68.9	73.5	20.8
$R_R$ (k)	38.5	45.3	45.8	39.6
$R_I$ (k)	11.0	12.7	13.3	10.3
$R_{Total}$ (k)	67.5	126.9	132.6	70.7

\*Compact section  
\*\*Braced non-compact and partially braced section

$I_s, S_s$ : Non-composite moment of inertia and section modulus of the steel section used for computing  $f_s$  (Total and Overload) due to non-composite dead loads (in<sup>4</sup> and in<sup>3</sup>).

$I_c(n), S_c(n)$ : Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing  $f_s$  (Total and Overload) due to short-term composite live loads (in<sup>4</sup> and in<sup>3</sup>).

$I_c(3n), S_c(3n)$ : Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing  $f_s$  (Total and Overload) due to long-term composite (superimposed) dead loads (in<sup>4</sup> and in<sup>3</sup>).

$Z$ : Plastic Section Modulus of the steel section in non-composite areas (in<sup>3</sup>).

$\phi$ : Un-factored non-composite dead load (kips/ft.).

$M_D$ : Un-factored moment due to non-composite dead load (kip-ft.).

$s_D$ : Un-factored long-term composite (superimposed) dead load (kips/ft.).

$M_{sD}$ : Un-factored moment due to long-term composite (superimposed) dead load (kip-ft.).

$M_L$ : Un-factored live load moment (kip-ft.).

$M_i$ : Un-factored moment due to impact (kip-ft.).

$M_u$ : Factored design moment (kip-ft.).  
 $1.3 [M_D + M_{sD}] + \frac{5}{8} (M_L + M_i)$

$M_u$ : Compact composite moment capacity according to AASHTO LFD 10.50.1.1 or compact non-composite moment capacity according to AASHTO LFD 10.48.1 (kip-ft.).

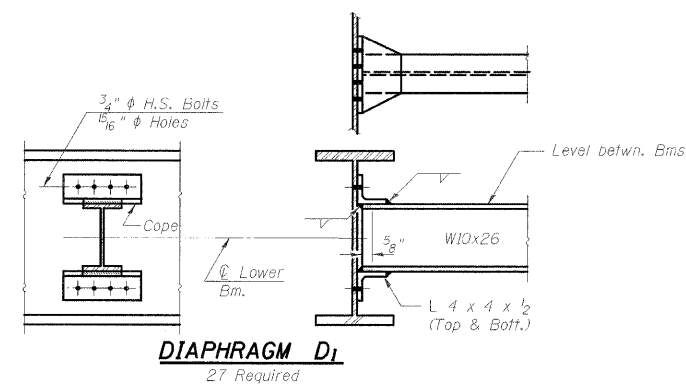
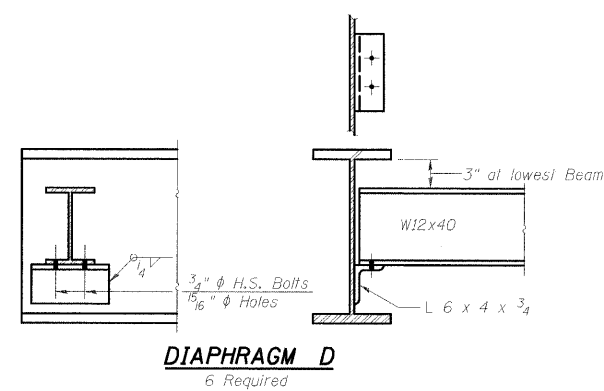
$f_s$  (Overload): Sum of stresses as computed from the moments below (ksi).  
 $M_D + M_{sD} + \frac{5}{8} (M_L + M_i)$

$f_s$  (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).  
 $1.3 [M_D + M_{sD}] + \frac{5}{8} (M_L + M_i)$

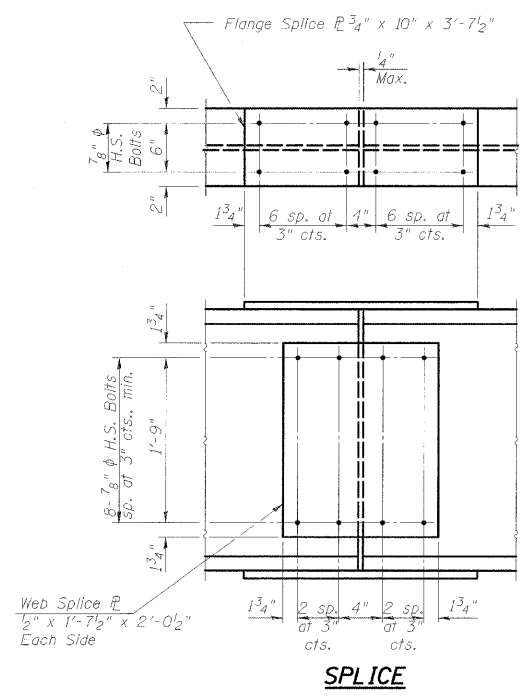
VR: Maximum  $t$  + impact horizontal shear range within the composite portion of the span for stud shear connector design (kips).

TOP OF BEAM ELEVATION TABLE

Location	Top of Beam 1	Top of Beam 2	Top of Beam 3	Top of Beam 4
Brg. South Abut.	103.788	103.902	103.902	103.788
Brg. Pier No. 1	103.870	103.985	103.985	103.870
Splice No. 1	103.863	103.978	103.978	103.863
Splice No. 2	103.759	103.874	103.874	103.759
Brg. Pier No. 2	103.727	103.842	103.842	103.727
Brg. North Abut.	103.392	103.506	103.506	103.392



Note:  
Two hardened washers shall be required over all oversize holes for diaphragms.



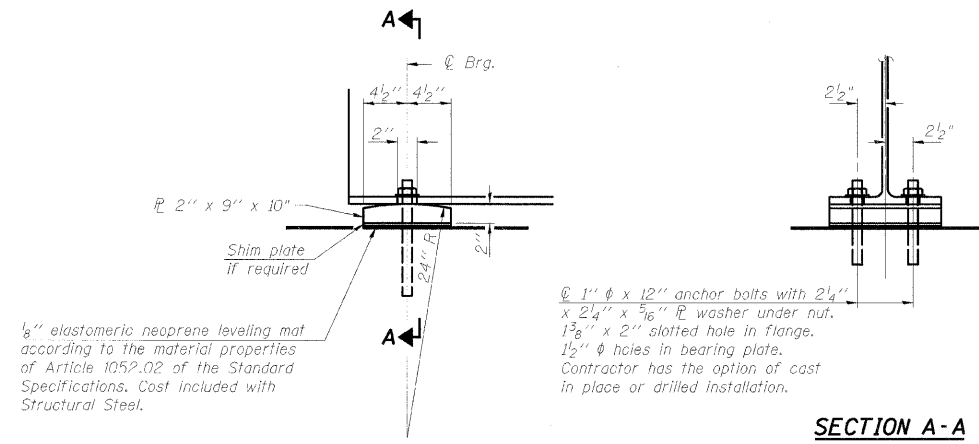
I-2-D 10-22-04

SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

STRUCTURAL STEEL DETAILS

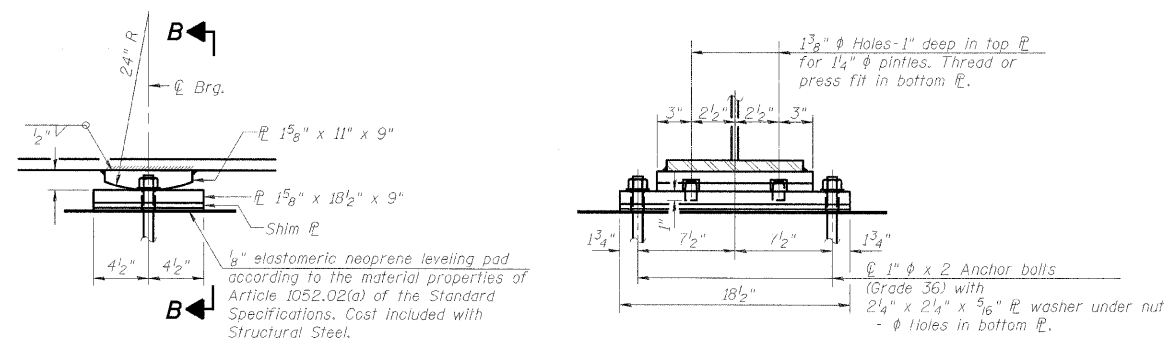
DESIGNED BY S.D.H.	<p>2700 McGraw Drive Bloomington, Illinois 61704 309/888-8836, 309/888-1871 fax</p>	FILE NO. 24-7191
DRAWN BY D.J.M.		DATE 03/17/09
CHECKED BY M.S.W.		SHEET NO. 17 of 28

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	18
STA.		TO STA.		
FED. ROAD DIST. NO. 7		ILLINOIS FED. AID PROJECT*		
CONTRACT NO. 87360		SHEET NO. <i>B11</i>		
OF 17 SHEETS				



