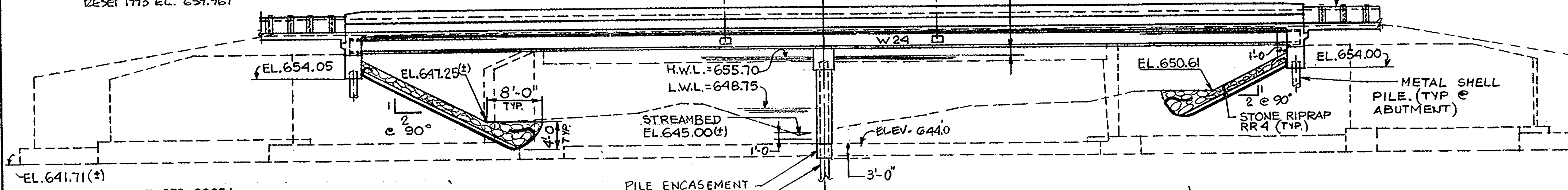
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP-840	135 BR	IROQUOIS	27	12
FED. ROAD DIST. NO.	ILLINOIS	PROJECT		

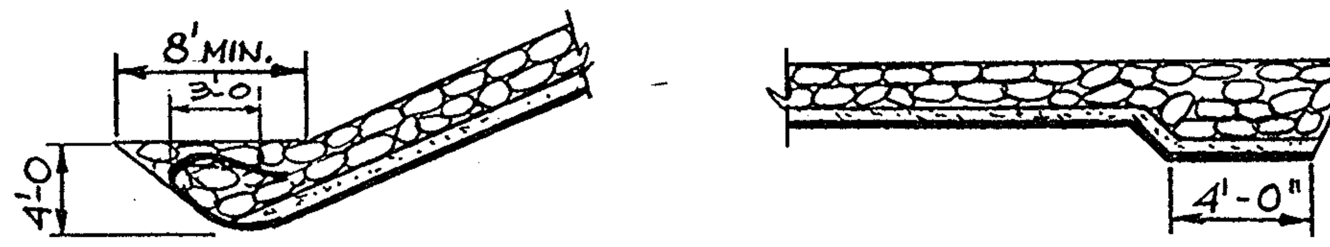
B.M. #25 - USGS S.E. CORNER BRIDGE
RESET 1959 EL. 661.18
RELOCATED ±500' SOUTH 4/13/93
RESET 1993 EL. 659.967



ELEVATION

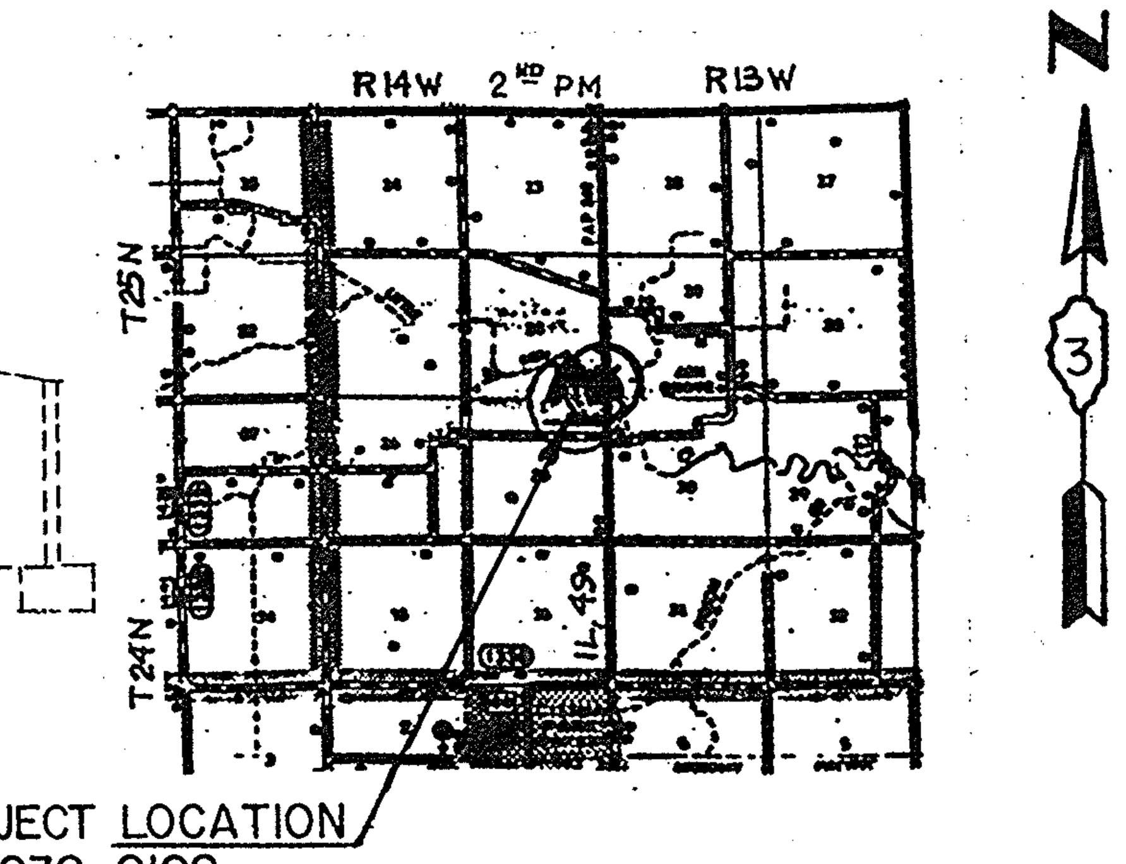
EXISTING STRUCTURE 038-0095:

THE EXISTING BRIDGE IS A 3 SPAN CONCRETE TEE BEAM, 127'-3" BACK TO BACK IN LENGTH WITH A ROADWAY WIDTH OF 36'-4" OUT TO OUT. THE BRIDGE WAS BUILT IN 1927 AND WIDENED IN 1958. THE PROPOSED IMPROVEMENT CONSISTS OF REMOVING AND REPLACING THE EXISTING STRUCTURE WITH A 32' FACE TO FACE WIDE BRIDGE STRUCTURE. THE CONTRACTOR SHALL REMOVE EXISTING CONCRETE TEE BEAMS, PIERS, PARTIALLY REMOVE EXISTING ABUTMENTS AND WINGWALLS TO REBUILD THE BRIDGE WITH 7 1/2" R.C. SLAB AND STEEL BEAMS ON NEW INTEGRAL ABUTMENTS AND AN ENCLOSED PILE BENT PIER. THE TRAFFIC SHALL BE MAINTAINED USING STAGE CONSTRUCTION.



