Request for Statement of Interest (SOI)
Blackberry Township Road District / Kane County Division of Transportation (KDOT)
Harley Road over the Union Pacific Bridge Replacement (Sec 17-004109-01-BR)

The Blackberry Township Road District is in need of professional services from a qualified consultant to provide engineering services as detailed in the attached project description. KDOT is assisting the Road District with the consultant selection process. Ultimately, the Road District will select the consultant and administer the project.

The design contract will begin in the fall of 2018.

The 2–page Statement of Interest document shall be submitted electronically via KDOT QBS no later than 4:00 pm on February 28, 2018. If you plan to enter into a joint venture with another firm for this project please note this on your Statement of Interest, including the name of the firm you are entering into a joint venture with for this project. The Short-listed firms will be posted on our Consultant Selection Summary Table website at http://www.co.kane.il.us/dot/SOISummary.aspx.

More information regarding the Qualifications Based Selection process may be found at http://www.co.kane.il.us/dot/consultant.aspx.

The Road District may elect to select the consultant after receiving proposals, omitting interviews.

A Statement of Interest (SOI) received after the above noted deadline will not be used as part of the consultant selection process.

This project has been readvertised to ensure compliance with the consultant selection process.

PROJECT DESCRIPTION

The project consists of phase I (and at the discretion of the Road District, phase II) engineering services for the rehabilitation of the Harley Road over the Union Pacific Railroad bridge (045-3143). The project will also include any necessary approach reconstruction or reprofilling.

The work includes all design, permitting, railroad coordination, plat and plan preparation activities necessary to construct the project.

The project is funded via STP-Bridge.

CONTACT INFORMATION

Any questions regarding the requested services or the Qualifications Based Selection Process should be directed to Mike Zakosek, Chief of Design, by email at zakosekmike@co.kane.il.us.

Bridge Inspection Report

STRUCTURE NO. 045-3143

Harley Road / TR 0152
Over Union Pacific Railroad

Prepared For

Kane County Division of Transportation

Blackberry Township

INSPECTION TYPE: In Depth
DATE: September 9, 2016

Hampton, Lenzini and Renwick, Inc.
Civil Engineering • Structural Engineering • Environmental Services • Land Surveying
www.hlrengineering.com

I. ADMINISTRATIVE DATA:

Region / District: 1 / 1
County: Kane
Feature Carried: Harley Road / TR 0152
Feature Crossed: Union Pacific Railroad
Latitude, Longitude: 41.88758° N, -88.42378° W

Weather: 70° F; Partly Sunny

II. ROADWAY/STRUCTURE DATA:

ADT (current): 1850 (2014 – IDOT Master Structure Report)
ADTT (current): 74 – 4% (2014 – IDOT Master Structure Report)
Inventory Rating HS: 1.00 (36) – (1994 by IDOT Master Structure Report); 0.62 (12.4) – 2016 by HLR
Operating Rating HS: 1.36 (48) – (1994 by IDOT Master Structure Report); 1.18 (23.7) – 2016 by HLR
Existing Clear Width: 30.0'
Width to Remain in Place: 22.0'
Improvement Width: 30.0'

CONSTRUCTION / RECONSTRUCTION / REPAIR HISTORY:

Year Constructed: 1996
Year/s Reconstructed: N/A

STRUCTURE DESCRIPTION:

Type: Precast prestressed concrete (PPC) deck beams (21" depth – Spans 1 & 3, 27" depth – Span 2)
Span Arrangement: Three simple spans (48'-5.5"; 68'-1"; 52'-5.5")
Length & Width: 171'-6" back-to-back of abutments; 33'-2" out-to-out of deck; 30'-0" face-to-face of parapets
Substructure: Concrete pile supported stub abutments; multi-column reinforced concrete piers with crashwalls supported on spread footings
Skew: 5° left forward

INSPECTION HISTORY (NBIS RATINGS):

Year:	Deck:	Super:	Sub:
2005	7	7	7
2009	7	7	7
2010	6	6	7
2012	5	5	7
2013	5	5	7
2015	5	5	7
2016	4	4	6

III. STRUCTURE CONDITION FINDINGS:

APPROACH PAVEMENT:
The approach pavement is in **fair condition** consisting of a bituminous surface with aggregate shoulders paved in 2013.

- Both approach pavements exhibit longitudinal and transverse cracks up to a ¼ inch wide.

BRIDGE PARAPETS:

- The New Jersey concrete bridge parapets are in **good condition** with only minor vertical hairline cracking noted.

DECK / SUPERSTRUCTURE:
The superstructure is in **poor condition**.
Top of Deck:
The deck overlay consists of a bituminous wearing surface (2" thick) and a waterproofing membrane system. The wearing surface is in **fair** condition.

- Open longitudinal reflective cracks are present along the beam joints in several locations in all spans, primarily in the south and center spans. – See TOP OF DECK (Att. C)
- The transverse construction joints above the piers are in poor condition with transverse cracks up to 2" wide in HMA surface allowing leakage to the substructure.
- The pavement joints at back of the abutments are open (to 1.25" wide). This is leaking water onto both abutments bearing seats.

Beams:
The PPC deck beams are in **poor condition** due to the condition of beam 7 north span. (See Photo Nos. 2, 3, 5, 6, 10, 12, 13, 15 & 16)

- North span beam 7 has a 2' x 1'x 2.5" deep spall with an exposed prestressed strand near midspan. (See Photo Nos. 15 & 16)
- North span: beam 6 has a 1' x 1" spalled area and a 1' x 1' delaminated area with corroded strands.
- South span: beams 9 and 10 have numerous delaminations and spalls.
- Numerous delaminated areas are present in other beams as noted in the DECK CONDITION – Attachment C. The fascia beam and adjacent beam typically are deteriorated.
- The majority of joints in all three spans are compromised and have water leakage.
- Signs of differential deflection up to ½ inch are present in north and south span beams.

Bearings:
This structure uses ½" fabric bearing pads at the abutments and piers.

SUBSTRUCTURE:
Overall the substructure is in **satisfactory condition**.
Abutments / Slopewalls:
The abutments are in **satisfactory condition**. (See Photo Nos. 3 & 11)

- Bearing seats on both caps are stained from water leakage with minor vertical hairline cracks.
- The slopewall cracking present at the northeast and southeast corners has not deteriorated.
- Minor transverse cracks are present throughout the concrete slopewalls.

Piers:
The piers are in **satisfactory condition**. (See Photo Nos. 4, 7, 9, 14, & 17)

- The caps are stained from water leakage through beam joint.
- Moderate delamination/spall with an exposed shear stirrup on the South face of Pier 1, but with no loss of bearing. (See Photo No. 8)

Wingwalls:

- Overall the wingwalls are in **good condition** with no deficiencies of note.

RAILROAD LINE:
The structure crosses a single line of the Union Pacific railroad.

- The railroad is aligned to the structure skew.
- According to existing plans the minimum height clearance for the railroad is 23.0' and the minimum horizontal clearance is 18.2'.

TRAFFIC SAFETY:
The structure is on a curved horizontal alignment (south) and a crest vertical curve. Sight distance is limited at the bridge deck due to the vertical profile from each approach. Pavement lane markings are present and visible.

Guardrail:
The guardrail is in **good condition.** Steel plate beam approach guardrails are present at all four corners of the structure. Guardrail is anchored to the bridge parapet with type 6 Terminal sections and terminated with Type 1 ends. The terminal end sections do not meet AASHTO or IDOT requirements.

- Some guardrail is not connected to posts at all four corners of the bridge.
- No noted damage.

Signage:

- Hazard clearance markers are present at all four corners of the structure.
- The structure is not load posted and is open for all legal loads.

UTILITIES:

- No utilities are attached to the structure.
- A pole mounted utility is located northwest of the structure's right-of-way.

STRUCTURE RATING:
A load rating analysis was performed on the PPC deck beams in Span 3 which controlled. The existing plans indicate that there are two rows of prestressing strands with 6 strands 1.75" up and 9 strands 3.25" up from the bottom of the beam for a total of 15 strands in the beams. Based on the deterioration present (presence of spall at the center of the span), the beams were rated based on the removal of *three* strands from the bottom row with no other reductions taken. The results of the analysis indicated an inventory rating of 12.4 tons and an operating rating of 23.7 tons. Load posting is not required at this time.

IV. CONCLUSIONS AND RECOMMENDATIONS:

CONCLUSIONS:

Overall the structure is in **poor condition,** the rating controlled by the superstructure.

- There are four beams with significant deterioration that are cause for concern: North spans – beam 6 & 7; South span – beam 9 & 10. These beams still can accommodate legal loads, but will continue to deteriorate.
- Many keyway joints have failed, especially along the fascia beam line. This is caused by the stiffer outside beam with parapets.
- Signs of differential deflection up to ½ inch are present in north and south span beams, with reflective cracking seen in the HMA wearing surface above.
- The 2.5" deep spall in Beam 7 in the north span has progressed, three strands presumed compromised. See rating in Attachment F.
- The guardrail ends do not meet current IDOT requirements.
- Posting is not required to restrict the weight of the legal vehicles; however, weight restrictions should be implements for Kane County permit vehicles. Refer to Structure Rating calculations (Attachment F) for recommended permit vehicle weight restrictions.
- These beams will need temporary supports in order to maintain legal load capacity as future deterioration degrades additional strands. At the point when beams from the center span require supports, then a full superstructure replacement will be required.

RECOMMENDATIONS:

Short Term (1 to 3 years):

- Construct temporary supports to deteriorated beams at the point of load restrictions.
- Repair keyways and transverse joints in all spans.
- Construct new overlay.
- Affix guardrail to posts.

Long Term (8 to 12 years):

- Superstructure replacement
- Upgrade approach guardrail

ATTACHMENTS:

Attachment A. Routine Inspection Report
Attachment B. IDOT Master Structure Report
Attachment C. Structure Sketches
Attachment D. Structure Photos
Attachment E. Cost Estimate
Attachment F. Structure Rating

Illinois Department of Transportation

Routine Inspection Report

SN: 045-3143	District: 1	Spans: 3	Appr. Spans:0	Skew: 0	ADT: 1850	Truck Pct: 4
ADT Un:	Maint. Co: Kane	Twsp: Blackberry			Status: Open - No Restrict	
Facility Carried: Harley Rd.			Feature Crossed: UP RR			
Location: 1.3 Mi. S of IL-38	Municipality:		Team/Sub Section: /		Insp/Rte:	
Bridge Name:			Material & Type: Prestress Concrete/Box Beam or Girder-Mul			
Insp. Intervals Routine: 24	Fracture Critical: 0	Underwater: 0	Special: N/A		Element Level: 24	
90 – Inspection Date: 09 / 09 / 2016		90C – Temp. (ºF): 70		90B1 – In Depth: ☒		
Is Delinquent: ☐	Reason:					
90A – Agency Program Manager:		90A3 – Consultant Program Manager: HLR - S. Megginson				
90A1 – Team Leader: HLR - A. Charlesworth		90A2 – Inspector: HLR - L. Potthast				
90B– Inspection Remarks:						
Previous Inspection						

Resources

Time to Inspect (H:M):	3:0	3:0	Traffic Control:	2	2	Boat:	N	N	Waders:	N	N	Snooper:	Y	Y
Ladder:	N	N	Manlift:	N	N	Bucket Truck:	N	N	Other:			RR		

Inspector's Appraisals

	Prev	New	Comments
58 – Deck Condition:	5	4	See Item 59
59 – Superstructure Cond:	5	4	12" spall with an exposed prestressed strand in the center half of the span. Beam 7 in the South span.
60 – Substructure Cond:	7	6	Moderate delamination/spall with an exposed shear stirrup on the South face of the South pier with no loss of bearing.
62 – Culvert Condition:	N	N	
61 – Channel Condition:	N	N	
71 – Waterway Adequacy:	N	N	
72 – Approach Rdwy Align:	6	6	Minor speed reduction.
111 – Pier Navig Protection:	N	N	

90B – Inspection Remarks:

Super - Moderate leakage with leaching present at multiple keyway joints.

Multiple spalls and delaminations up to 1/3 of the width of the beam.

Signs of differential deflection between beams 1 & 2, 3 & 4, 8 & 9, 10 & 11 in the South span up to 1/2". Also present between beams 6 & 7 in the North span.

Attachment A

Additional Inspection Data

	Prev	New
36A – Bridge Railing Adequacy:	3	3

Rail Types: New Jersey Parapets

	Prev	New		Prev	New		Prev	New
Approach Guardrail Adequacy: 36B – Transitions:	3	3	36C – Guardrail:	3	3	36D – Ends:	3	3

	Prev	New		Prev	New		Prev	New
108A – Wearing Surface Type:	F	F	108B – Type of Membrane:	A	A	108C – Deck Protection:	J	J

	Prev	New
108D – Total Deck Thickness (In.):	23.0	23.0

	Prev	New
59A – Paint Date (Mo/Yr):	__ / ____	/
59B – Paint Type:	– – – – – – – –	

Color: Fascia – _____; Inter. – _____;Railing – _____

	Prev	New
59C – Utilities Attached:	_ _ _	

		Prev	New
Weight Limit Posting:	70A2 – Single Unit Vehicles:	__	Tons
	70B2 – Combination Type 3S-1 (3 or 4 axles):	__	Tons
	70C2 – Combination Type 3S-2 (5 or more axles):	__	Tons
	70D2 – One Truck at a Time:	__	

Joint Openings (In.) N/A

90B – Inspection Remarks Continued:

	Signature	Date
Inspection Team Leader:		9/19/2016
Consultant Program Manager:	S. Meggendorfer	9/19/2016
Agency Program Manager:		/ /

Attachment A

Illinois Department of Transportation
Structures Information Management System
Master Structure Report (S-107)

Structure Number: 045-3143 **District: 1**

Inventory Data

Facility Carried:	HARLEY RD	**Bridge Name:**		**Sufficiency Rating:**	65.0
Feature Crossed:	C&NW RR	**Location:**	1.3 MI. S OF IL-38	**HBP Eligible:**	Yes
Bridge Remarks:				**Replaced By:**	
Bridge Status:	1 OPEN - NO RESTRICT	**StatusDate:**	12/1996	**Replaces:**	045-9941
Status Remarks:	BRIDGE OPENED AUTOMATICALLY BY KEY ROUTE ON UPDATE TRANSACTION			**Last Update Date:**	07/05/2012
Maint County:	045 KANE	**Maint Township:**	04 BLACKBERRY	**Parallel Structure:**	None
Maint Responsibility:	09 TOWNSHIP OR ROAD DISTRICT			**Multi-Level Structure Nbr:**	
Service On/Under:	1 HIGHWAY / 2 RAILROAD			**Skew Direction:**	Left
Reporting Agency:	3 COUNTY			**Skew Angle:**	0 D
Main Span Matl/Type:	5 PRESTRESS CONCRETE / 05 BOX BEAM OR GIRDER-MULTIPLE			**Structure Flared:**	No
Nbr Of Main Spans:	3	**Nbr Of Approach Spans:**	0	**Historical Significance:**	No
*****Approaches*****				**Border Bridge State:**	
Near #1 Matl/Type:	/			**Bdr State SN:**	
Near #2 Matl/Type:	/			**Bdr State % Responsibility:**	0
Far #1 Matl/Type:	/			**Structural Steel Wt:**	0
Far #2 Matl/Type:	/			**Substructure Material:**	55

Structure Length:	171.6				
AASHTO Bridge Length:	99.9				
Length of Long Span:	68.0				
Bridge Roadway Width:	22.0				
Appr Roadway Width:	22.0				
Deck Width:	34.0				
Sidewalk Width Right:	0.0				
Sidewalk Width Left:	0.0				
Navigation Control:	0 No				
Navigation Horiz Clear:	0				
Navigation Vert Clear:	0				
Culvert Fill Depth:	0.0				
Number Culvert Cells:	0				
Culvert Opening Area:	0.0				
Culvert Cell Height:	0.00				
Culvert Cell Width:	0.00				

Median Width/Type:	0 Ft. / 0 None	**Rated By:**	2 IDOT	**Rate Method:**	D ASSIGNED RATING BAS
Guardrail Type L/R:	0 None / 0 None	**Inventory Rating:**	1.000 (36)	**Load Rating Date:**	12/11/1996
Toll Facility Indicator:	0 No Toll	**Operating Rating:**	1.360 (48)		
Latitude:	41.88758619	**Longitude:**	88.42378264	**Design Load:**	99 UNKNOWN
Deck Structure Type:	N N/A	**Deck Structure Thickness:**	0.0	**SD:** N	**FO:** Y
Sidewalks Under Structure:	0 None				

*****Railroad Crossing Info*****

Crossing 1 Nbr:	
Crossing 1 Nbr:	
RR Lateral Underclear:	0.0
RR Vertical Underclear:	0 Ft 0 In

Key Route On Data

Key Route Nbr:	TOWNSHIP OR ROAD DISTRICT 0152	**Station:**	1.2700
Appurtenances	Main Route 00000	**Segment:**	
Inventory County:	045 KANE	**Linked:**	Y
Township/Road Dist	04 BLACKBERRY	**Natl. Hwy System:**	Not on NHS
Municipality:	0000	**Inventory Direction:**	
Urban Area:	1051	**Curr AADT Yr/Count:**	2014 / 1850
Functional Class:	7	**Est Truck Percentage:**	4 %
**** CLEARANCES ****	**South/East** **North/West**	**Number Of Lanes:**	2
Max Rdwy Width:	24.0	**One Or Two Way:**	2 Two-Way
Horizontal:	30.0 0.0	**Bypass Length:**	0
Min Vertical:	99 Ft 11 In 00 Ft 00 In	**Future AADT Yr/Cnt:**	2032 / 893
10 Ft Vertical:	99 Ft 11 In 00 Ft 00 In	**Designated Truck Rte:**	NONE
Lateral:		**Special Systems:**	No

Key Route Under Data

		Station:	
		Segment:	
		Linked:	
		Natl. Hwy System:	
		Inventory Direction:	
		Curr AADT Yr/Count:	/
		Est Truck Percentage:	%
	South/East **North/West**	**Number Of Lanes:**	
		One Or Two Way:	
		Bypass Length:	
	Ft In Ft In	**Future AADT Yr/Cnt:**	/
	Ft In Ft In	**Designated Truck Rte:**	
	Ft Ft	**Special Systems:**	

*** Marked Route On Data ***

	Designation	Kind	Number
Route #1:	1 Mainline	4 FAS, CH, or TR's Unmarked	
Route #2:	1 Mainline		
Route #3:	1 Mainline		

*** Marked Route Under Data ***

	Designation	Kind	Number
Route #1:			
Route #2:			
Route #3:			

Attachment B

Illinois Department of Transportation
Structures Information Management System
Master Structure Report (S-107)

Structure Number: 045-3143 **District: 1**

Data Related to Inspection Information

***Inspection Intervals ***				*** Maximum Allowable Posting Limits ***				Bridge Posting Level:	
Routine NBIS:	24 MOS	Underwater:	0 MOS	One Truck At A Time:	0	Combination Type 3S-1:	Tons	5	No Posting Required
Fracture Critical:	0 MOS	Special:	N	Single Unit Vehicles:	Tons	Combination Type 3S-2:	Tons		

Inspection/Appraisal Information

Inspection Date:	05/22/2015	Inspection Temperature:	71 Deg. F	Insp by (Name):	HaasM	** Actual Posted Limits **			
Deck:	5	FAIR CONDITION - MINOR SECTION LOSS, CRACKS		Insp by (Name):	Edgar Nunez	Single Unit Vehicles:		Tons	
Superstructure:	5	FAIR CONDITION - MINOR SECTION LOSS, CRACKS		Utilities Attached:	N N/A	Combination Type 3S-1:		Tons	
Substructure:	7	GOOD CONDITION - SOME MINOR PROBLEMS			N N/A	Combination Type 3S-2:		Tons	
Culvert:	N	NOT APPLICABLE			N N/A	One Truck At A Time:	0		
Channel and Protection:	N	NOT APPLICABLE		Deck Wearing Surf:	F MICRO SIL CON OVRLY	Last Paint Type:			
Structural Evaluation:	5	BETTER THAN ADEQUATE TO BE LEFT IN PLACE		Deck Membrane:	A WATERPROOF MEM SYST				
Deck Geometry:	3	INTOLERABLE - HIGH PRIORITY FOR CORRECTION		Deck Protection:	J NONE				
Underclearance-Vert/Lat.:	3	INTOLERABLE - HIGH PRIORITY FOR CORRECTION		Total Deck Thick:	23.0				
Waterway Adequacy:	N	NOT APPLICABLE		Last Paint Date:					
Approach Roadway Align:	6	EQUAL TO PRESENT MINIMUM CRITERIA		Inspection Remarks:					
Bridge Railing Appraisal:	3	Meets Standards							
Approach Guardrail:	333	Acceptable	Acceptable	Acceptable					
Pier Navig Protection:	N	N/A							

Underwater Inspection/Appraisal Information

Inspection Date:									
Temperature:		Inspection Method:							
Inspected By:		Inspected By:		Appraisal Rating:					
Inspection Remarks:									

Scour Critical Information

Rating:		Evaluation Method:	
Analysis Date:		Analysis By:	

Miscellaneous

Fracture Critical Members:	No
Microfilm Data Recorded:	No

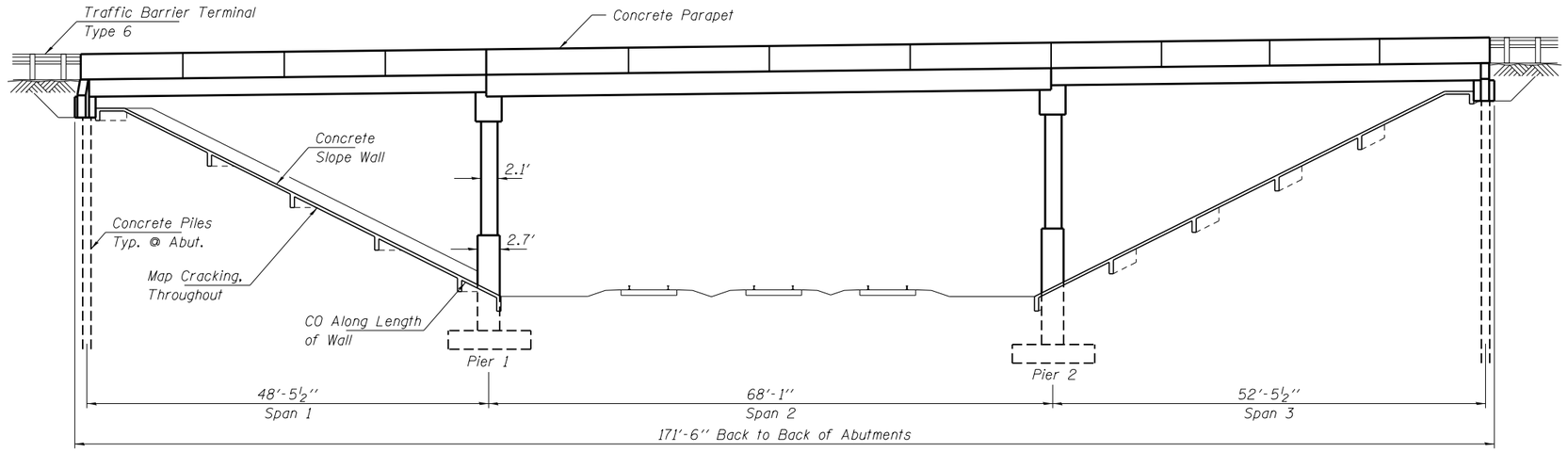
Construction Information

Year:	1996 Original			Reconstructed	
Route:	TR-152	Sta:	C-91-119-9		Sta:
Section Nbr:	89-04109-00-BR				
Contract Nbr:	83125				
Fed Aid Pr #:	BR-09-089(10)				
Built By:	0 UNKNOWN				

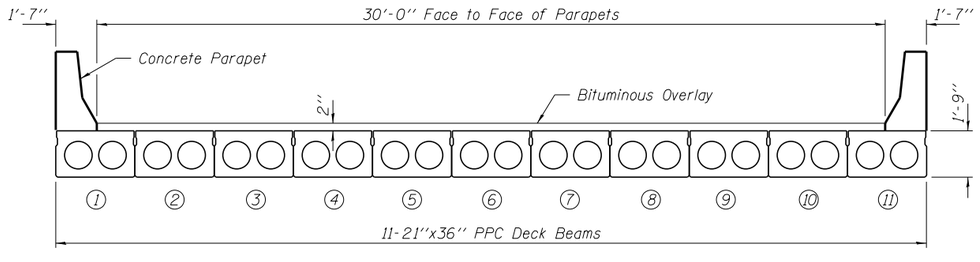
Proposed Improvement

Cost Estimate Year:		Length:	
Type of Work:		*** Costs in Dollars ***	
Done By:		Bridge Cost:	
Remarks:		Roadway Cost:	
		Total Project Cost:	