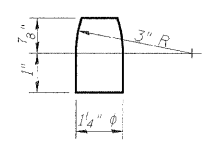
**ELEVATION AT ABUTMENT**

**FIXED BEARING**



**ELEVATION AT PIER**

**FIXED BEARING**



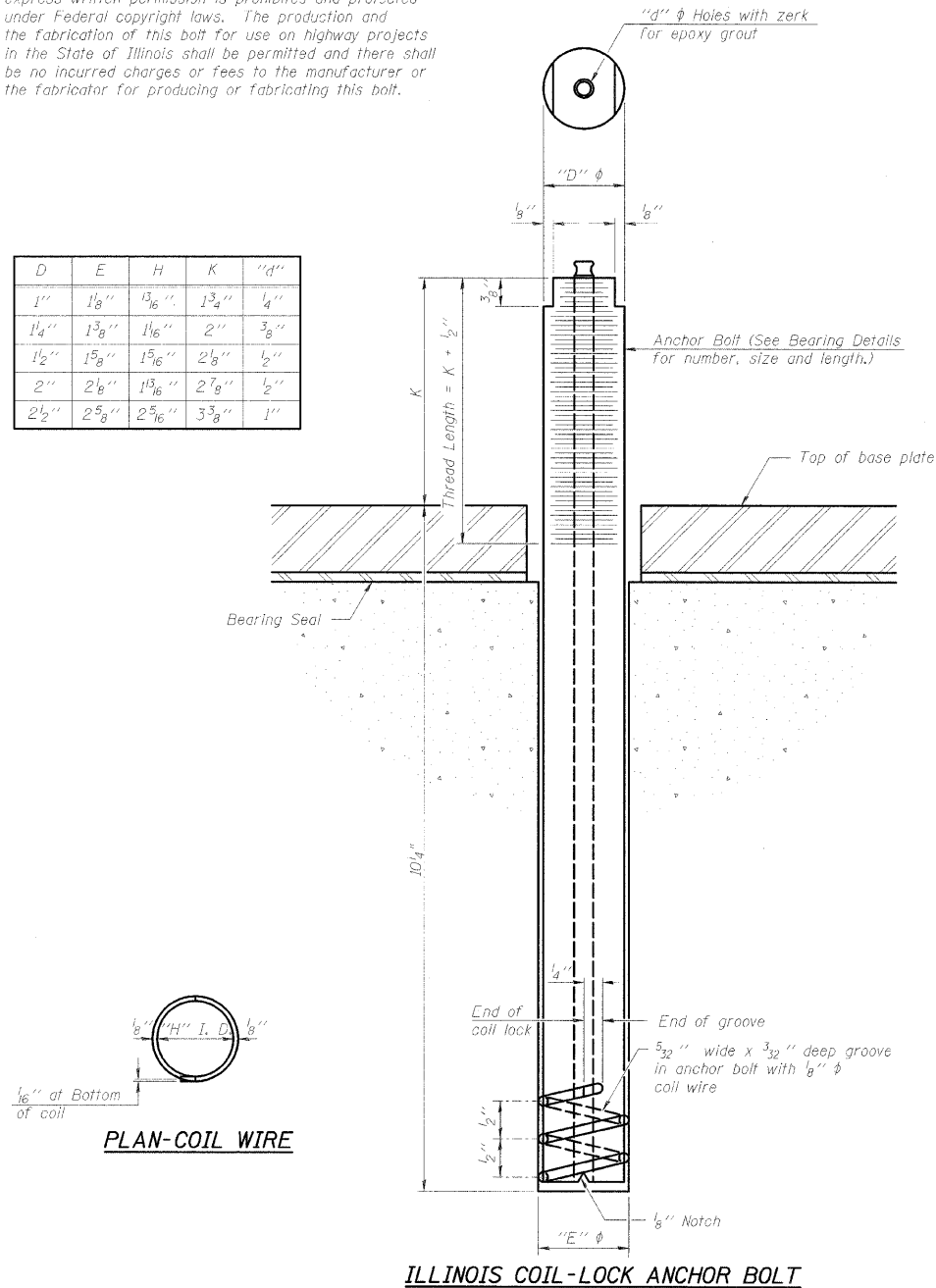
**PINTLE**

Notes:  
 Anchor bolts shall be ASTM F1554 all-thread (or an Engineer-approved alternate material) of the grade(s) and diameter(s) specified. ASTM A307 Grade C anchor bolts may be used in lieu of ASTM F1554 Grade 36 (Fy=36ksi). The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.  
 Anchor bolts at fixed bearings may be either cast in place or installed in holes drilled after the supported member is in place.  
 Anchor bolts for side retainers may be cast in place or installed in holes drilled before or after members are in place.  
 Drilled and set anchor bolts shall be installed according to Article 521.06 of the Standard Specifications.

SECTION 03-26140-00-BR SECTION 03-21117-00-BR LIVINGSTON COUNTY	
<b>BEARING DETAILS</b>	
DESIGNED BY S.D.H.	FILE NO. 24-7191
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CHECKED BY M.S.W.	SHEET NO. 18 of 28
 <b>Farnsworth GROUP</b> 2708 McGraw Drive Livingston, Illinois 61704 309/682-8686, 309/682-1871 fax	

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 1/2"	2"	3/8"
1 1/2"	1 5/8"	1 5/8"	2 1/8"	1/2"
2"	2 1/8"	1 3/4"	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 I 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.

### GENERAL NOTES

Holes in the masonry for anchor bolts shall be drilled through the base plates to the diameter and depth shown or according to the manufacturer's recommendation after beams or girders have been erected and adjusted.  
 Prior to setting the bolts, the holes shall be dry and all dust and loose particles shall be removed by the use of compressed air or vacuuming.  
 The anchor bolts, furnished and installed including the epoxy grout or capsules shall not be paid for separately but shall be included in the unit bid price for Furnishing and Erecting Structural Steel.

ABB-1

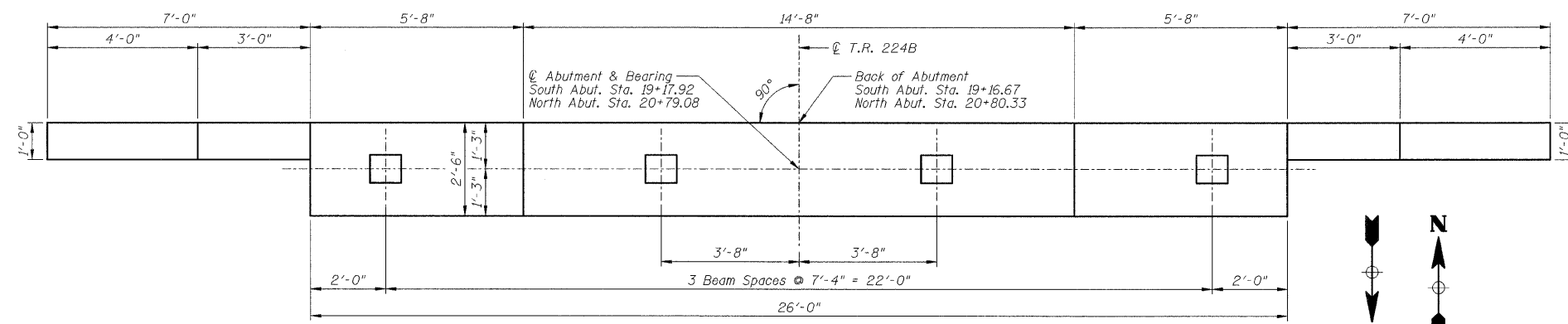
10-22-04

SECTION 03-26140-00-BR  
 SECTION 03-21117-00-BR  
 LIVINGSTON COUNTY

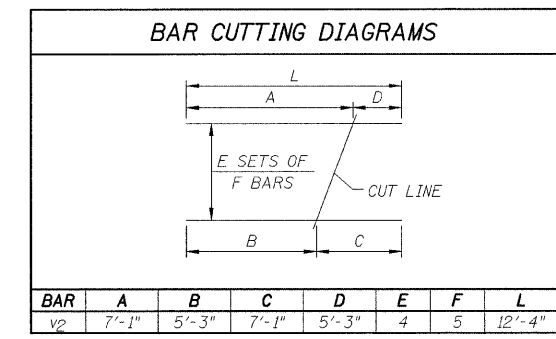
ANCHOR BOLT DETAILS  
 FOR BEARINGS

DESIGNED BY S.D.H.	 2706 McGraw Drive Livingston, Illinois 61704 309/833-8626, 309/833-1871 fax	FILE NO. 24-7191
DRAWN BY D.J.M.		DATE 03/17/09
CHECKED BY M.S.W.		SHEET NO. 19 of 28

F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	20
STA.	TO STA.			
FED. ROAD DIST. NO. 7		ILLINOIS FED. AID PROJECT*		
CONTRACT NO. 87360				SHEET NO. B13 OF 17 SHEETS

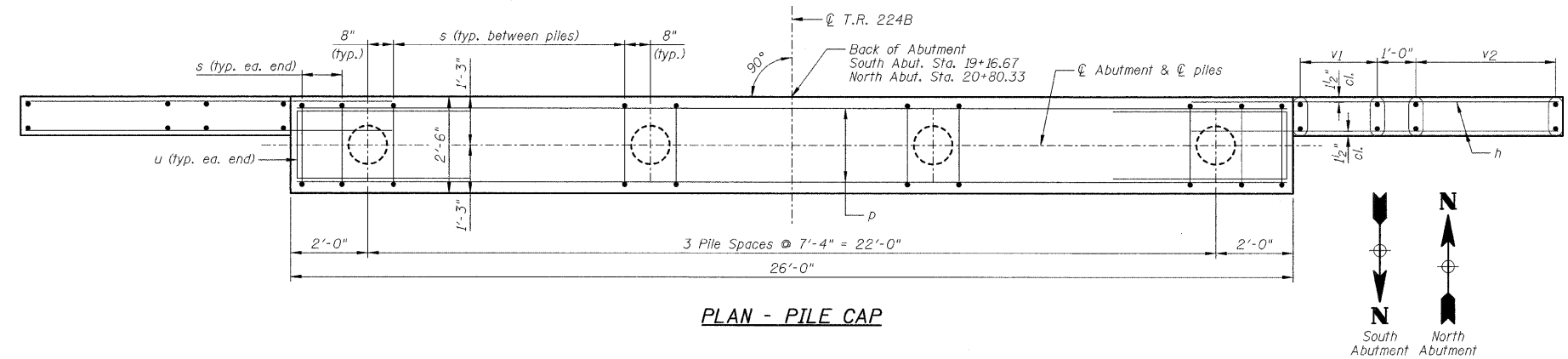


TOP VIEW ABUTMENT

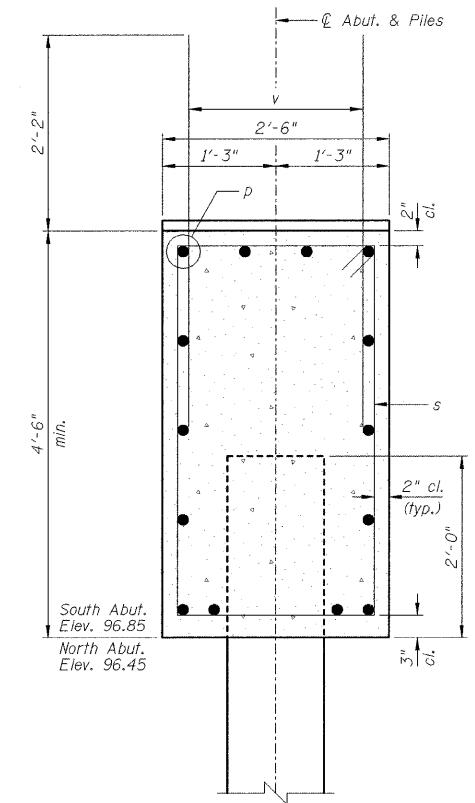


BILL OF MATERIALS - ABUTMENTS  
(Quantities for 2 Abutments)

