



04-26-2019 LETTING ITEM 123

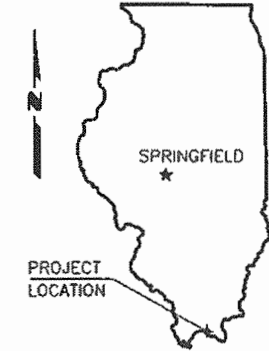
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

**SURFACE TRANSPORTATION PROGRAM
ON SYSTEM BRIDGE**

FAS ROUTE 937 (PORTLAND ROAD)
SECTION 16-00096-00-BR
PROJECT NO. G3U3(016)
JOB NO. C-99-503-17
UNNAMED CREEK

MASSAC COUNTY

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 937	16-00096-00-BR	MASSAC	11	1
PROJECT NO. G3U3(016)			CONTRACT NO. 99607	



SUMMARY OF QUANTITIES

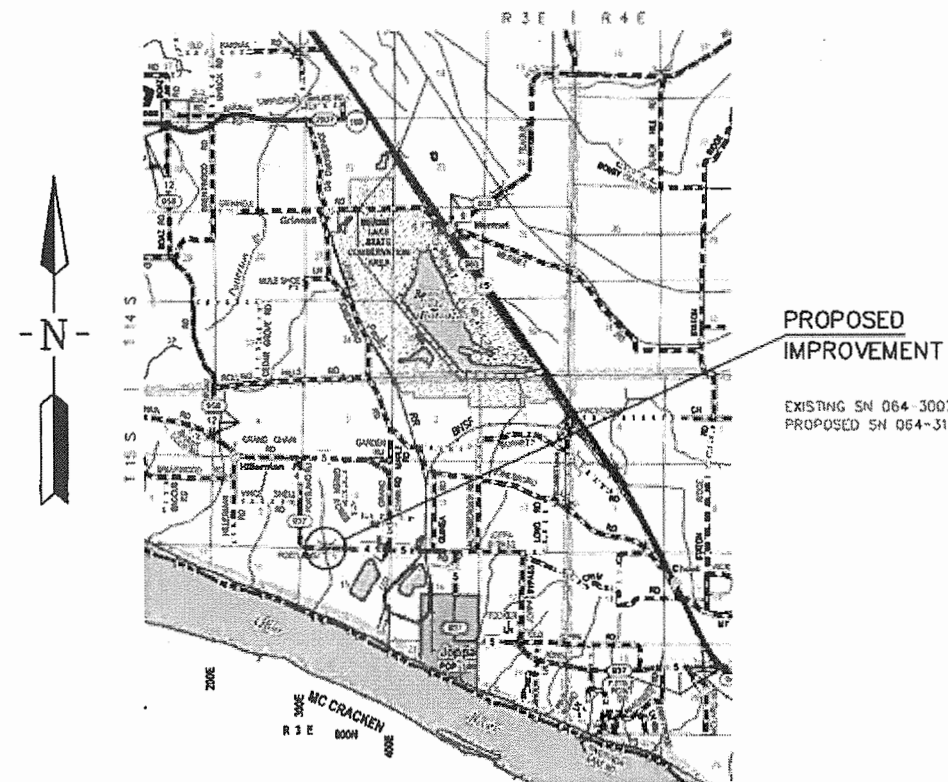
CODE NO.	PAY ITEM	UNIT	TOTAL
• X2501000	SEEDING, CLASS 2 (SPECIAL)	ACRE	0.2
• X6333500	TRAFFIC BARRIER TERMINAL REMOVAL	EACH	8
• 20033700	LONGITUDINAL JOINT SEALANT	FOOT	212
20200100	EARTH EXCAVATION	CU YD	39
• 20300100	CHANNEL EXCAVATION	CU YD	101
• 28100807	STONE DUMPED RIPRAP, CLASS A4	TON	227
40600290	BITUMINOUS MATERIALS (TACK COAT)	POUND	246
• 40603320	HOT-MIX ASPHALT SURFACE COURSE, MIX "C", N90	TON	48
44000155	HOT-MIX ASPHALT SURFACE REMOVAL, 1 1/2"	SQ YD	518
44200065	PAVEMENT PATCHING, TYPE II, 6 INCH	SQ YD	10
48101200	AGGREGATE SHOULDERS, TYPE B	TON	121
50100100	REMOVAL OF EXISTING STRUCTURES	EACH	1
50200100	STRUCTURE EXCAVATION	CU YD	91
50300225	CONCRETE STRUCTURES	CU YD	27.4
50300280	CONCRETE ENCASEMENT	CU YD	2.7
50400405	PRECAST PRESTRESSED CONCRETE DECK BEAMS (21" DEPTH)	SQ FT	1,204
50800105	REINFORCEMENT BARS	POUND	3,122
△ 50900205	STEEL RAILING, TYPE S1	FOOT	90
51201400	FURNISHING STEEL PILES HP10X42	FOOT	696
51202305	DRIVING PILES	FOOT	696
51500100	NAME PLATES	EACH	1
• 59300100	CONTROLLED LOW-STRENGTH MATERIAL	CU YD	20
△ 63000001	STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS	FOOT	225
△ 63100075	TRAFFIC BARRIER TERMINAL, TYPE 5A	EACH	2
△ 63100167	TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT	EACH	2
67100100	MOBILIZATION	L SUM	1
△ 72501000	TERMINAL MARKER - DIRECT APPLIED	EACH	4
△ 78001110	PAINT PAVEMENT MARKING - LINE 4"	FOOT	1,340

• SEE SPECIAL PROVISIONS
△ SPECIALTY ITEMS

INDEX OF SHEETS

- COVER SHEET
- PLAN & PROFILE
- GENERAL PLAN & ELEVATION
- 21" X 48" PPC DECK BEAMS
- 21" X 48" PPC DECK BEAM DETAILS
- ABUTMENT
- STEEL RAILING, TYPE S-1
- NAME PLATE
- PILING DETAILS
- CROSS SECTIONS
- STANDARDS: 000001-07 STD SYMBOLS, ABBREVIATIONS & PATTERNS
280001-07 TEMPORARY EROSION CONTROL SYSTEMS
630001-12 STEEL PLATE BEAM GUARDRAIL
630301-09 SHLDR WIDENING FOR TY 1 (SP) TERMINALS
701901-08 TRAFFIC CONTROL DEVICES
725001-01 OBJECT AND TERMINAL MARKERS
780001-05 TYPICAL PAVEMENT MARKINGS
BLR 21-9 TYP APPLICATION OF TRAF CONTR DEVICES
BLR 27-1 TRAFFIC BARRIER TERMINAL, TYPE 5A

CLASSIFICATION : MINOR COLLECTOR
ADT : 450
DESIGN SPEED : 50 MPH



LOCATION MAP

SCALE: 1" = 2 MILES

NET LENGTH OF IMPROVEMENT = 450.00 FT. = 0.0852 MILES

CONTRACT NO. 99607



Kevin Phillips
Kevin Phillips
PROFESSIONAL ENGINEER
#062-047293
EXP. RES NOV. 30, 2019

Round Table Design, Inc.
PROFESSIONAL ENGINEERING - LAND SURVEYING
1457 HIGHWAY 145 S HARRISBURG, IL (618) 253-6017

ILLINOIS DEPARTMENT OF TRANSPORTATION	
Approved	<i>November 28, 2018</i> <i>Joseph E. Matamoros</i> Massac County Engineer
Passed	<i>January 30, 2019</i> <i>[Signature]</i> District 9 Engineer of Local Roads and Streets
Releasing for Bid Based on Limited Review	<i>January 30, 2019</i> <i>Keith Roberts</i> Keith Roberts, P.E. Acting Region Five Engineer <i>JRS</i>

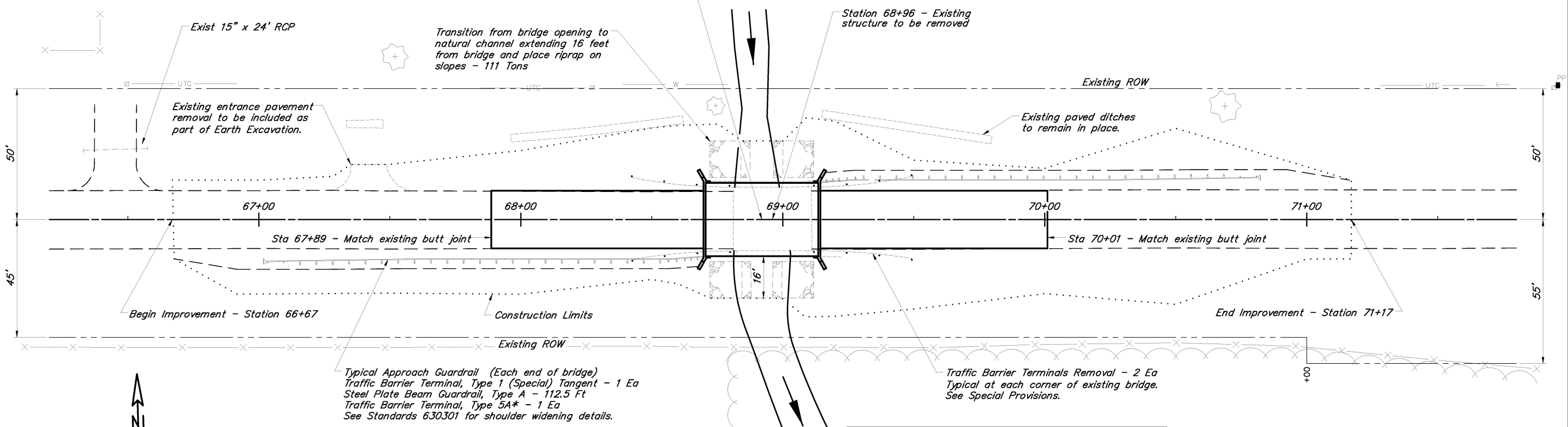
2170650 Cover 01/24/19 1051 RLM

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 937	16-00096-00-BR	MASSAC	11	2
PROJECT NO. G3U3(016)			CONTRACT NO. 99607	

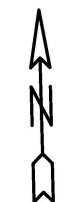
Existing Structure - Single span precast concrete channel beams on concrete abutment caps with timber piling. 24.6' W x 32.0' L

Station 68+92 - Single span, precast prestress concrete deck beam bridge 44'-7" bk-bk Abutments

Station 68+96 - Existing structure to be removed



SCALES:
1" = 40' HOR
1" = 10' VER



Typical Approach Guardrail (Each end of bridge)
Traffic Barrier Terminal, Type 1 (Special) Tangent - 1 Ea
Steel Plate Beam Guardrail, Type A - 112.5 Ft
Traffic Barrier Terminal, Type 5A* - 1 Ea
See Standards 630301 for shoulder widening details.

Traffic Barrier Terminals Removal - 2 Ea
Typical at each corner of existing bridge.
See Special Provisions.

* Note: All Traffic Barrier Terminal, Type 5 shall be flared 1 Ft. over length of terminal to allow Guard Rail to be placed 4 Ft from edge of pavement.