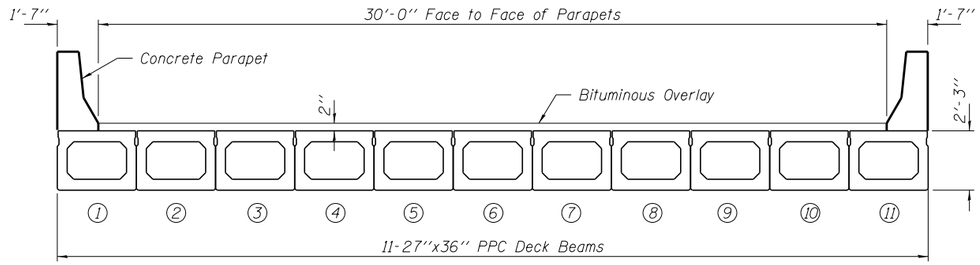
Attachment B



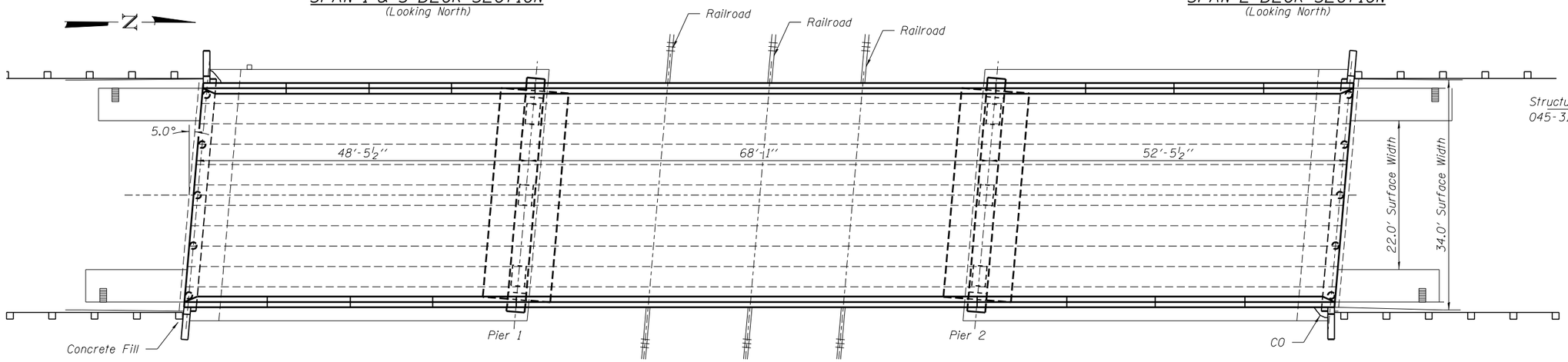
EAST ELEVATION
(Looking West)



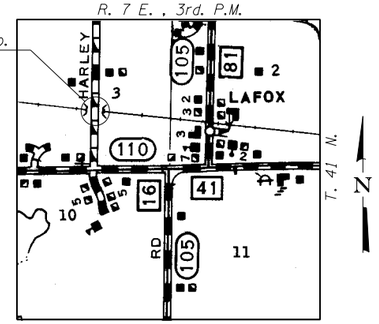
SPAN 1 & 3 DECK SECTION
(Looking North)



SPAN 2 DECK SECTION
(Looking North)



PLAN



LOCATION SKETCH

LEGEND

CO = Crack - Open
CC = Crack - Closed
DL = Delamination
LE = Leaching
PD = Plugged Drain Hole
PS = Prestressed Strand
RF = Reinforcement
RP = Repair
RS = Rust Staining
SP = Spall
SS = Shear Stirrup
ST = Efflorescence
WL = Water Leakage
Delamination
Spalls
Crack

Attachment C

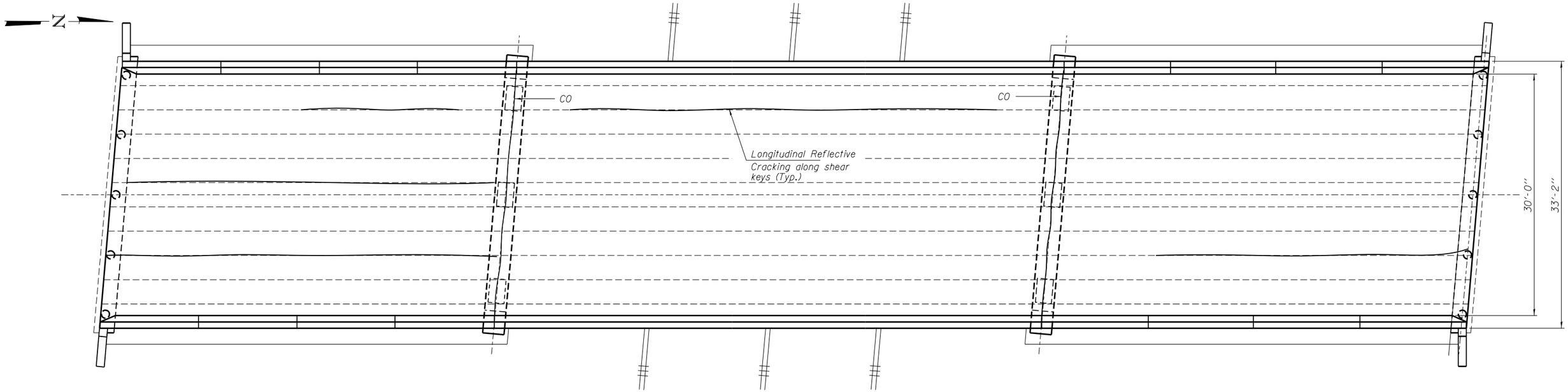
Blackberry Township

KANE COUNTY DIVISION OF TRANSPORTATION

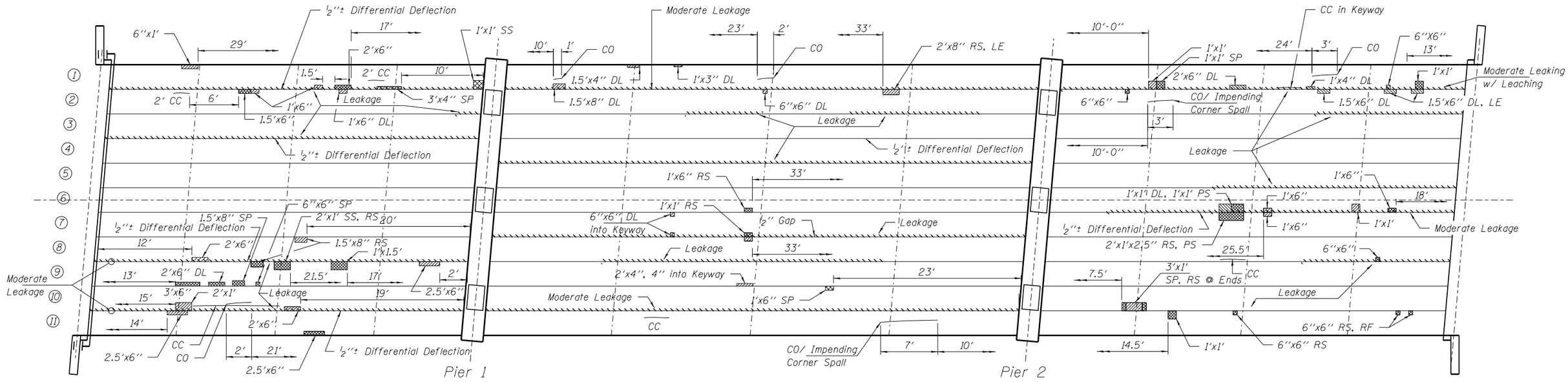
HARLEY ROAD OVER
UNION PACIFIC RAILROAD
KANE COUNTY
STRUCTURE NUMBER: 045-3143

GENERAL PLAN AND ELEVATION

DRAWN BY: RDH	HAMPTON, LENZINI AND RENWICK, INC.	DATE: SEPTEMBER 9, 2016
CHECKED BY: AMC	3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703	
PROJECT NO. 16.0118	ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORP. 184.005959	SHEET 1 OF 4



TOP OF DECK



UNDERSIDE OF DECK

LEGEND

CO = Crack - Open
CC = Crack - Closed
DL = Delamination
LE = Leaching
PD = Plugged Drain Hole
PS = Prestressed Strand
RF = Reinforcement
RP = Repair
RS = Rust Staining
SP = Spall
SS = Shear Stirrup
ST = Efflorescence
WL = Water Leakage
Delamination
Spalls
Crack

GENERAL BEAM CONDITION:

Leakage along joints between beams (Typ)
Minor efflorescence & rust spots

Attachment C

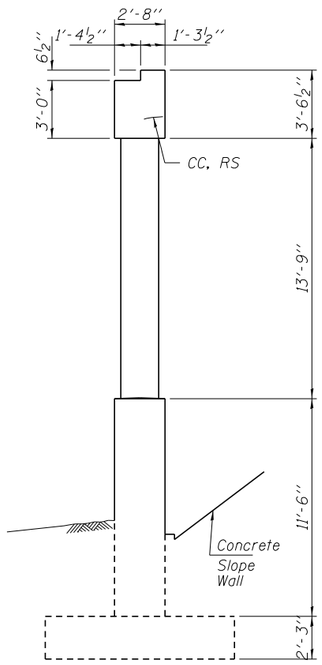
Blackberry Township

KANE COUNTY DIVISION OF TRANSPORTATION

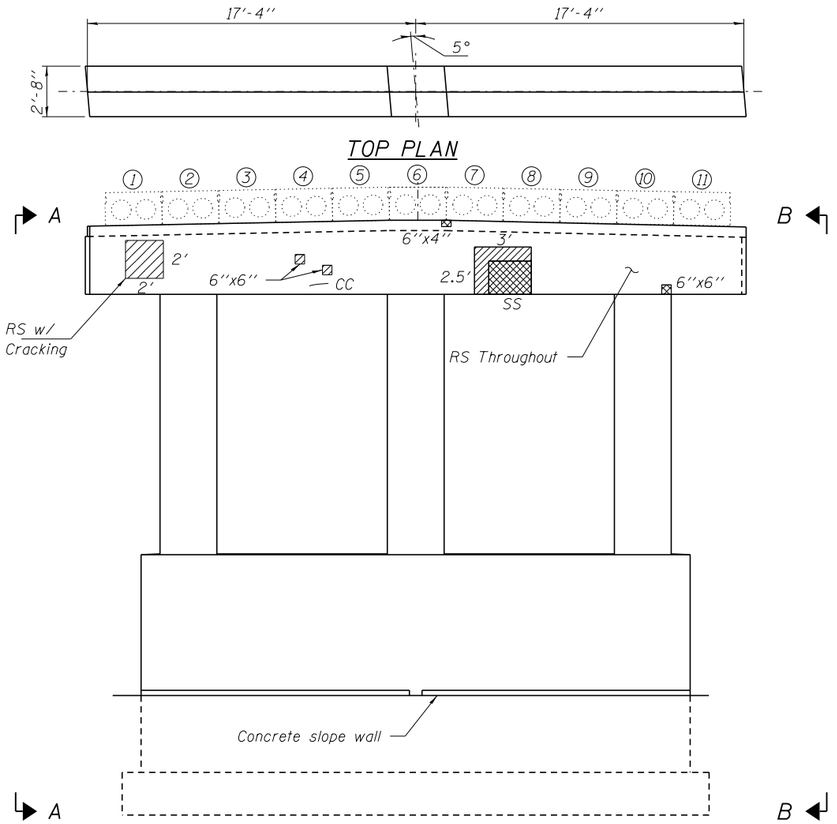
HARLEY ROAD OVER
UNION PACIFIC RAILROAD
KANE COUNTY
STRUCTURE NUMBER: 045-3143

DECK CONDITION

DRAWN BY: RDH	HAMPTON, LENZINI AND RENWICK, INC.	DATE:
CHECKED BY: AMC	3180 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703	SEPTEMBER 9, 2016
PROJECT NO. 16.0118	ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORP. 184.000959	SHEET 2 OF 4

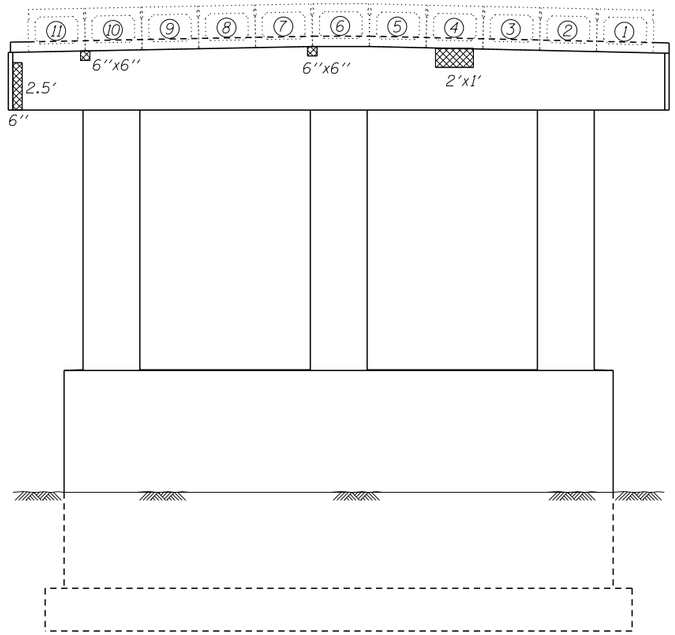


SECTION A-A



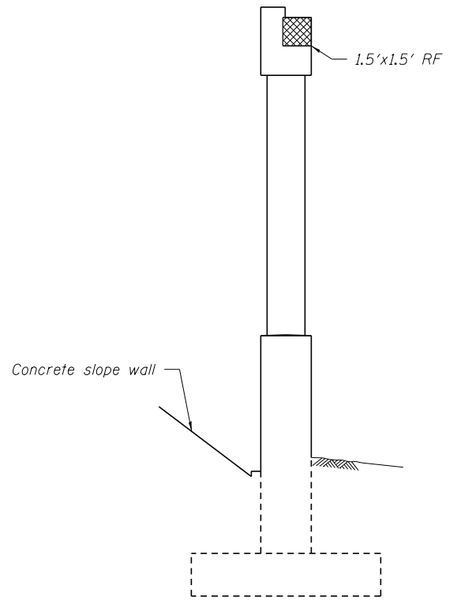
PIER 1

(Looking North)



PIER 1

(Looking South)



SECTION B-B

LEGEND

CO = Crack - Open	SS = Shear Stirrup
CC = Crack - Closed	ST = Efflorescence
DL = Delamination	WL = Water Leakage
LE = Leaching	
PD = Plugged Drain Hole	Delamination
PS = Prestressed Strand	
RF = Reinforcement	Spalls
RP = Repair	
RS = Rust Staining	Crack
SP = Spall	

Attachment C

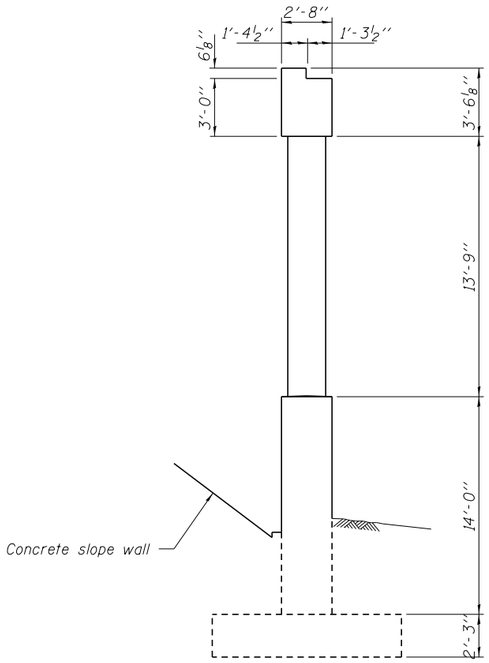
Blackberry Township

KANE COUNTY DIVISION OF TRANSPORTATION

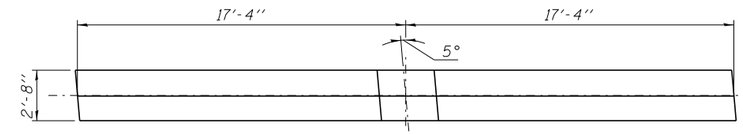
HARLEY ROAD OVER
UNION PACIFIC RAILROAD
KANE COUNTY
STRUCTURE NUMBER: 045-3143

PIER 1

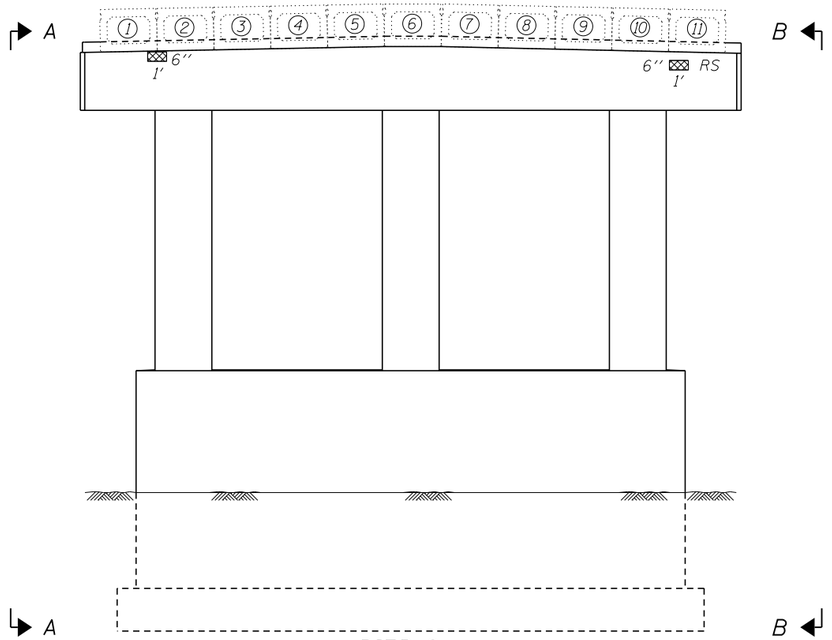
DRAWN BY: RDH	HAMPTON, LENZINI AND RENWICK, INC.	DATE:
CHECKED BY: AMC	3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703	SEPTEMBER 9, 2016
PROJECT NO. 16.0118	ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORP. 184.000959	SHEET 3 OF 4



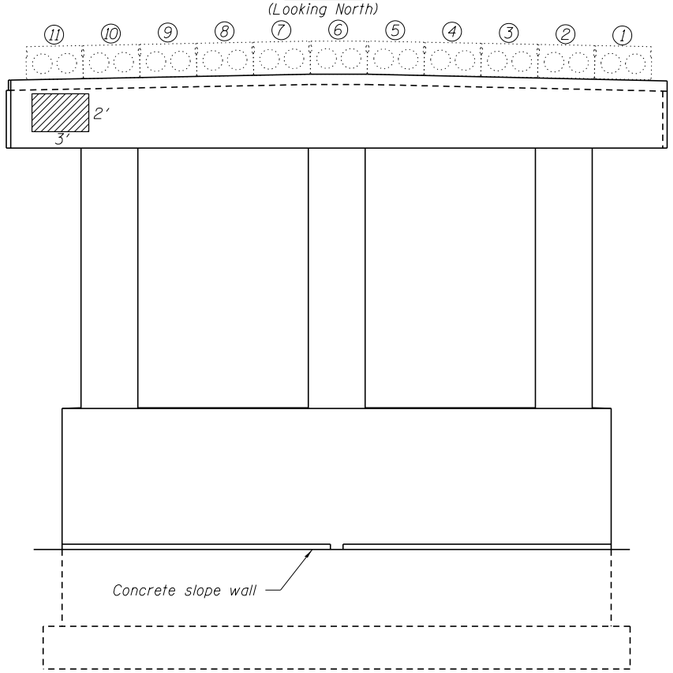
SECTION A-A



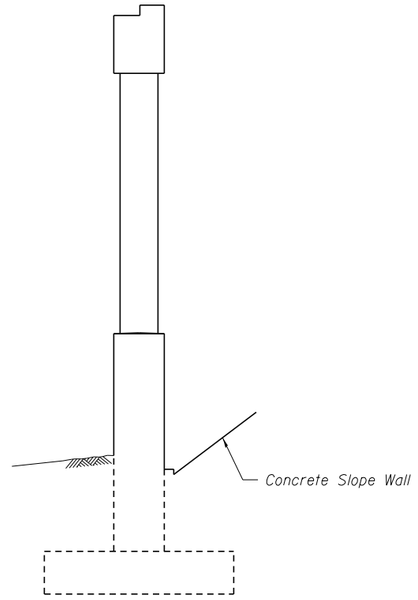
TOP PLAN



PIER 2
(Looking North)



PIER 2
(Looking South)



SECTION B-B

LEGEND

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Attachment C

Blackberry Township

KANE COUNTY DIVISION OF TRANSPORTATION

HARLEY ROAD OVER
UNION PACIFIC RAILROAD
KANE COUNTY
STRUCTURE NUMBER: 045-3143

PIER 2

DRAWN BY: RDH	HAMPTON, LENZINI AND RENWICK, INC.	DATE: SEPTEMBER 9, 2016
CHECKED BY: AMC	3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703	
PROJECT NO. 16.0118	ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORP. 184.000959	SHEET 4 OF 4

Photo 1 - Looking North down West Fascia

Photo 2 - Underside of Beams Looking Southeast - Span 1

Photo 3 - South Span and Abutment

Photo 4 - South Face of the North Pier

Photo 5 - Underside of Beams Looking Northeast - Span 2

Photo 6 - 2' x 1' Spall with an Exposed Shear Stirrup near Midspan - Beam 9, Span 1

Photo 7 - South Face of the South Pier

Photo 8 - 2.5' x 3' x 1.5' Deep Spall with an Exposed Shear Stirrup - South Face of South Pier

Photo 9 - North Face of the South Pier

Photo 10 - Underside of Beams Looking Southeast - Span 2

Photo 11 - North Span and Abutment

Photo 12 - Moderate Keyway Joint Leakage along Beams 10 & 11 - Span 3

Photo 13 - Underside of Beams Looking Northwest - Span 3

Photo 14 - North Face of the North Pier

Photo 15 - 2' x 1' x 2.5" Deep Spall with an Exposed Prestressed Strand near Midspan - Beam 7, Span 3

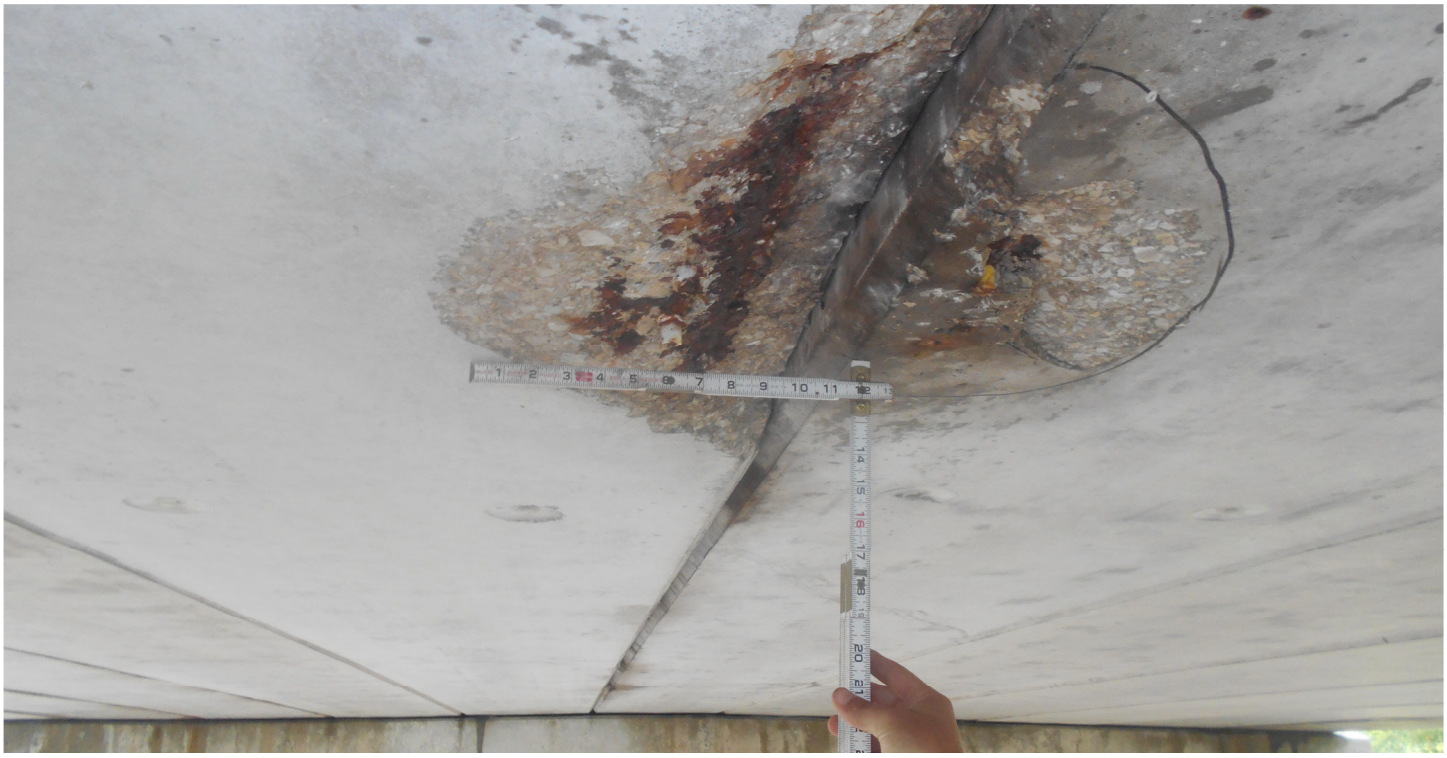


Photo 16 - Previously Mentioned Spall - Beam 7, Span 3

Photo 17 - Looking South down East Fascia

KANE COUNTY DIVISION OF
TRANSPORTATION

PLATO TOWNSHIP
STRUCTURE 045-3143
HARLEY ROAD OVER
U.P. R.R.