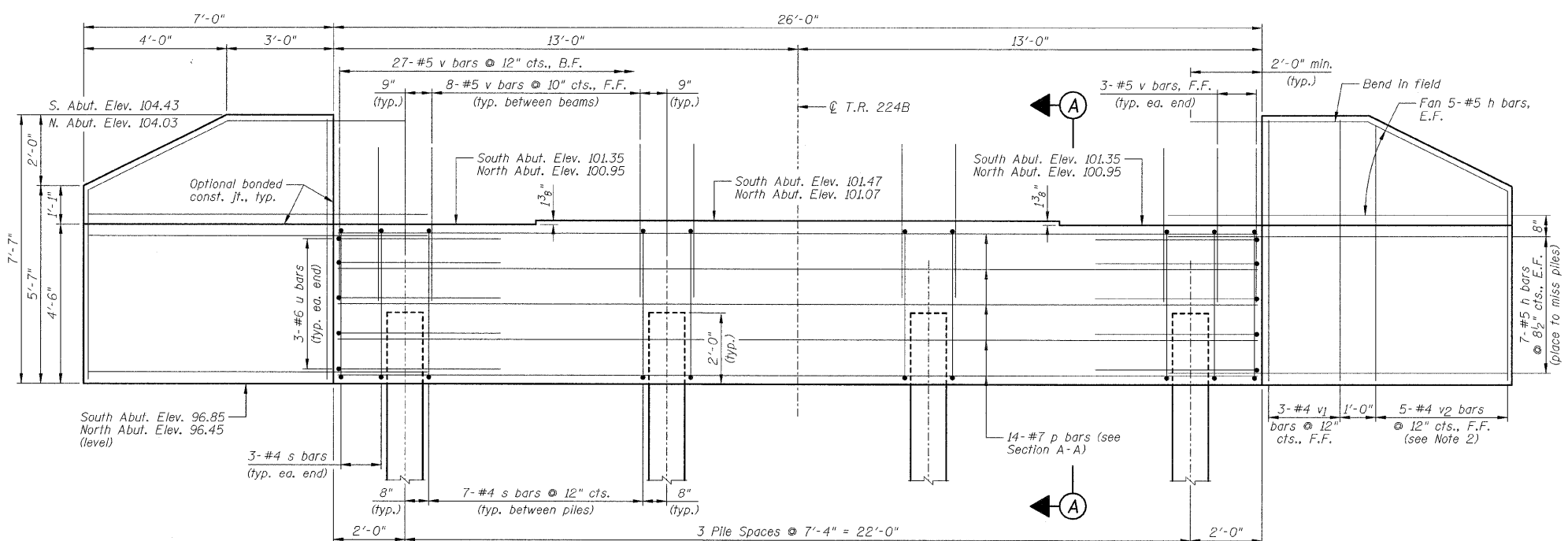
Bar	No.	Size	Length	Shape
h	96	#5	9'-6"	—
p	28	#7	25'-8"	—
s	54	#4	13'-3"	□
u	12	#6	11'-1"	□
v	114	#5	4'-4"	—
v1	24	#4	7'-3"	—
v2	20	#4	12'-4"	—
Item	Unit	Quantity		
Porous Granular Embankment, Special	Ton	250		
Concrete Structures	Cu. Yd.	28.8		
Reinforcement Bars, Epoxy Coated	Pound	3900		
Furnishing Metal Shell Piles 12"x0.250"	Foot	329		
Test Pile Metal Shells	Each	1		
Geocomposite Wall Drain	Each	68		
Pipe Underdrains For Structures 4"	Each	116		



PLAN - PILE CAP



SECTION A-A



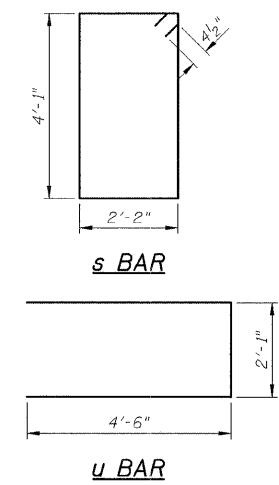
ABUTMENT ELEVATION

PILE DATA  
(2 Abutments)

Type:	Metal Shell 12" x 0.250"
No. Req'd.:	7-1 Test Pile
Est. Length:	47 Feet
Nom. Req. Brg.:	300 kips
Allowable Res. Avail.:	100 kips

NOTES:

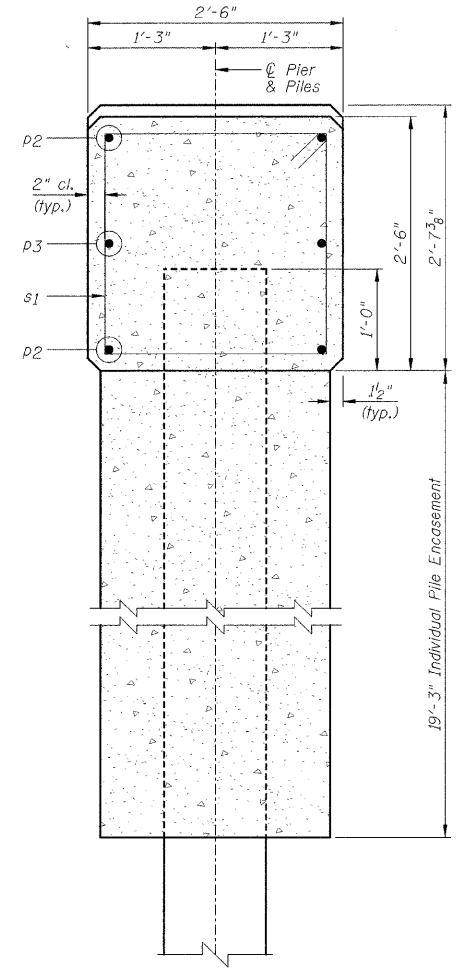
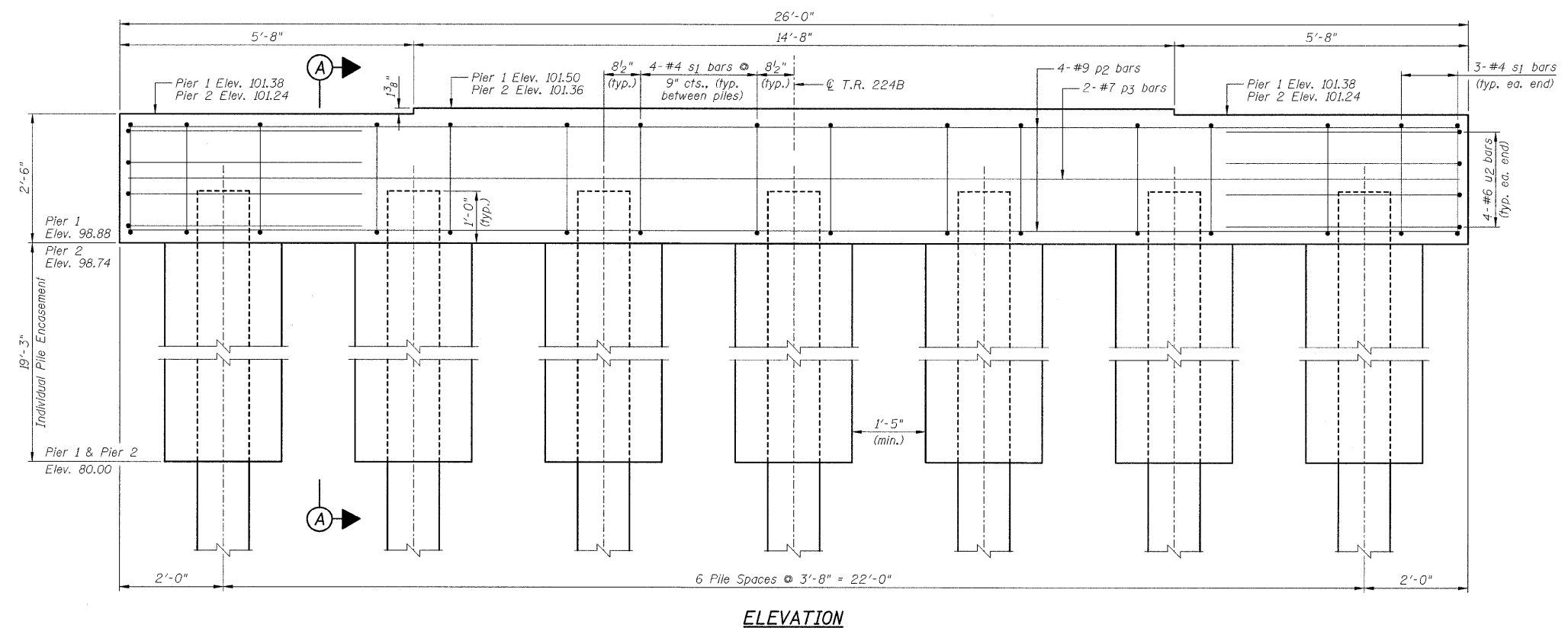
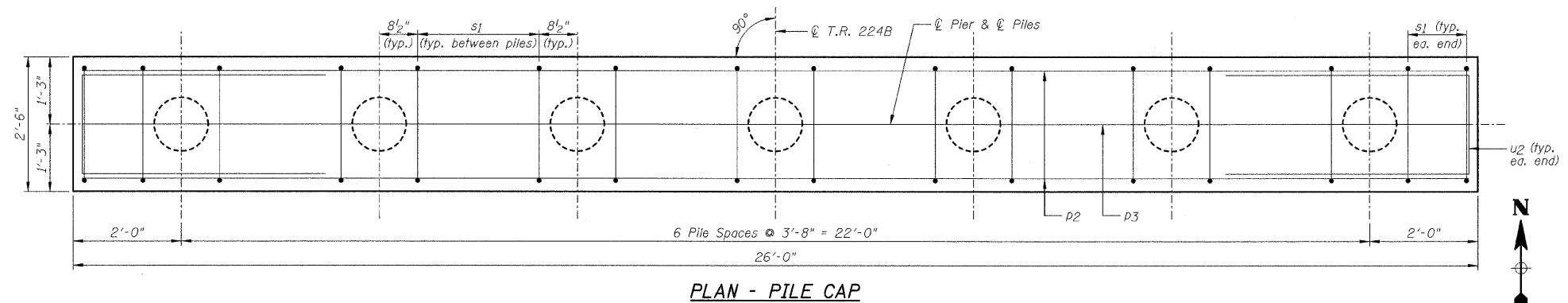
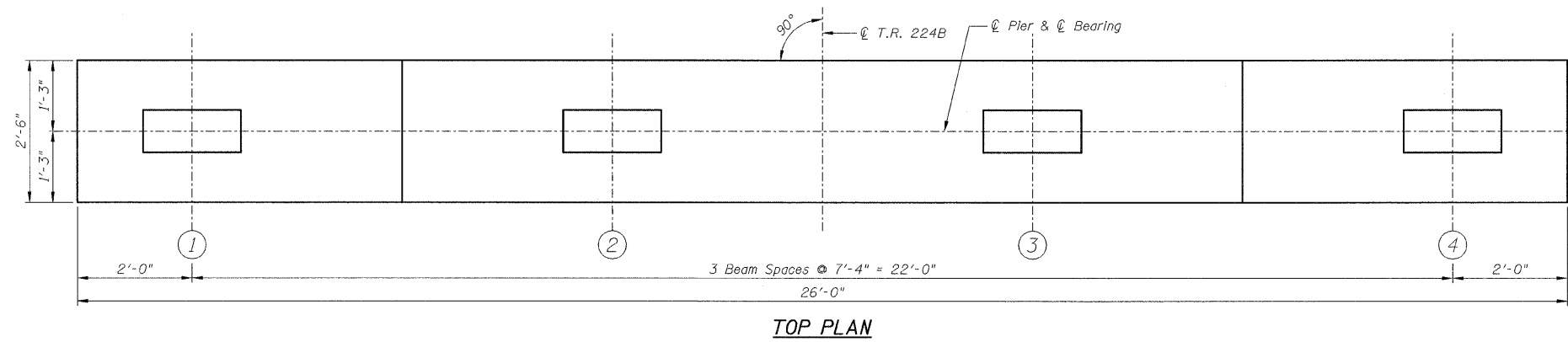
- 1.) Work this sheet with Sheets B7 & B15.
- 2.) Order v2 bars full length. Cut according to Bar Cutting Diagram. Use remainder of v2 bars in opposite face.
- 3.) Pour steps monolithically with cap.
- 4.) For pile details, see Sheet B15.
- 5.) Drive Test Pile in North Abutment.



SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

ABUTMENTS

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DRAWN BY D.J.M.		DATE 03/17/09
CHECKED BY M.S.W.		SHEET NO. 20 of 28

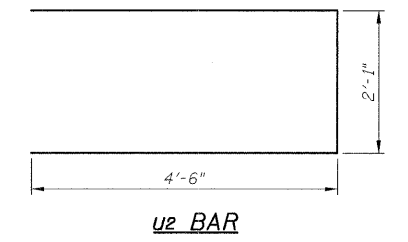
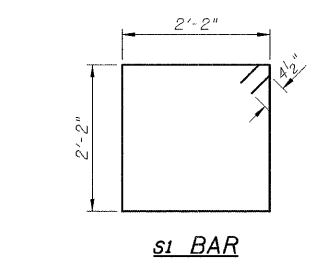
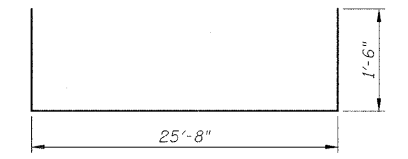


**PILE DATA**  
(2 Piers)

Type:	Metal Shell 12" x 0.250"
No. Req'd.:	13+1 Test Pile
Est. Length:	54 Feet
Nom. Req. Brg.:	288 kips
Allowable Res. Avail.:	96 kips

**BILL OF MATERIALS - PIERS**  
(Quantities for 2 Piers)

Bar	No.	Size	Length	Shape
p2	8	#9	28'-8"	□
p3	4	#7	25'-8"	—
s1	60	#4	9'-5"	□
u2	16	#6	11'-1"	□
Item				
Concrete Structures	Cu. Yd.	43.1		
Reinforcement Bars, Epoxy Coated	Pound	1630		
Furnishing Metal Shell Piles 12"x0.250"	Foot	702		
Test Pile Metal Shells	Each	1		



- NOTES:**
- 1.) Work this sheet with Sheet B15.
  - 2.) Space reinforcement in cap to miss anchor bolts.
  - 3.) Pour steps monolithically with cap.
  - 4.) For pile details, see Sheet B15.
  - 5.) Drive Test Pile in Pier 1.

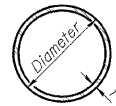
**SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY**

**PIERS**

DESIGNED BY S.D.H.	<b>Farnsworth GROUP</b> 2706 McGraw Drive Bloomington, Illinois 61704 309/833-8636, 309/833-8771 fax	FILE NO. 24-7191
DRAWN BY D.J.M.		DATE 03/17/09
CHECKED BY M.S.W.		SHEET NO. 21 of 28

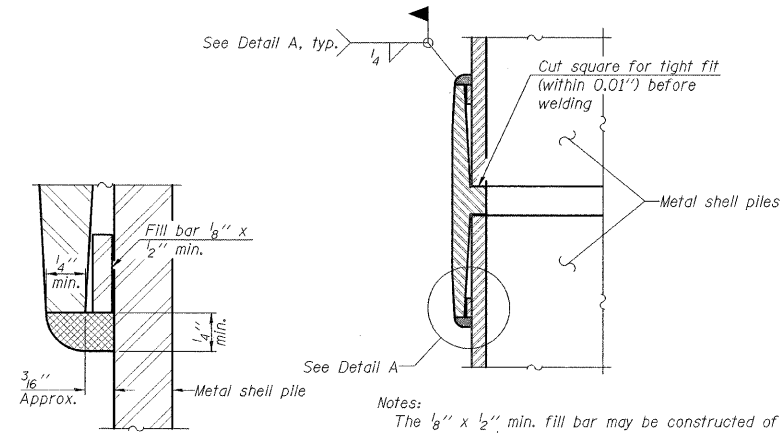
F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	03-26140-00-BR 03-21117-00-BR	LIVINGSTON	28	22
STA.		TO STA.		
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT	
CONTRACT NO. 87360		SHEET NO. B15		

OF 17 SHEETS



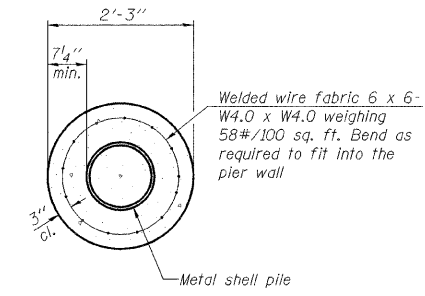
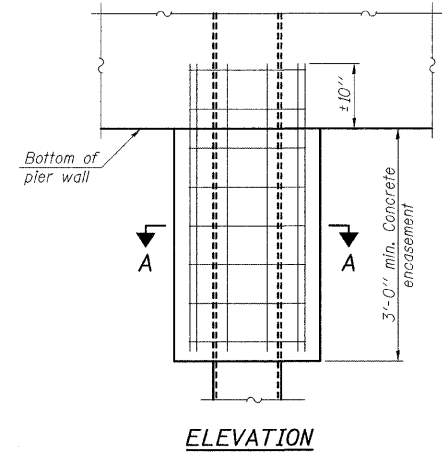
**METAL SHELL PILE TABLE**

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



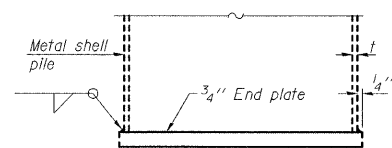
Notes:  
The 1/8" x 1/2" min. fill bar may be constructed of 2 bars with a 1/8" max. gap between them.  
Pile segments shall be driven to solid contact with splicer before welding.

**WELDED COMMERCIAL SPLICE**

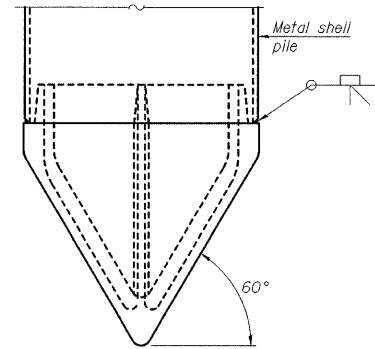


Note:  
Forms for encasement may be omitted when soil conditions permit.