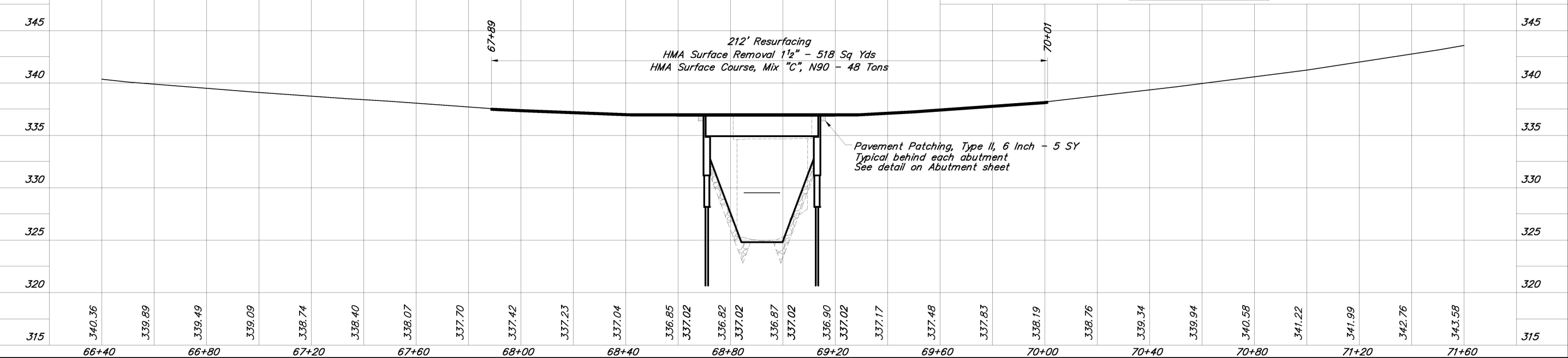
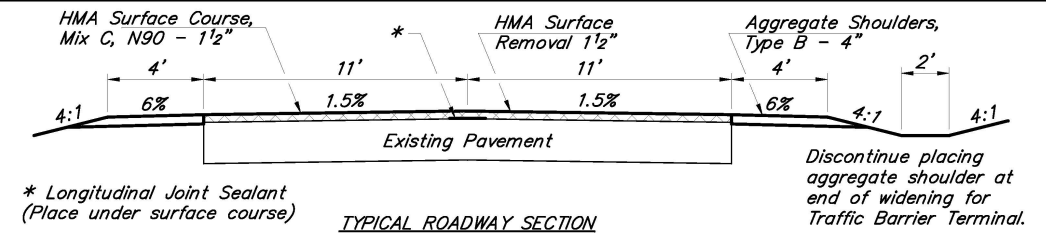
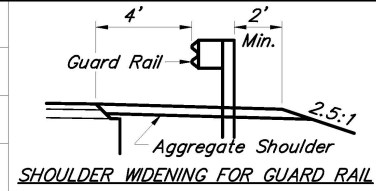
Paint Pavement Marking - Line 4" (Ft.)

Location	Centerline (Yellow Dashed)	Edge Line (White Solid)	No Passing (Yellow Solid)
Sta 66+67 to Sta 71+17	110	900	330

No Passing Zone - East bound lane from Sta 67+87 to Sta 71+17.
See Standard 780001 for typical pavement markings.

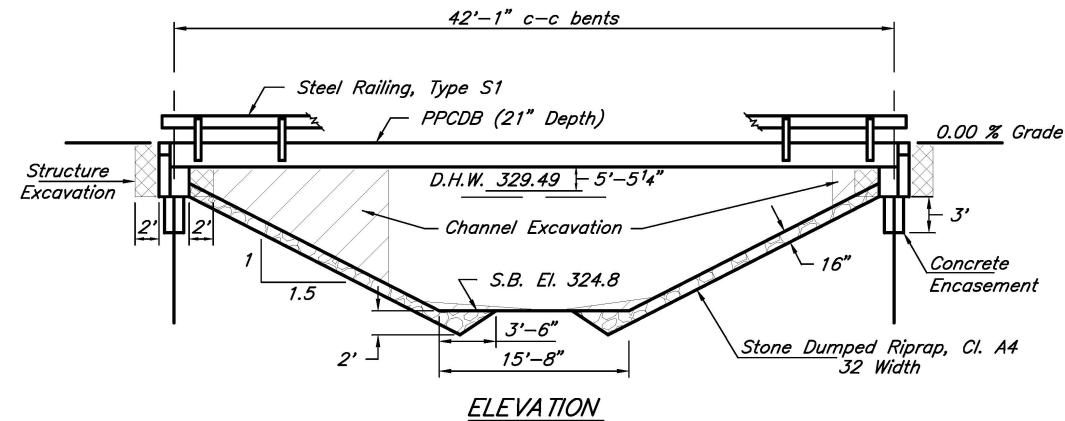
Control Points (Iron Pin)

No.	Location	Northing	Easting	Elevation
1	11.96' Lt Sta 64+95.91	202435.210	827326.496	344.952
2	13.86' Rt Sta 70+03.14	202396.334	827832.892	338.106
3	13.46' Lt Sta 73+33.04	202415.156	828163.385	350.758



Pavement Patching, Type II, 6 Inch - 5 SY
Typical behind each abutment
See detail on Abutment sheet

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 937	16-00096-00-BR	MASSAC	11	3
PROJECT NO. G3U3(016)			CONTRACT NO. 99607	



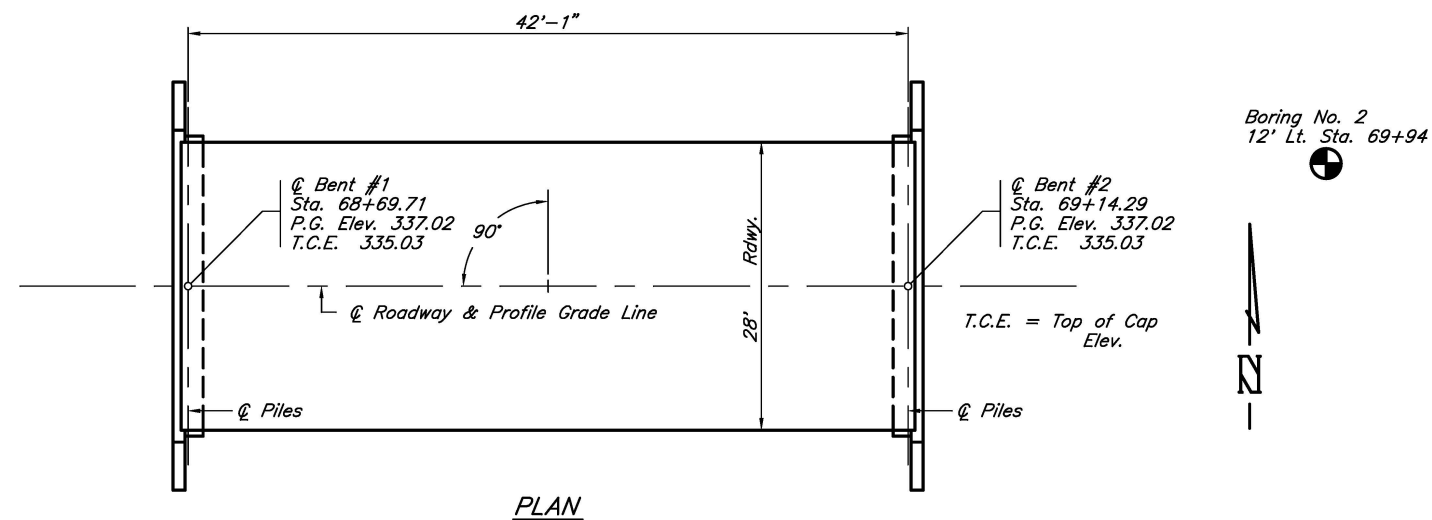
GENERAL NOTES

1. Steel H piles shall meet AASHTO M270 Grade 50 specifications.
2. See special provisions for boring logs.
4. A Corrosion inhibitor, as covered in the Standard Specifications, shall be used in the precast prestressed concrete deck beams.

TOTAL BILL OF MATERIAL

Item	Unit	Super	Sub.		Total
			Piers	Abuts.	
Channel Excavation	Cu. Yds.			101	101
Stone Dumped Riprap, Cl. A4	Tons			227	227
HMA Surf. Cse., Mix "C", N90	Tons	48			48
Removal of Existing Structures	Each	1			1
Structure Excavation	Cu. Yds.			91	91
Concrete Structures	Cu. Yds.			27.4	27.4
Concrete Encasement	Cu. Yds.			2.7	2.7
P.P. Conc. Dk. Bm. 21" Dp.	Sq. Ft.	1,204			1,204
Reinforcement Bars	Pound			3,122	3,122
Steel Railing, Type S1	Foot	90			90
Furnishing Steel Piles HP10x42	Foot			696	696
Driving Piles	Foot			696	696
Name Plates	Each			1	1

Existing Structure - Single span precast concrete channel beams on concrete caps with closed timber piling. 24.6' W x 32.0' L



Boring No. 1
9' Rt. Sta. 68+28

Boring No. 2
12' Lt. Sta. 69+94

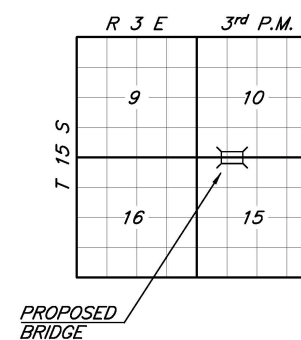
PILE DATA (2-ABUTS.)

Type & Size : HP10x42
Nominal Required Bearing : 261 kips
Factored Resistance Available : Refusal
Estimated Length : 85' Bent #1, 89' Bent #2
Number Required : 8

STATION 68+92
UNNAMED CREEK
SEC. 16-00096-00-BR BUILT 20____
COUNTY UNIT ROAD DISTRICT
MASSAC COUNTY
LOADING HL-93
STR. NO. 064-3151

LETTERING FOR NAME PLATE

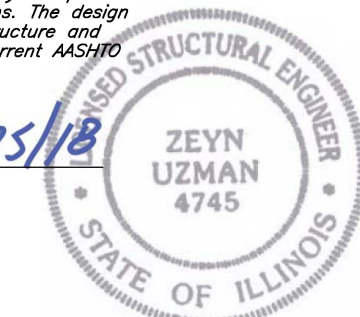
Locate Name Plate at southwest Corner of Bridge (See Sheet 8)



LOCATION SKETCH

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 type of structure and complies with the requirements of the current AASHTO LRFD Specifications.