ESTIMATE OF COST - Superstructure Rehabilitation & Beam Shoring

171'-6" bk-bk abutments; 30'-0" face-face parapets

ITEM NO.	ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL
1.	Keyway Repair	Ft	1700	$ 20.00	$ 34,000
2.	Bituminous Overlay Removal, 2"	Sq Yd	570	$ 30.00	$ 17,100
3.	Bituminous Wearing Surface, 2"	Ton	95	$ 150.00	$ 14,250
4.	Erosion Control / Seeding	L Sum	1	$ 10,000.00	$ 10,000
5.	Furnish & Erect Structure Steel	L Sum	1	$150,000.00	$ 150,000
6.	Railroad Protective Liability Insurance	L Sum	1	$ 10,000.00	$ 10,000
7.	Structural Repair of Concrete (≤ 5")	Sq Ft	25	$ 120.00	$ 3,000
8.	Traffic Control and Protection	L Sum	1	$ 10,000.00	$ 10,000
9.	Mobilization	L Sum	1	$ 5,000.00	$ 5,000
	SUBTOTAL				$253,350
	10% CONTINGENCY				$25,335
	TOTAL ESTIMATE OF COST				$278,685

Made by: AMC 11/4/16 Checked by: SWM 12/1/16

PLATO TOWNSHIP ROAD DISTRICT
STRUCTURE NO. 045-3143

PRELIMINARY ESTIMATE OF COST

TR 152 / HARLEY ROAD / U.P.R.R.

SUPERSTRUCTURE REPLACEMENT AND APPROACH ROADWAY RECONSTRUCTION

Type: Bridge & Bit. Approaches Width: 34'-0" Br. Thickness: Varies Shoulders: Varies

ITEM NO.	ITEMS	UNIT	QUANTITY	UNIT PRICE	TOTAL
1.	Tree Removal (6 to 15 Units Diameter)	Unit	250	25.00	6,250.00
2.	Tree Removal (Over 15 Units Diameter)	Unit	250	30.00	7,500.00
3.	Earth Excavation	Cu. Yd.	50	20.00	1,000.00
4.	Furnished Excavation	Cu. Yd.	660	30.00	19,800.00
5.	Porous Granular Embankment	Ton	70	30.00	2,100.00
6.	Seeding, Class 2A Special	Acre	2.9	9,000.00	26,100.00
7.	Erosion Control Blanket	Sq. Yd.	3,600	10.00	36,000.00
8.	Perimeter Erosion Barrier	Foot	1,800	5.00	9,000.00
9.	Furnishing & Placing Topsoil, 4"	Sq. Yd.	3,600	8.00	28,800.00
10.	Bituminous Materials (Prime Coat)	Gallon	750	3.00	2,250.00
11.	Temporary Ramp	Sq. Yd.	34	100.00	3,400.00
12.	HMA Surface Course, N90	Ton	1,074	120.00	128,880.00
13.	Bituminous Surface Removal - Butt Jt	Sq. Yd.	147	25.00	3,675.00
14.	Pavement Removal	Sq. Yd.	147	15.00	2,205.00
15.	Aggregate Shoulders, Type A	Ton	1,690	30.00	50,700.00
16.	Concrete Removal	Cu. Yd.	3.0	1,500.00	4,500.00
17.	Concrete Superstructure	Cu. Yd.	7.2	2,000.00	14,400.00
18.	Concrete Wearing Surface	Sq. Yd.	570	110.00	62,700.00
19.	Structural Repair of Concrete (=< 5")	Sq. Ft.	250	100.00	25,000.00
20.	Removal of Existing Superstructure	Each	1	50,000.00	50,000.00
21.	PPC Deck Beams	Sq Ft	5814	70.00	406,980.00

22.	Reinforcement Bars, Epoxy Coated	Pound	13,780	1.50	20,670.00
23.	Bridge Approach Pavement	Sq. Yd.	0	425.00	0.00
24.	Preformed Joint Strip Seal	Foot	40	200.00	8,000.00
25.	Formed Concrete Repair	Sq. Ft.	6	250.00	1,500.00
26.	Removal of Drain Structures	Each	4	400.00	1,600.00
27.	Steel Plate Beam Guardrail, Type A	Foot	500	30.00	15,000.00
28.	Traffic Barrier Terminal, Type 6	Each	4	3,500.00	14,000.00
29.	Traffic Barrier Terminal, Ty1 Spl Tangent	Each	6	3,500.00	21,000.00
30.	Guardrail Removal	Foot	1,250	15.00	18,750.00
31.	Storm Sewers, Class A, Type 2 12"	Foot	130	30.00	3,900.00
32.	Type C Inlet Box, Standard 609006	Each	4	500.00	2,000.00
33.	Removal of Drain Structures	Each	4	400.00	1,600.00
34.	Short Term Pavement Marking	Foot	590	3.00	1,770.00
35.	Epoxy Pavement Marking - Line 4"	Foot	13,100	1.50	19,650.00
36.	Railroad Protective Liability Insurance	L Sum	1	30,000.00	30,000.00
37.	Traffic Control and Protection	L Sum	1	30,000.00	30,000.00
38.	Mobilization	L Sum	1	35,000.00	35,000.00
39	Portable Changeable Message Sign	Cal Mo	4	1,500.00	6,000.00
					1,121,680.00
			Contingency	15%	
	TOTAL ESTIMATE OF COST				**$ 1,289,932.00**

Made by: SWM Date: 5/02/2016

Checked by: SWM Date:

Simple Span PPC Deck Beam Rating
LFR

Span 3 (53' Beam), Beam 7

Job Number	16.0118
County	Kane
Structure No.	045-3143
By	DWT
Date	07/20/16

Bridge:

Span Length	51.83	ft
WS Thickness	2.00	in
Rail / Parapet	0.460	k/ft
F's	270,000	psi
F'c	5,000	psi
F'ci	4,100	psi
Number of Actual Lanes	2	
Number of Design Lanes	2	
Strand Type	Stress Relieved	

Deck Beams:

Beam	21x36	Okay
Number of Beams	11	
% Strand Area Reduction	0.00	%
% Shear Key Reduction	0.00	%
Deck Width	33	ft
Beam Depth	21	in
Beam Width	3.00	ft
Beam Weight	0.550	k/ft
Beam Area	502.45	in^2
Centroid from Bottom	10.41	in
d	17.25	in

Strands:

Strand Area	0.153	in^2	
Number of Strands @	3	1.75	in
	9	3.25	in
Original Strand Layout:		4.50	in
6 @ 1.75"		6.00	in
9 @ 3.25"		7.50	in
2 @ 9.00"	2	9.00	in
		10.50	in
		12.00	in
		15.00	in
	C.G.	3.75	in

Dead Load:

Beam	0.550	k/ft / Beam
Wearing Surface	0.075	k/ft / Beam
Rail / Parapet (3 Bms Max)	0.153	k/ft / Beam
Fill	0.000	k/ft / Beam
Other / Diaphragm	0.011	k/ft / Beam
	0.789	k/ft / Beam

Moment Capacity: (PCM)

As*	2.14	in^2	
Aeff = bd	621.00	in^2	
ρ *	0.0034		(Eq. 10)
b'	11.00	in	
γ *	0.40		
β 1	0.80		
F*su	244,855	psi	(Eq. 11)
a	3.43	in	(Eq. 12)
a allowable	4.25	(Eq. 13)	
Limit	0.169		1.1.7
Limit Max	0.288	Okay	1.1.7
Mn	677.5	k-ft	(Eq. 13&14)
Mn max	NA	k-ft	(Eq. 15&16)
Humidity	70	%	
Es	28,000	ksi	1.1.5
Eci	3,650	ksi	1.1.5
e	6.662	in	1.1.6
I	24,965	in^4	
Mdl beam	184.69	k-ft	
f*cir	0.78	ksi	1.1.5
Msdl	80.37	k-ft	
fcds	0.26	ksi	1.1.5
SH	6.500	ksi	(Eq. 1a)
ES	5.995	ksi	(Eq. 1b)
CRc	7.576	ksi	(Eq. 1c)
CRs	14.787	ksi	(Eq. 1d&e)
Fsi	189,000	psi	1.1.4
% loss	18.44	%	(Eq. 2)
Fi	404.84	k	1.1.6
F	330.17	k	1.1.6
Sb	2397.8	in^3	
fpe	1.57	ksi	1.1.7
Fr	530.33	psi	1.1.7
M*cr	420.57	k-ft	(Eq. 17)
Asf	1.84	in^2	1.1.7
Asr	0.30	in^2	1.1.7
j	0.899		

Final Moment Capacities:

Mn	677.53	k-ft
1.2 * Mcr	504.69	k-ft
k	1.34	(2: 6.6.3.3)
Mn (if Mn < 1.2	909.56	k-ft
Use 1.2 * Mcr	No	
Mn = C	677.53	k-ft
% Cap. Reduc	0.00%	
C = Φ Rn	677.53	k-ft

Attachment F

16.0118
045-3143

Simple Span PPC Deck Beam Rating

Moments & Stresses: (AASHTO)

D = Dead Load	265.05	k-ft
L = Live Load HS20	216.20	k-ft
S	0.00	k-ft
St	2,358	in^3
Sb	2,398	in^3
Fd (Top)	1.349	ksi
Fd (Bottom)	-1.326	ksi
Fs (Top)	0.000	ksi
Fs (Bottom)	0.000	ksi
Fp (Top)	-0.276	ksi
Fp (Bottom)	1.574	ksi
Fd Fs Fp (Top)	1.073	ksi
Fd Fs Fp (Bottom)	0.248	ksi
F_L (Top)	1.100	ksi
F_L (Bottom)	-1.082	ksi
Negative = Tension	2.17	TOP
Positive = Compression	-0.83	BOTTOM

Live Load Distribution Factors:

Design

	IDOT PCM	*AASHTO*	
Design Lanes	2	2	
K	0.8	0.8	3.23.4.3
C	0.509	0.509	2.1.4/(Eq. 3-13)
S	3.00	3.00	
D	6.874	5.879	2.1.4/(Eq. 3-12)
DF design	0.436	0.510	2.1.4/(Eq. 3-11)

Permits & Posting (P&P)

	IDOT PCM	*AASHTO*	
Design Lanes	2	2	
K	0.8	0.8	3.23.4.3
C	0.509	0.509	2.1.4/(Eq. 3-13)
S	3.00	3.00	
D	6.874	5.879	2.1.4/(Eq. 3-12)
DF design	0.436	0.510	2.1.4/(Eq. 3-11)

RF = (C -A1*D) / (A2*L*(1+I))

A1 = 1.3
A2 = 2.17 (Inventory)
A2 = 1.3 (Operating)

Design Stress Limits

Comp.	3.00	ksi
Tension	-0.42	ksi

Beam Design Moments

Ms	481.26	k-ft
Mu	813.01	k-ft

Used

Impact	0.283		
DF Max	1.000		Wheel / Beam
Design DF	0.510	AASHTO	Wheel / Beam
P&P DF	0.510	AASHTO	3.8.2.1

** Live load moments & shears taken from AASHTO Appendix A

HS-20 Ratings	C / F'_c / F'_y	D / (F_d+F_p+F_s)	L / F_L	RF	HS	
M Concrete Tension	-0.42	0.25	-1.08	**0.621**	12.43	(Eq 4) - Bottom
M Concrete Compression	3.00	1.07	1.10	1.751	35.02	(Eq 5) - Top
M Concrete Compression	2.00	0.54	1.10	1.330	26.60	(Eq 5b) - Top
M Pre Steel Tension	216.00	95.79	78.13	1.539	30.77	
M Inventory	677.53	265.05	216.20	0.710	14.19	
M Pre Steel Tension	243.00	95.79	78.13	1.884	37.68	
M Operating	677.53	265.05	216.20	**1.185**	23.69	
V Inventory	See Below			1.574	31.47	
V Operating	See Below			2.623	52.45	

HS-20 Rating Factor:

	RF	**HS**
Inventory	**0.621**	**12.43**
Operating	**1.185**	**23.69**

Attachment F

Shear Rating Calculations:

Simple Span	Location 0.017	0.1	0.2	0.3	0.4	0.5	
	0.88	5.18	10.37	15.55	20.73	25.92	ft
V DL	19.76	16.36	12.27	8.18	4.09	0.00	k
V LL (Lane) - from ConSys	57.82	51.83	44.63	37.43	30.23	23.36	k
V LL (Beam)	18.92	16.97	14.61	12.25	9.90	7.64	k
Vs	38.69	33.33	26.88	20.43	13.99	7.64	k
Vult	66.70	58.03	47.61	37.18	26.76	16.56	k
M DL	17.60	95.42	169.63	222.64	254.45	265.05	k-ft
M LL (Lane) - from Consys	50.58	268.65	462.67	582.05	649.21	652.92	k-ft
M LL (Beam)	16.56	87.93	151.43	190.50	212.48	213.70	k-ft
Ms	34.15	183.35	321.06	413.15	466.93	478.75	k-ft
Mult	58.75	314.56	548.62	702.20	791.16	807.58	k-ft
e	6.66	6.66	6.66	6.66	6.66	6.66	in
d (0.8h min)	17.25	17.25	17.25	17.25	17.25	17.25	in
b'	11.00	11.00	11.00	11.00	11.00	11.00	in
vu	0.351	0.306	0.251	0.196	0.141	0.087	ksi
F/A	0.657	0.657	0.657	0.657	0.657	0.657	ksi
Fe/Sb	0.917	0.917	0.917	0.917	0.917	0.917	ksi
fpe	1.574	1.574	1.574	1.574	1.574	1.574	ksi
fd	0.088	0.478	0.849	1.114	1.273	1.326	ksi
Mcr	381.8	304.0	229.7	176.7	144.9	134.3	k-ft
vci	1.754	0.341	0.185	0.124	0.086	0.057	ksi
vci Used	1.754	0.341	0.185	0.124	0.120	0.120	ksi
Fe(y'-Cb)/I	0.000	0.000	0.000	0.000	0.000	0.000	ksi
M DL(y'-Cb)/I	0.000	0.000	0.000	0.000	0.000	0.000	ksi
fpc	0.657	0.657	0.657	0.657	0.657	0.657	ksi
vcw	0.445	0.445	0.445	0.445	0.445	0.445	ksi
Av	0.440	0.440	0.440	0.440	0.440	0.440	in^2
s	12.00	12.00	12.00	12.00	12.00	12.00	in
fy	60.00	60.00	60.00	60.00	60.00	60.00	ksi
vs	0.20	0.20	0.20	0.20	0.20	0.20	ksi
vn	0.580	0.487	0.347	0.292	0.288	0.288	ksi
C	110.1	92.4	65.8	55.3	54.7	54.7	kips
D	19.8	16.4	12.3	8.2	4.1	0.0	kips
L	18.9	17.0	14.6	12.3	9.9	7.6	kips
Inv RF	2.058	1.934	**1.574**	1.684	2.302	3.302	
Inv HS	41.16	38.68	31.47	33.67	46.05	66.03	Tons
Opr RF	3.430	3.223	**2.623**	2.806	3.837	5.503	
Opr HS	68.61	64.47	52.45	56.12	76.75	110.05	Tons

Shear Rating Factor:	**RF**	**HS**
Inventory	**1.574**	**31.47**
Operating	**2.623**	**52.45**

Attachment F

Simple Span PPC Deck Beam Rating

Illinois Posting Vehicles:

*Type 2 - 15.75 Tons	C	D	L	RF	Tons
M Inventory	677.53	265.05	106.85	1.436	22.62
M Operating	677.53	265.05	106.85	2.397	37.75
V Inventory	110.09	19.76	9.22	4.218	66.43
V Operating	110.09	19.76	9.22	7.041	110.89

*Type 3 - 22 Tons	C	D	L	RF	Tons
M Inventory	677.53	265.05	152.56	1.006	22.13
M Operating	677.53	265.05	152.56	1.679	36.93
V Inventory	110.09	19.76	12.76	3.048	67.06
V Operating	110.09	19.76	12.76	5.088	111.93

*Type 3-S1 - 29.25 Tons	C	D	L	RF	Tons
M Inventory	677.53	265.05	176.91	0.867	25.37
M Operating	677.53	265.05	176.91	1.448	42.35
V Inventory	110.09	19.76	14.38	2.704	79.08
V Operating	110.09	19.76	14.38	4.513	132.01

*Type 3-S2 - 36 Tons	C	D	L	RF	Tons	ConSYS	
M Inventory	677.53	265.05	230.00	0.667	24.02	702.72	k-ft/Lane
M Operating	677.53	265.05	230.00	1.114	40.09		
V Inventory	110.09	19.76	20.35	1.911	68.79	62.18	k/Lane
V Operating	110.09	19.76	20.35	3.190	114.83		

80k IDOT Legal Load:

*Type LL - 40 Tons	C	D	L	RF	Tons	ConSYS	
M Inventory	677.528	265.05	162.35	0.947	37.86	496.03	k-ft/Lane
M Operating	677.528	265.05	162.35	1.578	63.10		
V Inventory	110.086	19.76	13.58	2.868	114.73	41.49	k/Lane
V Operating	110.086	19.76	13.58	4.781	191.22		

* Data obtained from computer program "Envelopes from Simple Beam with Special Truck" - IDOT & ConSYS

Postings: (Operating Level)

	RF	Tons	Req.
Single Unit	1.679	**36.9**	NO
3 or 4 Axles	1.448	**42.3**	NO
5 or More Axles	1.114	**40.0**	NO

** Structures less than a rating of 3 Tons should be closed to traffic.
Inventory = May be utilized for an indefinite period of time
Operating = Absolute maximum permissible load level

Strand Areas: 3/8" = 0.085 in2 1/2" = 0.153 in2
7/16" = 0.115 in2 3/5" (0.6) = 0.217 in2

Codes Used:
1: Standard Specifications for Highway Bridges, 17th Ed. - AASHTO
2: Manual for Condition Evaluation of Bridges, 2nd Ed. - AASHTO
3: Prestressed Concrete Manual, 1994 Rev - IDOT
4: Guidelines for Load Rating and Posting Analysis, Draft - IDOT

Hampton, Lenzini, and Renwick Inc., 3085 Stevenson Drive, Suite 201, Springfield, IL 62703 217.546.3400

Simple Span PPC Deck Beam Rating

Kane County Posting Vehicles:

ConSYS Data

KC-1 Moment	938.65	k-ft
KC-1 Shear	78.68	k
KC-2 Moment	938.65	k-ft
KC-2 Shear	80.90	k
KC-3 Moment	894.87	k-ft
KC-3 Shear	87.96	k
KC-4 Moment	755.48	k-ft
KC-4 Shear	72.25	k

Gross WT

KC-1	85.00	Tons
KC-2	82.50	Tons
KC-3	70.00	Tons
KC-4	57.50	Tons

*KC-1	C	D	L	RF	Tons
M Inventory	677.53	265.05	307.22	0.499	42.45
M Operating	677.53	265.05	307.22	0.834	70.86
V Inventory	110.09	19.76	25.75	1.510	128.37
V Operating	110.09	19.76	25.75	2.521	214.27

*KC-2	C	D	L	RF	Tons
M Inventory	677.53	265.05	307.22	0.499	41.20
M Operating	677.53	265.05	307.22	0.834	68.78
V Inventory	110.09	19.76	26.48	1.469	121.17
V Operating	110.09	19.76	26.48	2.452	202.26

*KC-3	C	D	L	RF	Tons
M Inventory	677.53	265.05	292.89	0.524	36.67
M Operating	677.53	265.05	292.89	0.874	61.21
V Inventory	110.09	19.76	28.79	1.351	94.56
V Operating	110.09	19.76	28.79	2.255	157.84

*KC-4	C	D	L	RF	Tons
M Inventory	677.53	265.05	247.27	0.621	35.68
M Operating	677.53	265.05	247.27	1.036	59.56
V Inventory	110.09	19.76	23.65	1.645	94.56
V Operating	110.09	19.76	23.65	2.745	157.85

* Data obtained from ConSYS computer program

Postings: (Operating Level)

	RF	Tons	Pounds
KC-1	**0.834**	**70.9**	**141,700**
KC-2	**0.834**	**68.8**	**137,500**
KC-3	**0.874**	**61.2**	**122,400**
KC-4	**1.036**	**59.6**	**119,100**

Attachment F

Run 7/30/96 Letting 8/30/96

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R.152	89-04109-00-BR	KANE	23	1
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT	BR-09-089(10)	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANS FOR PROPOSED
BRIDGE REPLACEMENT & REHABILITATION PROGRAM

SCALES { PLAN 0' 100' | PROFILE HORIZ. 0' 100' | PROFILE VERT. 0' 10' | CROSS SECTIONS 0' 5' }

INDEX OF SHEETS

See Proposal Booklet for Borings.

STANDARDS

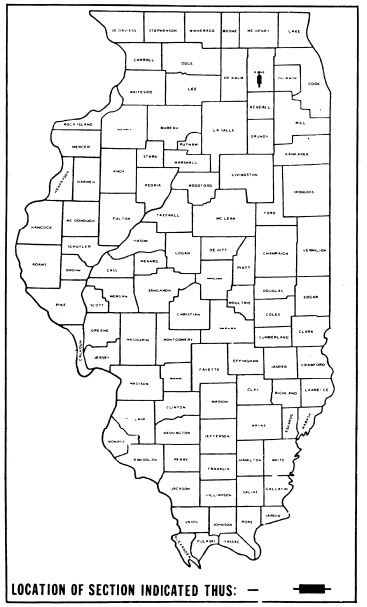
1686-5	STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS
1744-6	RIGHT-OF-WAY MARKERS
2113-4	DETAIL OF NAME PLATE FOR BRIDGES
2228-5	METAL END FOR PIPE CULVERTS
2230-18	STEEL PLATE BEAM GUARD RAIL
2298-12	TRAFFIC CONTROL DEVICES
2302-9	RURAL, 2-LANE, 2-WAY, OFF-ROAD OPERATIONS 4.5 M (15') TO 600 MM (24")
2303-10	RURAL LANE CLOSURE, 2-LANE, 2-WAY, ON ROAD TO 600 MM (24") OFF ROAD, DAY ONLY
2304-10	RURAL LANE CLOSURE, NIGHT 2-LANE, 2-WAY, ON ROAD TO 600 MM (24") OFF-ROAD
2307-10	RURAL LANE CLOSURE, 2-LANE, 2-WAY, SHORT TIME OPERATIONS
2323-14	PAVEMENT JOINTS
2324-10	BRIDGE APPROACH SHOULDER PAVEMENT AND DRAIN
2336-5	TRAFFIC BARRIER TERMINAL, TYPE 1
2341-10	TRAFFIC BARRIER TERMINAL, TYPE 6
2381-2	TEMPORARY EROSION CONTROL SYSTEMS
2396-1	TYPICAL PAVE MARKINGS
2443-3	BRIDGE APPROACH PAVEMENT (DRAIN DETAIL)
BLR 21-3	TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES TWO LANE, TWO WAY, RURAL, OVER ONE DAY

DESIGN FUNCTIONAL CLASSIFICATION
LOCAL ROAD, DHV 200-400
DESIGN TRAFFIC: 1000 ADT
DESIGN SPEED: 45 MPH

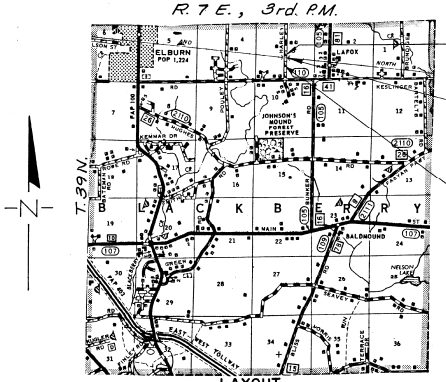
CONTRACT NO. 83125

HARLEY ROAD
(OVER CHICAGO & NORTHWESTERN R.R.)
BLACKBERRY ROAD DISTRICT
PROJECT ACBR-OS-089(10)
STATE SECTION 1992-042 SB
LOCAL AGENCY SECTION 89-04109-00-BR
KANE COUNTY
STRUCTURE NO. 045-3143
C-91-119-92

RECEIVED
OCT 28 1996
KANE COUNTY
DIVISION OF TRANSPORTATION



R. 7 E., 3rd. P.M.



LAYOUT

APPROXIMATE SCALE: 0 ½ 1 MILE

Improvement Ends
Sta. 21+00

Sta. 12+97.00 Special Bridge Design
Precast Prestressed Concrete Deck
Beam Bridge. Three Spans: 49'-0", 68'-0", 53'-0". 30'-0" Rdwy. Skew = 5°

Improvement Begins
Sta. 2+00

Gross Length = Net Length of Section = 1,900 Feet = 0.360 Miles

APPROVED March 7, 1996
Mike R. Sakraddin
LOCAL AGENCY REPRESENTATIVE

PASSED May 2, 1996
James R. Magnus
DISTRICT ENGINEER OF LOCAL ROADS & STREETS

APPROVED May 6, 1996
DISTRICT ENGINEER

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TOLL FREE JOINT UTILITY LOCATING INFORMATION FOR EXCAVATORS (J.U.L.I.E.)
TELEPHONE NUMBER 1-800-892-0123
CALL 24 HRS. BEFORE DIGGING

(Printed by Authority of the State of Illinois)

RICE, BERRY and UZMAN, CONSULTING ENGINEERS, SPRINGFIELD, ILLINOIS 217-546-3400

Michael K. Berry 7-16-93
Illinois Professional No. 33868 Expires 11-30-97

FEDERAL AID ENGINEER MAZHAR KHAN 708-705-4179

KANE COUNTY SECTION 89-04109-00-BR

2457

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109 -00-BR	KANE	23	2
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT	BR-OS-089(10)	