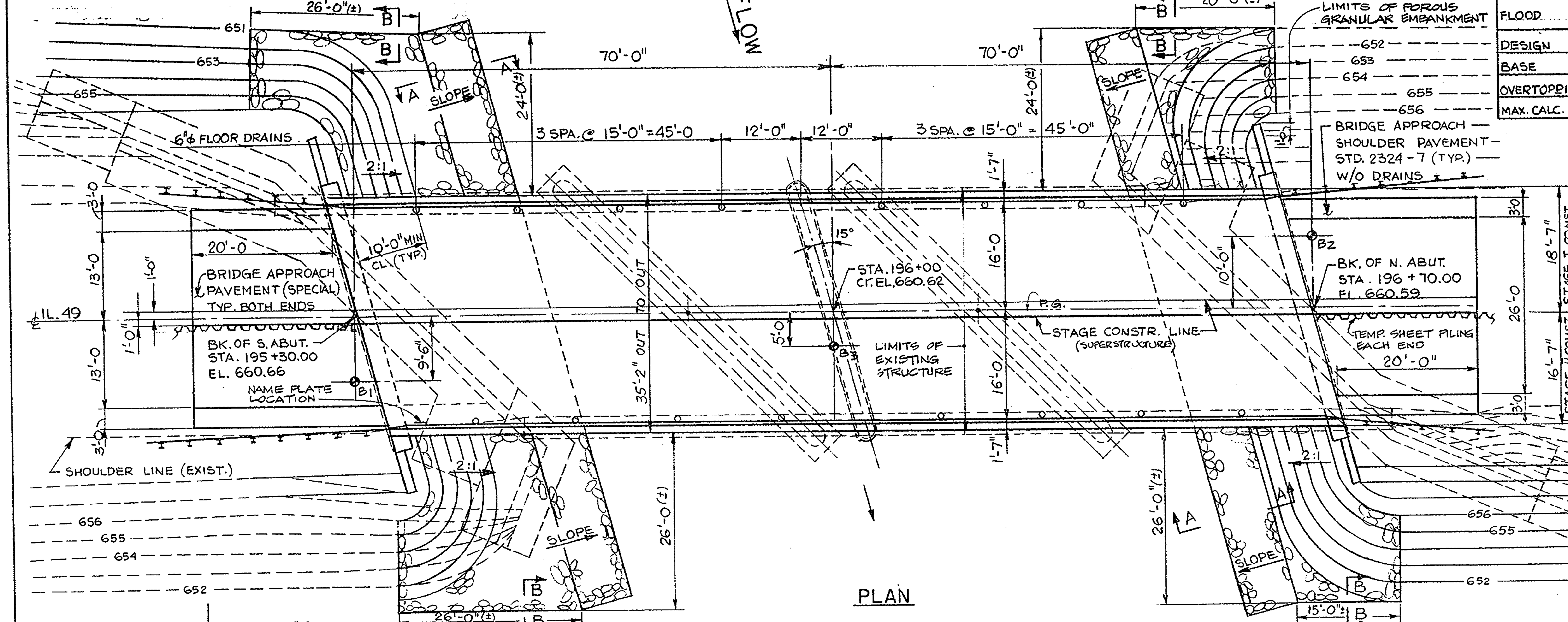
SECTION A-A

SECTION B-B

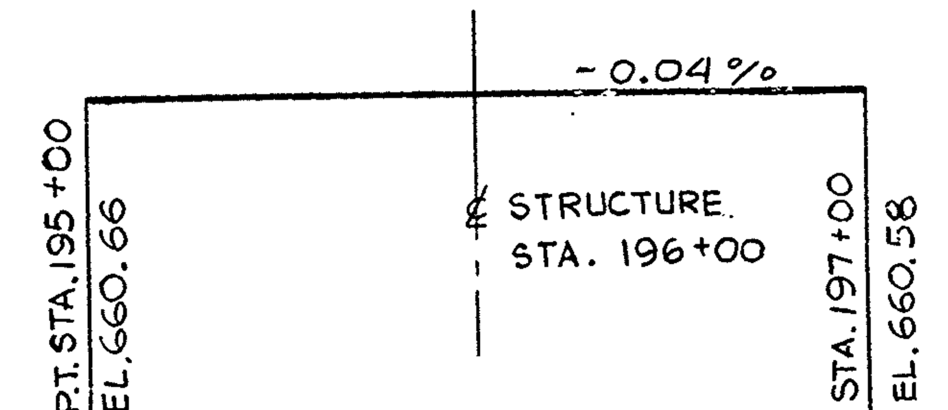


PROJECT LOCATION
S.N. 038-0198

LOCATION PLAN



PLAN



PROFILE GRADE

NAME PLATE
(SEE STD. 2113)

STATION 196+00
BUILT 199 BY
STATE OF ILLINOIS
FAP ROUTE-840 SEC.135 BR
F.A.PROJ.
LOADING HS-20
S.N. 038-0198

LEGEND:

- - - - - INDICATES EXISTING STRUCTURE.
——— INDICATES NEW STRUCTURE.
INDICATES TEMPORARY STEEL SHEET PILING.
⊕ INDICATES SOIL BORING LOCATION.

NOTES:

1. FASTENERS SHALL BE HIGH STRENGTH BOLTS. BOLTS 7/8" DIA., OPEN HOLES 15/16" DIA., UNLESS OTHERWISE NOTED.
2. CALCULATED WEIGHT OF STRUCTURAL STEEL: M-270 GRADE 50 = 131,690 LBS. M-270 GRADE 36 = 8,210 LBS.
3. FIELD WELDING OF CONSTRUCTION ACCESSORIES WILL NOT BE PERMITTED TO THE BOTTOM FLANGE OF BEAMS OR GIRDERS NOR TO THE TOP FLANGE FOR A DISTANCE EQUAL TO ONE-FOURTH THE SPAN LENGTH EACH WAY FROM THE PIER SUPPORTS. FIELD WELDING IN OTHER AREAS WILL BE PERMITTED ONLY WHEN APPROVED BY THE ENGINEER.
4. ANCHOR BOLTS SHALL BE SET BEFORE BOLTING DIAPHRAGMS OVER SUPPORTS.
5. THE MAIN LOAD CARRYING MEMBER COMPONENTS SUBJECT TO TENSILE STRESS SHALL CONFORM TO THE SUPPLEMENTAL REQUIREMENTS FOR NOTCH TOUGHNESS ZONE 2. THESE COMPONENTS ARE (THE WIDE FLANGE BEAMS)(THE TENSION FLANGES, WEBS) AND ALL SPLICE PLATE MATERIAL OF THE STEEL GIRDERS, EXCEPT FILL PLATES .
6. REINFORCEMENT BARS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-31, M-42 OR M-53 GRADE 60.
7. LAYOUT OF SLOPE PROTECTION SYSTEM MAY BE VARIED IN THE FIELD TO SUIT GROUND CONDITIONS AS DIRECTED BY THE ENGINEER.
8. BEARING SEAT SURFACES SHALL BE CONSTRUCTED OR ADJUSTED TO THE DESIGNATED ELEVATIONS WITHIN A TOLERANCE OF 1/8 INCH. ADJUSTMENT SHALL BE MADE EITHER BY GRINDING THE SURFACE OR BY SHIMMING THE BEARING. TWO 1/8" ADJUSTING SHIMS, OF THE DIMENSIONS OF THE BOTTOM BEARING PLATE, SHALL BE PROVIDED FOR EACH BEARING IN ADDITION TO ALL OTHER PLATES OR SHIMS.
9. THE ZINC-SILICATE AND VINYL PAINT SYSTEM SHALL BE USED FOR SHOP AND FIELD PAINTING OF STRUCTURAL STEEL EXCEPT WHERE OTHERWISE NOTED. THE COLOR OF THE VINYL FINISH COAT SHALL BE MUNSELL NO. 7.5G 4/8 (INTERSTATE GREEN).
10. TEST PILES: THE CONTRACTOR SHALL DRIVE ONE STEEL H TEST PILE IN A PERMANENT LOCATION AT PIER AND ONE METAL SHELL TEST PILE EACH AT THE NORTH AND SOUTH ABUTMENTS AS DIRECTED BY THE ENGINEER BEFORE ORDERING THE REMAINDER OF PILES.
11. EXCAVATION BETWEEN NEW AND EXISTING ABUTMENTS IS INCIDENTAL TO REMOVAL OF EXISTING STRUCTURE. FOR PAVEMENT REMOVAL BETWEEN NEW AND EXISTING ABUTMENTS SEE ROADWAY PLANS.
12. FOR CANTILEVER FORMING BRACKETS SEE SPECIAL PROVISIONS.

WATERWAY INFORMATION

DRAINAGE AREA = 53.5 MI² LOW GRADE ELEV. = 659.4 @ STA. 187+00

FLOOD	FREQ. YR.	Q C.F.S.	OPENING SQ. Ft. EXIST.	OPENING SQ. Ft. PROP.	NAT. H.W.E.	HEAD - Ft. EXIST.	HEAD - Ft. PROP.	HEADWATER EL. EXIST.	HEADWATER EL. PROP.
DESIGN	50	3280	340	840	655.7	0.9	0.8	656.6	656.5
BASE	100	3685	360	890	656.1	1.0	0.9	657.1	657.0
OVERTOPPING	—	—	—	—	—	—	—	—	—
MAX. CALC.	500	4605	385	950	656.6	1.9	1.1	658.5	657.7

DESIGN SPECIFICATIONS:

DESIGN LOADING: HS20-44, FUTURE WEARING SURFACE 25 PSF.

DESIGN SPECIFCATIONS: AASHTO 1989 STANDARD SPECIFICATION FOR HIGHWAY, BRIDGES AND 1990 & 1991 INTERIM SPECIFICATIONS.

CONSTRUCTION SPECIFICATION: ILLINOIS STANDARD SPECIFICATION FOR ROADS AND BRIDGES CONSTRUCTION ADOPTED JULY, 1988.

DESIGN STRESSES: REINFORCING STEEL: fy = 60,000 PSI
CONCRETE: f'c = 3,500 PSI
STRUCTURAL STEEL: fy = 50.0 KSI (M-270) GRADE 50