[Signature]
5/25/18
Zeyn B. Uzman
S.E. #81-4745
Expires Nov. 30, 2020



DESIGN SPECIFICATIONS

2014 AASHTO LRFD Bridge Design Specifications and all applicable interims.

LOADING HL-93

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

SEISMIC DATA

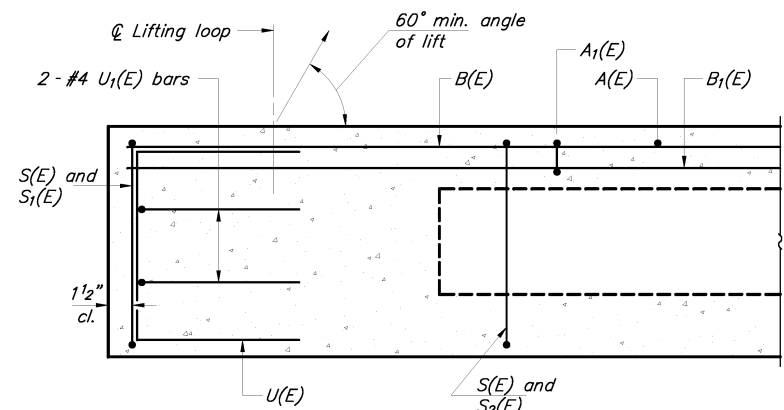
Soil Site Class = E
Design Spectral Acceleration at 0.2 sec. (S_{DS}) = 1.264
Design Spectral Acceleration at 1.0 sec. (S_{D1}) = 0.912
Seismic Performance Zone (SPZ) = 4

WATERWAY INFORMATION

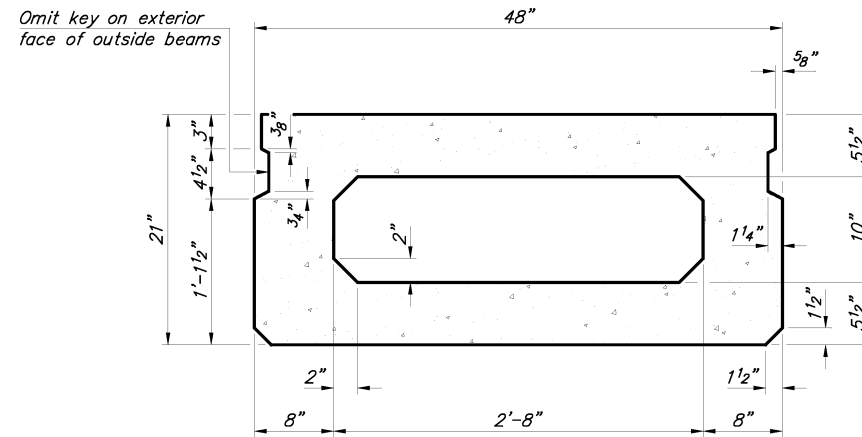
Drainage Area = 0.91 Sq. Mi.		Low Grade Elev. = 336.82		At Sta. 68+80					
Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft.		Natural H.W.E.	Head-Ft.		Headwater El.	
			Exist.	Prop.		Exist.	Prop.	Exist.	Prop.
Design	20	720	101.6	108.4	329.49	0.26	0.05	329.85	329.54
Base	100	1050	129.9	141.4	330.44	0.54	0.07	330.98	330.51
Overtopping	NA								
Max. Calc.	500	1410	155.2	173.9	331.33	0.81	0.05	332.14	332.38

GENERAL PLAN & ELEVATION
FAS ROUTE 937 (PORTLAND ROAD)
UNNAMED CREEK
SECTION 16-00096-00-BR
MASSAC COUNTY
STRUCTURE NO. 064-3151

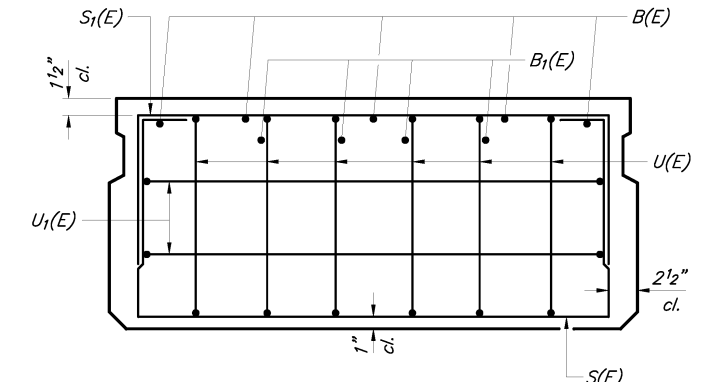
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 937	16-00096-00-BR	MASSAC	11	4
PROJECT NO. G3U3(016)			CONTRACT NO. 99607	



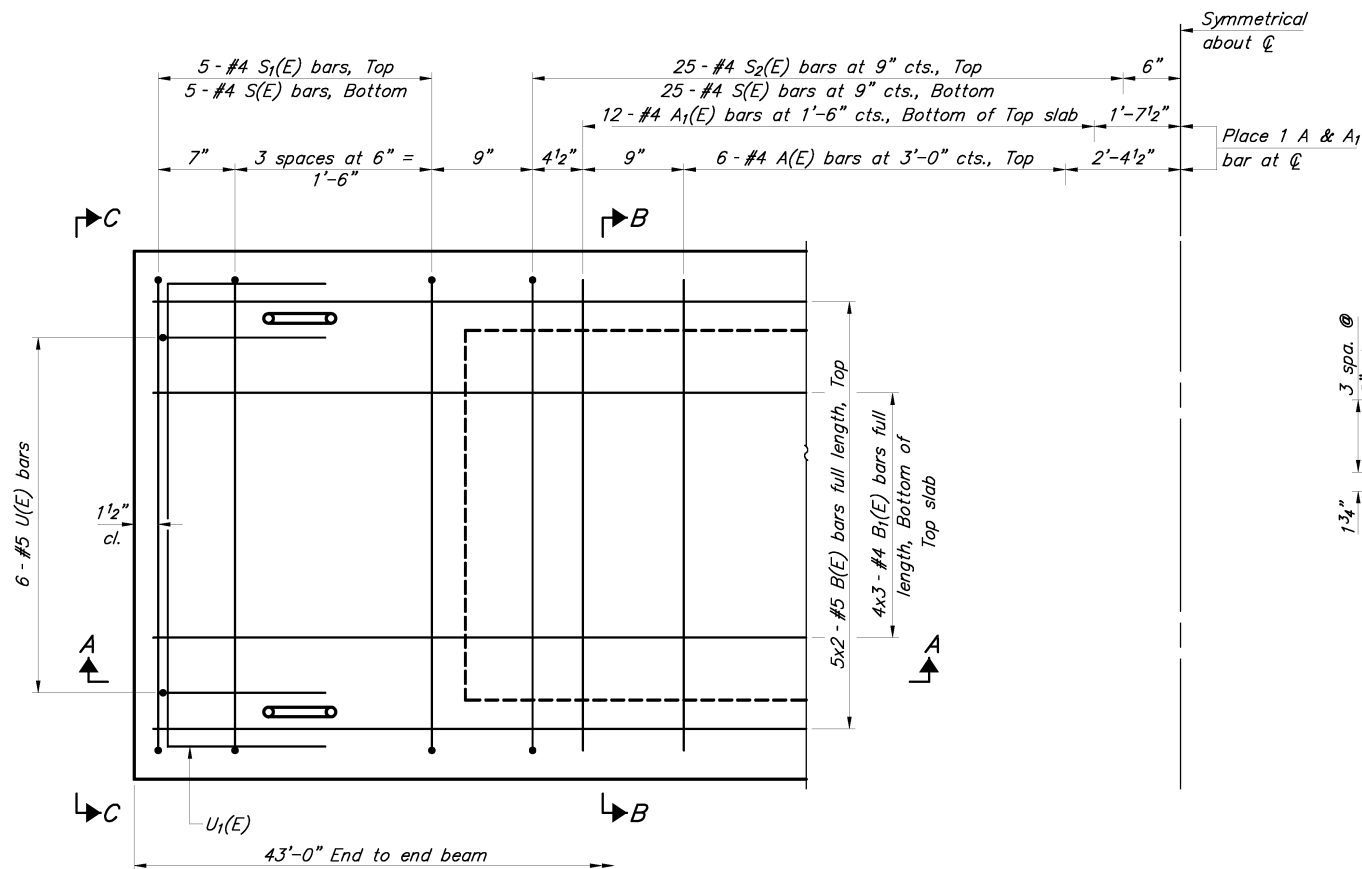
SECTION A-A



SECTION B-B
(Showing dimensions)

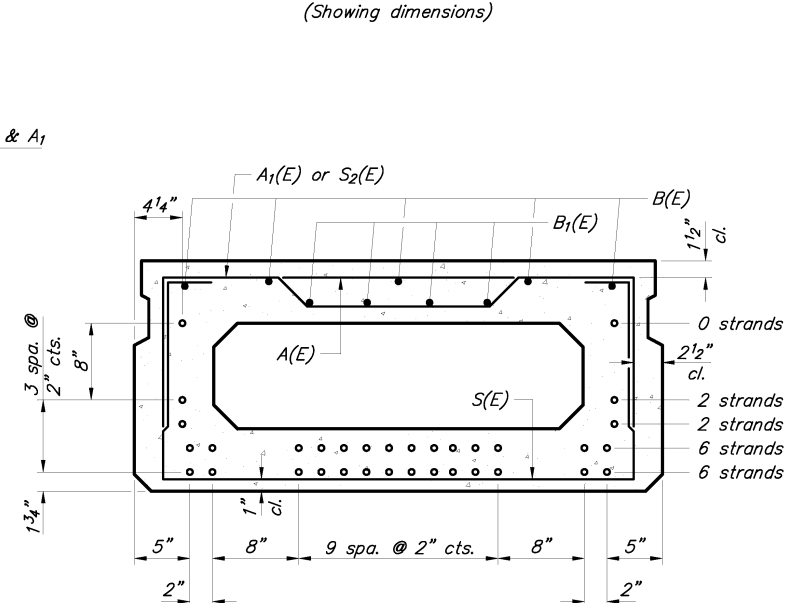


VIEW C-C



PLAN VIEW

Note: Spacing of S(E) and S2(E) bars may be adjusted up to 4" in the immediate area of the transverse tie diaphragms to miss the block outs for the transverse ties.



SECTION B-B
(Showing reinforcement and permissible strand locations)

Note: Place the number of strands specified in each row symmetrically about the centerline of beam in the permissible strand locations shown.

BAR LIST
ONE BEAM ONLY
(For information only)

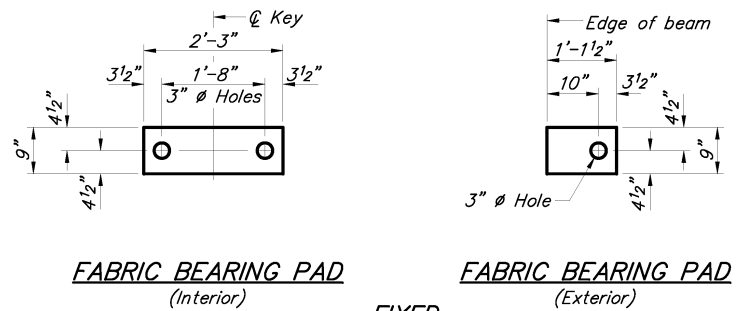
Bar	No.	Size	Length	Shape
A(E)	13	#4	3'-7"	—
A1(E)	25	#4	3'-10"	~
B(E)	10	#5	22'-8"	—
B1(E)	12	#4	15'-7"	—
S(E)	60	#4	7'-5"	□
S1(E)	10	#4	5'-11"	□
S2(E)	50	#4	6'-2"	□
U(E)	12	#5	4'-0"	□
U1(E)	4	#4	6'-0"	□

Notes:
See sheet 5 of 12 for additional details and Bill of Materials.
Bars noted thus 4x2-#5 etc. indicates 4 lines of bars with 2 lengths per line.