**CONCRETE ENCASEMENT AT PIERS**



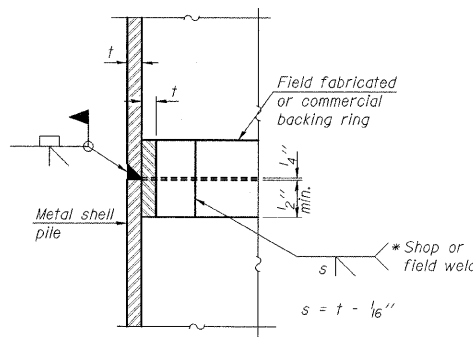
**END PLATE ATTACHMENT**



**METAL SHELL PILE SHOE ATTACHMENT**

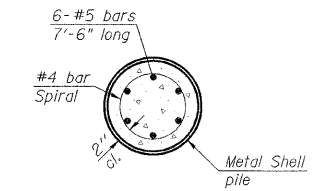
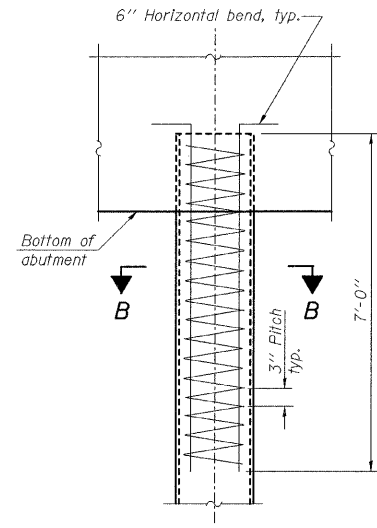
(See Note A)

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



**COMPLETE PENETRATION WELD SPLICE**

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



**METAL SHELL REINFORCEMENT AT ABUTMENTS**

**NOTES:**

- 1.) The metal shell piles shall be according to ASTM A 252 Grade 3.
- 2.) The cost of Excavation and Reinforcement is included with furnishing piles.
- 3.) The cost of Concrete Encasement is included with Concrete Structures.

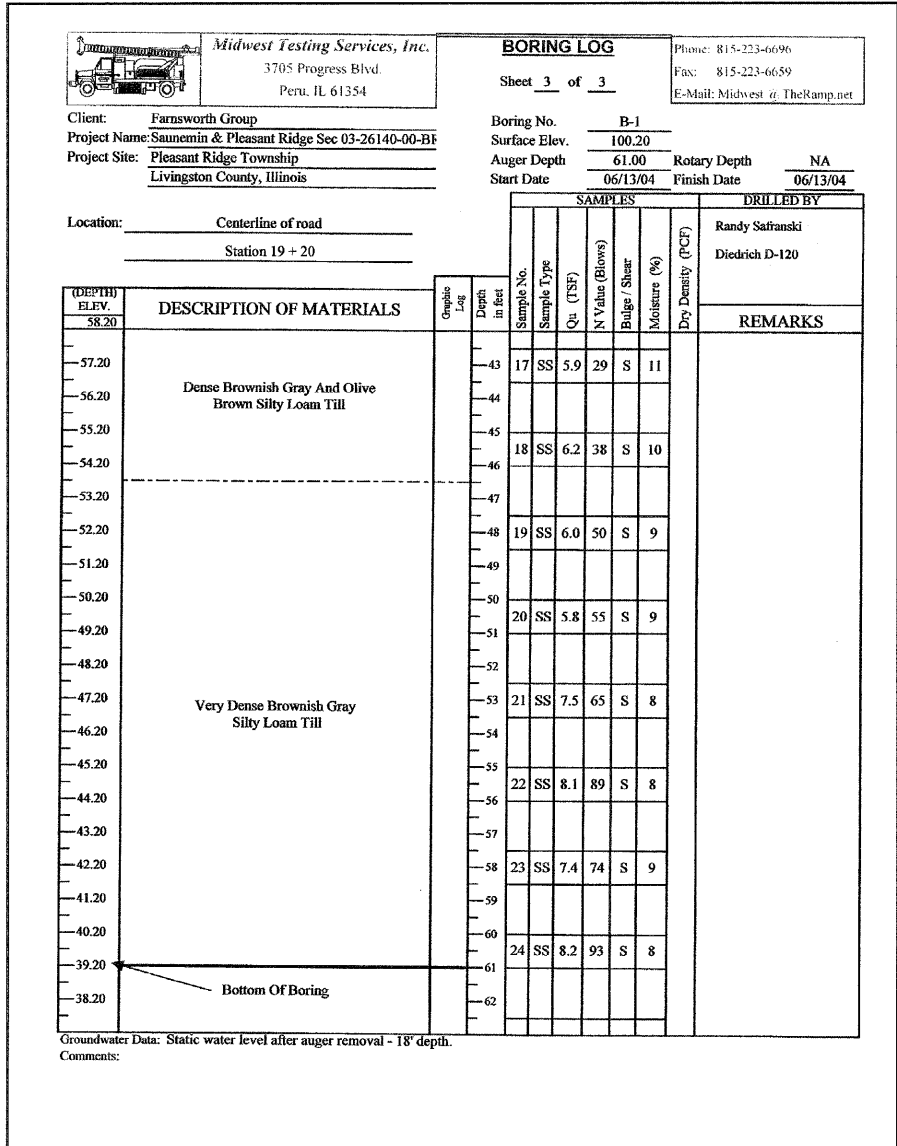
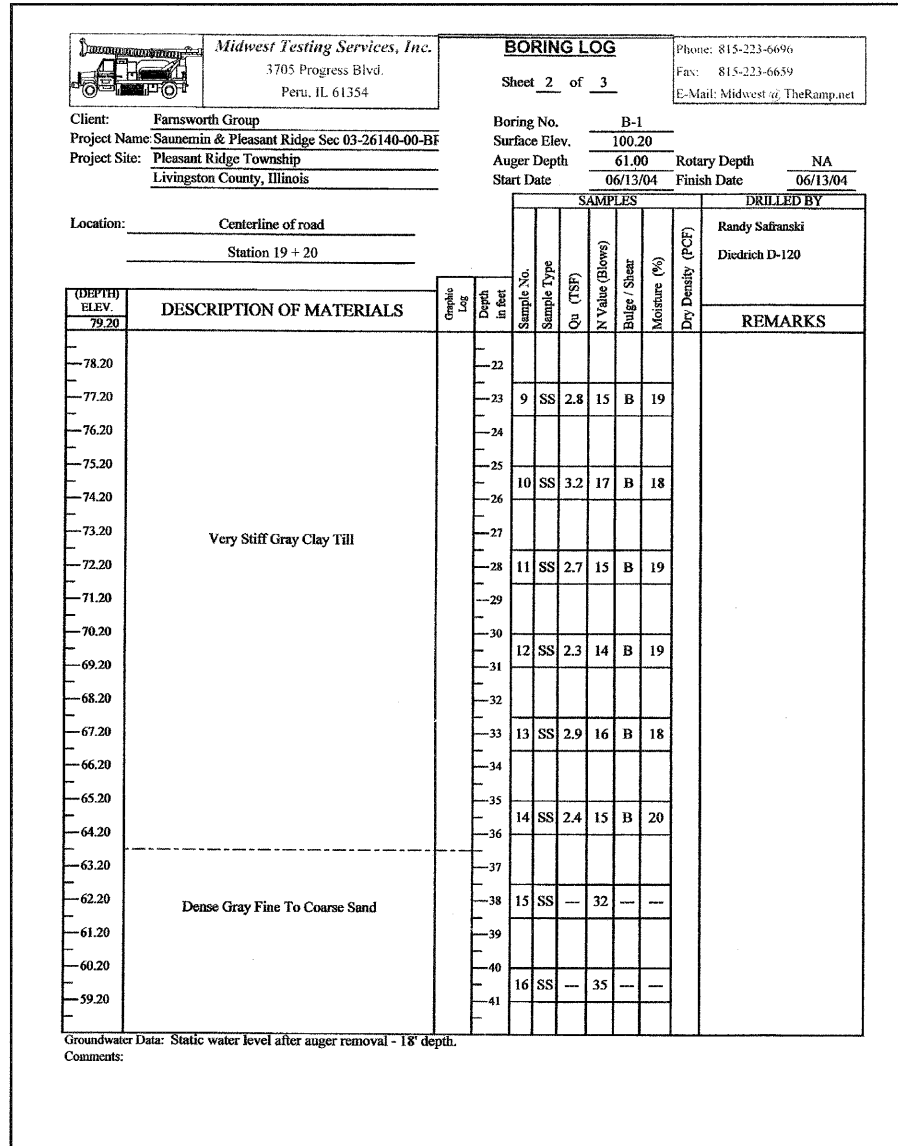
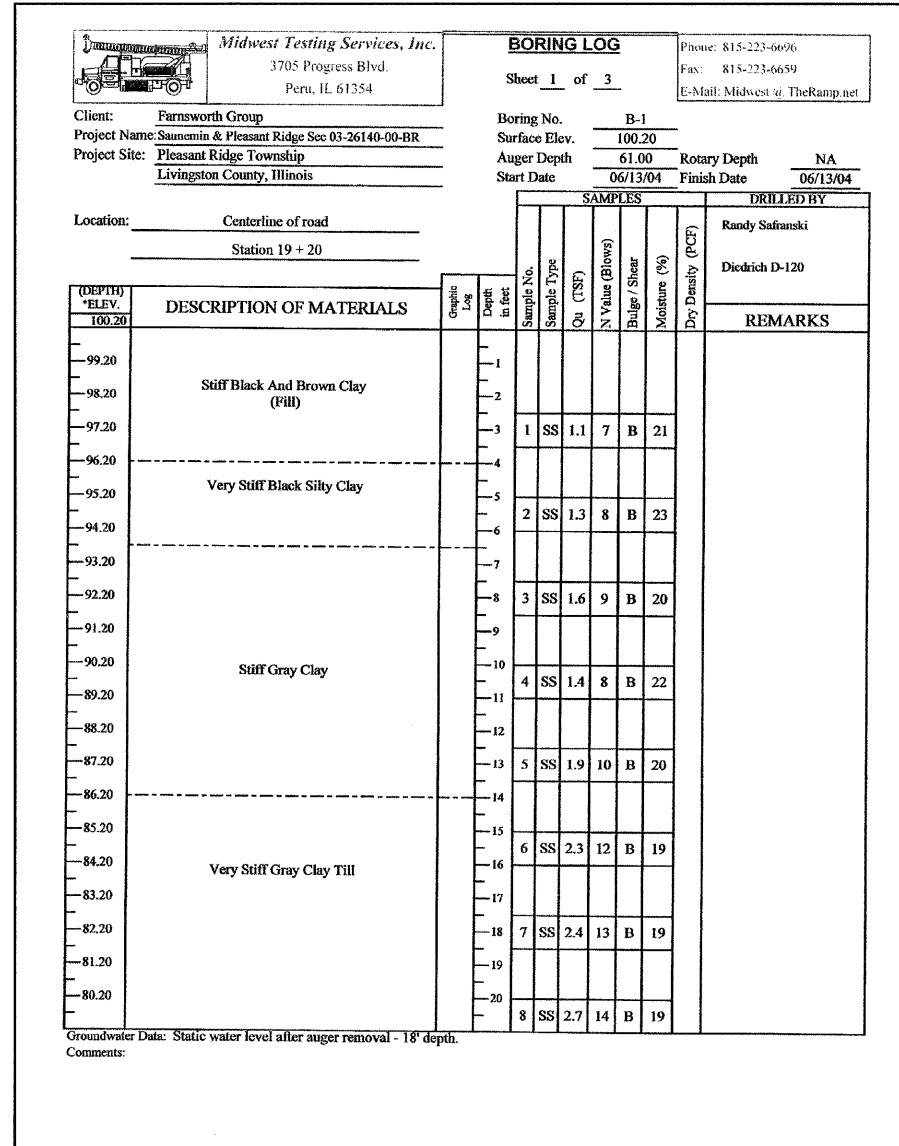
SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

