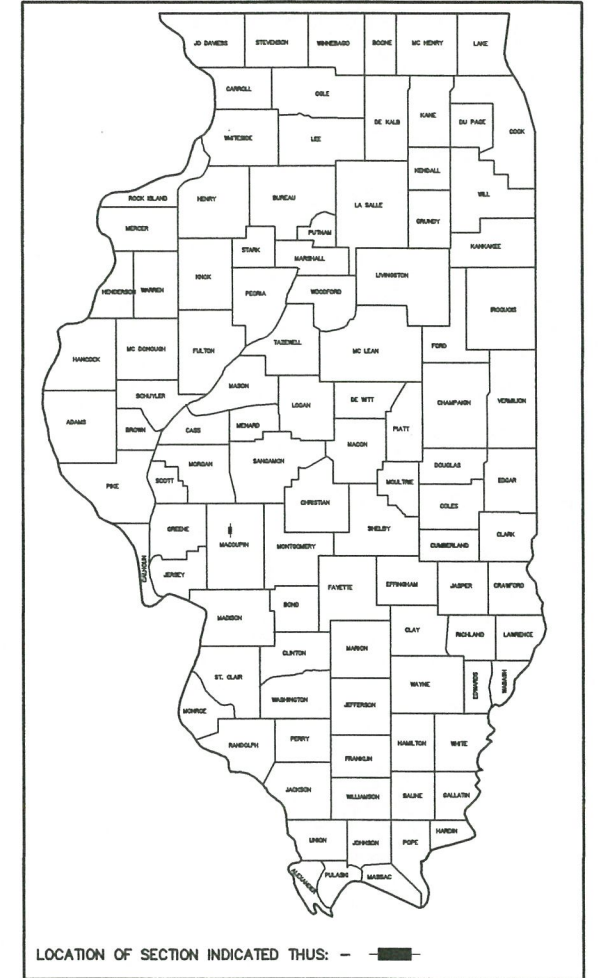


STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**PLANS FOR PROPOSED
SURFACE TRANSPORTATION PROGRAM - BRIDGE**

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
C.H. 24	14-00099-00-BR	MACOUPIN	16	1
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	



INDEX OF SHEETS

1. COVER SHEET
2. SUMMARY OF QUANTITIES & TYPICAL CROSS SECTION
3. PLAN AND PROFILE
- 4.-13. BRIDGE PLANS
- 14.-16. STATION CROSS SECTIONS

STANDARDS:

- 515001-03 NAME PLATE FOR BRIDGES
- 630301-09 SHOULDER WIDENING FOR TYPE 1 (SPECIAL) GUARDRAIL TERMINALS
- 701901-08 TRAFFIC CONTROL DEVICES
- 725001-01 OBJECT AND TERMINAL MARKERS
- BLR 21-9 TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS
- BLR 27-1 TRAFFIC BARRIER TERMINAL TYPE 5A

UTILITIES

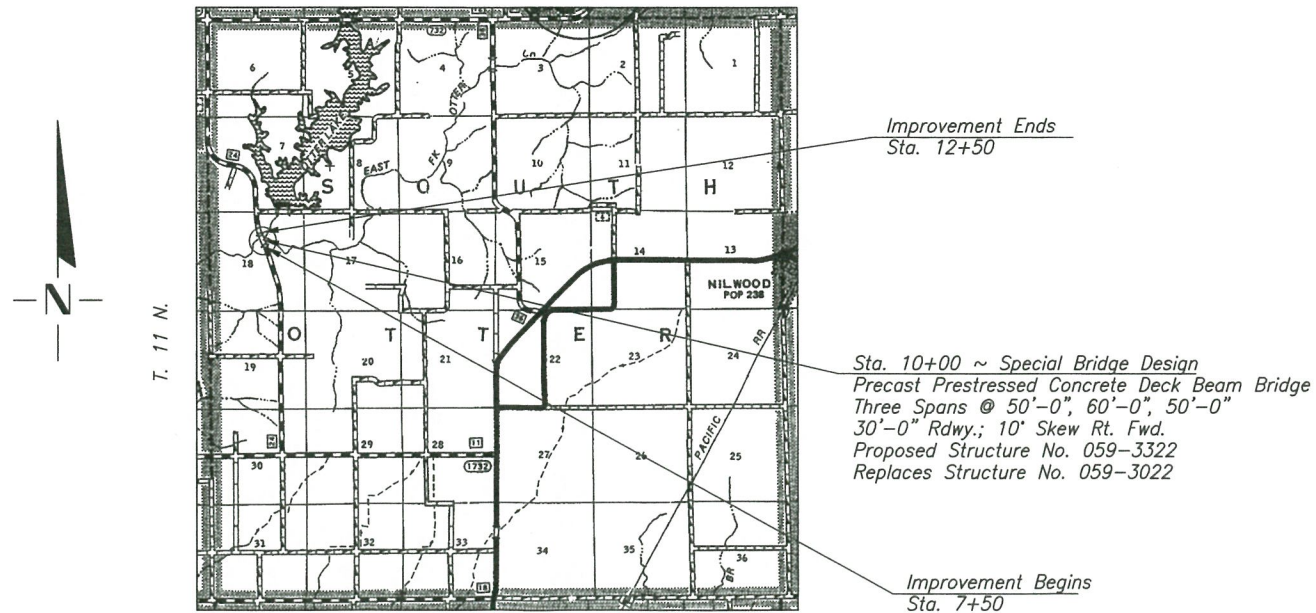
RURAL ELECTRIC CONVENIENCE COOPERATIVE
3973 WEST STATE ROUTE 104
AUBURN, IL 62615

FRONTIER COMMUNICATIONS
225 NORTH BROAD STREET
CARLINVILLE, IL 62626



SECTION 14-00099-00-BR
COUNTY HIGHWAY 24
MACOUPIN COUNTY
PROJECT COYR(728)
C-96-203-15

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



LAYOUT

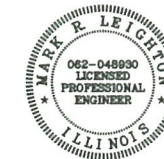
APPROXIMATE SCALE = 0 1 MILE
Net Length of Section = 500.00 Feet = 0.095 Miles

DESIGN FUNCTIONAL CLASSIFICATION:
MINOR COLLECTOR 400-1000 ADT
CURRENT ADT: 400
DESIGN SPEED: 3R GUIDELINES

CONTRACT NO. 93682



Mark R. Johnston
ILLINOIS PROFESSIONAL NO. 48930 Expires 11-30-19



APPROVED	<i>March 8</i>	2019
	<i>Thomas A Reinhart</i>	COUNTY ENGINEER
PASSED	<i>3-13</i>	2019
	<i>Ch Z Tabell</i>	DISTRICT SIX ENGINEER OF LOCAL ROADS & STREETS
Releasing for Bid Based on Limited Review	<i>3-13</i>	2019
	<i>Jeffrey M Smith</i>	REGION FOUR 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

SUMMARY OF QUANTITIES CONSTRUCTION TYPE CODE 0010			
CODE NO.	ITEM	UNIT	QUANTITY
			BRIDGE TYPE: 0010
20100210	TREE REMOVAL (OVER 15 UNITS DIAMETER)	UNIT	24
20100500	TREE REMOVAL, ACRES	ACRE	0.6
20200100	EARTH EXCAVATION	CU YD	710
20300100	CHANNEL EXCAVATION	CU YD	240
20400800	* FURNISHED EXCAVATION	CU YD	700
40600275	BITUMINOUS MATERIALS (PRIME COAT)	POUND	1860
40600290	BITUMINOUS MATERIALS (TACK COAT)	POUND	186
40603310	HOT MIX ASPHALT SURFACE COURSE, MIX "C", N50	TON	264
44000165	HOT MIX ASPHALT SURFACE REMOVAL, 4"	SQ YD	636
50100100	* REMOVAL OF EXISTING STRUCTURES	EACH	1
50300225	CONCRETE STRUCTURES	CU YD	40.1
50300280	CONCRETE ENCASEMENT	CU YD	31.1
50400505	PRECAST PRESTRESSED CONCRETE DECK BEAMS, (27" DEPTH)	SQ FT	4,800
50800205	REINFORCEMENT BARS, EPOXY COATED	POUND	5,390
Δ 50900205	STEEL RAILING, TYPE S1	FOOT	321
51200957	FURNISHING METAL SHELL PILES 12"x0.250"	FOOT	920
51202305	DRIVING PILES	FOOT	920
51203200	TEST PILE METAL SHELLS	EACH	2
51500100	NAME PLATES	EACH	1
54201060	PIPE CULVERTS, CLASS D, TYPE 2 15"	FOOT	46
54201063	PIPE CULVERTS, CLASS D, TYPE 2 18"	FOOT	62
58100200	WATERPROOFING MEMBRANE SYSTEM	SQ YD	540
58300100	PORTLAND CEMENT MORTAR FAIRING COURSE	FOOT	360
Δ 63100075	TRAFFIC BARRIER TERMINAL, TYPE 5A	EACH	4
Δ 63100167	TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT	EACH	4
67100100	MOBILIZATION	L SUM	1
XX009299	* TRAFFIC CONTROL AND PROTECTION, STANDARD BLR 21	L SUM	1
Δ 72501000	* TERMINAL MARKER-DIRECT APPLIED	EACH	4
X2501000	* SEEDING CLASS 2 (SPECIAL)	ACRE	0.9
X2810208	* STONE RIPRAP, CLASS A4 (SPECIAL)	TON	478
20076600	* TRAINEEES	HOUR	500
20076604	* TRAINEEES TRAINING PROGRAM GRADUATE	HOUR	500

* SEE SPECIAL PROVISIONS

Δ SPECIALTY ITEMS

~ = 0042

GENERAL NOTES

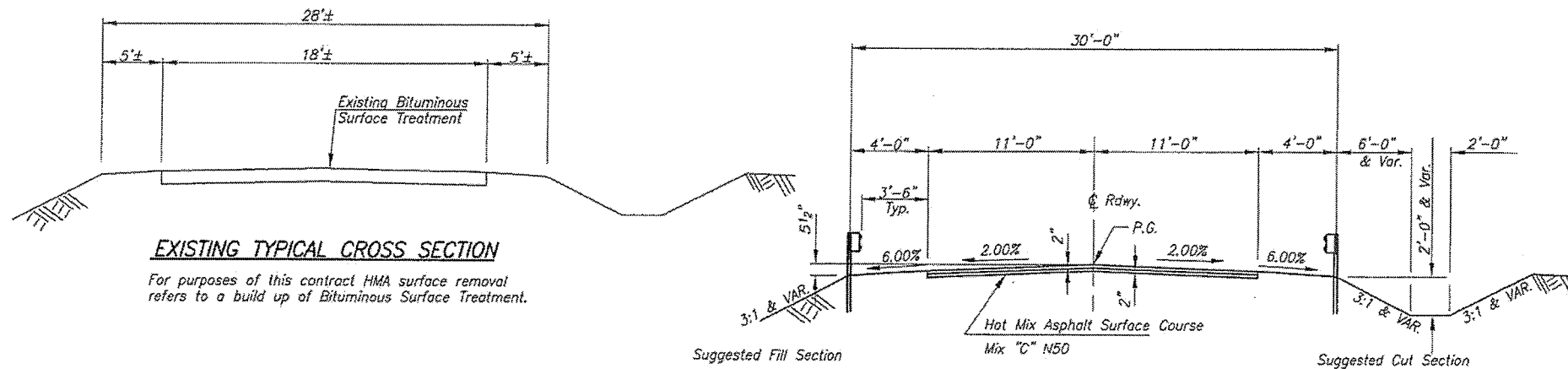
WHERE SECTION AND SUBSECTION MONUMENTS ARE ENCOUNTERED, THE ENGINEER SHALL BE NOTIFIED BEFORE SUCH MONUMENTS ARE REMOVED. THE CONTRACTOR SHALL PROTECT AND CAREFULLY PRESERVE ALL PROPERTY MARKS AND MONUMENTS UNTIL THE OWNER, AN AUTHORIZED SURVEYOR OR AGENT HAS WITNESSED OR OTHERWISE REFERENCED THEIR LOCATION.

THE AREA TO BE SEEDDED SHALL CONSIST OF ALL DISTURBED EARTH SURFACES WITHIN THE RIGHT OF WAY AND EASEMENTS AS DIRECTED BY THE ENGINEER.

SEEDING, CLASS 2 (SPECIAL) = 0.9 ACRES

THE COST OF REMOVAL OF ANY OBSTRUCTIONS OR CULVERTS NOT OTHERWISE INCLUDED IN REMOVAL OF EXISTING STRUCTURES WHICH INTERFERE WITH CONSTRUCTION WILL BE CONSIDERED INCIDENTAL TO THE COST OF EARTH EXCAVATION.

ALL PLAN ELEVATIONS REPRESENT NGS DATUM.



EXISTING TYPICAL CROSS SECTION

For purposes of this contract HMA surface removal refers to a build up of Bituminous Surface Treatment.

APPLICATION RATES USED IN QUANTITY CALCULATIONS

BITUMINOUS MATERIALS (PRIME COAT)	0.25 LBS./SQ. FT.
BITUMINOUS MATERIALS (TACK COAT)	0.025 LBS./SQ. FT.
HOT MIX ASPHALT (BINDER AND SURFACE COURSE)	112 LBS./SQ. YD./INCH
STONE RIPRAP	1.75 TON/CU. YD.

BITUMINOUS CONCRETE MIXTURE REQUIREMENTS				
ITEM	ASPHALT GRADE	AGGREGATE COMPOSITION	VOIDS	QUALITY MANAGEMENT
HMA SURFACE COURSE (Mix 'C') N50	PG 64-22	IL 9.5	4.0% @ N50 DESIGN	QC/QA

Road Classification: Minor Collector ADT 400-1000 ADT
Current ADT 400

PROPOSED TYPICAL CROSS SECTION

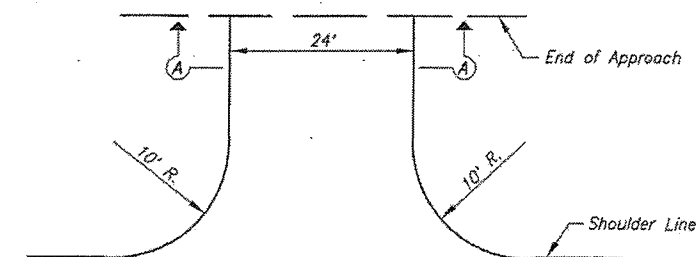
Sta. 8+00 to Sta. 12+00
Superelevation Transitioning from Sta. 10+84.58 to Sta. 12+00

Transition from the proposed roadway to the existing roadway to be constructed from Sta. 7+50 to 8+00 and from Sta. 12+00 to 12+50.

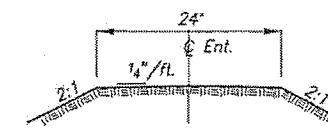
GUARD RAIL SCHEDULE

TRAFFIC BARRIER TERMINAL, TY. 5A	
LT. STA. 9+04.02 TO 9+17.27	= 1 EACH
RT. STA. 9+09.32 TO 9+22.57	= 1 EACH
LT. STA. 10+77.44 TO 10+90.69	= 1 EACH
RT. STA. 10+82.73 TO 10+95.98	= 1 EACH
TOTAL = 4 EACH	

TRAFFIC BARRIER TERMINAL, TY. 1 SPECIAL (TANGENT)	
LT. STA. 8+54.02 TO 9+04.02	= 1 EACH
RT. STA. 8+59.32 TO 9+09.32	= 1 EACH
LT. STA. 10+90.69 TO 11+40.69	= 1 EACH
RT. STA. 10+95.98 TO 11+45.98	= 1 EACH
TOTAL = 4 EACH	