MINIMUM BAR LAP
#4 bar = 1'-11"
#5 bar = 2'-6"

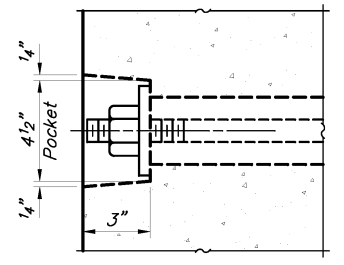
21" X 48" PPC DECK BEAM
FAS ROUTE 937 (PORTLAND ROAD)
UNNAMED CREEK
SECTION 16-00096-00-BR
MASSAC COUNTY
STRUCTURE NO. 064-3151

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 937	16-00096-00-BR	MASSAC	11	5
PROJECT NO. G3U3(016)			CONTRACT NO. 99607	

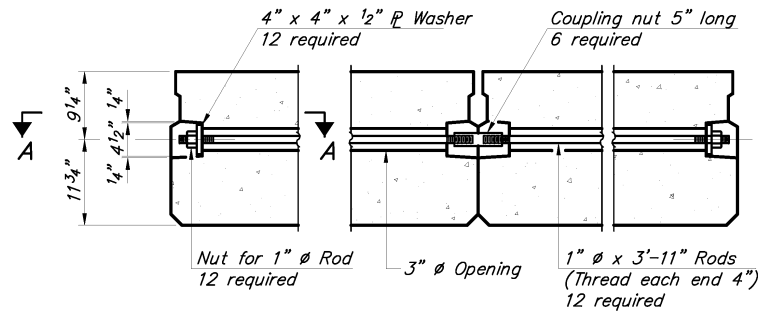


FABRIC BEARING PAD
(Interior) **FABRIC BEARING PAD**
(Exterior)

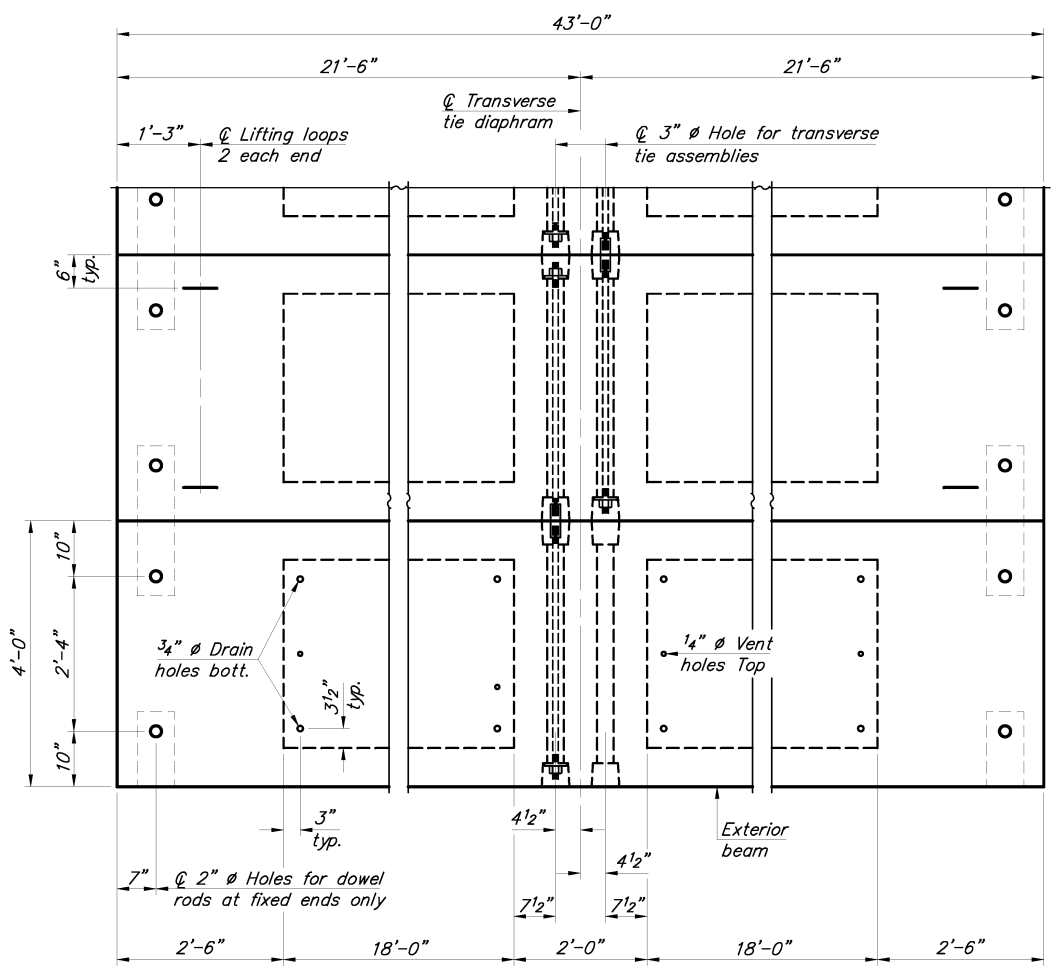
Notes:
All bearing pads shall be 1" thick.
Omit holes when using expansion bearings.
Expansion bearing pads shall be bonded to the substructure.



SECTION A-A

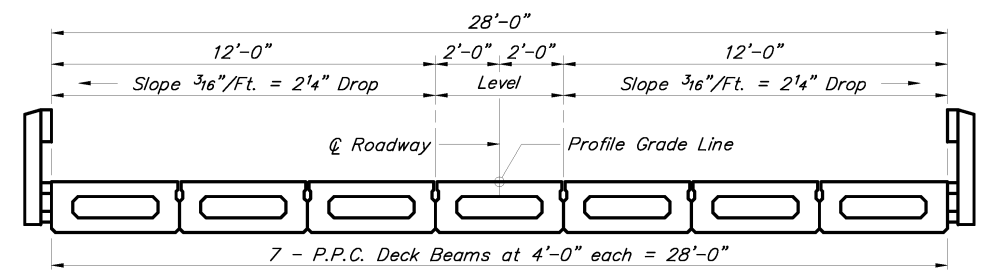


TYPICAL TRANSVERSE TIE ASSEMBLY

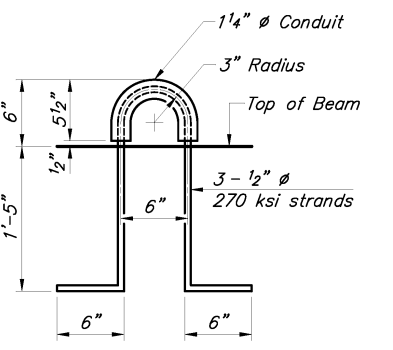
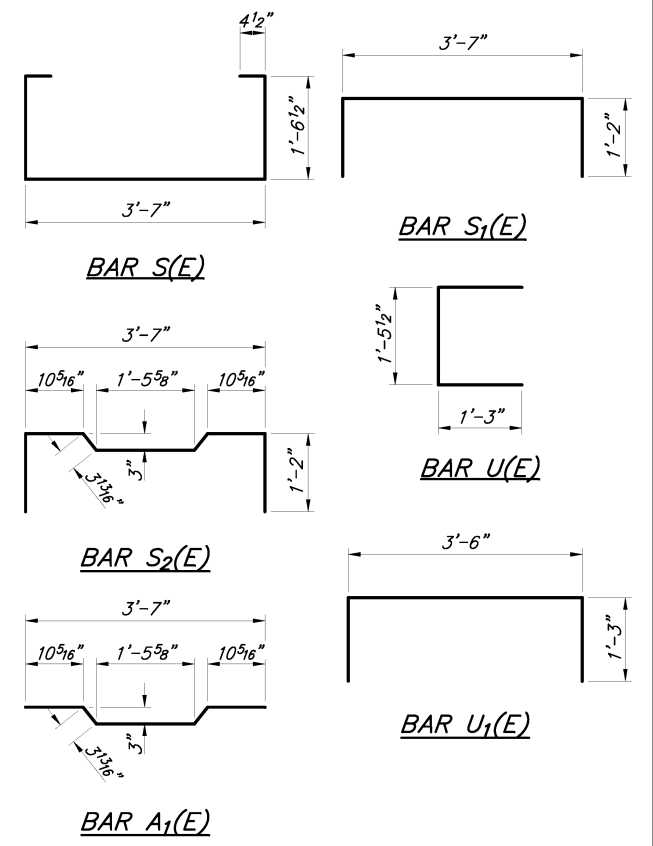


PLAN VIEW

Note: Connect beams in pairs with the transverse tie configuration shown.



CROSS SECTION



LIFTING LOOP DETAIL

NOTES

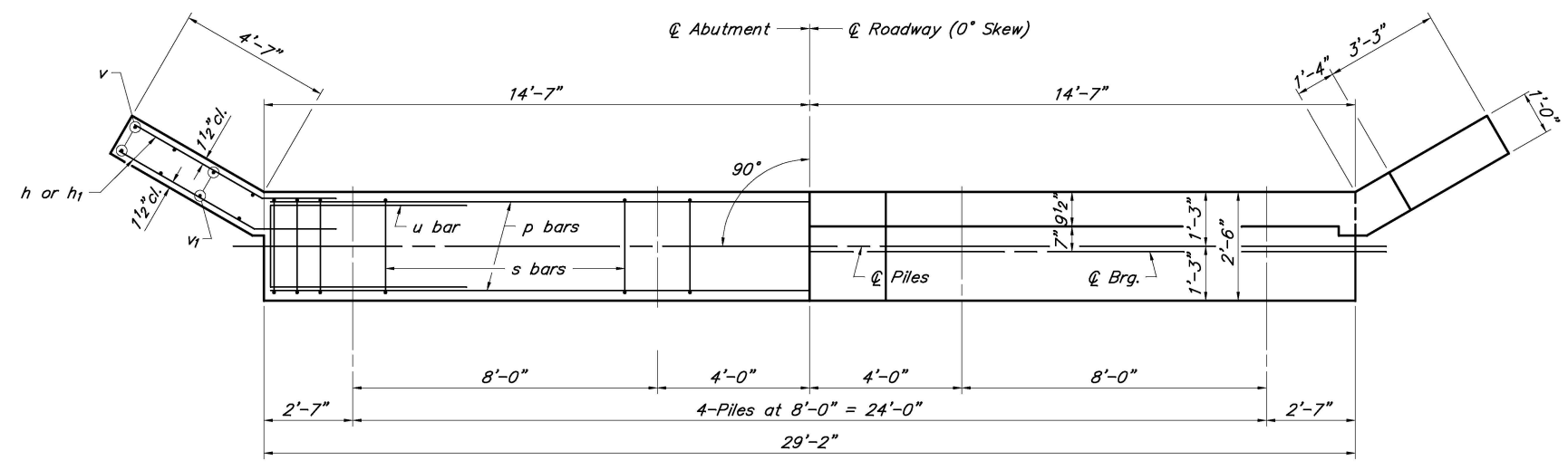
Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter shall be 1/2" and the nominal cross-sectional area shall be 0.153 sq. in. The 1" rods in the transverse tie assembly shall be tightened to a snug fit and the threads set. Pockets on exterior faces of bridge shall be filled with grout after transverse tie assembly is in place. Two 1/8" fabric adjusting shims of the dimensions of the exterior bearing pad shall be provided for each bearing pad location. A minimum 2 1/2" diameter lifting pin shall be used to engage the lifting loops during handling. Corrosion Inhibitor, per Article 1020.05(b)(10) and 1021.07 of the Standard Specifications, shall be used in the concrete for precast prestressed concrete deck beams. Compressive strength of prestressed concrete, f'c, shall be 6000 psi. Compressive strength of prestressed concrete at release, f'ci, shall be 5000 psi.