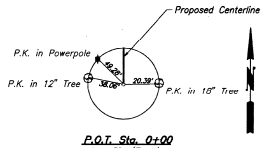
SUMMARY OF QUANTITIES

CONSTRUCTION TYPE CODE X180-5B

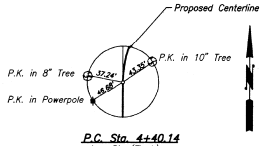
CODE NO.	ITEM	UNIT	TOTAL	FUNDING BRRP	FUNDING OTHER
20100110	TREE REMOVAL (6 TO 15 UNIT DIAMETER)	UNIT	1,300	1,300	
20100210	TREE REMOVAL (OVER 15 UNIT DIAMETER)	UNIT	250	250	
20200100	EARTH EXCAVATION	CU YD	2,780	2,780	
20500150	EMBANKMENT	CU YD	51,190	50,490	700
*20700400	POROUS GRANULAR EMBANKMENT, SPECIAL	CU YD	36	36	
21101500	FURNISHING & PLACING TOPSOIL, 6"	SQ YD	13,900	13,900	
*25001020	SEEDING, CLASS 2A (SPECIAL)	ACRE	2.9	2.9	
*25100820	HAY OR STRAW BALES	EACH	40	40	
*28000400	PERIMETER EROSION BARRIER	FOOT	4000	4000	
*28101700	RIPRAP SPECIAL	TON	40	40	
35101400	AGGREGATE BASE COURSE, TYPE B	TON	3,885	3,885	
40600100	BITUMINOUS MATERIALS (PRIME COAT)	GALLON	1,750	1,750	
40600570	LEVELING BINDER, (MACHINE METHOD), MIXTURE C, TYPE 2	TON	16	14	2
40600760	BITUMINOUS CONCRETE BINDER COURSE, MIXTURE B TYPE 2	TON	363	363	
40600850	BITUMINOUS CONCRETE SURFACE COURSE, MIX D, CLASS I, TYPE 2	TON	412	412	
42001500	P.C. CONCRETE BRIDGE APPROACH SHOULDER PAVEMENT	SQ YD	40	40	
48101500	AGGREGATE SHOULDERS TYPE B 6"	SQ YD	2,185	2,185	
50100100	REMOVAL OF EXISTING STRUCTURES	EACH	1	1	
50200100	STRUCTURE EXCAVATION	CU YD	335	315	20
50300225	CONCRETE STRUCTURES	CU YD	189.2	174.8	14.4
50300255	CONCRETE SUPERSTRUCTURE	CU YD	42.6	38.8	3.8
50300300	PROTECTIVE COAT	SQ YD	145	135	10
50400405	PRECAST PRESTRESSED CONCRETE DECK BEAMS, (21" DEPTH)	SQ FT	3,366	3,366	
50400505	PRECAST PRESTRESSED CONCRETE DECK BEAMS, (27" DEPTH)	SQ FT	2,244	1,589	655
50800105	REINFORCEMENT BARS	POUND	15,850	14,610	1,240
50800205	REINFORCEMENT BARS, EPOXY COATED	POUND	8,240	7,990	250
51100100	SLOPE WALL, 4 INCH	SQ YD	517	517	
51202200	FURNISHING CONCRETE PILES	FOOT	400	400	
51202800	DRIVING CONCRETE PILES	FOOT	400	400	
51204200	TEST PILE CONCRETE	EACH	1	1	
51500100	NAME PLATES	EACH	1	1	
542A1063	PIPE CULVERTS, CLASS A, TYPE 2, 18"	FOOT	104	104	
542A1075	PIPE CULVERTS, CLASS A, TYPE 2, 30"	FOOT	76	76	
542A1909	PIPE CULVERTS, CLASS A, TYPE 3, 24"	FOOT	82	82	
54213663	PRECAST REINFORCED CONCRETE FLARED END SECTION, 18"	EACH	4	4	
54213669	PRECAST REINFORCED CONCRETE FLARED END SECTION, 24"	EACH	2	2	
54213675	PRECAST REINFORCED CONCRETE FLARED END SECTION, 30"	EACH	2	2	
54213867	STFFI END SECTION, 12"	EACH	4	4	
58100200	WATERPROOFING MEMBRANE SYSTEM	SQ YD	572	522	50
58300100	PORTLAND CEMENT MORTAR FAIRING COURSE	FOOT	426	388	38
60103500	PIPE DRAINS, CORRUGATED STEEL, 12"	FOOT	198	198	
60103600	PIPE DRAINS, CORRUGATED STEEL, 15"	FOOT	100	100	
60900105	TYPE B, INLET BOX, STANDARD 2324	EACH	4	4	
60900515	CONCRETE THRUST BLOCKS	EACH	4	4	
63000000	STEEL PLATE BEAM GUARD RAIL, TYPE A	FOOT	1,700	1,700	
63000005	STEEL PLATE BEAM GUARD RAIL, TYPE B	FOOT	200	200	
63100035	TRAFFIC BARRIER TERMINAL, TYPE 1	EACH	4	4	
63100085	TRAFFIC BARRIER TERMINAL, TYPE 6	EACH	4	4	
*63200205	WOOD GUARD RAIL, REMOVAL	FOOT	656	656	
66600105	FURNISHING AND ERECTING RIGHT-OF-WAY MARKERS	EACH	17	17	
*90101830	TRAFFIC CONTROL AND PROTECTION, STANDARD BLR 21	L SUM	1	1	
*90301810	TEMPORARY PAVEMENT MARKING-LINE, 4"	FOOT	3,800	3,800	
90301900	SHORT-TERM PAVEMENT MARKING	FOOT	475	475	
T5020200	PAINT PAVEMENT MARKING LINE, 4"	FOOT	3,800	3,800	
*Z0048665	RAILROAD PROTECTIVE LIABILITY INSURANCE	L SUM	1	1	
Z0076600	TRAINEES	HOUR	500	500	

* SEE SPECIAL PROVISIONS.

CENTERLINE TIES



P.O.T. Sta. 0+00
Iron Pin (Flush)



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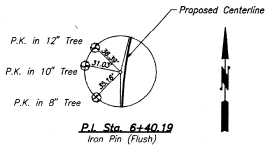

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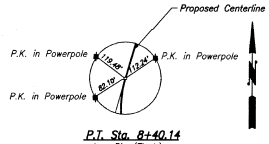

P.T. Sta. 8+40.14
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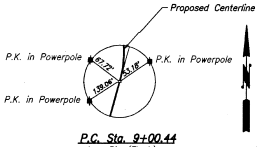

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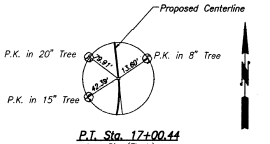

P.T. Sta. 17+00.44
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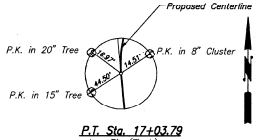

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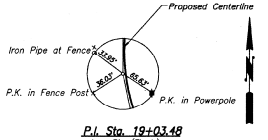

P.I. Sta. 19+03.48
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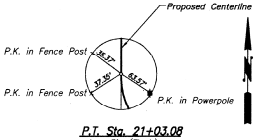


P.T. Sta. 21+03.08
Iron Pin (Flush)

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109 -00-BR	KANE	23	3
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT	BR-05-089(10)	

GENERAL NOTES

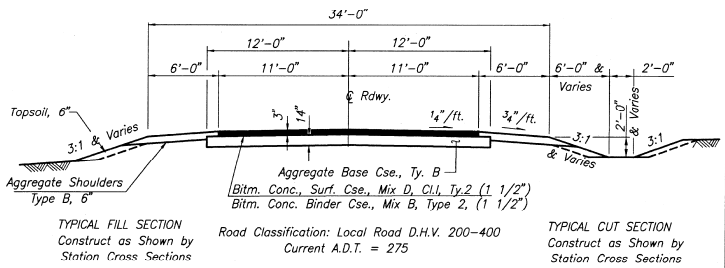
1. ALL CLEARING AND GRUBBING AND REMOVAL OF EXISTING DRAINAGE STRUCTURES AND PIPES ENCOUNTERED ARE TO BE INCLUDED IN THE UNIT PRICE BID FOR EARTH EXCAVATION.
2. THE LOCATIONS OF EXISTING GAS MAINS, ELECTRIC POWER LINES, TELEPHONE LINES AND OTHER UTILITIES AS SHOWN ON THE PLANS, ARE BASED ON CAREFUL FIELD INVESTIGATION AND THE BEST INFORMATION AVAILABLE, BUT THE LOCATIONS ARE NOT GUARANTEED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN THEIR EXACT LOCATION FROM THE UTILITY COMPANIES AND BY FIELD INSPECTION.
3. 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 MARKS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.
4. THE REVISION NUMBER INDICATED FOR THE STANDARD SHOWN IN THE INDEX OF SHEETS SHALL BE USED IN THE CONSTRUCTION OF THESE SECTIONS.
5. PAYMENT FOR OVERHAUL WILL NOT BE ALLOWED FOR EARTH EXCAVATION MOVED TO OR FROM ANY SOURCE.
6. THE CONTRACTOR SHALL CONSULT WITH THE ENGINEER IN REGARD TO THE EXACT LENGTH OF PIPE CULVERTS AND PIPE DRAINS BEFORE ORDERING THESE ITEMS.
7. ALL ELEVATIONS SHOWN ON THESE PLANS ARE ON U.S.G.S. DATUM.
8. THE AREA TO BE SEEDED SHALL CONSIST OF ALL DISTURBED EARTH SURFACES WITHIN THE RIGHT OF WAY AS DIRECTED BY THE ENGINEER. SEE SPEC. PROVISIONS.
   SEEDING, CLASS 2A (SPECIAL) = 2.9 ACRES
9. ALL TREES WITHIN THE RIGHT-OF-WAY THAT INTERFERE WITH CONSTRUCTION MAY BE REMOVED ONLY AT THE DIRECTION OF THE ENGINEER.
   TREE REMOVAL : 6-15 IN-DIA = 1300 UNIT-DIA
   OVER 15 IN-DIA = 250 UNIT-DIA
10. THE FOLLOWING RATES OF APPLICATION HAVE BEEN USED IN CALCULATING PLAN QUANTITIES:

BITUMINOUS CONCRETE	115 LB/IN/SQ YD
AGGREGATE BASE COURSE, TYPE B	2.05 TON/CU YD
BITUMINOUS MATERIALS (PRIME COAT)	0.4 GAL/SQ YD

11. THE AREA BEHIND THE ABUTMENT CAP SHALL BE BACKFILLED WITH POROUS GRANULAR EMBK, SPL FROM THE BOTTOM OF THE ABUTMENT CAP TO THE SUBGRADE AS DIRECTED BY THE ENGINEER.
    POROUS GRANULAR EMBANKMENT, SPECIAL = 36 CU YD
12. NOTIFY J.U.L.I.E. 24 HOURS PRIOR TO DIGGING

PAVEMENT DESIGN DATA

DESIGN PERIOD: 20 YEARS
STRUCTURAL DESIGN TRAFFIC (S.D.T.) = 1,000 YEAR 2002
P.V. = 92% S.U. = 5% M.U. = 3%
CLASS II ROAD
PERCENT OF S.D.T. IN DESIGN LANE P = 50 S = 50 M = 50
TRAFFIC FACTOR: T.F. = 0.14
MINIMUM SOIL SUPPORT: IBR = 3.0
STRUCTURAL NUMBER: Dt = 3.00
PAVEMENT STRUCTURE:
SURFACE COURSE: 3" CLASS I; $a_1 = 0.40$
BASE COURSE: 14" AGGREGATE, TY B, (100% CRUSHED); $a_2 = 0.13$
Dt FURNISHED = 3.02



TYPICAL FILL SECTION
Construct as Shown by Station Cross Sections

Road Classification: Local Road D.H.V. 200-400
Current A.D.T. = 275

TYPICAL CUT SECTION
Construct as Shown by Station Cross Sections

TYPICAL CROSS SECTION

STATION 2+00 TO 21+00
BRIDGE OMISSION: STA. 12+26.25 TO STA. 13+82.75

Transition from proposed roadway to existing roadway is to be constructed from Sta. 2+00 to Sta. 2+50 and from Sta. 20+50 to Sta. 21+00. See Sheet 14 for transition at bridge.

PAINT PAVEMENT MARKING LINE, 4"

STA. 2+00 TO STA. 21+00
DOUBLE YELLOW CENTERLINES, 4" = 3,800 FOOT

SHORT TERM PAVEMENT MARKING LINE, 4"

STA. 2+00 TO STA. 21+00
YELLOW CENTERLINES, 4" = 475 FOOT

Quantities for TEMPORARY PAVEMENT MARKING LINE-4" if required, are to be placed at the locations noted for PAINT PAVEMENT MARKING LINE, 4". See Special Provisions.
See Std. 2396 for details.

TRAFFIC BARRIER TERMINAL, TYPE 1

1 @ Each Corner = 4 Each
Note: T.B.T. Lt. Sta. 16+54.12 to be shop curved to 15' Radius

TRAFFIC BARRIER TERMINAL, TYPE 6

1 @ Each Corner = 4 Each

STEEL PLATE BEAM GUARD RAIL, TYPE B

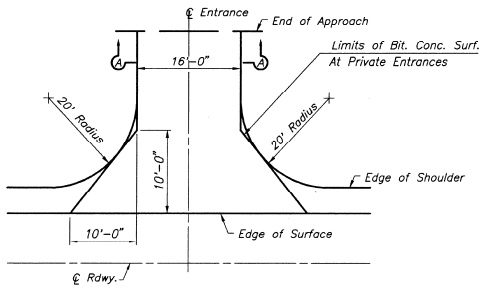
Lt. Sta.	11+97.62 to 12+47.62	= 50 Foot
Rt. Sta.	11+94.72 to 12+44.72	= 50
Rt. Sta.	14+01.22 to 14+51.22	= 50
Lt. Sta.	14+04.12 to 14+54.12	= 50
		200 Foot

STEEL PLATE BEAM GUARD RAIL, TYPE A

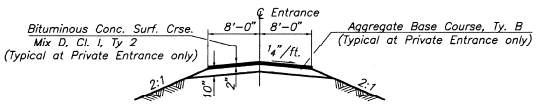
Lt. Sta.	5+97.62 to 11+97.62	= 600 Foot
Rt. Sta.	6+94.72 to 11+94.72	= 500
Rt. Sta.	14+51.22 to 18+51.22	= 400
Lt. Sta.	14+54.12 to 16+54.12	= 200
		1,700 Foot

WOOD GUARD RAIL, REMOVAL

Lt. Sta.	9+87.00 to 12+65.00	= 278 Foot
Rt. Sta.	9+87.00 to 12+65.00	= 278
Rt. Sta.	13+40.00 to 13+90.00	= 50
Lt. Sta.	13+42.00 to 13+92.00	= 50
		656 Foot