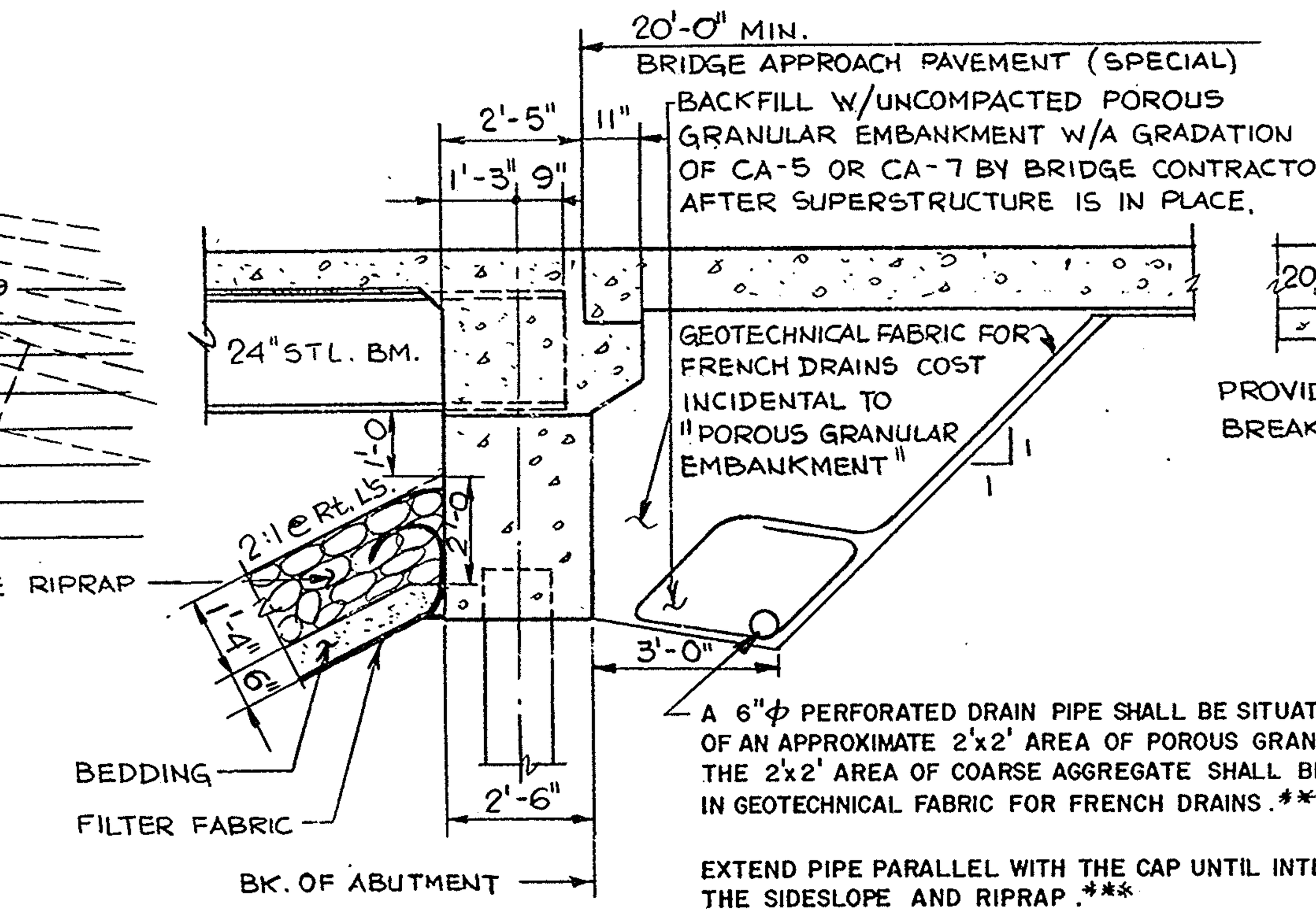
BR. SHT. 1 OF 16

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUP.STR.	SUB.STR	TOTAL
POROUS GRAN. EMBANKMENT	CU. YD.	—	280	280
** REMOVAL OF EXIST. STRUCT.	EACH	—	—	1
STRUCTURE EXCAVATION	CU. YD.	—	177	177
COFFERDAM EXCAVATION	CU YD		9	9
COFFERDAM (PIER 1)	EACH		2	2
FLOOR DRAINS	EACH	16	—	16
CLASS "X" CONC. SUPERSTR	CU. YD	167.1	—	167.1
* PROTECTIVE COAT	SQ. YD	611	—	611
CLASS "X" CONCRETE	CU. YD	—	64	64
FURNIS. & ERECTING STR. STEEL	L. SUM	1	—	1
STUD SHEAR CONNECTORS	EACH	2592	—	2592
REINFORC. BARS, EPOXY COAT	POUND	37,155	7430	44585
FURNISHING METAL PILE SHELL 14	LIN. FT.	—	783	783
FURNISHING STL. PILE HP10×57	LIN. FT.	—	730	730
DRIVING & FILLING SHELLS	LIN. FT	—	783	783
DRIVE STEEL PILE HP10×57	LIN. FT	—	730	730
TEST PILE MET. SHELLS.	EACH	—	2	2
TEST PILE STL. HP10-57	EACH	—	1	1
** TEMPOR. SHEET PILING	SQ. FT.	—	1890	1890
NAME PLATES	EACH	1	—	1
STONE RIPRAP CLASS A-4	SQ. YD.	—	550	550
BRIDGE DECK GROOVING	SQ. YD.	497	—	497
FILTER FABRIC FOR USE WITH RIPRAP	SQ. YD.	—	550	550

*INCLUDES DECK SURFACE.

**SEE SPECIAL PROVISIONS.



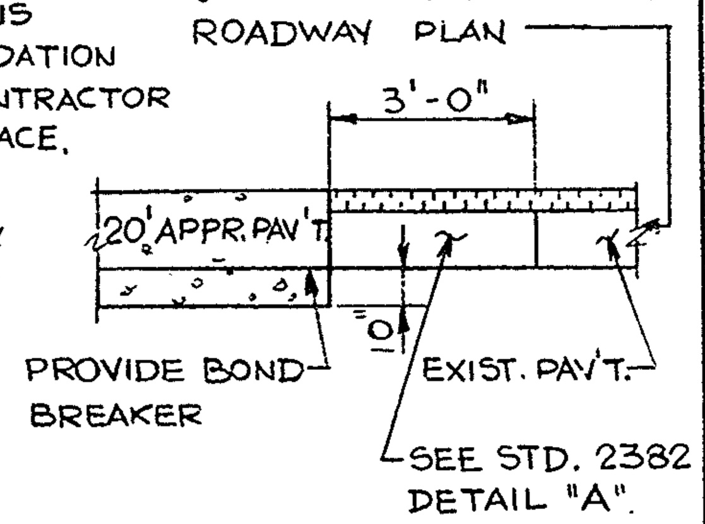
A 6"ϕ PERFORATED DRAIN PIPE SHALL BE SITUATED AT THE BOTTOM OF AN APPROXIMATE 2'x2' AREA OF POROUS GRANULAR EMBANKMENT. THE 2'x2' AREA OF COARSE AGGREGATE SHALL BE WRAPPED COMPLETELY IN GEOTECHNICAL FABRIC FOR FRENCH DRAINS.***

EXTEND PIPE PARALLEL WITH THE CAP UNTIL INTERSECTING WITH THE SIDESLOPE AND RIPRAP.***

***COST INCIDENTAL TO POROUS GRANULAR EMBANKMENT.

ABUTMENT DETAIL

ROADWAY PLAN DETAILS AND PAV'T. EXPANSION JOINT DETAILS BY THE ROADWAY PLAN



JOINT DETAIL
(BITUMINOUS SURFACE)