BILL OF MATERIAL

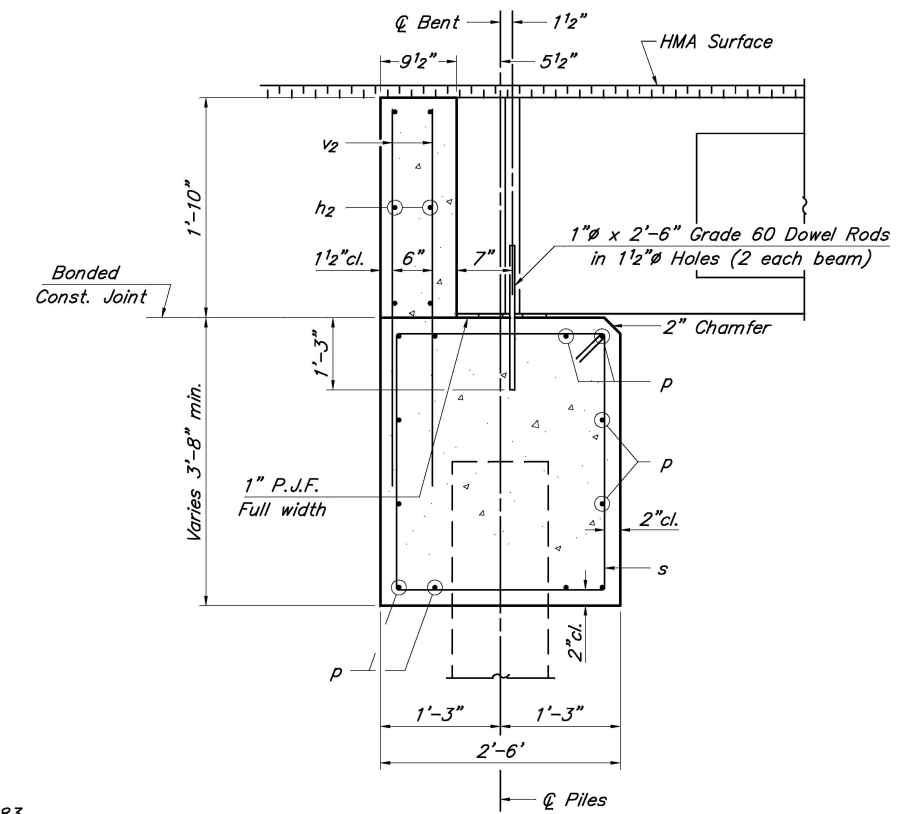
Precast Prestressed Concrete Deck Beams (21" depth)	Sq. Ft.	1,204
---	---------	-------

21" X 48" PPC DECK BEAM DETAILS
FAS ROUTE 937 (PORTLAND ROAD)
UNNAMED CREEK
SECTION 16-00096-00-BR
MASSAC COUNTY
STRUCTURE NO. 064-3151

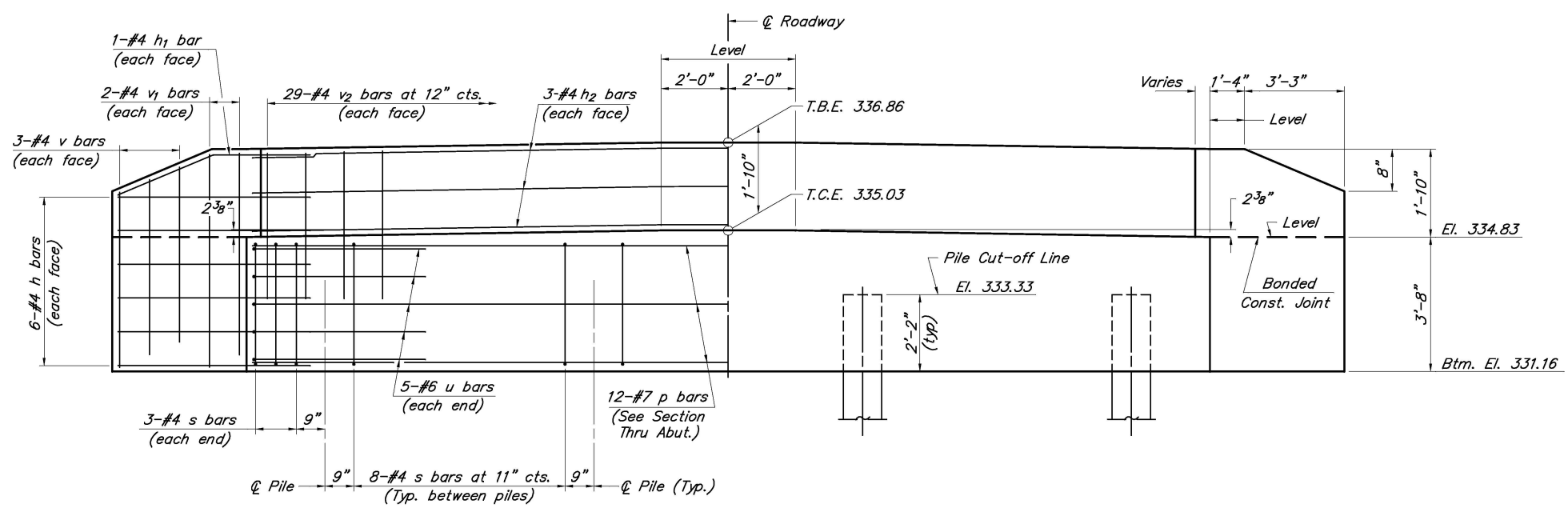
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 937	16-00096-00-BR	MASSAC	11	6
PROJECT NO. G3U3(016)			CONTRACT NO. 99607	



PLAN



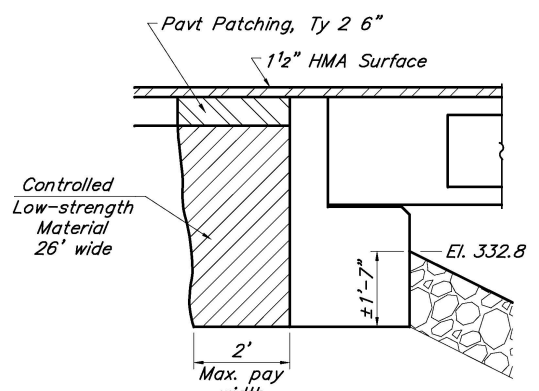
SECTION THRU ABUT.
(At Right Angles)



ELEVATION

BILL OF MATERIAL FOR ONE ABUTMENT

Bar	No.	Size	Length	Shape
h	24	#4	6'-7"	—
h1	4	#4	6'-7"	—
h2	6	#4	28'-10"	—
p	12	#7	28'-10"	—
s	30	#4	11'-9"	□
u	10	#6	12'-1"	—
v	12	#4	4'-8"	—
v1	8	#4	5'-4"	—
v2	58	#4	3'-5"	—
Concrete Structures			13.7	Cu. Yds.
Reinforcement Bars			1561	Lbs.



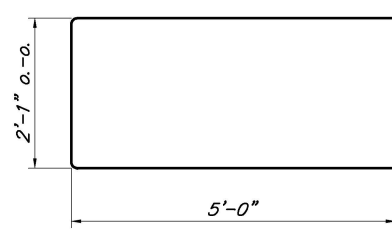
BACKFILL & BERM DETAIL
(At Right Angles to Abut.)

NOTES

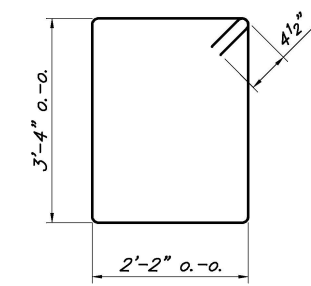
- The Backwall and the portion of the Wingwalls above the bonded construction joint shall be cast against the in-place beam.
- Reinforcement bars shall be according to ASTM A 706, Grade 60.

DESIGN STRESSES

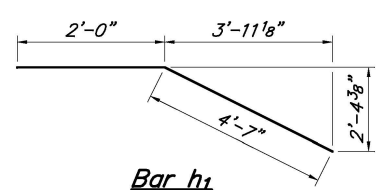
$f'_c = 3,500 \text{ psi}$
 $f_y = 60,000 \text{ psi}$