**METAL SHELL PILE DETAILS**

F-MS


10-1-08

DESIGNED BY S.D.H.	<p>2700 Midway Drive Bloomington, Illinois 61704 309/888-9636, 309/888-1671 fax</p>	FILE NO. 24-7191
DRAWN BY D.J.M.		DATE 03/17/09
CHECKED BY M.S.W.		SHEET NO. 22 of 28

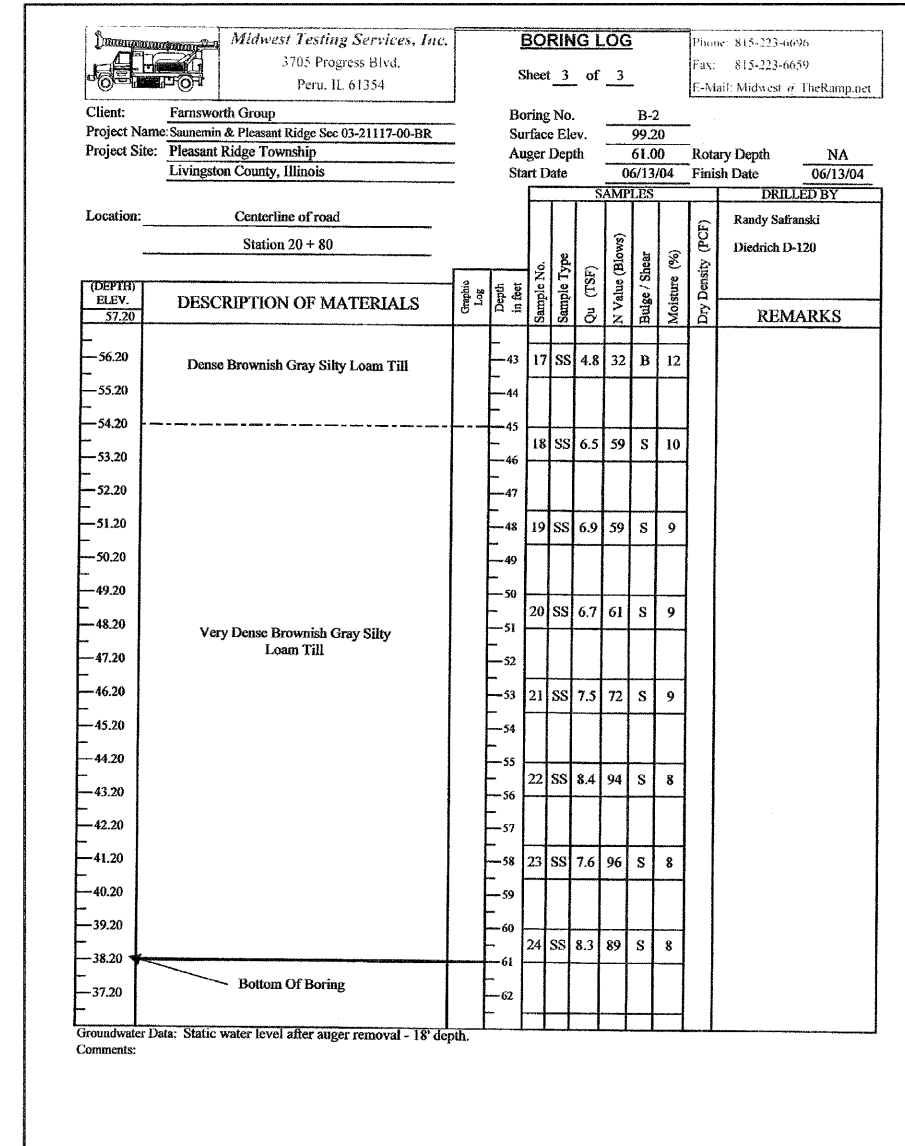
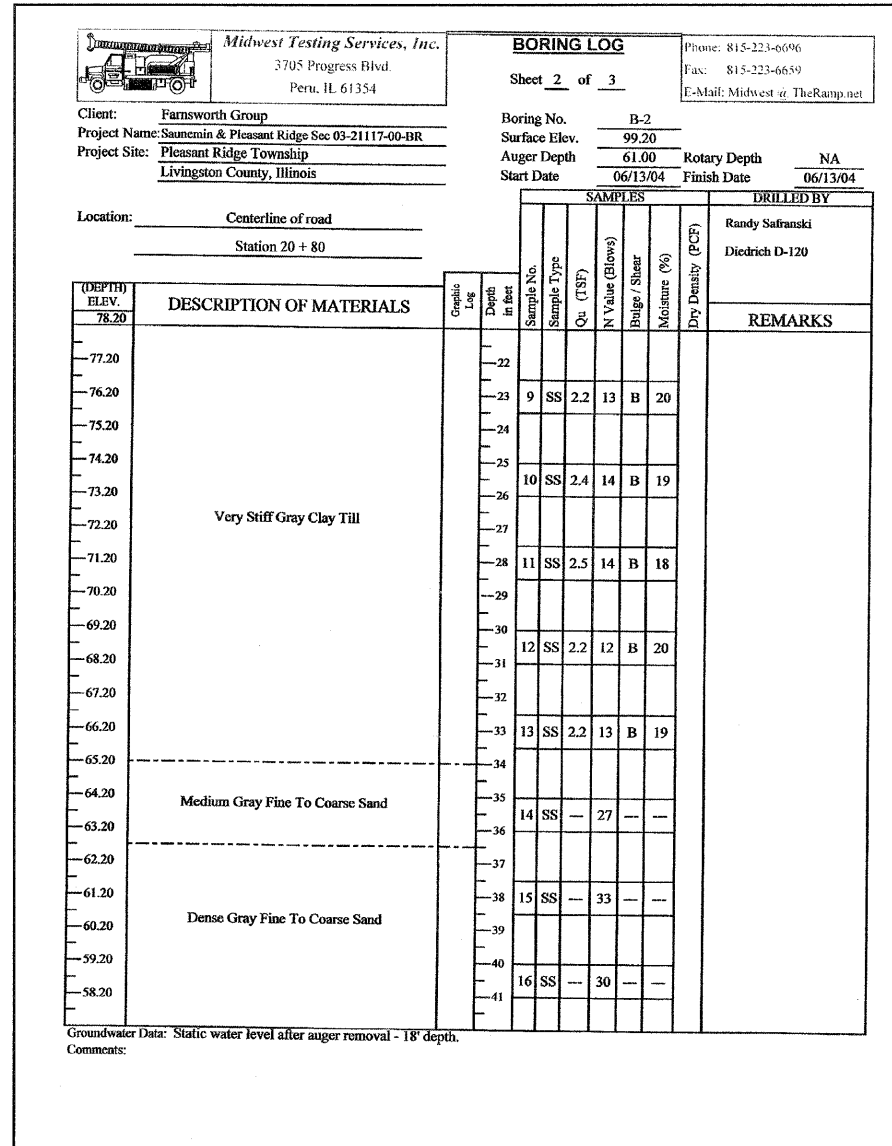
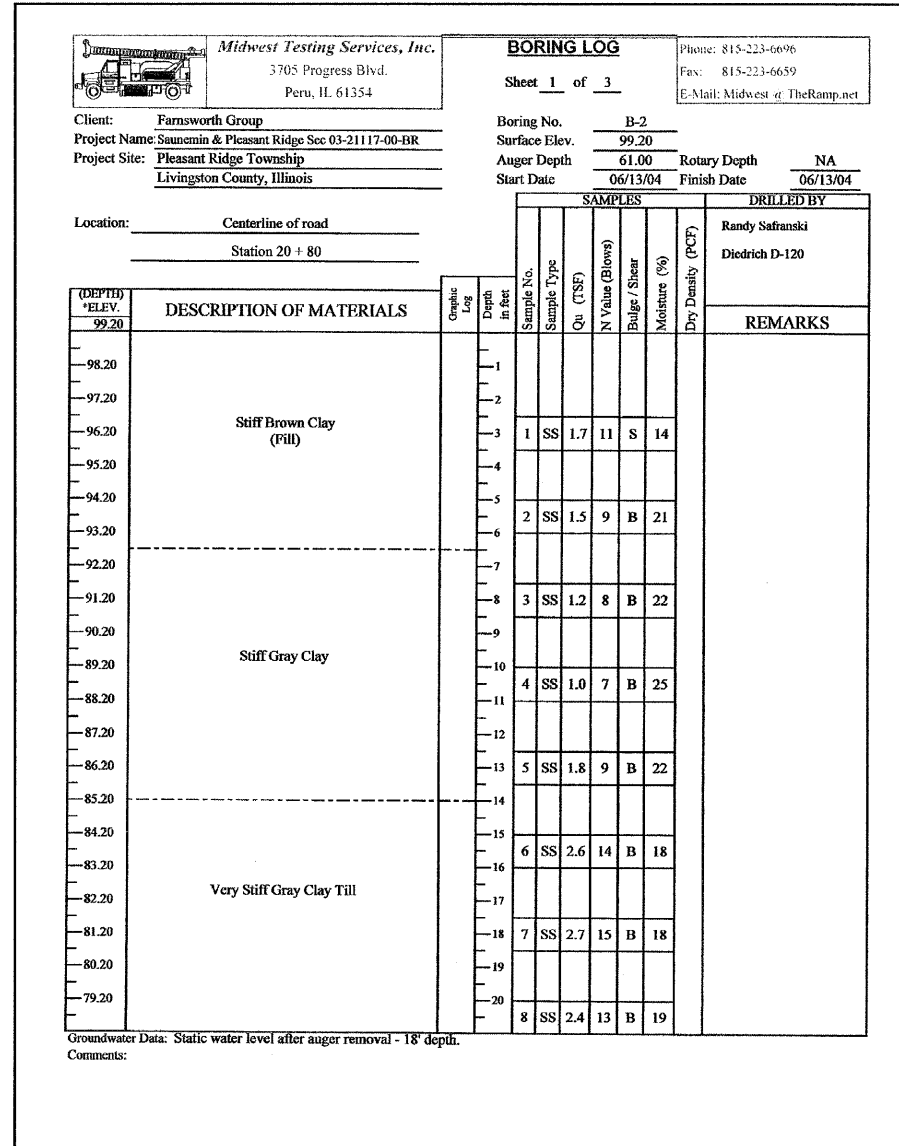