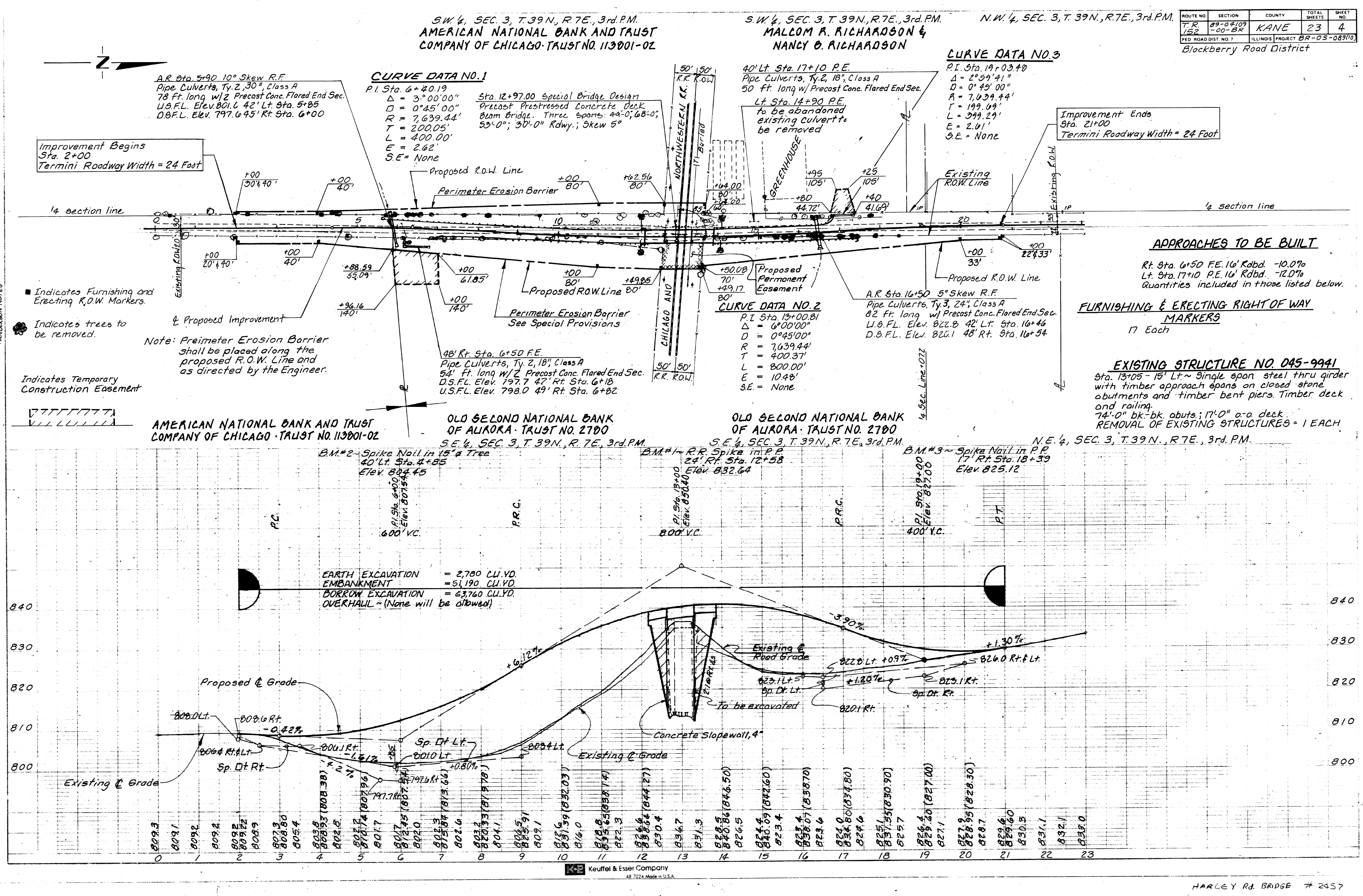


TYPICAL ENTRANCE DETAIL

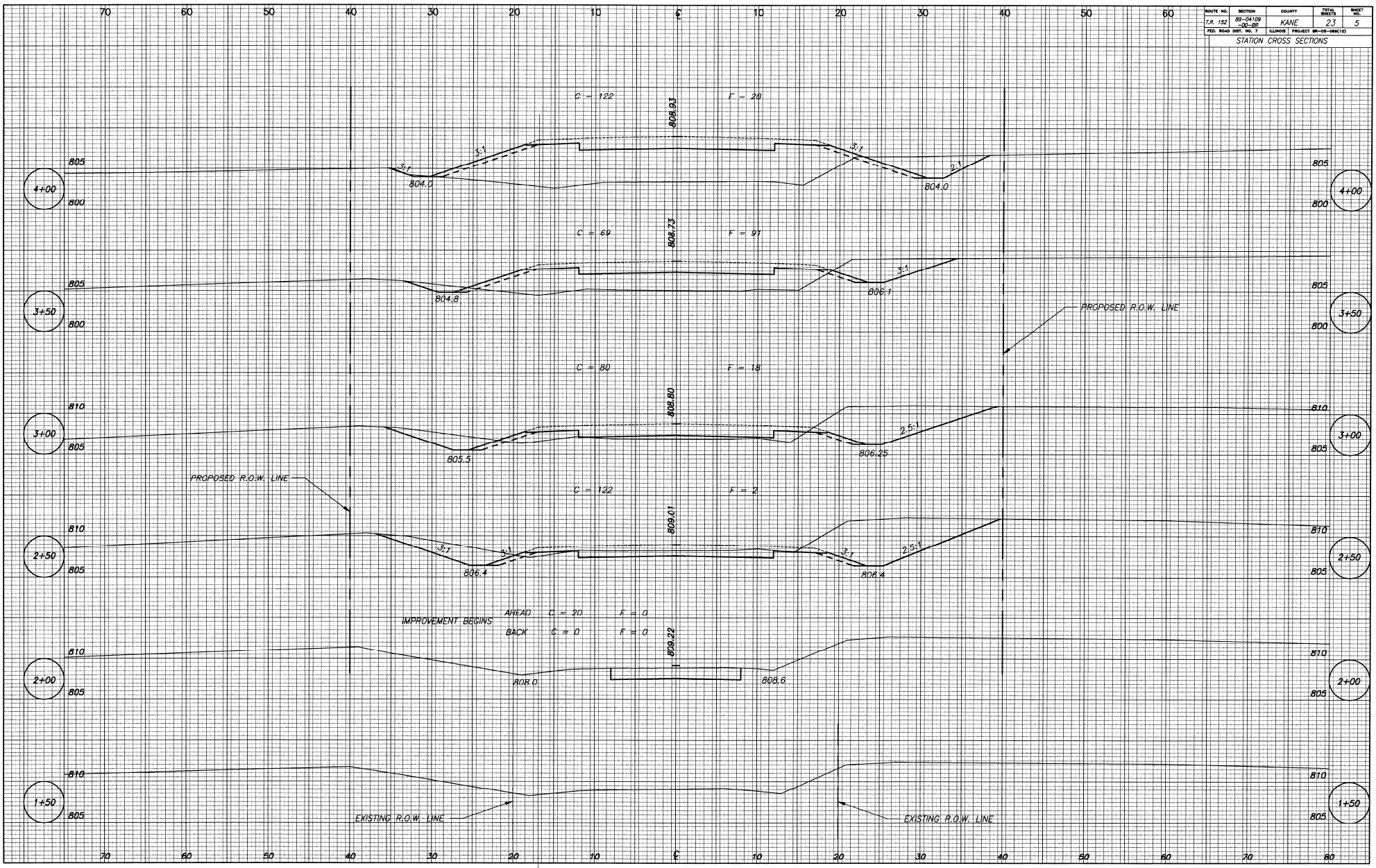


SECTION A-A

\2457\SUMQ.DWG

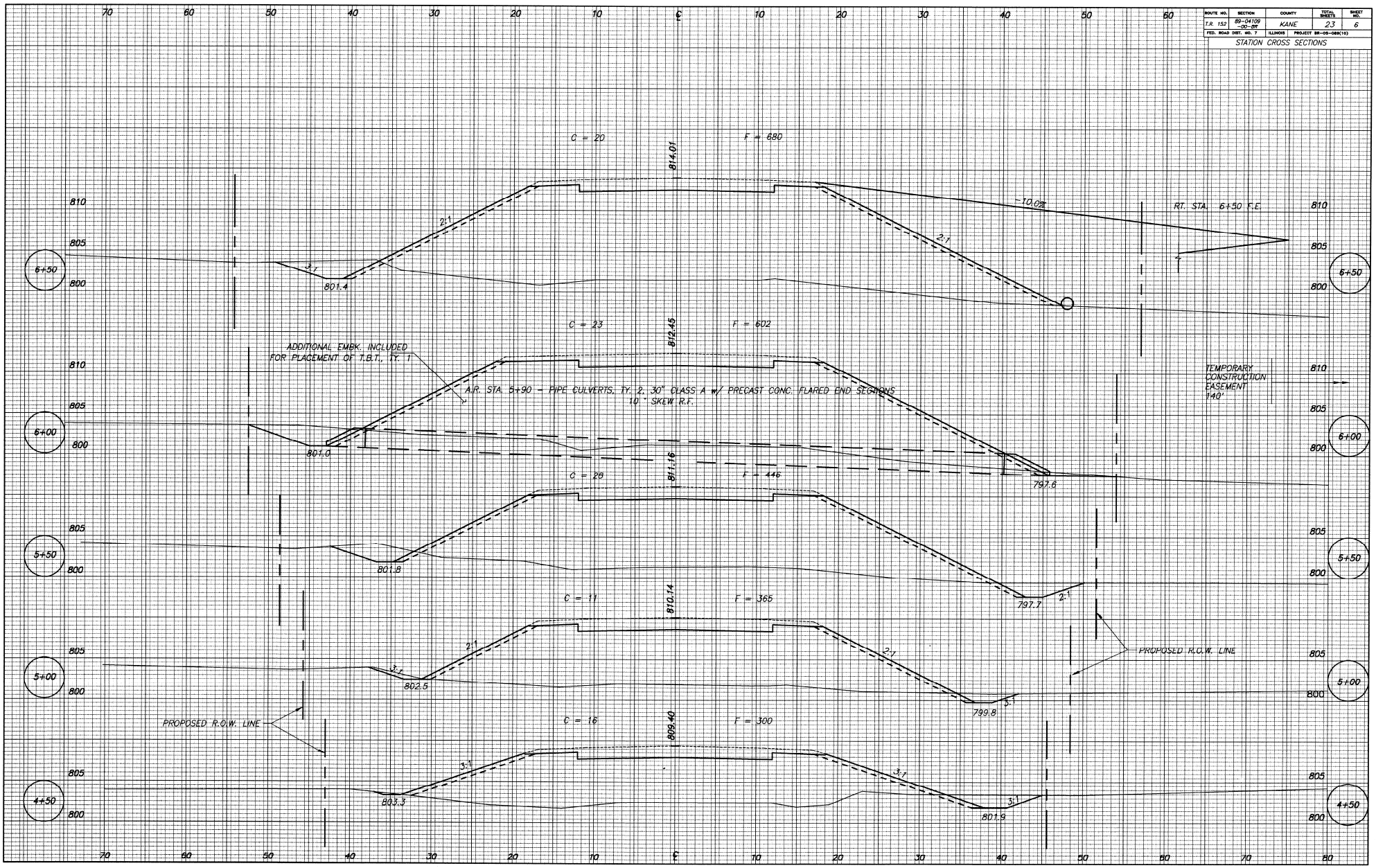


ROUTE NO. T.R. 152
SECTION 89-04109-00-BR
COUNTY KANE
TOTAL SHEETS 23
SHEET NO. 4
FED ROAD DIST. NO. 7
ILLINOIS PROJECT BR-OS-0891(10)
Blackberry Road District
S.W. ¼, SEC. 3, T.39 N., R.7E., 3rd P.M.
AMERICAN NATIONAL BANK AND TRUST COMPANY OF CHICAGO - TRUST NO. 113801-02
S.W. ¼, SEC. 3, T.39 N., R.7E., 3rd P.M.
MALCOM R. RICHARDSON & NANCY B. RICHARDSON
N.W. ¼, SEC. 3, T.39 N., R.7E., 3rd P.M.
CURVE DATA NO. 1
P.I. Sta. 6+40.19
Δ = 3°00'00"
D = 0°45'00"
R = 7,639.44'
T = 200.05'
L = 400.00'
E = 2.62'
S.E = None
CURVE DATA NO. 2
P.I. Sta. 13+00.81
Δ = 6°00'00"
D = 0°45'00"
R = 7,639.44'
T = 400.37'
L = 800.00'
E = 10.48'
S.E. = None
CURVE DATA NO. 3
P.I. Sta. 19+03.40
Δ = 2°59'41"
D = 0°45'00"
R = 7,639.44'
T = 199.69'
L = 399.29'
E = 2.61'
S.E. = None
A.R. Sta. 5+90 10° Skew R.F.
Pipe Culverts, Ty. 2, 30", Class A
78 Ft. long w/2 Precast Conc. Flared End Sec.
U.S.F.L. Elev. 801.6 42' Lt. Sta. 5+85
D.S.F.L. Elev. 797.645' Rt. Sta. 6+00
Improvement Begins
Sta. 2+00
Termini Roadway Width = 24 Foot
Sta. 12+97.00 Special Bridge Design
Precast Prestressed Concrete Deck Beam Bridge. Three Spans: 49'-0", 68'-0", 53'-0"; 30'-0" Rdwy.; Skew 5°
40' Lt. Sta. 17+10 P.E.
Pipe Culverts, Ty. 2, 18", Class A
50 ft. long w/ Precast Conc. Flared End Sec.
Lt. Sta. 14+90 P.E.
to be abandoned existing culvert to be removed
Improvement Ends
Sta. 21+00
Termini Roadway Width = 24 Foot
Proposed R.O.W. Line
Perimeter Erosion Barrier
Existing R.O.W. Line
¼ section line
GREENHOUSE
NORTHWESTERN R.R.
CHICAGO AND
50' 50' R.R. R.O.W.
■ Indicates Furnishing and Erecting R.O.W. Markers.
Indicates trees to be removed.
Indicates Temporary Construction Easement
℄ Proposed Improvement
Note: Preimeter Erosion Barrier shall be placed along the proposed R.O.W. Line and as directed by the Engineer.
Perimeter Erosion Barrier See Special Provisions
48' Rt. Sta. 6+50 F.E.
Pipe Culverts, Ty. 2, 18", Class A
54' ft. long w/2 Precast Conc. Flared End Sec.
D.S.F.L. Elev. 797.7 47' Rt. Sta. 6+18
U.S.F.L. Elev. 798.0 49' Rt. Sta. 6+82
Proposed Permanent Easement
A.R. Sta. 16+50 5° Skew R.F.
Pipe Culverts, Ty. 3, 24", Class A
82 ft. long w/ Precast Conc. Flared End Sec.
U.S.F.L. Elev. 822.8 42' Lt. Sta. 16+46
D.S.F.L. Elev. 826.1 48' Rt. Sta. 16+54
APPROACHES TO BE BUILT
Rt. Sta. 6+50 F.E. 16' Rdbd. -10.0%
Lt. Sta. 17+10 P.E. 16' Rdbd. -12.0%
Quantities included in those listed below.
FURNISHING & ERECTING RIGHT OF WAY MARKERS
17 Each
EXISTING STRUCTURE NO. 045-9941
Sta. 13+05 - 15' Lt. ~ Single span steel thru girder with timber approach spans on closed stone abutments and timber bent piers. Timber deck and railing.
74'-0" bk.-bk. abuts.; 17'-0" o-o. deck
REMOVAL OF EXISTING STRUCTURES = 1 EACH
AMERICAN NATIONAL BANK AND TRUST COMPANY OF CHICAGO - TRUST NO. 113801-02
OLD SECOND NATIONAL BANK OF AURORA - TRUST NO. 2700
S.E. ¼, SEC. 3, T.39 N., R.7E., 3rd P.M.
OLD SECOND NATIONAL BANK OF AURORA - TRUST NO. 2700
S.E. ¼, SEC. 3, T.39 N., R.7E., 3rd P.M.
N.E. ¼, SEC. 3, T.39 N., R.7E., 3rd P.M.
B.M.#2 ~ Spike Nail in 15" ø Tree
40' Lt. Sta. 4+85
Elev. 804.45
B.M.#1 ~ R.R. Spike in P.P.
24' Rt. Sta. 12+58
Elev. 832.64
B.M.#3 ~ Spike Nail in P.P.
17' Rt. Sta. 18+39
Elev. 825.12
P.C.
P.I. Sta. 6+00
600' V.C.
P.R.C.
P.I. Sta. 13+00
800' V.C.
P.R.C.
P.I. Sta. 19+00
400' V.C.
P.T.
EARTH EXCAVATION = 2,780 CU.YD.
EMBANKMENT = 51,190 CU.YD.
BORROW EXCAVATION = 63,760 CU.YD.
OVERHAUL ~ (None will be allowed)
Proposed ℄ Grade
Existing ℄ Grade
Existing ℄ Road Grade
To be excavated
Concrete Slopewall, 4"
+6.12%
-3.90%
+1.30%
-0.42%
+0.80%
+1.20%
840
830
820
810
800
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
PLAN
PROFILE
Keuffel & Esser Company
HARLEY Rd. BRIDGE # 2457


70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60
ROUTE NO. I.R. 152
SECTION 89-04109 -00-BR
COUNTY KANE
TOTAL SHEETS 23
SHEET NO. 5
FED. ROAD DIST. NO. 7
ILLINOIS
PROJECT BR-09-089(10)
STATION CROSS SECTIONS
C = 122
F = 28
808.93
3:1
804.0
804.0
4+00
805
800
C = 69
F = 91
808.73
804.8
806.1
3+50
PROPOSED R.O.W. LINE
C = 80
F = 18
808.90
2.5:1
805.5
806.25
3+00
810
805
PROPOSED R.O.W. LINE
C = 122
F = 2
809.01
806.4
806.4
2+50
IMPROVEMENT BEGINS
AHEAD C = 20 F = 0
BACK C = 0 F = 0
809.22
808.0
808.6
2+00
1+50
EXISTING R.O.W. LINE
EXISTING R.O.W. LINE

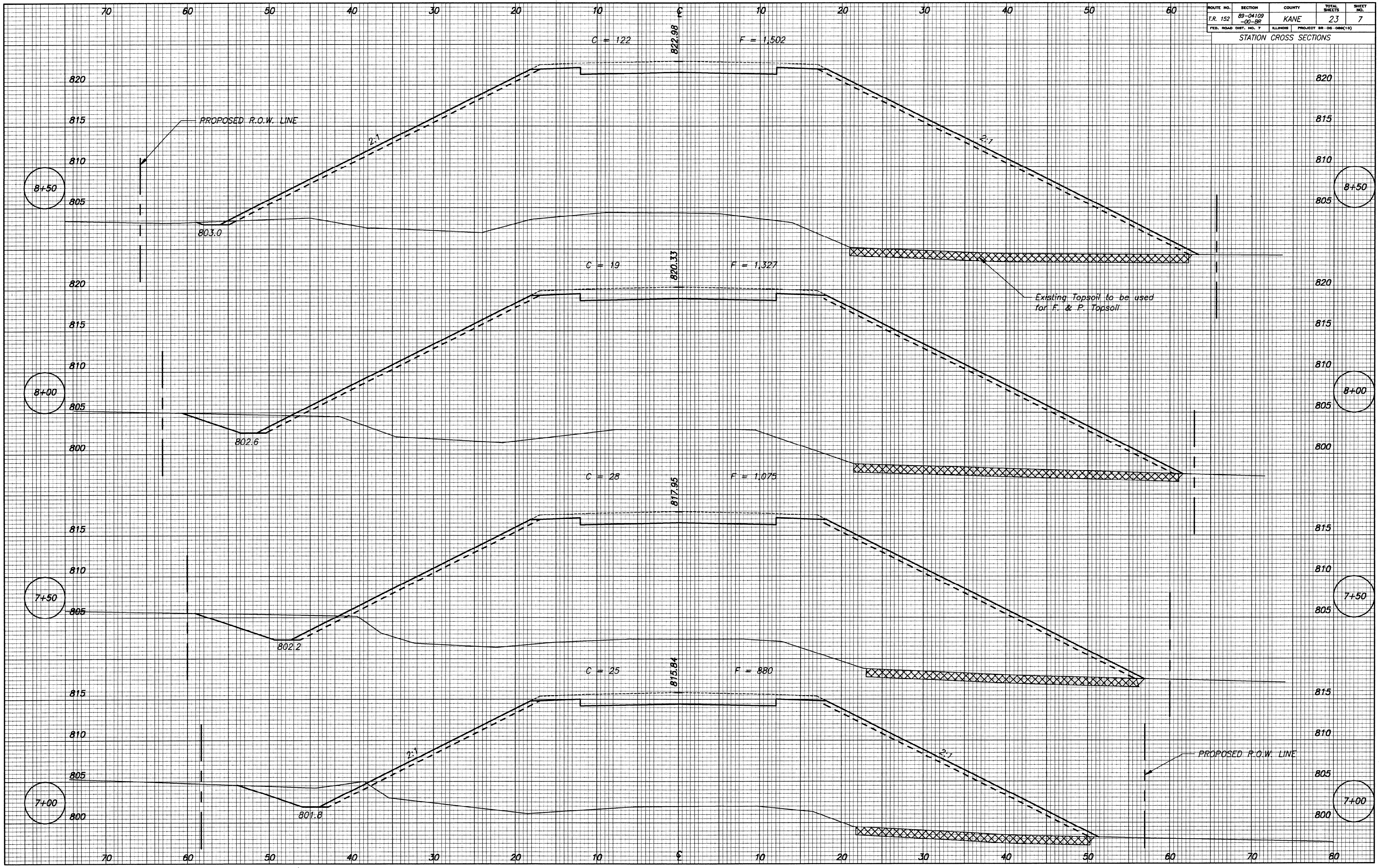
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109 -00-BR	KANE	23	6
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BR-OS-088(10)		

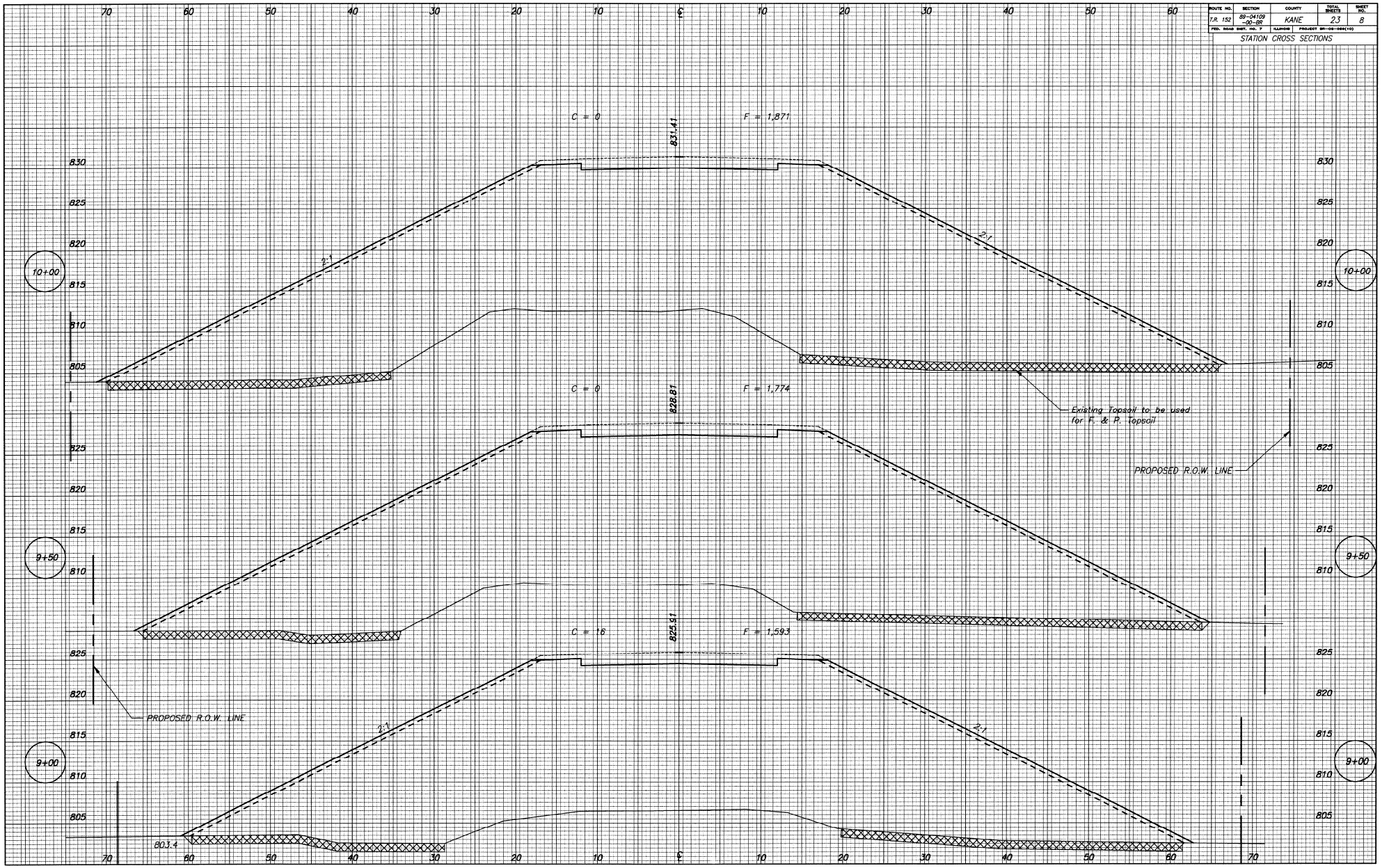
STATION CROSS SECTIONS

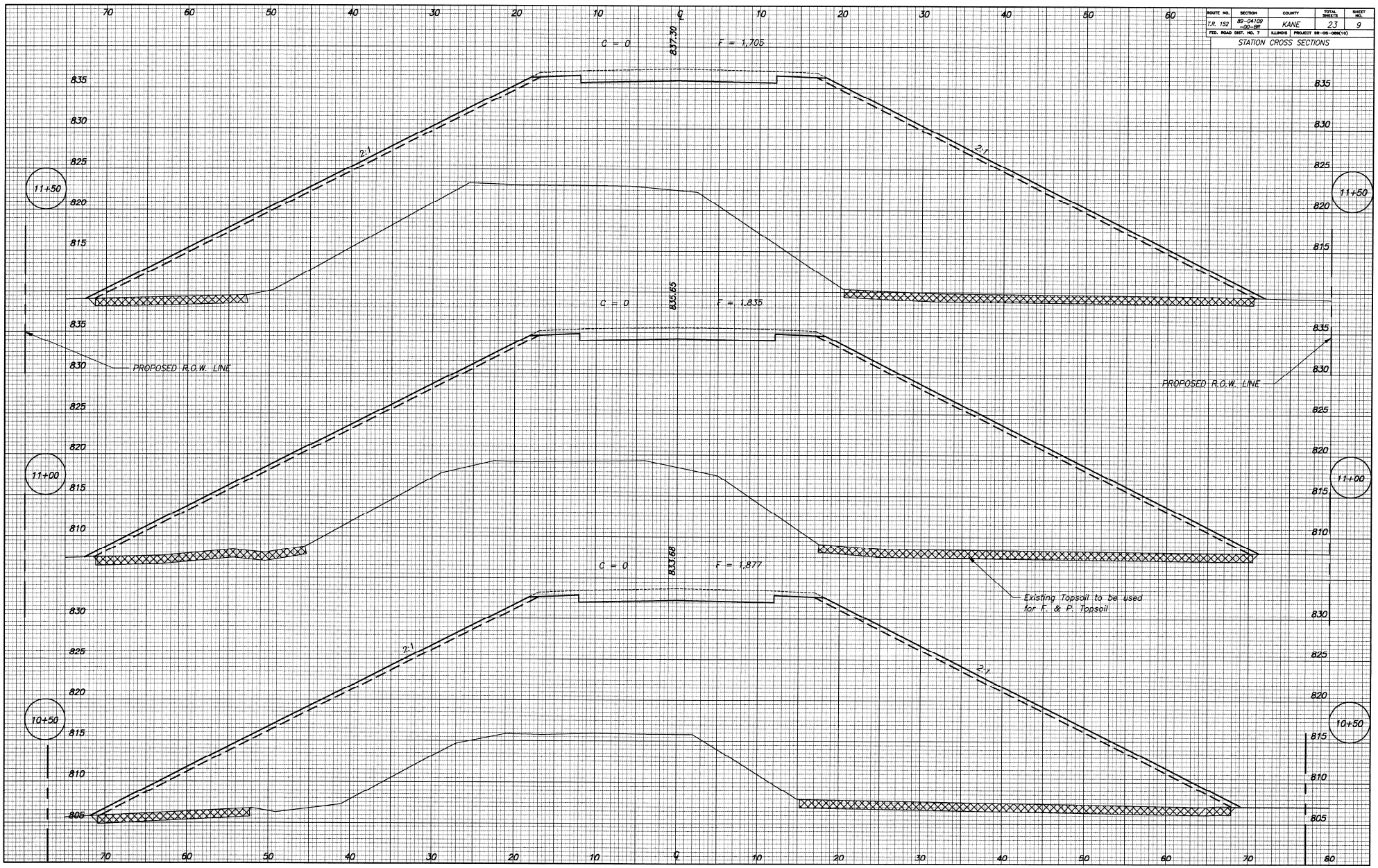


ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109 -00-BR	KANE	23	7
FED. ROAD DIST. NO. 7		ILLINOIS	PROJECT BR-OS-089(10)	

STATION CROSS SECTIONS

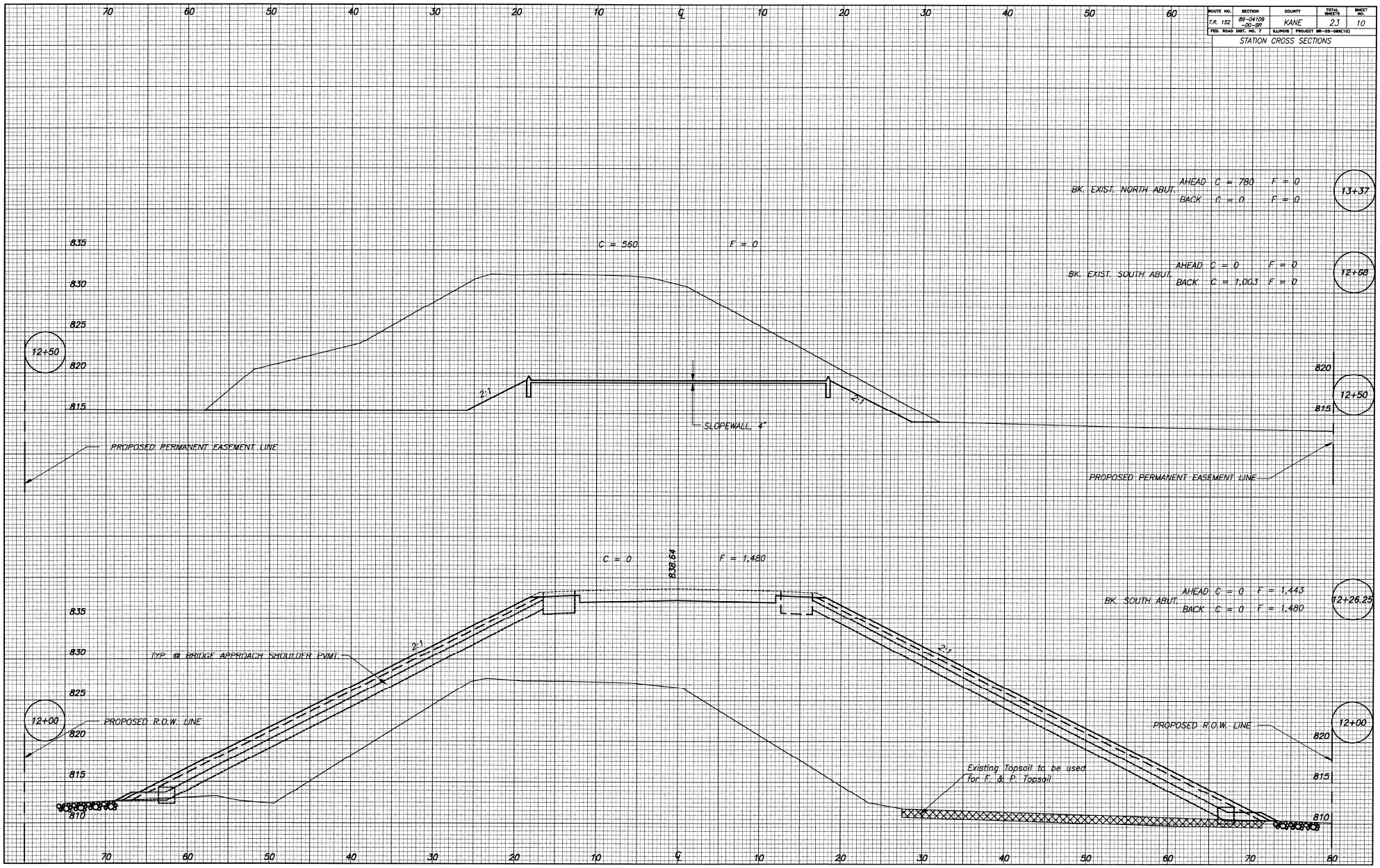



ROUTE NO. T.R. 152
SECTION 89-04109 -00-BR
COUNTY KANE
TOTAL SHEETS 23
SHEET NO. 8
FED. ROAD DIST. NO. 7
ILLINOIS
PROJECT BR-09-006(10)
STATION CROSS SECTIONS
C = 0
F = 1,871
831.41
2:1
2:1
10+00
C = 0
F = 1,774
828.81
Existing Topsoil to be used for F. & P. topsoil
PROPOSED R.O.W. LINE
9+50
C = 16
F = 1,593
825.91
PROPOSED R.O.W. LINE
2:1
2:1
9+00
803.4
70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70
830 825 820 815 810 805


ROUTE NO. T.R. 152
SECTION 89-04100 -00-RR
COUNTY KANE
TOTAL SHEETS 23
SHEET NO. 9
FED. ROAD DIST. NO. 7
ILLINOIS
PROJECT RR-OS-089(10)
STATION CROSS SECTIONS
C = 0
F = 1,705
837.30
C = 0
F = 1,835
835.65
C = 0
F = 1,877
833.68
2:1
PROPOSED R.O.W. LINE
Existing Topsoil to be used for F. & P. Topsoil
11+50
11+00
10+50

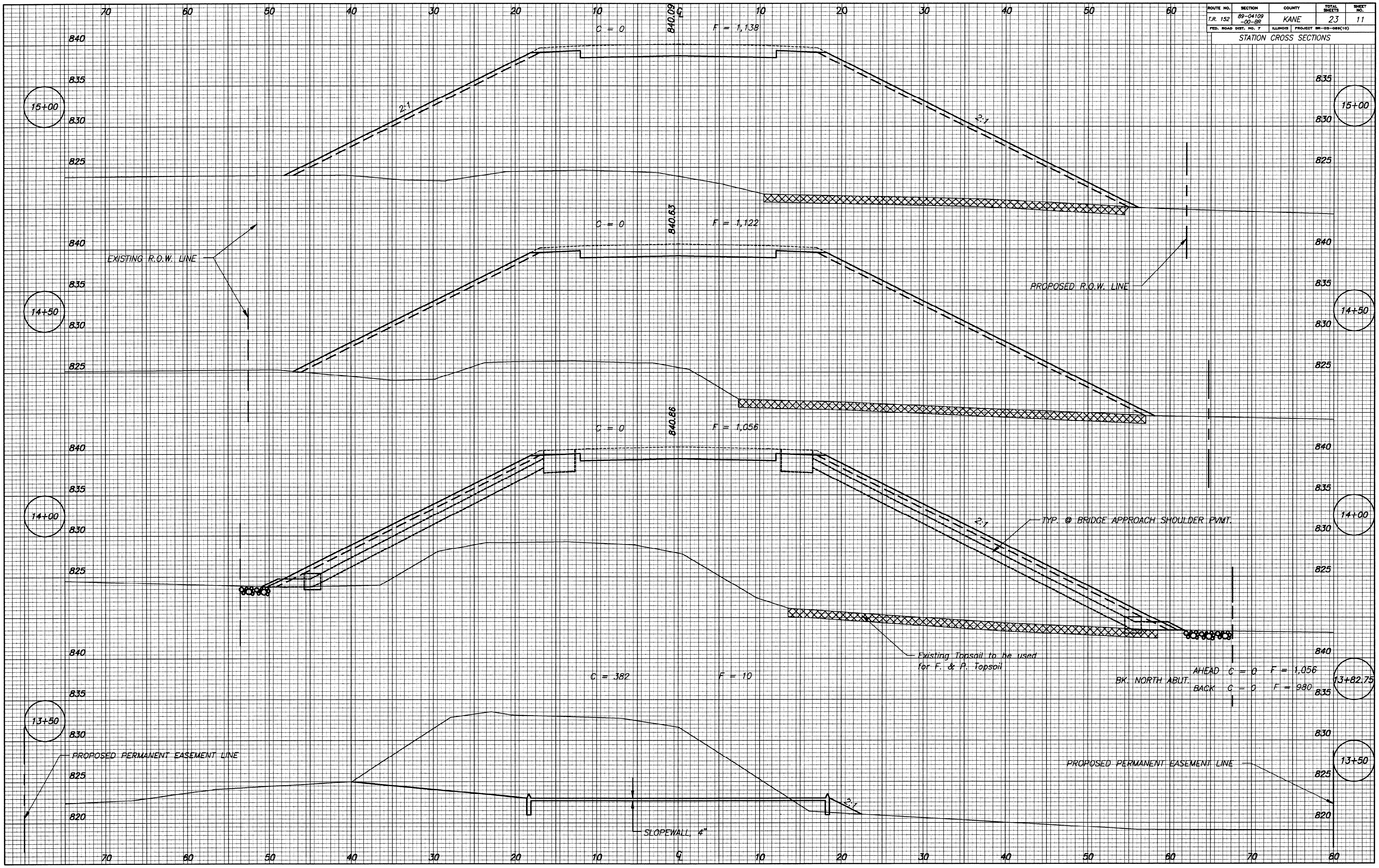
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109 -00-BR	KANE	23	10
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BR-0S-089(10)		

