

BENCHMARK: R.R. spike set in west side of power pole on east side at Route 88. First pole south of bridge. Elev. 660.20.

EXISTING STRUCTURE: S.N. 006-0088 - Single span reinforced concrete slab supported by closed reinforced concrete abutments. 40' face to face wide and 22' back to back of abutments. Remove in stages. No salvage. The Contractor shall replace the existing structure with a new one consisting of single span steel beams and a 7 1/2" reinforced concrete slab. Traffic shall be maintained at all times by utilizing stage construction.

*104BR-2				
ITEM	SECTION	COUNTY	TOTAL	SHEET
F.A.				
1A-646	*	BUREAU	46	23
STA.	TO STA.			
FILE, ROAD DIST. NO. 7	FILE, ROAD DIST. NO. 7			

SHEET NO. 1
SHEETS 15

GENERAL NOTES

- See Sheet #15 for Boring Data.
- Calculated weight of Structural Steel = AASHTO M270, Grade 50, 51,840 lbs.
AASHTO M270, Grade 36, 3,350 lbs.
- 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. 10B 3/6, Blue.
- Field welding of construction accessories will not be permitted to the bottom flange of beams. Field welding in other areas will be permitted only when approved by the Engineer.
- 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.
- Reinforcement bars shall conform to the requirements of AASHTO M-31, M-42 or M53 Grade 60.
- Layout of slope protection system may be varied in the field to suit ground conditions as directed by the Engineer.
- The Contractor shall drive two concrete test piles in a permanent location at North and South Abutments as directed by the Engineer before ordering the remainder of piles.
- The Contractor shall saw cut the existing abutments at the stage removal line before Stage 1 removal.
- Excavation behind existing abutment wall shall be done before removing the existing Superstructure.

TOTAL BILL OF MATERIAL - BRIDGE

Item	Unit	Super.	Sub.	Total
Removal of Existing Structures	Each	1	1	1
Class X Concrete	Cu. Yds	-	24	24
Class X Concrete Superstructure	Cu. Yds	113.4	-	113.4
Reinforcement Bars, Epoxy Coated	Lbs.	22,140	3,180	25,320
Furnishing Concrete Piles	Lin. Ft.	-	552	552
Driving Concrete Piles	Lin. Ft.	-	552	552
Test Pile Concrete	Each	-	2	2
Furnishing & Erecting Structural Steel	L. Sum	1	-	1
Stud Shear Connectors	Each	1,464	-	1,464
Bridge Deck Grooving	Sq. Yd.	289	-	289
Structure Excavation	Cu. Yds	-	215	215
Porous Granular Embankment	Cu. Yds	-	121	121
Temporary Sheet Piling	Sq. Ft.	-	1,329	1,329
Name Plates	Each	1	-	1
* Protective Coat	Sq. Yds	343	-	343
Filter Fabric for use with Riprap	Sq. Yds	-	840	840
Floor Drains	Each	8	-	8
Stone Riprap, Class A5	Sq. Yds	-	840	840
Channel Excavation	Cu. Yds	-	590	590

* Includes deck surface and top of parapet and inside face of curb and parapet.

WATERWAY INFORMATION

Drainage Area = 5.5 sq. mi. Low Grade Elev. = 662.26 @ St. 1268+00									
Flood	Freq. Yr.	Q. C.F.S.	Opening Sq. Ft. Exist.	Prop.	Nat. H.W.E.	Head-ft. Exist.	Prop.	Headwater Elev. Exist.	Prop.
Design	50	1,770	210	370	656.5	0.7	0.1	657.2	656.6
Base	100	2,030	215	390	656.8	1.0	0.2	657.8	657.0
Overtopping									
Max. Calc.	150	2,655	225	420	657.4	2.0	0.5	659.4	657.9

GENERAL PLAN AND ELEVATION
F.A. 646 ROUTE 88 OVER DITCH #4
SECTION 104BR-2
STRUCTURE #006-0157
STATION 1266+75.50
BUREAU COUNTY

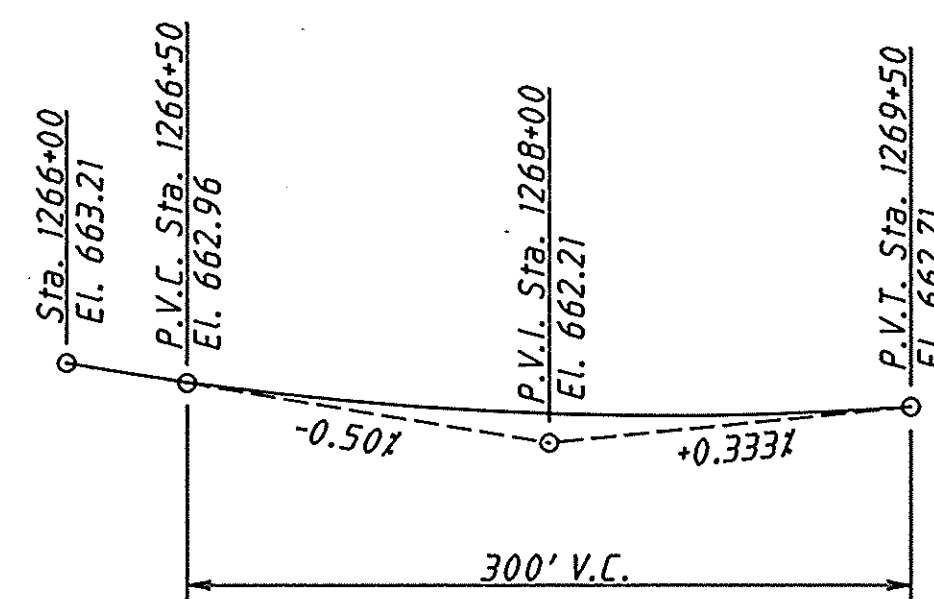
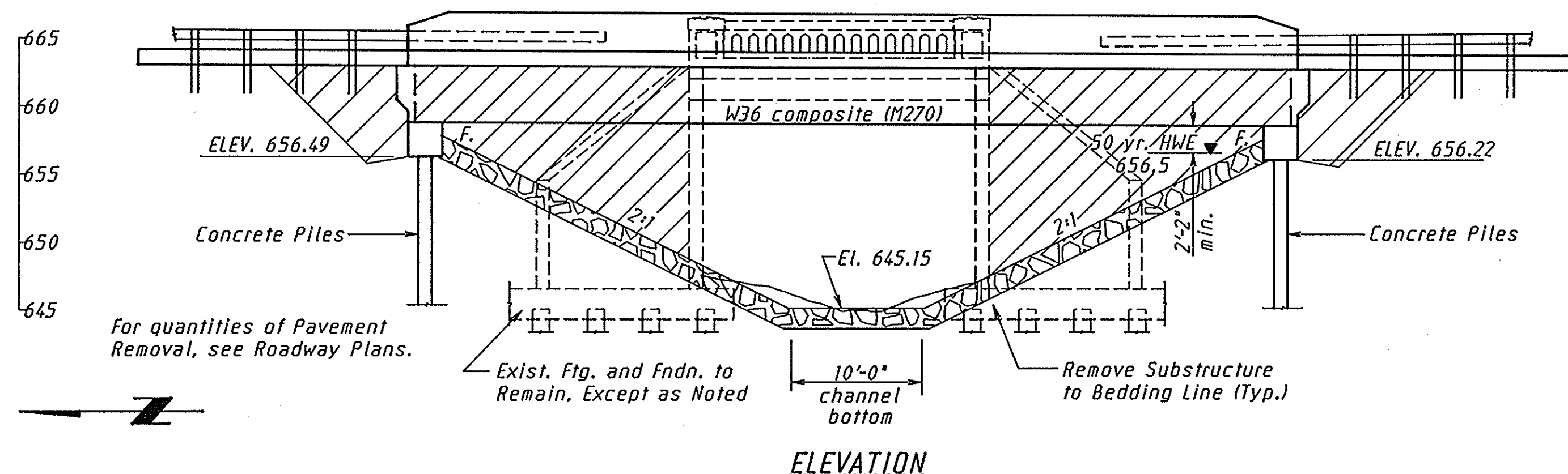


Larry L. Viley
LARRY L. VILEY
ILL. REG. S.E. NO. 4056
DATE: 7/14/92

APPROVED
FOR STRUCTURAL ADEQUACY ONLY
Ralph E. Anderson
Engineer of Bridges and Structures