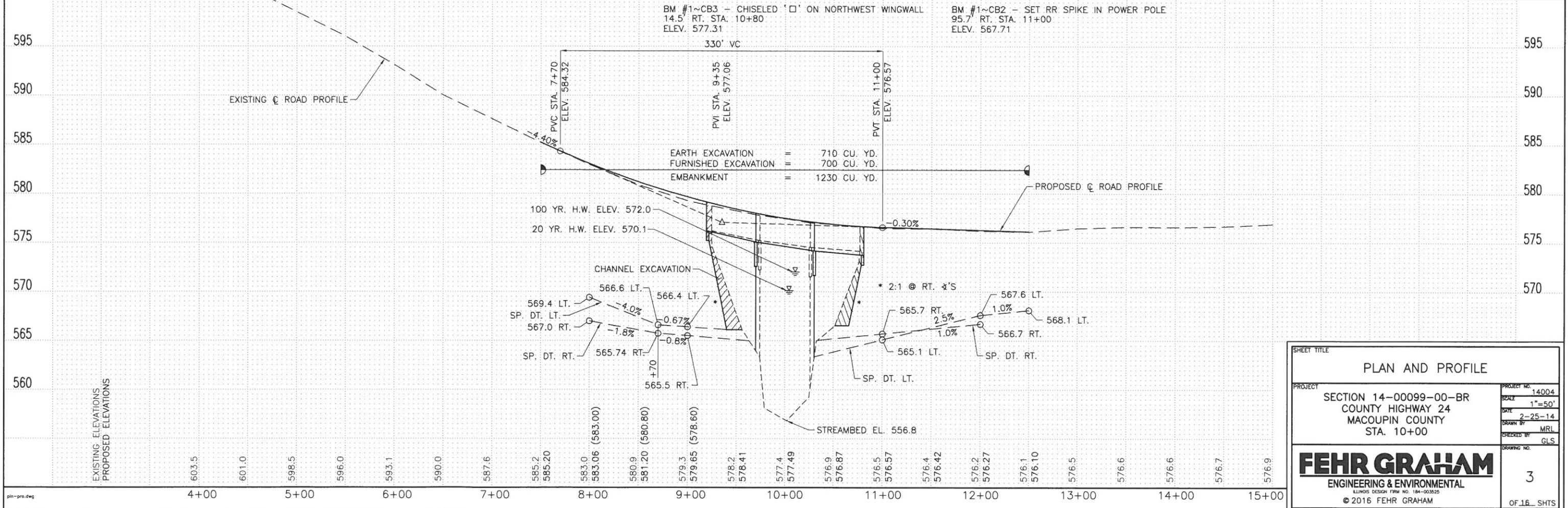
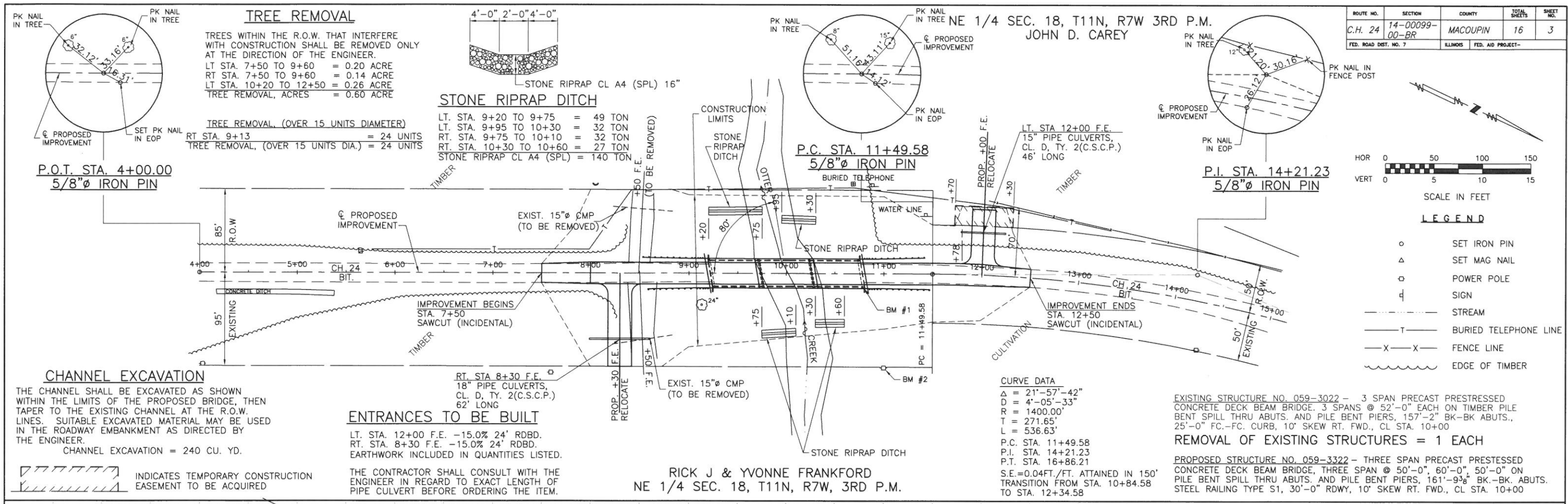


FIELD ENTRANCE DETAIL



SECTION A-A

SHEET TITLE SUMMARY OF QUANTITIES & TYPICAL CROSS SECTION	
PROJECT SECTION 14-00099-00-BR COUNTY HIGHWAY 24 MACOUPIN COUNTY STA. 10+00	PROJECT NO. 14004
SCALE DATE DRAWN BY CHECKED BY	SCALE 2-23-18 MRL MCB
ENGINEERING & ENVIRONMENTAL LICENSE DESIGN FIRM NO. 16-000022 © 2018 FEHR GRAHAM	
2 OF 16 SHTS	



SHEET TITLE
PLAN AND PROFILE

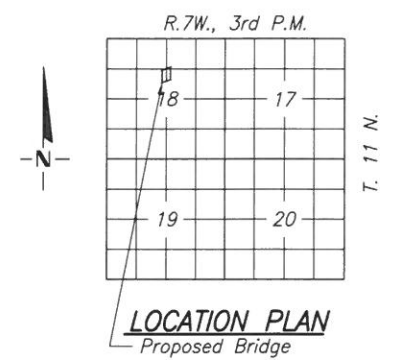
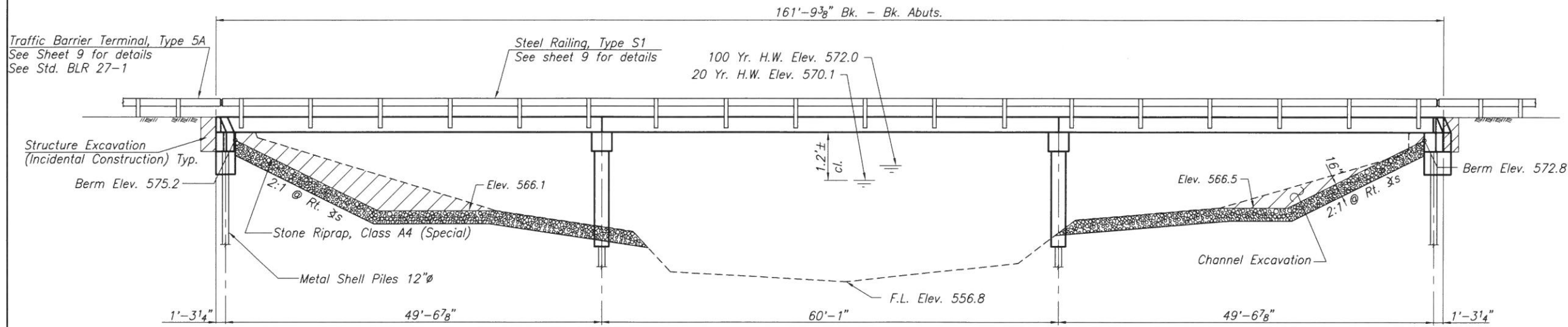
PROJECT
SECTION 14-00099-00-BR
COUNTY HIGHWAY 24
MACOUPIN COUNTY
STA. 10+00

PROJECT NO. 14004
SCALE 1"=50'
DATE 2-25-14
DRAWN BY MRL
CHECKED BY GLS
DRAWING NO. 3

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ENGINEERING & ENVIRONMENTAL
ILLINOIS DESIGN FIRM NO. 184-003525
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OF 16 SHEETS

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
C.H. 24	14-00099-00-BR	MACOUPIN	16	4
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	



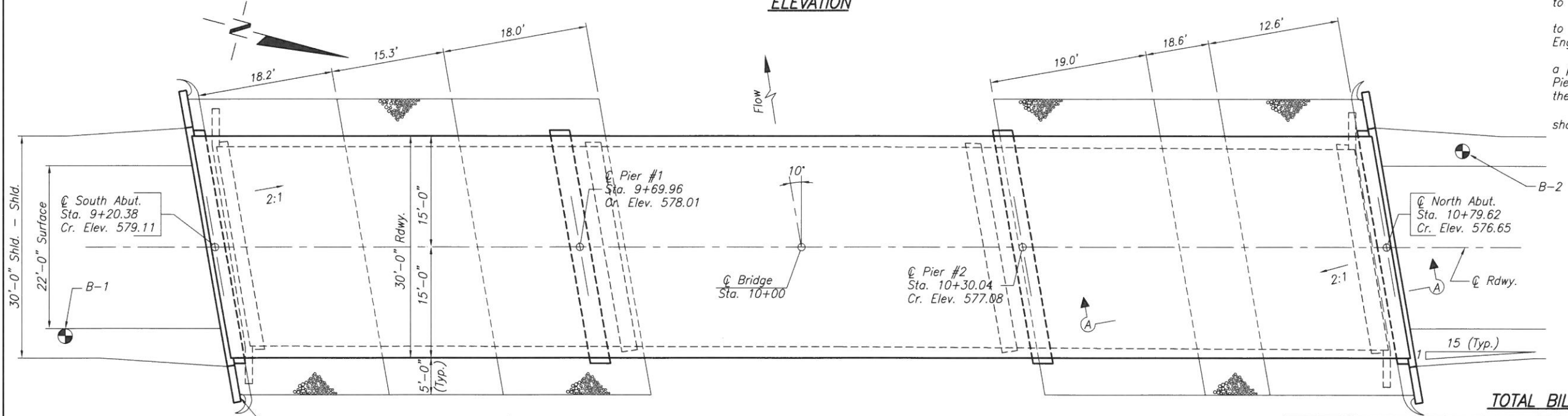
GENERAL NOTES

The Standard Specifications adopted by the Department of Transportation, April 1, 2016 shall apply to this work.
 The layout of riprap may be varied in the field to better suit ground conditions, as directed by the Engineer.
 The Contractor shall drive one steel test pile in a permanent location at the South Abutment and at Pier #2, as directed by the Engineer, before ordering the remainder of the piles.
 Hot Mix Asphalt Surface Course, Mix "C", N50, shall be used to level out the beam camber.

OTTER CREEK
 BUILT 201_ BY
 MACOUPIN COUNTY
 SEC. 14-00099-00-BR
 C.H. 24 STA. 10+00
 FA PROJ. COYR(728)
 STR. NO. 059-3322 LOADING HL 93

LETTERING FOR NAME PLATE
 See Std. 515001

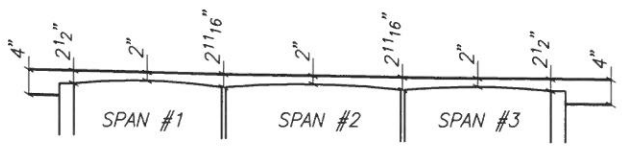
ELEVATION



TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Precast Prestressed Concrete Deck Beams (27" Depth)	Sq. Ft.	4,800		4,800
Concrete Structures	Cu. Yd.		40.1	40.1
Reinforcement Bars, Epoxy Coated	Pound		5,390	5,390
Steel Railing, Type S1	Foot	321		321
Name Plates	Each		1	1
Metal Shell Piles 12"Ø x 0.25"	Foot		920	920
Test Pile, Metal Shell	Each		2	2
Stone Riprap, Class A4 (Special)	Ton			338
Concrete Encasement	Cu. Yd.		31.1	31.1
Hot Mix Asphalt Surface Course, Mix "C", N50	Ton	79		79
Waterproofing Membrane System	Sq. Yd.	540		540
PC Mortar Fairing Course	Foot	360		360

PLAN

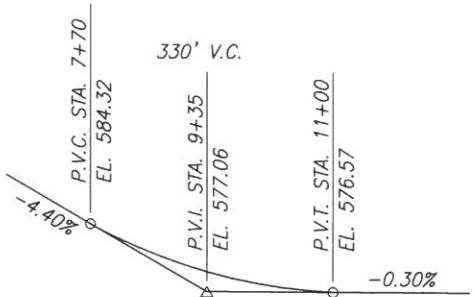


ANTICIPATED HMA WEARING SURFACE PROFILE
 Along Proposed Roadway Profile (For Information Only)

DESIGN SCOUR ELVATION TABLE

	S. Abut.	Pier #1	Pier #2	N. Abut.
Design Scour Elevation (ft.)	573.66	559.8	559.6	571.26

PROFILE GRADE



WATERWAY DATA

DRAINAGE AREA	51.82 SQ. MI.
EXISTING OPENING	887 SQ. FT.
REQUIRED OPENING	954 SQ. FT.
PROPOSED OPENING	954 SQ. FT.
DESIGN DISCHARGE (20YR.)	3840 C.F.S.
CREATED HEAD	0.50 FEET
100 YR. DISCHARGE	5745 C.F.S.
100 YR. CREATED HEAD	0.77 FEET

DESIGN STRESSES

f'c	= 6,000 psi (Prestressed Beams)
f'ci	= 5,000 psi (Prestressed Beams)
f's	= 270,000 psi (1/2"Ø Low Relaxation Strands)
f'si	= 201,960 psi (1/2"Ø Low Relaxation Strands)
f'c	= 3,500 psi (Substructure)
f'y	= 60,000 psi (Reinf. Bars)

Loading HL 93
 Design Specifications: 2014 AASHTO LRFD
 25#/Sq. Ft. included in dead load for future wearing surface.

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".



Mary Coombe Bloxdorf 04/02/18
 ILLINOIS STRUCTURAL NO. 4859 EXP. 11-30-18

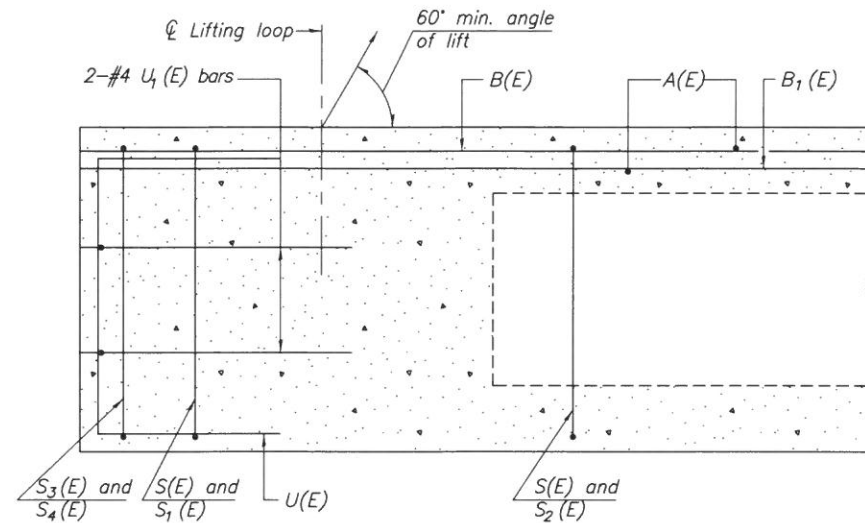
SHEET TITLE
GENERAL PLAN & ELEVATION

PROJECT: SECTION 14-00099-00-BR
 COUNTY HIGHWAY 24
 MACOUPIN COUNTY
 STATION 10+00

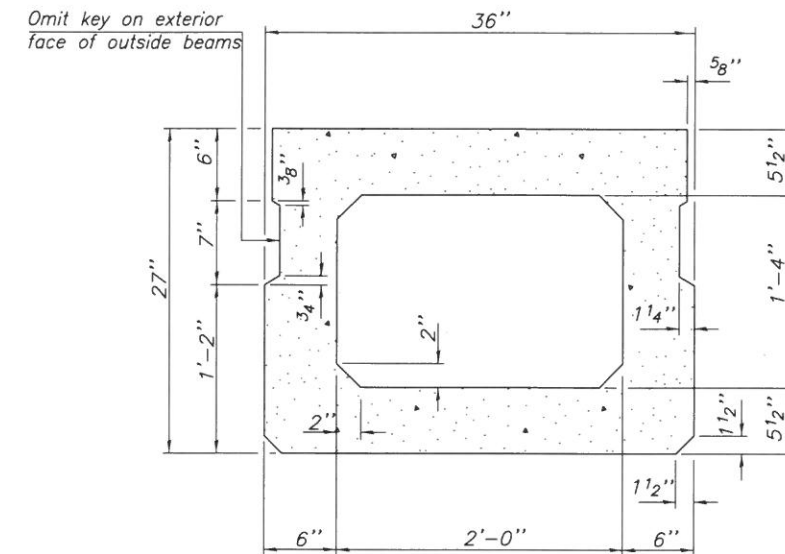
PROJECT NO. 14004
 SCALE: 2-23-18
 DATE: 2-23-18
 DRAWN BY: MRL
 CHECKED BY: MCB
 DRAWING NO. 4

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 ENGINEERING & ENVIRONMENTAL
 ILLINOIS DESIGN FIRM NO. 184-00355
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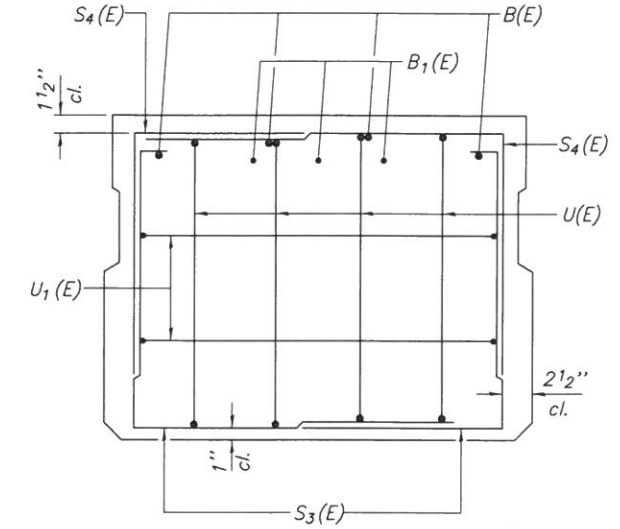
OF 16 SHEETS