ILLINOIS STRUCTURAL
#81-3298 EXPIRES 11-30-92

REVISED	
BY	DATE

ILLINOIS DEPARTMENT OF TRANSPORTATION

GENERAL PLAN
ILLINOIS ROUTE 49
FAP-840 SECTION 135 BR
STA. 196+00
IROQUOIS COUNTY
S.N. 038-0198

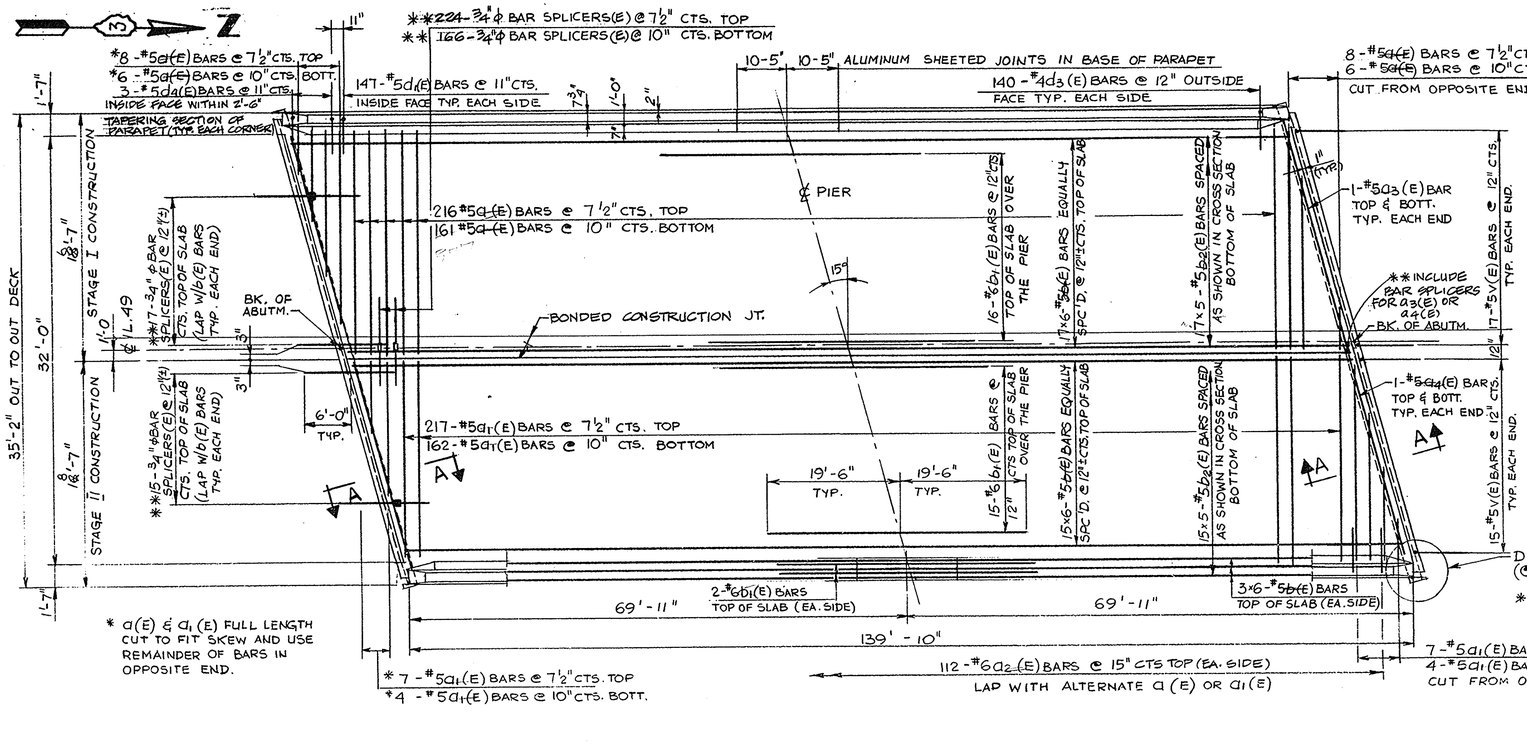
SCALE: NONE DATE:

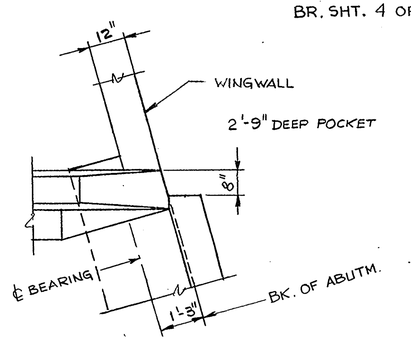
DRAWN BY I.M.
CHECKED BY S.J.

LOUIS BERGER & ASSOCIATES, INC. CHICAGO, IL.