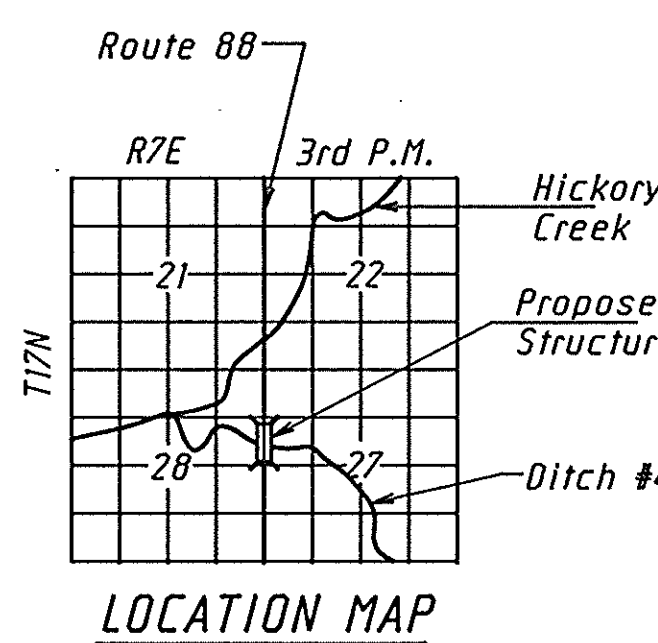
REVISIONS		DATE	BY	CHECKED	DESIGNED	SURVEYED
NO.	DESCRIPTION					
1	APRIL 1992					
2	591-5507-5101					

Environmental Science & Engineering, Inc.
8901 NORTH INDUSTRIAL RD., PEORIA, IL 61615-1589
PHONE (309) 693-5694

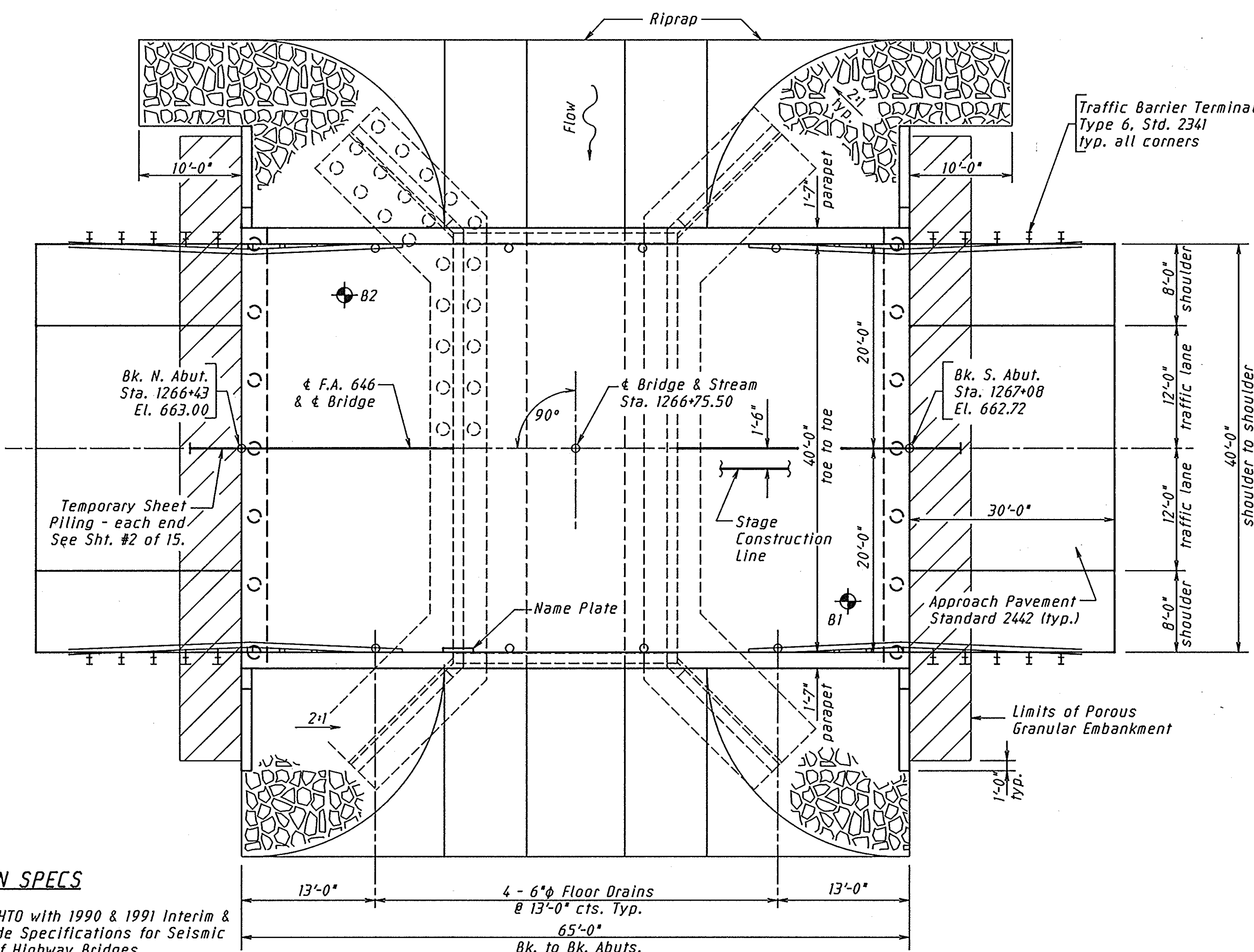


PROFILE GRADE

STATION 1266+75.50
BUILT 199
BY STATE OF ILLINOIS
F.A. RTE. 88 SEC. 104BR-2
LOADING HS20
STR. NO. 006-0157
LETTERING FOR NAME PLATE
See I.D.O.T. Std. 2113



LOCATION MAP



PLAN

DESIGN SPECS

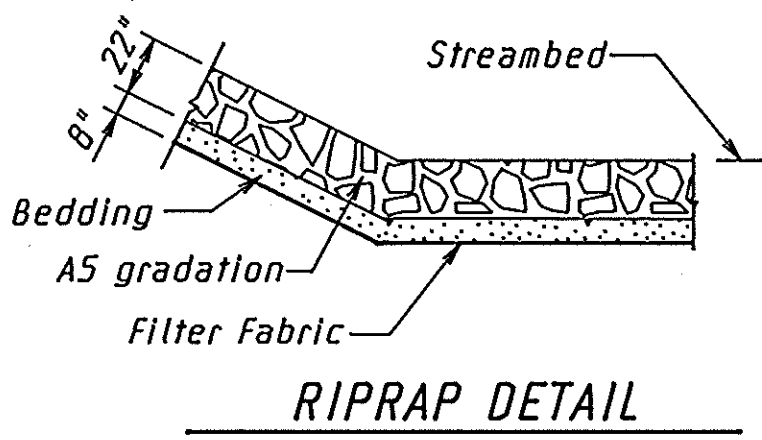
1989 AASHTO with 1990 & 1991 Interim & 1983 Guide Specifications for Seismic Design of Highway Bridges.

DESIGN LOADING:

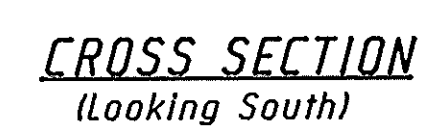
HS 20-44 Allow 25#/sq. ft. for Future Wearing Surface

DESIGN STRESSES:

$f'_c = 3,500$ psi
 $f_y = 60,000$ psi (reinf.)
 $f_y = 50,000$ psi (struct.) AASHTO M270 Gr. 50
 $f_y = 36,000$ psi AASHTO M270 Gr. 36

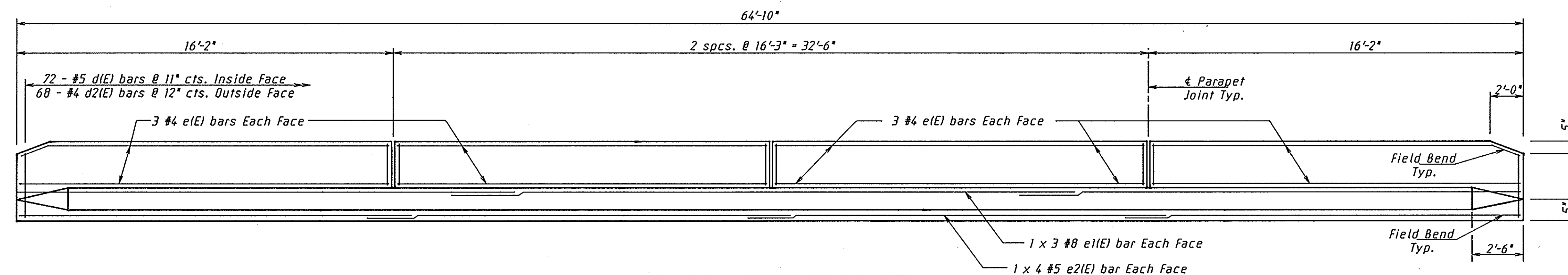


RIPRAP DETAIL



DECK PLAN AND CROSS SECTION
F.A. 646 ROUTE 88 OVER DITCH #4
SECTION 104BR-2
STRUCTURE #006-0157
STATION 1266+75.50
BUREAU COUNTY

REVISTIONS		Environmental Science & Engineering, Inc.	SURVEYED	DLH
ORG. NO.		8901 NORTH INDUSTRIAL RD., PEORIA, IL.	DRAWN	TLS
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		PHONE (309)693-5694	CHECKED	DOB