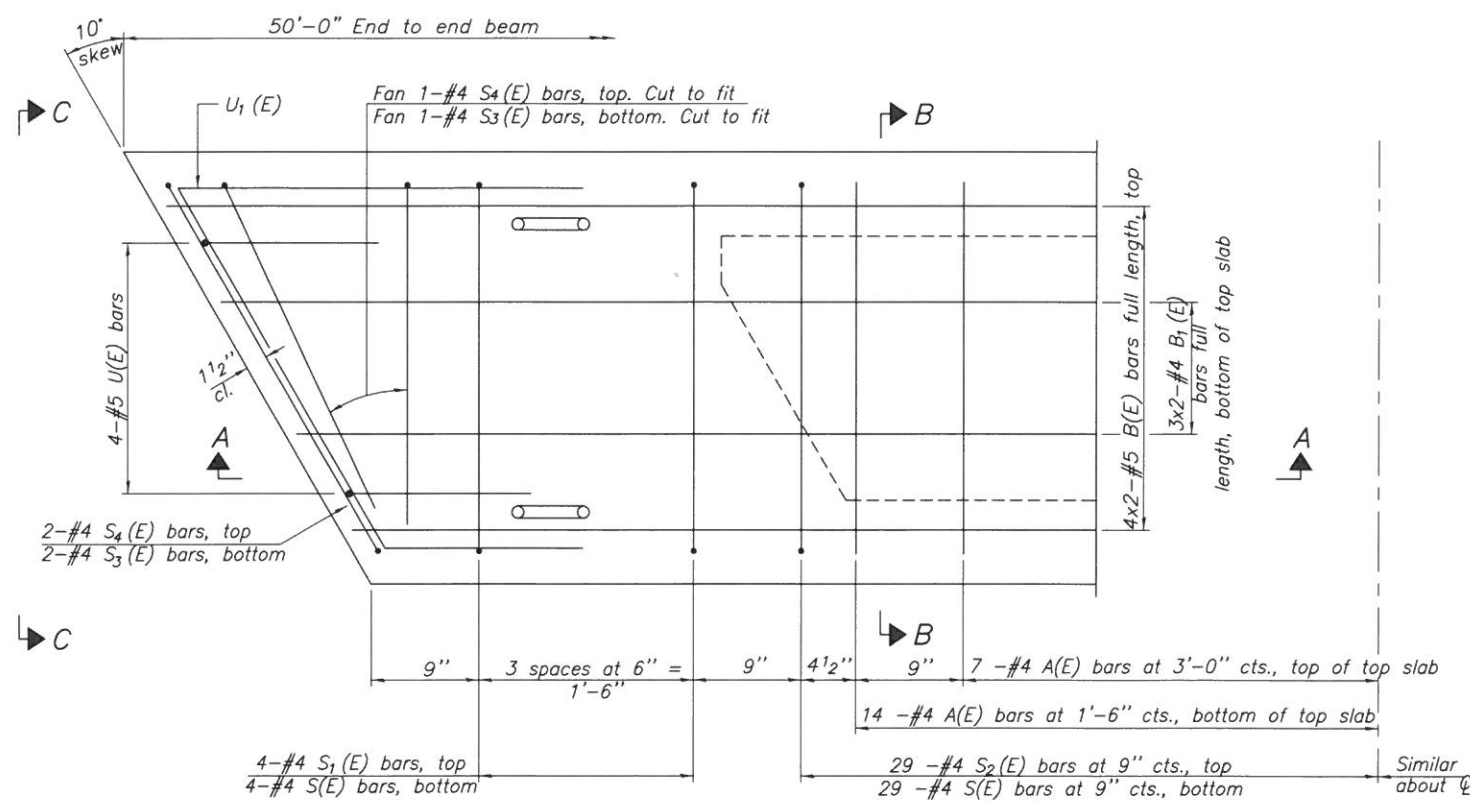
SECTION A-A



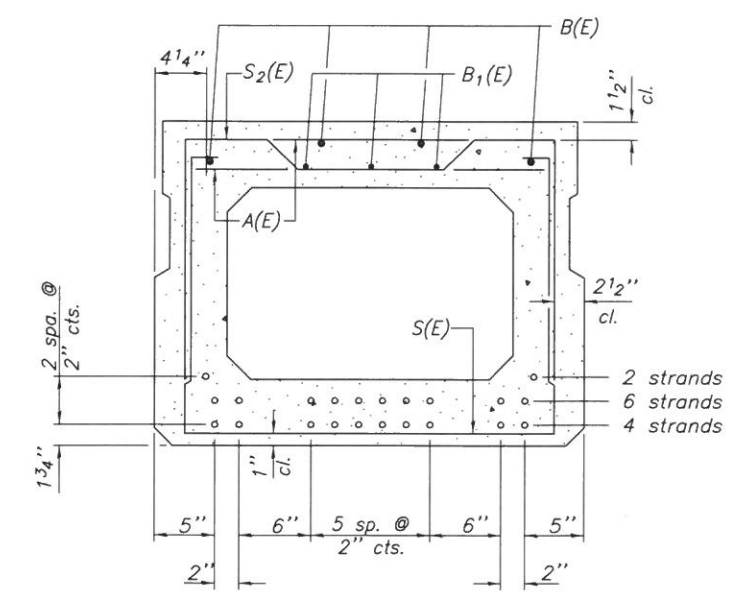
SECTION B-B
(Showing dimensions)



VIEW C-C



PLAN VIEW



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)	42	#4	2'-7"	—
B(E)	8	#5	26'-2"	—
B1(E)	6	#4	25'-11"	—
S(E)	66	#4	7'-5"	U
S1(E)	8	#4	5'-11"	U
S2(E)	58	#4	6'-2"	U
S3(E)	6	#4	4'-9"	U
S4(E)	6	#4	4'-0"	U
U(E)	8	#5	4'-6"	U
U1(E)	4	#4	5'-6"	U

Note: See sheet 6 of 16 for additional details and Bill of Material.

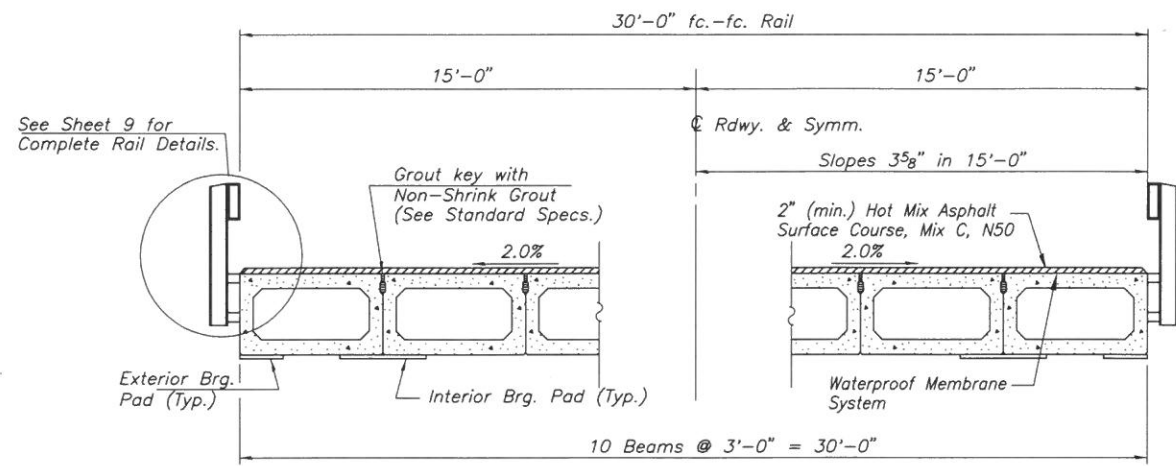
MINIMUM BAR LAP

#4 bar = 2'-5"
#5 bar = 3'-0"

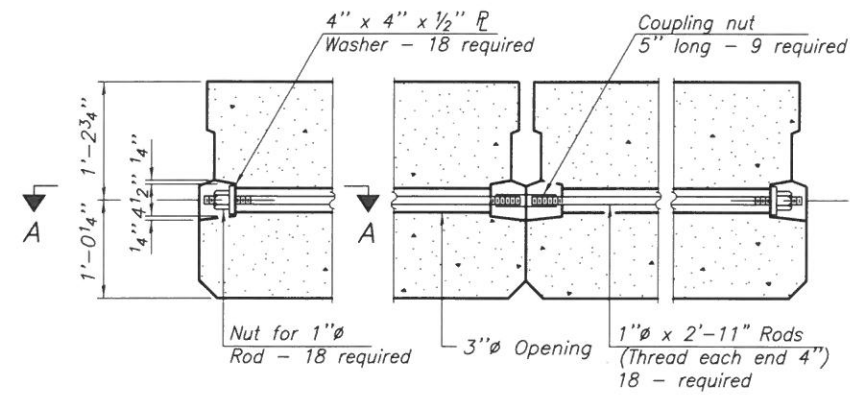
Note: Spacing of S(E) and S2(E) bars may be adjusted up to 4" in the immediate area of the transverse tie diaphragms to miss the block outs for the transverse ties.

SHEET TITLE		SUPERSTRUCTURE SPANS 1 & 3	
PROJECT	SECTION 14-00099-00-BR	PROJECT NO.	14004
	COUNTY HIGHWAY 24	SCALE	1/4" = 1'-0"
	MACOUPIN COUNTY	DATE	2-23-18
	STATION 10+00	DRAWN BY	MRL
		CHECKED BY	MCB
		DRAWING NO.	5
ENGINEERING & ENVIRONMENTAL			
ILLINOIS DESIGN FIRM NO. 184-000205			
© 2018 FEHR GRAHAM			
			OF 16 SHEETS

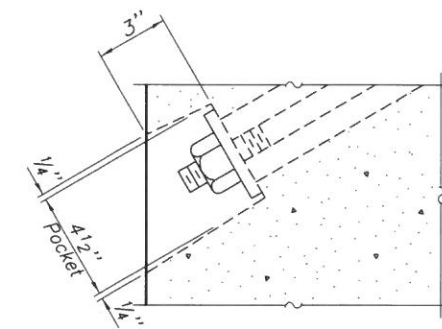
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
C.H. 24	14-00099-00-BR	MACOUPIN	16	6
FED. ROAD DIST. NO. 7	ILLINOIS		FED. AID PROJECT-	



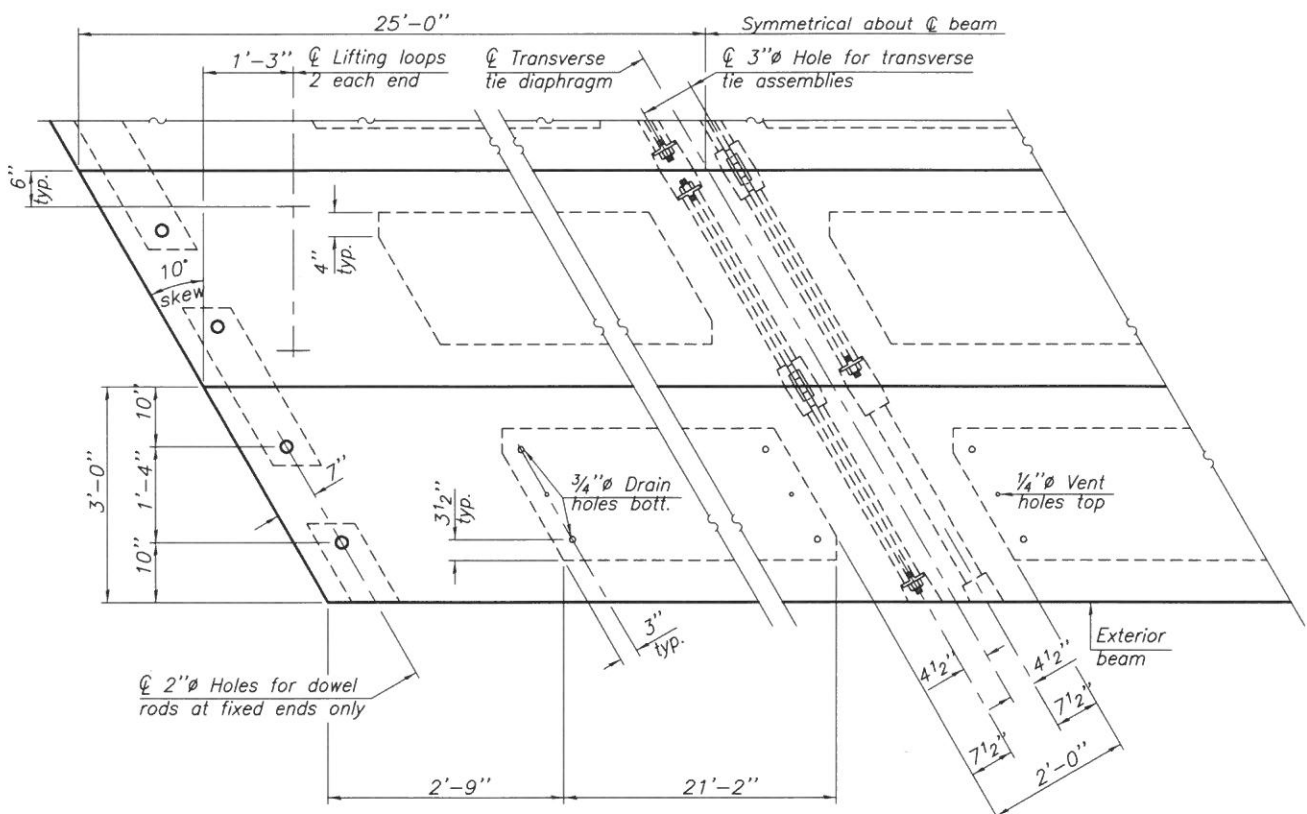
CROSS SECTION



TYPICAL TRANSVERSE TIE ASSEMBLY

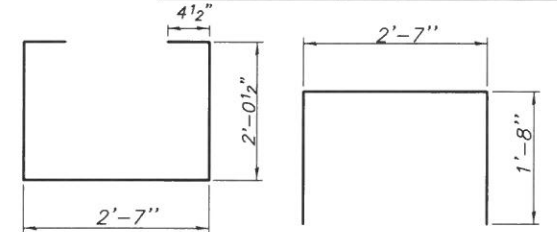


SECTION A-A



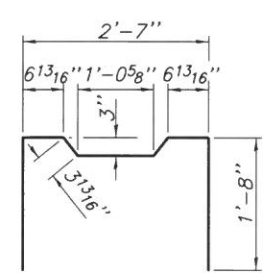
PLAN VIEW

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



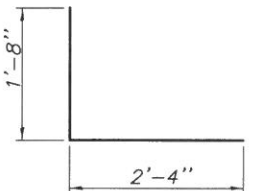
BAR S1(E)

BAR S(E)

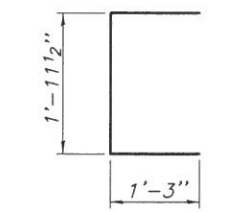


BAR S2(E)

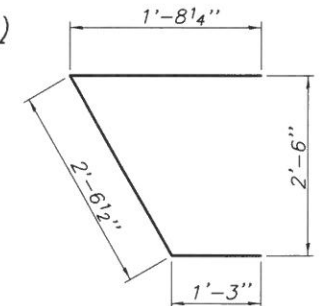
BAR S3(E)



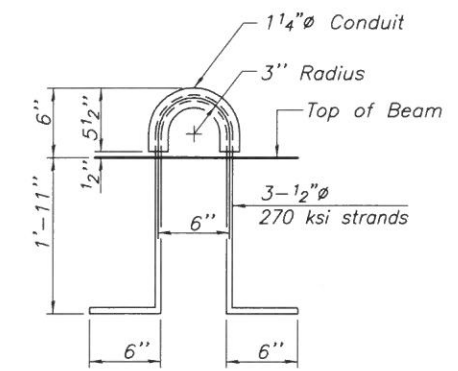
BAR S4(E)



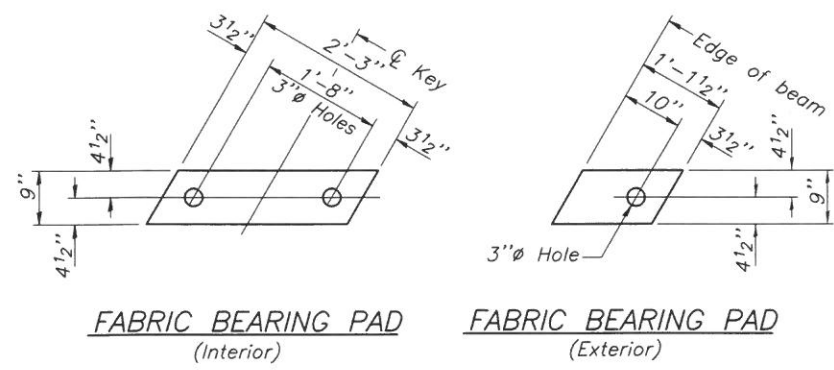
BAR U(E)



BAR U1(E)



LIFTING LOOP DETAIL



FABRIC BEARING PAD (Interior)

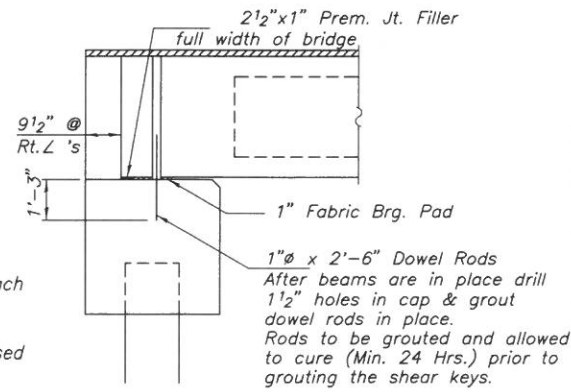
FABRIC BEARING PAD (Exterior)

FIXED

Notes: All bearing pads shall be 1" thick.

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. Reinforcement bars shall conform to ASTM A 706, Grade 60. (See Special Provisions). 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" 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.