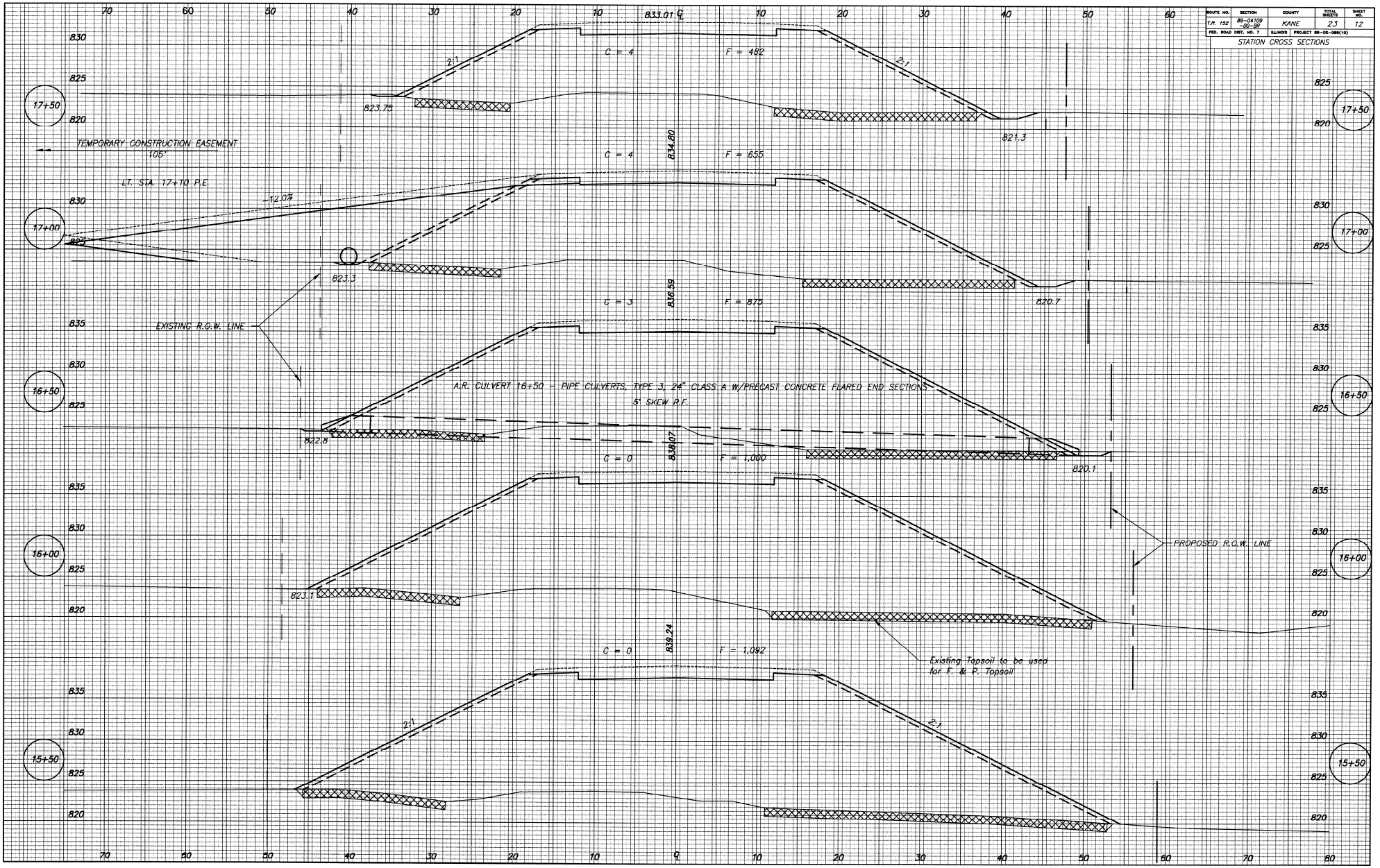
STATION CROSS SECTIONS



ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109 -00-BR	KANE	23	11
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BR-05-089(10)		

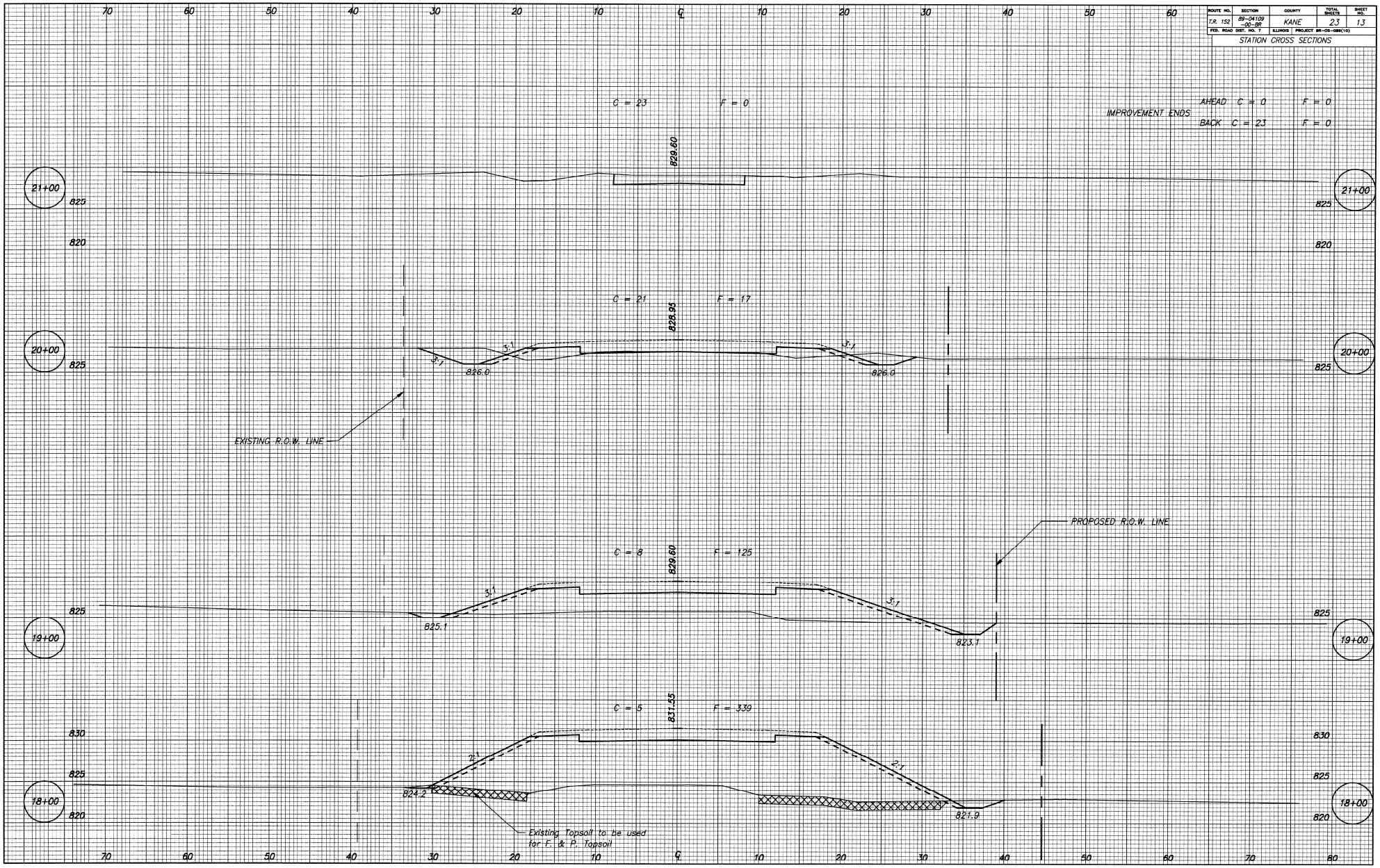
STATION CROSS SECTIONS



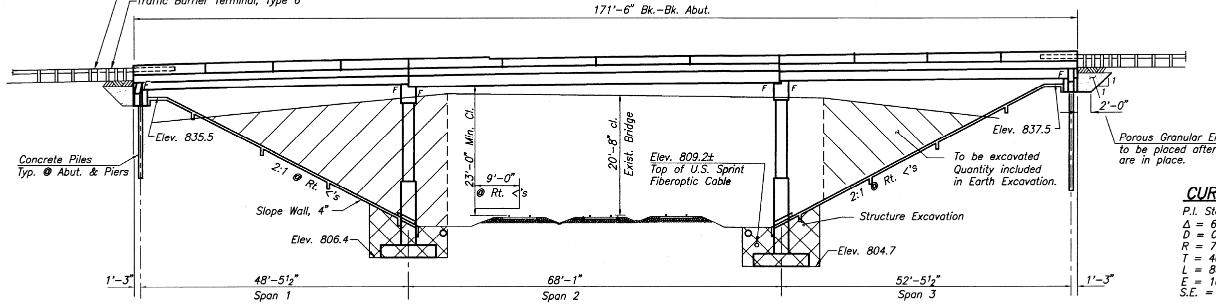

ROUTE NO. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO.
T.R. 152 | 89-04109-00-BR | KANE | 23 | 12
FED. ROAD DIST. NO. 7 | ILLINOIS | PROJECT BR-OS-0880(10)
STATION CROSS SECTIONS
833.01 ℄
C = 4
F = 482
2:1
2:1
823.75
821.3
17+50
TEMPORARY CONSTRUCTION EASEMENT
105'
LT. STA. 17+10 P.E.
12.0%
834.80
C = 4
F = 655
17+00
823.3
820.7
816.59
C = 3
F = 875
EXISTING R.O.W. LINE
A.R. CULVERT 16+50 - PIPE CULVERTS, TYPE 3, 24" CLASS A W/PRECAST CONCRETE FLARED END SECTIONS
5° SKEW R.F.
16+50
822.8
838.07
C = 0
F = 1,000
820.1
PROPOSED R.O.W. LINE
16+00
823.1
839.24
C = 0
F = 1,092
Existing Topsoil to be used for F. & P. Topsoil
2:1
2:1
15+50

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109 -00-BR	KANE	23	13
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BR-OS-088(10)		

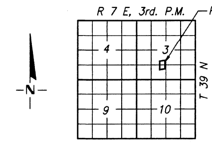
STATION CROSS SECTIONS



ROUTE NO.	SECTION	CITY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109 -00-BR	KANE	23	14
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT	BR-0S-089(10)	



ELEVATION



LOCATION PLAN

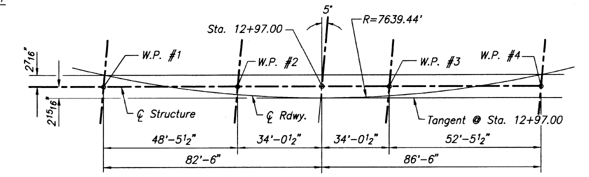
BUILT 199_ BY
KANE COUNTY
SECTION 89-04109-00-BR
F.A. PROJECT BR-0S-089(10)
STR. NO. 045-3143
LOADING HS 20

LETTERING FOR NAME PLATE

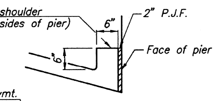
See Std. 2113

CURVE DATA

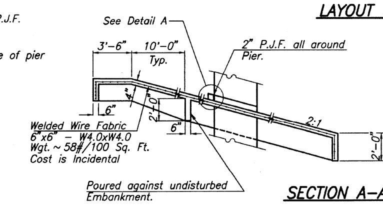
P.I. Sta. 13+00.81
Δ = 6° 00' 00"
D = 0° 45' 00"
R = 7,639.44'
T = 400.37'
L = 800.00'
E = 10.48'
S.E. = None



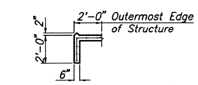
LAYOUT SKETCH



DETAIL A



SECTION A-A



SECTION B-B

Notch opening in wall to miss U.S. Sprint fiberoptic cable as required. Maintain 6" clearance around cable.

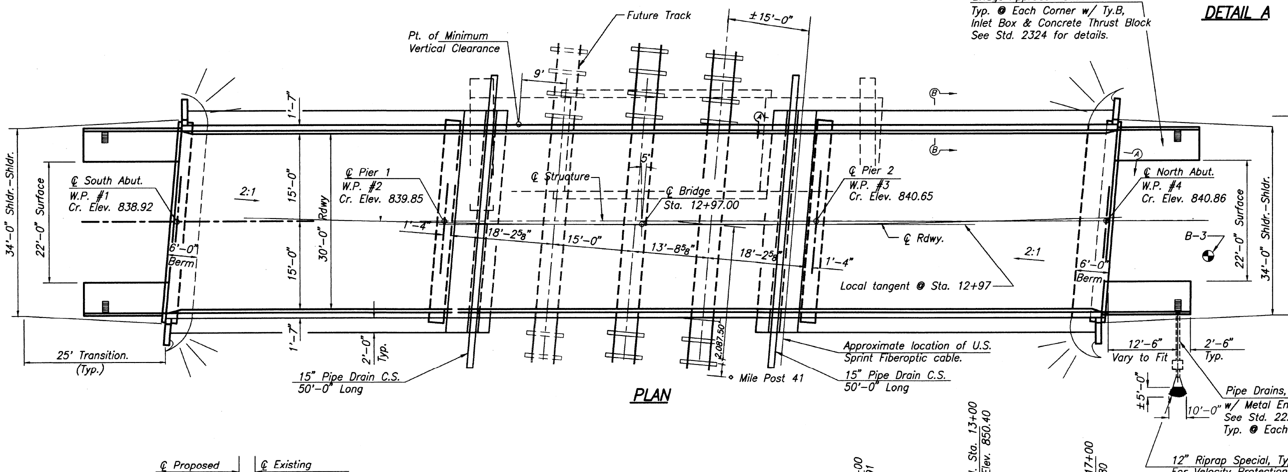
GENERAL NOTES

The Contractor shall drive one concrete test pile in a permanent location at the South Abutment before ordering the remainder of the piles.

The layout of the slope protection system may be varied in the field to better suit existing ground conditions, as directed by the Engineer.

See Proposal for Borings.

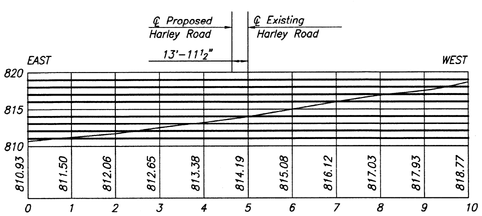
The Contractor may substitute Bituminous Concrete, Surface Course, Mix D, Cl. I., Ty 2 for the Leveling Binder Mixture.



PLAN

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Precast Prestressed Concrete Deck Beams (27" Depth)	Sq. Ft.	2,244		2,244
Precast Prestressed Concrete Deck Beams (21" Depth)	Sq. Ft.	3,366		3,366
Concrete Structures	Cu. Yd.		189.2	189.2
Reinforcement Bars	Pound		15,850	15,850
Reinforcement Bars, Epoxy Coated	Pound	2,780	5,460	8,240
Name Plates	Each	1		1
Waterproofing Membrane System	Sq. Yd.	572		572
Portland Cement Mortar Fairing Course	Foot	426		426
Leveling Binder (Machine Method) Mix C, Ty. 2	Ton	16		16
Bit. Conc., Surf. Cse., Mix D, Cl. I, Ty. 2	Ton	49		49
Slope Wall, 4"	Sq. Yd.			517
Concrete Piles	Foot		400	400
Test Pile Concrete	Each		1	1
Structure Excavation	Cu. Yd.			335
Concrete Superstructure	Cu. Yd.	42.6		42.6
Protective Coat	Sq. Yd.	145		145
Riprap, Special	Ton			40
Pipe Drains, 15" C.S.	Foot			100

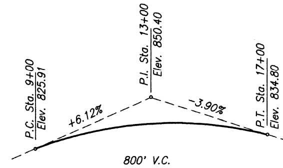


HIGH RAIL PROFILE

(South Rail, South Track)

DESIGN STRESSES

f'c = 5,000 p.s.i. (Prestressed Beams)
f'ci = 4,000 p.s.i. (Prestressed Beams) Span 1
f'ci = 4,800 p.s.i. (Prestressed Beams) Span 2
f'ci = 4,100 p.s.i. (Prestressed Beams) Span 3
fc = 1,400 p.s.i. (Class SI Concrete)
f's = 270,000 p.s.i. (Prestressed Strands)
f'si = 189,000 p.s.i. (Prestressed Strands)
fs = 20,000 p.s.i. (Reinf. Bars-Field Units)
fy = 60,000 p.s.i. (Reinf. Bars-Precast Units)
n = 9 (Class SI Concrete)
LOADING HS20-44
DESIGN SPECIFICATIONS: 1992 AASHTO & 1993 Interims.
25#/Sq. Ft. included in dead load for future wearing surface.



PROPOSED PROFILE GRADE

HARLEY ROAD

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

3/15/96

Illinois Structural No. 4745

ZEYN B. UZMAN 081-004745 LICENSED STRUCTURAL ENGINEER OF SPRINGFIELD ILLINOIS

Expires 11-30-94

GENERAL PLAN & ELEVATION
SECTION 89-04109-00-BR
HARLEY ROAD OVER
CHICAGO & NORTHWESTERN RAILROAD
KANE COUNTY
STATION 12+97.00

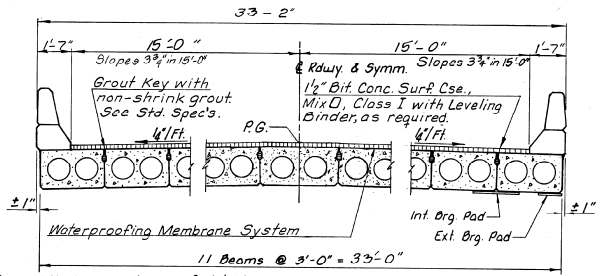
RBU RICE, BERRY AND UZMAN
CONSULTING ENGINEERS

DESIGNED S.W.M. & D.B. CHECKED Z.B.U.
DRAWN G.B. DATE 7-8-94 NO.12-05-008I

2457\GPE.DWG

C:\P\12050081\GPE Fri Mar 15 14:58:07 1996

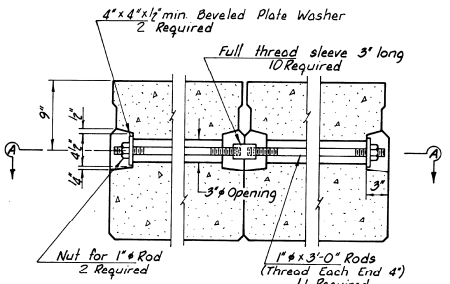
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A. 152	89-04109-00-BR	KANE	23	15
FED. ROAD DIST NO. 7	ILLINOIS	PROJECT BE-09-089(10)		



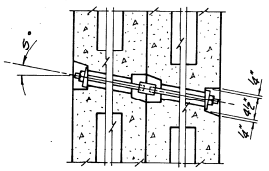
CROSS SECTION

Note: The top surface of the beams shall be finished in accordance with Art. 504.06 of the Standard Specifications except that the surface shall not be roughened by brooming. The finished surface shall be free of depressions or high spots with sharp corners, and the edge of keys shall be rounded or chamfered a minimum of 4".

Note: A Calcium Nitrite Corrosion inhibitor, shall be used in the concrete for precast prestressed concrete deck beams.

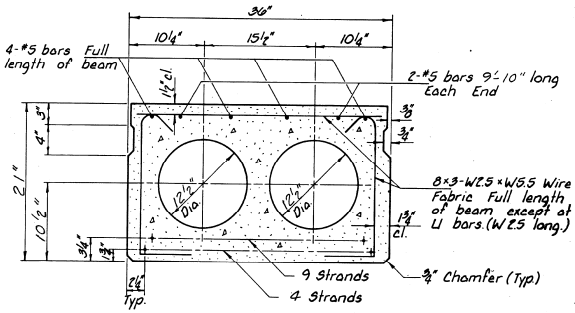


TRANSVERSE TIE ROD DETAIL



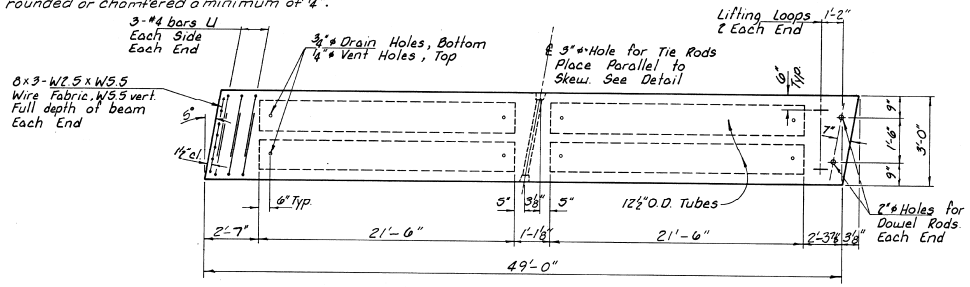
SECTION A-A

Note: Omit key on exterior face of outside beams.

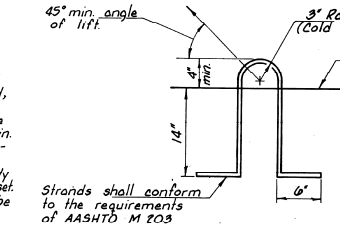


TYPICAL SECTION THRU BEAM

13-1/2" ϕ Strands Stressed to 28,900 Lbs. Each. Place strands symmetrically about ℄ of beam. Use Standard Grid Pattern.



TYPICAL PLAN OF BEAMS



NOTE: The loop shall be formed in a manner such that all strands are engaged during lifting. Loops shall be burned off after beams have been erected.

LIFTING LOOP DETAIL

Approved alternate may be substituted for the above.

NOTES

Prestressing steel shall be non-galvanized high strength, stress-relieved 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 7-wire stress relieved, 2-1/2" ϕ - 270 ksi strands.

The 1" ϕ rods in the transverse tie assembly shall be tightened to a snug fit & the threads set. Pockets that receive tie rods on outside shall be filled with grout after ties are in place.

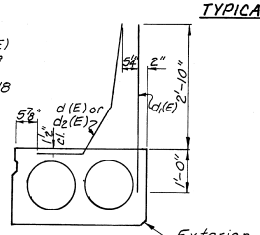
Reinforcement bars shall conform to AASHTO: M-31 or M-42 or M-53, Grade 60.

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.

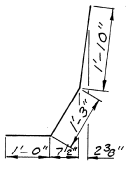
An equal substitution of the low-relaxation strands for the stress-relieved strands will be permitted.

Required Release Strength, f'ci, shall be 4,000 p.s.i.

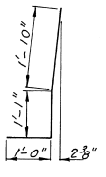
Bars d(E), $d_1(E)$ & $d_2(E)$ to be placed before Exterior Beam is poured. See Sheet #18 for bar spacing. Cost is incidental to deck beams.



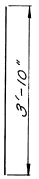
EXTERIOR BEAM



BAR d(E)
100 Req'd.

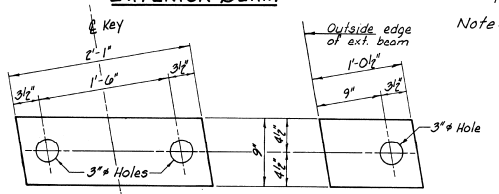


BAR $d_2(E)$
4 Req'd.

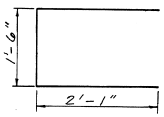


BAR $d_1(E)$
90 Req'd

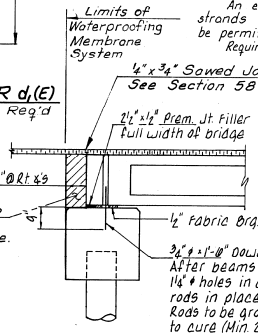
Note: Reinforcement Bars designated (E) shall be epoxy coated.



BEARING PAD DETAILS



BAR U



SECTION AT ABUTMENTS

Note: See sheet 16 for Section at Piers.

BILL OF MATERIAL

ITEM	UNIT	QUANTITY
Precast Prestressed Concrete Deck Beams (21" Depth)	Sq. Ft.	1,617
P.C. Mortar Foiring Course	Foot	123
Waterproofing Membrane System	Sq. Yd.	166
Leveling Binder (Machine Method)	Ton	4
Bit. Conc. Surf. Cse., Mix D, Cl. I, Ty. 2	Ton	14

SUPERSTRUCTURE - SPAN 1

SECTION 89-04109-00-BR

HARLEY ROAD OVER

CHICAGO AND NORTHWESTERN R.R.

KANE COUNTY

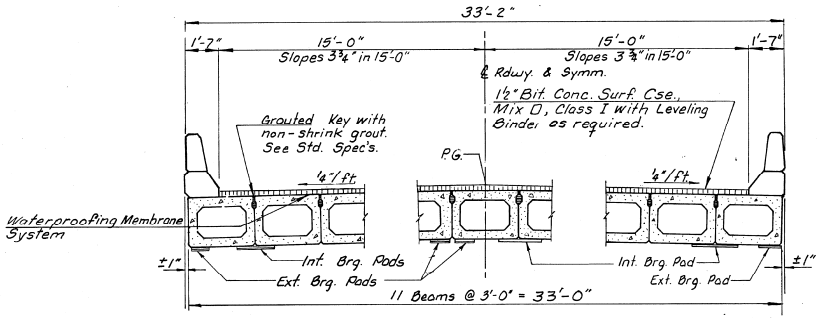
STATION 12+97.00

HLR RICE, BERRY AND UZMAN CONSULTING ENGINEERS

DESIGNED S.W.M. & O.B. CHECKED Z.B.U.