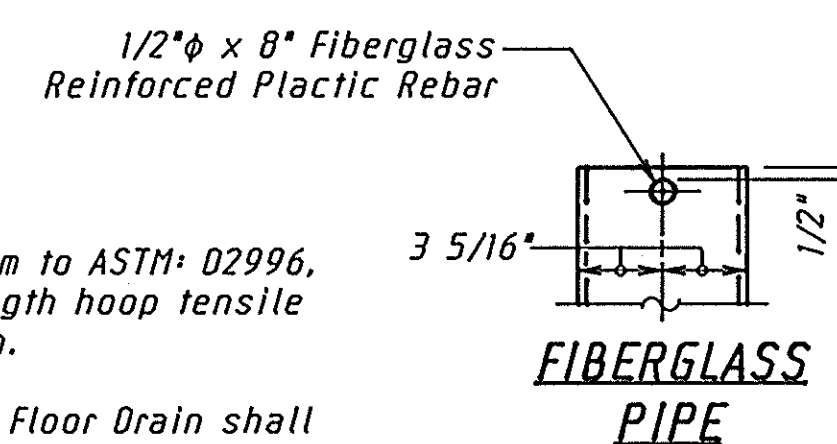


INSIDE ELEVATION OF PARAPET
Minimum bar laps in parapet: #5 = 1'-8", #8 = 4'-6"

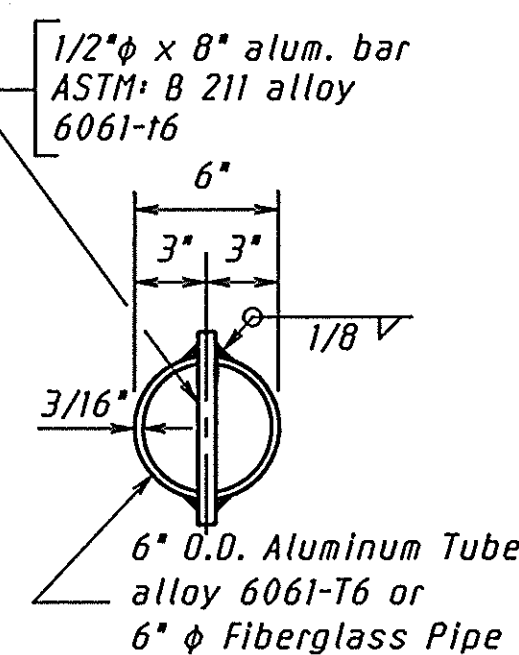
NOTE

Fiberglass pipe shall conform to ASTM: D2996, with short term rupture strength hoop tensile stress of 30,000 psi minimum.

The exterior surfaces of the Floor Drain shall be painted with the vinyl enamel coat painting specified for Structural Steel. The exterior surfaces of the Aluminum tube shall be cleaned and given a washcoat pretreatment in accordance with Steel Structures Painting Council's Spec. SSPC-SP1 & SSPC- Paint 27 prior to painting. Fiberglass to have prewash as per MIL-P-15328.

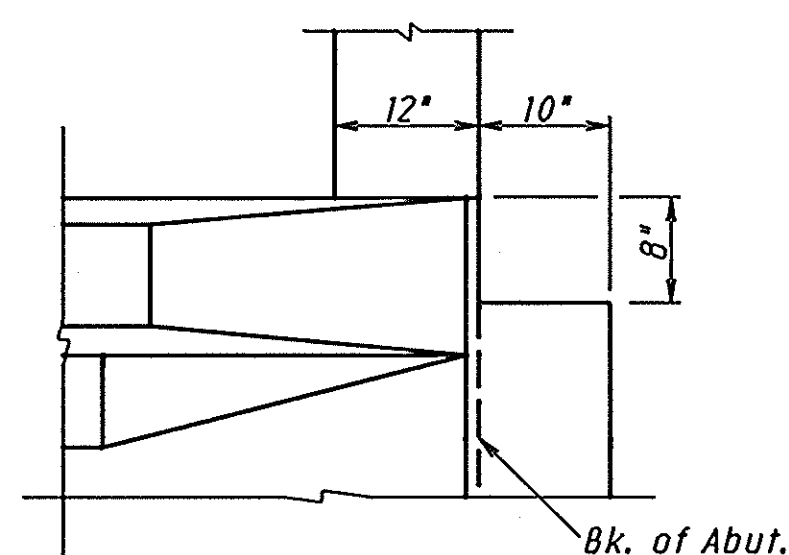


FIBERGLASS
PIPE

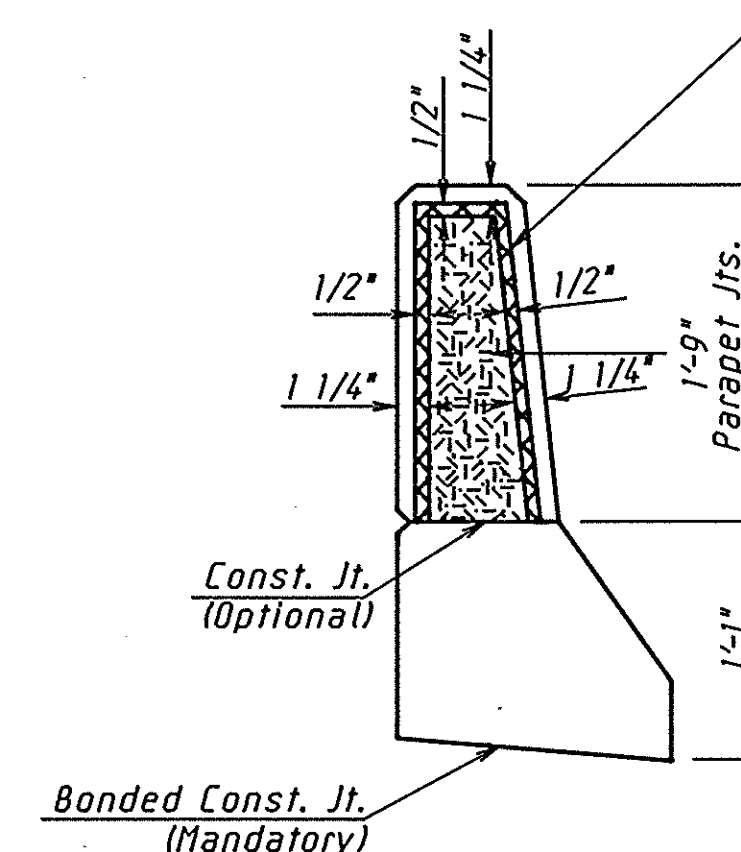


TOP PLAN

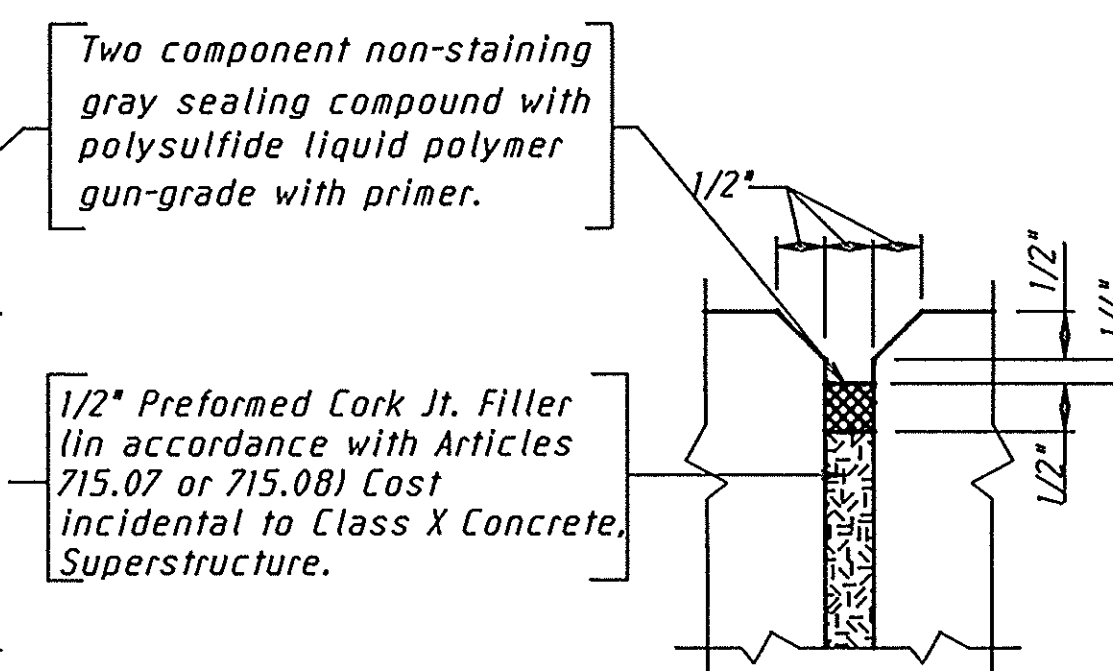
(Showing Aluminum Tube)