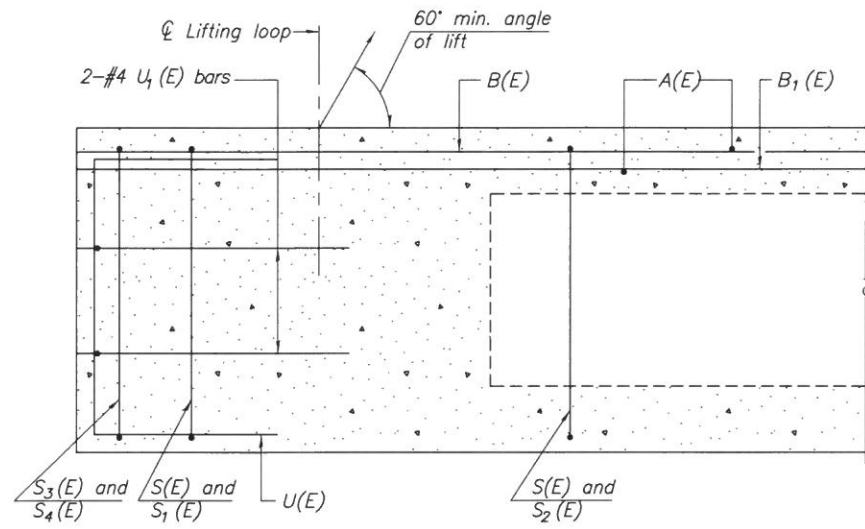


SECTION AT ABUTMENTS

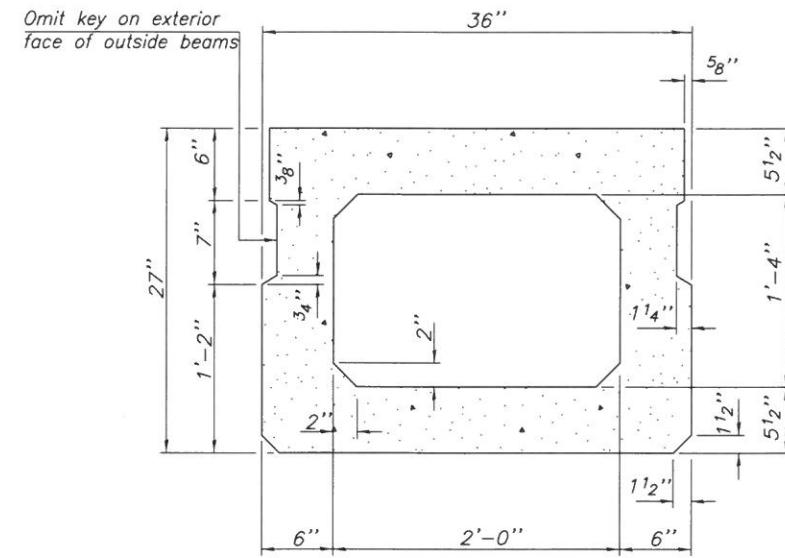
BILL OF MATERIAL

Precast Prestressed Conc. Deck Bms. (27" depth)	Sq. Ft.	3000
---	---------	------

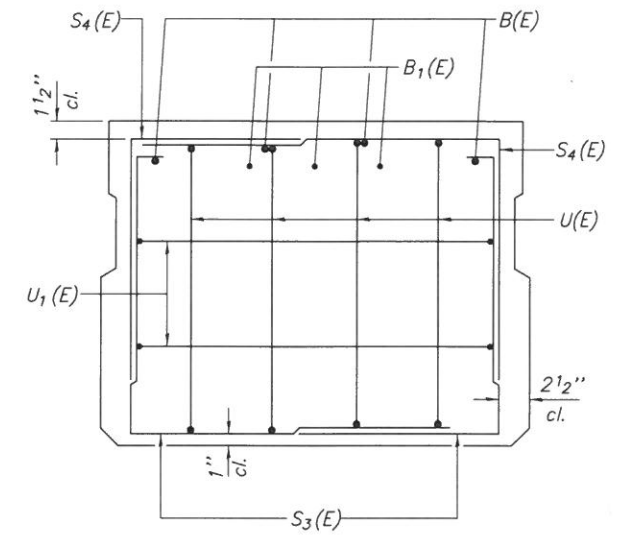
SHEET TITLE		PROJECT NO.	
SUPERSTRUCTURE DETAILS SPANS 1 & 3		14004	
PROJECT		DATE	SCALE
SECTION 14-00099-00-BR COUNTY HIGHWAY 24 MACOUPIN COUNTY STATION 10+00		2-23-18	
DRAWN BY		CHECKED BY	DRAWING NO.
MRL		MCB	6
FEHR GRAHAM ENGINEERING & ENVIRONMENTAL <small>ILLINOIS DESIGN FIRM NO. 104-033525</small> © 2018 FEHR GRAHAM		OF 16 SHEETS	



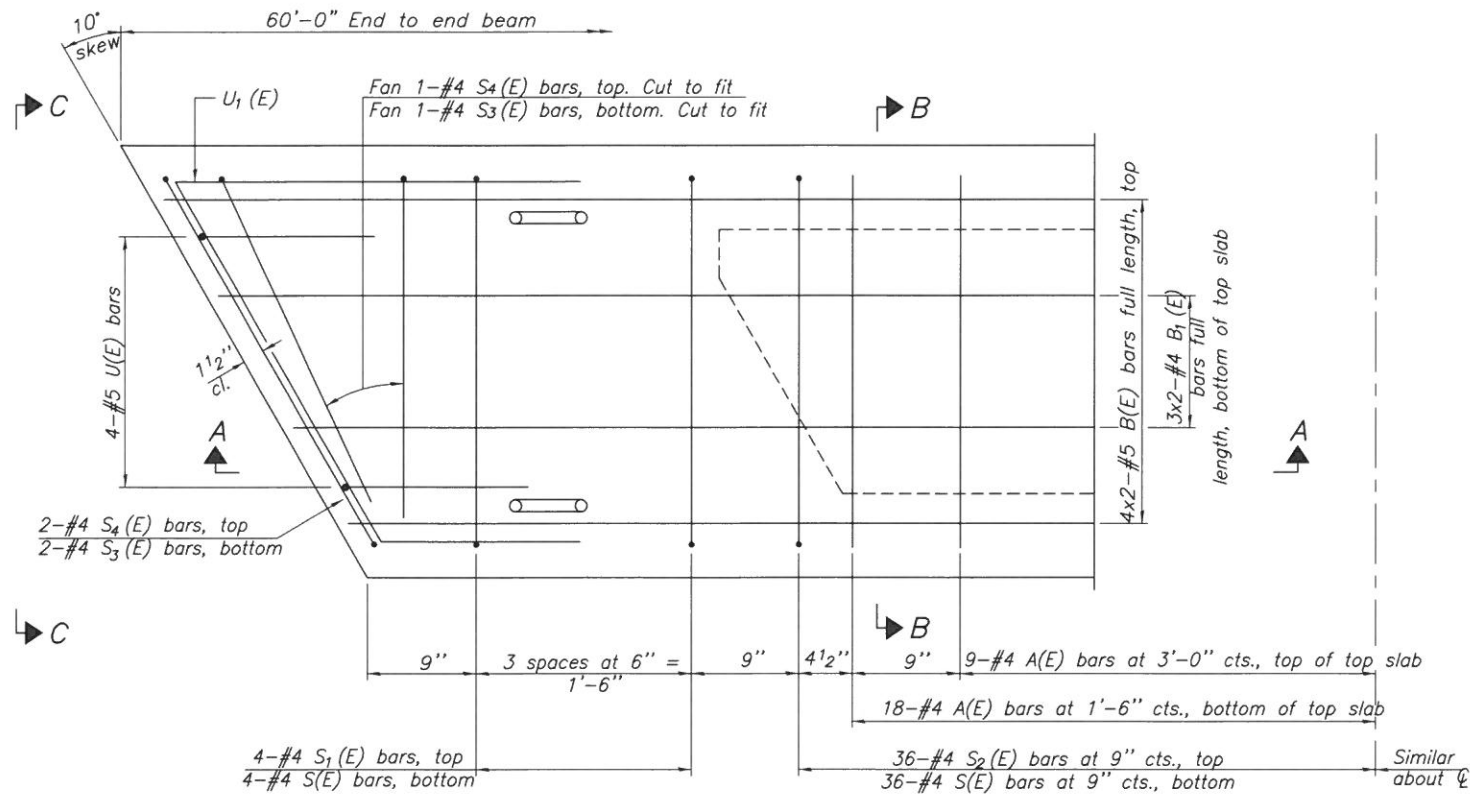
SECTION A-A



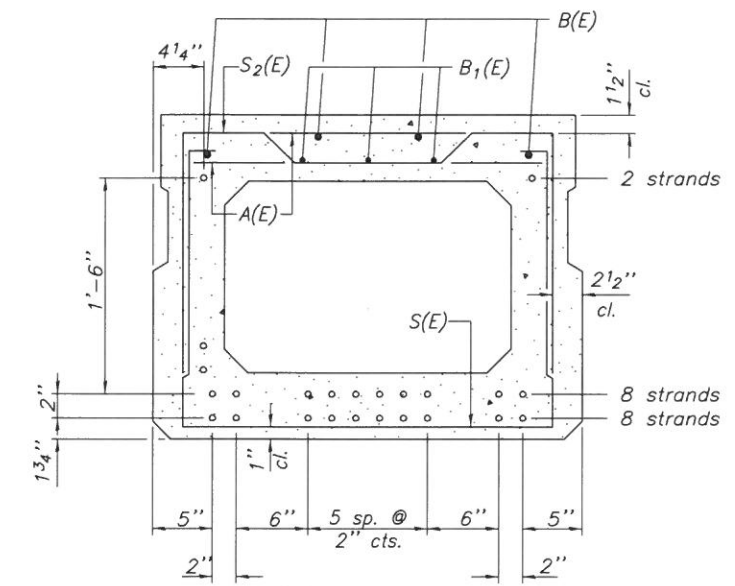
SECTION B-B
(Showing dimensions)



VIEW C-C



PLAN VIEW



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)	54	#4	2'-7"	—
B(E)	8	#5	31'-2"	—
B1(E)	6	#4	30'-11"	—
S(E)	80	#4	7'-5"	┌
S1(E)	8	#4	5'-11"	┌
S2(E)	72	#4	6'-2"	┌
S3(E)	6	#4	4'-9"	┌
S4(E)	6	#4	4'-0"	┌
U(E)	8	#5	4'-6"	┌
U1(E)	4	#4	5'-6"	┌

Note: See sheet 8 of 16 for additional details and Bill of Material.

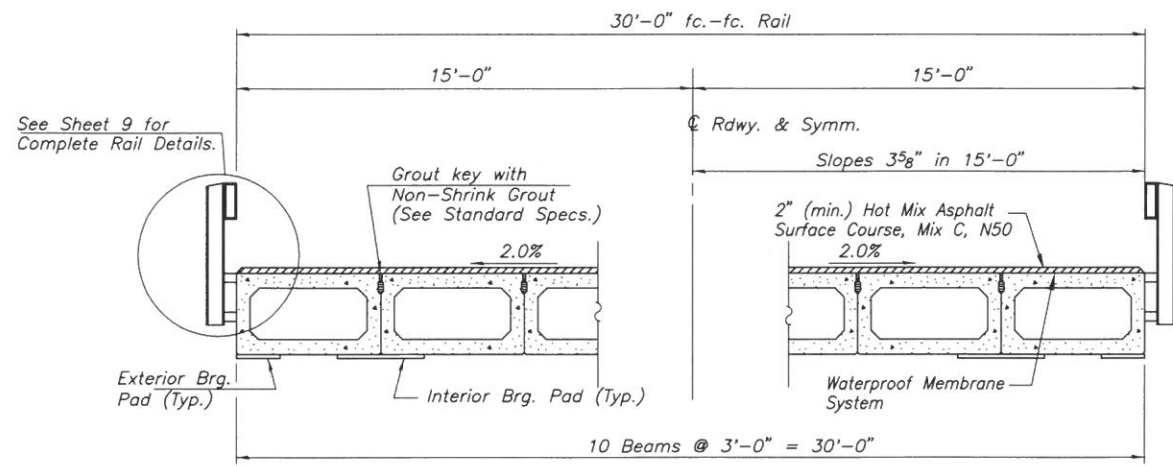
MINIMUM BAR LAP

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.

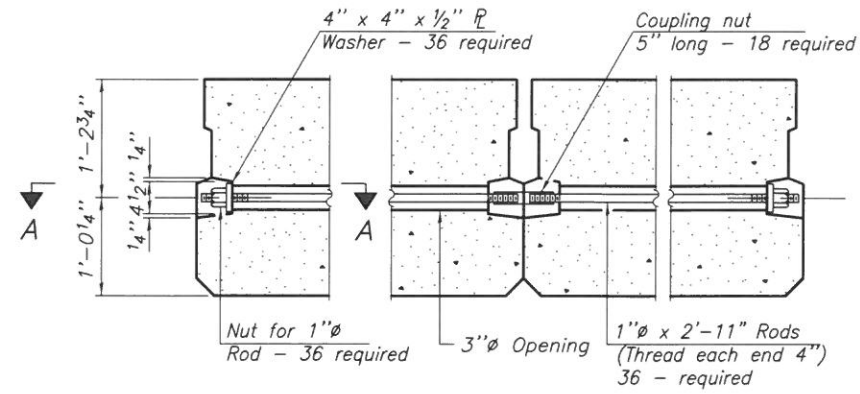
#4 bar = 2'-5"
#5 bar = 3'-0"

SHEET TITLE		SUPERSTRUCTURE SPAN 2	
PROJECT	SECTION 14-00099-00-BR	PROJECT NO.	14004
	COUNTY HIGHWAY 24	SCALE	
	MACOUPIN COUNTY	DATE	2-23-18
	STATION 10+00	DRAWN BY	MRL
		CHECKED BY	MCB
FEHR GRAHAM ENGINEERING & ENVIRONMENTAL <small>ILLINOIS DESIGN FIRM NO. 184-003825</small> © 2018 FEHR GRAHAM		DRAWING NO.	7
		OF 16 SHEETS	

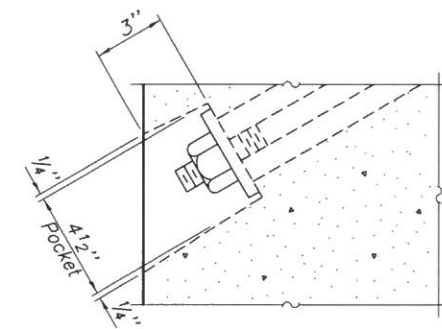
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
C.H. 24	14-00099-00-BR	MACOUPIN	16	8
FED. ROAD DIST. NO. 7	ILLINOIS		FED. AID PROJECT-	



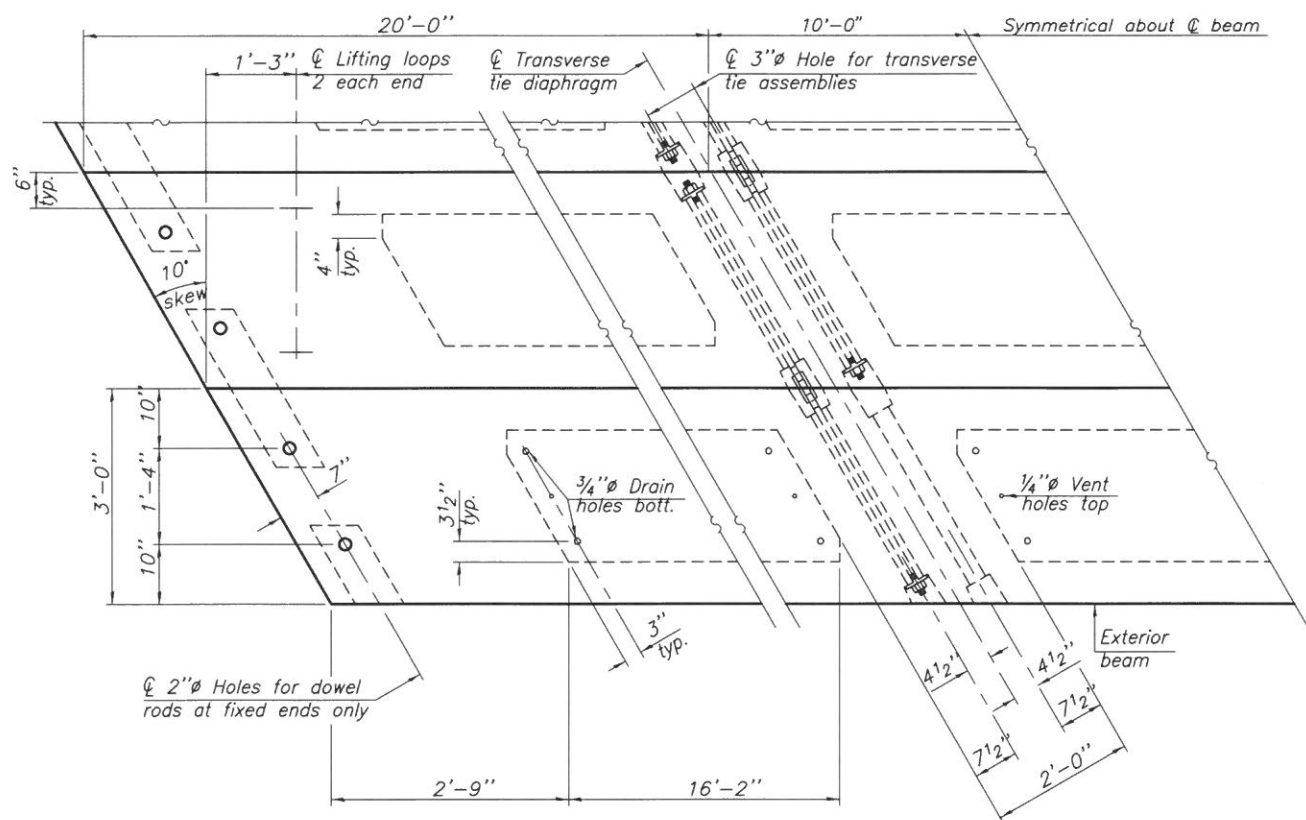
CROSS SECTION



TYPICAL TRANSVERSE TIE ASSEMBLY



SECTION A-A



PLAN VIEW

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

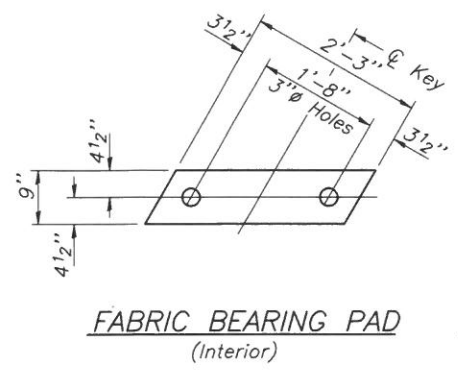
NOTES

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.