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAP-840	135BR	IROQUOIS	27	15
FED. ROAD DIST. NO.		ILLINOIS	PROJECT	

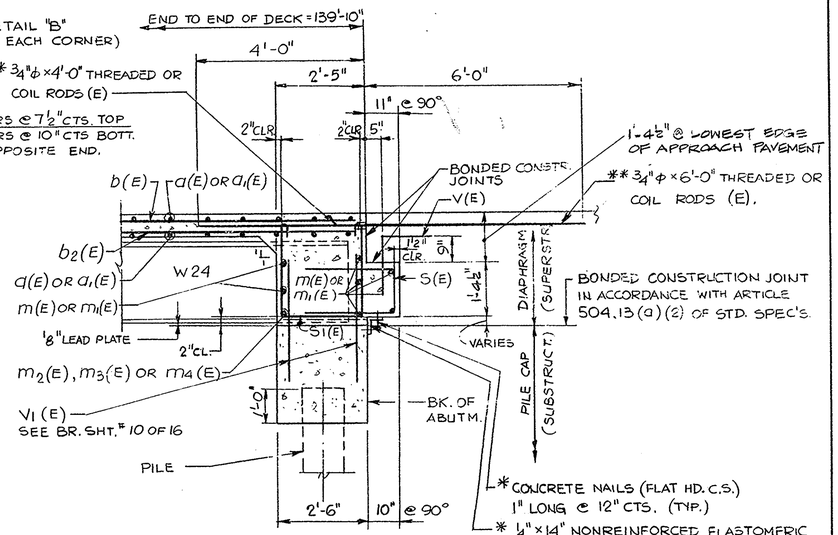
BR. SHT. 4 OF 16



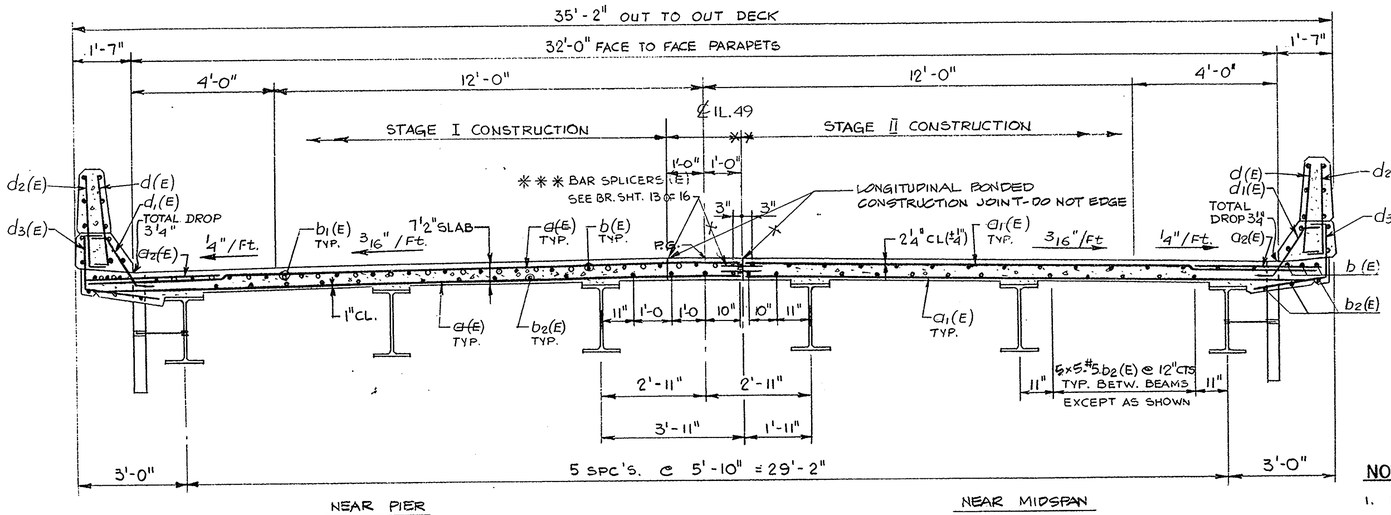


DETAIL "B"

(NOTCH IN CORBEL) ℄ EACH CORNER



SECTION A-A AT ABUTM'S.



NEAR PIER NEAR MIDSPAN

CROSS SECTION

(LOOKING NORTH)

MIN. BAR LAPS

#5 BARS = 2'-2"

NOTES:

1. REINFORCEMENT BARS DESIGNATED (E) SHALL BE EPOXY COATED.
2. BARS INDICATED THUS 17 × 5 ETC., INDICATES 17 LINES OF BARS WITH 5 LENGTHS PER LINE.
3. SEE BR. SHT.#5 OF 16 FOR PARAPET REINFORCEMENT.

***4. BAR SPLICES SHALL BE TIED WITH DOUBLE THE NUMBER OF TIES NORMALLY USED.

5 SEE BR. SHT.# 5 OF 16 FOR SUPERSTRUCTURE DETAILS AND BILL OF MATERIALS.

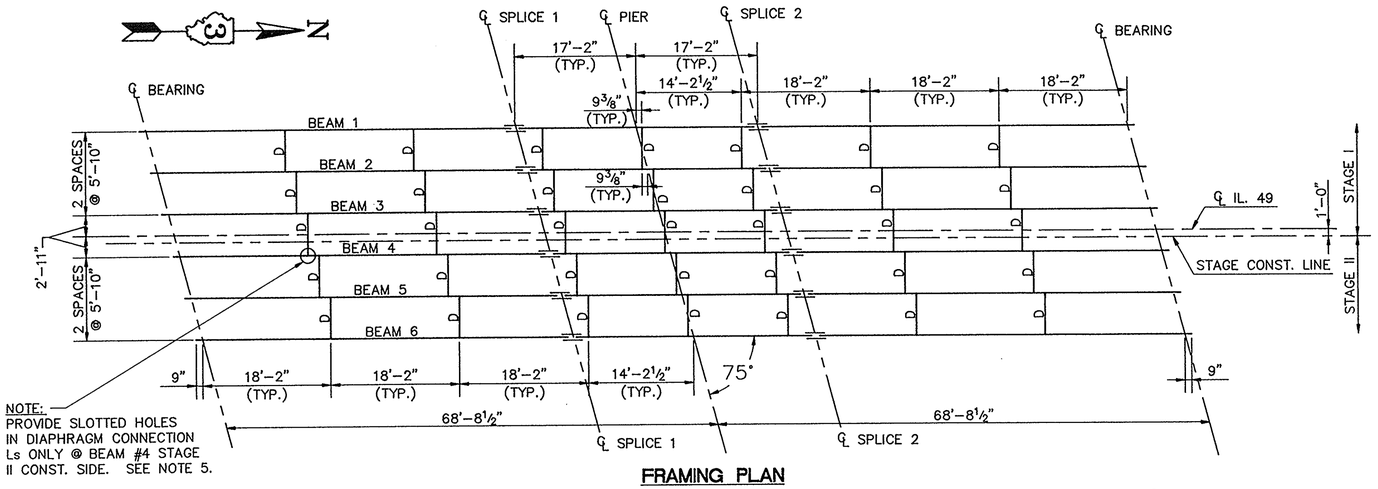
*COST IS INCIDENTAL TO CLASS "X" CONCRETE.

**COST IS INCIDENTAL TO REINFORCEMENT EPOXY COATED. SEE BR. SHT. 13 OF 16 FOR DETAILS

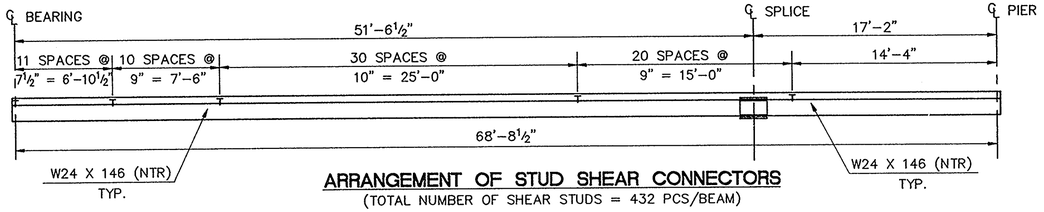
REVISED		ILLINOIS DEPARTMENT OF TRANSPORTATION
BY	DATE	
		DECK REINFORCEMENT PLAN
		ILLINOIS ROUTE 49
		FAP-840 SECTION 135BR
		STA. 196+00
		IROQUOIS COUNTY
		S.N. 038-0198
		SCALE: NONE DATE:
DRAWN BY	I. M.	LOUIS BERGER & ASSOCIATES, INC. CHICAGO, IL.
CHECKED BY	S.J.	