VIEW E-E
AT CORBEL ENDS



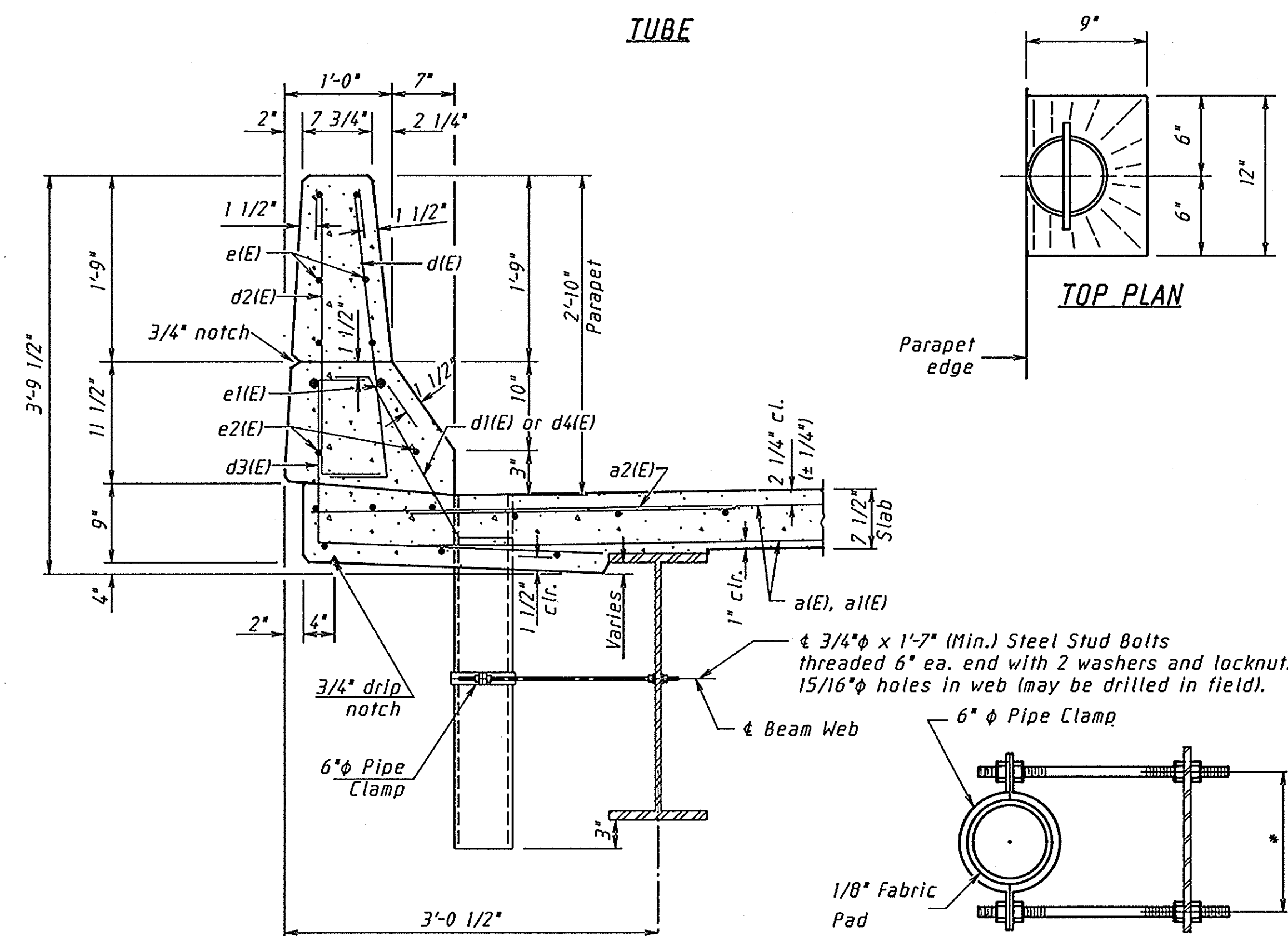
PARAPET JOINT DETAILS



SUPERSTRUCTURE
BILL OF MATERIAL

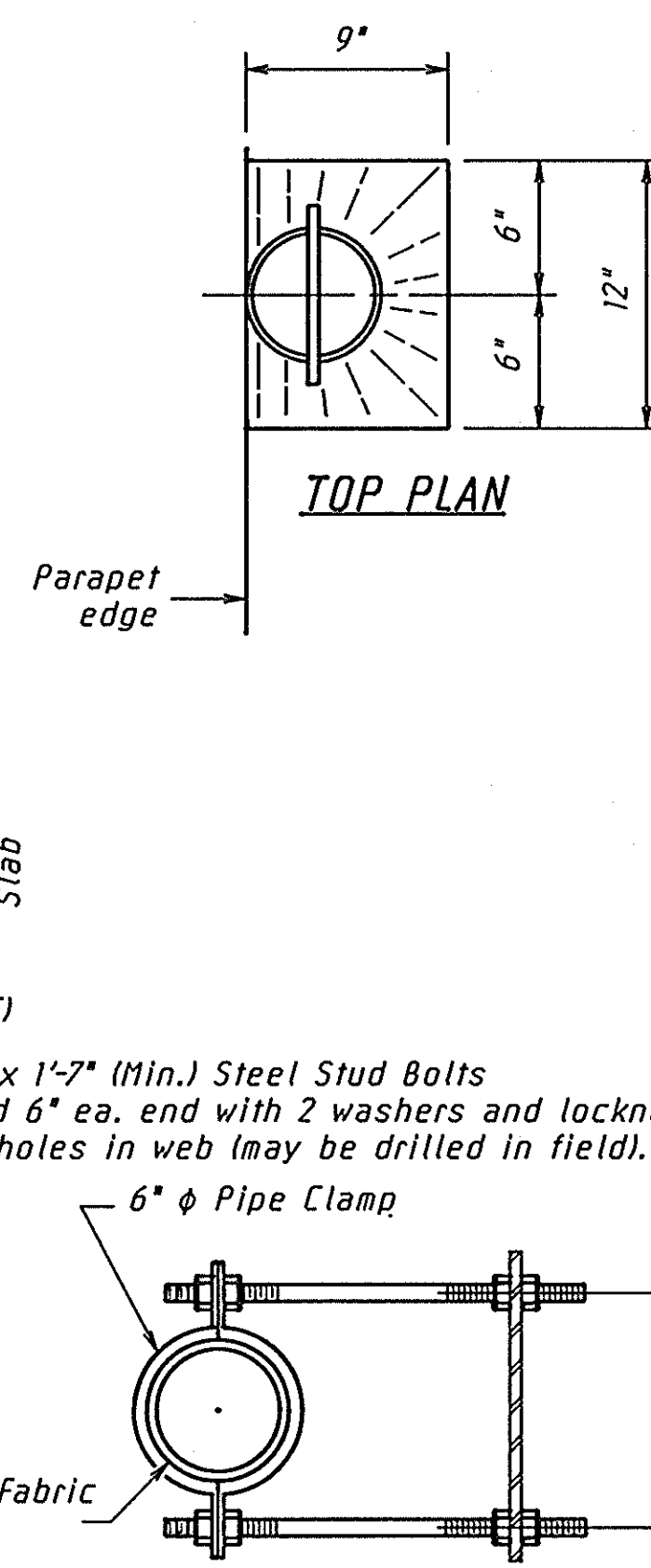
Bar	No.	Size	Length	Shape
a1(E)	222	#5	21'-9"	—
a1(E)	222	#5	18'-0"	—
a2(E)	130	#6	4'-0"	—
b1(E)	135	#5	22'-7"	—
b1(E)	164	#5	17'-5"	—
d1(E)	144	#5	3'-0"	┘
d1(E)	132	#5	2'-7"	┘
d2(E)	136	#4	3'-0"	┘
d3(E)	136	#4	3'-11"	┘
d4(E)	12	#5	2'-4"	┘
e1(E)	48	#4	15'-10"	—
e1(E)	12	#8	24'-6"	—
e2(E)	16	#5	17'-5"	—
m1(E)	4	#5	22'-11"	—
m1(E)	4	#5	19'-9"	—
m2(E)	4	#6	2'-8"	—
m3(E)	8	#6	7'-0"	—
m4(E)	10	#6	19'-9"	—
m5(E)	10	#6	22'-11"	—
m6(E)	2	#6	4'-10"	—
m7(E)	2	#6	1'-10"	—
m8(E)	4	#6	19'-1"	—
m9(E)	4	#6	22'-3"	—
s1(E)	82	#5	9'-1"	┘
s1(E)	82	#5	5'-3"	┘
v5(E)	86	#5	4'-0"	┘
Reinforcement Bars, Epoxy Coated			Lbs.	22,140
Class X Concrete Superstructure			Cu. Yds.	113.4

Reinforcement bars designated (E) shall be epoxy coated.
Bars indicated thus 20 x 3 - #5 etc. indicates 20 lines of bars with 3 lengths per line.