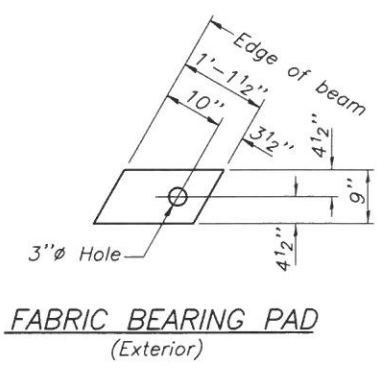
Reinforcement bars shall conform to ASTM A 706, Grade 60. (See Special Provisions). Two 1/8" fabric adjusting shims of the dimensions of the exterior bearing pad shall be provided for each bearing pad location.

A minimum 2 1/2" 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.



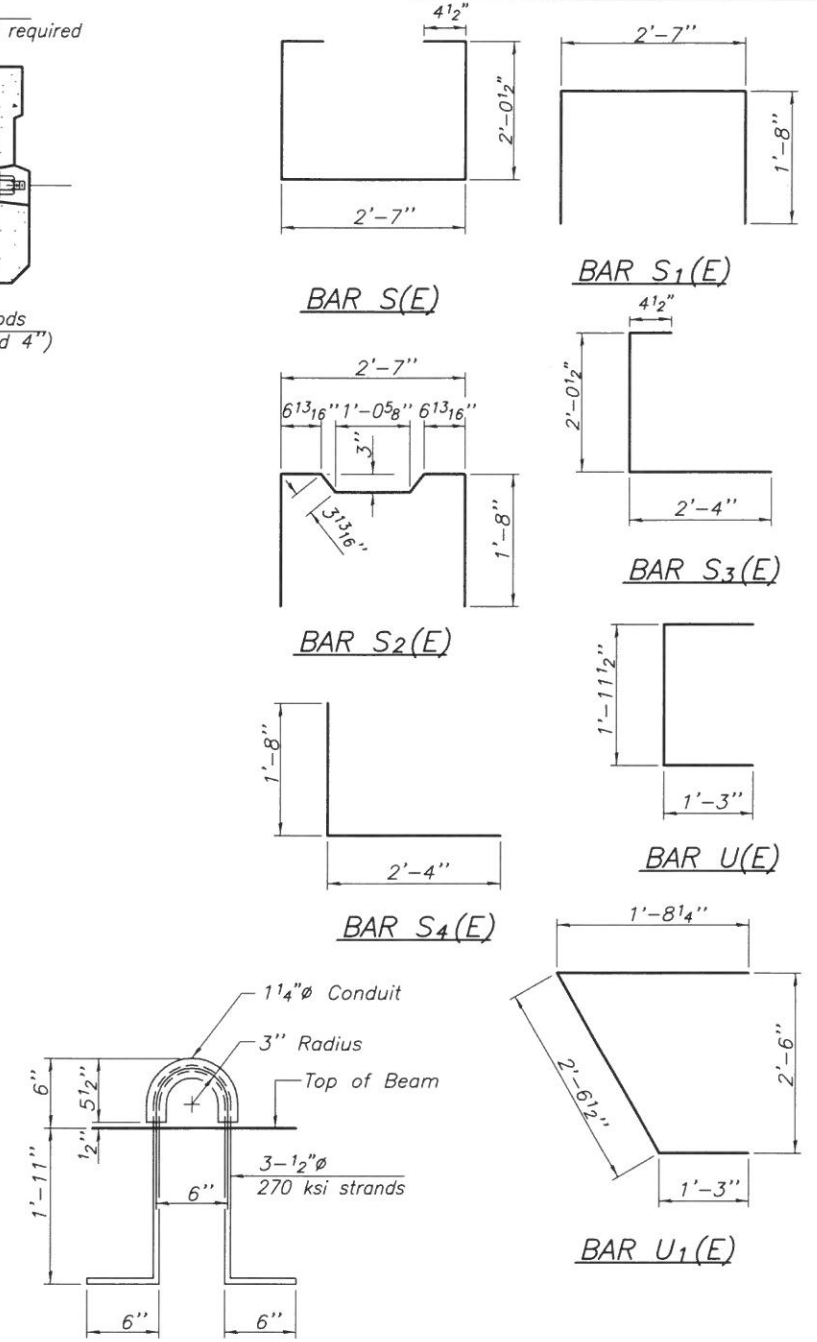
FABRIC BEARING PAD (Interior)



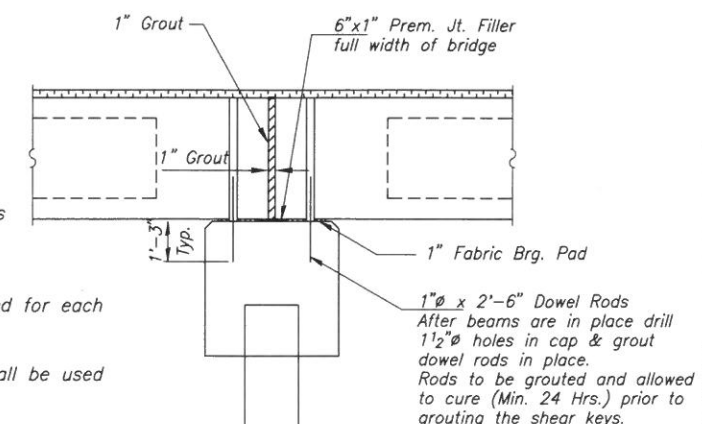
FABRIC BEARING PAD (Exterior)

FIXED

Notes: All bearing pads shall be 1" thick.



LIFTING LOOP DETAIL

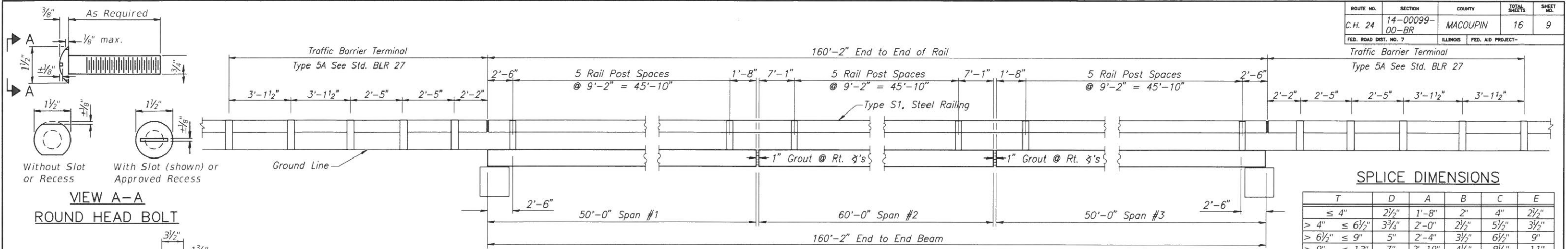


SECTION AT PIERS

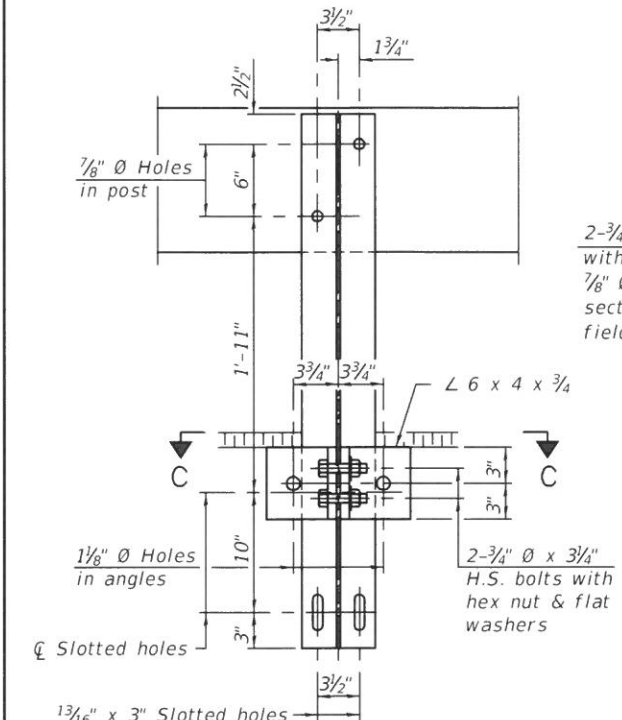
BILL OF MATERIAL

Precast Prestressed Conc. Deck Bms. (27" depth)	Sq. Ft.	1800
---	---------	------

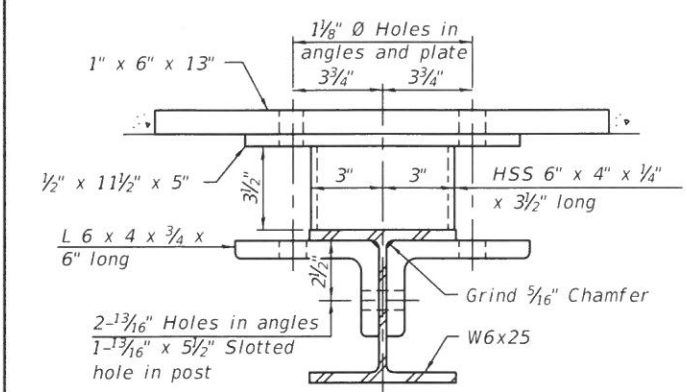
SHEET TITLE SUPERSTRUCTURE DETAILS SPAN 2		PROJECT NO. 14004
PROJECT SECTION 14-00099-00-BR COUNTY HIGHWAY 24 MACOUPIN COUNTY STATION 10+00		SCALE 2-23-18
DRAWN BY MRL		CHECKED BY MCB
FEHR GRAHAM ENGINEERING & ENVIRONMENTAL ILLINOIS DESIGN FIRM NO. 184-00355		DRAWING NO. 8
© 2018 FEHR GRAHAM		OF 16 SHEETS



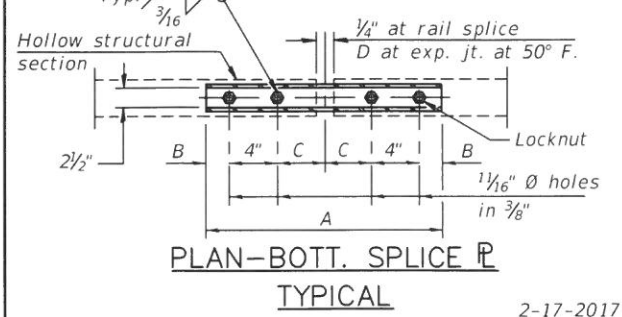
VIEW A-A
ROUND HEAD BOLT



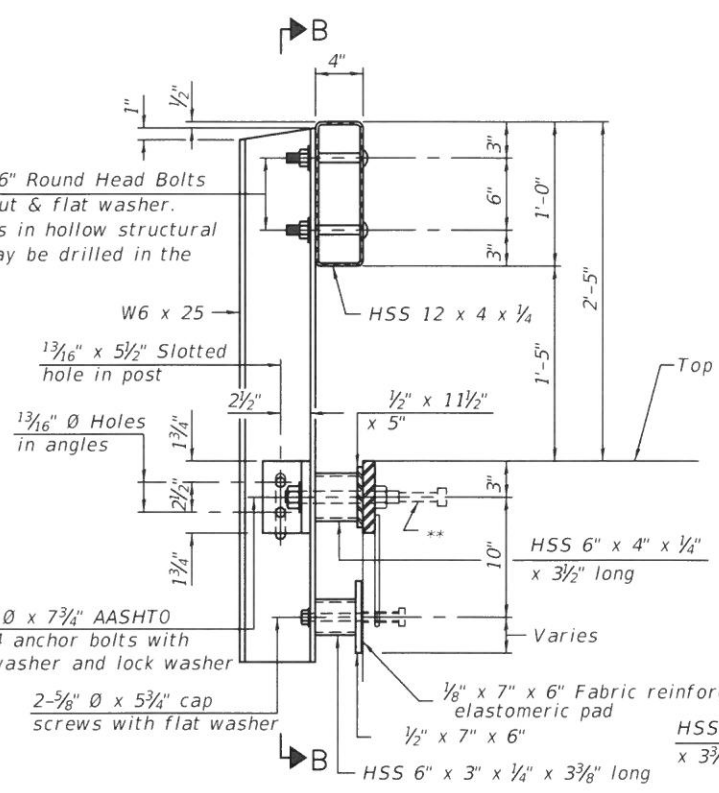
SECTION B-B



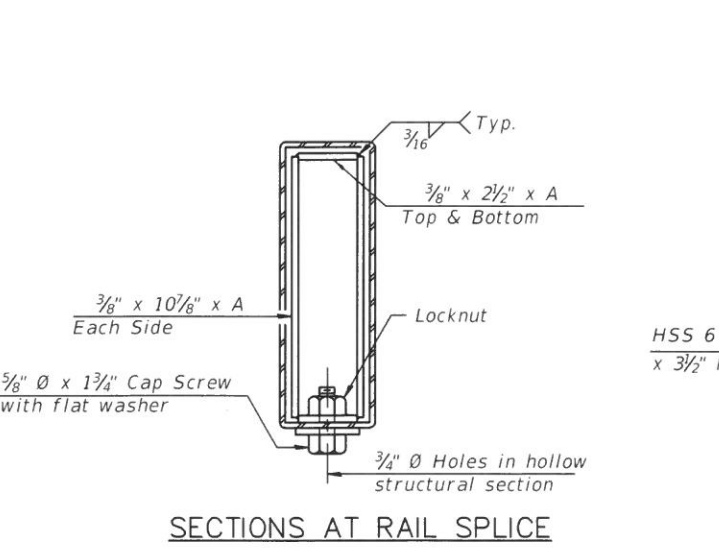
SECTION C-C



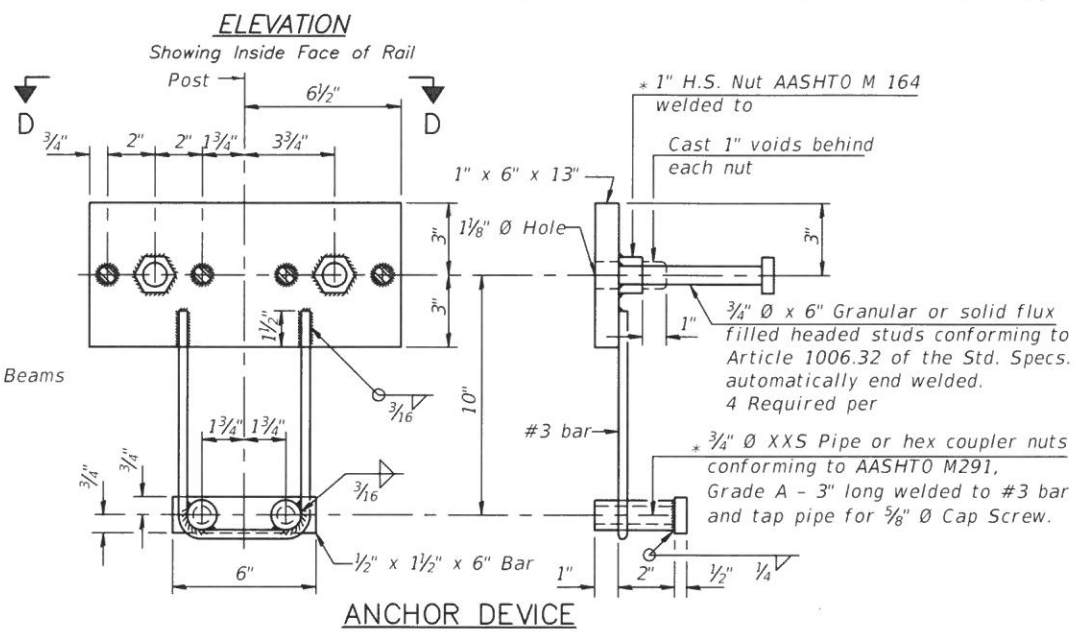
PLAN-BOTT. SPLICE TYPICAL



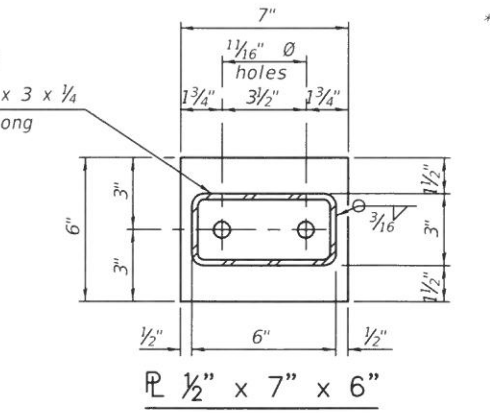
SECTION AT RAILING POST



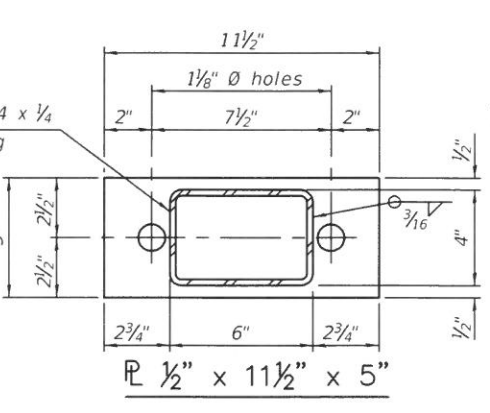
SECTIONS AT RAIL SPLICE



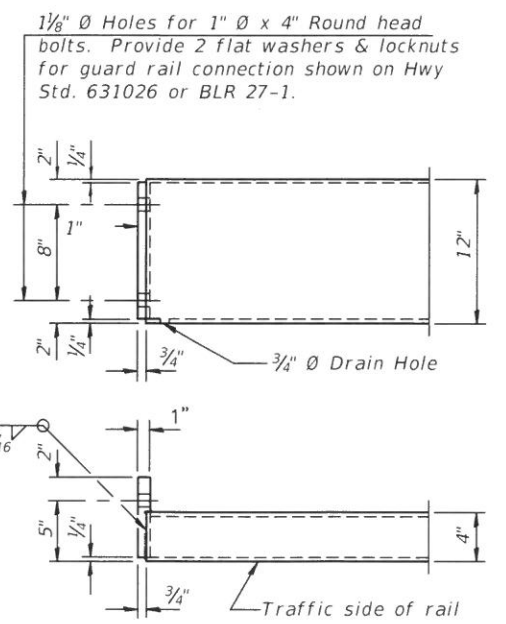
ANCHOR DEVICE



PL 1/2" x 7" x 6"