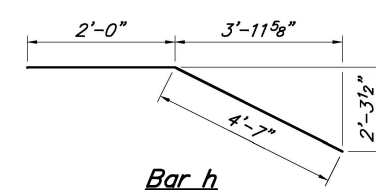
Bar u



Bar s



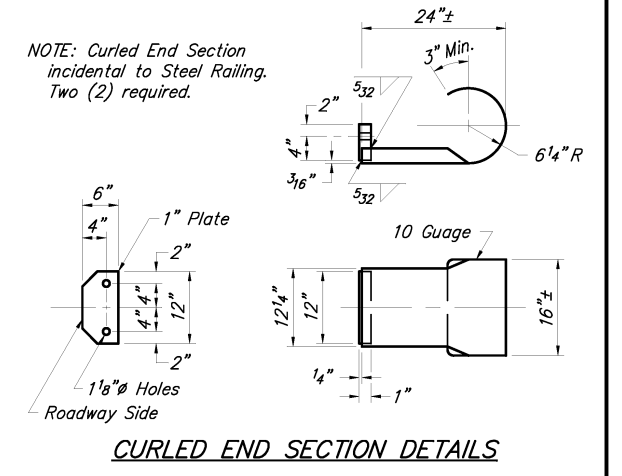
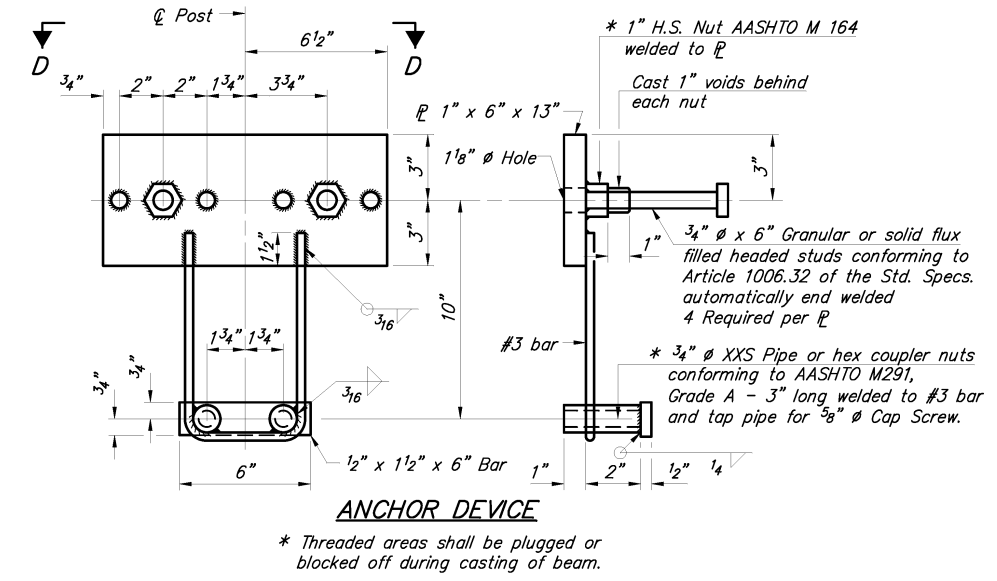
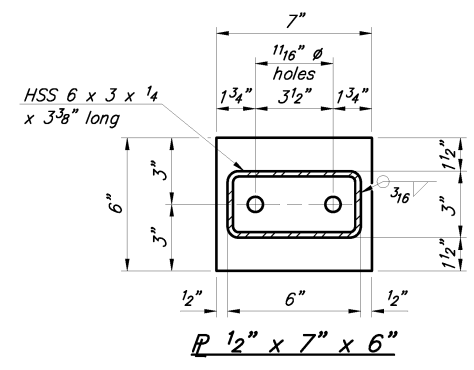
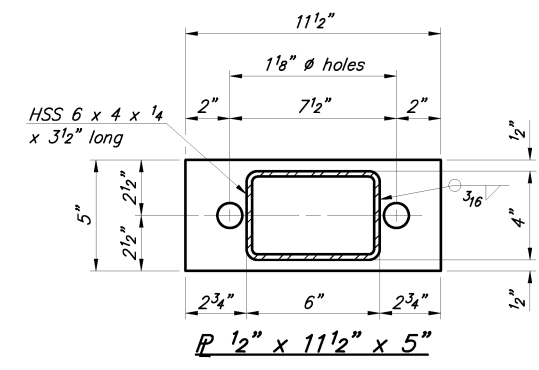
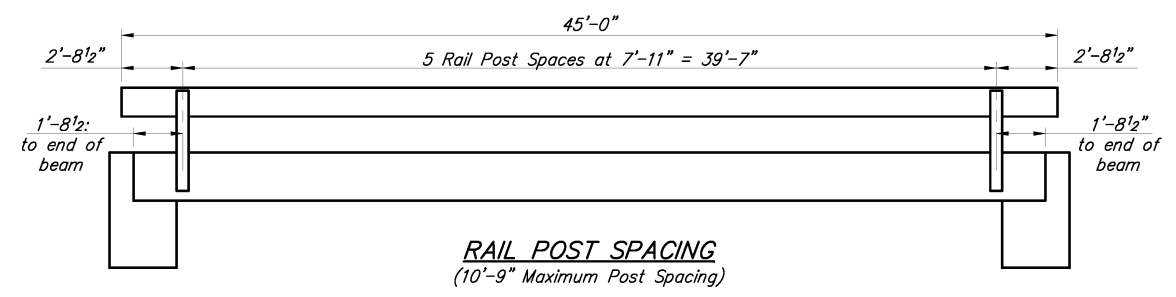
Bar h1



Bar h

ABUTMENT
FAS ROUTE 937 (PORTLAND ROAD)
UNNAMED CREEK
SECTION 16-00096-00-BR
MASSAC COUNTY
STRUCTURE NO. 064-3151

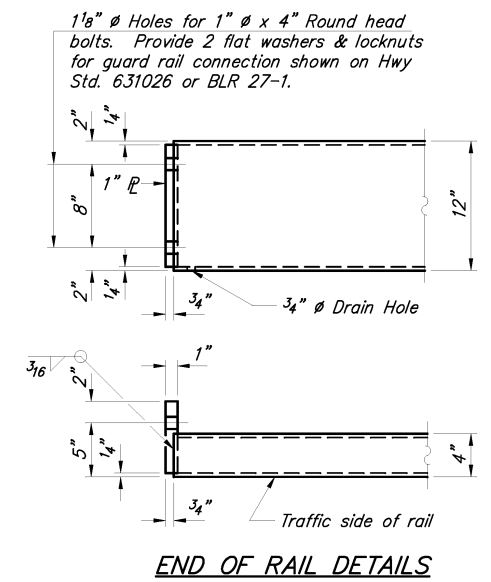
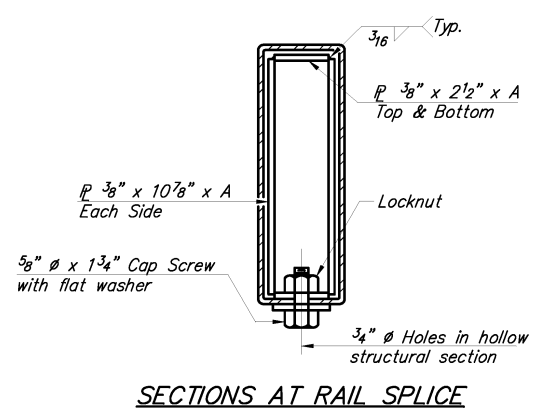
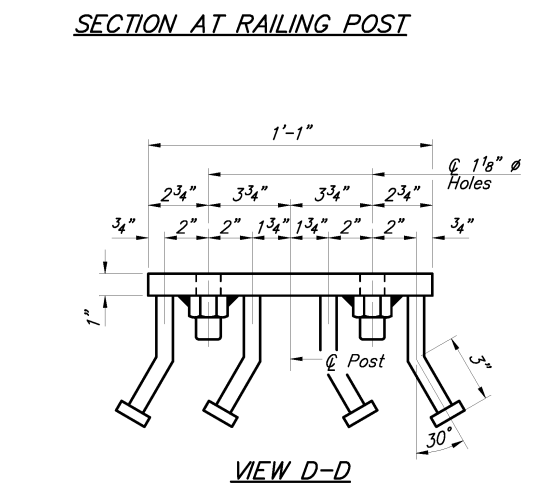
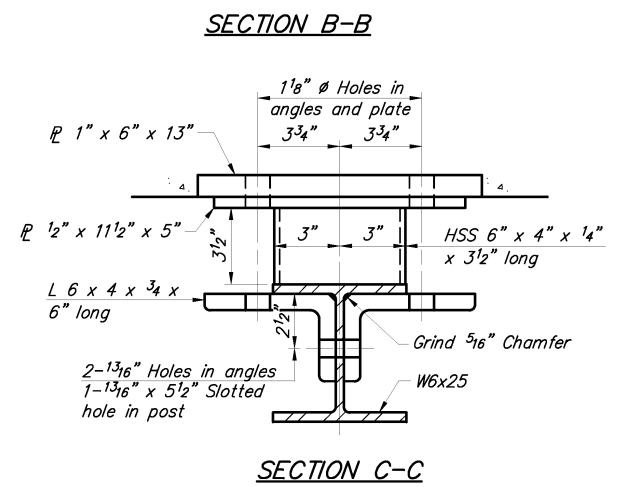
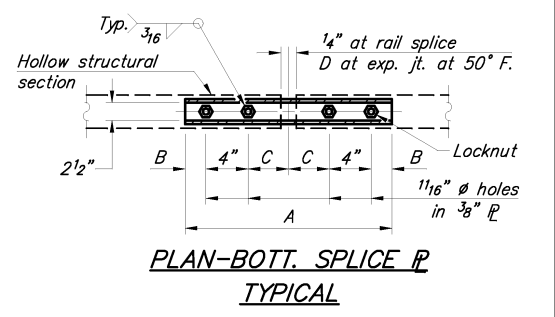
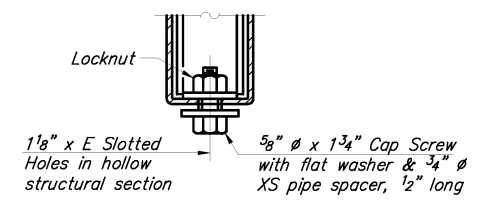
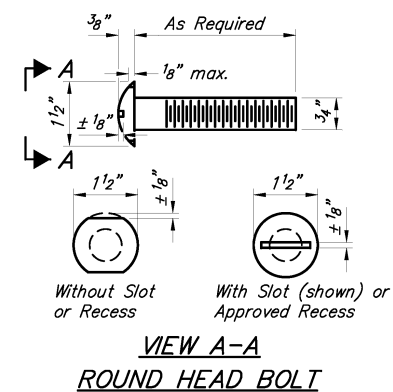
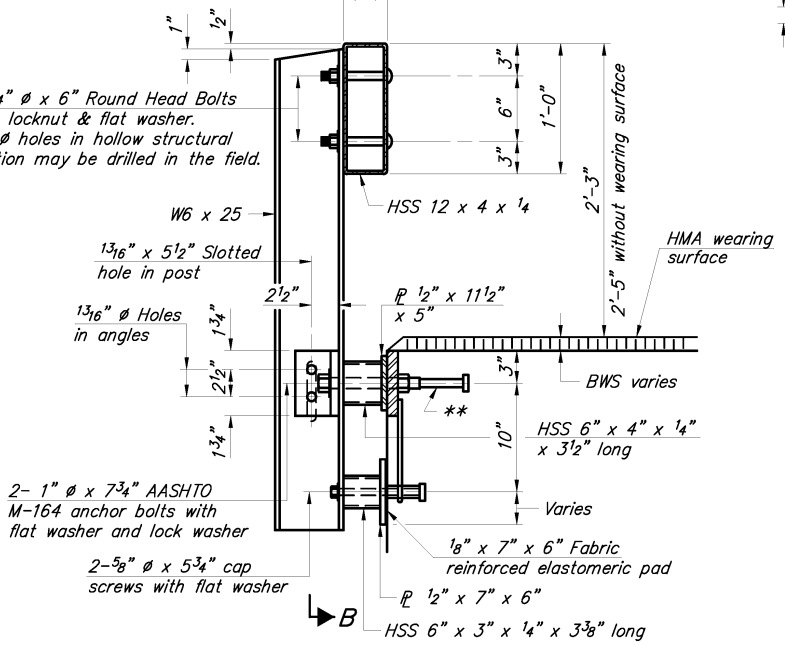
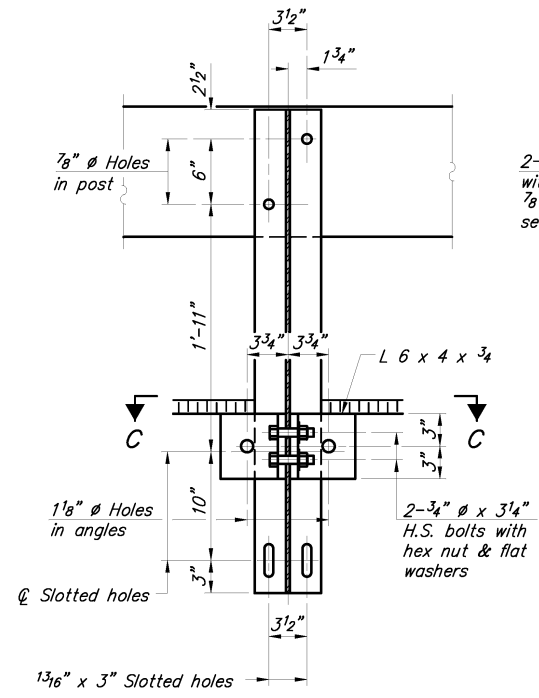
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 937	16-00096-00-BR	MASSAC	11	7
PROJECT NO. G3U3(016)			CONTRACT NO. 99607	



SPLICE DIMENSIONS

T	D	A	B	C	E
Up to 4"	2 1/2"	1'-8"	2"	4"	2 1/2"
>4" to 6 1/2"	3 3/4"	2'-0"	2 1/2"	5 1/2"	3 1/2"
>6 1/2" to 9"	5"	2'-4"	3 1/2"	6 1/2"	9"
>9" to 13"	7"	2'-10"	4 1/2"	8 1/2"	11"
Rail Splice	1 1/4"	1'-8"	2"	4"	

T = Total movement at expansion joint as shown on the design plans.