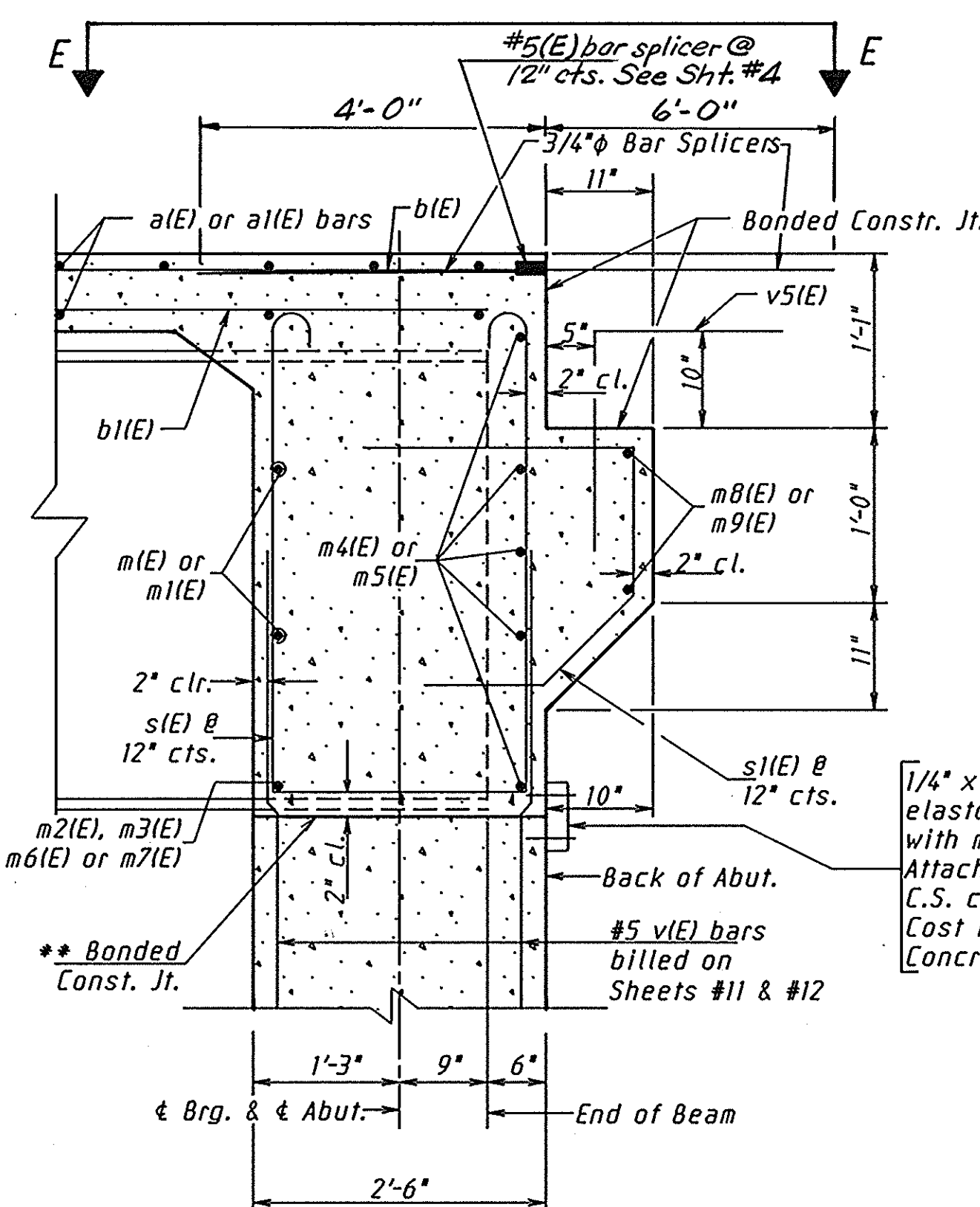
SECTION THRU PARAPET

The surface of the Fiberglass pipe shall be free of bond inhibiting agents.



SECTION A-A

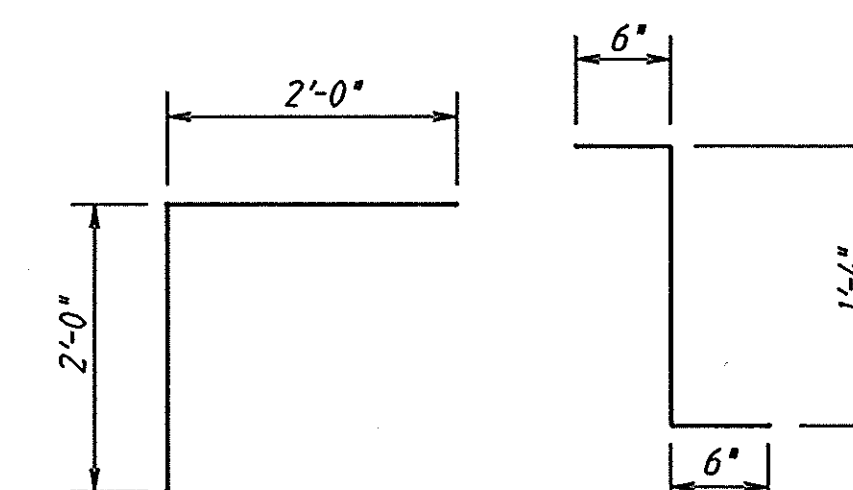
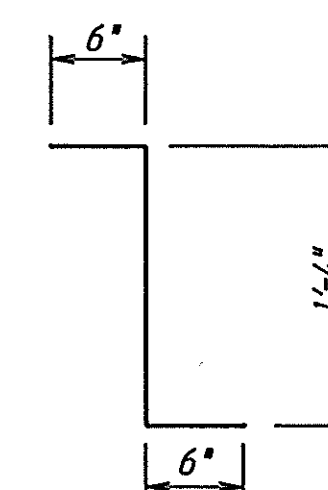
* Dimension as required
by Pipe Clamp



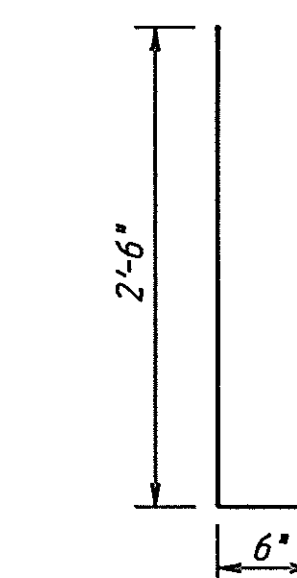
SEC. A-A
AT ABUT.(INTEGRAL)

NOTE: Reinforcement bars and Class X Concrete
are billed with superstructure on Sheet #6

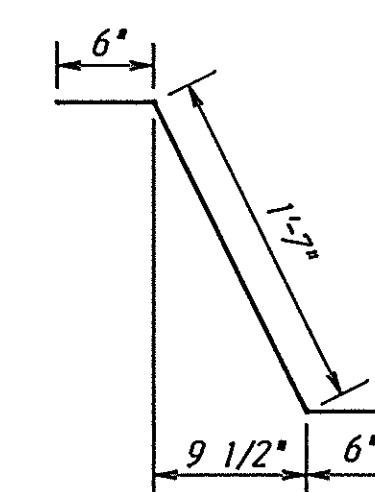
**** Bonded Construction Joint in accordance with Article 504.13(a)(2) of Std. Specs.**

Bar v5(E)

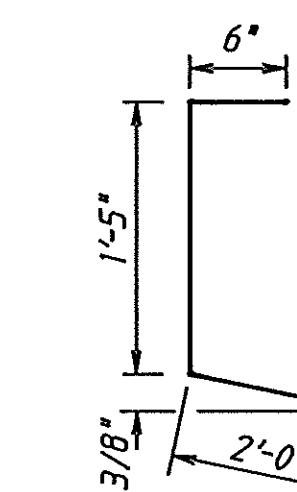
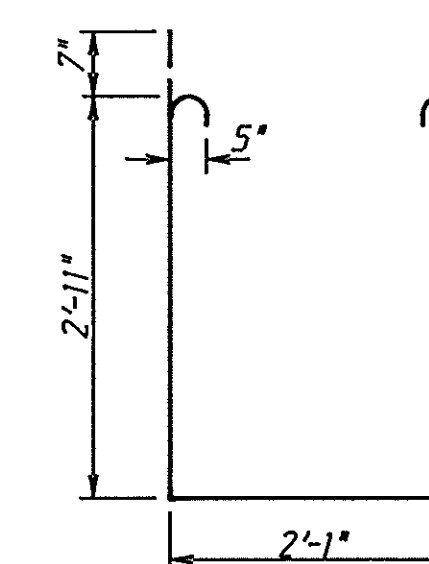
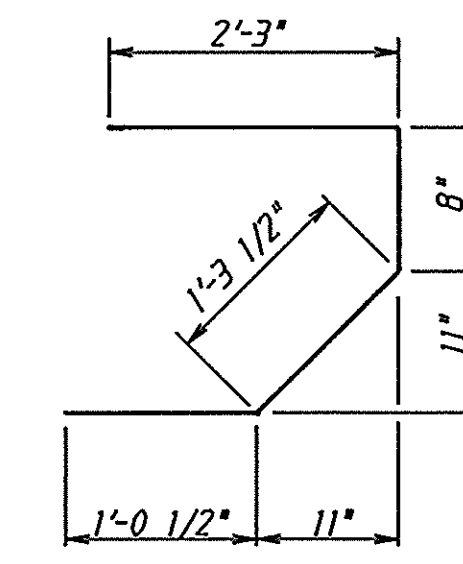
Bar d4(E)



Bar $d(E)$ & $d_2(E)$



Bar d1(E)