PL 1/2" x 11 1/2" x 5"



END OF RAIL DETAILS

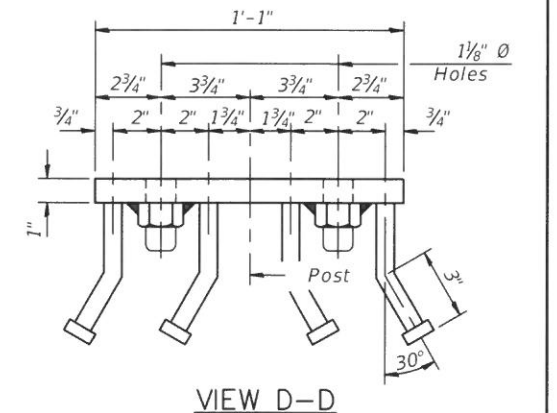
SPLICE DIMENSIONS

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

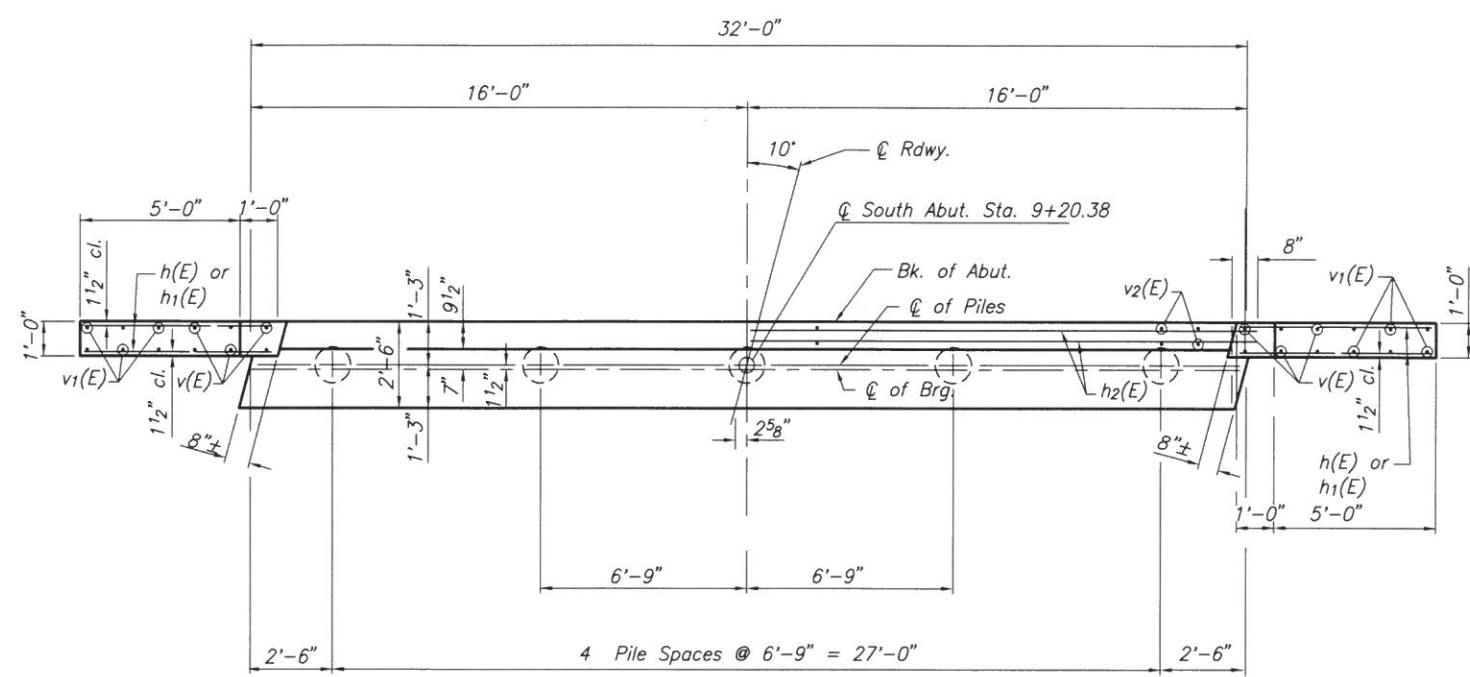


VIEW D-D

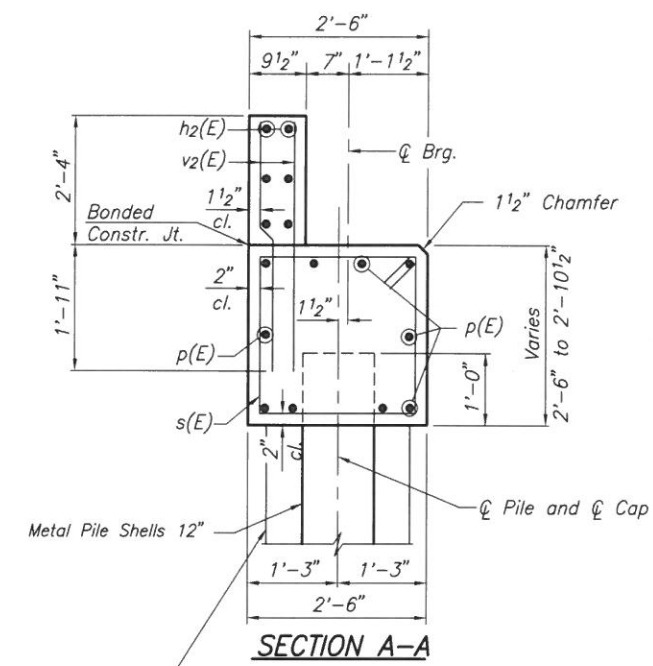
BILL OF MATERIAL

Item	Unit	Quantity
Steel Railing, Type S-1	Foot	321

SHEET TITLE		STEEL RAILING, TYPE S1	
PROJECT	SECTION 14-00099-00-BR	COUNTY HIGHWAY 24	MACOUPIN COUNTY
STATION	STATION 10+00		
FEHR GRAHAM		ENGINEERING & ENVIRONMENTAL	
© 2018 FEHR GRAHAM		OF 16 SHTS	

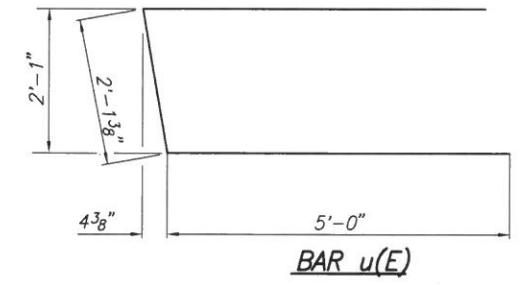


PLAN

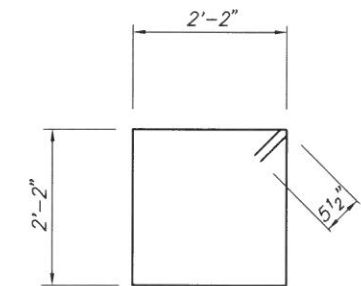


SECTION A-A

See Sheet 13 for Concrete Encasement details.

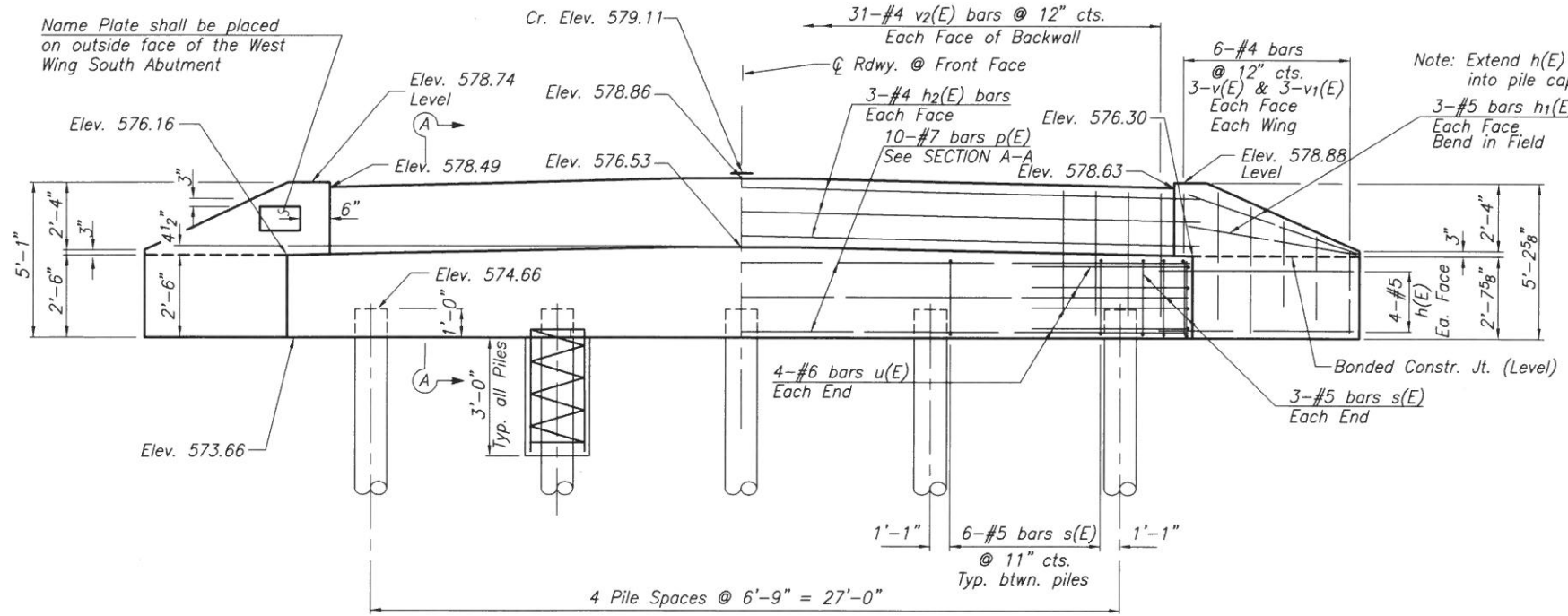


BAR u(E)



BAR s(E)

Note: After all beams are in place and dowel rods grouted, the backwall and portions of the wingwall above the bonded construction joint shall be poured.



ELEVATION

PILE DATA

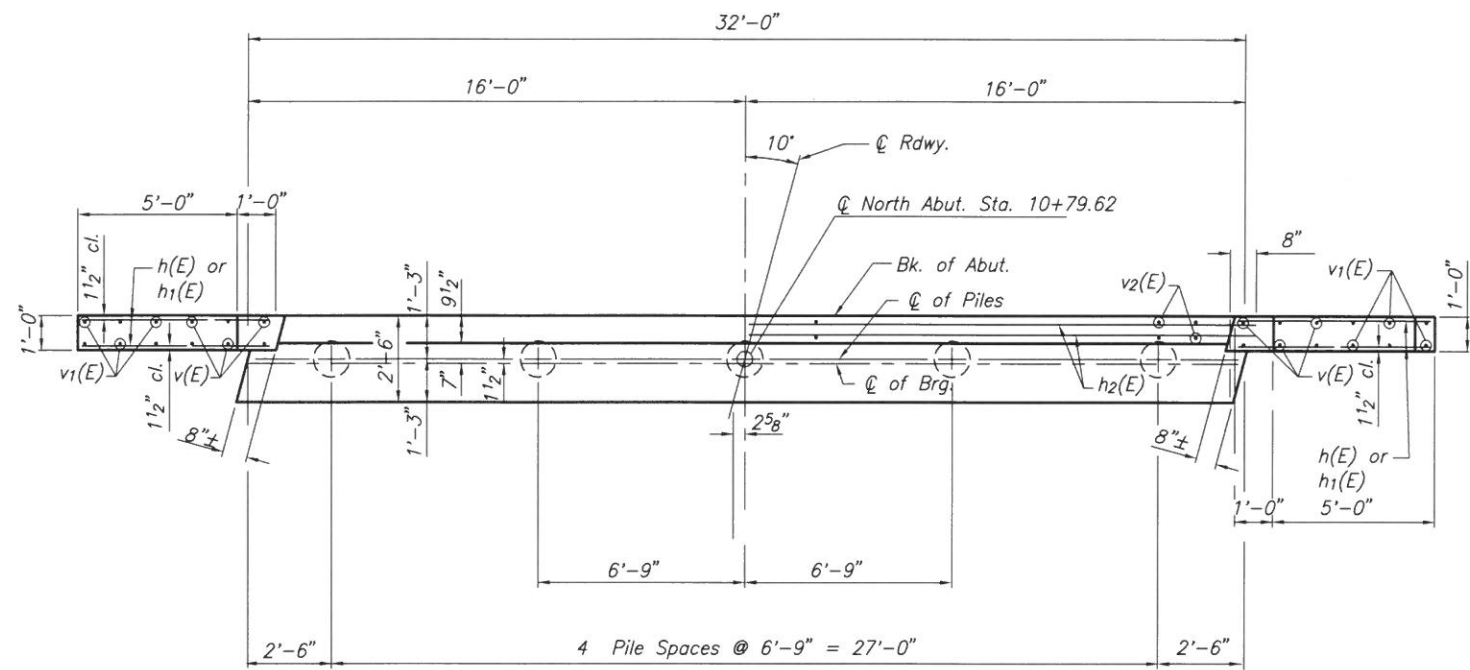
Type: Metal Shell - 12" ϕ x 0.25" walls
 Nominal Required Bearing 232 Kips
 Factored Resistance Available 116 Kips
 Est. Length 35 ft.
 Number Required 5*

*Includes one metal shell test pile to be driven in a permanent location.

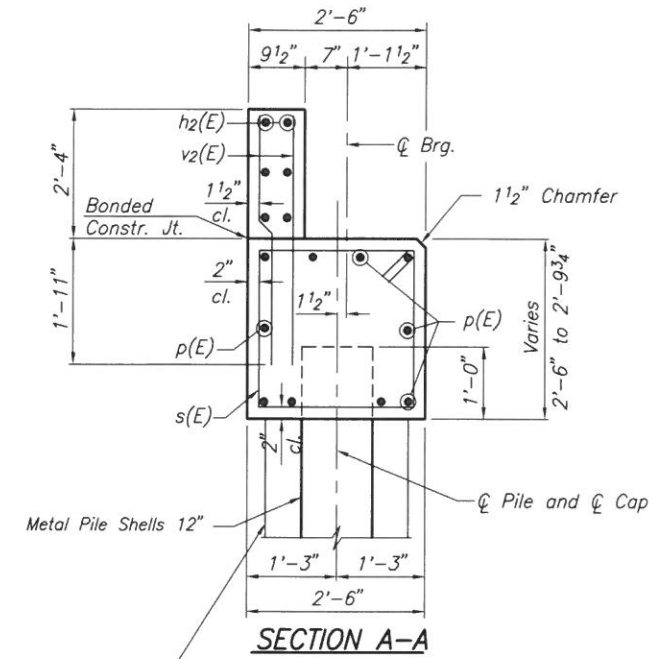
BILL OF MATERIAL - 1 ABUT.

BAR	NO.	SIZE	LENGTH	SHAPE
h(E)	16	#5	7'-0"	—
h1(E)	12	#5	5'-9"	—
h2(E)	6	#4	32'-6"	—
p(E)	10	#7	31'-8"	—
s(E)	30	#5	9'-7"	□
u(E)	8	#6	12'-2"	≡
v(E)	12	#4	4'-1"	—
v1(E)	12	#4	2'-8"	—
v2(E)	62	#4	4'-4"	—
Concrete Structures			Cu. Yd.	11.8
Reinforcement Bars, Epoxy Coated			Pound	1,650
Metal Shell Piles 12" x 0.25"			Foot	140
Test Pile, Metal Shells			Each	1
Conc. Encasement			Cu. Yd.	2.3

SHEET TITLE		SOUTH ABUTMENT	
PROJECT	SECTION 14-00099-00-BR COUNTY HIGHWAY 24 MACOUPIN COUNTY STATION 10+00	PROJECT NO.	14004
SCALE		DATE	2-23-18
DRAWN BY	MRL	CHECKED BY	MCB
		DRAWING NO.	10
ENGINEERING & ENVIRONMENTAL ILLINOIS DESIGN FIRM NO. 104-003025 © 2018 FEHR GRAHAM		OF 16 SHEETS	

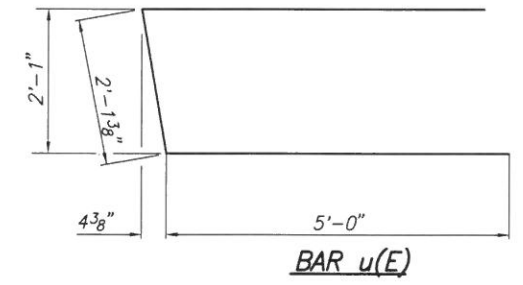


PLAN

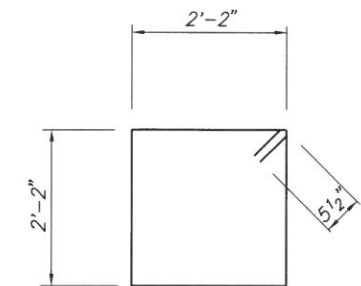


SECTION A-A

See Sheet 13 for Concrete Encasement details.