Notes:
For multi-span bridges, sufficient 1/4" x 6" x 1'-2" galvanized steel shims shall be provided to align rail between adjacent spans. Cost included with Steel Railing, Type S-1.
All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.

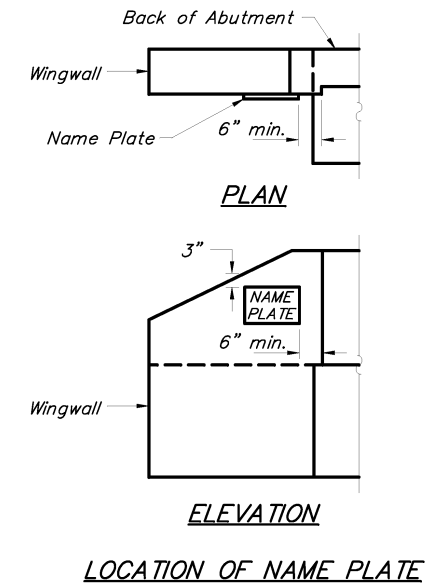
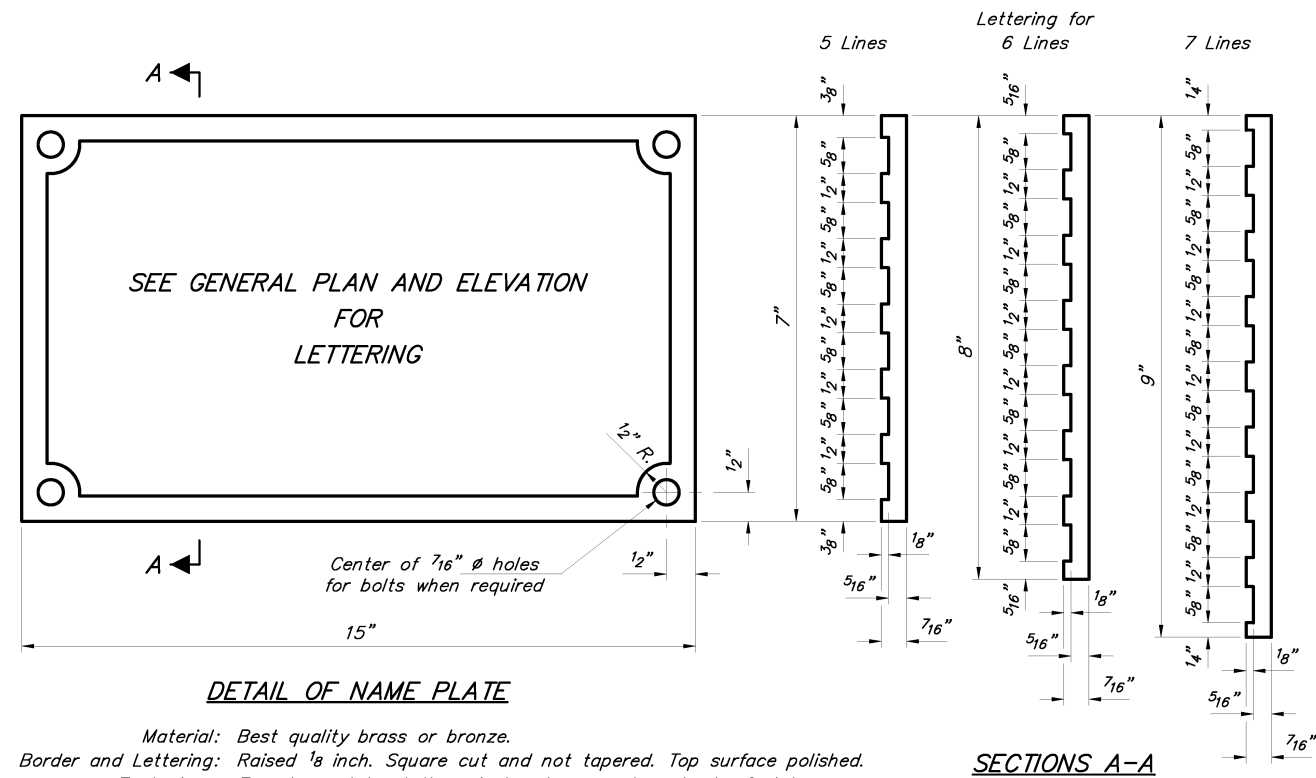
** The studs of the anchor devices shall be placed below the top reinforcement bars and the outermost longitudinal reinforcement bar shall be placed directly above the studs of the rail post anchor device. The anchorage studs may be bent down 1/2" to accommodate the top reinforcement bar placement.

BILL OF MATERIAL

Item	Unit	Quantity
Steel Railing, Type S-1	Foot	90

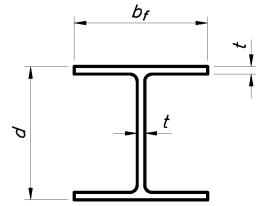
STEEL RAILING, TYPE S-1
FAS ROUTE 937 (PORTLAND ROAD)
UNNAMED CREEK
SECTION 16-00096-00-BR
MASSAC COUNTY
STRUCTURE NO. 064-3151

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 937	16-00096-00-BR	MASSAC	11	8
PROJECT NO. G3U3(016)			CONTRACT NO. 99607	



NAME PLATE
 FAS ROUTE 937 (PORTLAND ROAD)
 UNNAMED CREEK
 SECTION 16-00096-00-BR
 MASSAC COUNTY
 STRUCTURE NO. 064-3151

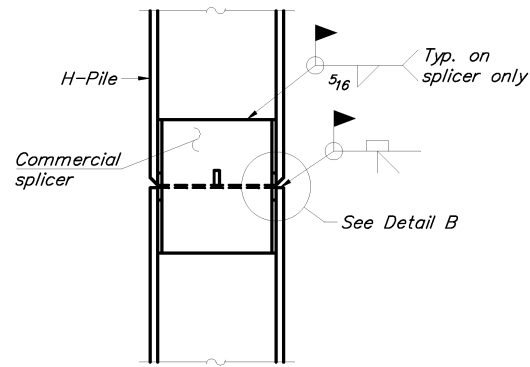
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 937	16-00096-00-BR	MASSAC	11	9
PROJECT NO. G3U3(016)			CONTRACT NO. 99607	



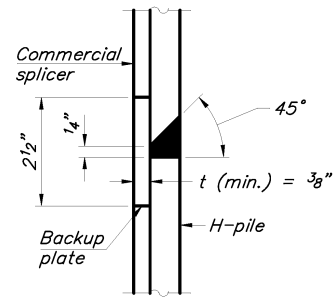
STEEL PILE TABLE

Designation	Depth d	Flange width b _f	Web and Flange thickness t	Encasement diameter A	Encasement Quantity/Ft. C.Y.
HP 14x117	14 1/4"	14 7/8"	1 3/16"	30"	0.173
x102	14"	14 3/4"	1 1/16"	30"	0.174
x89	13 7/8"	14 3/4"	5/8"	30"	0.175
x73	13 5/8"	14 5/8"	1/2"	30"	0.176
HP 12x84	12 1/4"	12 1/4"	1 1/16"	24"	0.110
x74	12 1/8"	12 1/4"	5/8"	24"	0.111
x63	12"	12 1/8"	1/2"	24"	0.112
x53	11 3/4"	12"	7/16"	24"	0.112
HP 10x57	10"	10 1/4"	9/16"	24"	0.112
x42	9 3/4"	10 1/8"	7/16"	24"	0.113
HP 8x36	8"	8 1/8"	7/16"	18"	0.063

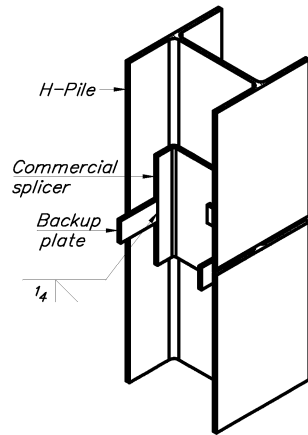
Note: The steel H-piles shall be according to AASHTO M270 Grade 50.



ELEVATION

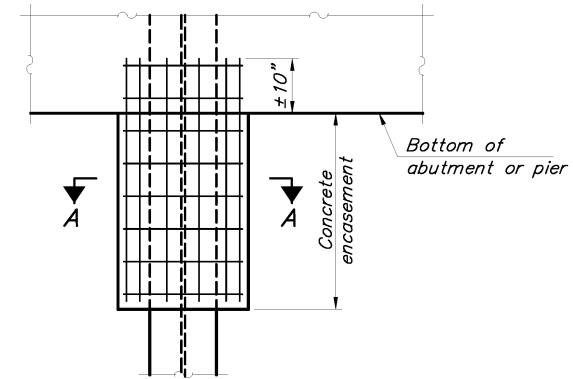


DETAIL "B"



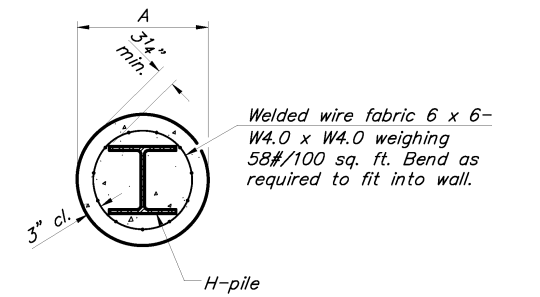
ISOMETRIC VIEW

WELDED COMMERCIAL SPLICE



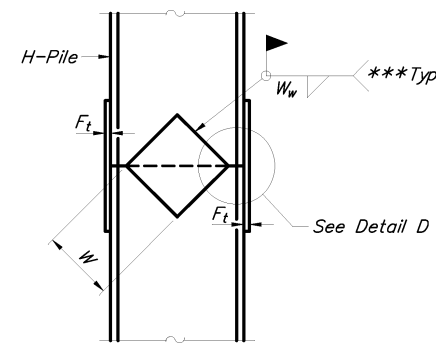
ELEVATION

PILE ENCASUREMENT

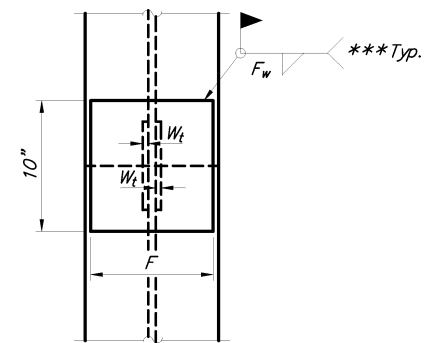


SECTION A-A

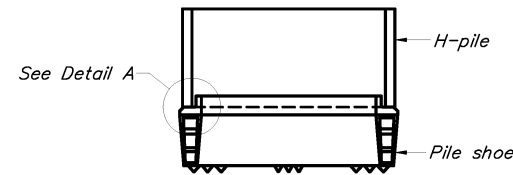
Note: Forms for encasement may be omitted when soil conditions permit.