DRAWN G.B. DATE 7-8-94 NO. 12-05-0008 I

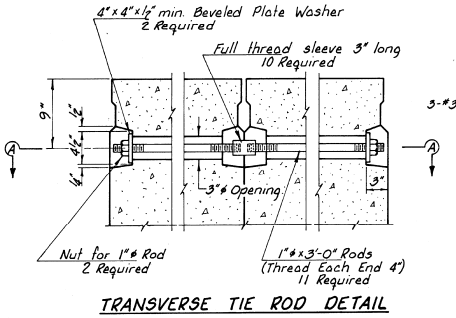
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R.152	89-04109-00-BR	KANE	23	16
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT		



CROSS SECTION

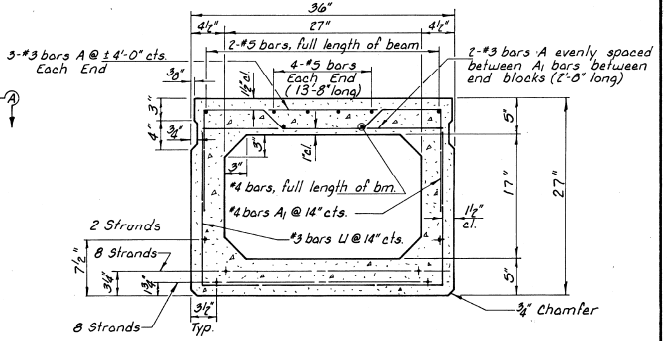
Note: The top surface of the beams shall be finished in accordance with Art. 504.06 of the Standard Specifications except that the surface shall not be roughened by brooming. The finished surface shall be free of depressions or high spots with sharp corners, and the edge of keys shall be rounded or chamfered a minimum of ¼".

Note: A Calcium Nitrite Corrosion inhibitor shall be used in the concrete for precast prestressed concrete deck beams.



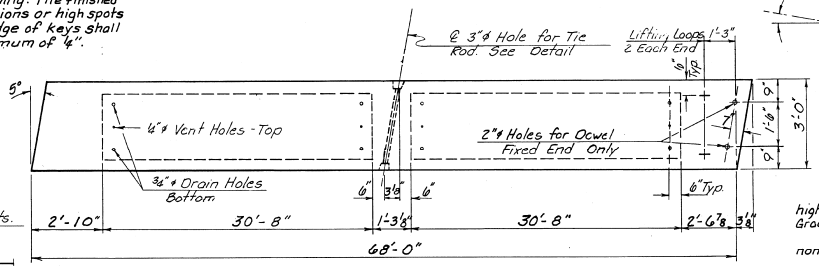
TRANSVERSE TIE ROD DETAIL

Note: Omit key on exterior face of outside beams.

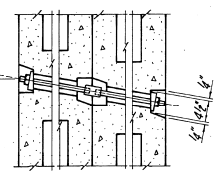


TYPICAL SECTION THRU BEAM

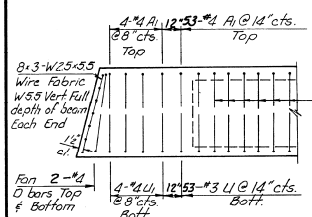
18 - ½" ℄ Strands Stressed to 28,900 Lbs. Each Place strands symmetrically about ℄ of beam. Use Standard Grid Pattern.



TYPICAL PLAN OF BEAMS



SECTION A-A



END PLAN

For SECTION AT EXTERIOR BEAMS ℄ d (E) ℄ d1 (E) details of bars, see sheet #15.

BARS REQUIRED
d(E) - 150 bars
d1(E) - 136 bars

NOTES

Prestressing steel shall be non-galvanized high strength, stress-relieved 7-wire strand, Grade 270.

The nominal diameter shall be ½" and the nominal cross-sectional area shall be 0.153 sq.in.

Lifting Loops shall be 7-wire stress-relieved, 2'-½" ℄ - 270 ksi strands.

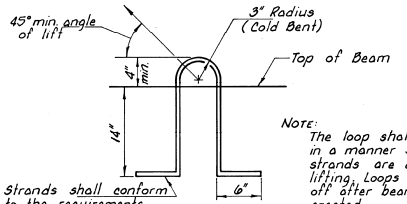
The 1" ℄ rods in the transverse tie assembly shall be tightened to a snug fit & the threads set. Pockets that receive tie rods on outside shall be filled with grout after ties are in place.

Reinforcement bars shall conform to AASHTO: M-31, M-42 or M-53, Grade 60.

The bearing seat surfaces shall be adjusted by shimming to assure firm and even bearing. Two ⅛" fabric adjusting shims of the dimensions of the Exterior Bearing Pad shall be provided for each bearing.

An equal substitution of the low-relaxation strands for the stress-relieved strands will be permitted.

Required Release Strength, f'ci, shall be 4,800 p.s.i.



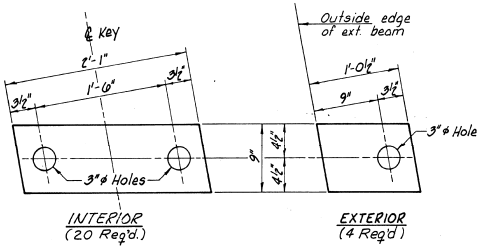
Note: The loop shall be formed in a manner such that all strands are engaged during lifting. Loops shall be burned off after beams have been erected.

LIFTING LOOP DETAIL

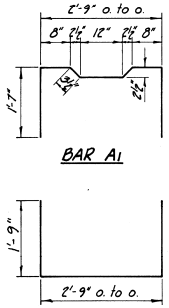
Approved alternate may be substituted for the above.

BILL OF MATERIAL

ITEM	UNIT	QUANTITY
Precast Prestressed Concrete Deck Beams (27" Depth)	Sq. Ft.	2,244
P.C. Mortar Fairing Course	Foot	170
Waterproofing Membrane System	Sq. Yd.	227
Leveling Binder (Machine Method)	Ton	7
Bit. Conc. Surf. Cse., Mix D, Cl. I, Ty. 2	Ton	20

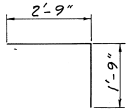


BEARING PAD DETAILS



BAR A1

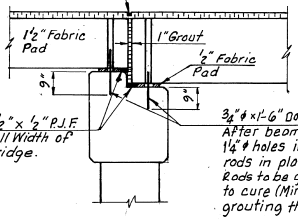
BARS U & U1



BAR O

Note: See sheet #14 for SECTION AT ABUTMENTS

¼"x¾" Sawed Joint w/Elastic Joint Filler. See Section 589 of the Standard Specifications.



After beams are in place drill 1¼" ℄ holes in cap & grout dowel rods in place. Rods to be grouted and allowed to cure (Min. 24 hrs.) prior to grouting the shear keys.

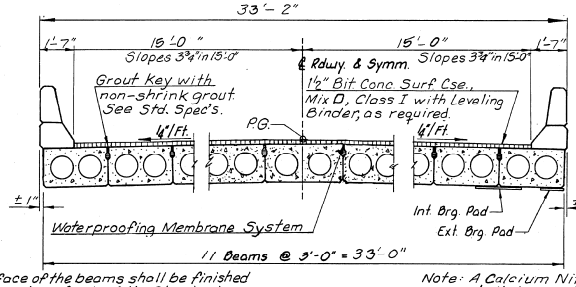
SECTION AT PIERS

SUPERSTRUCTURE - SPAN 2
SECTION 89-04109-00-BR
HARLEY ROAD OVER
CHICAGO AND NORTHWESTERN R.R.
KANE COUNTY
STATION 12+97.00

RICE, BERRY AND UZMAN
CONSULTING ENGINEERS

DESIGNED S.W.M. & D.B. CHECKED Z.B.U.
DRAWN G.B. DATE 7-8-94 NO 12-05-0008 I

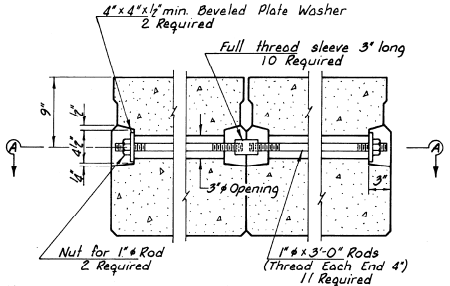
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109 -00-BR	KANE	23	17
FED. ROAD DIST NO. 7	ILLINOIS	PROJECT BR-89-089(10)		



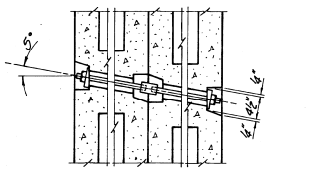
Note: The top surface of the beams shall be finished in accordance with Art. 504.06 of the Standard Specifications except that the surface shall not be roughened by brooming. The finished surface shall be free of depressions or high spots with sharp corners, and the edge of keys shall be rounded or chamfered a minimum of ¼".

CROSS SECTION

Note: A Calcium Nitrite Corrosion inhibitor, shall be used in the concrete for precast prestressed concrete deck beams.

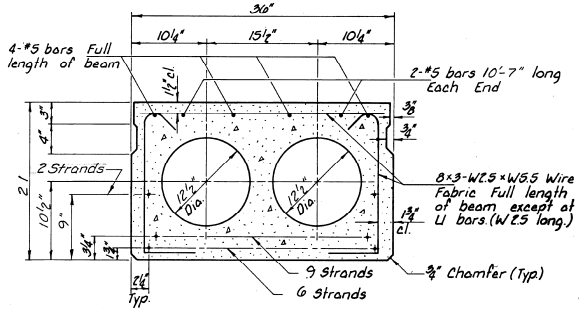


TRANSVERSE TIE ROD DETAIL



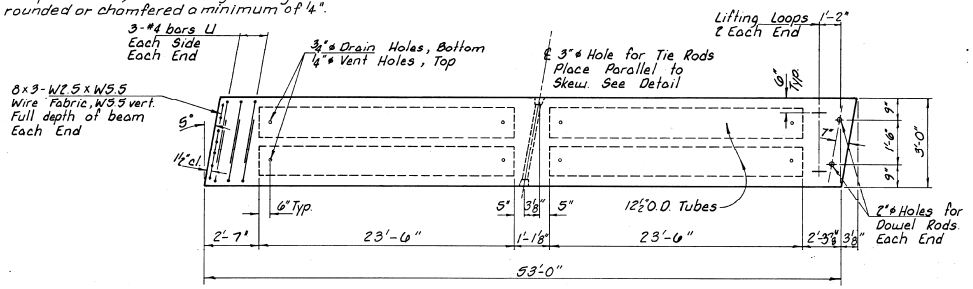
SECTION A-A

Note: Omit key on exterior face of outside beams.

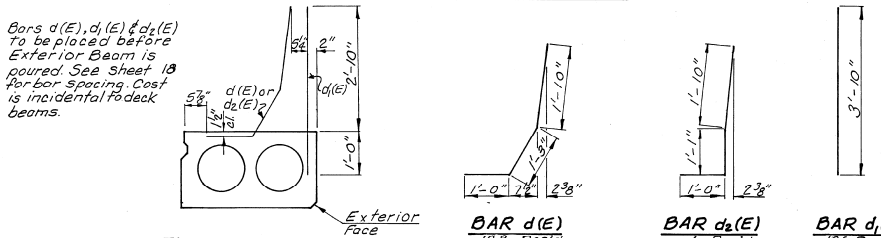


TYPICAL SECTION THRU BEAM

17 - ½"ϕ Strands Stressed to 28,900 Lbs. Each. Place strands symmetrically about ℄ of beam. Use Standard Grid Pattern.



TYPICAL PLAN OF BEAMS



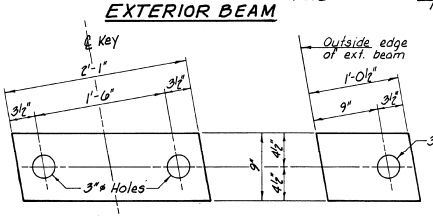
EXTERIOR BEAM

BAR d(E) 108 Req'd.

BAR d2(E) 4 Req'd.

BAR d1(E) 106 Req'd.

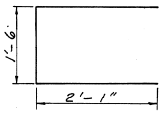
Note: Reinforcement Bars designated (E) shall be epoxy coated.



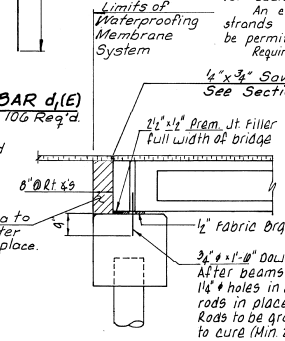
INTERIOR (20 Req'd.)

EXTERIOR (4 Req'd.)

BEARING PAD DETAILS



BAR U



SECTION AT ABUTMENTS

Note: For Section @ Piers see sheet 16

NOTES

Prestressing steel shall be non-galvanized high strength, stress-relieved 7-wire strand, Grade 270.

The nominal diameter shall be ½" and the nominal cross-sectional area shall be 0.153 sq. in.

Lifting Loops shall be 7-wire stress relieved, 2-½"ϕ-270 ksi strands.

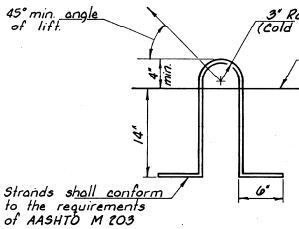
The 1"ϕ rods in the transverse tie assembly shall be tightened to a snug fit & the threads set. Pockets that receive tie rods on outside shall be filled with grout after ties are in place.

Reinforcement bars shall conform to AASHTO: M-31 or M-42 or M-53, Grade 60.

The bearing seat surfaces shall be adjusted by shimming to assure firm and even bearing. Two ⅛" fabric adjusting shims of the dimensions of the Exterior Bearing Pad shall be provided for each bearing.

An equal substitution of the low-relaxation strands for the stress-relieved strands will be permitted.

Required Release Strength, f'ci, shall be 4,100 p.s.i.



Note: The loop shall be formed in a manner such that all strands are engaged during lifting. Loops shall be burried off after beams have been erected.

LIFTING LOOP DETAIL

Approved alternate may be substituted for the above.

BILL OF MATERIAL

ITEM	UNIT	QUANTITY
Precast Prestressed Concrete Deck Beams (21" Depth)	Sq. Ft.	1,749
P.C. Mortar Fairing Course	Foot	133
Waterproofing Membrane System	Sq. Yd.	179
Leveling Binder (Machine Method)	Ton	5
Bit. Conc. Surf. Cse., Mix D, Cl. I, Ty. 2	Ton	15

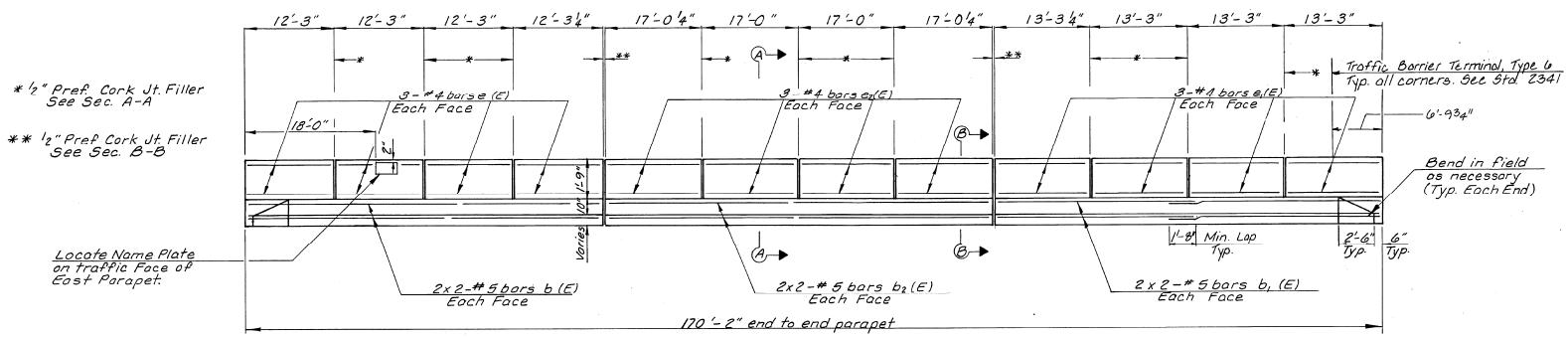
SUPERSTRUCTURE - SPAN 3

SECTION 89-04109-00-BR
HARLEY ROAD OVER
CHICAGO AND NORTHWESTERN R.R.
KANE COUNTY
STATION 12+97.00

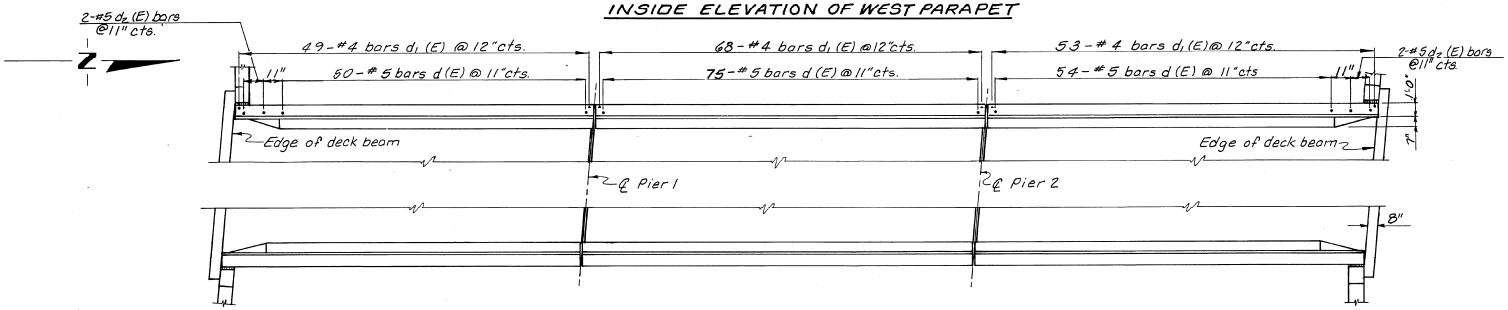
HLR RICE, BERRY AND UZMAN
CONSULTING ENGINEERS

DESIGNED S.W.M. & D.B. CHECKED Z.B.U.
DRAWN G.B. DATE 7-8-94 NO. 12-85-0008 I

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO
T-R 152	89-04109 -00-BR	KANE	23	18
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BR-08-089(10)		



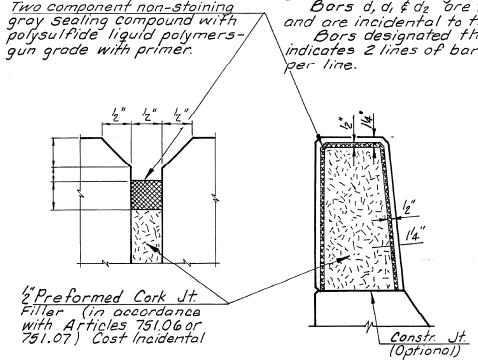
INSIDE ELEVATION OF WEST PARAPET



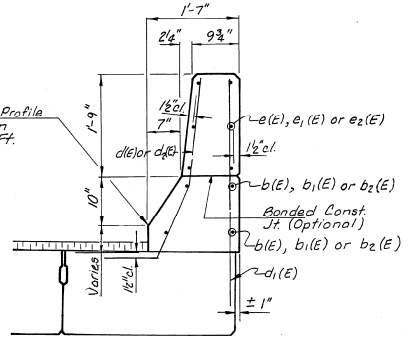
PLAN

Notes:
Curbs and paropets are to be poured after beams are set and grout in shear key has set.
Top of curb to be constructed parallel to ℄ Grade for full length of bridge.
Bars d, d1 & d2 are to be cast with beams and are incidental to the cost of the beams.
Bars designated thus 2x2-#5 etc. indicates 2 lines of bars with 2 lengths per line.

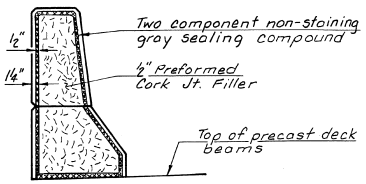
MIN. BAR LAPS
#5 bars = 1'-8"



PARAPET JOINT DETAIL
SECTION A-A



SECTION THRU PARAPET



PARAPET JOINT DETAIL
AT PIERS SECTION B-B

BILL OF MATERIAL—PARAPETS

BAR	NO.	SIZE	LENGTH	SHAPE
b(E)	16	#5	25'-1"	——
b1(E)	16	#5	27'-1"	——
b2(E)	16	#5	34'-7"	——
e(E)	48	#4	11'-11"	——
e1(E)	48	#4	12'-11"	——
e2(E)	48	#4	16'-8"	——
Name Plates			Each	1
Concrete Superstructure			Cu. Yd.	42.6
Reinforcement Bars, Epoxy Coated			Pound	2,780
Protective Coat			Sq. Yd.	145

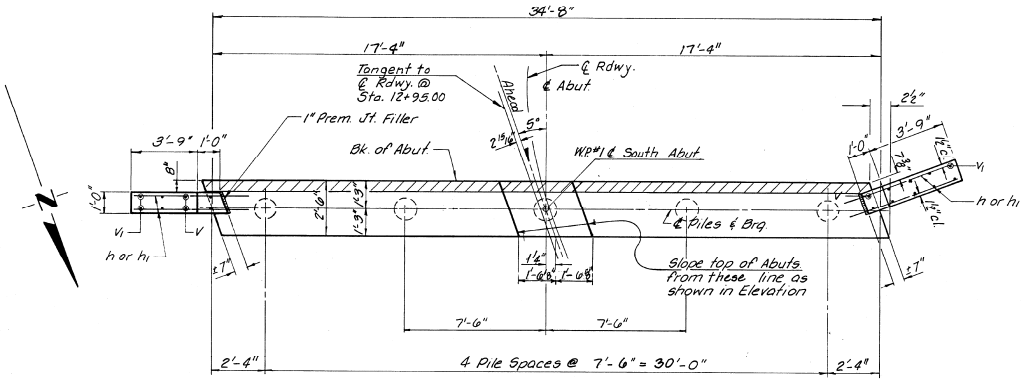
Reinforcement bars designated (E) shall be epoxy coated.

PARAPETS
SECTION 89-04109-00-BR
HARLEY ROAD OVER
CHICAGO AND NORTHWESTERN R.R.
KANE COUNTY
STATION 12+97.00

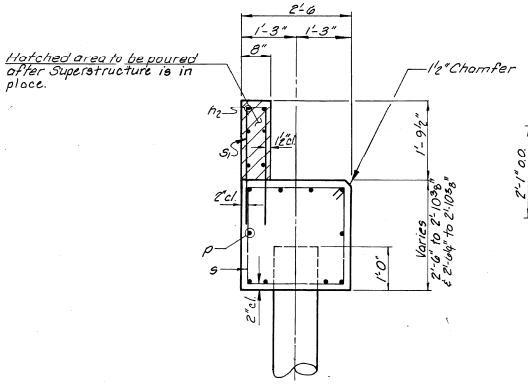
RICE, BERRY AND UZMAN
CONSULTING ENGINEERS

DESIGNED S.W.M. & D.B. CHECKED Z.B.U.
DRAWN G.B. DATE 7-8-94 NO. 12-05-0008T

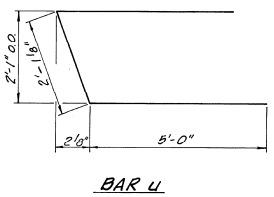
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109-00-BR	KANE	23	19
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BR-03-00900)		



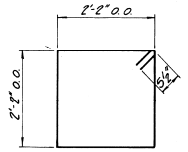
PLAN



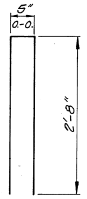
SECTION A-A



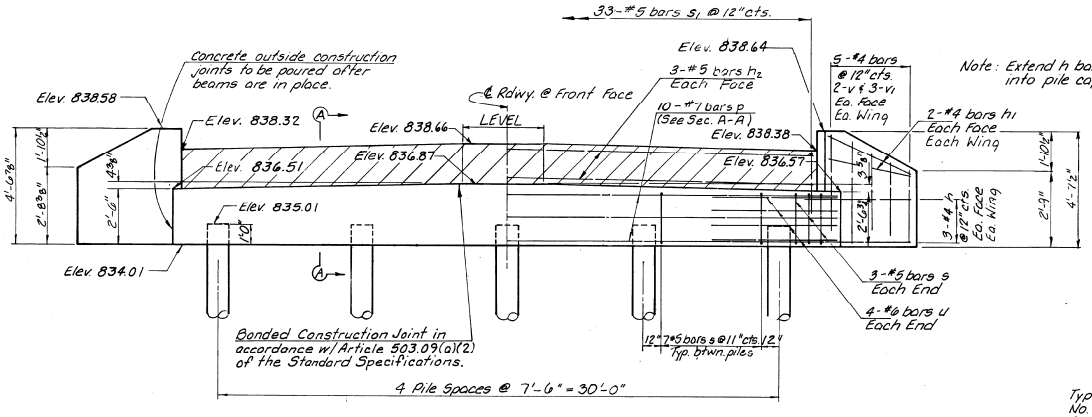
BAR u



BAR s



BAR s_1



ELEVATION

(LOOKING SOUTH)

PILE DATA

Type _____ Concrete
No. Req'd. (S. Abut) _____ 5*
Capacity _____ 45 Tons/pile
Est. Length _____ 50 Feet/pile
* Includes one concrete test pile to be driven in a permanent location.