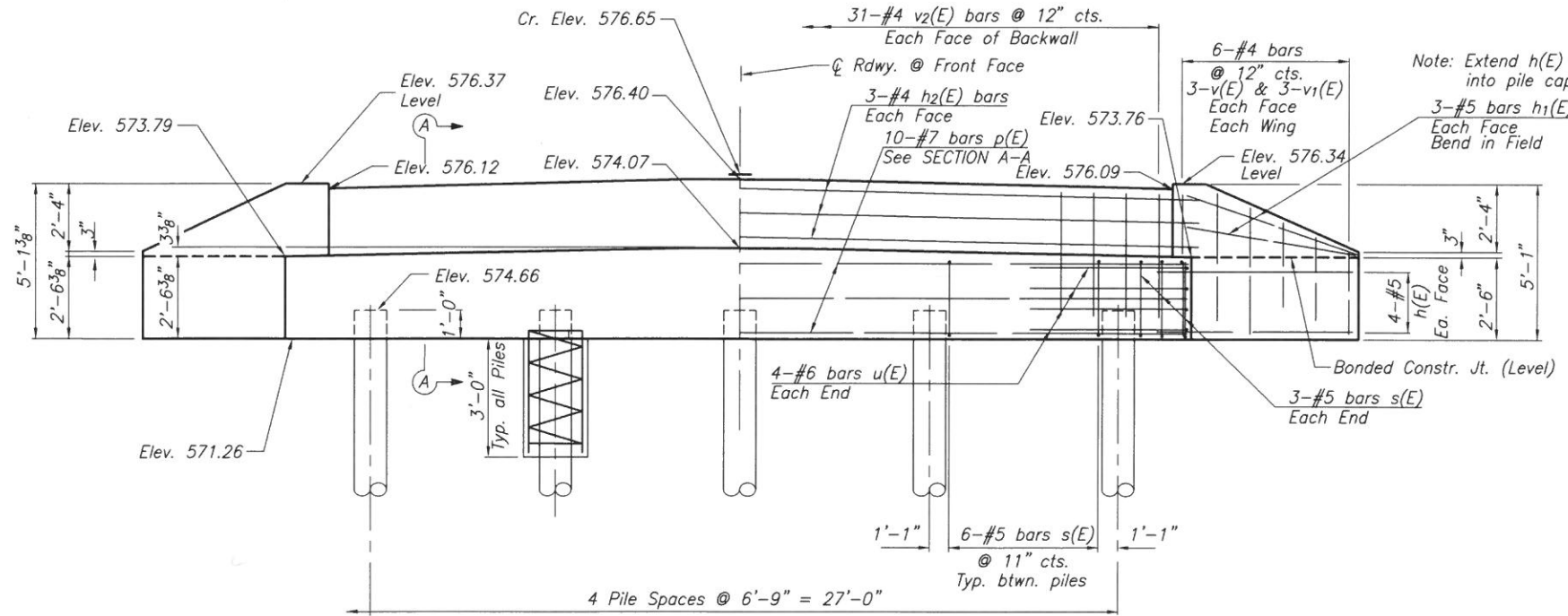


BAR u(E)



BAR s(E)

Note: After all beams are in place and dowel rods grouted, the backwall and portions of the wingwall above the bonded construction joint shall be poured.



ELEVATION

PILE DATA

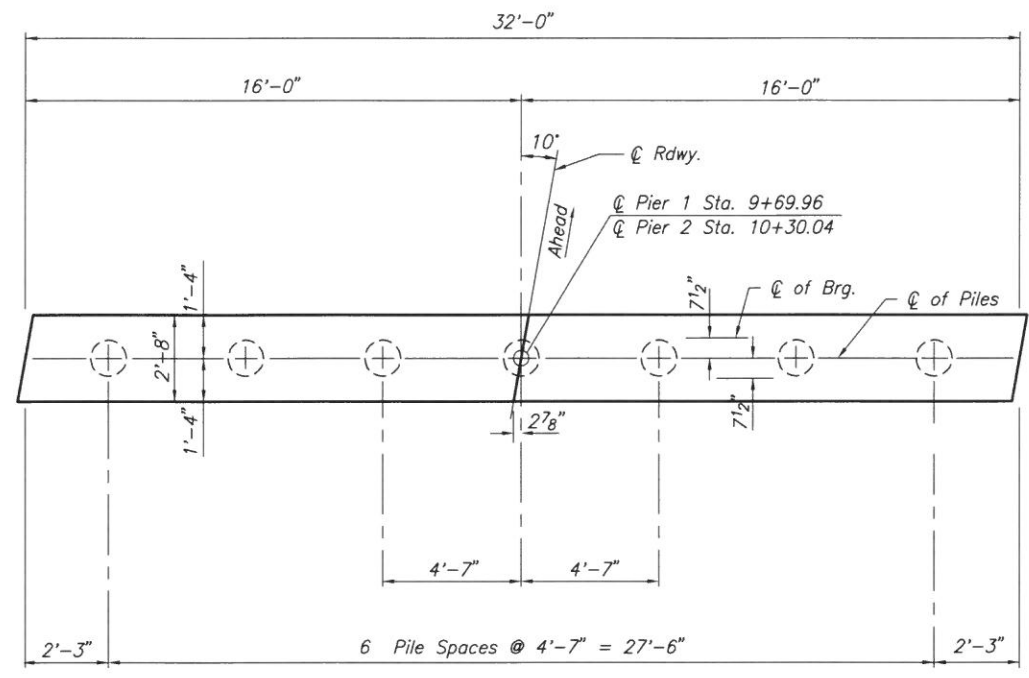
Type: Metal Shell - 12" ϕ x 0.25" walls
 Nominal Required Bearing 232 Kips
 Factored Resisitance Available 116 Kips
 Est. Length 40 ft.
 Number Required 5

BILL OF MATERIAL - 1 ABUT.

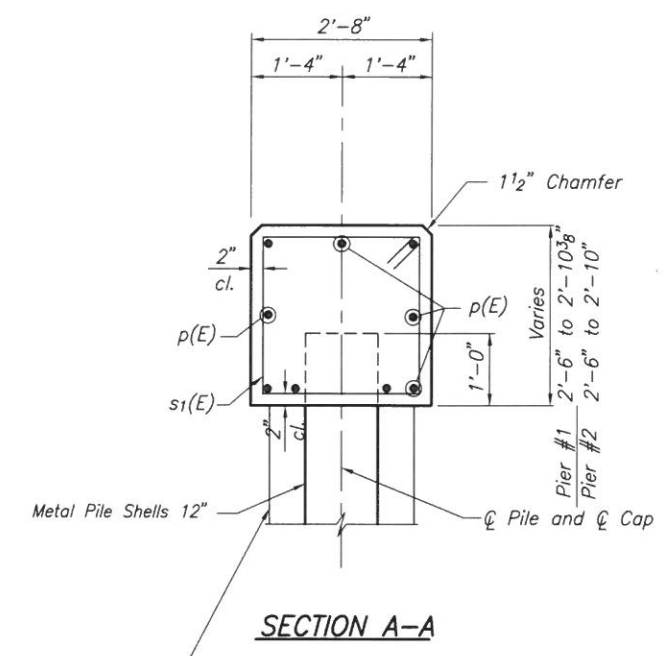
BAR	NO.	SIZE	LENGTH	SHAPE
h(E)	16	#5	7'-0"	—
h1(E)	12	#5	5'-9"	—
h2(E)	6	#4	32'-6"	—
p(E)	10	#7	31'-8"	—
s(E)	30	#5	9'-7"	□
u(E)	8	#6	12'-2"	—
v(E)	12	#4	4'-1"	—
v1(E)	12	#4	2'-8"	—
v2(E)	62	#4	4'-4"	—
Concrete Structures			Cu. Yd.	11.7
Reinforcement Bars, Epoxy Coated			Pound	1,650
Metal Shell Piles 12" x 0.25"			Foot	200
Conc. Encasement			Cu. Yd.	2.3

SHEET TITLE		NORTH ABUTMENT	
PROJECT	SECTION 14-00099-00-BR	PROJECT NO.	14004
	COUNTY HIGHWAY 24	SCALE	
	MACOUPIN COUNTY	DATE	2-23-18
	STATION 10+00	DRAWN BY	MRL
		CHECKED BY	MCB
FEHR GRAHAM		DRAWING NO.	
ENGINEERING & ENVIRONMENTAL		11	
ILLINOIS DESIGN FIRM NO. 184-003525		OF 16 SHTS	
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ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
C.H. 24	14-00099-00-BR	MACOUPIN	16	12
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

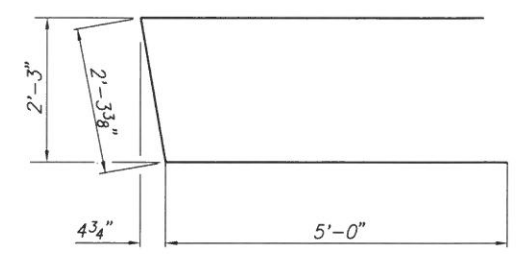


PLAN

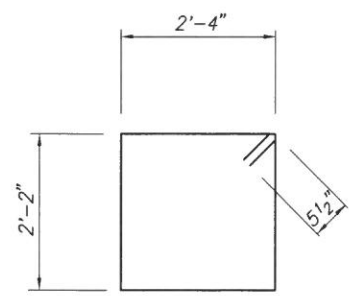


SECTION A-A

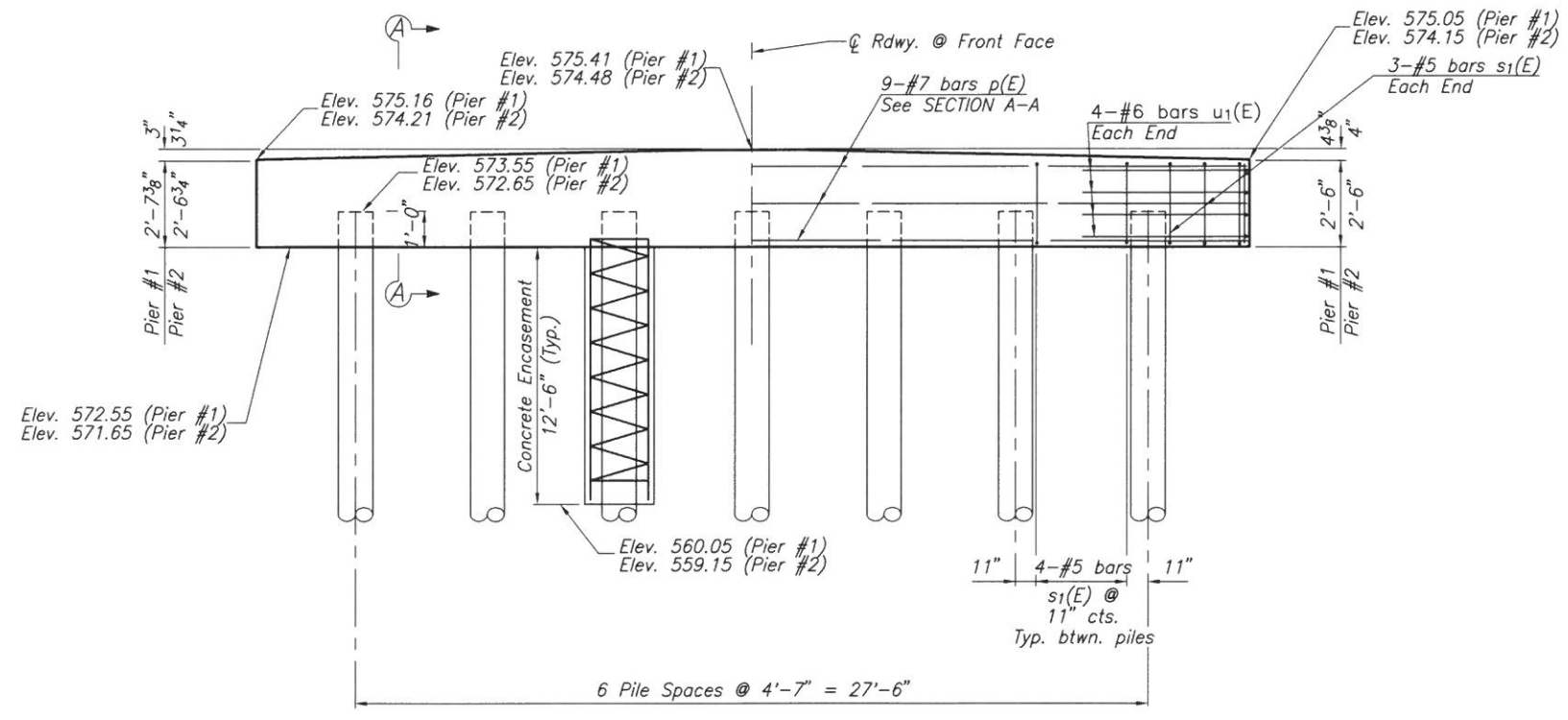
See Sheet 13 for Concrete Encasement Details.



BAR u1(E)



BAR s1(E)



ELEVATION
Looking North

BILL OF MATERIAL - 2 PIERS

BAR	NO.	SIZE	LENGTH	SHAPE
p(E)	18	#7	31'-8"	—
s1(E)	60	#5	9'-11"	□
u1(E)	16	#6	12'-4"	⊓
Concrete Structures			Cu. Yd.	16.6
Reinforcement Bars, Epoxy Coated			Pound	2,090
Metal Shell Piles 12"x0.25"			Foot	580
Test Pile, Metal Shells			Each	1
Concrete Encasement			Cu. Yd.	26.5

PILE DATA

	Pier #1	Pier #2
Type: Metal Shell - 12"ø x 0.25" walls		
Nominal Required Bearing	294 Kips	294 Kips
Factored Resitance Available	147 Kips	147 Kips
Est. Length	40 ft.	50 ft.
Number Required	7	7*

*Includes one metal shell test pile to be driven in a permanent location at Pier #2.

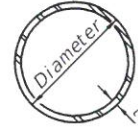
SHEET TITLE: **PIERS**

PROJECT: SECTION 14-00099-00-BR COUNTY HIGHWAY 24 MACOUPIN COUNTY STATION 10+00

PROJECT NO. 14004
SCALE 2-23-18
DATE 2-23-18
DRAWN BY MRL
CHECKED BY MCB

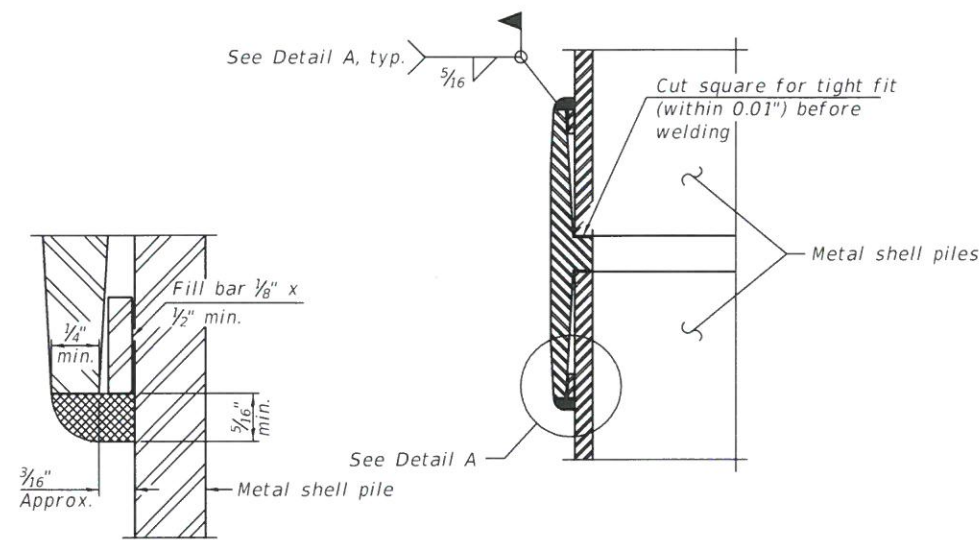
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ILLINOIS DESIGN FIRM NO. 184-003225
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12 OF 16 SHEETS

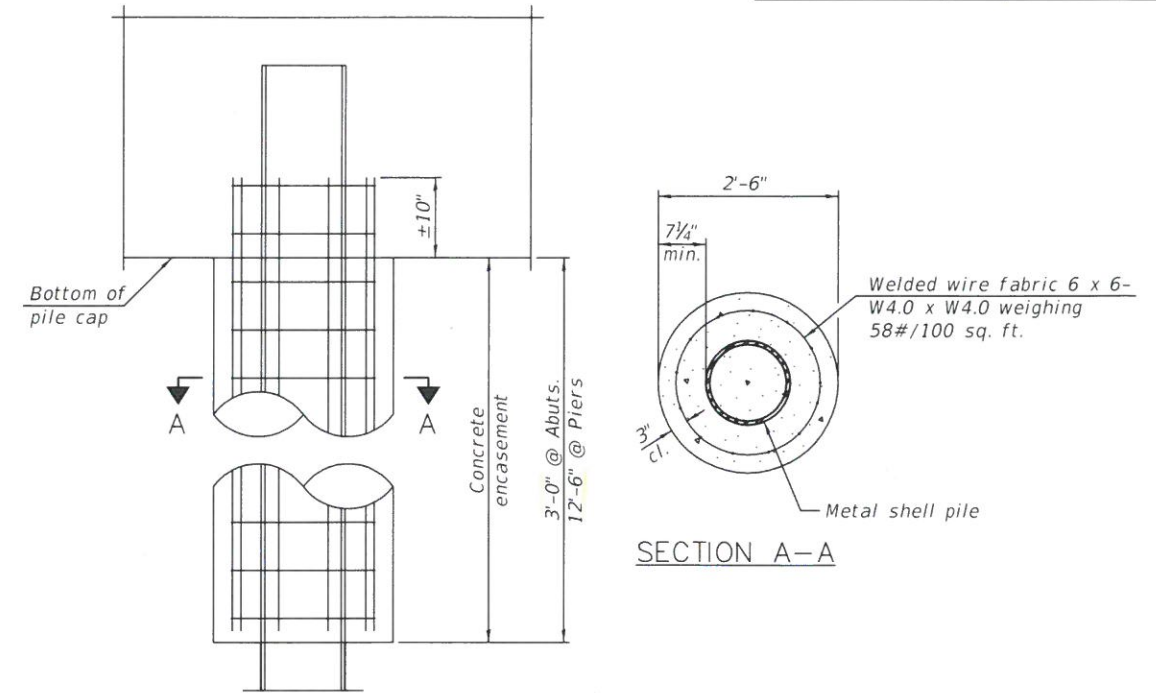


METAL SHELL PILE TABLE

Designation and outside diameter	Wall thickness t	Weight per foot (Lbs./ft.)	Inside volume (yd. ³ /ft.)
PP12	0.250"	31.37	0.0267
PP14	0.250"	36.71	0.0368
PP14	0.312"	45.61	0.0361
PP16	0.312"	52.32	0.0478
PP16	0.375"	62.64	0.0470