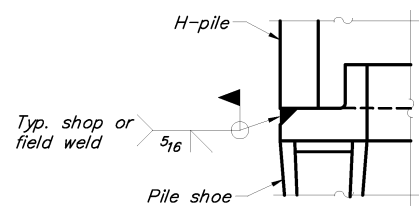
ELEVATION



END VIEW

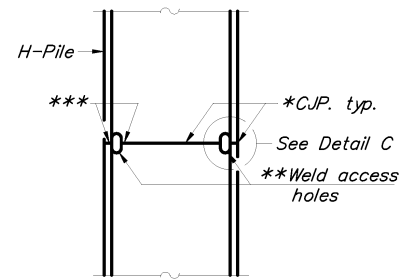


ELEVATION

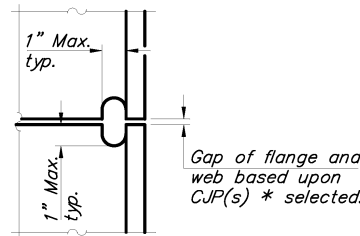


DETAIL A

H-PILE SHOE ATTACHMENT

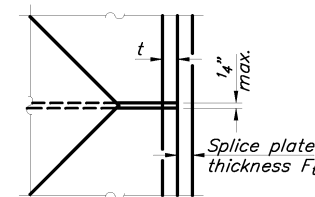


ELEVATION



DETAIL C

COMPLETE PENETRATION WELD SPLICE



DETAIL D

WELDED PLATE FIELD SPLICE

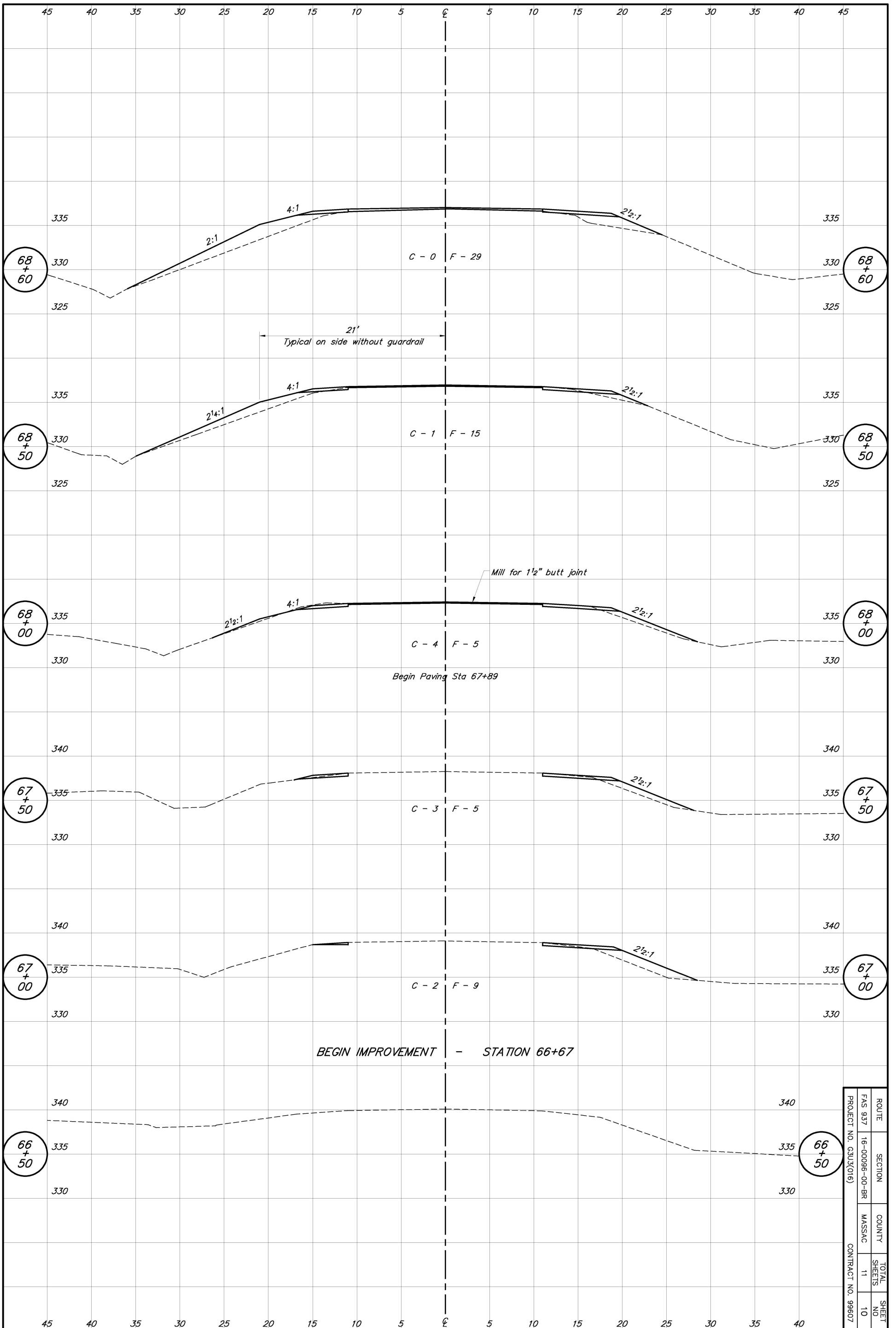
Designation	F	F _t	F _w	W	W _t	W _w
HP 14x117	12 1/2"	1"	7/8"	7 3/4"	5/8"	1/2"
x102	12 1/2"	7/8"	3/4"	7 3/4"	5/8"	1/2"
x89	12 1/2"	3/4"	1 1/16"	7 3/4"	5/8"	1/2"
x73	12 1/2"	5/8"	9/16"	7 3/4"	5/8"	1/2"
HP 12x84	10"	7/8"	1 1/16"	6 1/2"	5/8"	1/2"
x74	10"	7/8"	1 1/16"	6 1/2"	5/8"	1/2"
x63	10"	5/8"	1/2"	6 1/2"	1/2"	3/8"
x53	10"	5/8"	1/2"	6 1/2"	1/2"	3/8"
HP 10x57	8"	3/4"	9/16"	5 1/4"	1/2"	3/8"
x42	8"	5/8"	9/16"	5 1/4"	1/2"	3/8"
HP 8x36	7"	5/8"	7/16"	4 1/4"	1/2"	3/8"

* Use joint conforming to Fig. 3.4 in AWS D1.1. Structure Welding Code - Steel.

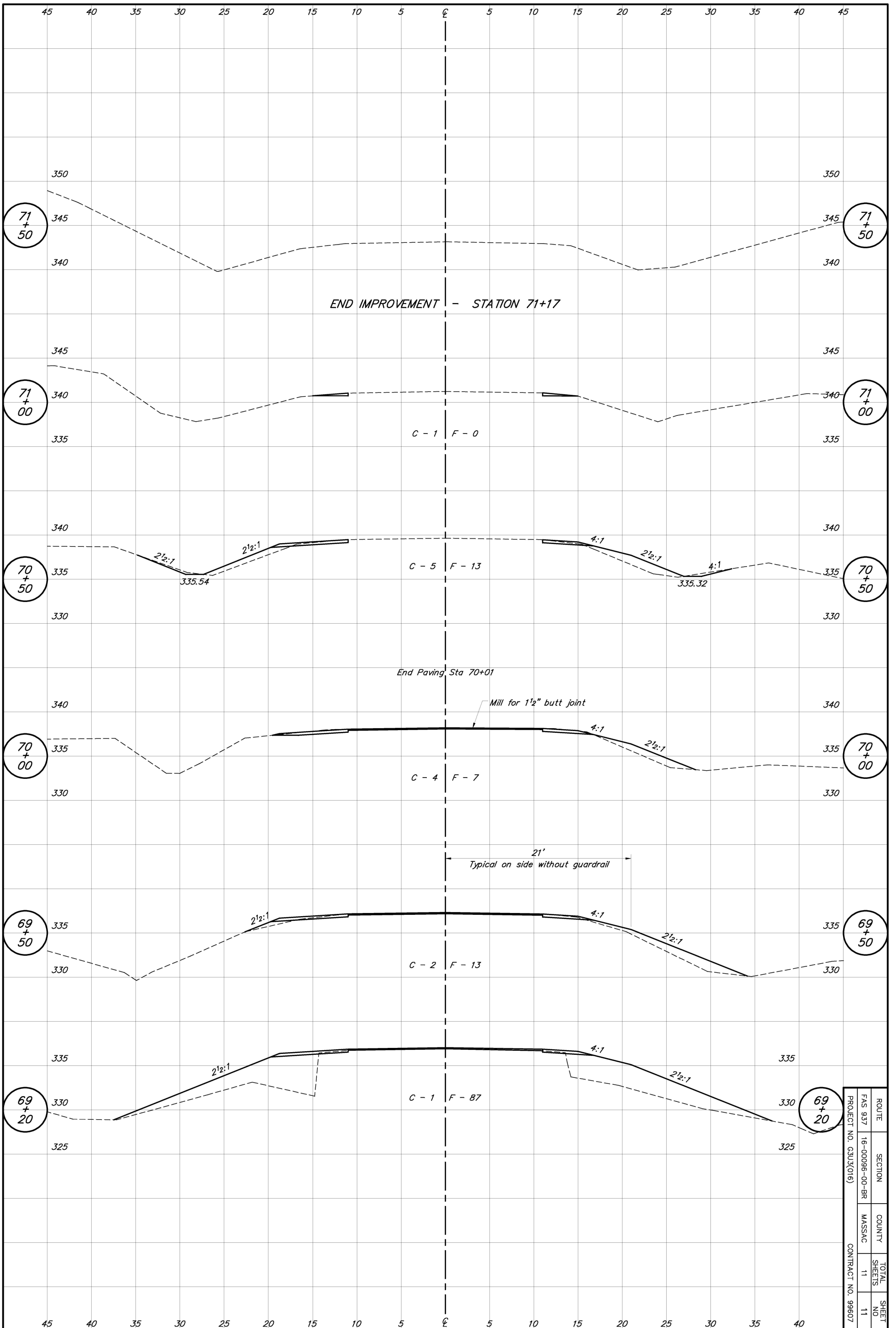
** Preparation per Fig. 5.2 in AWS D1.1. Structure Welding Code - Steel.

*** Interrupt welds 1/4" from end of each pile.

PILING DETAILS
 FAS ROUTE 937 (PORTLAND ROAD)
 UNNAMED CREEK
 SECTION 16-00096-00-BR
 MASSAC COUNTY
 STRUCTURE NO. 064-3151



ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO
FAS 937	16-00096-00-BR	MASSAC	11	10
PROJECT NO. G3J3(016)		CONTRACT NO. 99607		



ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO
FAS 937	16-00096-00-BR	MASSAC	11	11
PROJECT NO. G3U3(016)			CONTRACT NO. 99607	