SECTION 03-26140-00-BR  
SECTION 03-21117-00-BR  
LIVINGSTON COUNTY

**BORING LOGS**

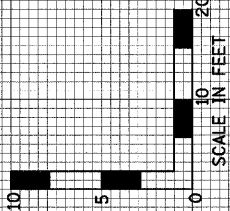
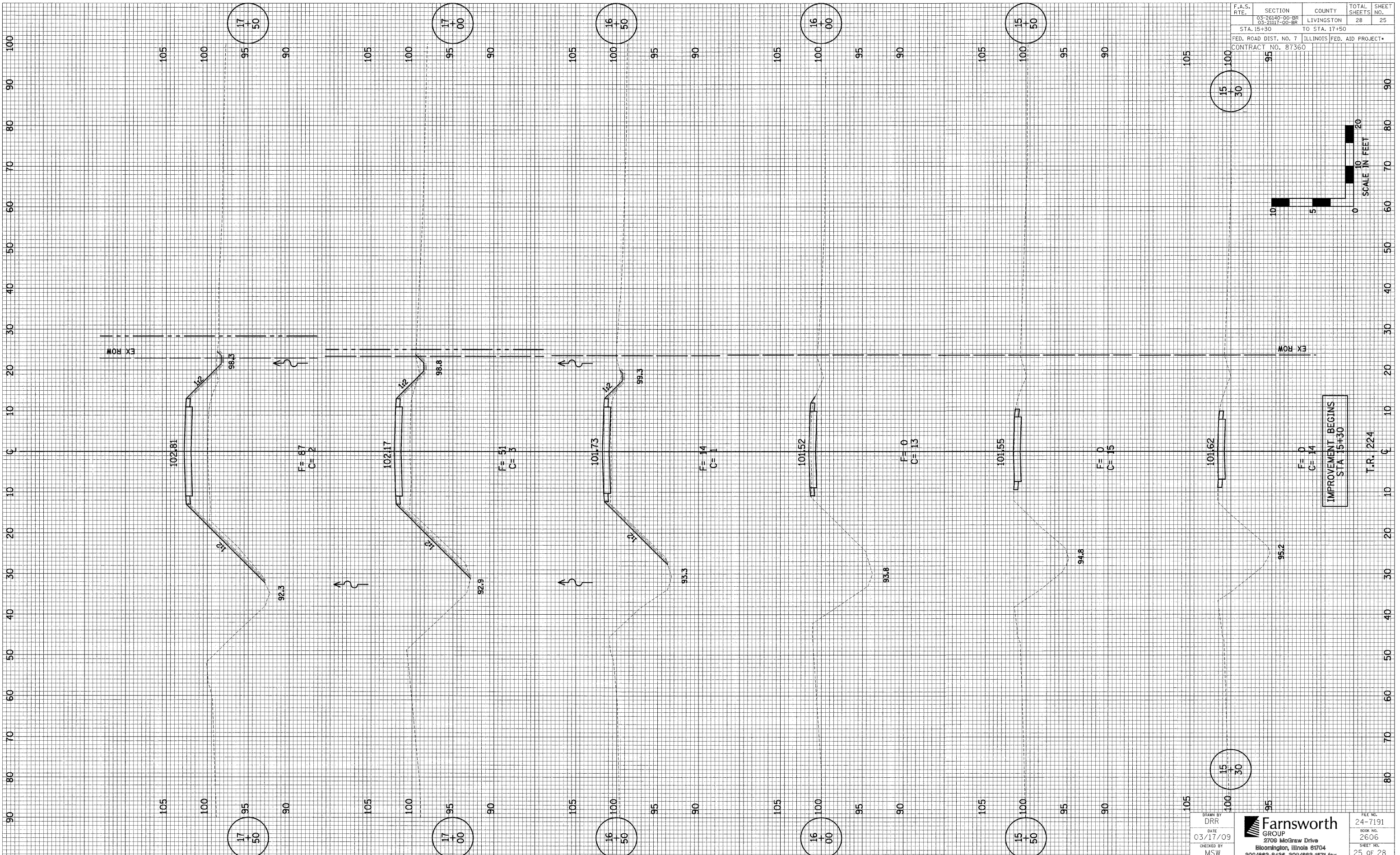
DESIGNED BY S.D.H.	 <b>Farnsworth GROUP</b> 2708 McGraw Drive Bloomington, Illinois 61704 304/853-8436, 304/853-1571 fax	FILE NO. 24-7191
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CHECKED BY M.S.W.		SHEET NO. 23 of 28

B17





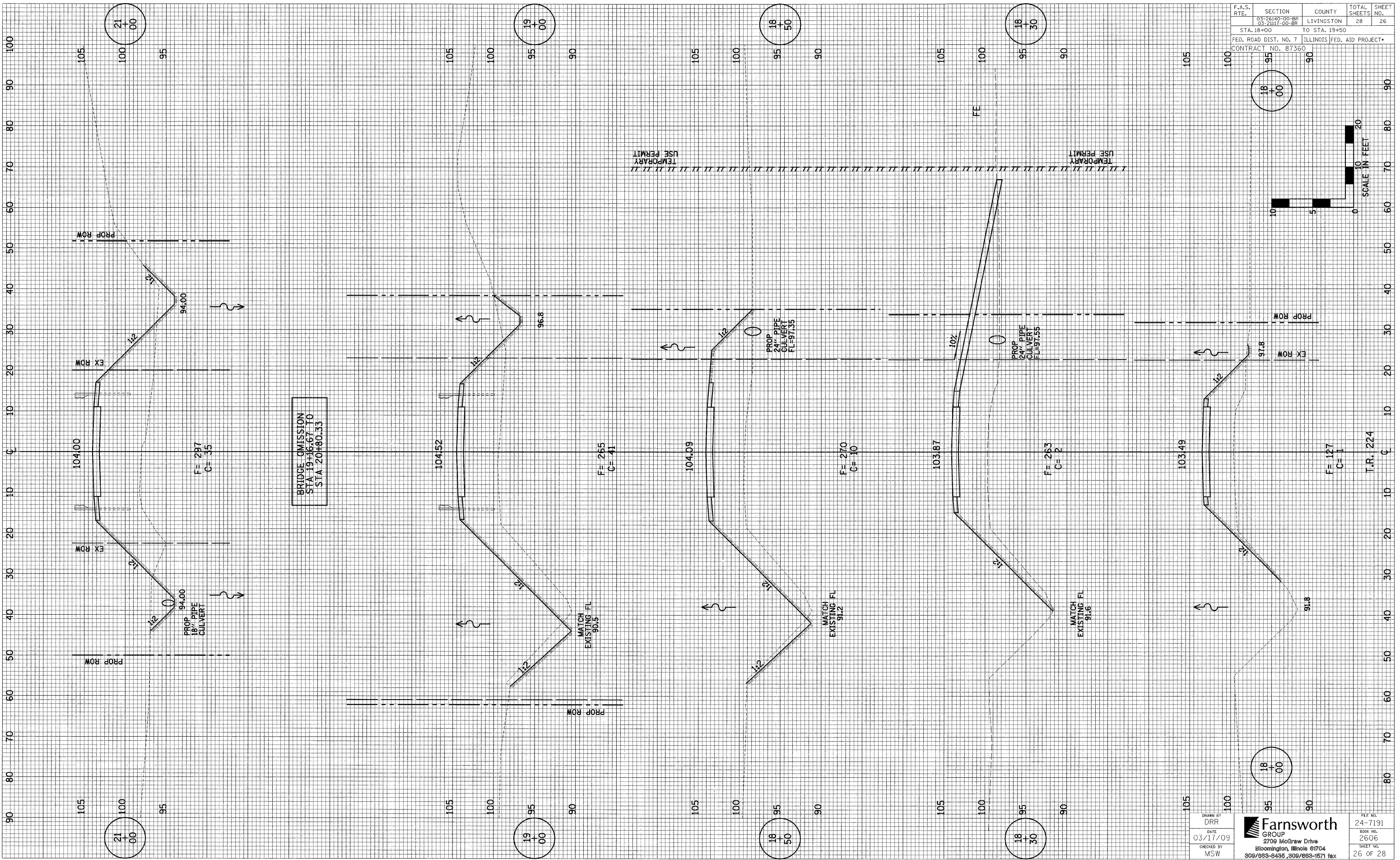
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FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT				
CONTRACT NO. 87360				