Bar d3(E)Bar s(E)

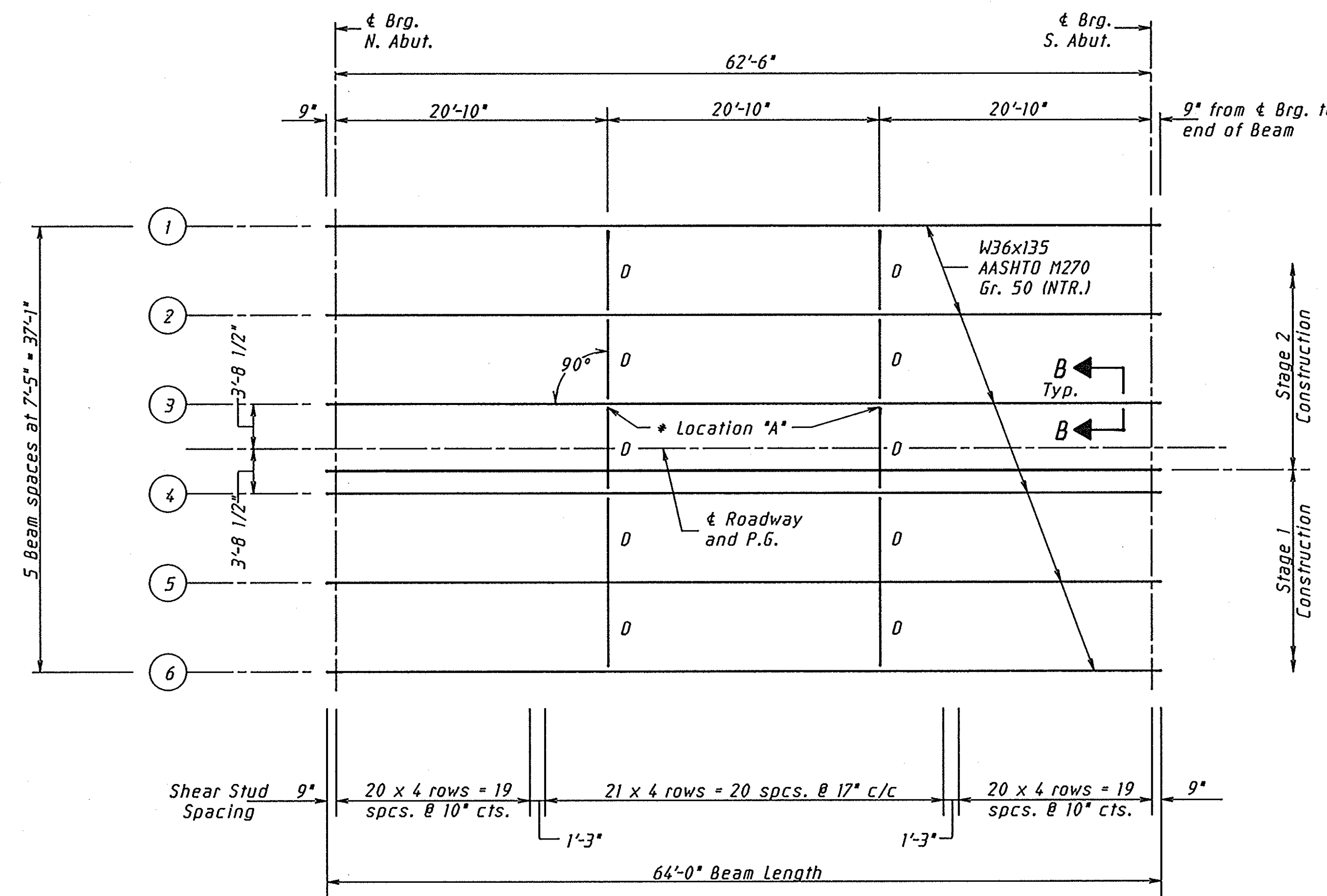
Bar $sl(E)$

PARAPET AND SUPERSTRUCTURE DETAILS
F.A. 646 ROUTE 88 OVER DITCH #4
SECTION 104BR-2
STRUCTURE #006-0157
STATION 1266+75.50
BUREAU COUNTY

REVIEWS		Environmental Science & Engineering, Inc.	SURVEYED	DLR
ORG. NO.			DRAWN	TLS
DATE		April 1992	CHECKED	CAF
JOB NO.		591-5507-5101	DESIGNED	CAF
			CHECKED	DDL

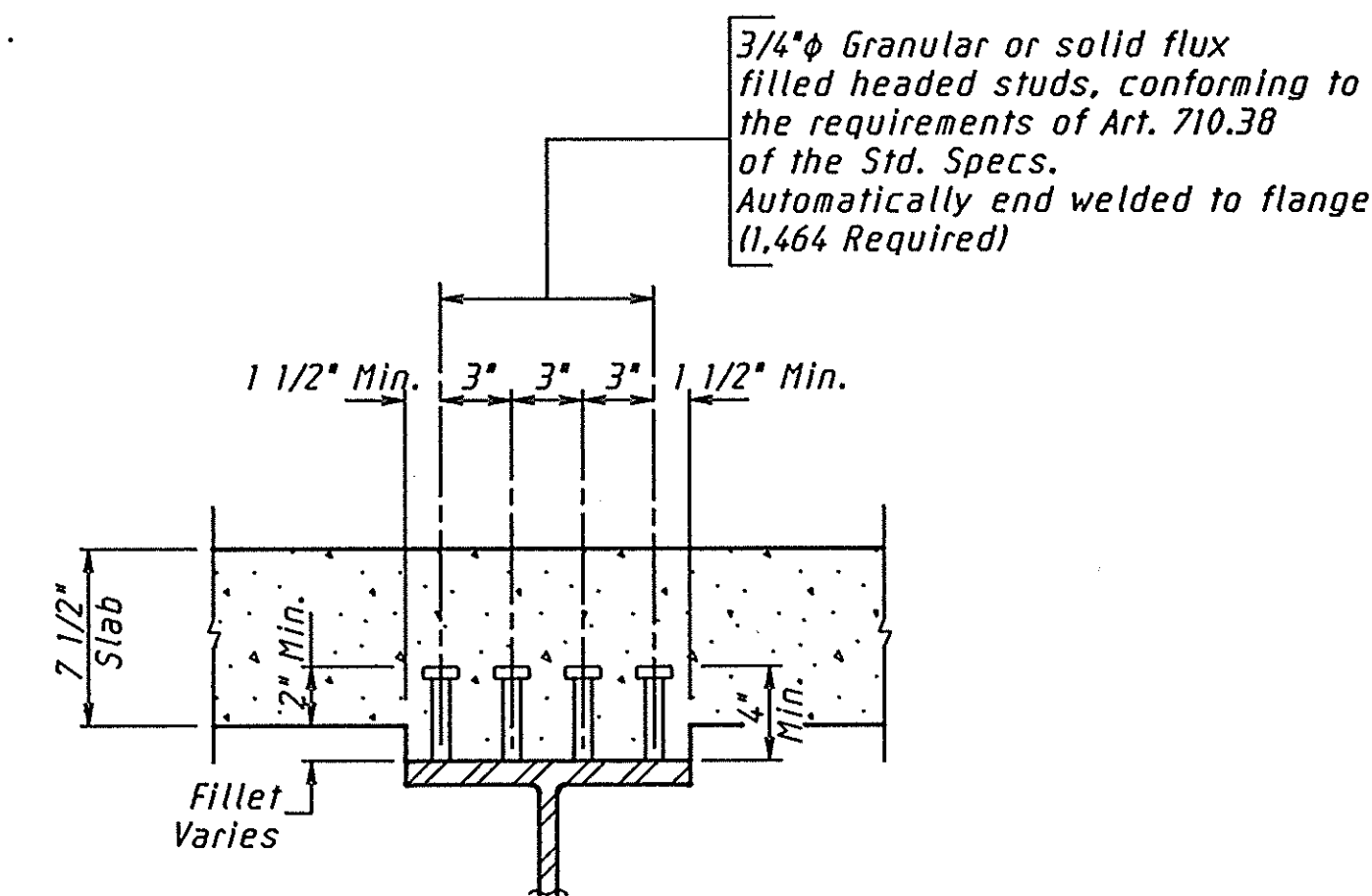
*104BR-2				
REVISION	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1	*	BUREAU	46	29
F.A. 646		TO STA.		
STA.		REV. AND PROJECT		