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.P. 840	135BR	IROQUOIS	27	18
FED. ROAD DIST. NO. 3	ILLINOIS	PROJECT P-93-062-89		

BR. SHT. 7 OF 16



FRAMING PLAN



ARRANGEMENT OF STUD SHEAR CONNECTORS

(TOTAL NUMBER OF SHEAR STUDS = 432 PCS/BEAM)

INTERIOR BEAM MOMENT TABLE

	0.4 SP. I	PIER
I_s (in^4)	4580	4580
I_c (in^4)	11690	
S_s (in^3)	371	371
S_c (in^3)	532.9	
Z (in^3)		418
M_{DL} ('K)	.742	1.025
M_{DL} ('K)	245.2	559.6
$_sM_{DL}$ (K/I)	.283	
M_{sDL} ('K)	111.6	
M_{LL} ('K)	436.6	235.5
Mimp ('K)	112.6	60.8
5/3 (M_{LL} + I) ('K)	915.3	493.8
Ma ('K)	1653.7	1369.4
Mu ('K)	2754	1741.7
f_s DL NON-COMP. (K.S.I.)	7.9	18.1
f_s DL (COMP.) (K.S.I.)	2.5	
f_s 5/3 (L_L + I) (K.S.I.)	20.6	16.0
f_s (OVERLOAD)(K.S.I.)	31.0	34.1
f_s (TOTAL) (K.S.I.)	40.3	44.3
VR (K)	35	

TOP OF BEAM ELEVATION

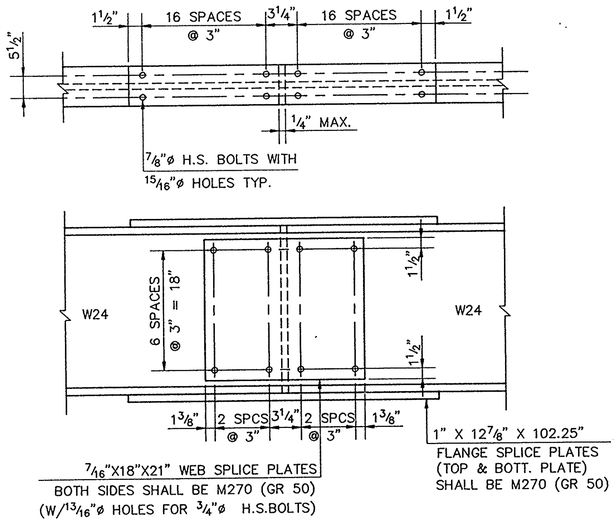
BEAM	℄ BRGS. S. ABUT.	℄ SPLICE 1	℄ PIER	℄ SPLICE 2	℄ BRGS. N. ABUT.
1.	659.700	659.679	659.672	659.665	659.645
2.	659.804	659.783	659.776	659.769	659.749
3.	659.895	659.874	659.867	659.860	659.840
4.	659.894	659.873	659.866	659.859	659.839
5.	659.802	659.781	659.774	659.767	659.747
6.	659.697	659.676	659.669	659.662	659.642

INTERIOR BEAM REACTION TABLE

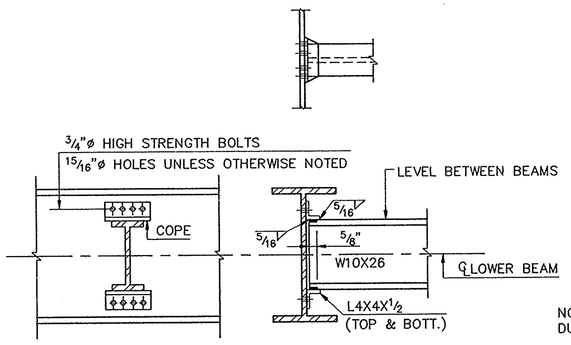
		ABUTMENT	PIER
R_{DL}	(K)	27.1	86.7
R_{LL}	(K)	32.2	41.3
$I_{mp.}$	(K)	8.3	10.7
R_{TOTAL}	(K)	67.6	138.7

BILL OF MATERIALS

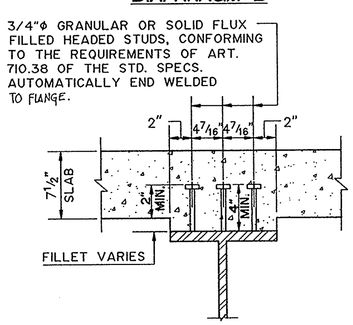
ITEM	UNIT	QUANTITY
STUD SHEAR CONNECTORS	EACH	2592
FURNISHING AND ERECTING STRUCTURAL STEEL	L.S.	1



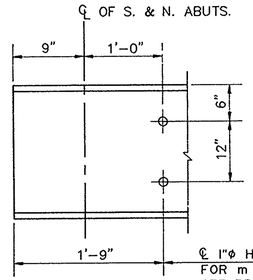
BEAM SPLICE DETAIL



DIAPHRAGM D



SHEAR STUDS



END OF BEAM ELEVATION

NOTE: BEAM #4 WILL NEED 1"X1½" SLOTTED HOLES (1½" VERTICLE) DUE TO SPLICER RODS EXTENDING PAST THAT BEAM.

LEGEND

I_s AND S_s ARE THE MOMENT OF INERTIA AND SECTION MODULUS OF THE STEEL SECTION USED IN COMPUTING f_s (TOTAL AND OVERLOAD).

I_c AND S_c ARE THE MOMENT OF INERTIA AND SECTION MODULUS OF THE COMPOSITE SECTION USED IN COMPUTING f_s (TOTAL AND OVERLOAD).

VR IS THE MAXIMUM L_L + IMPACT SHEAR RANGE IN SPAN.

Z IS THE PLASTIC SECTION MODULUS USED TO DETERMINE THE FULLY PLASTIC MOMENTS IN THE NON-COMPOSITE AREAS.
Ma (APPLIED MOMENT) = 1.3 (M_{DL} + M_s $_sD_L$ + 5/3 (ML_L + I))

THE FULLY PLASTIC MOMENT CAPACITY (M_U) IS COMPUTED ACCORDING TO A.A.S.H.T.O. 10.48.1 & 10.50.1.1.

f_s (TOTAL) IS THE SUM OF THE STRESSES DUE TO 1.3 (M_{DL} + M_{sDL} + 5/3 (M_{LL} + I))

f_s (OVERLOAD) IS THE SUM OF THE STRESSES DUE TO M_{DL} + M_{sDL} + 5/3 (M_{LL} + I)

M_{DL} - MOMENT DUE TO DEAD LOADS ON NON-COMPOSITE SECTION.

M_{sDL} - MOMENT DUE TO DEAD LOADS ON COMPOSITE SECTION.

M_{LL} - MOMENT DUE TO LIVE LOAD ON NON-COMPOSITE OR COMPOSITE SECTION.

I - LIVE LOAD IMPACT.