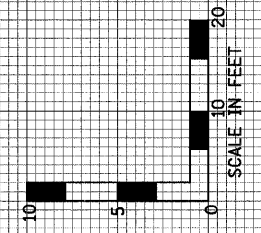
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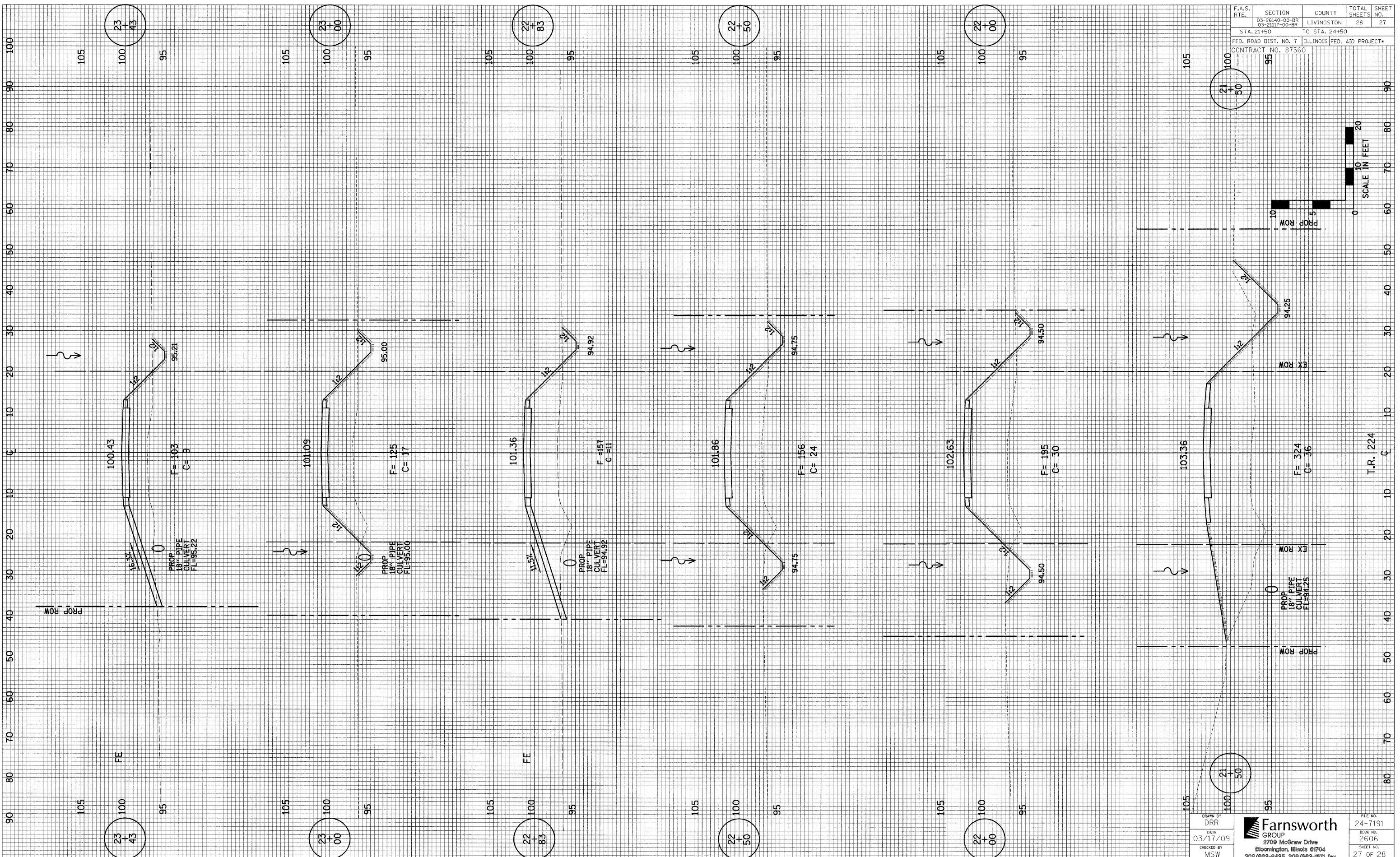
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T.R. 224

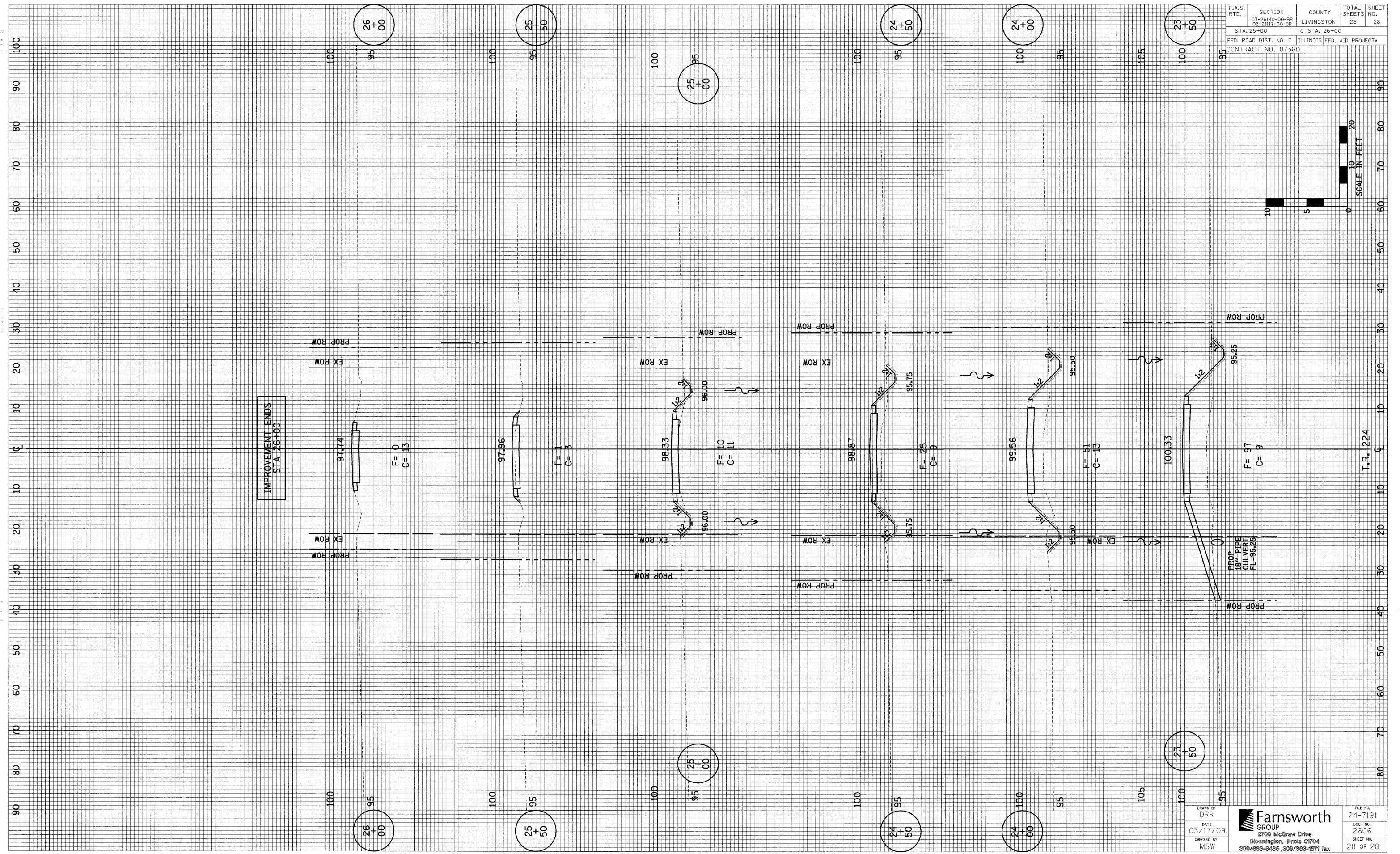
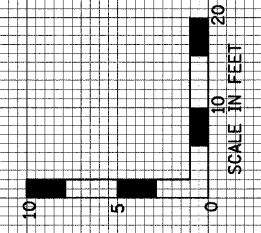


BRIDGE OMISSION  
STA 19+16.67 TO  
STA 20+80.33





F.A.S. RTE.	SECTION	COUNTY	TOTAL SHEETS NO.
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FED. ROAD DIST. NO. 7		ILLINOIS FED. AID PROJECT	
CONTRACT NO. 87360			



DRAWN BY DRR	<p>2709 McGraw Drive Bloomington, Illinois 61704 309/863-8435, 309/863-1571 fax</p>	FILE NO. 24-7191
DATE 03/17/09		BOOK NO. 2606
CHECKED BY MSW		SHEET NO. 28 OF 28