BILL OF MATERIAL - S. ABUT.

BAR	NO.	SIZE	LENGTH	SHAPE
h	12	#4	5'-6"	—
h_1	8	#4	4'-6"	—
h_2	6	#5	34'-5"	—
p	10	#7	34'-5"	—
s	34	#5	9'-7"	⌐
s_1	33	#5	5'-9	▭
u	8	#6	12'-1"	⌐
v	0	#4	4'-1"	—
v_1	12	#4	2'-7"	—
Concrete Structures			Cu. Yd.	11.3
Reinforcement Bars			Pound	1,710
Concrete Piles			Foot	200
Test Pile Concrete			Each	1

See sheet 23 for pile alternates.

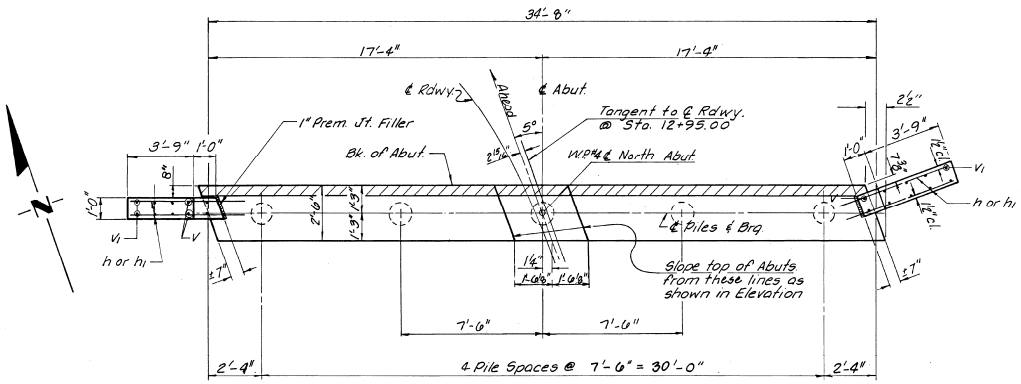
SOUTH ABUTMENT

SECTION 89-04109-00-BR
HARLEY ROAD OVER
CHICAGO AND NORTHWESTERN R.R.
KANE COUNTY
STATION 12+97.00

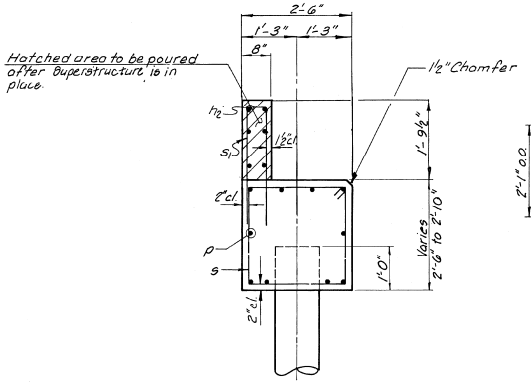
HLR RICE, BERRY AND UZMAN
CONSULTING ENGINEERS

DESIGNED S.W.M. & D.B. CHECKED Z.B.U.
DRAWN G.B. DATE 7-8-94 NO. 12-05-0008I

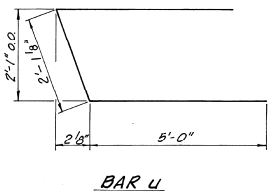
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109-00-BR	KANE	23	20
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT: BR-089-089,(02)		



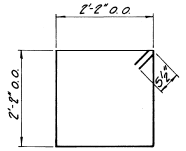
PLAN



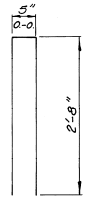
SECTION A-A



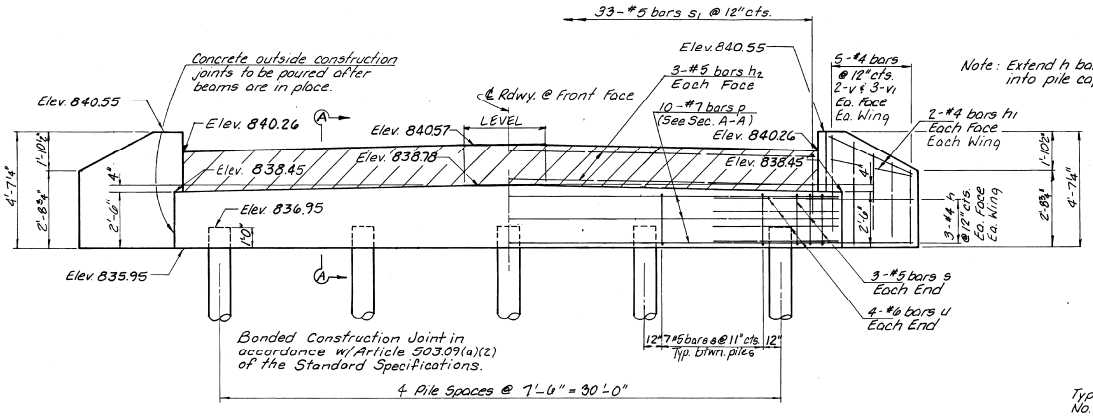
BAR u



BAR s



BAR s1



ELEVATION

(LOOKING NORTH)

PILE DATA

Type _____ Concrete
No. Req'd. (N. Abut) _____ 5
Capacity _____ 45 Tons/pile
Est. Length _____ 40 Feet/pile

BILL OF MATERIAL - N. ABUT.

BAR	NO.	SIZE	LENGTH	SHAPE
h	12	#4	5'-6"	
h1	8	#4	4'-6"	
h2	6	#5	34'-5"	
p	10	#7	34'-5"	
s	34	#5	9'-7"	
s1	33	#5	5'-9"	
u	8	#6	12'-1"	
v	0	#4	4'-1"	
v1	12	#4	2'-7"	
Concrete Structures		Cu. Yd.	11.2	
Reinforcement Bars		Pound	1,710	
Concrete Piles		Foot	200	

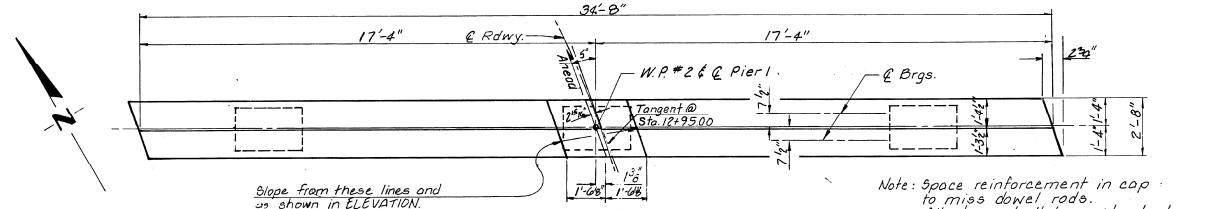
See sheet 23 for pile alternates.

NORTH ABUTMENT

SECTION 89-04109-00-BR
HARLEY ROAD OVER
CHICAGO AND NORTHWESTERN R.R.
KANE COUNTY
STATION 12+97.00

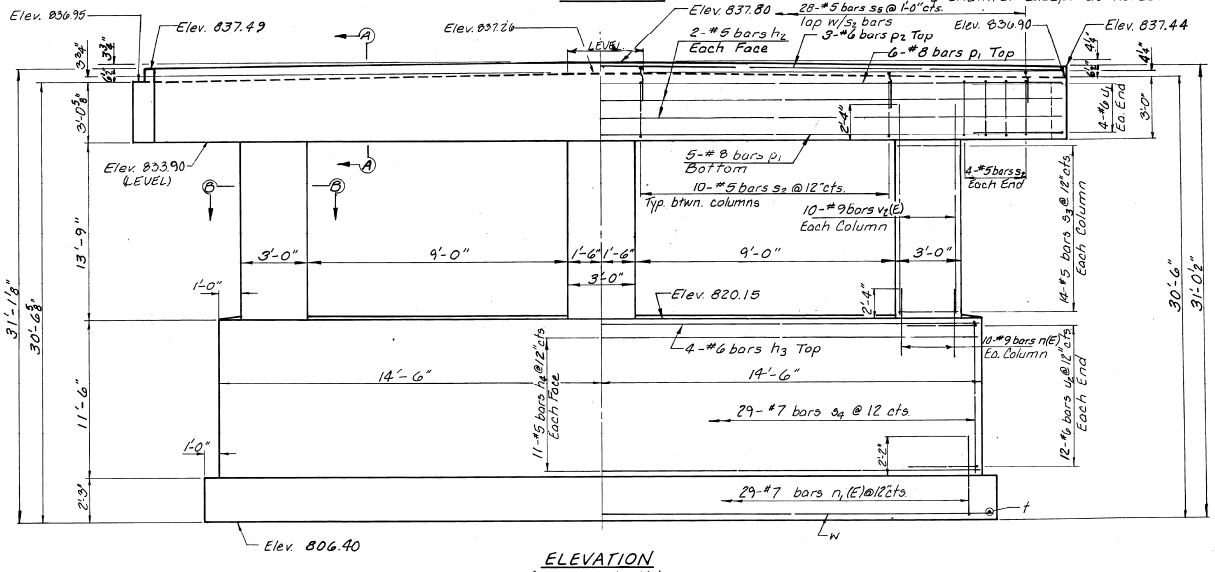
RICE, BERRY AND UZMAN
CONSULTING ENGINEERS

DESIGNED S.W.M. & O.B. CHECKED Z.B.U.
DRAWN G.B. DATE 7-8-94 NO. 12-05-00081

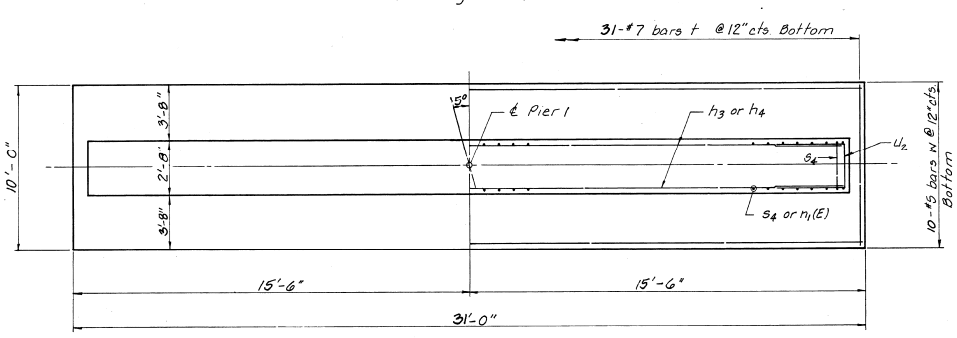


TOP PLAN

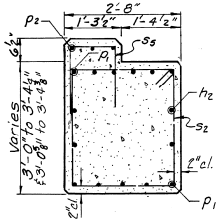
Note: Space reinforcement in cap to miss dowel rods. All edges shall have standard 3/4" chamfer except as noted.



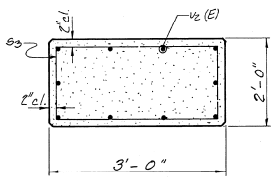
ELEVATION
(Looking North)



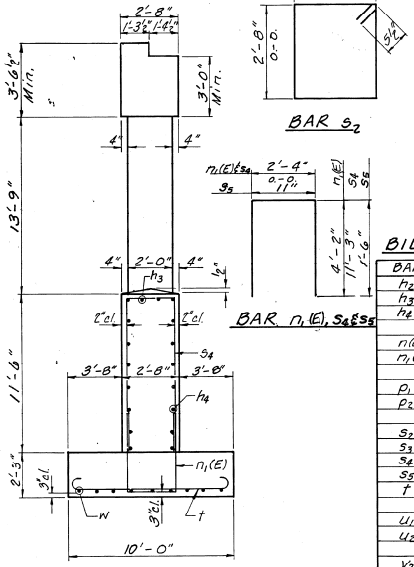
FOOTING PLAN



SECTION A-A



SECTION B-B

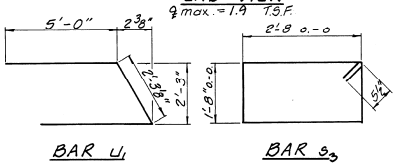


BAR s_2

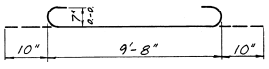
BAR u_2

BAR $n_1(E), s_4 \& s_5$

END VIEW
℄ max. = 1.9 T.S.F.



BAR u_1 BAR s_3



BAR t

Note: All Reinforcement Bars designated (E) shall be epoxy coated.

BILL OF MATERIAL - PIER 1

BAR	NO.	SIZE	LENGTH	SHAPE
h_2	4	#5	34'-5"	
h_3	4	#6	28'-8"	
h_4	22	#5	28'-8"	
$n(E)$	30	#9	4'-8"	
$n_1(E)$	29	#7	10'-8"	
p_1	11	#8	34'-5"	
p_2	3	#6	34'-5"	
s_2	28	#5	10'-11"	
s_3	42	#5	9'-7"	
s_4	29	#7	24'-10"	
s_5	28	#5	3'-11"	
t	31	#7	11'-4"	
u_1	8	#6	12'-3"	
u_2	24	#6	9'-2"	
$v_2(E)$	30	#9	15'-11"	
w	10	#5	30'-8"	
Concrete Structures			Cu. Yd	79.8
Reinforcement Bars			Pound	5,980
Structure Excavation			Cu. Yd	135
Reinf. Bars, Epoxy Coated			Pound	2,730

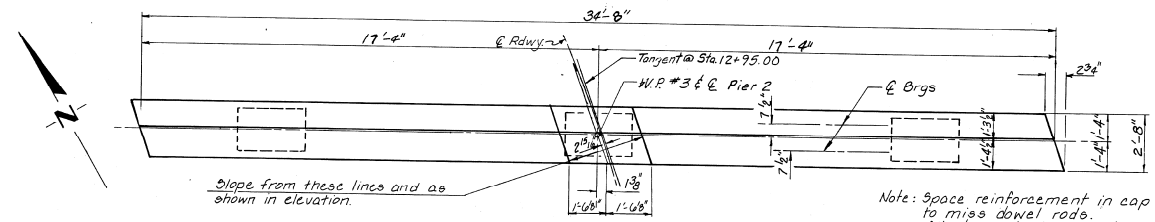
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109 -00-BR	KANE	23	21
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BRZ-05-009(10)		

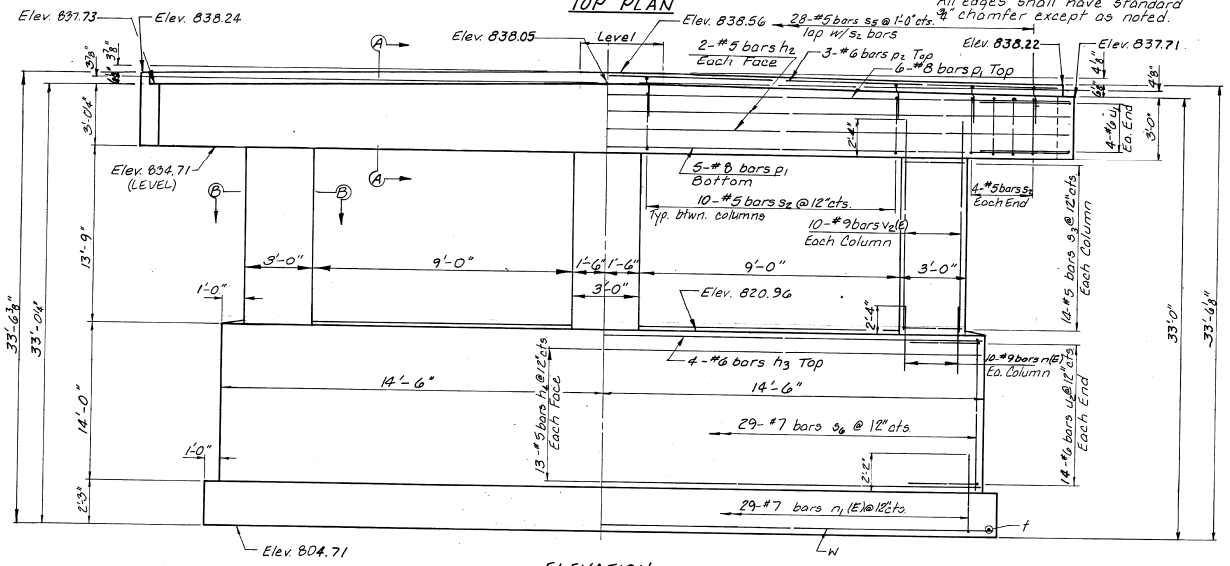
PIER 1
SECTION 89-04109-00-BR
HARLEY ROAD OVER
CHICAGO AND NORTHWESTERN R.R.
KANE COUNTY
STATION 12+97.00

HLR RICE, BERRY AND UZMAN
CONSULTING ENGINEERS

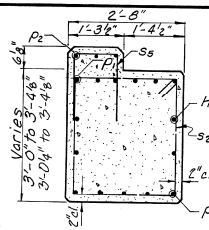
DESIGNED S.W.M. & D.B. CHECKED Z.B.U.
DRAWN G.B. DATE 7-8-94 No. 12-05-00081

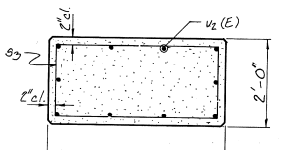
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 152	89-04109 -00-BR	KANE	23	22
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BR-05-089(10)		

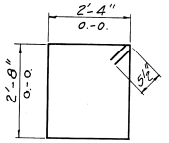


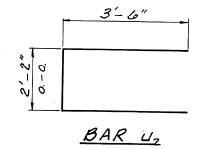


Note: Space reinforcement in cap to miss dowel rods. All edges shall have standard ¾" chamfer except as noted.





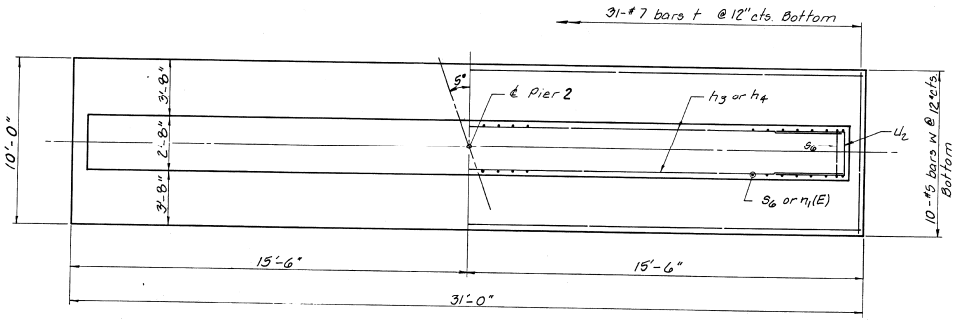


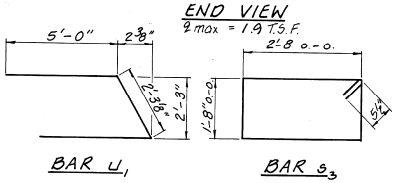


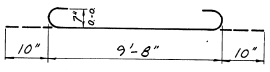
BILL OF MATERIAL - PIER 2

BAR	NO.	SIZE	LENGTH	SHAPE
h_2	4	#5	34'-5"	
h_3	4	#6	28'-8"	
h_4	26	#5	28'-8"	
$n_1(E)$	30	#9	4'-8"	
n_1 (E)	29	#7	10'-8"	
p_1	11	#8	34'-5"	
p_2	3	#6	34'-5"	
S_2	28	#5	10'-11"	
S_3	42	#5	9'-7"	
S_5	28	#5	3'-11"	
S_6	29	#7	29'-10"	
t	31	#7	11'-4"	
U_1	8	#6	12'-3"	
U_2	28	#6	9'-2"	
$V_2(E)$	30	#9	15'-11"	
W	10	#5	30'-8"	

Concrete Structures	Cu. Yd.	869
Reinforcement Bars	Pound	6,450
Structure Excavation	Cu. Yd.	200
Reinf. Bars, Epoxy Coated	Pound	2,730







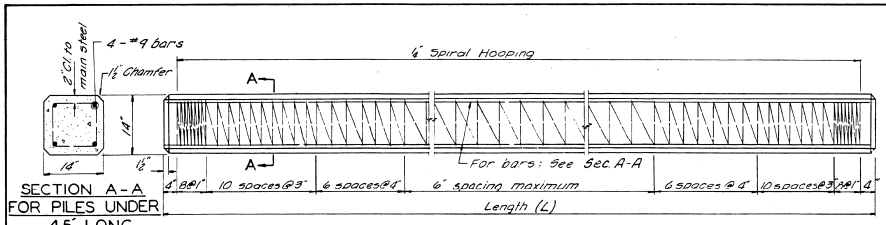
Note: All Reinforcement designated (E) shall be epoxy coated.

PIER 2

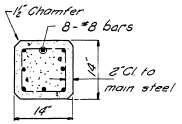
SECTION 89-04109-00-BR
HARLEY ROAD OVER
CHICAGO AND NORTHWESTERN R.R.
KANE COUNTY
STATION 12+97.00

HLR RICE, BERRY AND UZMAN
CONSULTING ENGINEERS

DESIGNED S.W.M. & D.B. CHECKED Z.B.U.
DRAWN G.B. DATE 7-8-94 NO. 12-05-0088.1



SECTION A-A FOR PILES UNDER 45' LONG

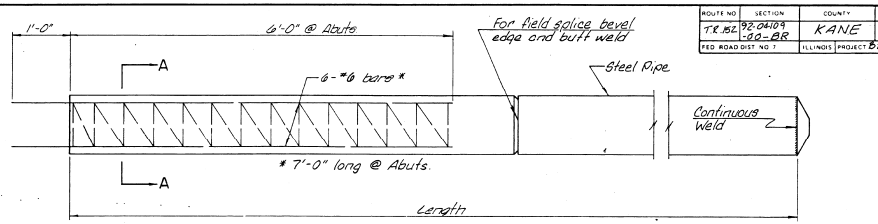


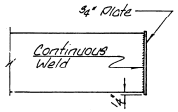
SECTION A-A FOR PILES 45' OR MORE

Handling:
For Pile Lengths up to 45 ft. use two slings placed at a distance of 0.21L* from each end. For piles longer than 45 ft use three slings placed at a distance of 0.12L* from each end and at mid-point of pile.

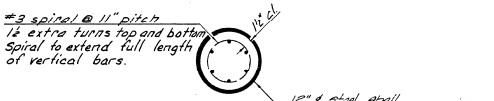
*L = Over all length of pile to be handled.

DETAIL OF PRECAST CONCRETE PILES





OPTIONAL FLAT END



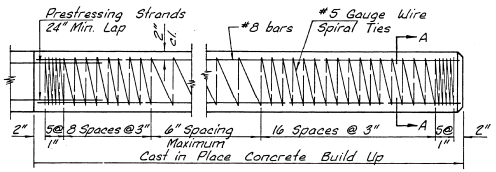
Note:
Driving and bearing ends of pipe shall be cut square.
Reinforcement may be omitted in piles to be encased.

SECTION A-A

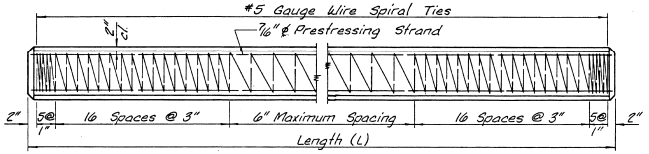
Note: Cost of reinforcement in piling is incidental to the cost of driving piles.

DETAIL OF CAST IN PLACE CONCRETE PILES

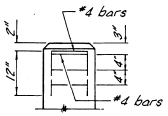
ROUTE NO	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
TR. BR.	92-04109-00-BR	KANE	23	23
FED. ROAD DIST. NO. 7	ILLINOIS	PROJECT BR-05-089(10)		



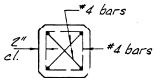
PILE BUILD UP



PILE PLAN



ELEVATION
(End Reinforcement)



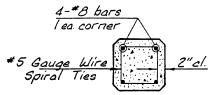
PLAN
(End Reinforcement)

DESIGN STRESSES

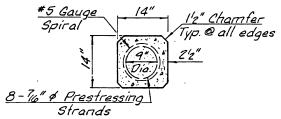
$f_c' = 5{,}000$ p.s.i.
$f_{ci}' = 4{,}000$ p.s.i.
$f_s' = 270{,}000$ p.s.i. (31,000 lbs.) — 7/16" ø
$f_{si} = 189{,}000$ p.s.i. (21,700 lbs.)
$f_s' = 270{,}000$ p.s.i. (41,300 lbs.) — ½" ø
$f_{si} = 189{,}000$ p.s.i. (28,900 lbs.)

NOTE

Precast prestressed concrete piles will not be permitted in pile bent piers.



SECTION A-A



SECTION THRU PILE

NOTES

Prestressing steel shall be non-galvanized extra high strength stress-relieved 7-wire strand. The nominal diameter shall be 7/16" and the minimum nominal cross-sectional area shall be 0.115 sq. in. or the equivalent 6 - ½" ø strands with a cross-sectional area of 0.153 sq. in. may be used.

For Pile lengths up to 65', use two slings placed at a distance of 0.21 L* from each end. For Piles longer than 65', use three slings place at a distance of 0.12 L* from each end and at midpoint of pile.

*L = Overall Length of Pile to be handled.

DETAIL OF PRECAST PRESTRESSED CONCRETE PILES

PILE DETAILS
SECTION 89-04109-00-BR
HARLEY ROAD OVER
CHICAGO AND NORTHWESTERN R.R.
KANE COUNTY
STATION 12+97.00

RICE, BERRY AND UZMAN
CONSULTING ENGINEERS

DESIGNED S.W.M. & D.B. CHECKED Z.B.U.
DRAWN G.B. DATE 7-8-94 No. 12-05-0008I