SHEET NO. 7
SHEETS 15

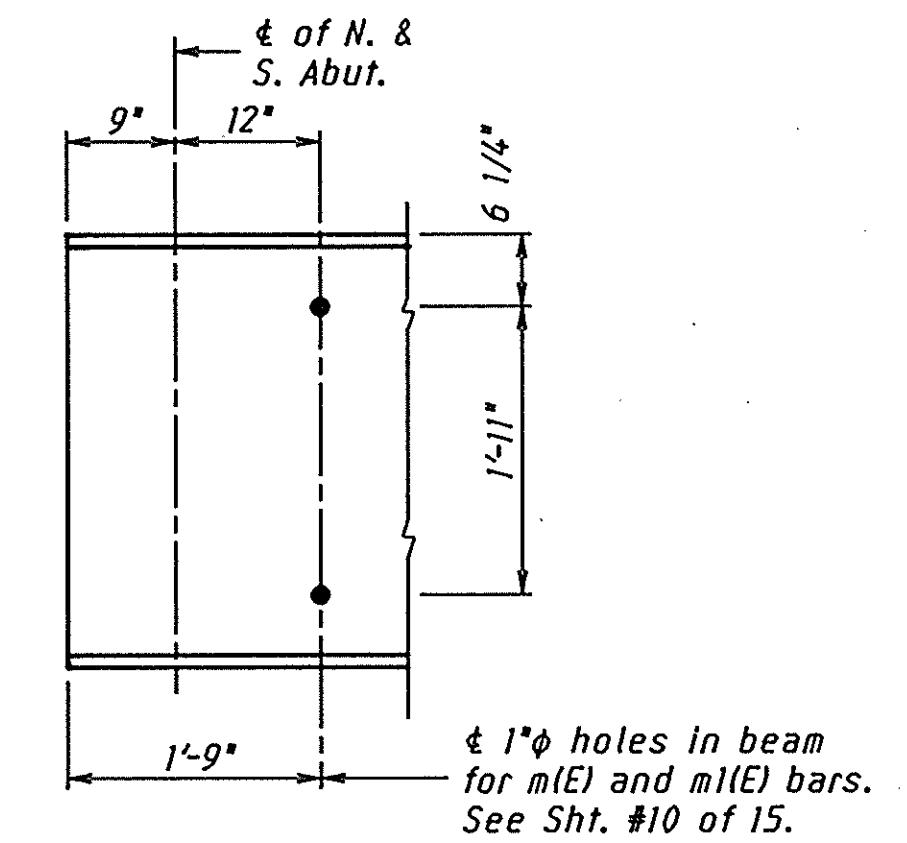


FRAMING PLAN

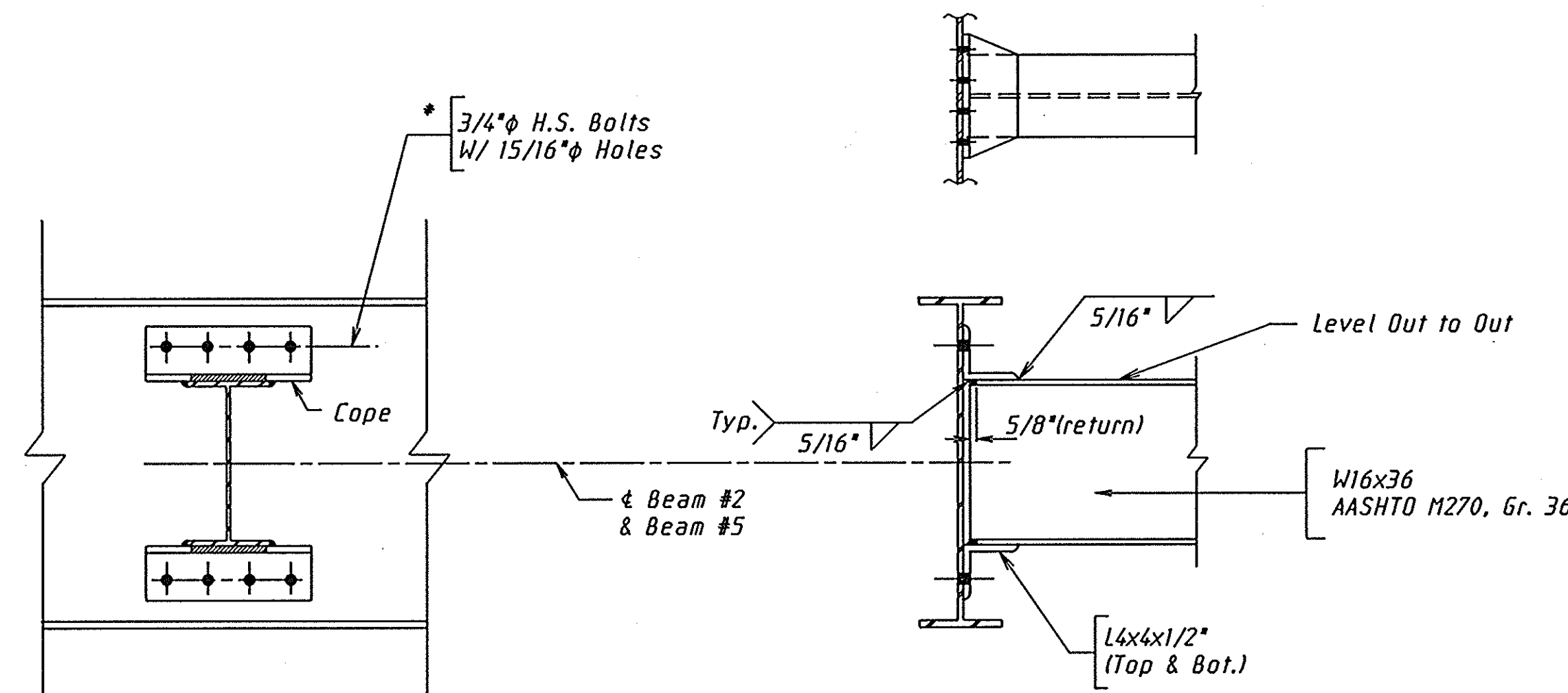
Note: NTR denotes Notch Toughness Requirements



SECTION B-B



END OF BEAM ELEVATION



DIAPHRAGM D

Note: Two hardened washers shall be required for all 15/16" holes for diaphragms.

Top of Beam Elevations *						
	Beam 1	Beam 2	Beam 3	Beam 4	Beam 5	Beam 6
± Brg. S. Abut.	661.693	661.843	661.953	661.953	661.843	661.693
± Brg. N. Abut.	661.963	662.113	662.233	662.233	662.113	661.963

* For Fabrication Only

* Use 13/16" x 1 1/2" slotted holes in angle 4 x 4 x 1/2 at Location 'A' only. Provide 5/16" plate washers for slotted holes. Bolts shall be finger-tightened prior to the deck pour for Stage 2 Construction. Tighten bolts after deck is poured.

STRUCTURAL STEEL DETAILS
F.A. 646 ROUTE 88 OVER DITCH #4
SECTION 104BR-2
STRUCTURE #006-0157
STATION 1266+75.50
BUREAU COUNTY

REVISIONS		DESIGNED		CHECKED		SURVEYED	
DATE	APRIL 1992	DESIGNED	CAM	CHECKED	CAM	DESIGNED	DLH
JOB NO.	591-5507-5101	DESIGNED	CAM	CHECKED	CAM	DESIGNED	DLH

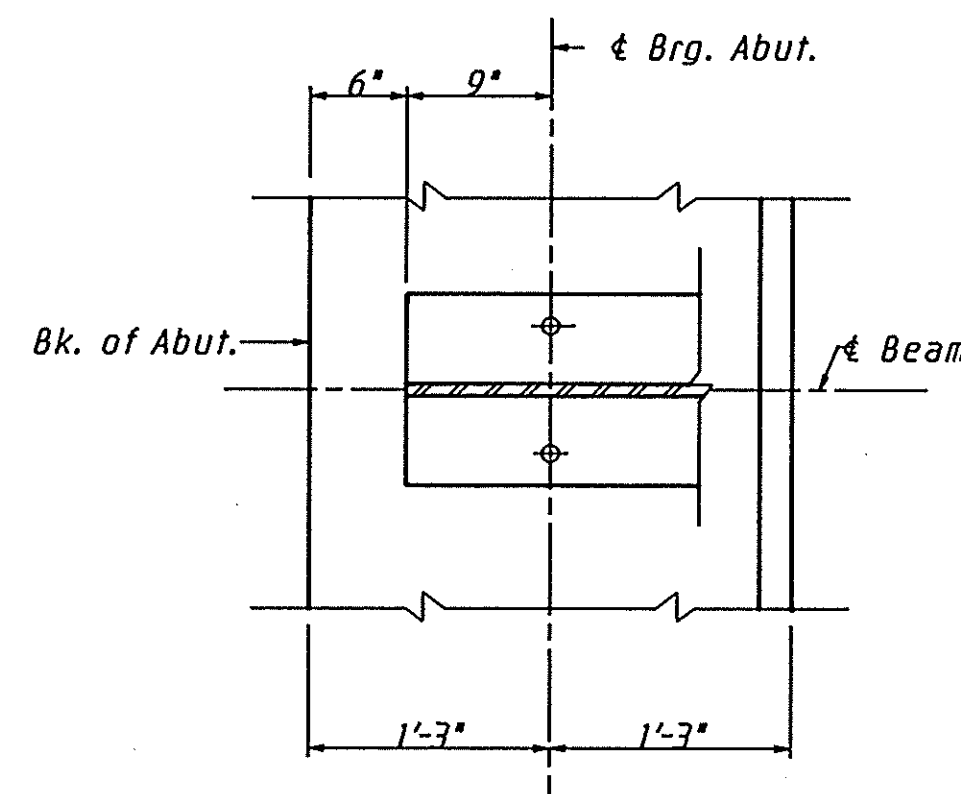


Environmental
Science &
Engineering, Inc.
8901 NORTH INDUSTRIAL RD., PEORIA, IL
61615-1589 PHONE (309) 693-5694