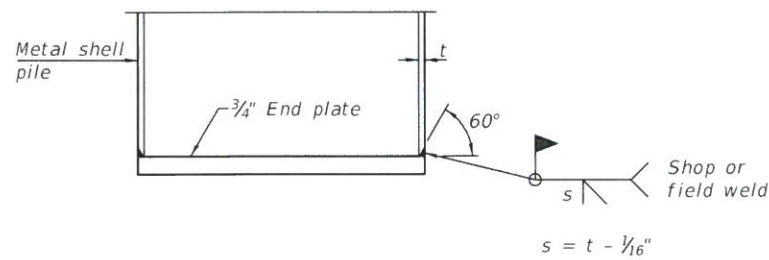
DETAIL A



ELEVATION

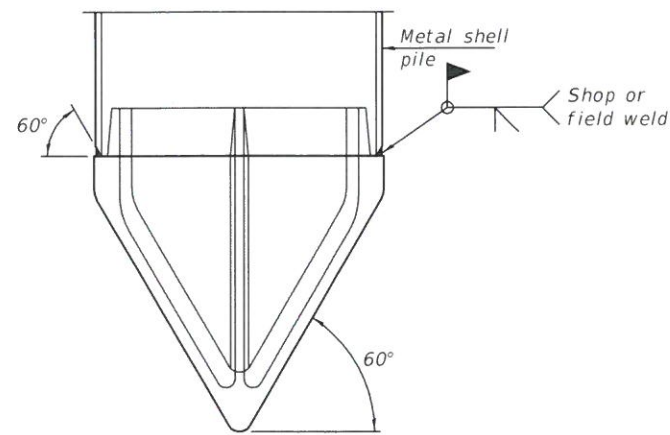
SECTION A-A

INDIVIDUAL PILE CONCRETE ENCASUREMENT AT PIERS



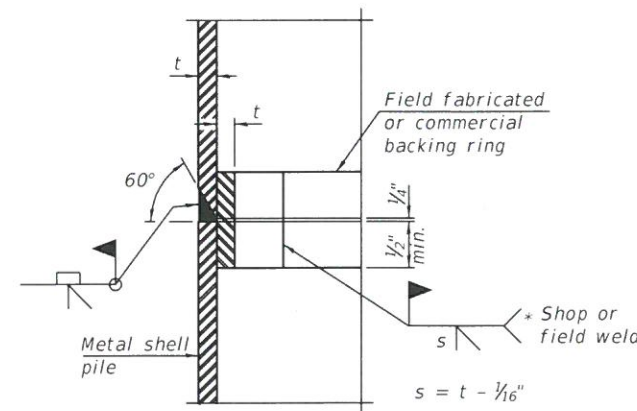
END PLATE ATTACHMENT

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



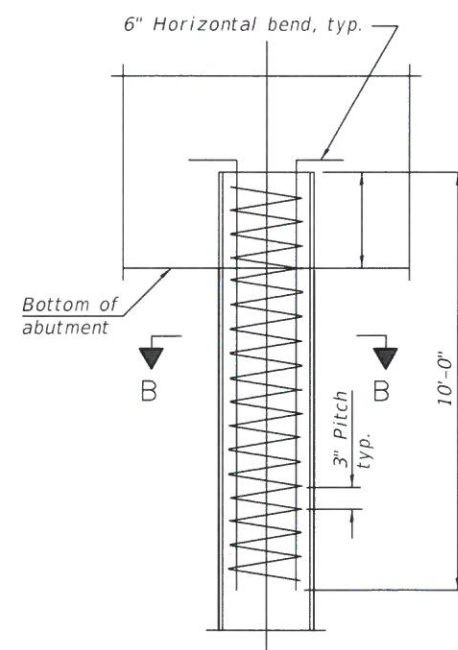
PILE SHOE ATTACHMENT

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



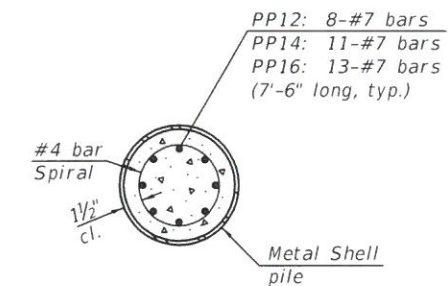
COMPLETE PENETRATION WELD SPLICE

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



ELEVATION

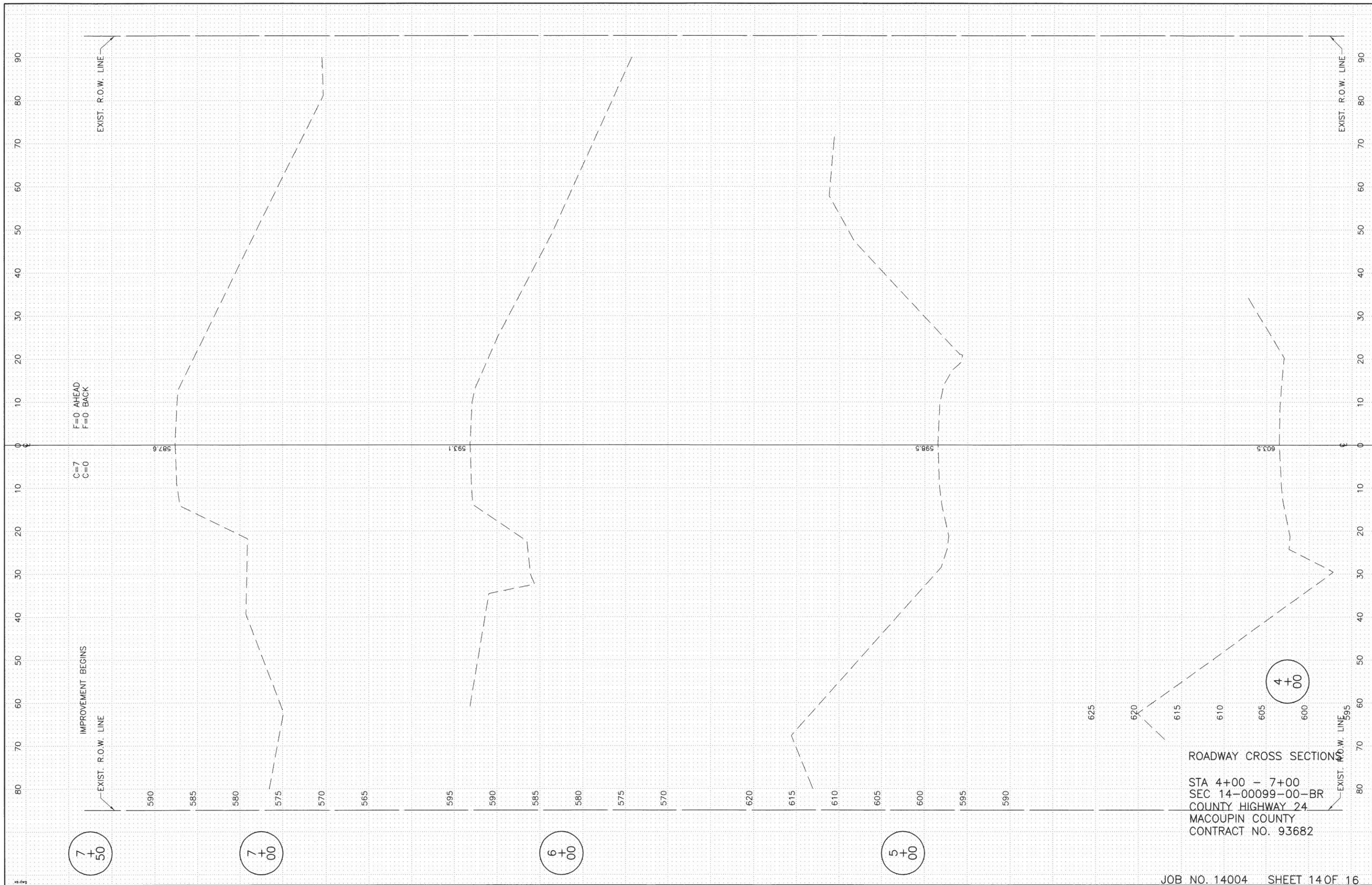
REINFORCEMENT AT ABUTMENTS

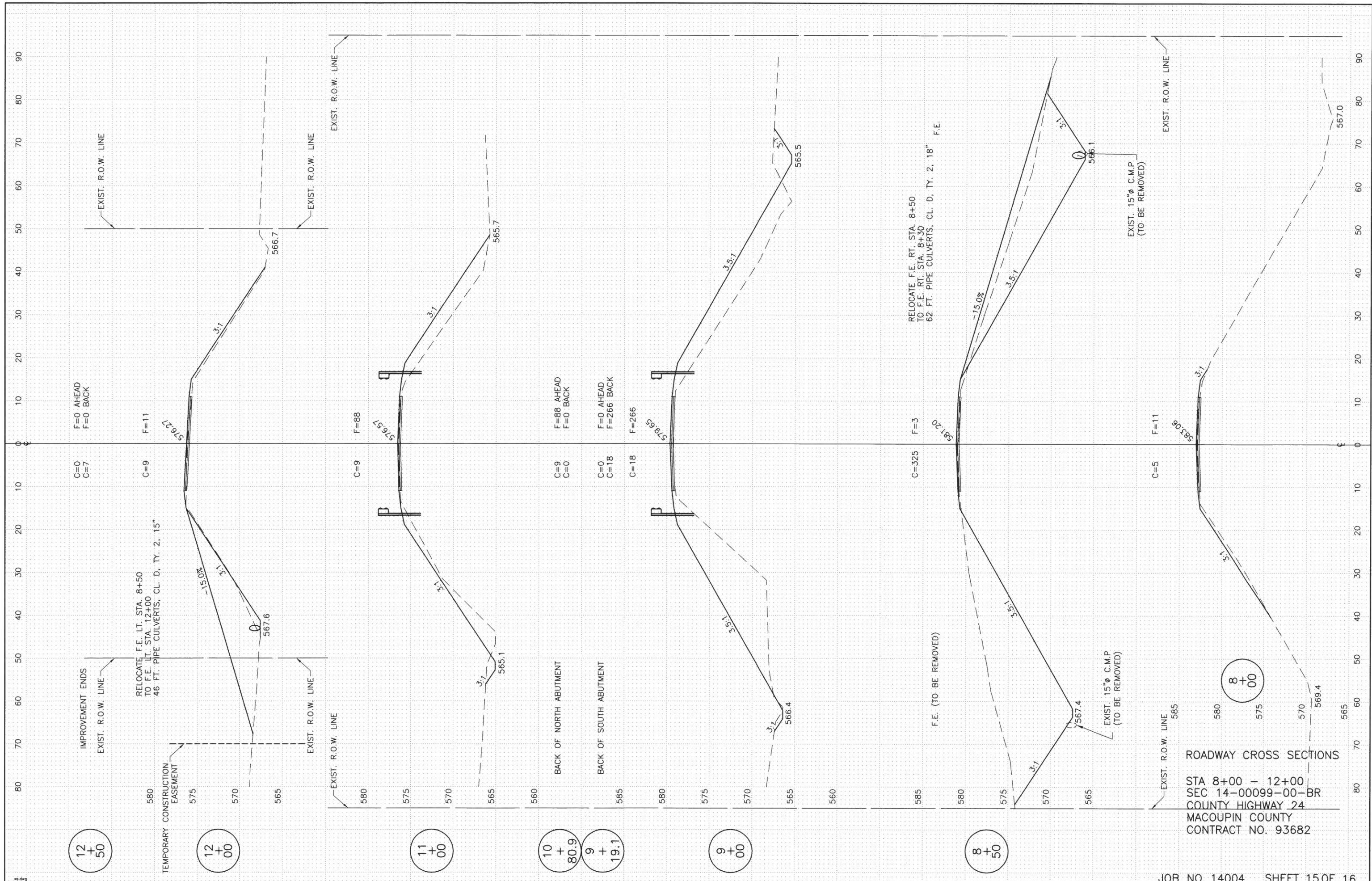


SECTION B-B

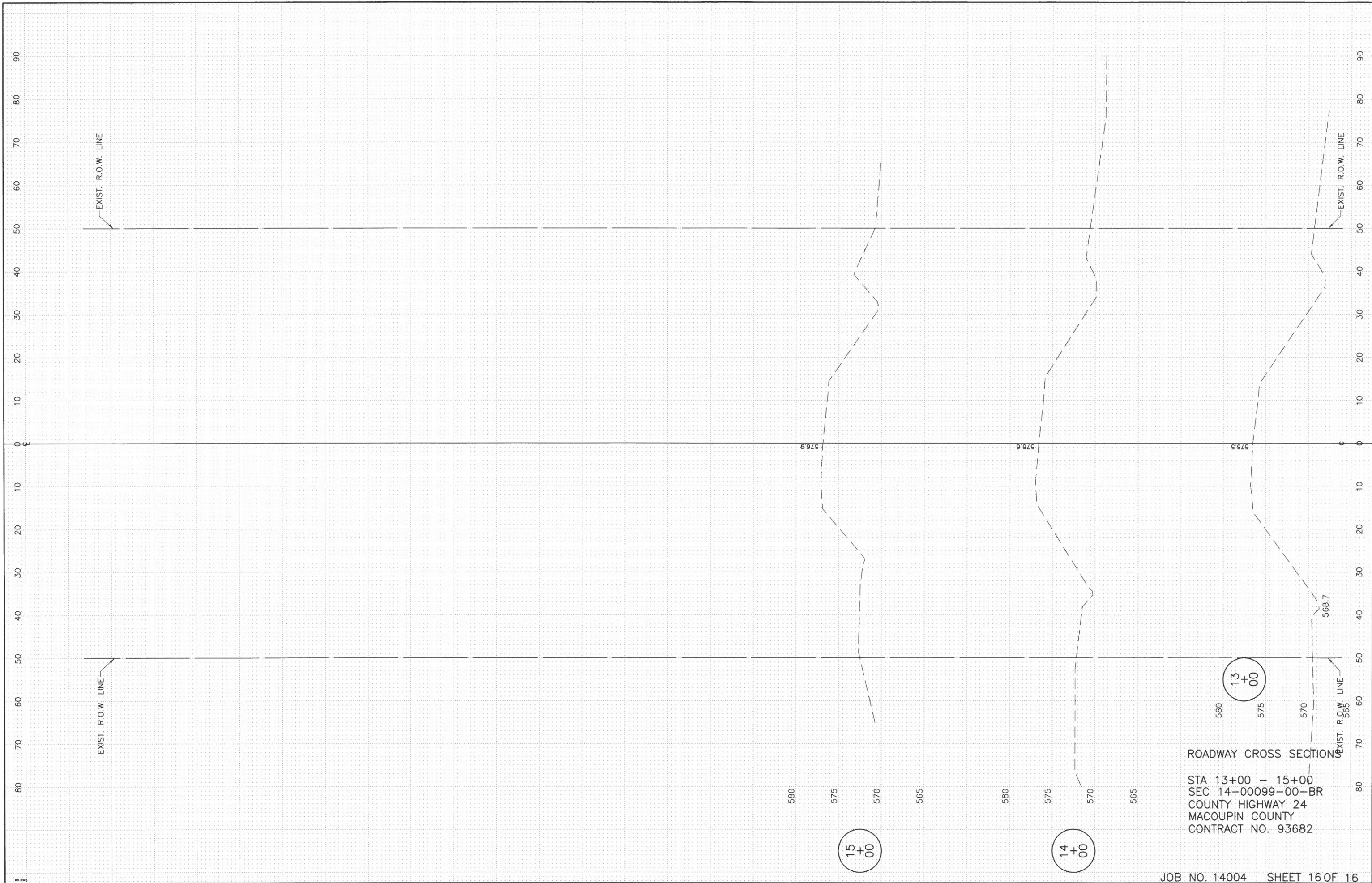
Note:
 The metal shell piles shall be according to Article 1006.05 of the Standard Specifications.

SHEET TITLE METAL SHELL PILE DETAILS	
PROJECT SECTION 14-00099-00-BR COUNTY HIGHWAY 24 MACOUPIN COUNTY STATION 10+00	PROJECT NO. 14004 SCALE DATE 2-23-18 DRAWN BY MRL CHECKED BY MCB DRAWING NO.
FEHR GRAHAM ENGINEERING & ENVIRONMENTAL ILLINOIS DESIGN FIRM NO. 184-003525 © 2018 FEHR GRAHAM	
13 OF 16 SHEETS	





ROADWAY CROSS SECTIONS
 STA 8+00 - 12+00
 SEC 14-00099-00-BR
 COUNTY HIGHWAY 24
 MACOUPIN COUNTY
 CONTRACT NO. 93682



ROADWAY CROSS SECTION
 STA 13+00 - 15+00
 SEC 14-00099-00-BR
 COUNTY HIGHWAY 24
 MACOUPIN COUNTY
 CONTRACT NO. 93682