NOTES

1. ALL SPLICE PLATE MATERIAL, EXCEPT FILL PLATES, ARE SUBJECT TO NOTCH TOUGHNESS REQUIREMENTS.
2. ALL W 24 STEEL BEAM SHALL CONFORM TO THE REQUIREMENTS OF A.A.S.H.T.O. M-270 (GRADE 50).
3. THE MAIN LOAD CARRYING MEMBER COMPONENT SUBJECT TO TENSILE STRESS SHALL CONFORM TO THE SUPPLEMENTAL REQUIREMENTS FOR NOTCH TOUGHNESS ZONE 2. THIS COMPONENT IS THE BEAM WIDE FLANGE. NTR DESIGNATES NOTCH TOUGHNESS REQUIREMENTS.
4. TWO HARDENED WASHERS SHALL BE REQUIRED OVER ALL HOLES FOR DIAPHRAGMS.
5. SLOTTED HOLE SIZE = 15/16" X 1½"(VERTICLE). THE SLOTTED HOLE SHALL HAVE 5/16" PLATE WASHER OVER THE HOLE. THE BOLTS FOR THE SLOTTED HOLES SHALL ONLY BE FINGER-TIGHTENED PRIOR TO THE DECK SLAB POURING AND THEN FULLY TIGHTENED AFTER THE COMPLETION OF THE POURING.

TOTAL WEIGHT OF STEEL: 140,100 lbs.

LAST PLOT DATE: 03/06/92
CAD FILENAME: IL-49\STEELDET

REVISED BY	DATE
DRAWN BY	A.S.
CHECKED BY	

ILLINOIS DEPARTMENT OF TRANSPORTATION

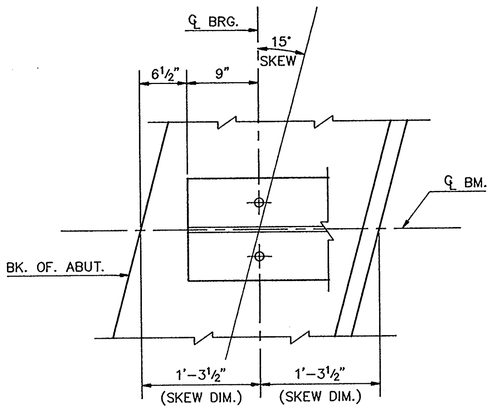
ILLINOIS ROUTE 49
F.A.P. 840 STA. 196+00
STEEL FRAMING PLAN; TABLE OF DESIGN DATA; DETAILS
S.N. 038-0198

SCALE: NONE DATE: 09/03/91

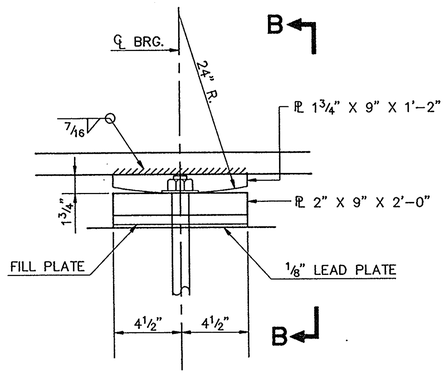
LOUIS BERGER & ASSOCIATES, INC. CHICAGO, IL.

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.P. 840	135 BR	IROQUOIS	27	19
FED. ROAD DIST. NO.	ILLINOIS	PROJECT P-93-062-89		

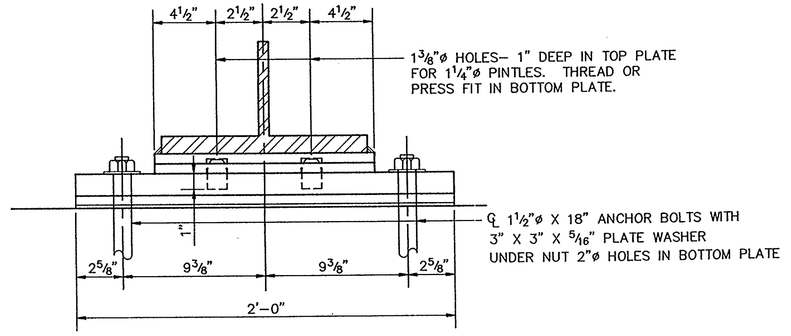
BR SHT. 8 OF 16



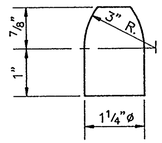
SECTION C - C



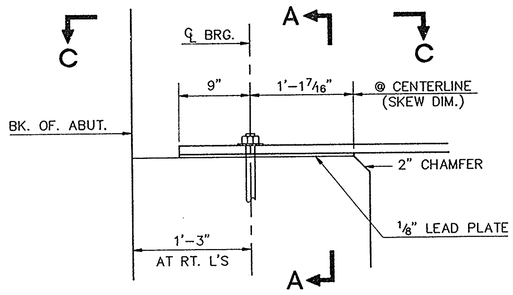
ELEVATION AT PIER



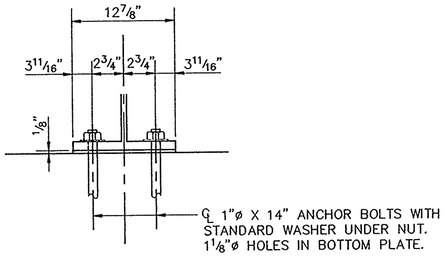
SECTION B - B



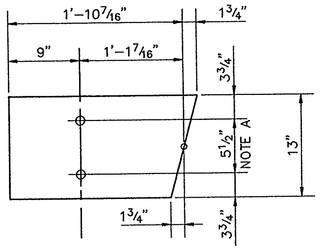
PINTLE



SECTION AT ABUTMENTS



SECTION A - A



PLAN
(⅛" LEAD PLATE)

NOTE A: 1⅛"ø HOLES FOR 1"ø ANCHOR BOLTS AND STANDARD WASHER UNDER NUT.

LAST PLOT DATE: 03/06/92
CAD FILENAME: IL-49\BEARINGS

REVISED	
BY	DATE
DRAWN BY	A.S.
CHECKED BY	

ILLINOIS DEPARTMENT OF TRANSPORTATION

ILLINOIS ROUTE 49
F.A.P. STA. 196+00
BEARING DETAILS
S.N. 038-0198

SCALE: NONE DATE: 09/19/91

LOUIS BERGER & ASSOCIATES, INC. CHICAGO, IL.