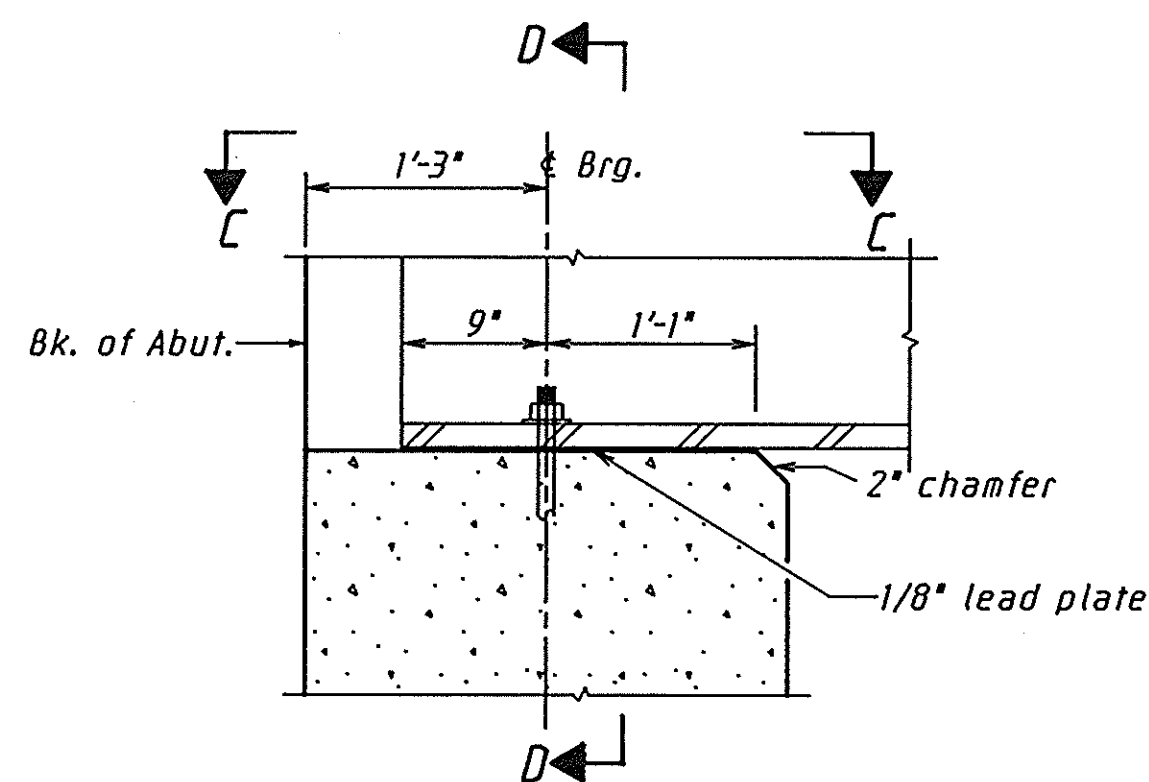
*104BR-2				
REVISION	SECTION	COPY	TOTAL	SHEET
NO. 1	*	BUREAU	46	30
DATE	TO STA.			
PER. DRAW. NO. 7	REVISION	PER. AND PROJECT		

SHEET
NO. 8

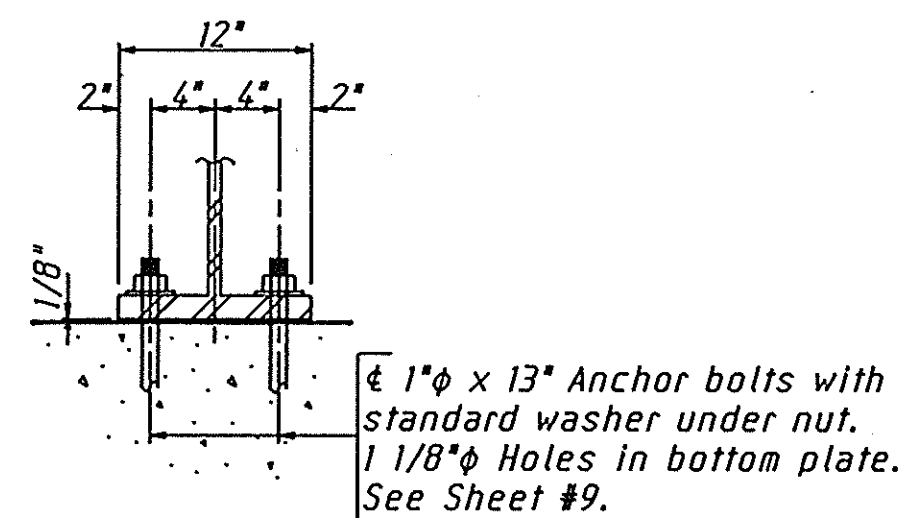
SHEETS 15



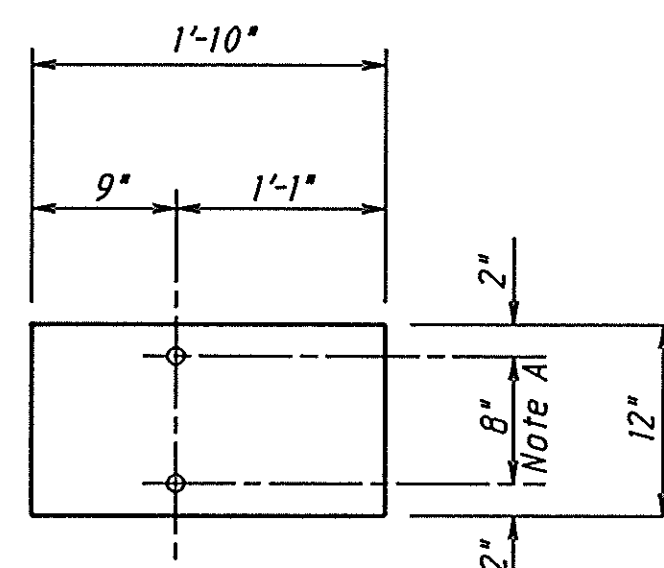
SECTION C-C



SECTION AT ABUTMENTS



SECTION D-D

PLAN
(1/8" Lead Plate)

Note A: 1 1/8" Holes for 1" Anchor Bolts and standard washer under nut. Lead plates shall be incidental to cost of "Furnishing & Erecting Structural Steel."

INTERIOR GIRDER MOMENT TABLE		0.5 Sp. #1
I_s	(in ⁴)	7800
I_c	(in ⁴)	20,102.7
S_s	(in ³)	439
S_c	(in ³)	632.2
Z	(in ³)	509
P	(K/ft.)	0.855
M_L^D	(K)	417.5
s_L^D	(K/ft.)	0.321
M_s^D	(K)	156.7
M_L^I	(K)	574.6
M^I	(K)	153.4
$\frac{1}{2}(M_L^I + I)$	(K)	1213.3
M_a	(K)	2323.75
M_u	(K/ft.)	3603.6
f_s (non-comp) (k.s.i.)		11.41
f_s (comp) (k.s.i.)		3.27
f_s (I + I) (k.s.i.)		23.03
f_s (Overload) (k.s.i.)		37.71
VR	(K)	58.50

INTERIOR GIRDER REACTION TABLE		Abuts.
R_L^D	(K)	36.75
R_L^I	(K)	46.17
Impact	(K)	12.33
R (Total)	(K)	95.25

NOTES

1. I_s and S_s are the moment of inertia and section modulus of the steel section used in computing f_s (Overload).
2. I_c and S_c are the moment of inertia and section modulus of the composite section used in computing f_s (Overload).
3. VR is the maximum Live Load + Impact shear range in span.
4. M_a (Applied Moment) = $1.3M_L^D + M_s^D + \frac{1}{2}(M_L^I + I)$.
5. M_u is the Full Plastic Moment Capacity for the Compact Braced section.
6. f_s (Overload) is the sum of the stresses due to $M_L^D + M_s^D + \frac{1}{2}(M_L^I + I)$.
7. M_L^D - Moment due to dead loads on non-composite section.
8. M_s^D - Moment due to dead loads on composite section.
9. M_L^I - Moment due to live loads on non-composite or composite section.
10. I - Live load impact.
11. Z is the fully plastic section modulus used to determine the fully plastic moments in the non-composite areas.
12. The fully plastic moment capacity (M_u) is computed according to AASHTO 10.48.1 to 10.50.1.1.

BEARING DETAILS
F.A. 646 ROUTE 88 OVER DITCH #4
SECTION 104BR-2
STRUCTURE #006-0157
STATION 1266+75.50
BUREAU COUNTY

REVISIONS					
DRG. NO.					
DATE	APRIL 1992				
JOB NO.	591-5507-5101				
Environmental Science & Engineering, Inc.		SURVEYED DLW			
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PHONE (309) 693-5694		DESIGNED CAH			
		CHECKED DDB			